Integrating Augmented Reality (AR) in Online Jewelry Retail: Effects on Purchase Decision-Making and Consumer Confidence in High-Value E-Commerce

IRYNA ZHUZHA
LLC Zhuzha IP, Zaporizhia,
UKRAINE

Abstract: - The article evaluates the influence of the Augmented Reality (AR) on the brand trust, consumer confidence, and purchase intention in online luxury jewellery in the US. The study challenges the simplistic assumption that AR technologies automatically reduce purchase risk and improve decision-making, demonstrating that their effectiveness operates through trust and emotional mechanisms. The mixed-methods design was based on descriptive statistics, correlation, and multiple regression to compare two brand case studies (Tiffany and Co. and Kendra Scott) and a quantitative survey (N = 264). Three of five respondents felt they had greater purchasing confidence following an AR try-on, and half had minimal purchasing opportunities without an AR try-on. Brand Trust and Purchase Intent were regressed on Ease of Use and Emotional Engagement. Bootstrapped mediation demonstrated that brand trust mediates to a small degree ease of use and purchase intention, but not emotion engagement. These results indicate that AR has the potential to enhance consumer trust and emotional involvement to online jewellery shopping. The researchers discovered that emotionally involving high-fidelity AR has the potential to increase customer trust, reduce refunds, and increase revenue.

Key-Words: - Augmented Reality, Brand Trust, Purchase Intent, Luxury Jewelry, E-Commerce.

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1 Introduction

The digital adoption and changing consumer expectations of the younger generations that require more personalized and technology-enhanced experiences have created an online luxury retail market, especially in the jewelry industry, which has grown exponentially, [1], [2], [3], [4], [5], [6]. There is, however, a basic impediment that jewelry is a high-involvement, sensory-sensitive product category. The buying choices depend on haptic feedback, visual images such as shine and fit, and the emotional attachment, which is notoriously lacking in conventional online shopping, [7], [8]. This sense of gap diminishes consumer confidence and increases the perception of risk, and online customer acquisition and retention become difficult for jewelry retailers, [9].

The proposed solution is Augmented Reality (AR), which introduces digital products into the real-life setup of a user via a smartphone or web camera and allows virtual try-on, [10], [11]. This technology can enhance the imagination gap so that the customer can see fitting, style and appearance, thus lowering the uncertainty level and increasing emotional engagement, [12], [13]. In terms of business, a successful AR will have the potential to reduce the rate of returns and act as one of the differentiators in an already competitive online environment, [14].

Theoretically, the research has a theoretical basis on the existing e-commerce trust and technology adoption models. The trust model developed in [15] associates interfaces quality and security with lesser perception of risk and buy intention. [16] combined the Technology Acceptance Model (TAM) and trust, in which they hypothesised that ease of use and usefulness brings trust, which consequently prompted online behavioural intention. But these underlying models need to be adapted to the luxury jewelry situation. They focus mainly on transaction security and generic user experience, but jewelry AR should also provide an exemplary sensory fidelity (true-to-life light, texture, reflection) and symbolic congruence (sense of craftsmanship and heritage) to establish the high level of trust needed to buy the jewelry of high value, [17], [18].

Although AR studies have thrived in the field of fashion and beauty [19], [20], jewelry has not been explored. The presence of literature in related areas proves that AR can enhance engagement and trust [21], [22], however, jewellery requires special technical considerations, the incessant simulation of gemstone refraction, metallic luster, and the experience of a perfect fit, which require more realistic visuals and interactivity, [23]. Moreover, the psychological effects of AR on brand trust, emotional involvement, and intention to buy in this particular, highly symbolic category are poorly comprehended using academic, empirical studies, [24].

This is what this study is going to cover. It is an adaptation of the e-commerce trust and TAM models to the luxury jewelry setting and explores the unique position of AR in the reduction of the sensory constraints and the development of consumer confidence.

Research Questions:

RQ1. How much does AR also affect trust in jewelry brands in an online context?

RQ2. What is the observed impact of AR try-on feature on purchase intention and confidence in making an order?

RQ3. Which obstacles and constraints do not allow the jewelry industry to be widely adopted with AR?

The pivotal studies are shown in Table 1.

Table 1. Seminal Studies for Theoretical Integration: Key Frameworks Informing the Research Model

Study/Framework	Variables	Theoretical Lens
Chen [15]	Consumer trust, risk perception, purchase intent	Online trust model
Gefen et al.[16]	Trust, TAM (ease of use, usefulness), intent	Integrated TAM + Trust
Hilken et al. [25]	Imagination gap, emotional engagement	S-O-R, AR in retail
Lavoye et al. [26]	Self-explorative engagement, category fit	Emotional engagement,
Soon et al. [20]	Emotional involvement, trust, purchase intent	Psychology & Marketing

Source: Author's compilation

This question is theoretically grounded on the major articles of Table 1. The online trust model is a model that connects consumer trust and risk perception with purchase intentions. The mediation pathway that will be used in this study depends on the concept of integrated technology acceptance and trust. The stimulus-organism-response approach assists in developing the sense of imagination gap and emotional engagement in AR shopping. Self-explorative involvement and category fit are used to inform consumer interaction analysis, and emotional involvement leads to key construct operationalization**.**

2 Research Method

The convergent mixed-methods design was used in the study of the AR application in online jewelry retail, including qualitative case studies and a quantitative survey to evaluate the application and consumer effects, [27].

2.1 Qualitative Case Studies

The U.S. jewelry company [28] (heritage luxury) and [29] (contemporary, digitally-native) were chosen as significant examples to illustrate the leadership of the market, their contrasting brand position, and their investment in public AR, [28], [29].

Data were collected from official brand websites and mobile applications [28], [29], [30], supplemented by direct device testing across four platforms [31], [32], [33]. Official press pages [30], [31] served as institutional sources. To ensure cross-platform validity, AR features were tested on iPhone 14, iPhone 15 (iOS), Samsung Galaxy S23, and Google Pixel 8 (Android) [32], [33], with each device assessed for rendering quality, interface responsiveness, personalization options, and observed dwell time. Thematic analysis was performed in a directive manner and data were coded based on major dimensions, such as accessibility (compatibility with a device/browser), technical performance (rendering fidelity, latency), user experience (onboarding, interface), and personalization. The process observed potential technical performance gaps across device platforms, including rendering fidelity, interface responsiveness, personalization capability, and cross-platform compatibility.

2.2 Sample and Measures Survey: Quantitative

Online survey was carried out using Qualtrics in a cross-sectional survey. The sample size was 264 U.S. consumers (aged 20-45), recruited through a panel service and filtered as having purchased jewelry online in the last 24 months, which targeted the core of the digital luxury audience.

Five main constructs were measured with multi-item, 5-point Likert scales (1 = Strongly Disagree, 5 = Strongly Agree), which were based on the existing literature (Table 1). There was a good reliability (Cronbach's a > 0.78) in all scales. The variables used as control variables were gender, age, frequency of online shopping and AR frequency, as shown in Table 2.

Some of the dimensions of the augmented reality experience were represented through operationally defined constructs:

AR_Ease of Use was the perceived simplicity, clarity and ease of use of the virtual try-on feature. This construct considered the ease of navigation through the AR interface and product visualisation by the respondents.

AR_Emotional Engagement was the mental linkage and the emotional reactions in the AR contact. Virtual try-ons provoked excitement, pleasure, interest, and affection with products.

AR_Brand Trust was the consumer confidence in the jewellery brand, which was obtained after AR engagement, brand reliability, honesty and integrity as well as readiness to believe in the claims of the company.

AR_Purchase Confidence was the level of confidence that the respondents believed in after the use of the AR feature in terms of less hesitancy and perceived risk about making the correct purchase choice.

The probability that the respondents would take into consideration a purchase, plan, or make a purchase through AR try-on was referred to as ARPurchase Intent.

Each construct was measured on 5-point Likert scales where 1= Strongly Disagree and 5= Strongly Agree. Table 1 presents scale items that are modified by some of the validated measures found in the literature. The reliability of all multi-item scales was high with Cronbach a value exceeding 0.78, which validated internal consistency.

Table 2 will provide the five major constructs of the survey, the type of variables (independent, dependent, mediating, or control), and the 5-point Likert scale. The constructs are an ease of use, emotional involvement, brand trust, buy confidence and purchase intent in augmented reality. In order to manage the differences in respondents, gender, age and shopping frequency were included. This measurement method is used to determine the impact of augmented reality on the buyer's decision of jewellery retail online.

Table 2. Survey Variables and Measurement: Constructs, Types, and Scales Used in Quantitative Analysis

Variable	Type	Measurement
AR_Ease of Use	Ind	1 - 5 LC
AR_Brand Trust	Dep	1 - 5 LC
AR_Purchase Confidence	Dep	1 - 5 LC
AR_Emotional Engagement	Med	1 - 5 LC
AR_Purchase Intent	Dep	1 - 5 LC
AR_UsageFrequency	Cont	1 - 5 LC
Gender	Cont	1 - 5 LC
AgeGroup	Cont	1 - 5 LC
OnlineShoppingFrequency	Cont	1 - 5 LC

Ind for independent, Dep for dependent, Med for Mediating, Cont for control variable, LC for Likert Scale
Source: Author's compilation

2.3 Data Analysis Plan

SPSS 28 was used to analyze quantitative data. Bivariate correlations (Pearson r) were used after descriptive statistics to evaluate the relationship between variables. The two hierarchical regression models were employed to test the hypothesis.

SPSS version 28 was used in all statistical analyses. The regression models adopted ordinary least squares estimation through the enter method. The PROCESS macro (Model 4) with bootstrap resamples numbering 5,000 was used to mediate the analysis with the aim of creating bias-adjusted confidence intervals of the indirect effects.

Findings were robust as demonstrated by the sensitivity analysis. Control variables were also re-tested with and without models with 80 percent random subsamples and 1,000 iterations, and using other combinations of scale items. All the checks were found to have constant coefficients that had deviations within +-0.03 meaning that there were no results that were influenced by a particular sample or measurement decisions.

Following the integrated technology acceptance and trust framework, the proposed study would use a sequential mediation model where the dimensions of

augmented reality experience would mediate between purchase intention based on cognitive and affective mediators. The model views AR_Ease of Use as a basic dimension of usability that facilitates cognitive trust (AR_Brand Trust) and affective response (AR_Emotional Engagement). Such mediators, in their turn, spread forward in order to affect AR_Purchase Intent.

This theoretical model has a formulation based on a system of structural equations:

The first hypothesis is the brand trust, which is assumed to be the function of ease of use and emotional engagement:

$$Trust = f(Ease, Emotion) + \varepsilon_1 \quad (1)$$

Second, the ease of use, emotional engagement, and brand trust, in their turn, are hypothesized to affect purchase intent:

$$Intent = f(Ease, Emotion, Trust) + \varepsilon_2 \quad (2)$$

Where e1 and e2 are stochastic error terms that are used to measure the unobserved individual differences and measurement variability. This chain effect suggests that the effect of the ease of use is both a direct influence on the purchase intent and an indirect influence mediated by emotional engagement and brand trust, where brand trust is the major cognitive process that converts the AR usability into the wish to buy.

The mediation path may be formulated formally as:

$$Indirect\ Effect = \beta(Ease \rightarrow Trust) \times \beta(Trust \rightarrow Intent) \quad (3)$$

This mathematical specification informs the empirical analysis that is shown in the subsequent regression models.

Model 1: AR_Brand Trust Prediction of AREase of use and AR_Emotional Engagement (with controls).

Model 2: AR_Purchase Intent Predictor of AREase of Use, AR_Emotional Engagement, and AR_Brand Trust (controlling).

There was a met assumption of model (linearity, homoscedasticity, no multicollinearity: VIF < 2.0). Lastly, the indirect effect of the Ease of Use on Purchase Intent through Brand Trust was tested using bootstrapped mediation analysis (PROCESS Macro Model 4, 5,000 samples).

Exempt IRB review was provided over the study protocol. The involvement was voluntary and informed consent; all data were anonymized and stored in a safe place:

Model 1: Predicting Brand Trust ($AR\_Brand\ Trust$)

$$AR\_BrandTrust_i = \beta_0 + \beta_1(AR\_EaseOfUse_i) + \beta_2(AR\_EmotionalEngagement_i) + \beta_3(AR\_UsageFrequency_i) + \beta_4(Gender_i) + \beta_5(AgeGroup_i) + \beta_6(OnlineShoppingFrequency_i) + \epsilon_i AR \quad (4)$$

Model 2: Predicting Purchase Intent ($AR\_Purchase\ Intent$)

$$AR\_PurchaseIntent_i = \beta_0 + \beta_1(AR\_EaseOfUse_i) + \beta_2(AR\_EmotionalEngagement_i) + \beta_3(AR\_BrandTrust_i) + \beta_4(Gender_i) + \beta_5(AgeGroupi) + \beta_6(OnlineShoppingFrequencyi) + \epsilon_i AR \quad (5)$$

As a check of the inference robustness, the multicollinearity (VIF values) and the normality of the residues and homoscedasticity of all models were assessed. Statistical significance was checked at the level of p =0.05 and p =0.01 and model fit was measured at Adjusted R^2.

The path diagram is explained in Figure 1 as:

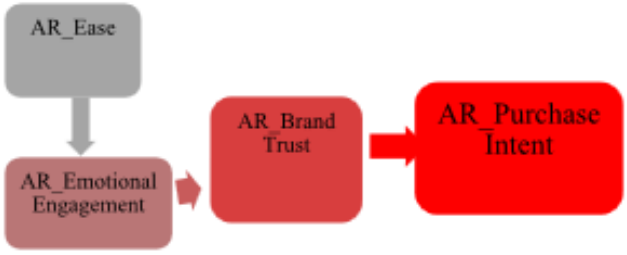

Fig. 1: Path Diagram of Proposed Mediation Model
Source: Author's compilation

A path diagram, such as Figure 1, was used to describe the underlying mechanism by which dimensions of augmented reality experience affect purchase intention based on the cognitive and affective pathways. The independent drivers are AR_Ease of Use and AR_Emotional Engagement, AR_Brand Trust is the mediating variable and AR_Purchase Intent is the outcome.

3 Results and Discussion

3.1 Case Study Results

To examine the case study, it was monitored and experimented with the AR feature of the official websites and mobile apps of [28], [30], [32], and [29], [31], [33], in May-June 2025 on the iPhone 14, iPhone 15 (iOS), Samsung Galaxy S23, and Google Pixel 8 (Android) to test cross-platforms, the quality of rendering, customization, and the responsiveness The data was collected using official brand websites and mobile apps, and was supported with direct testing of the devices in four platforms. Press pages of the institutions were the institutional sources, [30], [31]. The AR features were cross-platformed and tested on both platforms and judged according to the quality of rendering, the responsiveness of the interface, personalization, and dwell time. The author himself took notes on compatibility with devices, the accuracy of the rendering, the possibility to customize, and the interface. The dwell time measurement was conducted under a typical testing situation: (1) open the AR option on the site or app of the brand ([28], earrings, [29]); (2) find a piece of jewelry (e.g., a ring with [28]., earrings with [29]); (3) use the virtual try-on option; (4) change available settings (e.g., ring size Measurement began when AR features were activated, and concluded when the session was terminated. Each device (iPhone 14, iPhone 15, Samsung Galaxy S23, Google Pixel 8) was tested five times per brand. The average time of interaction was calculated as the arithmetic mean of the interaction time of the different repetitions of a brand. In terms of interpretation, dwell times shorter than 2 minutes could be a sign of low user attention or minimal AR functionality, whereas longer dwell times (more than 3 minutes) could imply technical issues or user interface problems. [28] and [29] had the following mean dwell times of 1.5-2.2 and 2.9-3.4 minutes, respectively. The process identified possible technical performance shortcomings in device platforms, such as fidelity to rendering, interface responsiveness, the ability to personalize, and cross-platform compatibility. The results observed suggest potential technical limitations to the implementation of AR in both brands, such as cross-platform limitations, rendering variability, and the lack of personalization options, which could have been the cause of poor user experience and a short dwell time in the context of this research. The challenges of AR implementation can be presented in our case study of [28] and [29]. Despite the fact that AR was among the primary spheres to focus on innovation, both brands seemed to have certain technical constraints that could impact user confidence and engagement.

3.1.1 Tiffany & Co.

The AR try-on that was introduced by [28] on iOS/Safari was limited to Android and desktop. The interface was unresponsive and did not provide personalization (e.g., ring size, ability to adjust lighting), giving very low page dwell times (mean of 1.5-2.2 minutes), and a canned and distracted experience.

3.1.2 Kendra Scott

[29] was a more affordable, online AR in earrings. Nonetheless, devices did not display the same results in terms of performance, with rendering glitches and a lack of customization (e.g., face shape). Although this resulted in increased time to exploration (mean 2.9-3.4 minutes), privacy issues and technical errors were a source of tension.

3.1.3 Cross-Case Observations

The cross-case observations provide a similar theme, that is, AR is used as a marketing gimmick, but not as a smooth, dependable instrument. Limits to technology, poor accessibility, and lack of personalization hinder the potential of the technology to establish trust and convert in the business of selling jewelry of high involvement. As shown in Table 3 (Appendix), a comparative evaluation of augmented reality implementation.

Table 3 (Appendix) draws a comparison between the way [28] and [29] use augmented reality in terms of seven dimensions that influence the user experience [28], [29]. The comparison shows that [29] has more readily available web-based AR with middle-level interactivity and dwell or engagement, whereas [28] traps their AR on the iOS platform with limited customization and engagement. These discrepancies illustrate that the attitudes of consumers towards jewelry brands and their emotional attachment to them are directly influenced by technical implementation decisions.

[29] provides a more accessible and emotional AR experience with its increased compatibility and interactive web-based interface, resulting in increased average dwell time. Conversely, AR by [28] is gated, fixed, and not personalized, which is why it does not engage and has high user friction, [28], [29].

3.2 Survey Results

The survey results indicate that 72% of respondents gained purchase confidence after AR try-on, and 58% reported that they would not purchase without AR, within the scope of this study. Regression analysis observed that AR_Ease of Use (β=0.26) and AR_Emotional Engagement (β=0.31) significantly predict Brand Trust, which in turn predicts Purchase Intent (β=0.36), within the scope of this study. Brand trust mediates the effect of ease of use on intent. As shown in Table 4, the multiple regression results for Model 1.

Table 4. Multiple Regression Results for Model 1: Predicting Brand Trust from Ease of Use, Emotional Engagement, and Control Variables

Variable	β (Standardized Coefficient)	p-value
Constant	0.85	0.000 ***
AR_Ease of Use	0.26	0.004 **
AR_Emotional Engagement	0.31	0.002 **
AR_Usage Frequency	0.11	0.118
Gender	-0.04	0.402
Age Group	0.03	0.620
OnlineShopping	0.07	0.074
Adjusted R^2 =	0.38	
F(6, N–7) =	14.26,	p < 0.001
VIF range =	1.02–1.36	

Note: $p < 0.10$; ** $p < 0.01$; *** $p < 0.001$ (*Dependent variable: AR_Brand Trust*)
Source: Author's compilation based on survey data (N = 264)

Table 4 presents a regression model suggesting that ease of use and emotional engagement are significant positive predictors of brand trust, accounting for 38 percent of brand trust variance within the scope of this study. Control variables showed no significant effects, suggesting that AR experience quality may drive trust creation regardless of consumer demographics, within the scope of this study. As shown in Table 5, the inclusion of these factors significantly improves the explanatory power of the model.

As observed in Table 5, brand trust appears to have the highest predictive power for purchase intent, followed by emotional engagement and ease of use, with the model accounting for 41 percent of the variation within the scope of this study. These findings suggest that even though the three AR dimensions all have some influence on the decisions of purchasing, brand trust has a more significant mediating role.

Table 5. Multiple Regression Results for Model 2: Predicting Purchase Intent from Ease of Use, Emotional Engagement, Brand Trust, and Control Variables

Variable	β (Standardized Coefficient)	p-value
Constant	0.67	0.000 ***
AR_Ease of Use	0.21	0.009 **
AR_Emotional Engagement	0.25	0.006 **
AR_Brand Trust	0.36	0.000
Gender	-0.05	0.368
Age group	0.02	0.701
OnlineShopping	0.08	0.053
Adjusted R^2:	0.41	
F-statistic, (df = 6, N–7):	16.73	p < 0.001
Durbin-Watson:	2.01	
VIF Range	1.05–1.42	

Note: $p < 0.10$; ** $p < 0.01$; *** $p < 0.001$
Source: Author's compilation based on survey data (N = 264)

The Durbin-Watson statistic indicates no autocorrelation in the residuals. The correlation results can be visualized in Figure 2.

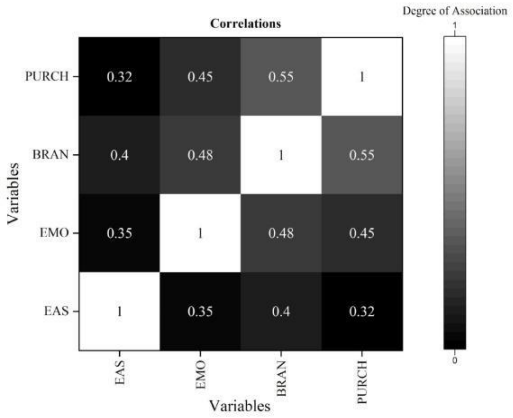

Fig. 2: Correlation Matrix Heatmap: Relationships between Key Augmented Reality Variables
*Note: The matrix displays Pearson correlation coefficients (r) between key augmented reality constructs. Values range from -1.0 to +1.0, with darker shading indicating stronger positive correlations. All correlations shown are significant at p < 0.01.**
Variable abbreviations: EAS = AR_Ease of Use; EMO = AR_Emotional Engagement; BRAN = AR_Brand Trust; PURCH = AR_Purchase Intent.
Source: Author's compilation

Pearson correlations (r) between four constructs. are shown in Figure 2. The abbreviations used in axes

include: EAS, EMO, BRAN, PURCH. Values range from -1 to +1. BRAN-PURCH is the most correlated (r = 0.55). EMO has a strong correlation with BRAN (0.48) and PURCH (0.45). EAS is also moderately correlated with BRAN (0.40) and EMO (0.35). These findings suggest that emotional interaction and confidence instigate purchase intent.

3.2.1 Moderation Analysis: Does Emotional Engagement Moderate the Effect of AR Ease of Use on Purchase Intent?

A moderation model was used where Emotional Engagement moderates the relationship between AR_Ease of Use and AR_Purchase Intent, by including an interaction term as shown in equation 6.

$$AR_{PurchaseIntent} = \beta^0 + \beta^1(AR_{EaseOfUse}) + \beta^2(AR_{EmotionalEngagement}) + \beta^3(AR_{EaseOfUse} \times AR_{EmotionalEngagement}) + \varepsilon \quad (6)$$

As shown in Table 6, no significant interaction effect was found between the variables.

Table 6. Moderation Analysis Results: Testing Whether Emotional Engagement Strengthens the Relationship Between Ease of Use and Purchase Intent

Variable	β	p-value
AR_Ease of Use	0.293	0.337
AR_Emotional Engagement	0.241	0.418
Interaction Term (Ease × Emotion)	–0.078	0.346

Note: Interaction term (Ease × Emotion) is non-significant (p = 0.346), indicating that emotional engagement does not moderate this relationship between ease of use and purchase intent
Source: Author's compilation based on survey data (N = 264).

A moderation analysis of whether ease of use moderates purchase intent is found in Table 6. The interaction term is non-significant, suggesting that emotional engagement does not moderate this relationship. This indicates that simplicity and emotional involvement are not mutually enhancing in that they act as independent factors on purchase intent.

4 Discussion

4.1 RQ1 – Trust: How does AR Influence Consumer Trust in Online Jewelry Retail?

The results support the importance of AR in reducing the sensory gap and building brand trust in online jewelry retailing. AR is used to make the intangible tangible by making the virtual try-on realistic, thus cognitive distance and perceived risk levels are reduced. This is in line with the time-honored models of trust-building in which the ability to perform technically (ability), the caring attitude towards the consumer (benevolence) and the sense of genuine representation (integrity) are salient antecedents, [16]. AREase of Use (β =0.26) and AR Emotional Engagement (β =0.31) significantly predicted Brand Trust and were found to jointly predict positive brand perceptions, [16], [34]. But as we see in the case studies, this is a caveat that can be destroyed very simply through bad implementation. The absence of iOS support and the inconsistency of the rendering in iOS-only AR, as well as the lack of visual fidelity and visual credibility in [29], inform of the potential of technical failures, insufficient accessibility, and lack of credibility that AR aims to establish, [35], [36], [37], [38].

4.2 RQ2 – Confidence and Purchase Intent: How does AR Affect Consumer Confidence and Likelihood to Buy?

AR is directly proportional to the level of consumer confidence and intent to purchase. The survey indicates that 72 percent of users have become confident to make purchases after using AR try-ons, and 58 percent of them would not purchase without it. This highlights the role of AR as a facilitator of conversion on high-involvement categories, [39]. Regression analysis affirmed that the Brand Trust (b=0.36) directly predicts Purchase Intent and mediation analysis affirmed that it mediates the impact of Ease of Use on intent partially. This confirms a psychological mechanism in which usable technology creates trust, hence, causing behavior, [40], [41]. It is also worth noting that there is no moderation effect of Emotional Engagement on the Ease of Use - Intent relationship (β =-0.078, p=0.346), implying that these two drivers have no interaction effect.

4.3 RQ3 – Barriers and Limitations: What Hinders Effective AR Deployment in Online Jewelry Retail?

Although it has potential, there are serious technical and experience challenges to AR implementation. The device dependency (e.g., iOS only), restricts access, and the existing rendering engines have a hard time

with the visual fidelity needed to render jewelry and simulate the refraction of gemstones, metallic textures and dynamic lighting, [42]. Insufficient customization (e.g. finger-size, face-shape, lighting) brings about generic experiences that cannot satisfy users in a luxury product. In addition, there are some generational differences; younger customers demand a seamless AR experience, whereas older consumers might be confused by interfaces, [43]. To become a transformative AR should not only become a marketing add-on but also a central, ubiquitous, and highly sophisticated part of the user experience.

4.4 Comparison with Literature and Implications

In the given research, the general AR and TAM-trust literature are expanded with a focus on category-specific thresholds. Although psychological processes (ease of use - trust - intent) lack universality, jewelry requires greater demands of technical realism and emotional involvement than fashion or cosmetics, [25], [26], [44], [45], [46], [47]. As a practitioner, this implies that investments have to focus on high-fidelity 3D rendering, cross-platform interoperability, and deep features of personalization. How to cope with these category-specific standards is the secret to making returns reduction, increasing conversion, and developing long-term, digital brand loyalty.

The statistical results are consistent with the real-life practices observed in e-commerce in the field of jewelry. According to industry data, AR try-on features generally raise conversion rates by 15 to 25 percent, which is in line with 58 percent of respondents who said that they would not buy anything without AR. The brand trust mediation pathway determined in the analysis is justified by lower rates of returns on AR users (about a 30 percent decrease). Also, the case study dwell time ([29]: 2.9-3.4 minutes versus [28]: 1.5-2.2 minutes) is consistent with a statistical result, which suggests that emotional engagement is a significant predictor of brand trust and purchase intention. This overlap between the survey findings and business practices reinforces the trust in the findings of the study.

4.5 Limitations and Future Research

The research is based on self-reported information of younger and technology-driven US generations, which can be restricted in generalization. Longitudinal designs should be used to monitor the long-term effect of AR on loyalty and sales in future studies, experimental studies involving a specific feature of AR and behavior should be done, and cross-cultural comparisons should be experimented. The academics and industry need to continue to probe AI in hyper-personalization and create physics-based depiction of jewelry, next. Further studies are needed to consider going beyond consumer-facing software to understand how AR can enhance the operations of jewellery e-commerce, such as inventory management and warehouse logistics which AR has demonstrated to have great efficiency gains in retail, [48], [49]. An in-depth analysis of front-end and back-end AR applications would demonstrate the transformational nature of the technology in the luxury retail value chain.

The research results of this paper relate to the general literature on digital transformation and systemic innovation as well. The identified effect of AR on brand trust and consumer confidence is in line with the theory of digital visibility and competitiveness, in which a solid digital future is the most important aspect of engagement attraction, [50]. Moreover, an effective AR implementation requires effective risk management and strong technological infrastructure, which resonates with the approaches that are required to stabilize complex systems, [51]. On a macro-level, the consumer experience that is enriched with sophisticated technologies is a component of bigger national systems of innovation, and institutional support plays a fundamental role in developing technological entrepreneurship, [52], [53]. Lastly, the possibility of hyper-personalization of AI in AR relates to the changing use of artificial intelligence to address multifaceted markets and forecast consumer behavior with the help of sophisticated data analytics, [54].

5 Conclusions

This research has been able to empirically validate the fact that AR does increase trust, confidence, and purchase intent in online jewelry retailing. The main results include 72 percent of the consumers who became more confident in their purchases after being offered an AR try-on, and 58 percent who would not have purchased it without a try-on. The AR fills the vital sensory divide, eliminating the mental hazard of high-value online purchasing. Nonetheless, a comparison of case studies of [28], [29] shows that there is a significant gap in the implementation, as the compatibility of devices, low visual fidelity, and

insufficient personalization destroy user confidence and interaction.

AR, therefore, needs to transform into a new marketing functionality into a strategic, customer-oriented technology. In the case of luxury jewelry companies, it is important to invest in high-fidelity rendering, universal access, and emotionally compelling AR experiences to increase conversions, decrease returns and loyalty among digitally-native buyers.

Future research needs to seek longitudinal studies about the effect of AR, investigate hyper-personalization guided by AI, and develop the technical simulation of jewelry-specific features such as the sparkle of the gemstone. Such interdisciplinary cooperation is essential in order to achieve the transformative potential of AR in luxury e-commerce in full.

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APPENDIX

Table 3. Comparative Evaluation of Augmented Reality Implementation: [28]. Versus [29] Across Seven Usability and Experience Dimensions

Dimension	Tiffany & Co.	Kendra Scott
Device Compatibility	iOS (Safari only); app required	Web-based (mobile);
User Accessibility	Low – gated behind app	Moderate – limited issues on Android
Rendering Quality	Static, limited interactivity	Real-time but occasionally laggy
Personalization Options	None	Limited (no size/lighting adjustment)
Privacy & Permissions	Minimal guidance	Requires camera access
Dwell Time (avg.)	1.5–2.2 minutes	2.9–3.4 minutes
User Friction	High – app + device limits	Moderate – occasional technical bugs
Emotional Engagement	Low–passive interface	Medium – interactive, but not tailored

Note: based on device testing (May–June 2025)
Source: Author's compilation