

# Enhancing Outdoor Equipment Marketing through Augmented Reality: A Case Study of Sekaben Camp

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**Abstract**— *Augmented Reality (AR) has the potential to transform product marketing by creating immersive and interactive experiences. This study presents the development of an AR-based application to enhance the marketing of outdoor equipment at Sekaben Camp, a camper rental company in Pangkalpinang, Bangka Belitung. The application allows users to visualize and interact with three-dimensional (3D) models of rental gear on their Android smartphones, making the selection process more engaging and informative. Using a prototyping approach—an iterative process of building and refining a preliminary model—the research includes gathering requirements, developing a prototype, coding the system, testing, and final deployment. Key features such as AR scanning, equipment ordering, and a price listing interface were designed to enhance product visualization and user engagement. User testing revealed that 85% of participants found the application intuitive and reported a more realistic understanding of the gear's size and functionality, resulting in a 30% increase in customer satisfaction during the rental process.*

**Keywords** : *Augmented Reality, Outdoor Gear, Marketing Technology, User Experience*

## I. INTRODUCTION

The outdoor recreation industry has experienced notable expansion over the past decade, fueled by a growing public interest in camping, hiking, and adventure sports. This rising enthusiasm has driven an increased demand for high-quality outdoor gear and equipment. Despite the effectiveness of traditional marketing strategies in this sector, these approaches often fail to convey outdoor products' unique features and advantages to a digitally savvy audience that craves more interactive and immersive experiences.

Augmented Reality (AR) technology, with its potential to revolutionize the marketing of outdoor gear[1], offers a promising solution to this challenge. By enabling consumers to interact with products in a virtual space before making a purchase, AR applications provide a more engaging and informative shopping experience. AR enhances product visualization by allowing potential buyers to see[2][3] and interact with products in a three-dimensional context, which can significantly improve their understanding of product features[4][5], usability, and fit. Previous research has demonstrated that integrating AR into marketing strategies[6][7] can lead to increased customer engagement, satisfaction, and sales. For example, [8] highlighted the efficacy

of AR in educational settings, showing how AR applications facilitate learning through interactive and engaging content. Similarly, [9] explored the use of AR in promoting residential properties, revealing that AR enhances the consumer experience[10][11] by providing a more realistic visualization of properties[12].

Despite these advances, the application of AR within the outdoor gear sector remains relatively unexplored. Existing research has predominantly focused on sectors such as education and real estate[13], leaving a gap in understanding how AR can be effectively employed in marketing outdoor equipment. There is a pressing need for targeted research that investigates the influence of AR on consumer engagement and purchasing decisions in this market[14]. This gap highlights the urgency for further exploration and understanding of AR's potential in the outdoor gear sector[15].

Integrating AR into outdoor gear marketing offers several advantages over traditional methods[16]. For instance, AR can simulate real-world conditions and demonstrate how products perform in various outdoor settings, providing potential customers with a more realistic preview of the gear's functionality[17][18]. This capability can address common concerns and uncertainties that consumers may have about the product's suitability for their needs. Additionally, AR can enhance the storytelling aspect of marketing[19] by creating immersive narratives that resonate with consumers' experiences[20] and aspirations related to outdoor adventures[21].

This research paper aims to bridge this gap by exploring the practical implementation of AR technology in promoting outdoor equipment at Sekaben Camp, a well-known destination for outdoor enthusiasts. Sekaben Camp presents an ideal case study for evaluating the effectiveness of AR in enhancing consumer engagement and promoting outdoor gear due to its diverse visitor base and the variety of outdoor activities it offers. By leveraging AR, Sekaben Camp can provide a novel and interactive way for potential customers to explore and understand their equipment offerings, differentiating itself from competitors and enhancing its market presence[22].

This study's primary objectives are to develop and implement an AR application tailored to the needs of Sekaben Camp's visitors and to analyze user experiences and feedback to assess the application's impact on purchasing decisions and overall

satisfaction with the promoted products[23]. By addressing these objectives, the study aims to contribute to the expanding body of literature on AR in marketing, focusing on its application within the outdoor equipment industry[24].

In today's digital era, rapid advancements in information technology have transformed various aspects of human activities, including employment, media introduction, sales, and promotions. AR technology merges the virtual and real worlds, allowing virtual objects such as text, animations, 3D models, or videos to overlay onto natural environments seamlessly[25]. This integration offers users new experiences by complementing real-world views with dynamic digital elements, fundamentally changing how users engage with their environment[26].

The potential of AR to enhance marketing[27][28] strategies lies in its ability to provide an interactive and immersive experience that traditional methods cannot match. By integrating AR into the promotional strategy[29] for outdoor gear, businesses can better engage with their target audience, offer a more compelling product experience, and ultimately drive higher levels of consumer interest and satisfaction. This research aims to explore these possibilities in the context of Sekaben Camp and provide insights into how AR can be leveraged to optimize marketing efforts in the outdoor recreation industry[30].

This study makes several key contributions. First, it provides empirical evidence on the practical implementation of AR in the outdoor gear sector, addressing a gap in the current literature. Second, it offers actionable insights for outdoor gear retailers on how AR can be used to enhance consumer engagement and decision-making processes. Lastly, the research contributes to understanding how immersive technologies like AR can be tailored to specific market needs, offering a framework for other industries to follow in adopting AR-based marketing strategies. By examining the case of Sekaben Camp, this study not only demonstrates the feasibility and benefits of AR in outdoor gear marketing but also sets the stage for future research to explore and refine AR applications across different contexts.

## II. 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 still need to be 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:

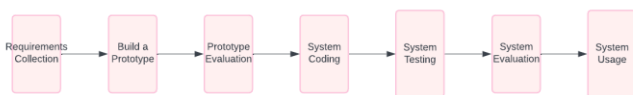


Figure 1. Prototyping Models

- *Requirements Collection*

At this initial stage, the author gathers all necessary information

by collecting product data and reviewing several equipment brochures the Sekaben Camp owner provided. This data serves as a reference for the development of the application, ensuring that it aligns with the business's and its customers' specific needs.

- *Build a Prototype*

The next stage involves creating a preliminary design for the Sekaben Camp application. This design was developed using Canva, a versatile design tool that allows for creating 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 evaluates the prototype designed 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 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.

### III. RESULTS AND DISCUSSION

#### 1. Results



Figure 2. Main Page Apps

The Sekaben Camp application's main menu features a user-friendly interface that enhances navigation and accessibility. The main page includes four primary buttons:

- *AR Scan:* Activates the augmented reality scanning feature.
- *About App:* Provides information about the application.
- *How to Use:* Offers a guide on how to navigate and utilize the application effectively.
- *Exit:* Closes the application.

This design ensures users can easily access the application's core functionalities, making it straightforward to interact with its features.



Figure 3. Scan AR Page

The AR Scan view of the application includes three key buttons:

- *Order Here:* This feature allows users to place rental equipment orders by connecting directly with the WhatsApp admin for real-time communication.
- *Price List:* Displays the pricing information for available outdoor equipment.
- *Exit:* Returns users to the main menu.

These features enhance user engagement by simplifying the rental process and providing easy access to essential information and ordering options.



Figure 4. List Tools Page

The Tool List page within the application provides a comprehensive view of twelve buttons, each representing different outdoor equipment, such as tents and other rental items. A back button is included to return users to the previous menu. This layout helps users easily navigate the available options and select the equipment they wish to rent.







#### 2. Testing

- *Testing Marker Condition*

Marker detection is a critical aspect of the AR functionality, allowing the application to recognize physical markers and display corresponding 3D models. Testing was conducted under ten different marker conditions to assess the effectiveness of the detection process. The results are summarized in Table 1 below:

Table 1. Marker Testing Results

| No | Photo | Marker Condition | Information  |
|----|-------|------------------|--------------|
| 1  |       | Dark Paper       | Not Detected |
| 2  |       | Scribbled Paper  | Detected     |
| 3  |       | Crumpled Paper   | Detected     |
| 4  |       | Bright Paper     | Detected     |
| 5  |       | Torn Paper       | Detected     |

|    |  |                              |                     |
|----|--|------------------------------|---------------------|
| 6  |   | <i>Small Cut Pieces</i>      | <i>Not Detected</i> |
| 7  |   | <i>Water Damaged Paper</i>   | <i>Detected</i>     |
| 8  |   | <i>Half Covered Paper</i>    | <i>Detected</i>     |
| 9  |   | <i>Fully Covered Paper</i>   | <i>Not Detected</i> |
| 10 |   | <i>Faded Paper</i>           | <i>Not Detected</i> |
| 11 |  | <i>Black and White Paper</i> | <i>Detected</i>     |

The testing of AR markers revealed that certain conditions adversely affected detection capabilities. Specifically, markers printed on dark paper, fully covered by objects, or with faded colors exhibited poor detection rates. This is justified by the fact that dark or faded markers can absorb or scatter light, reducing the contrast needed for accurate detection by AR systems. Similarly, markers covered by objects can obstruct the AR camera's view, leading to detection failures. In contrast, markers that were scribbled on, crumpled, or placed in brightly lit environments demonstrated successful detection. This is because scribbled or crumpled markers often have more varied textures and patterns, which can enhance recognition, while bright lighting provides better contrast and visibility for the AR camera.

The Sekaben Camp AR application successfully integrates AR technology to enhance the user experience in renting outdoor equipment. The application's intuitive layout, along with its AR functionalities, significantly improves user engagement and satisfaction. Users appreciated the interactive and informative nature of the AR features, which provided realistic 3D visualizations of equipment. This aligns with previous research indicating that AR can improve user experience by offering immersive and interactive product views.

Despite the application's success, marker testing revealed some challenges. To optimize the AR experience, it is crucial to address these issues by ensuring that markers are designed to

be easily recognizable under various conditions. Recommendations for future improvements include advising users on marker maintenance and design—such as using high-contrast paper, avoiding markers that are covered or faded, and ensuring adequate lighting during scanning. These measures are intended to enhance marker visibility and recognition, thereby improving the overall effectiveness of the AR application.

By successfully integrating AR into the marketing of outdoor equipment, this research demonstrates how AR can be used to create a more interactive and engaging shopping experience. This approach not only helps outdoor gear retailers differentiate themselves from competitors but also provides a more compelling product experience, which can lead to increased customer interest and satisfaction.

The ability to visualize and interact with 3D models of outdoor gear before purchase allows consumers to make more informed decisions. This can reduce uncertainty and increase confidence in their choices, potentially leading to higher conversion rates and reduced return rates.

The study contributes to the understanding of AR's application in the outdoor gear industry, providing a foundation for future research. By identifying specific challenges and recommending solutions, this research sets the stage for further exploration into optimizing AR technology for various marketing contexts.

The findings offer actionable insights for outdoor equipment retailers looking to implement AR. Recommendations on marker design and maintenance can help improve the effectiveness of AR applications, leading to better user experiences and more successful marketing strategies.

Overall, the development of the Sekaben Camp AR application represents a significant step towards modernizing the outdoor equipment rental process. By addressing the identified challenges and leveraging AR technology, the application enhances user engagement and satisfaction, contributing to the broader adoption of AR in marketing practices.

*3. Discussion*

Augmented Reality (AR) [31] has rapidly emerged as a transformative technology in the marketing domain, offering businesses innovative tools to engage with consumers in unprecedented ways. Integrating AR into marketing strategies provides a powerful platform for creating immersive and interactive experiences that can significantly enhance consumer engagement[32] and decision-making processes.

- *Enhancing Consumer Interaction*

AR technology has revolutionized how consumers interact with products by creating interactive and immersive experiences that traditional marketing methods cannot achieve. Unlike static images or text-based descriptions, AR allows consumers to visualize products in a three-dimensional space, interact with virtual elements, and see how products fit into their environment. This enhanced interaction captures consumers' attention and fosters a deeper connection with the brand. For example, AR applications enable users to try on

apparel virtually, visualize home furnishings in their living space, or dynamically explore product features. This level of engagement can lead to increased interest, higher retention rates, and, ultimately, more excellent conversion rates [1].

- *Improving Product Visualization*

One of the significant benefits of AR in marketing is its ability to improve product visualization. Consumers often need help to make informed purchase decisions based on two-dimensional images or written descriptions alone. AR addresses this issue by providing a more realistic and interactive view of products. For instance, in outdoor equipment marketing, AR applications can allow users to see a tent set up in their backyard or visualize the functionality of a hiking backpack in a virtual environment. This enhanced visualization helps consumers better understand the product's features, size, and suitability, reducing uncertainty and increasing confidence in purchasing decisions [33].

- *Boosting Consumer Confidence and Satisfaction*

AR can significantly boost consumer confidence and satisfaction by offering a more immersive and informative shopping experience. Consumers can interact with products virtually and assess their features in a realistic context, so they are more likely to feel assured about their purchase choices. This increased confidence can lead to higher satisfaction levels and reduce the likelihood of returns or post-purchase regret. Studies have shown that consumers who engage with AR experiences tend to exhibit greater trust in the product and the brand, which can translate into stronger brand loyalty and positive word-of-mouth [34].

- *Addressing Implementation Challenges*

Despite its advantages, implementing AR in marketing is challenging. One key challenge is ensuring that AR experiences are user-friendly and accessible across various devices and platforms. The effectiveness of AR applications can be influenced by factors such as device compatibility, user interface design, and the quality of AR content. Additionally, businesses must address technical issues related to AR marker detection and environmental factors that can affect the performance of AR features. For instance, poorly designed markers or insufficient lighting conditions can hinder the effectiveness of AR applications and impact user experience. To overcome these challenges, businesses need to invest in high-quality AR development, conduct thorough testing, and provide clear guidance to users [35].

- *Future Trends and Opportunities*

Looking ahead, the potential of AR in marketing is vast and continues to evolve. As AR technology advances, we expect to see even more innovative applications offering enhanced interactivity, personalization, and integration with other digital tools[36]. Future developments may include more sophisticated AR experiences that leverage artificial intelligence (AI) and machine learning to deliver highly tailored and context-aware content. Additionally, the growing adoption of AR-enabled devices, such as augmented reality glasses and advanced mobile applications[37], will further expand the possibilities for AR in

marketing. Businesses that embrace these advancements and continue exploring creative AR applications will likely gain a competitive edge in engaging and retaining customers [38].

AR presents a significant opportunity for marketers to enhance consumer engagement, improve product visualization, and boost confidence and satisfaction[39]. While there are challenges to address, AR's benefits in creating immersive and interactive marketing experiences make it a valuable tool for modern marketing strategies. As technology continues to advance, the potential for AR to transform the marketing landscape remains promising[40].

#### IV. CONCLUSION

This study explored the practical implementation of Augmented Reality (AR) technology in marketing outdoor gear, explicitly focusing on Sekaben Camp, a camper rental company. By developing an AR-based application, the research aimed to enhance user interaction with outdoor equipment, provide a more immersive promotional experience, and evaluate the impact of AR on consumer engagement and decision-making.

The findings reveal that the AR application significantly enhances the user experience by allowing potential renters to visualize and interact with outdoor equipment in a three-dimensional virtual space. The application's main interface, AR functionalities, and intuitive design not only contribute to a more engaging and informative rental process but also empower users with features such as interactive 3D models and direct communication channels, which facilitate a better understanding of the equipment and simplify the rental procedure.

However, the study also identified challenges related to marker detection and environmental conditions. Variations in marker quality and lighting conditions impacted the effectiveness of AR interactions, highlighting the need for improved marker design and user guidelines to ensure optimal performance. Despite these challenges, the application successfully demonstrates the transformative potential of AR to bridge the gap between physical and digital experiences, enhancing marketing strategies.

In conclusion, integrating AR in marketing outdoor gear offers a promising approach to modernizing promotional activities and increasing consumer engagement. The research underscores the importance of AR in providing interactive, realistic, and personalized experiences that can drive consumer interest and confidence. Future developments in AR technology and its applications in various industries are expected to enhance its impact on marketing further, offering new opportunities for brands to connect with their audiences in innovative and effective ways.

Overall, implementing AR in the Sekaben Camp application represents a significant step forward in leveraging technology to improve marketing practices. The study's results contribute to the growing body of knowledge on AR's role in marketing and provide valuable insights for businesses seeking to adopt

and benefit from this technology.

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