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BarberMetrics - BarberShop Monitoring System

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1 Introduction

The "BarberMetrics" system aims to provide barbershop owners with a comprehensive computer vision solution to track the occupancy of their barbershop chairs. By accurately counting the number of customers seated on the chairs, the app will calculate real-time and historical data regarding customer flow, barber speed, and revenue generated and it also provide a dataset for extracting further insights. This concept note outlines the key features and benefits of the BarberMetrics system.

1.1 Objectives

The BarberMetrics project seeks to achieve the following objectives:

- Real-time Occupancy Tracking: Utilize computer vision algorithms to detect and count the number of customers seated on barbershop chairs in real time.
- Profit Calculation: Calculate revenue generated by analyzing the occupancy data in correlation with pricing information.
- Performance Analytics: Analyze barber performance by calculating the average time spent on each customer and identifying potential bottlenecks.
- Barber Performance Comparison: Implement a mechanism to measure and compare the service times of different barbers, allowing for performance analysis and identification of potential areas for improvement.
- Historical Insights: Store historical data for day-to-day, weekly, monthly, and yearly trends, aiding in strategic decision-making.

1.2 Scope

The BarberMetrics system will encompass the following components:

- Computer Vision Module: Develop a computer vision model to detect and count occupied chairs using image processing techniques.
- Revenue Calculation Module: Implement a revenue calculation algorithm based on occupancy count and pricing information.
- Performance Analytics Module: Calculate average service time per customer, providing insights into each barber efficiency.
- Barber Performance Comparison Module: Create a mechanism to measure and compare the service times of different barbers based on their interactions with customers.
- Data Storage: Store historical occupancy and revenue data for different time intervals (daily, weekly, monthly, yearly).

1.3 Methodology

The project will follow these steps:

- Data Collection and Preparation: Gather labeled chair images and occupancy data for model training and algorithm testing.
- Model Development: Develop a computer vision model using appropriate libraries (e.g., OpenCV, TensorFlow) for chair detection and tracking.
- Occupancy Tracking: Implement real-time chair detection and occupancy counting using the trained model.
- Revenue Calculation: Develop an algorithm to calculate revenue based on the occupancy count and pricing information.
- Performance Analysis: Calculate average service time and other relevant performance metrics.
- Data Storage: Implement a data storage solution to save historical occupancy and revenue data.

1.4 Expected Outcomes

- Enhanced Profitability: By providing real-time insights into chair occupancy and revenue, shop owners can optimize scheduling and resource allocation, leading to increased profitability.
- Improved Efficiency: Barber performance analytics can help identify areas for improvement and streamline service delivery.
- Optimized Business Operations: Barbershop owners can make data-backed decisions to enhance profit making while maintaining high levels of customer satisfaction.

- **Balanced Approach:** By providing insights into both revenue generation and barber efficiency, the system aims to strike a harmonious balance between profit making and customer satisfaction.
- **Enhanced Accountability and Transparency:** The system will promote accountability and transparency between shop owners and barbers, leading to a more equitable and collaborative environment.
- **Informed Decision-Making:** Historical occupancy and revenue data will aid in strategic decision-making for business growth.
- **User Satisfaction:** Barbers can gauge their speed and performance, fostering healthy competition and professional development.

1.5 Conclusion

The BarberMetrics project presents an innovative solution for modernizing barber-shops through technology. By combining computer vision, revenue calculation, and performance analysis, the system aims to contribute to the success and efficiency of barbershop operations.