

A Project Report

On

A Cross-Platform mobile application to display the important

features of Yamaha Bike.

Batch Details  
CCS-G04

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**1. INTRODUCTION**

**General Introduction**

This project focuses on developing a cross-platform mobile application to display the key features of Yamaha bikes using Augmented Reality (AR). By leveraging Vuforia and Unity, the app will overlay 3D features such as engine type, suspension details, and frame structure onto real Yamaha bikes when scanned with a mobile camera. This AR app will enhance user engagement by providing a modern and interactive way to explore the technical details of Yamaha bikes.

**Introduction to the domain of the Problem Statement**

Augmented Reality (AR) is becoming increasingly significant in many industries, particularly in product visualization and education. In the automotive industry, AR allows potential customers and enthusiasts to interact with complex vehicle components without needing a deep technical background. This project focuses on applying AR to Yamaha motorcycles, enabling users to visualize important features and technical details in real-time. Using technologies like Vuforia and Unity, we aim to bridge the gap between static brochures and immersive experiences.

**2. LITERATURE REVIEW**

Existing Methods

Several methods are used to visualize motorcycle features, including traditional 2D brochures, 3D models in websites, and even interactive web-based configurations. Below are some existing methods, their advantages, and limitations:

1. Printed Brochures

- Advantages: Easy to distribute; provides static information.

- Limitations: Lacks interactivity and fails to provide an immersive experience.

2. Website Configurators

- Advantages: Users can configure bikes in real-time with color, accessories, etc.

- Limitations: Limited to 2D or basic 3D models; lacks physical interaction.

3. Augmented Reality in Retail

- Advantages: AR apps exist to visualize products (furniture, fashion) in physical environments.

- Limitations: Most apps focus on static products, not highly technical items like motorcycles.

4. VR Showrooms

- Advantages: Immersive experience where users can "test" products in virtual environments.

- Limitations: Requires VR headsets; limited accessibility.

5. Interactive Apps for Technical Training\*\*

- Advantages: Hands-on learning for technical subjects like mechanical parts.

- Limitations: Primarily used in education, not for general consumers.

6. Product Comparison Websites

- Advantages: Detailed side-by-side comparison of motorcycle specs.

- Limitations: Lacks visual and interactive elements.

7. YouTube Demonstrations

- Advantages: Visual demonstrations of bike features.

- Limitations: Passive experience without interactivity.

8. Standalone AR Bike Apps

- Advantages: Some AR apps show bike features, but are brand-specific and lack cloud integration.

- Limitations: Lack of cross-platform capabilities and real-time cloud recognition.

**Research Gaps**:

Existing methods either lack interactivity or are not tailored to high-tech applications like Yamaha motorcycles. While some AR solutions exist, they are not integrated with advanced object recognition or cloud services, limiting their scalability and functionality.

**3. OBJECTIVES**

Based on the literature review, the following objectives were set for the project:

1. Develop a cross-platform AR application for both iOS and Android.

2. Implement AR using Vuforia to scan and display Yamaha bike features in real-time.

3. Integrate cloud recognition for enhanced bike detection and tracking.

4. Create an intuitive user interface that allows interactions like taking screenshots and sharing content.

**4. METHODOLOGY**

**Hardware and Software Used**

**Software:** Unity (for app development), Vuforia (for AR and cloud recognition), GitHub (for version control), and possibly Google Poly (for 3D model sourcing).

**Hardware:** Mid-to-high-end Android and iOS devices for testing AR performance and compatibility.

**Design Procedure**

1. **AR Camera**: Integrate Vuforia into Unity to launch the AR camera view when the app opens.

2. **Object Detection**: Configure Vuforia's cloud recognition to detect various Yamaha bike models.

3. **Feature Overlay**: Design 3D models representing features such as the engine, suspension, and headlight. Overlay these features on the real bike in the AR view.

4. **Interaction**: Enable features like taking screenshots and sharing them through the app.

5. **Testing**: Perform rigorous testing on both iOS and Android devices to ensure cross-platform compatibility and high performance (30+ FPS).

**5. TIMELINE FOR EXECUTION OF PROJECT**

1.Design (1-2 months):

* Create wireframes, UI/UX designs, and 3D models.
* Set up Vuforia object recognition and cloud backend.

2. Development (3-4 months):

* Implement AR tracking and cloud recognition.
* Build user interactions, including screenshot and sharing functionality.

3. Testing & Debugging (1-2 months):

* Perform cross-platform testing on various devices.
* Debug any issues related to AR object detection and performance.

**6. EXPECTED OUTCOMES**

* A fully functional cross-platform AR application that allows users to scan Yamaha bikes and view key features using AR.
* Smooth and responsive user experience with frame rates of 30+ FPS during AR interactions.
* Real-time cloud recognition of Yamaha bike models using Vuforia.
* User-friendly interface that encourages interaction, such as taking and sharing screenshots.

**7. CONCLUSION**

This project aims to provide a modern, engaging way for users to explore Yamaha bikes through augmented reality. By developing a cross-platform mobile app that uses AR technology, users will be able to view technical features of motorcycles in an immersive way. The project leverages Vuforia’s cloud recognition and Unity’s AR capabilities to deliver a scalable and responsive application. Despite potential risks such as technical challenges in AR recognition and platform compatibility, careful planning and iterative development using Agile methodology will help mitigate these risks.

**8. REFERENCES**

* Dalmasso, I., et al. "Survey, comparison, and evaluation of cross-platform mobile application development tools." Software, Practice, and Experience 42.1 (2013): 1-18.
* Singh, A., and Kumar, S. "A Study on Cross-Platform Mobile App Development Using Flutter and React Native." International Journal of Advanced Science and Technology 29.4 (2020): 3275-3283.
* Macho, S., and del Campo, P. "Improving User Engagement Through Cross-Platform Development in the Automotive Sector." Journal of Information Technology and Management 35.3 (2019): 199-212.
* Unity Documentation. "Unity Manual." Available at: [Unity Docs]([https://docs.unity.com](https://docs.unity.com/)).
* Vuforia Documentation. "Vuforia Developer Portal." Available at: [Vuforia Developer](<https://developer.vuforia.com>).
* AR and Cloud Recognition Methods.