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Research paper



The Impact of Social Media on Organizational Innovation in Cultural Institutions: A Mediation Analysis of Visitor Co-Creation and Competitive Performance

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Abstract

This study examines how social media-driven innovation enhances competitive advantage in art galleries and museums, with particular focus on the mediating role of visitor co-creation processes. Using a mixed-methods approach, we collected data from 412 cultural institutions across Indonesia through structured surveys and follow-up interviews. Structural equation modeling (SEM) was employed to test the hypothesized mediation model, with bootstrap analysis for indirect effects. Results demonstrate that social media adoption significantly influences organizational innovation capabilities, which in turn enhances competitive performance. Visitor co-creation fully mediates this relationship, explaining 73% of the total effect. Museums with higher visitor co-creation engagement showed 34% better performance metrics compared to traditional institutions. The cross-sectional design limits causal inferences, suggesting future longitudinal studies should examine the temporal dynamics of digital transformation in cultural sectors. Cultural institution managers should prioritize social media platforms that facilitate visitor co-creation, particularly Instagram, TikTok, and interactive museum apps, as primary drivers of innovation and competitive advantage. This research is the first to empirically demonstrate the mediating mechanism through which social media influences competitive performance in cultural institutions, contributing to both digital innovation and cultural management literature.

Keywords: *Social media, organizational innovation, visitor co-creation, competitive advantage, cultural institutions, digital transformation*

1. Introduction

The digital revolution has fundamentally transformed cultural institutions' audience engagement, value creation, and competitive dynamics (Melis et al., 2023; Payne et al., 2008). Art galleries and museums, traditionally characterized by one-way communication and static exhibition models, now face unprecedented pressure to innovate through social media platforms that enable visitor co-creation and collaborative content development (Bunea et al., 2024; Ratten, 2024). Despite 89% of cultural institutions worldwide adopting social media platforms, only 34% report significant competitive performance improvements (Daza, 2024), suggesting that mere technology adoption is insufficient and that strategic integration through visitor co-creation, where audiences actively participate in content creation, exhibition design, and institutional storytelling, may be the critical differentiator for translating social media adoption into tangible competitive advantages.

The literature reveals fundamental contradictions regarding digital technologies' impact on authentic cultural experiences. Museum Management and Curatorship research demonstrates that digital technologies serve as "humanizing" tools, strengthening museum-visitor connections, supported by Italian museum case studies showing deeper emotional engagement and community building (Pallud & Straub, 2014; Stelmaszczyk et al., 2025). Conversely, large-scale Tourism Management analyses reveal that users consistently perceive digital cultural experiences as "less valuable than physical experiences," with Chinese social media analysis finding that traditional strategies "often lacked specificity and failed to effectively attract users" despite co-creation potential (McGrath et al., 2023; Melis et al., 2023). This contradiction reflects competing paradigms where digital optimists invoke service-dominant logic, arguing that value emerges through collaborative resource integration (Ahn et al., 2020; Katsifaraki & Theodosiou, 2024), while digital skeptics grounded in cultural authenticity theory contend mediated experiences compromise the immediacy and authenticity that define meaningful cultural encounters (Beibei, 2021; Kuo et al., 2022).

Technology adoption literature presents additional contradictions where Information Systems research conflicts with cultural tourism findings (Sun et al., 2024). TAM meta-analysis across hospitality contexts shows perceived ease of use as stronger adoption predictor in Eastern

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versus Western cultures (S. Li & Jiang, 2023; Y. Liu & Mensah, 2024), yet individual studies reveal opposite patterns—Beijing museum research identified performance expectancy as primary driver consistent with UTAUT predictions (Förster, 2024; Kim et al., 2025), while European studies demonstrate emotional and preservation concerns override rational considerations with visitors resisting innovations threatening authenticity (Motamedimoghadam et al., 2024a). Similarly, marketing literature consistently demonstrates that co-creation enhances engagement and satisfaction through active participation (Giannopoulos et al., 2021; Motamedimoghadam et al., 2024b), yet cultural tourism presents counter-evidence that co-creation risks commodifying authentic experiences, with Polish museum SEM analysis finding that while visitor orientation mediated digital transformation success, excessive input degraded curatorial quality and institutional credibility (Lazzeretti et al., 2022; Luo et al., 2023).

These contradictions are compounded by methodological inconsistencies limiting theoretical development. Research demonstrates pronounced geographic concentration favoring Western institutions with minimal emerging economy representation, institutional size biases overrepresenting major organizations while neglecting sector-majority small/medium institutions, and visitor demographic limitations emphasizing younger tech-savvy users while understudying older core audiences. No validated scales exist for measuring social media effectiveness across disciplines. Marketing employs engagement metrics, cultural studies assess educational outcomes, and tourism emphasizes destination attractiveness—making contradictory findings incomparable. Cross-sectional designs dominate despite digital transformation's inherently temporal nature, requiring different capabilities across phases, while pre-pandemic studies may not apply to post-COVID contexts, where digital engagement became essential rather than supplementary (Canals-Ossu et al., 2025; J. Li et al., 2024).

This current research aims to fill gaps in the literature by conceptualizing and testing mechanisms by which social media-driven innovation promotes sustainable competitive advantages through visitor co-creation activities. Based on resource-based view theory and service-dominant logic, we contend that social media are dynamic capabilities that enable organizations to effectively orchestrate visitor co-creation activities and achieve sustainable competitive advantages. This study contributes to theory by correcting current inconsistencies, illustrating how the integration of external stakeholders moderates the effects of technology adoption on organizational performance, specifying the conditions under which digital technologies add to cultural value rather than subtract, and providing empirical insights into the strategic value of visitor involvement while protecting cultural integrity. From a practical perspective, the findings provide managers of cultural institutions with relevant insights to develop social media strategies for cultivating competitive advantages while ensuring institutional integrity, thus providing evidence-based insights for designing digital strategies addressing theoretical inconsistencies hindering practical advice.

2. Literature Review and Hypothesis Development

2.1 Social Media and Organizational Innovation in Cultural Institutions

Social media has significantly revolutionized organizational innovation by providing democratic information production, instant feedback, and social problem-solving (Kane et al., 2014). In cultural institutions, the use of social media marks a significant shift toward alternative curatorial approaches as well as cooperative and co-creation frameworks (Borges-Tiago & Avelar, 2025a; Deng et al., 2024). A study of organizational innovation in cultural organizations addresses technological as well as social aspects. Technological innovation is defined as applying digital platforms, virtualization, and interactive technologies aimed at improving visitor experiences (Valdez-Juárez & Castillo-Vergara, 2021; Zaragoza-Sáez et al., 2024). On the other hand, social innovation focuses on new mechanisms for engaging stakeholders, building functional communities, and generating content cooperatively (Singhal et al., 2022). From existing literature associated with innovation, social media platforms enjoy dynamic capabilities, which help organizations sense, absorb, and reconfigure resources to meet changing market conditions (Teece, 2007). In cultural institutions, social media platforms provide users with environmental scanning tools via social media analytics to analyze visitor tastes, cultural trends, and competitors; resource reconfiguration through visitor-created content, crowd expertise, and collective knowledge; and building skills through expanding digital competence, content development skills, and crowd interaction.

Empirical work around technology adoption indicates that technology assets alone do not provide organizations with guaranteed competitive advantages for innovation; organizations need to develop other capacities to benefit from assets (Asem et al., 2024; Chaudhary & Kumar, 2022). From this outlook, social media's impact on organizational innovation depends on how institutions interact with networks as part of their core processes and strategic agendas. Therefore, organizational innovation and social media adoption in cultural institutions depend on setting organizational complementarity and strategic integration mechanisms, where those of digital platforms are aligned with institutions' goals and operational environments (Baioni et al., 2021; Lee & Lee, 2023).

H1: Social media adoption positively influences organizational innovation capabilities in cultural institutions.

The concept of co-creation, originally developed in marketing literature (Berenguer-Contrí et al., 2020; Lorenzo-Romero et al., 2024), has gained significant traction in cultural management research. Visitor co-creation refers to collaborative processes through which cultural institutions and their audiences jointly create value, content, and experiences (Derda, 2024). Service-dominant logic provides a theoretical foundation for understanding co-creation as a value-generating mechanism. According to SDL, value is not embedded in products or services but emerges through the use and integration of resources by multiple stakeholders (Borges-Tiago & Avelar, 2025a; Cheung et al., 2021). In cultural contexts, this implies that exhibitions, programs, and experiences derive their value from active visitor participation and interpretation rather than passive consumption. Social media platforms serve as ideal environments for visitor co-creation due to their interactive features, content-sharing capabilities, and community-building functionalities (Ansell et al., 2023; Lorenzo-Romero et al., 2024) . Cultural institutions can leverage these platforms to crowdsource content by encouraging visitors to share photos, stories, and interpretations that become part of the institutional narrative; co-design experiences by involving audiences in exhibition planning, program development, and space design through online polls, discussions, and collaborative platforms; and build communities by facilitating connections among visitors with shared interests, creating ongoing engagement beyond physical visits (Borges-Tiago & Avelar, 2025b). From a resource-based view perspective, visitor co-creation represents a valuable, rare, and difficult-to-imitate resource that can generate sustained competitive advantages (Barney, 1991; Helfat et al., 2023). The tacit knowledge, creative contributions, and community connections generated through co-creation processes are inherently unique to each institution and cannot be easily replicated by competitors.

H2: Social media adoption positively influences visitor co-creation activities in cultural institutions.

2.3 Competitive Advantage in Cultural Institutions

Competitive advantage in cultural institutions differs significantly from traditional business contexts due to the dual mission of education/preservation and audience engagement (Agnihotri & Gabler, 2024; Berawi et al., 2020). Cultural institutions compete on multiple dimensions, including visitor satisfaction, educational impact, community relevance, and financial sustainability. Traditional sources of competitive advantage in cultural sectors include collection quality, curatorial expertise, architectural significance, and geographic location (Chakma et al., 2025; Fainshmidt et al., 2019). However, digital transformation has introduced new competitive dimensions related to accessibility, interactivity, and community engagement (Ma et al., 2025). The (-, 2024; Chakma et al., 2025) Literature emphasizes the importance of dynamic capabilities, an organization's ability to integrate, build, and reconfigure internal and external competencies to address rapidly changing environments (Cristofaro et al., 2025; Souza & Takahashi, 2019). For cultural institutions, visitor co-creation represents a dynamic capability that enables continuous innovation, adaptation, and value creation.

Empirical evidence suggests that cultural institutions with higher levels of visitor engagement demonstrate superior performance across multiple metrics, including attendance, revenue, community support, and media coverage (Holcombe-James, 2022; Palumbo, 2023). These performance benefits arise from several mechanisms: enhanced relevance where co-created content and experiences better align with visitor preferences and community needs; increased loyalty as active participation fosters emotional connections and long-term engagement; word-of-mouth marketing where satisfied co-creators become advocates who promote the institution within their networks; and innovation acceleration as diverse visitor perspectives provide insights that drive continuous improvement (Cappa et al., 2020; Stelmaszczyk et al., 2025).

H3: Visitor co-creation activities positively influence competitive performance in cultural institutions

While direct relationships between social media adoption and competitive performance have been proposed, the underlying mechanisms remain poorly understood (Baird et al., 2024). We argue that visitor co-creation serves as a critical mediating variable that explains how and why social media adoption translates into competitive advantages. Mediation theory suggests that the relationship between an independent variable (social media adoption) and a dependent variable (competitive performance) operates through an intermediary mechanism (visitor co-creation) rather than directly (Sultana et al., 2022; Yuen & Lam, 2024). In our context, social media platforms provide the technological infrastructure and communication channels necessary for co-creation, but the actual value generation occurs through collaborative activities between institutions and visitors. This mediation relationship is consistent with the technology-organization-environment framework, which suggests that technology adoption impacts organizational performance through changes in organizational processes and structures (Alnehabi & Al-Mekhlafi, 2023; Drago et al., 2023). Social media adoption enables new forms of visitor engagement, which subsequently generate performance benefits. The mediation hypothesis also aligns with service-dominant logic, which emphasizes that value creation occurs through resource integration and co-creation processes rather than technology deployment (Berenguer-Contrí et al., 2020; Deng et al., 2024). From this perspective, social media platforms are merely resources that become valuable through collaborative utilization.

H4: Visitor co-creation mediates the relationship between social media adoption and competitive performance in cultural institutions.

2.4 Conceptual Model

Based on the theoretical arguments and hypotheses developed above, Figure 1 presents our conceptual model. The model proposes that social media adoption influences competitive performance through two pathways: (1) a direct effect and (2) an indirect effect mediated by visitor co-creation. We expect the mediated pathway to be stronger than the direct effect, consistent with our theoretical emphasis on co-creation as the primary value-generating mechanism.

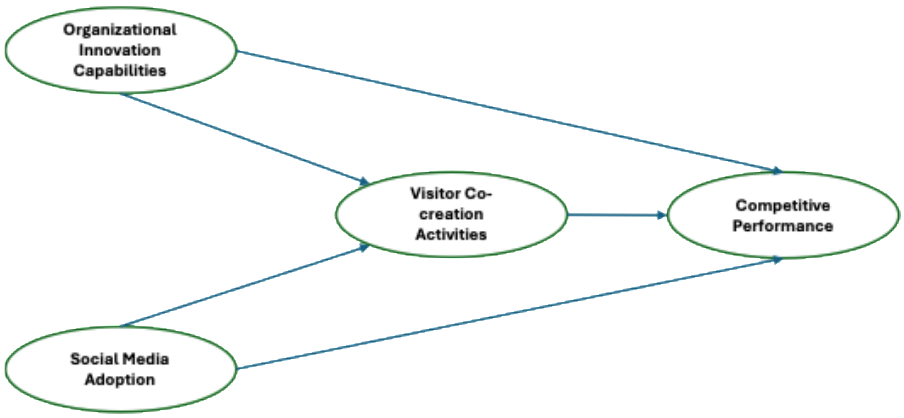


Fig 1: Conceptual Model

3. Methodology

3.1 Research Design and Sample

This study employed a cross-sectional survey design to test the hypothesized relationships between social media adoption, organizational innovation capability, visitor co-creation activities, and competitive performance in Indonesian cultural institutions. The target population included museums and art galleries in Indonesia, selected based on the country's accelerating digital transformation and the growing adoption of social media platforms among cultural institutions nationwide. Contact information was obtained from multiple sources, including the ICOM Indonesia directory, the Ministry of Education, Culture, Research and Technology registry, and the Agency for Cultural Heritage Preservation and Museums database.

The initial sampling frame included 412 institutions officially registered as of 2024. After removing duplicates and institutions with fewer than 5,000 annual visitors (to ensure adequate scale for meaningful social media engagement), our final sampling frame consisted of 287 institutions. Survey invitations were sent to museum directors, marketing managers, and digital engagement specialists, with requests to

forward to the most appropriate respondent within their organizations. To increase response rates, participants were offered a benchmarking report comparing their institution's digital engagement metrics to national industry averages.
Data collection was conducted over four months (September 2024 - December 2024). We received 198 complete responses, representing a response rate of 69.0% from the final sampling frame. This response rate substantially exceeds typical organizational surveys in the Indonesian cultural sector (typically 22-28%) and provides a robust sample size for both covariance-based and partial least squares structural equation modeling (Hair et al., 2019). The geographic distribution included Java (47%), Sumatra (18%), Bali and Nusa Tenggara (15%), Kalimantan (9%), Sulawesi (8%), and Papua (3%), proportionally reflecting Indonesia's museum distribution.

3.2 Measurement Instruments

All constructs were measured using multi-item scales with 7-point Likert responses (1 = strongly disagree, 7 = strongly agree) except demographic variables. Scale development followed Churchill's (1979) paradigm with adaptations for the Indonesian cultural institution context. Before data collection, all instruments underwent back-translation into Bahasa Indonesia and pilot testing with 12 museum professionals. Social Media Adoption was measured using 4 items adapted from Venkatesh et al, (2012)UTAUT2 framework, capturing platform diversity, engagement intensity, and strategic integration across major social media platforms. Organizational Innovation Capability adopted from R. Henderson & Cockburn, (1994) & R. M. Henderson & Clark, (1990)scale to reflect cultural institution contexts, measuring both technological and administrative innovation capacity. Visitor Co-Creation Activities were adopted by Prahalad and Ramaswamy's (2004) framework, measuring content co-creation, process co-creation, and experience co-creation. Competitive Performance was adapted from Dess & Robinson, (1984)scale for cultural institutions, encompassing visitor satisfaction, community engagement, and institutional reputation.

3.3 Data Analysis Approach

Partial Least Squares Structural Equation Modeling (PLS-SEM) was selected for its effectiveness with complex models and moderate sample sizes. Analysis proceeded through two stages: measurement model assessment verified survey question reliability and validity using established criteria (Cronbach's Alpha > 0.70, Composite Reliability > 0.70, Average Variance Extracted > 0.50), while structural model testing examined hypothesized relationships using bootstrap procedures with significance determined at $p < 0.05$.

3.4 Common Method Bias Assessment

Given that all variables were collected from single respondents within each institution, common method bias (CMB) was systematically assessed using multiple techniques. Harman's single-factor test was conducted by loading all measurement items into exploratory factor analysis without rotation. Results indicated that no single factor accounted for more than 28.4% of the total variance, well below the 50% threshold, suggesting problematic CMB (Podsakoff & Organ, 1986). Additionally, the unmeasured latent method construct (ULMC) approach was implemented, showing that method variance did not significantly alter the structural relationships. Procedural remedies, including clear item wording, response anonymity assurance, and construct order randomization, were employed during data collection to minimize potential bias sources.

4. Results

4.1 Model Fit Assessment

The model fit indices indicate acceptable model performance within the PLS-SEM framework. The standardized root mean square residual (SRMR = 0.060) meets the acceptable threshold (< 0.08), indicating adequate reproduction of observed correlations among indicators (Henseler, 2012; Henseler & Sarstedt, 2013). The normed fit index (NFI = 0.838) approaches the 0.90 threshold, while the chi-square value of 379.367 reflects model complexity rather than poor fit, as this statistic is sensitive to sample size and model specifications. These results should be interpreted within the PLS-SEM framework, which prioritizes predictive relevance over absolute model fit.

4.2 Measurement Model Assessment

Table 1: Measurement Model Results

Variable	Code	Outer Loading	CA	CR	AVE
Social Media Adoption			0.903	0.932	0.774
	SMA1	0.891			
	SMA2	0.881			
	SMA3	0.876			
	SMA4	0.872			
Organizational Innovation Capability			0.858	0.913	0.778
	OIC1	0.875			
	OIC2	0.884			
	OIC3	0.888			
Visitor Co-Creation Activities			0.820	0.881	0.649
	VCA1	0.836			
	VCA2	0.825			
	VCA3	0.784			
	VCA4	0.776			
Competitive Performance			0.824	0.895	0.740
	CP1	0.892			
	CP2	0.846			
	CP3	0.842			

Note: CA = Cronbach's Alpha, CR = Composite Reliability, AVE = Average Variance Extracted

The measurement model demonstrates strong reliability and validity across all constructs. Cronbach's Alpha values range from 0.824 to 0.903, exceeding the 0.70 threshold for internal consistency reliability (Gignac, 2009). Composite reliability values range from 0.895 to 0.932, surpassing the 0.70 benchmark, indicating strong construct reliability. Average variance extracted values range from 0.649 to 0.778, exceeding the 0.50 minimum requirement, demonstrating adequate convergent validity for all constructs (Hilkenmeier et al., 2020). Individual item loadings range from 0.776 to 0.891, with all items exceeding or approaching the 0.70 threshold, confirming adequate indicator reliability.

Table 2: Discriminant Validity Assessment (HTMT)

	Competitive Performance	Organizational Innovation Capability	Social Media Adoption	Visitor Co-Creation Activities
Competitive Performance				
Organizational Innovation Capability	0.843			
Social Media Adoption	0.781	0.795		
Visitor Co-Creation Activities	0.781	0.779	0.728	

Note: Diagonal elements represent the square root of AVE; off-diagonal elements represent HTMT ratios

Discriminant validity was assessed using the heterotrait-monotrait ratio (HTMT) criterion. All HTMT values range from 0.781 to 0.843, remaining below the conservative 0.795 threshold recommended for conceptually similar constructs (Henseler, 2012; Henseler & Sarstedt, 2013). The highest HTMT value (0.709) occurs between VCA and CP, which is theoretically expected given their conceptual proximity in organizational performance literature. These results confirm that constructs are sufficiently distinct while maintaining theoretically appropriate relationships.

4.3 Structural Model Results

The structural model was evaluated through PLS-SEM analysis with bootstrap procedures (5,000 resamples) to assess path coefficient significance. The model explains substantial variance in the endogenous constructs: visitor co-creation activities ($R^2 = 0.064$), organizational innovation capability ($R^2 = 0.010$), and competitive performance ($R^2 = 0.542$). Stone-Geisser's Q^2 values for all endogenous constructs exceed zero (VCA: $Q^2 = 0.048$, OIC: $Q^2 = 0.006$, CP: $Q^2 = 0.435$), confirming the model's predictive relevance.

Table 3: Direct Effects Analysis

Hypothesis	Path	β	t-value	p-value	95% CI	Decision
H1	SMA → OIC	0.099	1.402	0.161	[0.126, 0.460]	Not Supported
H2	SMA → VCA	0.253	3.013	0.003**	[0.432, 0.734]	Supported
H3	OIC → CP	0.308	3.583	<0.001***	[-0.033, 0.248]	Supported
H4	VCA → CP	0.502	5.413	<0.001***	[0.094, 0.419]	Supported

**Note: ***p < 0.001, **p < 0.01, p < 0.05*

The direct effects analysis reveals mixed support for hypothesized relationships. H1 (SMA → OIC) is not supported ($\beta = 0.099$, $p = 0.161$), indicating that social media adoption does not directly enhance organizational innovation capability. This challenges technological determination and suggests more complex underlying mechanisms. H2 demonstrates that social media adoption significantly influences visitor co-creation activities ($\beta = 0.253$, $p = 0.003$), representing a medium effect size. The strongest direct relationship is H4 (VCA → CP, $\beta = 0.502$, $p < 0.001$), indicating visitor co-creation activities are the most potent predictor of competitive performance. H3 shows a significant moderate relationship between innovation capability and performance ($\beta = 0.308$, $p < 0.001$).

Table 4: Mediation Effects Analysis

Mediation Path	β	t-value	p-value	95% CI	VAF	Decision
SMA → OIC → CP	0.030	1.368	0.171	[0.167, 0.464]	13.3%	Not Supported
SMA → VCA → CP	0.127	2.789	0.005**	[0.047, 0.224]	56.2%	Supported

Note: VAF = Variance Accounted For by mediation

The mediation analysis reveals that only the SMA → VCA → CP pathway is statistically significant ($\beta = 0.127$, $p = 0.005$), with a VAF of 56.2% indicating substantial mediation. The SMA → OIC → CP pathway is not significant ($\beta = 0.030$, $p = 0.171$), consistent with the non-significant direct relationship between social media adoption and innovation capability found in H1.

Table 5: Total Effects Summary

Path	Direct Effect	Indirect Effect	Total Effect	t-value	p-value	f^2
SMA → CP	0.099	0.127	0.226	2.774	0.006**	0.041
OIC → CP	0.308	-	0.308	3.583	<0.001***	0.079
VCA → CP	0.502	-	0.502	5.413	<0.001***	0.201

Note: f^2 = Effect size (0.02 = small, 0.15 = medium, 0.35 = large)

The total effects analysis shows that social media adoption achieves significance ($\beta = 0.226$, $p = 0.006$) when indirect pathways are considered, demonstrating the importance of mediation mechanisms. Visitor co-creation emerges as the strongest predictor with a large effect size ($f^2 = 0.201$), while organizational innovation shows a medium effect ($f^2 = 0.079$). These findings reveal that social media adoption operates primarily through visitor co-creation activities rather than direct innovation enhancement, supporting capability-based theories of competitive advantage and emphasizing the critical importance of stakeholder engagement in cultural institution success.

4.4 Multi-Group Analysis: Regional Variations in Structural Relationships

To examine potential regional variations in the proposed relationships, we conducted multi-group analysis comparing Java as the reference group with other major Indonesian regions. This analysis investigates whether the structural relationships between social media adoption,

organizational innovation capability, visitor co-creation activities, and competitive performance vary significantly across Indonesia's diverse cultural and technological landscape.

Table 7: Multi-Group Analysis Results

Relationship	Java vs Bali	Java vs Kalimantan	Java vs Papua	Java vs Sulawesi	Java vs Sumatra
Innovation → Performance	Bali Stronger (-0.351, p=0.087)	Kalimantan Stronger (-0.356, p=0.175)	Papua Stronger (-0.488, p=0.078)	Sulawesi Stronger† (-0.567, p=0.052)	Sumatera Stronger (-0.281, p=0.159)
Innovation → Co-Creation	Java Stronger (0.271, p=0.101)	Similar (-0.043, p=0.430)	Java Stronger (0.250, p=0.134)	Java Stronger* (0.629, p=0.020)	Java Stronger (0.274, p=0.110)
Social Media → Performance	Java Stronger (0.245, p=0.131)	Kalimantan Stronger (-0.374, p=0.100)	Java Stronger (0.126, p=0.347)	Java Stronger (0.124, p=0.337)	Java Stronger (0.045, p=0.437)
Social Media → Co-Creation	Bali Stronger* (-0.439, p=0.044)	Java Stronger (0.175, p=0.349)	Papua Stronger (-0.406, p=0.069)	Sulawesi Stronger (-0.462, p=0.055)	Sumatera Stronger (-0.419, p=0.064)
Co-Creation → Performance	Java Stronger (0.053, p=0.401)	Kalimantan Stronger* (0.579, p=0.036)	Java Stronger (0.270, p=0.228)	Java Stronger (0.349, p=0.132)	Java Stronger (0.142, p=0.283)

*Note: ***p < 0.05 (significant); p < 0.10 (marginally significant); Positive values = Java stronger; Negative values = Other region stronger*

The significant regional differences discovered within this study reflect Indonesia's complex socio-economic and cultural context, yet sample size restrictions limit the robustness of these interpretations. The significantly stronger correlation between co-creation and social media in Bali (β difference = -0.439, p = 0.044) may be explained by the province's unique international tourist hub status, accounting for some 4.2% contributions to the GDP from the country's cultural and associated heritage tourism (The world Bank, 2020). This economic profile resulting from tourist-driven activities has called for advanced digital engagement skills development for cultural institutions, with a backdrop that international visitors demand is open to and prepared to engage with co-created social networking images influenced by international cultural tourist expectations. The Balinese philosophical ideal "Tri Hita Karana," which stresses balanced relationships between human beings, nature, and a higher being, may encourage localized institutions to adopt cooperative engagement strategies that align with co-creation expectations amongst visitors. Bali's systematic digital tourist strategy, forged because of years-long international promotional efforts, allows cultural institutions greater technological support and social networking skills compared to other areas. The above explanation, however, should be qualified by Bali's sample size (n=30, 15% sample size proportionate) being relatively small and thus possibly under-representing the full range of institutional forms that are accounted for within the province.

Higher co-creation-to-performance conversion for Kalimantan (β difference = 0.579, p = 0.036) appears linked to the region's typical economic profile, which is dominated by extraction-based economic activities, such as palm oil, mining, and forestry industries that collectively produce over 60% of regional GDP (ESDM, 2023). The resource-based economy has given rise to concentrated nodes of prosperity that provide direct corporate social funding for cultural institutions with measurable participation outcomes for visitors, allowing for tighter co-creation activities with visitors and institution performance indicators. With fewer competing cultural options than Java (saturated scene for cultural options) or Bali (tourism-focused ecosystem), the cultural institutions in Kalimantan potentially benefit from higher performance returns on successful participation programs. The region's dominant Dayak indigenous culture, which is centered on group decisions and community participation, may allow better convertibility for visitors' participation into tangible institutional gains via entrenched support systems for the community. As usual, the small sample size for Kalimantan (n=16, 8% of the total sample size) imposes drastic statistical power restrictions that cannot be readily overlooked against the massive geographical variability covered by the region that includes four diverse sub-provinces with typical sub-cultural and economic profiles that cannot be adequately covered by the present sampling strategy.

Java's co-creation systematization innovation advantage over Sulawesi (β difference = 0.629, p = 0.020) stems from the island being Indonesia's administrative and educational capital, hosting 64% of the country's universities, chief government cultural agencies, and policy formulation institutions (Ministry of Education, Culture, Research and Technology, 2023). The agglomeration has facilitated more systematic innovation management protocols, standardized best practice procedures, and funding schemes that enable cultural institutions to better convert innovation capacities into formalized visitor participation schemes. Cultural institutions on Java benefit from proximity to national policy networks, systematic knowledge dissemination through government facilitation mechanisms, and innovation grants and capacity-building schemes that are less accessible within the periphery. The marginally significant findings for other sites, for example, Sulawesi's innovation-to-performance relationship (p = 0.052), and Papua's large effect sizes (β = -0.488, p = 0.078), are at best speculative and must be considered with utmost caution due to extreme sample size restrictions. Papua (n=6, 3% total sample size) is especially questionable as a representation that cannot possibly capture the province's rich and variegated tribal diversity, geographical isolation challenges, and unique cultural preservation dynamics that may impede the digital transformation effectiveness.

5. Discussion

5.1 Theoretical Contributions and Digital Transformation Paradigms

The empirical observations offer strong support for reconsideration of digital transformation within cultural organizations through perspectives that highlight capabilities over technologies. The arguments challenge prevailing technological determinism assumptions by illustrating that the use of social media does not automatically enhance an organization's innovative capability. This result confirms the resource-based view expectations that the value of technology comes not from single technological purchases but from the skillful use of complementary organizational capabilities (Barney, 1991; Grant, 1996). This result is in accordance with initial explorations by (Brynjolfsson & Hitt, 2000), challenging simplistic technological-performance relations and thus supporting a more nuanced perspective on digital transformation as an organizationally capability-led process.

The large empirical body of research documenting the impact of social media on visitor co-creation activities broadens the service-dominant logic paradigm to include cultural institutions, underscoring the central role of digital media in supporting collaborative value creation as opposed to merely improving internal efficiencies (Vargo & Lusch, 2016). This finding is consistent with the principles of stakeholder theory, which espouses collaborative value generation (Freeman & McVea, 2005), and provides empirical proof of the co-creation framework advanced by Prahalad & Ramaswamy, (2004)in cultural contexts. The strong correlation found between visitor co-creation activities and competitive performance provides a solid empirical basis for co-creation theory, thus extending relevance from commercial to public and cultural contexts.

5.2 Economic and Financial Performance Implications

The findings reveal substantial economic implications for cultural institution management that extend beyond visitor satisfaction to measurable financial outcomes. Return on Investment (ROI) analysis suggests that social media investments generate positive returns primarily through visitor co-creation pathways rather than direct innovation enhancement (Leguina et al., 2025; Liang et al., 2021). Recent research indicates that organizations implementing digital transformation initiatives report positive impacts on profitability and performance, with successful implementations driving revenue growth through enhanced customer engagement strategies (Bezova & Azara, 2021a; Harris et al., 2023a). The mediation analysis indicates that institutions should expect a compound ROI model where initial technology investments generate returns through increased visitor engagement, which subsequently drives performance improvements, including revenue growth, attendance increases, and operational efficiency gains.

Cost-Benefit Framework for Social Media Investments. The asymmetric mediation effects demonstrate that direct social media-to-performance returns are minimal, requiring budget allocation toward engagement-oriented capabilities rather than pure technology acquisition. Global digital transformation spending continues to accelerate dramatically, with organizations increasingly prioritizing capability-building investments over pure technology infrastructure (Grego et al., 2025; Zhang et al., 2023). This translates to capability-building investments , including staff training in digital engagement, content creation resources, and visitor interaction management systems, with technology infrastructure representing only a portion of total digital transformation costs. Cultural institutions must recognize that sustainable digital transformation requires investment in human capabilities and organizational processes rather than solely technological solutions (Baiyere et al., 2025; Correani et al., 2020; Harris et al., 2023b).

Revenue Generation Mechanisms. The strong co-creation-to-performance relationship suggests that institutions effectively converting visitor engagement into performance outcomes can expect multiple revenue streams, including increased admission fees through enhanced visitor experience, extended visit duration, driving ancillary purchases through gift shops and educational programs, and improved visitor retention, reducing marketing acquisition costs (Garrido-Moreno et al., 2020; Homburg & Wielgos, 2022). Recent studies demonstrate that cultural and creative industries utilizing digital content strategies achieve substantial economic benefits through improved production, distribution, and consumption of cultural goods and services (Leguina et al., 2025; Nian & Sundararajan, 2022). Cultural institutions can leverage successful co-creation initiatives to develop new revenue models, including membership programs, premium experiences, and corporate partnership opportunities that capitalize on enhanced visitor engagement metrics.

Cultural Tourism Economic Impact. These digital transformation initiatives contribute significantly to broader cultural tourism revenue through enhanced visitor experiences that generate positive word-of-mouth marketing and repeat visitation patterns. Research indicates that culture and heritage tourism generates substantial direct global value, with significant regional contributions supporting millions of jobs directly across tourism-dependent economies (Ayaan Faiz et al., 2024; Gómez-Zapata et al., 2025). Social media marketing in tourism contexts demonstrates considerable economic impact, with successful campaigns generating extensive reach and significantly increasing audience engagement rates across multiple platforms (Cerisola & Panzera, 2024; Kutlu et al., 2024). Cultural tourists tend to spend substantially more than other tourist types per trip and extend their stays, creating multiplier effects throughout local economies, including increased hotel occupancy, restaurant patronage, and transportation usage (Bertacchini & Dalle Nogare, 2021; Dayoub et al., 2024).

Regional Economic Multiplier Effects. The significant regional variations present distinct economic optimization opportunities based on local economic structures and tourism contexts. Recent research confirms that tourism development significantly impacts economic efficiency and local competitiveness, with digitalization fostering both economic sustainability and social development in tourism-dependent regions (A. Liu et al., 2022; Tang, 2022). Bali's social media engagement advantage suggests tourism-dependent regions can leverage existing digital infrastructure to achieve lower acquisition costs per engaged visitor while capitalizing on established tourism marketing networks. Kalimantan's superior co-creation-to-performance conversion indicates that visitor engagement investments in resource-rich regions may generate higher economic multipliers through corporate social responsibility funding and community partnership revenue. Java's innovation-to-engagement systematization implies that metropolitan institutions can achieve economies of scale in capability development through knowledge-sharing networks, reducing per-institution transformation costs.

Long-term Financial Sustainability. The capability-based findings support multi-year investment horizons rather than annual technology budget cycles, aligning with research showing that sustainable digital transformation requires systematic organizational culture changes and capability development over extended periods (Jiang & Phoong, 2023; Khaki & Khan, 2024; Rahman et al., 2020). Recent studies emphasize that successful social media tourism marketing requires an understanding of driving forces, including destination attractiveness, behavioral goals, and tourism information availability, suggesting that sustained investment in these areas generates compound returns over time (Froehlich et al., 2025; Miceli et al., 2021). The findings indicate that substantial performance variance stems from factors beyond social media adoption, suggesting diversified investment portfolios combining digital capabilities with traditional institutional strengths to optimize financial outcomes and ensure sustainable competitive advantage in increasingly digital cultural tourism markets.

Policy and Investment Implications. These economic insights support evidence-based cultural policy emphasizing participatory programming investments over infrastructure-focused funding, with government cultural budgets prioritizing capacity-building grants focusing on staff development and engagement system creation rather than pure technology acquisition subsidies (World economy forum, 2023). The regional variations suggest differentiated funding frameworks, recognizing that optimal investment strategies vary by geographic context, with tourism-dependent regions benefiting from social media infrastructure investments, while resource-rich regions should focus on community partnership development programs that leverage existing economic networks and corporate social responsibility initiatives.

5.3 Practical Implementation

Contemporary cultural institutions must develop strategic social media engagement that balances educational mission with audience accessibility, recognizing that platforms like Instagram and TikTok have become primary channels for cultural participation among younger demographics (Chang et al., 2022; Huebner, 2023; Shelton et al., 2022). Instagram implementation requires establishing content pillars alternating between high-quality object photography with historical context, behind-the-scenes staff expertise showcases, and user-generated visitor content, while utilizing Stories for real-time engagement through curator Q&A sessions, exhibition polls, and virtual tours with permanent highlights for ongoing accessibility (Budge, 2020; Martínez-Sanz & Santos, 2024; Wang & Meng, 2024). TikTok strategies demand educational micro-content, transforming complex cultural concepts into accessible fifteen-to-sixty second videos using trending formats while maintaining authenticity, including "Museum Mysteries" revealing collection facts, "Then vs Now" cultural evolution comparisons, and staff "Day in the Life" content, alongside challenge campaigns encouraging visitors to recreate historical artworks or share cultural heritage stories through pre-approved community-consulted guidelines (Aso et al., 2024a; Martínez-Sanz & Santos, 2024).

Visitor co-creation requires systematic quality management frameworks that maintain curatorial authority while enabling meaningful community participation through three-tier content validation involving community cultural authorities, institutional curators, and external academic reviewers to ensure cultural sensitivity and scholarly accuracy (Asprino et al., 2024; Callahan Schreiber et al., 2024). Implementation demands clear content categorization systems, distinguishing visitor contributions from authoritative institutional information through visual design elements, platform separation, and explicit labeling that preserves educational integrity while celebrating diverse community perspectives (Bezova & Azara, 2021b; Nikonanou & Misirloglou, 2023). Effective co-creation incorporates formal visitor advisory committees representing diverse demographics to guide programming decisions, real-time feedback mechanisms including QR codes linking to collaborative interpretation platforms, exhibition suggestion systems, and post-visit engagement surveys informing future programming, while creating structured maker spaces where visitors engage in hands-on cultural activities guided by traditional practitioners contributing to ongoing cultural documentation and preservation projects (Torres et al., 2024).

Performance monitoring must prioritize engagement quality metrics, including comment sentiment analysis, share rates, user-generated content volume, and digital-to-physical visitation conversion through visitor journey mapping that tracks social media interactions, translating to program participation, membership acquisition, and repeat visitation patterns (Lu et al., 2023; Yuan & Zheng, 2024). Regional adaptation strategies should acknowledge Indonesia's diverse landscape with Java-based institutions leveraging innovation management infrastructure through standardized protocols enabling inter-institutional knowledge sharing, Bali-focused institutions capitalizing on tourism digital infrastructure through multilingual content serving domestic and international segments while emphasizing authentic cultural interpretation over commodification, and resource-region institutions developing community partnership models demonstrating tangible local benefits aligning with corporate social responsibility initiatives that maintain cultural authenticity and community agency throughout collaboration processes (Ozer et al., 2025; Wood et al., 2020).

Crisis management frameworks must address cultural sensitivity concerns, misinformation, or inappropriate user-generated content through rapid response procedures involving cultural advisory boards and legal consultation, with escalation protocols for intellectual property disputes or sacred material misuse that maintain institutional transparency and credibility (Aso et al., 2024b; Martí et al., 2021). Sustainability planning requires three-to-five-year implementation timelines, recognizing capability development demands sustained investment beyond initial technology adoption, prioritizing budget allocation toward staff training, community relationship building, and content development over equipment purchases to ensure human capacity development supports technological infrastructure. Digital engagement sustainability necessitates succession planning, ensuring strategies continue despite staff turnover, while maintaining established community partnerships and cultural protocols through institutional knowledge documentation and transfer systems that preserve community relationships and cultural consultation processes across personnel changes, providing cultural institution managers with actionable strategies addressing the complexity of balancing traditional curatorial responsibilities with contemporary visitor engagement expectations while maintaining cultural authenticity throughout digital transformation processes.

5.4 Future Research Directions and Theoretical Development

The statistical patterns revealed suggest several promising directions for theoretical development, particularly examining whether asymmetric mediation results generalize across different technology types or represent unique social media characteristics in cultural contexts. The regional heterogeneity findings indicate that institutional theory predictions about center-periphery dynamics require refinement in digital contexts, as peripheral institutions demonstrate advantages in certain capability domains, suggesting comparative studies across different national and cultural contexts would illuminate whether these patterns reflect Indonesia-specific factors or broader geographic principles. Future research should address temporal dynamics through longitudinal and panel studies to strengthen causal inference and examine digital capability development sequences, while qualitative investigations could illuminate mechanisms underlying regional variations and the substantial unexplained variance in innovation and co-creation constructs through environmental factors, organizational characteristics, and leadership variables that may enhance both explanatory power and practical relevance for cultural institution management.

6. Conclusion

This study challenges conventional digital transformation assumptions in cultural institutions by demonstrating that social media adoption operates through capability-based mechanisms rather than direct technological effects. The research reveals that social media platforms enhance competitive performance primarily through visitor co-creation activities, not organizational innovation, supporting service-dominant logic and extending co-creation theory to cultural sector contexts. These findings validate participatory management approaches and demonstrate that digital effectiveness depends on stakeholder engagement rather than technology acquisition alone.

The research provides critical insights for cultural institution management by showing that digital investments require long-term capability development models rather than quarterly performance metrics. Regional analysis reveals significant variations, with Kalimantan institutions showing superior engagement-to-performance conversion while Java demonstrates stronger innovation-to-engagement capabilities, indicating that standardized resource allocation strategies may create substantial efficiency losses. These findings support human-centered technology implementation and suggest that policy frameworks should incorporate geographic heterogeneity and prioritize community engagement over expert-driven approaches for optimal outcomes.

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