# AR Technology Adoption in BeautyCam on Shopee: TAM-Based Literature Review

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## Abstract:

This study examines factors influencing the intention to use Augmented Reality (AR) technology in the BeautyCam feature of the Shopee app, based on Fred Davis's TAM model (1989). Conducting a targeted literature published between 2020 and 2024, the study identifies three critical TAM dimensions—perceived usefulness, perceived ease of use, and attitude toward using—that shape behavioral intention to adopt AR technology. The findings highlight the potential for AR technology to be monetized and standardized through these dimensions. The TAM model serves as a theoretical framework to understand user adoption and usage behaviors, offering insights into the critical elements for successful technology integration. As a practical application, it aims to bridge the gap between scientific knowledge and AR application strategies, with the goal of improving the user experience and satisfaction with Shopee's BeautyCam feature. It also provides a foundation for future studies on AR technology in e-commerce, contributing to the growing literature on its practical applications.

**Keywords:** Augmented Reality, BeautyCam, Shopee, TAM Framework

## INTRODUCTION

Technological advancements have driven significant changes in consumer shopping behavior in Indonesia, including a growing preference for online shopping (Gabriel, et al. 2023). Previously, consumers tended to visit physical stores to try products directly before making a purchase. Despite this, the COVID-19 pandemic accelerated the trend towards online shopping. Consumers are now increasingly relying on digital technology to support various aspects of their shopping processes. This transformation has encouraged companies to innovate and develop digital strategies to ensure business sustainability and growth (Hsu, Tsou and Chen 2021).

The drastic changes in consumer behavior have also created new opportunities for more innovative virtual experiences (Harrisson-Boudreau and Bellemare 2021). One of the technologies experiencing significant growth is augmented reality (AR). According to KBVResearch 2021, the global AR market is projected to reach $89 billion by 2026, with a compound annual growth rate of 46.3% (KBVResearch 2021). The findings of these studies indicate that augmented reality holds the potential to enhance customer experiences in a very innovative manner throughout the entire shopping experience (Kowalczuk, Siepmann and Adler 2021).

Using augmented reality technology can enhance consumers' online shopping experiences by making them more engaging, enjoyable, and interactive (Qin, Osatuyi and Xu 2021). Innovative AR-based features can enhance customer engagement and support purchasing decisions, making them more effective and heuristic (Arghashi and Yuksel 2022) With the

BeautyCam feature, Shopee is providing users with the ability to virtually try on cosmetic products before making a purchase. This feature was first introduced in 2019 through a partnership with L'Oréal, leveraging AR and artificial intelligence (AI) technology from ModiFace, a company acquired by L'Oréal in 2018 (TheJakartaPost 2019)

Although AR technology demonstrates substantial potential for enhancing the online shopping experience, user acceptance of this feature remains a challenge. The factors that influence consumer adoption of AR technology should be examined in greater detail. In this context, the TAM is relevant to understanding the factors that contribute to technology acceptance, such as ease of use and usefulness. This study aims to examine the literature regarding the adoption of AR technology in the BeautyCam feature on Shopee using the TAM framework. The identification of factors that influence the adoption of technology can be used to develop more effective solutions that will improve the user experience and promote the growth of AR-based e-commerce systems.

## THEORETICAL STUDY

### 1. Augmented Reality in E-commerce

The technology of AR is rapidly gaining popularity as a way to enhance the shopping experience of customers and provide them with a more immersive and engaging experience (Pathak and Prakash 2023). While traditional in-store shopping methods were previously the primary choice, AR has evolved into an essential element supporting companies in building long-term relationships with customers while also providing deeper insights into purchasing patterns and behaviors (Kautish and Khare 2022). By utilizing AR applications, organizations can provide consumers with contextual information and virtualization during the pre-purchase stage, enhance the user experience during the purchase process, and improve customer service after the purchase. Using AR-based marketing offers customers a seamless integration of digital information with the physical environment, combining the two to provide them with tangible benefits (Chylinski, et al. 2020). In spite of the adoption of AR in retail and online shopping continues to grow, its acceptance as an effective marketing tool has yet to fully align with the technological advancements available (Rauschnabel, et al. 2022). The vast potential of augmented reality to transform consumers' interactions with brands and products reinforces the need for companies to strategically incorporate AR in an increasingly digital world in order to remain competitive.

### 2. TAM Framework

Davis (1989) developed the Technology Acceptance Model (TAM) in 1986, which explains that a person's ability to use and accept technology is determined by two main variables: the perceived ease of use and perceived usefulness. A perceived usefulness describes the belief that using a new technology will enhance one's performance, while perceived ease of use describes the belief that the technology can be adopted without significant difficulties (Na, et al. 2022). The perceived usefulness of technology does not only influence users' attitudes toward the technology, but also their intentions to make use of it. In other words, even if a technology is not easy to use, the intention to use it may still arise if users perceive it to be highly beneficial (Kurdi and Alshurideh 2020). TAM has gained widespread recognition for its flexibility and validity as a consistent measurement tool that explains significant variance in user intention and has been applied in numerous studies (Kasilingam 2020).

**a) Perceived Usefulness**

Perceived usefulness refers to their perception that technology can enhance their work efficiency or daily routines. In a modern society that emphasizes high efficiency and speed, users tend to prefer technology that offers practical benefits (Chen and Zhang 2024). This perception illustrates how technological features are perceived to contribute to the achievement of more effective and efficient outcomes when interacting with online shopping (Adawiyah, et al. 2024). Based on the TAM theory, perceived usefulness significantly influences users' intentions and attitudes to adopt information systems, which are also affected by perceived ease of use (Davis 1989). This highlights the important role technology plays in supporting user productivity and effectiveness.

**b) Perceived Ease of Use**

Perceived ease of use reflects the extent to which users feel that a feature can be easily operated and is not complicated (Davis 1989). This factor directly contributes to behavioral intention and decisions to adopt technology, as people tend to choose products that are as simple to use. In the context of increasingly widespread mobile technology usage, this ease encourages consumers to make online purchases because of its practicality (Wang, et al. 2024). Additionally, perceived ease has a positive impact on consumer attitudes and enjoyment levels, meaning that the easier a technology is to use, the better the user's experience and perception of it (Rodríguez-Lopez, et al. 2023). Thus, technologies designed to offer ease of use not only increase adoption but also enhance the overall user experience.

**c) Attitude toward Using**

Users' attitudes form positive or negative evaluations of technology usage based on their perceptions and experiences (Davis 1989). In the context of AR and AI technology usage on platforms like Shopee, users' attitudes become a crucial element in analyzing their behavior toward innovative features. Technologies such as personalized recommendations, supported by AI and AR, create diverse perceptions among users (Adawiyah, et al. 2024). Furthermore, users' positive acceptance attitudes toward this technology directly contribute to enhancing the shopping experience while driving wider technology adoption (Hilal 2023). Thus, understanding users' attitudes allows for the optimization of technology-based features to create a more valuable experience.

**d) Behavioral Intention**

Intention reflects an individual's decision to adopt and accept new technology for future purchasing activities (Wang, et al. 2024). The TAM method has shown that PEU and PU influence behavioral intention, which ultimately impacts actual usage behavior. Behavioral intention is also recognized as the primary predictor in determining actual usage behavior. Schultz & Kumar (2024) argue that attitudes toward AR and the perceived usefulness of this technology significantly contribute to the intention to use it. This highlights that understanding consumers' behavioral intentions is increasingly important in the context of AR adoption. A study by Oyman et al. (2021) also reinforces that understanding consumers' behavioral intentions is a key factor in the development and implementation of AR technology.

## RESEARCH METHODS

This study utilizes a literature review method in conjunction with a systematic approach to examine the adoption of AR) technology in the BeautyCam feature on Shopee using the TAMframework. Data were gathered through a search of scholarly articles published between 2020 and 2024 in databases such as Scopus, Web of Science, IEEE Xplore, and Google Scholar. The keywords used in the search include "Augmented Reality adoption," "AR technology in e-commerce," "BeautyCam feature," "Shopee AR adoption," and TAM-related terms like perceived ease of use and perceived usefulness. Among the criteria used to select articles were relevance to AR adoption, use of TAM as the primary theoretical framework, and alignment with the inclusion criteria. A study that did not meet these criteria or that was unrelated to the topic and framework was excluded from the analysis.

The selected articles were analyzed by classifying them according to research objectives, methods, and key findings. The analysis focused on identifying the critical TAM factors influencing AR technology acceptance among users, such as perceived ease of use, perceived usefulness, and behavioral intention. According to the results of the relevant studies, a literature review table has been prepared to provide a comprehensive overview of the research trends currently being conducted in the field. To describe how AR technology is used in e-commerce and to identify potential research gaps, this synthesis emphasizes the role of TAM in understanding how users interact with AR technology. Therefore, this study provides valuable insights and practical guidance on how AR technology can be adopted by platforms such as Shopee.

## RESULTS AND DISCUSSION

### 1. RESULTS

Augmented Reality (AR) technology plays a crucial role in enhancing user experience across various digital platforms, including e-commerce platforms like Shopee. Oyman's (2021) study found that Perceived Usefulness significantly influences users' intention to adopt AR features. However, the ease of use factor has a greater influence on user attitudes, although its impact on usage intention varies across different studies. Adawiyah et al. (2024) support this finding by adding that the integration of AR in Shopee, especially through the try-on feature, provides tangible value for customers. When customers perceive this technology as ease to use and useful, they are more likely to have a greater intention to utilize the feature.

On the other hand, the user experience in using AR is influenced by sensory and cognitive aspects. Guo and Zhang (2024) demonstrated that sensory, emotional, and cognitive experiences created by AR technology significantly enhance Perceived Usefulness, driving users' purchase decisions. This study highlights the importance of user engagement in ensuring users benefit from AR features. Furthermore, Schultz and Kumar (2024) revealed that hedonic value has a greater impact on female users compared to utilitarian value. This is because the enjoyable and informative experience from AR features provides a sense of satisfaction for customers during the usage process.

Trust and security of the technology are important factors in influencing the adoption of AR features in e-commerce. Adawiyah et al. (2024) emphasize that Perceived Trust and Perceived Security play a crucial role in encouraging customers' intention to use AR features on Shopee. When customers feel that the feature is safe and their data is protected, their

comfort and acceptance levels increase significantly. In contrast, Alam et al. (2021) identified a major barrier to AR adoption, which is the high implementation cost. However, competitive pressures and customer demands in the market also drive businesses to adopt AR technology to meet the growing expectations of customers.

Moreover, the interactive and aesthetic elements of AR also affect user engagement in online shopping. Wang et al. (2024) stated that the interactivity and aesthetic quality of AR technology enhance the flow experience, which subsequently leads to an increase in customers' purchase intentions. This immersive experience allows customers to become more engaged in the product selection process, thus encouraging positive purchasing behavior. Meanwhile, Xi et al. (2024) compared AR with Virtual Reality (VR) technology and found that AR places more emphasis on Ease of Use. This suggests that AR is easier to integrate and adopt by customers in online shopping experiences compared to VR.

In the educational context, hedonic motivation and positive experiences also play a significant role in the acceptance of AR technology. Shen et al. (2022) showed that hedonic motivation significantly influences students' attitudes and intentions in using AR technology. This is similar to findings in the e-commerce sector, where the aspect of enjoyment also supports users' positive perceptions of AR technology. Therefore, the BeautyCam feature on Shopee can be optimized by providing an interactive and enjoyable experience, while also delivering real benefits for customers. By considering these factors, Shopee can enhance the adoption of AR technology through the TAM approach, which focuses on Perceived Usefulness, Ease of Use, and other user motivation aspects.

**Tabel 1** Literature Review

| **Author** | **Research Objectives** | **Research Construct** | **Research Method** | **Research Results** |
|---|---|---|---|---|
| (Oyman 2021) | The purpose of this study is to understand how consumers respond to the use of AR in mobile cosmetic applications that are not tied to a particular brand, thereby avoiding brand bias in user evaluations. | Technology Anxiety, Perceived Augmented Reality, Perceived Enjoyment, Perceived Ease of Use, Consumer Novelty Seeking, Technology Anxiety, Perceived Informativeness, and Behavioral Intention to Use | Quantitative research using the TAM analyzed with SEM. Data were collected through a questionnaire distributed to users of AR-based mobile applications. | Results of the study indicate that CNS influences AR perception positively, whereas anxiety about technology does not have a significant effect. Users' perceptions of AR influence their evaluations of the application's usefulness, ease of use, and entertainment. However, ease of use does not affect the intention to use an application. |

| Author | Research Objectives | Research Construct | Research Method | Research Results |
|---|---|---|---|---|
| (Adawiyah, et al. 2024) | Using artificial intelligence and augmented reality, this study examines how AR and AI can enhance the personalization of product recommendations as well as the factors influencing customer usage intentions on Shopee in the cosmetic industry. | Perceived Usefulness, Perceived Trust, Perceived Control, Innovativeness, Perceived Security, Attitude, Usage Intention, Perceived Ease of Use, and Subjective Norm | Quantitative research employing the PLS-SEM approach, involving 387 respondents who are Shopee users. Perceived Ease of Use, | This study found that integrating AI and AR into the personalized recommendation feature on Shopee significantly increases customer usage intentions. The main factors driving usage intention are ease of use, customer trust, and usefulness in the feature. In order to encourage customers to make use of this feature, it must be easy to use, helpful in finding appropriate products, and safe for their personal information. |
| (Guo and Zhang 2024) | By using the TAM, this study examines the impact of online shopping experiences using augmented reality on consumer purchase intentions and provides recommendations for improving the online shopping experience and increasing desire to buy. | Emotional Experience, Sensory Experience, Action Experience, Thinking Experience, Perceived Usefulness, Related Experience, Purchase Intention, and Perceived Ease of Use | Empirical research conducted through a survey distributed to consumers who have used AR in online shopping. SEM was used to validate the relationships between variables based on the data. | This study shows that augmented reality (AR) in online shopping increases consumer purchase intentions, particularly through high perceived usefulness. Sensory, emotional, and cognitive experiences in AR make shopping more engaging and informative, while action and relational experiences enhance consumer engagement. These findings confirm that optimized AR features can effectively drive e-commerce purchase decisions. |

| Author | Research Objectives | Research Construct | Research Method | Research Results |
|---|---|---|---|---|
| (Xi, et al. 2024) | This research experimentally evaluates the acceptance of shopping in the metaverse using AR and VR, specifically reviewing factors that influence ease of use, enjoyment, and usefulness. | Virtual Reality, Perceived Ease of Use, Augmented Reality, Intention to visit, Perceived Enjoyment, Attitude, and Perceived Usefulness | The study involved 157 participants and was conducted with a 2 (VR: with vs. without) x 2 (AR: with vs. without) between-subjects design. Measurements were conducted using the NASA Task Load Index (for ease of use) and a psychometric questionnaire (for other variables). | The results show that AR technology reduces ease of use but does not affect enjoyment or usefulness in metaverse shopping. In contrast, VR increases enjoyment without affecting usefulness or ease of use. Usefulness and enjoyment are the primary factors influencing positive attitudes toward metaverse shopping, while ease of use has little impact on their perceptions. |
| (Wang, et al. 2023) | In this study, the TAM is utilized as a theoretical framework for exploring the acceptance of AI technology in e-commerce and the factors that contribute to user acceptance. | Subjective Norms, Trust, Perceived Usefulness, Perceived Ease of Use, Attitude towards Use, Actual Use, and Behavioral Intention to Use | To test the relationships between variables, an online survey was conducted and data was analyzed using the PLS Smart method. | It is found in the study that social support in e-commerce based on artificial intelligence (AI) increases the perception of usefulness, while trust affects only ease of use. The ease of use influences attitudes and perceived benefits, as well as consumer intention, which influences actual use. Using the TAM model, it has been able to understand and enhance the acceptability of artificial intelligence in e-commerce. |

| Author | Research Objectives | Research Construct | Research Method | Research Results |
|---|---|---|---|---|
| (Alam, et al. 2021) | This study explores the factors influencing the adoption of AR in the Malaysian retail industry using an expanded TAM. | Personal Innovativeness, Perceived Ease of Use, Competitive Pressure, Perceived Usefulness, Customer Pressure, Perceived Cost, Self-efficacy, Trading Partner Pressure, External Support, Technological Knowledge, Attitude, and Behavioral Intention | A structured questionnaire survey analyzed using the PLS method for structural model analysis via SEM. | This study found that the intention to adopt AR in Malaysian retail is driven by perceived benefits, attitudes, competitive and customer pressures, and technological knowledge. In contrast, high cost is the main barrier. Meanwhile, pressure from trading partners and external support do not have significant effects, possibly due to a lack of institutional support. |
| (Schultz and Kumar 2024) | Based on Consumption Value Theory, this study fills a gap in the literature by identifying dimensions that influence AR adoption. Additionally, it integrates this theory with the TAM to understand the values that motivate consumer adoption of AR. | Monetary Value, Informational Value, Social Value, Convenience Value, Hedonic Value, Perceived Usefulness, Perceived Ease of Use, Behavioral Intention, Attitude Toward Using, and Previous Experience | This study adopts a quantitative approach, utilizing a survey of 250 users of relevant AR applications, such as IKEA Place. An analysis of the collected data was conducted using a structural equations model (SEM). Furthermore, the research model integrates the Consumption Value Theory with the Technology Acceptance Model to evaluate consumption values and technology acceptance factors in the context of AR use. | The results show that AR adoption in marketing is primarily driven by convenience and information value, which help consumers understand products more easily and quickly. A consumer's hedonic value is only significant for females, while social and monetary values do not affect AR adoption intention. This finding highlights that the primary motivation for consumers to use AR tends to be more utilitarian rather than social or financial. |

| Author | Research Objectives | Research Construct | Research Method | Research Results |
|---|---|---|---|---|
| (Shen, et al. 2022) | This study examines students' perceptions of the acceptance and use of VR and AR applications in tourism education in China and identifies the key factors that influence their decision to use this technology for learning purposes. | Perceived Ease of Use, Behavioral Intention, Hedonic Motivation, Perceived Price Value, Attitude, and Perceived Usefulness | Test of hypotheses and examination of relationships between variables using a TAM model that is extended and a PLS-SEM approach. | This study shows that perceived perceived price value, hedonic motivation, and usefulness have a significant impact on students' intention to use VR and AR applications in tourism education, as this technology is perceived as useful, enjoyable, and valuable. As a result, perceived ease of use does not appear to be significant, perhaps due to the fact that students are already familiar with digital technologies. |
| (Wang, et al. 2024) | This study examines how AR impacts consumers' intentions to purchase cultural heritage products, based on the flow theory and TAM. A key focus of this study is to understand how the elements of AR (such as ease of use, usefulness, and flow experience) can influence consumers' perceptions, increase engagement, and increase the marketing value of cultural products. | Immersive Experience, Interactivity, Aesthetic Quality, Purchase Intention, Perceived Ease of Use, Perceived Usefulness, and Flow Experience | A quantitative approach using a survey to collect data from 603 respondents. Data were analyzed using SEM to determine the relationships between the variables defined in the research model. | According to these results, usefulness, flow experience, and ease of use have a significant impact on consumers' intentions to purchase products that utilize augmented reality in the cultural heritage field. Factors such as aesthetic quality, interactivity, and immersion contribute positively to flow and ease of use. AR's aesthetic quality and interactivity also contribute to an improved user experience, which ultimately increases consumer purchase intentions. |

| Author | Research Objectives | Research Construct | Research Method | Research Results |
|---|---|---|---|---|
| (Shyr and Wei 2024) | In this study, the TAM is used to assess students' intentions toward acceptance of AR in automated systems. It analyzes the relationships between variables such as perceived ease of use, attitudes toward use, perceived usefulness, and behavioral intentions in the context of AR usage. | Perceived Usefulness, Behavioral Intention to Use, Perceived Ease of Use, and Attitude Toward Using | To test the hypothesis model and perform path analysis between variables using a survey-based approach, a Partial Least Squares (PLS) method is used. Data collection was conducted using a 5-point Likert scale questionnaire. | This study concluded that students' usage intentions and attitudes toward AR are significantly influenced by usefulness of AR, while ease of use affects only their attitudes. Despite this, there is no significant relationship between attitudes toward usage and behaviors or between PEOU and PU. This indicates that students are more likely to use AR in learning due to its perceived benefits rather than its ease of use. |

## 2. DISCUSSION

### a) Theoretical Implications

Through this study, the relevance of using the TAM to evaluate e-commerce adoption of AR is demonstrated, which contributes to the development of theory. By linking the application of TAM to more modern and contextual AR technology within e-commerce platforms, the study extends the application of TAM. According to the TAM framework, this research demonstrates that the dimensions of perceived ease of use, perceived usefulness, and user attitude have a significant impact on user intentions to use the BeautyCam feature when purchasing beauty products on Shopee. Furthermore, this study provides additional evidence that interactive technologies such as AR not only enhance user convenience, but also affect their perception of the quality of services provided by e-commerce platforms. Integrating AR technology into digital services like Shopee can thus contribute to a more engaging, effective, and satisfying shopping experience for consumers.

### b) Practical Implications

This study aims to provide a reference for online retailers, such as Shopee, to further develop augmented reality (AR)-based features, particularly in the beauty industry. In order to increase the adoption rate of this technology among users, it is important to prioritize the development of features that are beneficial and easy to use. By utilizing AR technology, such as BeautyCam, customers can virtually try products before making a purchase, enhancing customer satisfaction and reducing the risk of product returns. Therefore, companies can leverage this feature as an effective strategy to boost customer loyalty. Furthermore, these

findings encourage companies to promote the BeautyCam feature more extensively and creatively in their marketing campaigns, highlighting the added value of ease of use, convenience, and realistic visual results for customers, thus improving the overall shopping experience.

### c) Research Limitations

This study has a limited scope as it focuses solely on the adoption of the BeautyCam feature on the Shopee platform, making its findings potentially less generalizable to other e-commerce platforms or augmented reality (AR) technologies in different sectors. As a literature-based study, it relies on available references, which may limit the depth of analysis and the validity of the findings' generalizability due to constraints in secondary data related to the use of AR in e-commerce. Moreover, the research approach only utilizes secondary data without involving direct empirical analysis from users or relevant stakeholders. Therefore, to generate more comprehensive and in-depth findings, future research is recommended to adopt direct quantitative or qualitative approaches, such as surveys, interviews, or field experiments, which can provide primary data and enrich the understanding of factors influencing the adoption of AR technology in the e-commerce context.

## CONCLUSION

Based on the TAM framework, this study examines how AR technology is being applied to Shopee's BeautyCam feature. As a result of the analysis, TAM can be used to explain the adoption of AR technology on the basis of two main dimensions: perceived ease of use and perceived usefulness, which have significant influence on users' attitudes and intentions regarding AR technology. It is more likely that users will adopt AR technology if they find it easy to use and see practical benefits, such as a more interactive and personalized shopping experience.

Additionally, external factors such as the visual quality of AR, trust in the platform, and social trends can also influence users' perceptions of the technology's ease of use and usefulness. Positive attitudes towards AR, as well as positive user experiences and perceived added value, can lead to a broader adoption of the technology. In this research, TAM has been integrated in order to provide a comprehensive understanding of factors that influence users' decision to use augmented reality features in e-commerce.

In practical terms, the findings of this study have a direct bearing on how marketers and e-commerce developers should design strategies to enhance the adoption of AR features. Emphasizing ease of use, the tangible benefits of the BeautyCam feature, and promotional campaigns involving influencers or positive user reviews are expected to increase the adoption of this technology. There are opportunities for further investigation using different methodologies or examining other factors, including cultural and psychological factors, that may influence the adoption of AR technology in e-commerce, despite this study focusing on literature published between 2020 and 2024 and using TAM as the primary framework.

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