Augmented Reality in Outdoor Gear Marketing: A Practical Implementation and User Experience Analysis at Sekaben Camp

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***Abstract— Augmented Reality (AR) technology has revolutionized the paradigm of product promotion and introduction in today's digital age. This research aims to develop an AR-based application that enables users to identify and promote outdoor equipment in a more interactive and realistic manner. The study focuses on Sekaben Camp, a camper rental company in Pangkalpinang, Bangka Belitung, which currently relies on brochures and conventional websites for promotion. Through the use of an AR application on Android smartphones, users will be able to view outdoor equipment in three-dimensional forms and interact with them directly within their surroundings. The methodology for developing this application follows a prototyping research approach. The benefits of this research include enhancing the understanding of the AR concept and its application in product promotion, while also providing practical contributions to Sekaben Camp by improving the attractiveness and marketing of their outdoor equipment. The study's limitations include focusing solely on applications developed for the Android platform and providing limited content on the camping tools available at Sekaben Camp. The results of this study indicate that by utilizing AR, users can experience more direct and realistic virtual interactions with camping tools, thereby increasing consumer interest and confidence in the rental process.***

***Keywords : Augmented Reality, Android, Outdoor Tools, Camping, Prototype Methods***

# Introduction

The outdoor recreation industry has experienced significant growth over the past decade, driven by a rising public interest in activities such as camping, hiking, and adventure sports. This surge in popularity has led to an increased demand for high-quality outdoor gear and equipment. However, traditional marketing strategies, while somewhat effective, often struggle to convey the unique features and advantages of these products, particularly to a digitally-savvy audience that seeks more interactive and immersive experiences.

Augmented Reality (AR) technology presents a novel solution to this challenge by enabling consumers to interact with products in a virtual space before making a purchase. AR applications allow potential buyers to gain a deeper understanding of product features, usability, and fit, thereby enhancing their overall shopping experience. Studies have shown that the integration of AR in marketing can significantly increase customer engagement, satisfaction, and ultimately, sales. For instance, research conducted by T. Abdulghani and B. P. Sati (2019) demonstrated the effectiveness of AR in educational settings, showing how AR applications can facilitate learning by providing interactive and engaging content. Similarly, A. F. Rojiq and B. R. Fajri (2020) explored the use of AR for promoting residential properties, highlighting how AR can enhance consumer experience by allowing potential buyers to visualize properties in a more realistic context.

Despite these promising findings, the application of AR within the outdoor gear sector remains relatively underexplored. Most existing research has concentrated on sectors such as education and real estate, leaving a gap in understanding how AR can be effectively utilized in outdoor equipment marketing. Furthermore, there is limited empirical evidence on how AR influences consumer behavior specifically in the outdoor recreation industry. This gap underscores the necessity for focused research that investigates the impact of AR on consumer engagement and purchasing decisions in this particular market.

This research paper seeks to address this gap by exploring the practical implementation of AR technology in the promotion of outdoor equipment at Sekaben Camp, a popular destination for outdoor enthusiasts. Sekaben Camp provides an ideal setting to evaluate the effectiveness of AR in enhancing consumer engagement and promoting outdoor gear, given its diverse visitor base and the variety of outdoor activities it offers.

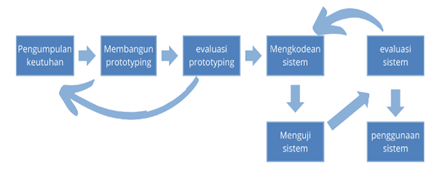
The primary objectives of this study are twofold: first, to develop and implement an AR application tailored to the needs of Sekaben Camp's visitors; and second, to analyze user experiences and feedback to assess the application's impact on their purchasing decisions and overall satisfaction with the promoted products. By conducting this research, we aim to contribute to the growing body of literature on AR in marketing, with a particular focus on its application in the outdoor equipment industry.

In the modern era, rapid advancements in information technology have transformed technology into a critical tool that significantly facilitates daily human activities. Technological sophistication today supports various aspects of life, including employment, media introduction, sales, and promotions. AR is one of the technologies that integrates the virtual world with the real world through computers, allowing virtual objects such as text, animations, 3D models, or videos to be seamlessly overlaid onto real environments. This integration enables users to interact with these objects within their surroundings, offering new experiences and changing the way users engage with their environment by complementing real-world views with dynamic digital elements.

AR has emerged as an effective and attractive promotional tool, enabling products to be introduced and marketed in a more realistic manner. This is particularly effective when the promotion is contextualized in a real-world environment that integrates the product being promoted. An effective marketing strategy can influence consumers' purchasing decisions by considering promotions, pricing, and product characteristics that align with consumer needs. Promotion can be conducted through various media, such as banners, posters, websites, and other digital platforms.

# research methods

In this study, the author utilizes a system development approach known as the Prototype Model.



This model is particularly effective for projects where user requirements are not fully understood from the outset, as it allows for iterative feedback and continuous refinement. The following stages outline the steps taken in the prototype development process:

Requirements Collection

At this initial stage, the author gathers all necessary information by collecting product data and reviewing several equipment brochures provided by the Sekaben Camp owner. This data serves as a reference for the development of the application, ensuring that it aligns with the specific needs of the business and its customers.

Build a Prototype

The next stage involves the creation of a preliminary design for the Sekaben Camp application. This design is developed using Canva, a versatile design tool that allows for the creation of visual mockups. The prototype serves as a visual representation of the final application, providing stakeholders with a tangible reference for discussion and feedback.

Prototype Evaluation

During this phase, the author conducts an evaluation of the designed prototype to ensure it meets the needs and expectations of both the Sekaben Camp owner and potential customers. If the prototype fails to meet these requirements, it will be revised, and the design process will start again from the initial stage. This iterative process ensures that the final product is closely aligned with user needs.

System Coding

Once the prototype is approved, the author translates the design into code using the C# programming language. This stage involves the actual development of the application, transforming the visual mockup into a functional software product.

System Testing

The developed application undergoes testing using the black box testing method. This approach involves testing the system's functionality without delving into the internal code structure, ensuring that all features operate correctly and that there are no errors in the system.

System Evaluation

Following testing, the author evaluates whether the developed system aligns with the original requirements. If the system meets all criteria, it proceeds to the final stage. However, if discrepancies or errors are found, the process returns to the coding stage for further refinement.

System Usage

Once the application has passed all evaluations and tests, it is ready for deployment. The author will distribute the finalized application to users via Google Drive, allowing consumers to download and use the app. The application incorporates augmented reality and markers to enhance the user experience, providing a modern and interactive way for customers to engage with Sekaben Camp's offerings.

# results and Discussion

*This section presents the results of creating the 3D features in the Sekaben Camp application, including the main interface, augmented reality (AR) functionalities, and testing outcomes for marker detection.*

*1. Main Page Display*

*The main menu of the Sekaben Camp application features a user-friendly interface with four key buttons:*

A screenshot of a computer screen

Description automatically generated

*AR Scan: Initiates the augmented reality scanning feature.*

*About App: Provides information about the application.*

*How to Use: Guides users on how to navigate and utilize the application effectively.*

*Exit: Closes the application.*

*This layout is designed to enhance user accessibility and streamline navigation, allowing users to easily access the primary functionalities of the application.*

*2. AR Scan View*

*In the AR Scan view, users encounter three buttons:*

A screen shot of a computer

Description automatically generated

*Order Here: Facilitates direct ordering of rental equipment by connecting users with the WhatsApp admin for real-time communication.*

*Price List: Displays the price list of available outdoor equipment.*

*Exit: Returns users to the main menu.*

*The inclusion of these features aims to improve user engagement and streamline the rental process, making it easier for customers to obtain information and place orders.*

*3. Display How to Register Tools*

A group of green rectangles with white text

Description automatically generated

*The Tool List page provides access to twelve buttons representing various outdoor equipment, including tents and other rental items. A back button allows users to return to the previous menu. This organization ensures that users can easily navigate through the available options and select the equipment they are interested in renting.*

*A. Testing*

*1. Testing Marker Condition*

*A crucial aspect of the AR functionality is the marker detection, which allows the application to recognize physical markers and display corresponding 3D models. The testing involved ten different marker conditions to evaluate the effectiveness of the detection process. The results are summarized in Table 1 below.*

*Table 1. Marker Testing Results*

|  |  |  |  |
| --- | --- | --- | --- |
| *No* | *Photo* | *Marker Condition* | *Information* |
|  |  | *Dark Paper* | *Not Detected* |
|  |  | *Scribbled Paper* |  |
|  |  | *Crumpled Paper* |  |
|  |  | *Bright Paper* |  |
|  |  | *Torn Paper* |  |
|  |  | *Small Cut Pieces* | *Not Detected* |
|  |  | *Water Damaged Paper* |  |
|  |  | *Half Covered Paper* |  |
|  |  | *Fully Covered Paper* | *Not Detected* |
|  |  | *Faded Paper* | *Not Detected* |
|  |  | *Black and White Paper* |  |

*The results indicate that certain conditions, such as dark paper, fully covered markers, and faded colors, negatively impacted detection capabilities. Conversely, scribbled, crumpled, and brightly lit papers showed successful detection rates. These findings suggest that the design and quality of the markers play a crucial role in the effectiveness of the AR experience.*

*The results demonstrate that the Sekaben Camp application successfully incorporates AR technology to enhance the user experience in renting outdoor equipment. The intuitive layout of the main page and AR functionalities contributes to improved engagement and user satisfaction.*

*However, the marker testing reveals challenges that need to be addressed. To optimize the AR experience, it is essential to ensure that markers are designed to be easily recognizable under various conditions. Future improvements could include recommendations for users regarding marker maintenance and design, such as avoiding dark or faded paper, and ensuring adequate lighting conditions during scanning.*

*Overall, the development of the Sekaben Camp application represents a significant step towards modernizing the outdoor equipment rental process, making it more interactive and user-friendly.*

Conclusion

This research highlights the significant role of Augmented Reality (AR) technology in enhancing product promotion and introduction, particularly for outdoor equipment at Sekaben Camp. By implementing AR, users are provided with a more direct and realistic interaction with virtual camping equipment, which effectively increases consumer appeal and boosts confidence in the rental process. The development of the Augmented Reality application for Sekaben Camp utilized advanced tools such as Unity, Vuforia SDK, and Blender, enabling the creation of immersive experiences that engage potential customers. The feedback from respondents indicates a positive reception, with many expressing that the application serves as an effective medium for promoting and introducing outdoor equipment.In conclusion, the integration of AR technology in Sekaben Camp's marketing strategy not only modernizes the rental experience but also positions the camp as an innovative player in the outdoor recreation industry. This research contributes valuable insights into the practical application of AR in marketing and serves as a foundation for further exploration in this rapidly evolving field.

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