**PROJECT BRIEF**

**Project: AI Customer Analyzer**

**Group: 19**

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# 1 Project Brief History

## 1.1 Document Location

This document is only valid on the day it was printed.

The source of the document will be found on the project's PC in location

## 1.2 Revision History

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## 1.3 Approvals

This document requires the following approvals.

Signed approval forms are filed in the Management section of the project files.

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| --- | --- | --- | --- | --- |
| **Name** | **Signature** | **Title** | **Date of Issue** | **Version** |
| Dr.Yasas Jayaweera |  | Project Executive |  |  |
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## 1.4 Distribution

This document has been distributed to:

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## 3 Project Brief

The brief clearly and concisely describes the project and its objectives. It overviews the business case, including the estimated costs, benefits, and expected return on investment. It outlines the project approach and methodology, including key assumptions, dependencies, and risks. The document also identifies the key stakeholders, their roles and responsibilities, and any relevant regulatory or legal requirements.

DreamSpace is a company looking to build an AI-powered computer vision-based customer analysis system that can monitor and gather data about its customers. The system will be placed at the entrance of the company's premises to detect customers as they enter and collect information such as the number of customers, their age range, gender, and emotions. It also analyzes real-time audio to calculate the negative and positive words used by sales employees when talking with customers to improve their communication skills in the future.

## 4 Purpose

The purpose of the app is to develop an AI-powered computer vision-based customer analysis system that can accurately count the number of customers entering DreamSpace's premises, detect the age range, gender, emotions, and race of customers, as well as monitor sales employees' vocals to improve their professional communication skills. Additionally, the app will provide a mask reminder to visitors if necessary and a user-friendly interface for easy interaction with visitors. Finally, the app will include a backend panel to allow DreamSpace to view and analyse the gathered data. The app’s goal is to provide a more efficient and effective solution for visitor analysis, freeing up staff time and resources while providing valuable customer analysis data.

## 5 Background

In today's world, companies must understand their customers to serve them better and provide a personalized experience. Customer analysis helps businesses identify the demographics of their target audience, preferences, and behaviour. Traditional methods of customer analysis, such as surveys and interviews, it can be time-consuming and may not accurately represent the customer base.

DreamSpace Market, based in Sri Lanka, recognizes the need for a more efficient and accurate customer analysis system, to address this, they have initiated a project to develop an AI-powered computer vision-based customer analysis system to monitor and gather data about its customers in real time. This system will use computer vision algorithms to detect the number of customers, age range, gender, emotions, and even race. And moreover, it will monitor the interactions between sales employees and customers to improve their communication skills in the future.

The system will be placed at the entrance of the company's premises. It will perform the essential duties of a security guard, welcoming visitors, counting them, and predicting their age range, gender, and mood. The system will also remind visitors to wear a face mask if necessary, contributing to the customer’s and staff's health and safety. The company aims to develop a user-friendly interface for system administration, making interacting with the procedure easy.

This project will leverage computer vision learning algorithms, such as convolutional neural networks (CNNs), and machine learning libraries, such as OpenCV and TensorFlow, to develop an accurate and efficient AI Customer Analyzer bot for visitor analysis and mask reminder. The project will be delivered within ten weeks from the start date, with regular updates and progress reports provided to the client. The system will provide valuable insights and data that can be used to understand better and serve customers, ultimately leading to improved customer satisfaction and business growth.

## 6 Project Definition

### 6.1 Project Objectives:

This project aims to develop an AI-powered computer vision-based customer analysis system that will perform the essential duties of a security guard, including welcoming visitors, counting them, and predicting their age range, gender, and mood. The system should also remind visitors to wear a face mask if necessary.

* To make the company’ mall as AI-based one
* To build an AI-powered system that can accurately count the number of customers entering DreamSpace's premises.
* To detect the age range of customers.
* To detect the gender of customers.
* To detect the emotions of customers.
* To detect the race of customers.
* To monitor sales employees' vocals to improve their professional communication skills.
* Provide a backend panel for DreamSpace to view and analyze the gathered data.

### 6.2 Project Scope:

This project's scope includes the development of an AI security bot that uses computer vision and machine learning to perform the following tasks:

* Welcome visitors as they enter the premises in Tamil, Sinhala, English,
* Count the number of visitors.
* Predict the age range, gender, and mood of visitors using computer vision and machine learning algorithms.
* Provide reminders to visitors to wear a face mask if necessary.

### 6.3 Project Deliverables:

* Project Plan: A detailed project plan that includes a timeline, milestones, and resources required to complete the project.
* Design and Architecture: A complete design and architecture plan for the system, including the hardware and software requirements.
* Welcome Visitor Functionality: The system should be able to welcome visitors in Tamil, Sinhala, and English.
* Visitor Counting Functionality: The system should accurately count the number of visitors entering DreamSpace's premises.
* Age Prediction Functionality: The system should predict the age range of visitors using computer vision and machine learning algorithms.
* Gender Prediction Functionality: The system should predict the gender of visitors using computer vision and machine learning algorithms.
* Mood Prediction Functionality: The system should predict the mood of visitors using computer vision and machine learning algorithms.
* Race Prediction Functionality: The system should predict the race of visitors using computer vision and machine learning algorithms.
* Mask Reminder Functionality: The system should remind visitors to wear a mask if necessary.
* User-friendly Interface: The system should have a user-friendly interface that allows easy visitor interaction.
* Backend Panel: A web-based backend panel that allows DreamSpace to visualize and analyze the gathered data.
* Audio Monitoring Functionality: The system should monitor sales employees' vocals to improve their professional communication skills.
* Test and system testingsive testing of the system to ensure that it meets the specified requirements.
* Documentation: Documentation of the project, including user manuals, technical manuals, and installation instructions.
* Training: Training for DreamSpace's staff on how to use the system and interpret the gathered data.
* Ongoing Support: Ongoing technical support and maintenance for the system after the project is completed.

### 6.4 Agriculture Diagram:

**Diagram

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## 7 Outline Business Case

The project of developing an AI-powered computer vision-based customer analysis system for DreamSpace supports the company's business strategy and plans in several ways.

Firstly, the system aligns with the company's goal of providing excellent customer service. By accurately counting and analysing customer data, the system will help the company understand its customers better, their needs, and preferences, enabling DreamSpace to offer personalized and relevant products and services. This, in turn, will lead to increased customer satisfaction, loyalty, and retention.

Secondly, the system's ability to monitor sales employees' vocals and improve their communication skills will align with the company's plan to improve employee training and development. This will create a positive and professional work environment that will benefit the staff and the company's customers.

Thirdly, the mask reminder feature of the system will help ensure the health and safety of visitors and staff, aligning with the company's plan to prioritize and maintain the safety of its customers and employees.

Finally, by providing a user-friendly interface and a backend panel for DreamSpace to view and analyze the gathered data, the system will help the company make data-driven decisions, which will help develop and execute effective marketing and sales strategies.

Therefore, the project is needed to achieve DreamSpace's business strategy, plans, and programs to improve customer service, employee training and development, health and safety, and data-driven decision-making.

## 8 Customer’s Quality Expectations

* Usability: Customers will expect the system to be user-friendly and easy to interact with. The user interface should be intuitive and straightforward, providing a seamless experience for visitors interacting with the system.
* Reliability: Customers will expect the system to be reliable and function consistently, without interruptions or errors. The system must be capable of running for extended periods without requiring frequent maintenance, and any issues must be resolved quickly to minimize downtime.
* Usability: Customers will expect the system to be user-friendly and easy to interact with. The user interface should be intuitive and straightforward, providing a seamless experience for visitors interacting with the system.
* Security: Customers will expect the system to be secure and protect sensitive data. The system must adhere to security standards and protocols to ensure the confidentiality and integrity of the collected data.
* Usability: Customers will expect the system to be user-friendly and easy to interact with. The user interface should be intuitive and straightforward, providing a seamless experience for visitors interacting with the system.
* Security: Customers will expect the system to be secure and protect sensitive data. The system must adhere to security standards and protocols to ensure the confidentiality and integrity of the collected data.

## 9 Acceptance Criteria

* Accuracy: The system should accurately count the number of visitors entering the premises, with a minimum accuracy rate of 65%.
* Age prediction: The system should accurately predict visitors’ age range, with a maximum deviation of +/- 5 years from the actual age.
* Gender prediction: The system should predict the gender of visitors accurately, with a minimum accuracy rate of 60%.
* Emotion detection: The system should accurately visitors’ emotions visitors, with a minimum accuracy rate of 60%.
* Language support: The system should be able to welcome visitors in Tamil, Sinhala, and English, with clear pronunciation and accurate translations.
* User-friendly interface: The system should have a user-friendly interface that allows easy interaction with visitors, with clear instructions and guidance.
* Scalability: The system should be scalable to handle many visitors and should be able to accommodate future upgrades and enhancements.
* Security: The system should be visitors privacy of visitors, with data encryption and user authentication features.
* Maintenance and support: The system should be easy to maintain and update, with clear documentation and technical support available to the client.

## 10 Any Known Risks

* Technical Risks: The project involves complex technical aspects such as computer vision and machine learning algorithms. There is a risk that the algorithms need to be more accurate, leading to incorrect predictions and unreliable data.
* Data Privacy and Security Risks: The project involves collecting and analysing customer data, which could pose data privacy and security risks. Sensitive customer information must be hand carefully to avoid any potential data breaches or leaks.
* Integration Risks: The system should be integrated with the backend panel to visualize and analyse gathered data. Integration problems can occur if the system does not work as expected with the panel, leading to errors in data analysis.
* User Acceptance Risks: The system is designed to interact with visitors, and there is a risk that some visit need to may not accept or feel comfortable with the system. This could lead to negative experiences and potential reputational damage for DreamSpace.
* Hardware Risks: The system requires specific hardware components, such as cameras and microphones, to function correctly. Hardware malfunctions or failures could cause the system to malfunction and provide incorrect or no data.
* Staff Training Risks: The system monitors sales employees' vocals to improve their professional communication skills. Staff training may be required to ensure they understand how the system works and how to use the feedback to improve their communication skills.