Research on the Application of AR Technology in Brand Marketing

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Abstract. The application of AR technology in brand marketing has garnered widespread attention. AR is gradually emerging as an indispensable tool in future brand marketing strategies. However, the cost of developing and implementing AR applications remains high, and the technology is still not sufficiently mature for small businesses. Meanwhile, there exists a problem of low user satisfaction. This article delves into the specific applications of AR in brand marketing, exploring both its positive impacts and shortcomings. The analysis reveals that the application of AR in brand marketing is beneficial for enhancing consumer interaction experience and improving consumption efficiency and convenience. However, the equipment and cost associated with it still require further development. Based on this, the article proposes several suggestions for small brands: providing fewer resources and technical support to reduce costs, enhancing the technical performance and compatibility of the AR experience, implementing strict data privacy policies, and ensuring transparent user consent processes.

Keywords: Brand marketing; Dewu App; online try-on; return rate.

1. Introduction

Augmented Reality (AR) technology has rapidly evolved from a futuristic concept to a core component of digital innovation, especially in brand marketing. AR technology blurs the boundaries between digital and physical environments by superimposing virtual content on the real world through real-time computing and sensor fusion, providing consumers with immersive experiences [1]. This interactive technology is increasingly being used across a wide range of industries, from beauty brands such as L'Oréal and Estée Lauder, which offer virtual makeup trials, to automotive companies such as BMW and Mercedes-Benz, which use AR to simulate in-car experiences [2].

This study aims to explore the impact of AR technology on consumer behavior, with a particular focus on how AR technology affects engagement, purchasing decisions, and brand loyalty. The study will explore the pros and cons of incorporating AR into mobile applications and consumer acceptance of AR technology, and shed light on its effectiveness in increasing brand awareness and promoting deeper connections between consumers and brands. In addition, this study aims to understand how AR technology helps shape consumers' perceptions of brand authenticity and credibility. By providing small interviews and detailed analysis, this study will evaluate the potential of AR technology to build long-term consumer-brand relationships and drive future brand marketing trends.

2. AR Concepts and Applications

2.1. The Role of AR

Augmented Reality is a technology that overlays virtual information into the real world. Utilizing cameras, sensors, and display devices, AR can seamlessly integrate digital content with the user's actual environment in real time, providing interactive and immersive experiences.AR Marketing is defined as the strategic integration of AR experiences, alone or in combination with other media or

brand-related [1]. Augmented Reality (AR) represents the cutting edge of modern society's social-technological development. Independent groups and organizations are creating AR applications all over the world for use within many disparate fields [2]. A joint AR small paper virtual message wall debut was made possible by EZXR and NetEase Cloud Music. American augmented reality technology developer Bevond created a virtual fitting room, and Swedish furniture company IKEA released the "IKEA Now" app. With time, augmented reality technology has been incorporated into applications for social media, gaming, travel, and interior design. Customers can virtually experience things and engage their imagination thanks to augmented reality technology. While seeing the live real-world environment, the viewer can also see computer-generated graphics layered on top of it. Different AR applications can use GPS, image registration, and computer vision to have these AR graphics fit in and act more naturally with the real world [3]. AR technology creates a link between the physical and digital worlds, making it easier to market products and enhance the shopping experience for customers.

2.2. Case Study on AR

AR, as a tool for deep information expansion, is increasingly being adopted by e-commerce platforms due to its intuitive expressive power to help consumers select the most suitable products. People may run into issues when decorating their new houses, such as buying furniture that isn't the right size or color match, which can leave the overall home décor looking unsatisfying. IKEA Place, the company's online store, takes care of these issues for everyone. Through augmented reality, consumers can not only see the actual impact of furniture placement in their homes, but they can also include slam technology to determine whether a piece of furniture is the right size beforehand. It aims to close the present omnichannel gap by the blend of digital and real worlds at the touch of a smartphone [4]. As a result, customers can improve their purchasing efficiency and reduce the return rate of their purchases.

The "AR Virtual Try on" feature on the DeWu App provides users with thousands of shoe styles that can be tried on. This virtual technology helps customers see the effect of trying on shoes without leaving their homes, overcoming the shopping difficulties of people in harsh weather conditions such as hot summers or cold winters.

On e-commerce platforms, people can use AR technology to try on clothing, shoes, glasses, and other accessories themselves, as well as try assorted colors and effects of cosmetics in front of virtual mirrors. Virtual furniture, appliances, and other items can be placed in specific locations within one's own home to visually observe their effects in the actual environment, helping them make more informed purchasing decisions. AR enables consumers to interact with products, showcasing brand stories, and product manufacturing processes, and increasing consumer brand identity. The introduction of AR technology in e-commerce platforms can enhance user experience, attract consumers to stay longer, and thus increase conversion rates and sales. By providing more intuitive product displays, consumers are more likely to make purchasing decisions. Provide personalized recommendations based on user preferences and historical purchase records to enhance the relevance and satisfaction of shopping.

3. Impact of AR Application

3.1. Positive Impact

Augmented reality (AR) technology has become a powerful tool for brand marketing, with unique advantages in improving consumer engagement and experience. One of the main advantages of AR in marketing is that it can provide immersive and interactive experiences, which can significantly increase consumer engagement. For example, the QQ-AR Torch Relay event during the 2016 Rio Olympics allowed users to virtually participate in the Olympic Torch Relay, greatly increasing user engagement and brand interaction [5]. This innovative use of AR not only promoted the Olympics and raised people's awareness of the Olympics, but also enhanced the brand image. For another

example, for the AR try-on function of the Douyin APP, AR allows consumers to virtually try on products such as shoes in a highly interactive and realistic environment. This not only makes the shopping experience more pleasant and improves consumer satisfaction, but also helps to narrow the gap between online and offline shopping, and by mimicking the physical try-on experience, it increases the likelihood of purchase [6].

Another advantage of AR technology is that it can improve the efficiency and convenience of consumer purchases. AR can combine elements of the real world with virtual content, allowing consumers to intuitively see products in a casual environment, helping them make informed purchasing decisions, and increasing their confidence in purchasing, thereby increasing the attractiveness of products. Mobile AR dominates AR marketing research with a share of 57.58%, which not only highlights the widespread and effective use of AR functions of mobile applications in various fields but also reflects that AR is gradually becoming an indispensable tool in future brand marketing strategies [7].

3.2. Existing Problems

Despite the many advantages of AR technology, several challenges limit its widespread adoption in brand marketing. One of the biggest barriers is the high cost of developing and implementing AR applications. Creating immersive and engaging AR experiences requires advanced supporting facilities and often a dedicated team of developers, designers, and content creators. This can be a significant financial burden, especially for small businesses or startups with limited budgets. While for large businesses, the cost may be justified given the scale of operations and potential returns, for smaller brands, the financial investment required to leverage AR can be a considerable barrier to entry. In addition, the costs do not stop at the initial development, and further financial investment is required to maintain and update AR systems to keep up with changing consumer demands and technological advances.

Another significant challenge comes from technical issues that affect user experience. While AR technology has improved in recent years, its performance depends heavily on the capabilities of consumer devices. Many AR applications require high processing power and high memory capabilities to run smoothly. Consumers using older smartphones or devices with limited specifications may experience issues such as lags, overheating, etc., resulting in a poor AR experience. This disparity can create disadvantages and alienate users, especially in markets where the latest technology is not readily available or affordable to the average consumer.

In addition, the effectiveness of AR marketing depends on the seamless integration of virtual elements with the real world. If AR content looks fake or does not blend well with the physical environment, it may break the immersive experience, thereby reducing consumer engagement. In addition, ineffective AR applications may damage brand image because consumers may associate technical failures with the company itself, ultimately reducing customer satisfaction and trust. Finally, these challenges often overlap with each other. For example, a brand may invest heavily in developing an AR experience, but it performs poorly due to poor integration or consumer device limitations, resulting in wasted resources and reduced ROI.

In addition, there are concerns related to consumer privacy and data security in AR applications, especially when these technologies collect data from user devices, such as personal location, camera, and personal information. These factors add another layer of complexity to effectively implementing AR solutions and maintaining user trust.

4. Recommendations

To address these challenges, brands can adopt several strategies to improve the effectiveness of AR in marketing campaigns and ensure greater consumer satisfaction.

First, companies should focus on optimizing the scalability and accessibility of AR applications [8]. While high development costs are a barrier for small brands, costs can be reduced by using

simplified AR tools that require fewer resources but still provide a compelling experience. For example, open-source AR platforms can reduce initial development costs by providing pre-built AR features that brands can customize to suit their needs [9]. Not only can these platforms provide cost-effective solutions, but they can also encourage faster deployment of AR features, allowing brands to quickly adapt to market trends. In addition, AR tools designed for multi-platform compatibility can expand the reach of applications, allowing brands to cater to both high-end and low-end devices, meeting the needs of different brands and consumers.

Second, improving the technical performance and compatibility of AR applications is essential. Regularly updating and optimizing AR applications is important to maintain consumer interest and engagement. Brands should invest in technology that can ensure smooth operation on a variety of devices and use minimal processing power without compromising the quality of the AR experience. Developers can employ adaptive algorithms to adjust the complexity of AR visuals based on the user's device specifications, ensuring that even consumers with less powerful devices can get a satisfying experience.

In addition, brands should focus on combining AR with user-friendly interfaces to improve learnability and ease of use. AR should be intuitive and require minimal user effort to interact with so that consumers can easily engage with brand content. Regularly surveying different consumer groups is essential to understand how different users interact with AR experiences and to identify potential usability issues early in the design process.

Third, privacy issues must be proactively addressed. AR applications often require access to personal data such as camera sources, geolocation, and user preferences, which raises concerns about how this data is collected, stored, and used. To address this, brands must implement transparent and user-friendly privacy policies that clearly explain what data is being collected and how it is used. Giving users control over their data through opt-in mechanisms and providing options to limit data collection is essential to maintaining consumer trust. Compliance with national and international data privacy regulations is essential to ensure that AR applications remain legally compliant while safeguarding consumer rights.

Fourth, as AR continues to develop, brands should explore the potential of combining AR with other emerging technologies such as artificial intelligence (AI) and big data. By leveraging AI, brands can personalize AR experiences for individual users, providing customized recommendations based on previous interactions, preferences, and behaviors. This not only enhances the relevance of AR content but also deepens the emotional connection between consumers and brands [10].

Finally, brands should seek to collaborate with industry partners to co-develop AR technology. Collaboration between technology companies, marketing companies, and brands can pool resources and expertise, reduce cost burdens, and promote innovation. Through collaboration, smaller brands can gain access to cutting-edge AR technology without bearing the full cost, while larger brands can benefit from the agility and creativity of startups.

By implementing these strategies, brands can address the challenges associated with AR, lower barriers to entry, and create more meaningful, interactive, and trustworthy experiences for consumers. As AR technology continues to mature, it will play an increasingly important role in shaping the future of brand marketing, promoting deeper connections between consumers and brands, and revolutionizing the retail landscape.

5. Conclusion

In summary, AR technology, as one of the major highlights of technological convergence in contemporary society, is infiltrating and transforming a wide range of fields, including social media, gaming and entertainment, travel and adventure, and interior decorating, at an unprecedented rate. The fundamental attraction lies in the ability to seamlessly integrate virtual reality into everyday situations, creating stunning immersive scenarios that greatly broaden the boundaries of consumer interaction and deepen the emotional connection between businesses and consumers. For example,

IKEA's 'IKEA Now' app allows users to preview furniture layouts at home, while the AR try-on innovation driven by the DeWu app further exemplifies the promise of AR technology in optimizing shopping convenience and reinforcing brand loyalty.

While augmented reality (AR) technology has demonstrated many attractive benefits for brand marketing, such as greatly facilitating consumer interaction and accelerating the purchasing decision process, the road ahead is not without obstacles. High R&D costs, complexity of implementation, and user issues such as device compatibility are just some of the hurdles that need to be overcome. It's these challenges that fuel innovation in the industry, driving technology developers and brands to continue to explore more efficient and cost-effective solutions.

Looking to the future, with the trend of maturing technology and decreasing costs, the application of Augmented Reality (AR) technology in e-commerce is becoming more and more promising. It will not only present a more intuitive and vivid product display experience, but is also expected to leverage the power of Big Data and Artificial Intelligence to reach a more refined personalized recommendation strategy, which will lead to the deep-level optimization of the user experience, lengthening the user's length of stay, and boosting the conversion rate and sales performance. In this process, AR technology will undoubtedly play a key role in driving the innovation and transformation of the e-commerce industry, leading people into a new era of intelligent and efficient retail.

Authors Contribution

All the authors contributed equally and their names were listed in alphabetical order.

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