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**Assessment Cover Page**

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| *Student Full Name* | Denisse Garcia Vivolo |
| *Student Number* | sbs24050 |
| *Module Title* | Strategical Thinking |
| *Assessment Title* | CA 1 – Capstone Project Proposal |
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**Declaration**

By submitting this assessment, I confirm that I have read the CCT policy on academic misconduct and understand the implications of submitting work that is not my own or does not appropriately reference material taken from a third party or other source.

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I further confirm that this work has not previously been submitted for assessment by myself or someone else in CCT College Dublin or any other higher education institution.

Abstract

[NOTE: This section is designated for the abstract. Abstracts are not assigned page numbers and should precede the table of contents. If an abstract is unnecessary for your work, please delete this page.]

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Title: Forecasting the Future: A Customer Service Demand Prediction Model for Efficient Resource Planning

# Introduction

This capstone project aims to study customer service case data and how resource availability and skills impact the customer satisfaction.

This project will contribute to improved customer service by:

* Enabling proactive resource planning to meet customer demand.
* Reducing customer wait times and enhancing satisfaction.
* Optimizing operational costs associated with customer service.

Companies must understanding customer needs and putting initiatives in place to deliver more than what customer expect, creating efficiency in the process and resource allocation will help delivering superior customer service, it has been proven that establishing reputations will attract more business (Hinson, 2019)

# Objectives

This project studies, business forecasting for customer service resource allocation by leveraging historical case data and customer satisfaction data, using ML model so that companies can:

1. **Case Volume forecasting**: Predict the number of inquiries received through various channels (phone, chat, email).
2. **Support Latency**: Estimate average wait times for customers seeking support.
3. **High Demand Periods**: Identify peak demand periods to optimize resource allocation.
4. **Best Resource Available**: Determine best available resource for customer query.
5. **CSAT Prediction**: Predict the customer satisfaction (CSAT) per case base on resource allocation and best fit for customer query.

The goal is addressing these objectives is not limited to predict demand for customer service interactions through multiples channels but also to benefit business to be more efficient and drive cost saving by using lean methodology and only allocate resources when needed (Miletić and Miletić, 2017) and provide the best support.

# Problem Definition

Customer service is a critical touchpoint for any organization no matter if is a big, medium or small company, this help to shape customer perception and loyalty. Some companies does not have a tool that permits them to predict the customer service demand, which makes it difficult to plan and allocate resources to address customers queries rapidly, impacting the business and the customer perception of the brand. Companies need to improve strength of the service offerings to provide more customer satisfaction and create holistic value for their customers. (Jabr, 2011)

The challenges of the project are the following:

1. Appropriate data: finding a dataset that has enough rows to support the objective of the analysis.
2. Avoid bias in the analysis: Stay neutral and focus on the facts.
3. Finding sustainable solutions for the problem supported with reliable datasets: the lack of insufficient data has led to continuous research. The project aims to raise awareness, allowing the reader to research sustainable solutions.

# Scope

|  |  |  |
| --- | --- | --- |
|  | Semester 1 | Semester 2 |
| Description |  |  |
| Scope | * Definition of the problem and objective. * Analysis of the dataset of worldwide plastic usage. * Forecast * Analysis of the global pollution dataset. | * Analysis of general waste. * Forecast about the capacity of recycling facilities. * Conclusion of the analysis to bring awareness to the topic |
| Approach |  |  |
| Timeline |  |  |

# Data Sources

This dataset serves as a valuable resource for conducting Exploratory data analysis (EDA), Visualization, and Machine Learning Classification tasks pertaining to customer service performance evaluation, satisfaction forecasting, and customer behavior analysis within the e-commerce sector.

|  |  |  |
| --- | --- | --- |
| Dataset | Link | Tables |
|  | [Customer Support Ticket Dataset (kaggle.com)](https://www.kaggle.com/datasets/suraj520/customer-support-ticket-dataset) |  |
|  | [eCommerce Customer Service Satisfaction (kaggle.com)](https://www.kaggle.com/datasets/ddosad/ecommerce-customer-service-satisfaction) |  |
|  |  |  |

# Ethical Considerations

User data

While the report global plastic usage: future impact awareness does not directly involve sensitive data, user privacy or potential societal impact, however I believe ethical considerations remain essential to the report.

The report will prioritise transparency and accuracy in the use of data, adhering to proper dataset usage.

All the sources referenced will be appropriately cited under the guidelines of Harvard Reference to acknowledge the contribution of others to avoid plagiarism.

Additionally, the report will emphasise the importance of responsible data handling and the ethical use of information for academic and educational purposes.

This capstone project while not involving medical data, still raises several ethical considerations, particularly concerning sensitive data, user privacy, and potential societal impacts.

1. Data Privacy and Consent: Handling customer service data necessitates careful consideration of user privacy. The project should prioritize obtaining explicit consent from users for the collection, storage, and analysis of their data. Compliance with global data protection regulations such as the General Data Protection Regulation (GDPR) in the European Union and the California Consumer Privacy Act (CCPA) in the United States is imperative. These regulations outline strict guidelines for the collection, processing, and storage of personal data and require transparency regarding data usage.

2. Data Security: Ensuring the security of the collected data is essential to prevent unauthorized access, data breaches, or misuse. Employing robust encryption techniques, secure storage practices, and access controls can mitigate security risks associated with handling sensitive customer data.

3. Bias and Fairness: The predictive model developed as part of the project should be assessed for potential biases to ensure fairness and equity in resource allocation decisions. Biases in the data or the model can result in discriminatory outcomes, disadvantaging certain groups of customers. Techniques such as fairness-aware machine learning and bias mitigation strategies should be implemented to address these concerns.

6. Societal Impact: Assessing the potential societal impacts of the predictive model is crucial to mitigate any unintended consequences. For example, changes in resource allocation based on predictions may affect customer experiences, employee workloads, and overall service quality. Conducting thorough impact assessments and soliciting feedback from stakeholders can help identify and address any adverse effects.

7. Ethical Guidelines and Frameworks: Adhering to established ethical guidelines and frameworks in data science and machine learning, such as the ACM Code of Ethics and Professional Conduct or the IEEE Global Initiative for Ethical Considerations in Artificial Intelligence and Autonomous Systems, can provide valuable guidance in navigating ethical challenges associated with the project.

By carefully considering these ethical considerations and adhering to relevant regulations and guidelines, the Forecasting the Future project can develop a customer service demand prediction model that maximizes efficiency while respecting user privacy and promoting fairness and transparency.

# Reference

Hinson, R. (2019). *Customer service essentials : lessons for Africa and beyond*. Charlotte, NC: Information Age Publishing.

Jabr, F. (2011). John A. Long - Publications List. *Publicationslist.org*, [online] 14(6). Available at: http://publicationslist.org/jlong.

Miletić, M. and Miletić, I. (2017). LEAN METHODOLOGY AND ITS DERIVATES USAGE FOR PRODUCTION SYSTEMS IN MODERN INDUSTRY. *Applied Engineering Letters*, [online] 2(4), pp.144–148. Available at: https://doaj.org/article/854bd42875b7497b9a85755f0b91f297 [Accessed 24 Mar. 2024].