

Project Proposal

Project Title: Proactive Customer Experience: Predicting and Preventing Journey Disruptions

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1. Project Overview

The primary objective of this project is to develop a predictive model that identifies and prevents potential disruption in the customer experience at the National Center for the Non-Profit Sector. The existing system handles customer complaints and requests manually, and they are only examined for root causes once the issues have been experienced. This is a reactive approach and leads to delays in solving recurring problems and negative impacts on customer satisfaction. Using artificial intelligence, in this case, machine learning and natural language processing (NLP) methodologies, the project will predict complaints from customers in real-time to enable early interventions. The model will flag the point when a particular problem accumulates five to ten complaints to send an alert before it is too late. This strategy not only will increase customer satisfaction but also improve efficiency by enabling the team to take care of matters in time. Note: the language used in raising complains is Arabic and the geographical scope in KSA.

2. Project Goal

The goal of this project is to:

- Develop a predictive model to forecast when a specific issue trigger multiple customer complaint.
- Improve operational efficiency by enabling a proactive approach to problem identification and resolution.
- Create a tool that notifies relevant personnel when a potential issue is likely to disrupt the customer journey, allowing for preemptive action.

3. Approach

To achieve the aim of advance forecasting of complaints of customers, the following activities shall be performed:

- **Data Collection:** Data shall be collected from the customer gateway of the National Center for the Non-Profit Sector through which customers submit requests, complaints, and inquiries. The data will include:
 - **Types of tickets** (e.g., request, ticket, inquiry, complaint, technical issue, objection).
 - **Types of services** (e.g., governance sector, digital transformation sector, growth sector).
 - **Text content of Complaints' content** (use of NLP approaches to problem comprehension and categorization).
- **Data Processing:** There will be pre-processing of raw data, i.e.:
 - **Cleaning:** Duplicates deletion, dealing with missing values, and normalizing text data.
 - **Model/Method Selection:** NLP and ML methods will be adopted according to the nature of the problem.

- **Machine Learning:** Supervised learning algorithms (e.g., Random Forest, Gradient Boosting Machines) will be used to predict the likelihood of multiple complaints based on historical patterns.
- **Natural Language Processing (NLP):** Sentiment analysis and topic modeling would be used to examine complaint content and categorize them.
- **Anomaly Detection:** Clustering or time series would be used to detect patterns of sudden spikes in complaints and create early warning triggers.
- **Testing and Evaluation:** Model performance would be measured based on:
- **Accuracy measures:** Precision, recall, F1 score, and ROC-AUC to identify correct prediction.
- **Customer satisfaction impact:** Watching predictive alert performance and response time or correlation of CSAT score increase.
- **Model generalizability:** Cross-validation and out-of-sample testing to ensure the model is well-performing on other problem types and sizes.

4. Project Steps and Timeline

- **Data Collection and Preparation (1-2 months):** Collect and clean the complaint and request data from the National Center for the Non-Profit Sector.
- **Preprocess the text data** for NLP tasks (tokenization, stemming, etc.) **(1-2 months)**
- **Model Building and Training (3- 4 months):**
- **Develop and train the predictive model** using machine learning algorithms and NLP techniques. **(2- 3 months):**
- **Testing and Evaluation (2 months):**
 - **Evaluate the model's performance** on historical data.
 - **Analyze** the correlation between predictive alerts and improved CSAT.
- **Final Adjustments and Reporting (1 month):**
 - **Refine** the model based on testing results.
 - **Prepare a comprehensive report** detailing the methodology, results, and potential business impacts.

5. Expected Results

- **Improved Accuracy in Predicting Customer Complaints:** The model ought to be capable of accurately forecasting when a certain issue will result in a spike complaint, allowing for timely intervention.
- **Early Alerts for Problem Prevention:** The system will provide warnings when complaints regarding a specific issue attain the threshold value (five or ten complaints), allowing the customer service department to take preventative actions.
- **Enhanced Customer Satisfaction:** By addressing potential issues prior to their escalation, the project will yield a measurable improvement in customer satisfaction (CSAT), reducing frustration and building greater trust in the services provided by the National Center for the Non-Profit Sector.

6. Resources Needed

- Tools and Software:
- Programming languages: Python (for machine learning and NLP).
- Libraries: TensorFlow for model development, processing, and analysis.
- Database tools: SQL or NoSQL for data storage and retrieval.
- Cloud services (e.g., AWS or Google Cloud) for computational resources, particularly for model training.
- Datasets:
- Historical complaint data from the National Center for the Non-Profit Sector, including both text-based content and categorical data on complaint types.
- Collaboration with domain experts in the non-profit sector for deeper insights into customer needs and complaint patterns.

7. References

- National Center for the Non-Profit Sector Website: [<https://ncnp.gov.sa>]