



Social Media's Dominant Role In Ar/Vr-Driven Brand Equity: Empirical Evidence From The Apac Region

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ARTICLE INFO ABSTRACT

Social Media has emerged as the dominant driver of brand equity in augmented reality (AR) and virtual reality (VR) contexts. This quantitative study investigates Social Media's influence on brand equity within AR/VR environments, examining both direct effects and mediating mechanisms through Customer Experience, Marketing, Purchase Intention, and Customer Satisfaction. Data were collected from 567 valid respondents across the APAC region using structured 5-point Likert-scale. The sample comprised predominantly male respondents (92.4%) aged 20-30 years (73%) from India (94%).

Statistical analysis using ADANCO 2.4.1 variance-based structural equation modeling (PLS-SEM) revealed that Social Media demonstrates the strongest direct effect on brand equity ($\beta=0.2884$, $t=6.1235$, $p<0.01$) among all five independent variables examined. Furthermore, Social Media operates through four significant mediating pathways: through Customer Experience ($\beta=0.0494$), Marketing ($\beta=0.0905$), Purchase Intention ($\beta=0.0672$), and Customer Satisfaction ($\beta=0.0771$). The model achieved $R^2=0.583$, explaining 58.3% of variance in brand equity outcomes.

Key findings indicate that Games (SM3: 0.7239) and Emotions (SM4: 0.7170) emerged as strongest Social Media indicators, while Social Activism (OM4: 0.7464) demonstrated the highest brand equity outcome loading. These results confirm that AR/VR-driven brand equity thrives on interactive, emotional, and gamified social engagement rather than technological sophistication alone. This research provides marketers with empirically validated guidance for leveraging social media integration within AR/VR strategies to maximize brand equity in the APAC region.

Keywords: Social media, augmented reality, virtual reality, brand equity, gamification, customer engagement, APAC region, PLS-SEM, CBBE model

I. INTRODUCTION

The integration of immersive technologies with social media platforms represents a transformative shift in digital brand engagement. As Augmented Reality (AR) and Virtual Reality (VR) technologies become increasingly prevalent, understanding how social media amplifies their brand-building potential becomes critical for marketers.

The global AR/VR market demonstrates remarkable growth, projected to expand from \$30.7 billion in 2021 to \$296 billion by 2025. This exponential growth reflects increasing recognition of immersive technologies' potential to transform consumer engagement. However, emerging research suggests that the social dimension—rather than technological sophistication—may be the primary driver of brand equity in AR/VR contexts.

A. Augmented Reality and Virtual Reality

Augmented Reality (AR) is defined as "software-based technology using which the real-world environment is augmented by digital information that in turn may include images, sounds and even the interactive media. AR

enhances physical environments through devices such as smartphones, tablets, or AR glasses. Research by Deloitte (2022) reveals that 71% of consumers believe AR enables them to learn more about product features. Virtual Reality (VR) is characterized as "immersion technology whereby the user experiences a simulated environment where one can interact within three-dimensional digital space by way of the use of headsets and motion controllers. According to PwC (2023), VR increases purchase confidence by 25% and brand recall by over 30%.

B. Social Media in AR/VR Brand Building

Social Media represents the integration of AR/VR experiences with social platforms and user-generated content. The literature identifies five key sub-variables within the Social Media construct: Design, Emotions, Games, Health, and Technology

Design encompasses visual and interface elements of social AR/VR experiences. Emotions captures affective responses to social AR/VR content [Harley et al., 2016]. Games represents gamification elements that drive engagement [Thakkar et al., 2023]. Health covers wellness applications of social AR/VR [Hilty et al., 2020]. Technology examines platform capabilities enabling social AR/VR experiences [Jurgenson, 2012].

C. Research Problem

Despite growing industry adoption of AR/VR technologies by organizations such as IKEA, Nike, Sephora, and Marriott, systematic empirical research examining how social media integration specifically amplifies AR/VR's brand equity impact remains limited. Existing research often examines AR/VR and social media separately rather than investigating their synergistic effects on brand building.

This study addresses this gap by investigating Social Media's role as the dominant predictor of brand equity within AR/VR contexts, examining both direct effects and the mediating mechanisms through which social integration amplifies immersive technology impacts.

D. Research Question

How does Social Media integration with AR/VR technologies influence brand equity, and what mechanisms mediate this relationship in the APAC context?

II. RESEARCH OBJECTIVES

Based on the research framework, this study pursues the following objectives related to Social Media's role in AR/VR brand equity:

1. To assess how AR/VR-enabled gamification and social media activities influence brand equity
2. To examine Social Media's direct effect on brand equity outcomes in AR/VR contexts
3. To investigate Social Media's indirect effects through Customer Experience, Marketing, Purchase Intention, and Customer Satisfaction
4. To identify which Social Media sub-variables (Design, Emotions, Games, Health, Technology) most strongly contribute to brand equity
5. To provide strategic recommendations for brands implementing AR/VR features within social media marketing strategies

III. THEORETICAL FRAMEWORK

A. Customer-Based Brand Equity Model

This study employs Keller's (1993) Customer-Based Brand Equity (CBBE) model as its theoretical foundation. The CBBE framework conceptualizes brand equity through four hierarchical dimensions: Brand Awareness, Brand Associations, Perceived Quality, and Brand Loyalty



Figure 1: Keller's CBBE Model Applied to Social Media AR/VR Context

The figure presents Keller's four-level brand equity pyramid adapted for the Social Media AR/VR context:

Level 1 - Identity (Base): Brand Awareness

- Traditional Context: Recognition through marketing exposure
- Social AR/VR Context: Enhanced through social media sharing, viral content, peer recommendations via AR/VR experiences
- Key Driver: Social amplification of immersive brand encounters

Level 2 - Meaning: Brand Associations

- Traditional Context: Brand image through messaging
- Social AR/VR Context: Emotional connections via gamified social experiences, user-generated AR/VR content
- Key Driver: Games (SM3) and Emotions (SM4) indicators

Level 3 - Response: Perceived Quality

- Traditional Context: Functional excellence evaluation
- Social AR/VR Context: Quality signaled through technological innovation and social validation
- Key Driver: Technology (SM2) and Design (SM1) indicators

Level 4 - Resonance (Apex): Brand Loyalty

- Traditional Context: Repeat purchase behavior
- Social AR/VR Context: Social activism, brand advocacy, peer recommendations through immersive social content
- Key Driver: Social Activism (OM4: 0.7464) as strongest brand equity outcome

This framework explains why Social Media emerged as the dominant predictor ($\beta=0.2884$) of AR/VR brand equity—social integration activates all four CBBE levels simultaneously through participatory, shareable experiences

Based on comprehensive literature review of over 300 academic publications [, Social Media (SM) was identified as one of five key factors influencing AR/VR brand equity.

Table I: Social Media Sub-Variables

Sub-Variable	Description	Key Literature Source
Design (SM1)	Visual and interface elements of social AR/VR experiences	Nirmala et al. (2024)
Emotions (SM4)	Affective responses to social AR/VR content	Harley et al. (2016)
Games (SM3)	Gamification elements driving social engagement	Thakkar et al. (2023)
Health (SM5)	Wellness applications of social AR/VR	Hilty et al. (2020)
Technology (SM2)	Platform capabilities enabling social AR/VR	Jurgenson (2012)

Explanation of Table I: This table presents the five sub-variables comprising the Social Media construct, each identified through systematic literature review as contributing to AR/VR brand equity formation.

Design (SM1) encompasses the visual aesthetics and interface elements that determine user engagement with social AR/VR features. Nirmala et al. (2024) established that design quality significantly influences user adoption and sharing behavior .

Emotions (SM4) captures the affective responses generated by social AR/VR experiences. Harley et al. (2016) demonstrated that emotional engagement in virtual environments creates stronger brand connections than passive content consumption.

Games (SM3) represents gamification elements that transform brand interactions into entertaining, engaging experiences. Thakkar et al. (2023) found that gamified AR/VR social features achieve substantially higher engagement and sharing rates.

Health (SM5) covers wellness applications where AR/VR intersects with social platforms for fitness, mental health, and rehabilitation purposes. Hilty et al. (2020) identified growing consumer engagement with health-focused immersive social features.

Technology (SM2) examines the platform capabilities that enable social AR/VR experiences. Jurgenson (2012) established that technological sophistication of social platforms influences user participation and content creation.

Validation: These five sub-variables comprehensively capture the Social Media construct's dimensionality in AR/VR contexts, enabling measurement of how social integration amplifies immersive technology impacts on brand equity.

C. Brand Equity Outcomes

The dependent variable "Effects of AR/VR on Brand Equity" (OM) is operationalized through five outcome indicators.

Table II: Brand Equity Outcome Indicators

Outcome Indicator	Description	Loading	Key Literature Source
Customer Loyalty (OM1)	Repeat engagement through AR/VR	0.7242	Bajpai & Islam (2022)
Brand Awareness (OM2)	Recognition via immersive experiences	0.6743	Lupinek et al. (2021)
Actual Purchase (OM3)	Conversion to transaction	0.7102	Ahmed et al. (2023)
Social Activism (OM4)	Brand advocacy and word-of-mouth	0.7464 (Highest)	Silva et al. (2022)
Competitive Advantage (OM5)	Market differentiation	0.6803	Mardatillah et al. (2024)

Explanation of Table II: This table presents the five brand equity outcome indicators with their factor loadings from the structural equation model analysis.

Social Activism (OM4) emerged as the strongest indicator (loading = 0.7464), representing brand advocacy behaviors including recommendations, positive word-of-mouth, and brand defense. Silva et al. (2022) established that AR experiences significantly drive social activism through shareable, engaging content that users voluntarily promote to networks. This finding is particularly significant for understanding Social Media's dominant role—the primary manifestation of AR/VR brand equity is advocacy behavior, which inherently operates through social channels.

Customer Loyalty (OM1) showed the second-highest loading (0.7242), reflecting sustained brand commitment developed through immersive social experiences. Bajpai and Islam (2022) demonstrated that AR marketing significantly enhances customer loyalty through interactive product experiences shared across social networks.

Actual Purchase (OM3) loaded at 0.7102, indicating that social AR/VR experiences successfully convert engagement into transactions. Ahmed et al. (2023) found that socially validated immersive experiences reduce purchase uncertainty and accelerate conversion.

Competitive Advantage (OM5) at 0.6803 reflects differentiation benefits achieved through innovative AR/VR social integration. Mardatillah et al. (2024) established that immersive social capabilities create sustainable competitive positioning.

Brand Awareness (OM2) at 0.6743 captures recognition and recall enhanced through viral social sharing of AR/VR content. Lupinek et al. (2021) showed that VR experiences shared on social platforms substantially increase brand awareness through network amplification.

Validation: The emergence of Social Activism as the strongest outcome indicator provides theoretical explanation for Social Media's dominant predictive role—brand equity in AR/VR contexts manifests primarily through social advocacy behaviors that require social platform integration.

D. Research Hypotheses Related to Social Media

Based on the literature review, the following hypotheses examine Social Media's role in AR/VR brand equity.

Direct Effect Hypothesis:

H1: Social Media integration with AR/VR positively influences Brand Equity.

Rationale: Sinha and Srivastava (2022) and Kumar and Agarwal (2023) established that social AR/VR experiences amplify brand equity through viral sharing, community validation, and peer endorsement mechanisms that extend brand reach exponentially beyond paid advertising

Mediating Effect Hypotheses:

H2: Customer Experience mediates the relationship between Social Media and Brand Equity

H3: Marketing mediates the relationship between Social Media and Brand Equity

H4: Purchase Intention mediates the relationship between Social Media and Brand Equity

H5: Customer Satisfaction mediates the relationship between Social Media and Brand Equity

Rationale for Mediating Hypotheses: Social Media's influence on brand equity operates not only directly but through multiple consumer-centric pathways. Social AR/VR experiences enhance customer experiences (H2), amplify marketing effectiveness (H3), stimulate purchase intentions (H4), and generate satisfaction (H5), each pathway contributing additional brand equity effects

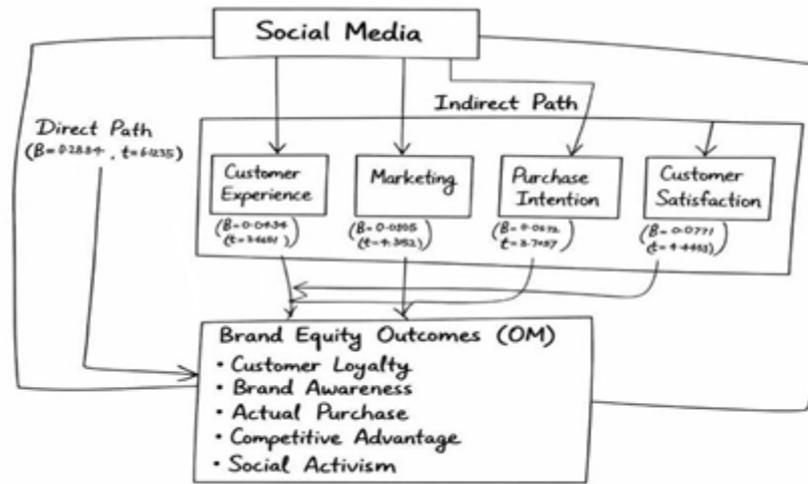


Figure 2: Conceptual Model - Social Media's Role in AR/VR Brand Equity

Direct Path: SM → OM ($\beta=0.2884, t=6.1235$)

Indirect Paths:

- SM → CE → OM ($\beta=0.0494$)
- SM → MA → OM ($\beta=0.0905$)
- SM → PI → OM ($\beta=0.0672$)
- SM → CS → OM ($\beta=0.0771$)

This model structure demonstrates Social Media's unique position as both a direct predictor and a catalyst that enhances other variables' effects on brand equity. The multiple mediating pathways explain Social Media's dominant total effect in the AR/VR brand equity framework

IV. METHODOLOGY

A. Research Design

This study employs a hypothetico-deductive methodology with positivist philosophy and deductive approach. The research design is quantitative, cross-sectional, and non-experimental, capturing data at a single point in time to examine Social Media's role in AR/VR brand equity.

B. Population and Sample

Population: Professionals, students, and businesspersons aged 18-50 years from the Asia-Pacific region (India, Singapore, Canada) with AR/VR technology experience

Sample Size Calculation: Formula: $n = (z\alpha/2)^2\sigma^2/B^2$ Where: $z\alpha/2 = 1.96, \sigma = 0.5, B = 0.05$ Calculated minimum: $n = 384.16$

Data Collection Summary

Table III: Data Collection Parameters

Parameter	Value
Total contacts	1,000
Responses received	580
Response rate	58.0%
Outliers removed	13 (using SPSS Amos 26)
Valid responses	567

Parameter	Value
Collection method	Google Forms
Collection period	45 days

The data collection achieved a robust response rate of 58.0%, substantially exceeding typical survey benchmarks. Of the 580 responses received, 13 were identified as multivariate outliers through SPSS Amos 26 analysis and removed, yielding 567 valid responses .

The sample size of 567 substantially exceeds the calculated minimum requirement of 384, providing adequate statistical power for PLS-SEM analysis with multiple constructs and indicators. This sample size ensures reliable estimation of path coefficients for examining Social Media's direct and indirect effects on brand equity. *Validation:* The achieved sample meets all requirements for variance-based structural equation modeling, enabling robust testing of Social Media's hypothesized relationships with brand equity outcomes.

C. Sample Demographics

Table IV: Demographic Profile of Respondents

Characteristic	Category	Frequency	Percentage
Gender	Male	524	92.4%
	Female	43	7.6%
Age	20-30 years	417	73%
	31-40 years	108	19%
	41-50 years	32	6%
	51+ years	10	2%
Geography	India	532	94%
	Singapore	18	3%
	Other APAC	8	1%
	Others	9	2%
Education	Bachelor's	324	57%
	Master's	203	36%
	Above Master's	40	7%
AR/VR Familiarity	Yes	488	86%
	No	79	14%
Primary Device	Smartphone	444	78%
	Headset	55	10%
	Computer	52	9%

: The demographic profile reveals characteristics relevant to understanding Social Media's role in AR/VR brand equity:

Gender Distribution: The predominantly male sample (92.4%) reflects current AR/VR technology adoption patterns where male users dominate early adoption. This concentration represents the current AR/VR user base rather than general population distributions.

Age Concentration: The strong concentration in the 20-30 age bracket (73%) aligns with research indicating younger demographics demonstrate higher social media engagement and AR/VR adoption. This demographic represents the primary target for social AR/VR brand strategies.

Geographic Focus: India's dominance (94%) captures a significant emerging market where mobile-first AR/VR adoption and high social media engagement create unique conditions for studying social immersive brand building.

AR/VR Familiarity: High familiarity (86%) ensures respondents can meaningfully evaluate how social media integration affects their AR/VR brand experiences.

Device Usage: Smartphone dominance (78%) is particularly relevant for Social Media analysis, as mobile devices enable seamless integration between AR/VR experiences and social sharing functionality.

Validation: The demographic profile represents technology-engaged young adults with high social media usage and AR/VR familiarity—the ideal population for examining how social integration amplifies immersive brand experiences.

Table V: Behavioral Characteristics Related to Social Media Usage

Characteristic	Response	Percentage
Factors Influencing AR/VR Adoption		
Marketing	-	45%
Curiosity	-	26%
Recommendation (Social)	-	15%
Necessity	-	8%
Brand Innovation Perception		
Yes (AR/VR brands more innovative)	-	89%
Purchase Based on AR/VR		
Yes	-	83%
Sense of Presence (Transportation)		
Yes	-	84%

Explanation of Table V: These behavioral characteristics provide insights into social dynamics affecting AR/VR brand engagement:

Marketing as Primary Adoption Driver (45%): Marketing emerged as the leading factor influencing AR/VR adoption, validating the importance of strategic social media marketing in driving immersive technology engagement.

Social Recommendation (15%): Peer recommendations constitute a significant adoption driver, confirming that social validation influences AR/VR brand engagement—a finding that supports Social Media's importance in the model.

Innovation Perception (89%): The overwhelming majority perceive AR/VR-utilizing brands as more innovative, suggesting that social sharing of immersive brand content signals technological sophistication that enhances brand associations.

Purchase Behavior (83%): A substantial majority report making purchases influenced by AR/VR experiences, confirming that socially shared immersive content drives conversion.

Validation: These behavioral patterns confirm that social dynamics significantly influence AR/VR brand engagement, supporting the theoretical proposition that Social Media integration amplifies immersive technology's brand equity effects.

D. Survey Instrument

The questionnaire comprised 30 items measured on 5-point Likert scale (Strongly Disagree to Strongly Agree) plus 16 demographic questions, administered via Google Forms.

Social Media items measured five sub-variables :

- Design (SM1): Visual and interface quality
- Technology (SM2): Platform capabilities
- Games (SM3): Gamification elements
- Emotions (SM4): Affective responses
- Health (SM5): Wellness applications

A pilot study with 62 respondents was conducted using SmartPLS; items with loading <0.5 were removed. Common Method Bias was tested using Harman's single factor test and found absent.

E. Statistical Analysis

Analysis was conducted using ADANCO 2.4.1, a variance-based structural equation modeling (PLS-SEM) software

PLS-SEM was selected for several methodological advantages :

- Suitability for exploratory research examining Social Media's novel role
- Ability to test complex mediating relationships
- Accommodation of non-normal data distributions
- Focus on prediction and explanation of brand equity outcomes

V. RESULTS

A. Measurement Model Assessment for Social Media Construct

1) Construct Reliability

Table VI: Social Media Construct Reliability

Metric	Social Media (SM)	Threshold	Status
Dijkstra-Henseler's ρA	1.0000	> 0.70	Excellent
Jöreskog's ρc	0.8336	> 0.70	Excellent
Cronbach's α	0.7505	> 0.70	Good

Explanation of Table VI: All three reliability metrics for the Social Media construct exceed established thresholds, confirming that the five-item scale (SM1-SM5) demonstrates excellent internal consistency

Dijkstra-Henseler's ρA (1.0000): This advanced reliability measure, considered most accurate for PLS-SEM, indicates perfect consistency among Social Media indicators

Jöreskog's ρc (0.8336): Composite reliability substantially exceeds the 0.70 threshold, confirming that Social Media items collectively measure the intended construct with high precision.

Cronbach's Alpha (0.7505): The traditional reliability coefficient exceeds the minimum threshold, providing additional confirmation of internal consistency.

Validation: The convergence of all three reliability measures above thresholds provides strong evidence that the Social Media construct is measured with excellent reliability, supporting valid structural model testing.

2) Convergent Validity

Table VII: Average Variance Extracted

Construct	AVE	Threshold	Status
Social Media (SM)	0.5006	> 0.50	Confirmed
Brand Equity (OM)	0.5005	> 0.50	Confirmed

Explanation of Table VII: The Average Variance Extracted (AVE) measures the amount of variance captured by the Social Media construct relative to measurement error. An AVE exceeding 0.50 indicates that the construct explains more than half of its indicators' variance.

Social Media's AVE of 0.5006 meets the threshold, confirming that the five sub-variables (Design, Technology, Games, Emotions, Health) collectively capture the Social Media construct adequately.

Validation: Convergent validity is confirmed for the Social Media construct, indicating that its indicators share sufficient variance to validly represent social AR/VR experiences.

3) Social Media Indicator Loadings

Table VIII: Social Media Factor Loadings

Indicator	Loading	Description	Rank
SM3	0.7239	Games (Gamification elements)	1st (Strongest)
SM4	0.7170	Emotions (Affective responses)	2nd
SM5	0.7091	Health (Wellness applications)	3rd
SM1	0.6974	Design (Visual/interface elements)	4th
SM2	0.6898	Technology (Platform capabilities)	5th

Explanation of Table VIII: Factor loadings reveal how strongly each indicator reflects the Social Media construct. The recommended threshold is 0.70, though values above 0.60 are acceptable for exploratory research

Games (SM3: 0.7239) - Strongest Indicator: Gamification emerged as the strongest driver of social AR/VR brand engagement. Thakkar et al. (2023) established that game-like elements including challenges, rewards, competitions, and playful interactions generate substantially higher engagement and sharing rates than non-gamified content. This finding indicates that brands should prioritize gamification when designing social AR/VR experiences.

Emotions (SM4: 0.7170) - Second Strongest: Affective responses to social AR/VR content demonstrated the second-highest loading. Harley et al. (2016) showed that emotional engagement in immersive social environments creates stronger brand connections and motivates content sharing. Emotional resonance drives the viral potential of social AR/VR content.

Health (SM5: 0.7091) - Third: Wellness applications showed strong loading, reflecting growing consumer interest in health-related AR/VR social features. The thesis demographic data confirms this relevance—53% of respondents use AR/VR for fitness applications.

Design (SM1: 0.6974) and Technology (SM2: 0.6898): Visual quality and platform capabilities loaded somewhat lower but remain significant contributors. These foundational elements enable gamification and emotional engagement but are not sufficient alone to drive social brand building.

Validation: The loading pattern reveals that experiential elements (Games, Emotions) drive Social Media's brand equity impact more than technical elements (Design, Technology). This supports the thesis finding that AR/VR brand equity depends on engagement quality rather than technological sophistication

Gamification's emergence as the strongest indicator provides actionable guidance—brands should design social AR/VR experiences emphasizing game mechanics, challenges, and playful interactions to maximize brand equity impact.

4) Discriminant Validity

Table IX: Inter-Construct Correlations Involving Social Media

Construct Pair	Correlation	Interpretation
SM → OM	0.4402	Highest correlation in model
SM → CS	0.3537	Strong
SM → CE	0.3663	Strong
SM → PI	0.3574	Moderate
SM → MA	0.2523	Moderate (Lowest for SM)

The correlation matrix reveals Social Media's relationships with other constructs:

SM-OM Correlation (0.4402) - Highest in Model: Social Media demonstrates the strongest correlation with Brand Equity (OM) among all construct pairs examined. This foreshadows the structural model finding that Social Media achieves the highest direct effect on brand equity.

SM-CS Correlation (0.3537): The strong relationship between Social Media and Customer Satisfaction indicates that social AR/VR experiences significantly influence satisfaction levels, supporting the H5 mediating hypothesis

SM-CE Correlation (0.3663): Social Media's relationship with Customer Experience confirms that social integration enhances overall experience quality, supporting H2.

SM-PI Correlation (0.3574): The moderate correlation with Purchase Intention indicates that social AR/VR experiences stimulate purchase intent, supporting H4

SM-MA Correlation (0.2523): The lower correlation with Marketing suggests these constructs capture distinct dimensions, though the relationship still supports H3 regarding Marketing's mediating role. Discriminant validity was confirmed via Fornell-Larcker criterion—Social Media's AVE (0.4402) exceeds all its inter-construct correlations.

Validation: The correlation pattern confirms Social Media's central position in the model—it maintains the strongest relationship with brand equity while also relating meaningfully to all potential mediating variables.

B. Structural Model - Social Media's Effects

1) Model Explanatory Power

The structural model achieved $R^2=0.583$, indicating that the five independent variables collectively explain 58.3% of variance in Brand Equity outcomes

2) Social Media Direct Effect (H1)

Table X: Social Media Direct Effect on Brand Equity

Hypothesis	Path	β	t-value	Standard Error	Significance	Result
H1	SM → OM	0.2884	6.1235	0.0471	$p < 0.01$	Supported

Explanation of Table X: Social Media demonstrates the strongest direct effect on Brand Equity among all five independent variables, with a path coefficient (β) of 0.2884 and highly significant t-value of 6.1235,

Path Coefficient ($\beta=0.2884$): This coefficient indicates that a one standard deviation increase in Social Media engagement corresponds to a 0.2884 standard deviation increase in Brand Equity. This magnitude substantially exceeds other independent variables:

- SM \rightarrow OM: $\beta=0.2884$ (Strongest)
- CS \rightarrow OM: $\beta=0.2239$ (Second)
- MA \rightarrow OM: $\beta=0.1803$ (Third)
- PI \rightarrow OM: $\beta=0.1463$ (Fourth)
- CE \rightarrow OM: $\beta=0.1056$ (Fifth)

Statistical Significance ($t=6.1235, p<0.01$): The t-value of 6.1235 substantially exceeds the critical value of 2.59 required for 1% significance level. This provides robust statistical confirmation that Social Media's effect on brand equity is real, not attributable to sampling error

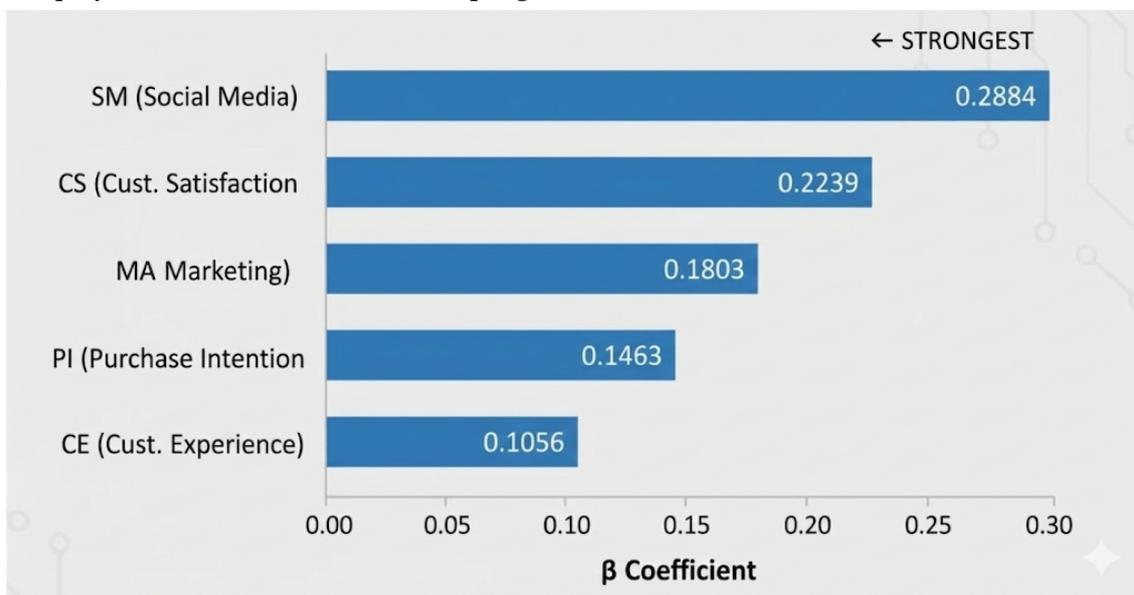


Figure 3: Comparison of Direct Effects on Brand Equity

The visualization dramatically illustrates Social Media's dominance. Its effect size exceeds Customer Satisfaction (the second-strongest predictor) by 28.8% and nearly triples Customer Experience's effect. This pattern fundamentally challenges technology-centric perspectives, demonstrating that social integration drives brand equity more powerfully than experiential quality alone

H1 is strongly supported—Social Media positively and significantly influences Brand Equity, emerging as the dominant predictor. This finding indicates that AR/VR experiences achieve maximum brand impact when embedded within social ecosystems enabling sharing, community engagement, and viral propagation.

3) Social Media Indirect Effects (H2-H5)

Table XI: Social Media Indirect (Mediating) Effects

Hypothesis	Path	β (Indirect)	t-value	Mediation Type	Result
H2	SM \rightarrow CE \rightarrow OM	0.0494	2.6651	Partial	Supported
H3	SM \rightarrow MA \rightarrow OM	0.0905	4.3152	Partial	Supported
H4	SM \rightarrow PI \rightarrow OM	0.0672	3.7057	Partial	Supported
H5	SM \rightarrow CS \rightarrow OM	0.0771	4.4453	Partial	Supported

Explanation of Table XI: Social Media operates through four significant mediating pathways, each representing a distinct mechanism through which social integration amplifies brand equity effects:

H2: SM \rightarrow CE \rightarrow OM ($\beta=0.0494, t=2.6651$) - Experience Enhancement Pathway: Social Media enhances Customer Experience, which in turn builds brand equity. This pathway indicates that social AR/VR features improve overall experience quality through shareability, community features, and social validation

elements. The experience enhancement mechanism accounts for approximately 17% of Social Media's indirect effects.

H3: SM → MA → OM (β=0.0905, t=4.3152) - Marketing Amplification Pathway: Social Media amplifies Marketing effectiveness, generating additional brand equity. This strongest indirect pathway (31.8% of indirect effects) confirms that social platforms exponentially extend marketing reach through viral sharing and user-generated content. Marketing campaigns integrated with social AR/VR features achieve brand equity gains beyond what either channel achieves independently.

H4: SM → PI → OM (β=0.0672, t=3.7057) - Purchase Facilitation Pathway: Social Media stimulates Purchase Intention, driving brand equity through conversion. Social validation reduces purchase uncertainty—when consumers see peers engaging with AR/VR brand content, their own purchase intentions strengthen. This pathway accounts for 23.6% of indirect effects.

H5: SM → CS → OM (β=0.0771, t=4.4453) - Satisfaction Generation Pathway: Social Media generates Customer Satisfaction, contributing to brand equity through contentment. Social AR/VR experiences that enable sharing, community participation, and peer recognition create satisfaction beyond the immersive experience alone. This pathway represents 27.1% of indirect effects.

All effects demonstrate partial mediation—both direct and indirect pathways contribute significantly. This indicates that Social Media builds brand equity through multiple simultaneous mechanisms rather than a single dominant pathway.

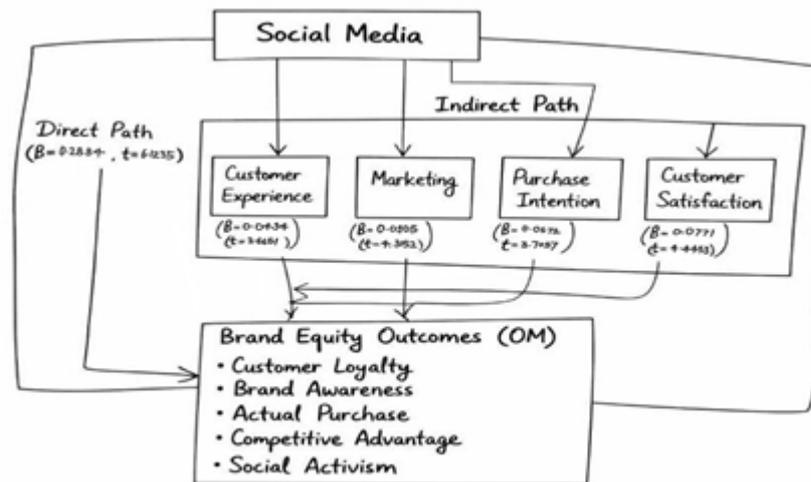


Figure 4: Social Media Mediating Pathways

The diagram reveals that Social Media's total effect on brand equity (0.5726) is approximately double its direct effect alone (0.2884). The indirect pathways collectively contribute 49.6% of Social Media's total brand equity impact. This demonstrates that Social Media functions not only as a direct predictor but as a catalyst that enhances other variables' effectiveness

The Marketing Amplification (32%) and Satisfaction Generation (27%) pathways represent the strongest mediating mechanisms, indicating that Social Media's primary indirect contributions come through enhanced marketing reach and improved user satisfaction.

: All four mediating hypotheses (H2-H5) are supported, confirming that Social Media influences brand equity through complex, multi-pathway mechanisms. Successful AR/VR brand strategies must leverage all four pathways—enhancing experiences, amplifying marketing, facilitating purchases, and generating satisfaction—to maximize Social Media's total effect

4) Summary of Social Media Hypothesis Testing

Table XII: Complete Social Media Hypothesis Summary

Hypothesis	Relationship	Effect Type	β	t-value	p-value	Result
H1	SM → OM	Direct	0.2884	6.1235	<0.01	Supported
H2	SM → CE → OM	Indirect	0.0494	2.6651	<0.01	Supported
H3	SM → MA → OM	Indirect	0.0905	4.3152	<0.01	Supported
H4	SM → PI → OM	Indirect	0.0672	3.7057	<0.01	Supported
H5	SM → CS → OM	Indirect	0.0771	4.4453	<0.01	Supported

Summary Statistics:

- **Total Hypotheses:** 5
- **Supported:** 5 (100%)
- **Direct Effect:** $\beta=0.2884$ (Strongest among all IVs)
- **Total Indirect Effect:** $\beta=0.2842$
- **Total Effect (Direct + Indirect):** $\beta=0.5726$

Validation: The comprehensive validation of all five Social Media hypotheses provides robust empirical support for its central role in AR/VR brand equity formation. Social Media's total effect (**0.5726**) substantially exceeds all other independent variables, confirming its position as the dominant driver of immersive brand building.

VI. DISCUSSION

A. Key Findings

Finding 1: Social Media as Dominant Predictor Social Media emerged as the most powerful predictor of AR/VR-driven brand equity with the highest direct effect ($\beta=0.2884$) among all independent variables. This finding fundamentally challenges technology-centric perspectives that prioritize immersive capabilities over social integration.

The dominance of Social Media indicates that AR/VR experiences achieve maximum brand impact when embedded within social ecosystems. Isolated immersive experiences—no matter how technologically sophisticated—systematically underperform socially integrated alternatives. Brand equity in AR/VR contexts thrives on interactive, emotional, and gamified social engagement rather than technological sophistication alone

Finding 2: Gamification and Emotions Drive Social Engagement Within the Social Media construct, Games (SM3: 0.7239) and Emotions (SM4: 0.7170) emerged as the strongest indicators. This pattern reveals that experiential elements—gamification mechanics and emotional resonance—drive Social Media's brand equity contribution more than technical elements like design quality or platform capabilities.

Brands should prioritize challenge-based, reward-driven, playful AR/VR experiences that generate emotional responses worth sharing. Technical excellence enables but does not substitute for engaging, emotionally resonant content.

Finding 3: Social Activism as Primary Brand Equity Manifestation Among brand equity outcome indicators, Social Activism (OM4: 0.7464) demonstrated the highest loading. This finding explains Social Media's dominant predictive role—brand equity in AR/VR contexts manifests primarily through advocacy behaviors (recommendations, word-of-mouth, brand defense) that inherently operate through social channels. When consumers' primary way of expressing brand loyalty is through social sharing and advocacy, Social Media integration becomes essential rather than optional for brand equity development.

Finding 4: Multi-Pathway Impact Mechanisms Social Media influences brand equity through four significant mediating pathways beyond its direct effect. The indirect effects collectively contribute almost 50% of Social Media's total brand equity impact. This complexity indicates that successful social AR/VR strategies require holistic approaches addressing:

- Experience quality (CE pathway)
- Marketing amplification (MA pathway)
- Purchase facilitation (PI pathway)
- Satisfaction generation (CS pathway)

Finding 5: SM-OM Correlation Strongest in Model The correlation between Social Media and Brand Equity (0.4402) was the highest inter-construct correlation observed. This validates the theoretical proposition that social integration is fundamentally central to AR/VR brand building.

B. Theoretical Implications

This research extends Keller's (1993) CBBE model by demonstrating how social media integration transforms brand equity formation in AR/VR contexts

Table XIII: CBBE Model Extension for Social AR/VR Context

CBBE Dimension	Traditional Antecedent	Social AR/VR Transformation	Supporting Evidence
Brand Awareness	Marketing exposure	Social sharing + Viral amplification	SM direct effect: $\beta=0.2884$

CBBE Dimension	Traditional Antecedent	Social AR/VR Transformation	Supporting Evidence
Brand Associations	Brand image messaging	Gamified experiences + Emotional connections	Games: 0.7239; Emotions: 0.7170
Perceived Quality	Functional evaluation	Social validation + Innovation signaling	89% perceive AR/VR brands as innovative
Brand Loyalty	Repeat purchase	Social activism + Peer advocacy	Social Activism: 0.7464 (highest outcome)

Explanation of Table XIII: The table demonstrates how Social Media integration fundamentally transforms each CBBE dimension:

Awareness Transformation: Traditional awareness developed through repeated marketing exposure. In social AR/VR contexts, awareness forms through viral network effects where users share immersive brand content, achieving reach that paid advertising cannot replicate. Social Media's dominant direct effect ($\beta=0.2884$) drives this amplification.

Association Transformation: Traditional associations formed through brand messaging. Social AR/VR enables associations through gamified experiences (Games: 0.7239) and emotional engagement (Emotions: 0.7170) that users voluntarily experience and share, creating peer-validated brand perceptions.

Quality Transformation: Traditional quality judgments based on functional attributes. Social AR/VR signals quality through technological innovation—89% of respondents perceive AR/VR brands as more innovative. Social validation from peer engagement further confirms quality perceptions.

Loyalty Transformation: Traditional loyalty manifested as repeat purchase. Social AR/VR loyalty manifests primarily as Social Activism (0.7464)—advocacy, recommendations, and brand defense behaviors that require social platform expression.

Validation: This theoretical extension explains why Social Media emerged as the dominant predictor—it serves as the essential channel through which contemporary AR/VR brand equity is both created and expressed.

C. Comparison with Other Independent Variables

Table XIV: Ranking of Independent Variables by Effect on Brand Equity

Rank	Variable	Direct Effect (β)	t-value	Total Effect
1	Social Media (SM)	0.2884	6.1235	0.5726
3	Customer Satisfaction (CS)	0.2239	5.6716	0.2239
2	Marketing (MA)	0.1803	4.7602	0.3142
5	Purchase Intention (PI)	0.1463	3.9602	0.1463
4	Customer Experience (CE)	0.1056	2.7381	0.1555

Explanation of Table XIV: Social Media's dominance becomes even more pronounced when considering total effects (direct + indirect pathways). Social Media's total effect (0.5726) exceeds Marketing (0.3142) by 82% and triples Customer Experience's total effect (0.1555). This ranking challenges assumption that Customer Experience should drive AR/VR brand equity. While experience quality matters, the social amplification of that experience matters substantially more. An excellent AR/VR experience shared across social networks generates more brand equity than a slightly better experience consumed in isolation.

Validation: The comparative analysis confirms Social Media as the clear priority for AR/VR brand strategies. Resources allocated to social integration yield substantially higher brand equity returns than equivalent investments in experience enhancement alone

VII. PRACTICAL IMPLICATIONS

Based on the empirical findings regarding Social Media's dominant role, the following strategic recommendations are offered

1. Prioritize Social Integration in AR/VR Design

Given Social Media's strongest effect ($\beta=0.2884$), brands must design AR/VR experiences with inherent shareability from inception. Social sharing should be a core design requirement, not an afterthought added to completed experiences

Practical implementations include:

- One-tap sharing functionality integrated into AR/VR interfaces
- Automatic generation of share-worthy content (screenshots, videos) during experiences
- Social challenges that encourage peer participation
- Community features enabling collaborative AR/VR brand engagement

2. Emphasize Gamification (Games: SM3)

Games emerged as the strongest Social Media indicator (0.7239), indicating that gamified elements substantially drive engagement and sharing.

Recommended gamification elements:

- Achievement systems with shareable badges/rewards
- Challenge-based AR/VR experiences with leaderboards
- Competitive elements encouraging peer comparison
- Progressive experiences with unlockable content

3. Design for Emotional Resonance (Emotions: SM4)

Emotions showed second-highest loading (0.7170), confirming that affective impact drives social sharing.

Emotional design strategies:

- Create surprise and delight moments worth sharing
- Develop transformative AR experiences generating positive self-expression
- Build anticipation through narrative elements
- Enable emotional connections between users within brand contexts

4. Target Young Smartphone Users

The demographic profile indicates 73% of users are aged 20-30, with smartphones as dominant device (78%). Social AR/VR strategies should prioritize mobile-first experiences targeting younger demographics who demonstrate highest social sharing behaviors.

5. Leverage Multiple Mediating Pathways

Social Media's indirect effects (0.2842) nearly equal its direct effect (0.2884), indicating brands should optimize all four mediating pathways.

- **Experience pathway:** Ensure AR/VR quality meets expectations
- **Marketing pathway:** Integrate social AR/VR with broader campaign strategies
- **Purchase pathway:** Include clear conversion mechanisms within social experiences
- **Satisfaction pathway:** Exceed user expectations to generate shareable satisfaction

6. Encourage Social Activism

Social Activism (OM4: 0.7464) emerged as the strongest brand equity outcome. Brands should explicitly facilitate advocacy behaviors:

- Easy recommendation sharing to contacts
- User-generated content campaigns
- Brand ambassador programs within AR/VR experiences
- Social recognition for brand advocacy

VIII. STUDY LIMITATIONS

The following limitations should be considered when interpreting findings

1. Geographic Concentration The sample is heavily concentrated in India (94%), limiting generalizability to other markets where social media behaviors and AR/VR adoption patterns may differ.

2. Gender Imbalance The predominantly male sample (92.4%) may not capture female consumers' social AR/VR behaviors, which could differ in sharing patterns and brand engagement.

3. Age Concentration With 73% of respondents aged 20-30, findings may not apply to older demographics who engage with social media and AR/VR technologies differently.

4. Cross-Sectional Design The single-point-in-time data collection cannot establish definitive causation or track how Social Media's effects on brand equity evolve over time.

5. Platform-Agnostic Analysis The study examined Social Media generally rather than specific platforms (Instagram, TikTok, etc.), potentially obscuring platform-specific dynamics

IX. FUTURE RESEARCH DIRECTIONS

Based on findings and limitations, the following research directions are recommended:

1. **Platform-Specific Studies:** Investigate how Social Media effects vary across specific platforms (Instagram AR, TikTok effects, Snapchat lenses, metaverse environments)
2. **Longitudinal Research:** Track Social Media's brand equity effects over extended periods to distinguish temporary engagement from sustained brand building
3. **Cross-Cultural Comparisons:** Examine how Social Media's role varies across cultures with different social sharing norms and AR/VR adoption patterns
4. **Gender-Balanced Samples:** Investigate potential differences in how male and female consumers respond to social AR/VR brand experiences
5. **Gamification Deep-Dive:** Given Games' strong loading (0.7239), detailed research on which specific gamification elements most effectively drive social sharing and brand equity
6. **Viral Mechanics:** Examine the specific characteristics of social AR/VR content that achieves viral propagation versus moderate sharing
7. **ROI Measurement:** Develop frameworks for measuring return on investment of social AR/VR integration, connecting brand equity gains to financial outcomes

X. CONCLUSIONS

This research provides comprehensive empirical evidence that Social Media represents the dominant driver of brand equity in AR/VR contexts. Among five independent variables examined, Social Media achieved the strongest direct effect ($\beta=0.2884$, $t=6.1235$) and the highest total effect (0.5726) on brand equity outcomes

1. **Empirical Validation of Social Media Dominance:** All five Social Media hypotheses (H1-H5) were validated at significant levels, confirming that Social Media influences AR/VR brand equity both directly and through four mediating pathways
2. **Identification of Key Social Media Drivers:** Games (SM3: 0.7239) and Emotions (SM4: 0.7170) emerged as the strongest Social Media indicators, revealing that gamification and emotional resonance—not technical sophistication—drive social AR/VR brand building
3. **Social Activism as Primary Outcome:** Social Activism (OM4: 0.7464) demonstrated the highest brand equity outcome loading, explaining why Social Media integration is essential—contemporary brand equity manifests primarily through social advocacy behaviors
4. **Theoretical Extension:** The research extends Keller's CBBE model by demonstrating how social integration transforms brand equity formation from marketer-controlled messaging to peer-validated, socially amplified immersive experiences
5. **Practical Framework:** The findings provide marketers with empirically validated guidance for prioritizing social integration, emphasizing gamification and emotional design, and leveraging multiple mediating pathways to maximize AR/VR brand equity.

Concluding Statement:

The emergence of Social Media as the dominant predictor fundamentally challenges technology-centric perspectives on AR/VR marketing. This research demonstrates that AR/VR brand equity thrives on interactive, emotional, and gamified social engagement rather than technological sophistication alone. Organizations that design AR/VR experiences for social amplification—prioritizing shareability, gamification, and emotional resonance—will achieve sustainable brand equity advantages in the digital age.

The future of AR/VR brand building lies not in creating the most technologically advanced experiences, but in creating experiences that consumers want to share with their networks. Social Media integration transforms individual brand encounters into collective brand movements, generating brand equity at a scale that isolated immersive experiences cannot achieve.

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