Digital transformation and community empowerment in tourism villages: Evidence from Malang Raya, Indonesia

A. Faidlal Rahman [1]*, Azna Abrory Wardana [1], Mufarrohah [1],

[1] *Universitas Brawijaya, Indonesia*

**Corresponding author: faidrahman@ub.ac.id*

Journal of Tourism, Culinary, and Entrepreneurship

e-ISSN: 2776-0928

Publisher:
School of Tourism,
Universitas Ciputra Surabaya,
Indonesia

Keywords:
Digital Transformation
Community Empowerment
Tourism Village
Digital Orientation
Malang Raya

Received: *September 24, 2026*
Revised: *September 29, 2026*
Accepted: *October 2, 2026*

ABSTRACT

Digital transformation is increasingly promoted as a pathway to strengthen rural tourism; however, empirical evidence on its capacity to empower local communities remains limited. This study investigated the relationship between digital transformation and community empowerment in tourism villages across Malang Raya, East Java, Indonesia. A quantitative explanatory, cross-sectional design was employed, using purposive sampling of 300 key stakeholders directly involved in tourism-village management. Digital transformation was operationalized through technology scope, digital capabilities, ecosystem coordination, and digital architecture, while community empowerment encompassed economic, psychological, social, political, and environmental dimensions. Data was analyzed using Partial Least Squares Structural Equation Modeling (PLS-SEM). The measurement model demonstrated strong reliability and convergent validity. Digital transformation was positively and statistically significantly associated with community empowerment (β = 0.168, t = 2.454, p = 0.014), although its explanatory power and effect size were limited (R^2 = 0.028; f^2 = 0.029). These findings suggest that digital transformation serves as an enabling condition rather than an automatic mechanism for empowerment. Therefore, tourism-village digitalization initiatives should be accompanied by human capital development, inclusive participation, institutional strengthening, and equitable access to digital opportunities and benefits.

1. INTRODUCTION

Digital transformation has changed tourism from the use of isolated digital tools into a broader reconfiguration of how destinations create, communicate, and deliver value (Daryana & Waluyo, 2025). Digital platforms, data, online communication, and connected service systems increasingly shape destination marketing, visitor interaction, coordination, and decision-making (Buhalis & Foerste, 2015). Vial (2019) defined digital transformation as organizational change triggered by digital technologies, while Verhoef et al. (2021) distinguished it from digitization and digitalization by emphasizing strategic and organization-wide change. In tourism, Gretzel et al. (2015) similarly showed that smart tourism depends on

© This is an open access article distributed under the Creative Commons Attribution - Non-Commercial - Share Alike 4.0 International License.

information and communication technologies that enable data to be collected, exchanged, and transformed into value. Consequently, the relevance of digital transformation lies not simply in whether a destination uses social media or online booking, but in whether digital technologies become embedded in capabilities, processes, coordination, and governance (Kusumawidjaya et al., 2021).

This issue becomes particularly important in tourism villages because the destination is simultaneously a tourism product, a place of residence, and a community-managed development space. Local residents may act as resource owners, homestay operators, guides, micro-entrepreneurs, cultural custodians, environmental stewards, and participants in village decision-making (James & Suryani, 2025; Vinodan & Meera, 2022). Digital transformation in this setting extends beyond destination visibility. Social media, digital information, online booking, digital payments, visitor data, and digital communication can potentially widen market access and improve coordination among village government, Tourism Awareness Groups *(Pokdarwis)*, village-owned enterprises *(BUMDes)*, MSMEs, community groups, and external partners. Yet the presence of these technologies does not by itself demonstrate that residents have gained greater access to benefits, confidence, collective capacity, influence, or environmental agency (Conrad & Hilchey, 2011; Indrianto et al., 2024).

This issue constitutes the central research problem. Tourism villages may achieve greater digital visibility and operational connectivity, yet the distribution of capabilities and benefits among residents often remains unequal (Adekuajo et al., 2025; Minghetti & Buhalis, 2010). A village may maintain multiple social media accounts, digital payment channels, online information resources, or reservation systems. However, these digital outputs can coexist with limited digital literacy, centralized decision-making, restricted market access, or low levels of community participation (Bühler et al., 2023; Mariën & Prodnik, 2014). The primary analytical question is whether digital transformation is substantively linked to community empowerment, rather than simply modernizing tourism-village operations. This distinction matters for public policy, as technology-focused programs may overestimate empowerment if they measure success mainly by platforms, content, connectivity, or transaction metrics.

Community empowerment provides the social outcome through which this question can be examined. Boley and McGehee (2014), through the Resident Empowerment through Tourism Scale (RETS), conceptualize empowerment in psychological, social, and political terms. Moreira dos Santos et al. (2024) extend this framework through RETS 2.0 by incorporating economic and environmental empowerment. In tourism villages, these five dimensions are closely connected: economic empowerment reflects residents' access to income and enterprise opportunities; psychological empowerment captures pride, confidence, and perceived capability; social empowerment concerns cohesion and collective action;

© This is an open access article distributed under the Creative Commons Attribution - Non-Commercial - Share Alike 4.0 International License.

political empowerment concerns voice and influence in tourism decisions; and environmental empowerment concerns residents' capacity to protect and manage local resources. Empowerment is therefore broader than participation or income alone and provides an appropriate multidimensional outcome for evaluating whether digital transformation is associated with meaningful community-level change (Boudebouz et al., 2025).

Although previous studies have clarified aspects of this relationship, they have not fully resolved it. Rahman et al. (2025), in their examination of tourism villages in Batu City, identified strong psychological and social empowerment, along with positive economic and political empowerment, thereby confirming that tourism-village development can generate multiple forms of resident agency. Wardani et al. (2026) demonstrated that community-based tourism management relies on stakeholder interaction, negotiation, communication, and the mobilization of social and human capital. Similarly, Wiramatika and Suryawati (2026) highlighted the significance of community participation in planning, management, and evaluation within tourism areas. Collectively, these studies underscore the importance of empowerment, participation, and institutional capacity; however, they do not quantitatively examine the relationship between digital transformation and multidimensional community empowerment.

Research on digitalization provides the complementary side of the argument. Kindermann et al. (2021) conceptualized digital orientation through technology scope, digital capabilities, ecosystem coordination, and digital architecture, offering a strategic view that goes beyond technology adoption. Lapuz (2023), in rural tourism in the Philippines, showed that community involvement in digital transformation is associated with technical capability, social networks, political influence, and participation in decision-making. These findings suggest a plausible pathway from digital transformation to empowerment, but the existing evidence is still fragmented across digital adoption, rural-tourism transformation, participation, institutional development, and empowerment studies. Recent evidence from rural tourism similarly indicates that digital platforms can improve destination visibility, market access, and local economic participation, but their benefits remain constrained by disparities in digital literacy, connectivity, and infrastructure (Adekuajo et al., 2025). This evidence further supports the view that digitalization can create enabling opportunities without automatically producing community empowerment.

The existing literature identifies three primary research gaps. First, a conceptual gap persists because digital tourism studies mainly examine platforms, smart technologies, marketing, or visitor experience, whereas empowerment research focuses on participation, residents' support, or sustainable tourism outcomes. The direct relationship between digital transformation and community empowerment remains insufficiently explored. Second, an empirical gap is evident, as few studies quantitatively assess the relationship between

© This is an open access article distributed under the Creative Commons Attribution - Non-Commercial - Share Alike 4.0 International License.

multidimensional digital transformation and multidimensional community empowerment in tourism villages. Although studies such as Lapuz (2023) provide relevant qualitative evidence, the magnitude and statistical significance of this relationship remain underexplored. Third, a contextual gap is present in Indonesian tourism villages, where digital transformation unfolds within community-based governance involving village institutions, *Pokdarwis*, *BUMDes*, and MSMEs, and residents. While Indonesian studies contribute valuable insights into empowerment and stakeholder participation, empirical evidence directly testing whether greater digital transformation is associated with stronger community empowerment remains limited.

Malang Raya provides a relevant setting for addressing these gaps. The region comprises Batu City, Malang Regency, and Malang City and includes tourism villages characterized by agro-tourism, nature-based attractions, cultural resources, local enterprises, and community-based management, alongside differing levels of digital use. This heterogeneity makes Malang Raya suitable for examining whether variations in technology scope, digital capabilities, ecosystem coordination, and digital architecture are associated with variations in economic, psychological, social, political, and environmental empowerment. The setting is also analytically useful because tourism-village development in the region depends on collaboration among community organizations and local institutions rather than on a single destination-management organization.

This study's novelty lies in integrating digital transformation and community empowerment through a socio-technical perspective on tourism-village development. Rather than treating digitalization as a proxy for development or empowerment, this study operationalizes digital transformation through technology scope, digital capabilities, ecosystem coordination, and digital architecture, while measuring community empowerment using the five RETS/RETS 2.0 dimensions. This approach conceptualizes digital transformation as an enabling condition, with its relationship to empowerment contingent upon communities' capacity to translate technological and coordinating affordances into agency. Consequently, the focus shifts from whether tourism villages are simply becoming more digital to whether digital transformation is associated with increased community empowerment.

Given this context, this study investigates whether digital transformation is positively associated with community empowerment in tourism villages in Malang Raya. The primary objective is to examine the relationship between digital transformation and community

© This is an open access article distributed under the Creative Commons Attribution - Non-Commercial - Share Alike 4.0 International License.

empowerment in these villages. Drawing on theoretical frameworks and prior empirical findings, the following hypothesis is proposed:

H_1: Digital transformation is positively associated with community empowerment in tourism villages in Malang Raya.

2. METHODOLOGY

Research Design and Context

The study employed a quantitative explanatory, cross-sectional survey design to examine a theoretically specified association between two latent constructs. Because the principal data was collected within a single research period, the analysis focuses on the association between digital transformation and community empowerment rather than establishing temporal causality. The research context comprised tourism villages and tourism communities in Malang Raya, East Java, Indonesia, covering Batu City, Malang Regency, and Malang City. The unit of observation was an individual key stakeholder directly involved in tourism-village management or development. Respondents were treated as key informants who assessed village-level management practices based on their direct involvement and knowledge of local tourism activities.

Purposive sampling was used to recruit respondents with relevant knowledge and experience. Eligibility criteria included being at least 18 years old, living or working in the study area, having at least one year of involvement in tourism-village management or development, and possessing knowledge of digital practices and community empowerment. Respondents included *Pokdarwis* members, village-government or *BUMDes* representatives, homestay and attraction managers, guides, micro and small business operators, arts/community-group members, and other relevant local actors.

The study included 15 tourism villages or communities across Malang Raya: seven in Batu City, four in Malang Regency, and four in Malang City. The study analyzed 300 usable responses: 155 from Batu City, 70 from Malang Regency, and 75 from Malang City. The number of respondents varied by location because selection criteria were based on eligibility and direct stakeholder involvement rather than proportional allocation. Table 1 presents the sample's geographical distribution. Recruitment was purposive and continued until the required number of eligible, usable responses was obtained. Because a fixed sampling frame and a known number of invited participants were not used, a conventional survey response rate was not calculated.

© This is an open access article distributed under the Creative Commons Attribution - Non-Commercial - Share Alike 4.0 International License.

Table 1. Distribution of Respondents by Tourism Village/Community

Administrative Area	Tourism Village	n
Batu City	Sidomulyo	25
	Bumiaji	25
	Punten	20
	Tulungrejo	25
	Gunungsari	20
	Oro Oro Ombo	20
	Pandanrejo	20
Malang Regency	Pujon Kidul	25
	Sanankerto	15
	Gubugklakah	20
	Wringinanom	10
Malang City	Kayutangan	25
	Jodipan	15
	Polowijen	20
	Dinoyo	15
Total	**15 locations**	**300**

Source: Processed Primary Survey Data (2026)

Because purposive sampling was used, the distribution was intended to provide geographical and stakeholder coverage rather than proportional representation of the wider tourism-village population. Accordingly, the findings represent the perspectives of the selected key stakeholders and should not be interpreted as statistically representative of all residents in Malang Raya.

Measurement

Data was collected using a structured questionnaire with a five-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree). Digital transformation consisted of 16 items representing four dimensions: technology scope, digital capabilities, ecosystem coordination, and digital architecture. Its conceptual basis was adapted from the digital orientation framework developed by Kindermann et al. (2021). Community empowerment consisted of 15 items representing economic, psychological, social, political, and environmental empowerment, drawing on RETS and RETS 2.0 (Boley & McGehee, 2014; Moreira dos Santos et al., 2024). Higher scores indicated more positive assessments of the conditions represented by each construct.

The multidimensional specification was retained because both constructs describe organizational and community conditions that cannot be captured adequately by a single indicator. Digital transformation in a tourism village may involve technology adoption without corresponding capability or coordination. Likewise, empowerment may be economically visible while political voice or environmental agency remains weak. The measurement model was therefore evaluated before interpreting the structural relationship.

© This is an open access article distributed under the Creative Commons Attribution - Non-Commercial - Share Alike 4.0 International License.

Table 2. Measurement Items for Digital Transformation and Community Empowerment

Variable	Dimension	Code	Questionnaire item
Digital Transformation	Technology Scope	DT1	Our tourism village uses social media, such as Instagram, Facebook, TikTok, or YouTube, to promote tourism attractions, activities, and products.
	Technology Scope	DT2	Our tourism village provides information on locations, attractions, prices, activity schedules, and management contacts through websites, social media, or other digital platforms.
	Technology Scope	DT3	Our tourism village uses digital technology to support the booking of tour packages, homestays, guides, or tourism activities.
	Technology Scope	DT4	Our tourism village provides digital payment methods, such as QRIS, bank transfers, digital wallets, or payments through booking platforms.
	Digital Capabilities	DT5	Tourism village managers are able to create photos, videos, captions, and digital promotional materials that reflect the characteristics of the tourism village.
	Digital Capabilities	DT6	Tourism village managers are able to update information on prices, activity schedules, facilities, and service contacts on the digital media used.
	Digital Capabilities	DT7	Tourism village managers are able to respond to tourists' questions, complaints, and requests through WhatsApp, social media, or other digital platforms.
	Digital Capabilities	DT8	Tourism village managers are able to interpret basic data, such as views, reach, interactions, reviews, or number of bookings, to evaluate promotional activities.
	Ecosystem Coordination	DT9	Managers use WhatsApp groups or other digital communication media to coordinate tourism activities with the village government, *Pokdarwis*, *BUMDes*, MSMEs, and community groups.
	Ecosystem Coordination	DT10	Information on visit schedules, tourist needs, task allocation, and activity changes is shared digitally with the parties involved.
	Ecosystem Coordination	DT11	Managers use digital media to offer tourism packages that combine attractions, culinary products, homestays, handicrafts, transportation, and services provided by local communities.
	Ecosystem Coordination	DT12	The tourism village uses digital platforms to develop promotional or sales partnerships with travel agencies, hotels, communities, government agencies, universities, or other partners.
	Digital Architecture	DT13	Data on bookings, visitor numbers, types of packages, and payments are recorded in digital systems or electronic documents accessible to authorized managers.
	Digital Architecture	DT14	Information displayed on social media, WhatsApp, websites, and booking platforms uses consistent prices, schedules, contacts, and product descriptions.
	Digital Architecture	DT15	Tourist booking data are regularly forwarded to homestay providers, guides, MSMEs, arts groups, or other relevant service providers.
	Digital Architecture	DT16	The digital systems used can be updated when there are changes in tourism packages, prices, facilities, personnel, or tourists' service needs.
Community Empowerment	Economic Empowerment	CE1	Tourism village activities provide opportunities for local residents to earn income as homestay operators, guides, food providers, artists, craftspeople, or transportation providers.

© This is an open access article distributed under the Creative Commons Attribution - Non-Commercial - Share Alike 4.0 International License.

Variable	Dimension	Code	Questionnaire item
	Economic Empowerment	CE2	The development of tourism village provides opportunities for local residents to establish or develop businesses that serve tourists' needs.
	Economic Empowerment	CE3	Tourist visits increase opportunities for local residents to sell food, beverages, handicrafts, agricultural products, souvenirs, or local services.
	Psychological Empowerment	CE4	Tourism village development increases community pride in the village's culture, natural environment, culinary traditions, handicrafts, or local way of life.
	Psychological Empowerment	CE5	Tourism activities encourage the community to place greater value on the uniqueness of their village's culture and environment.
	Psychological Empowerment	CE6	The success of the tourism village strengthens the community's confidence that the village has the capacity to develop through tourism.
	Social Empowerment	CE7	Tourism village activities strengthen solidarity among *Pokdarwis*, *BUMDes*, MSMEs, arts groups, women's groups, youth groups, and other residents.
	Social Empowerment	CE8	Tourism village activities provide opportunities for community members to work together in serving tourists.
	Social Empowerment	CE9	Problems arising in tourism village management encourage community members to discuss them and seek solutions together.
	Political Empowerment	CE10	Community members have opportunities to express their opinions regarding attractions, packages, facilities, prices, and visitor regulations.
	Political Empowerment	CE11	Community opinions are considered before important decisions regarding tourism village development are made.
	Political Empowerment	CE12	The community has influence over the direction of tourism village development and management.
	Environmental Empowerment	CE13	Tourism village activities increase community involvement in maintaining environmental cleanliness, managing waste, and caring for public facilities in the village.
	Environmental Empowerment	CE14	Community members have opportunities to express concerns when tourism activities may damage water sources, agricultural land, forests, rivers, or residential environments.
	Environmental Empowerment	CE15	Tourism village development strengthens the community's capacity to protect and restore the environment through greening, conservation, waste reduction, or restrictions on environmentally damaging tourism activities.

Source: Research Instrument (Adapted from Kindermann et al. (2021), Gretzel et al. (2015), Neuhofer et al. (2015), Boley and McGehee (2014), Moreira dos Santos et al. (2024)).

Table 2 summarizes the measurement framework used in this study. Digital transformation is operationalized through 16 items across technology scope, digital capabilities, ecosystem coordination, and digital architecture, whereas community empowerment was measured through 15 items covering economic, psychological, social, political, and environmental empowerment. The table demonstrates that each questionnaire item is aligned with the multidimensional conceptualization of the two focal constructs.

© This is an open access article distributed under the Creative Commons Attribution - Non-Commercial - Share Alike 4.0 International License.

Data Analysis

Data analysis was conducted in two stages. Descriptive statistics were first used to summarize respondent characteristics and the overall tendencies of the two study variables. Inferential analysis then used Partial Least Squares Structural Equation Modeling (PLS-SEM) in SmartPLS. PLS-SEM was selected because it is appropriate for estimating structural relationships among multidimensional latent constructs and for evaluating both measurement and structural models within a unified analytical framework (Hair et al., 2019; Hair et al., 2022).

The measurement model was evaluated using outer loadings, Cronbach's alpha, composite reliability, average variance extracted (AVE), and discriminant validity. Indicator loadings of approximately 0.708 or higher, internal-consistency reliability above 0.70, and AVE above 0.50 were considered satisfactory. Discriminant validity was assessed using the heterotrait-monotrait ratio (HTMT), with values below 0.85 or 0.90 interpreted according to conceptual similarity. The structural model was assessed using the path coefficient, coefficient of determination (R^2), effect size (f^2), and bootstrapping significance, with hypotheses considered supported when $p < 0.05$. Because both focal constructs were modeled as multidimensional higher-order constructs, the dimension-level assessment additionally examined higher-order outer loadings, outer weights, and variance inflation factors (VIF) before the structural relationship was interpreted.

3. RESULTS AND DISCUSSION

Respondent Profile and Descriptive Findings

The sample represented stakeholders with substantial exposure to tourism-village management. Most respondents were male (57.7%), while 42.3% were female. The largest age groups were 36–45 years (32.0%) and 26–35 years (31.3%). Most respondents had completed senior high school or vocational high school (58.7%). In terms of involvement, 46.7% had participated in tourism-village management for four to six years and 18.4% had been involved for seven years or longer. Importantly, 59.0% had attended tourism or digital training, whereas 41.0% had not. The latter proportion is relevant to the interpretation of structural results because digital transformation depends not only on technological availability but also on human capability.

Table 3 indicates that the respondents were predominantly adults with practical experience in tourism-village management. The concentration of respondents with four to six years of involvement supports their relevance for assessing digital practices and community empowerment, although the 41.0% who had never attended tourism or digital training also signals uneven capacity development.

© This is an open access article distributed under the Creative Commons Attribution - Non-Commercial - Share Alike 4.0 International License.

Table 3. Selected Respondent Characteristics

Characteristic	Category	n	%
Gender	Male	173	57.7
	Female	127	42.3
Age	18–25 years	34	11.3
	26–35 years	94	31.3
	36–45 years	96	32.0
	46–55 years	57	19.0
	≥55 years	19	6.3
Education	Primary school/equivalent	13	4.3
	Junior secondary/equivalent	35	11.7
	Senior secondary/vocational/equivalent	176	58.7
	Diploma	15	5.0
	Bachelor's degree	53	17.7
	Postgraduate degree	8	2.7
Length of involvement	1–3 years	105	35.0
	4–6 years	140	46.7
	7–10 years	35	11.7
	>10 years	20	6.7
Tourism/digital training	Yes	177	59.0
	No	123	41.0

Source: Processed Primary Survey Data (2026)

Descriptively, digital transformation was rated very highly by 87.0% of respondents, while community empowerment was rated very highly by 81.0%. Digital transformation items had mean values of approximately 4.00–4.45, indicating generally positive perceptions of technology use, digital capability, ecosystem coordination, and digital architecture. Community empowerment items ranged approximately from 3.85 to 4.53, suggesting that economic benefits, confidence and pride, social cooperation, participation in decision-making, and environmental involvement were generally perceived positively but not uniformly. The coexistence of high descriptive ratings and a modest structural relationship is analytically important: favorable perceptions of digital development do not necessarily imply a strong statistical association with community empowerment.

Table 4. Descriptive Category of Study Variables

Variable	Dominant category	Proportion
Digital Transformation	Very high	87.0%
Community Empowerment	Very high	81.0%

Source: Processed Primary Survey Data (2026)

Table 4 demonstrates that both focal constructs received predominantly high assessments, with digital transformation at 87.0% and community empowerment at 81.0%. These descriptive findings suggest favorable perceptions of digital development and empowerment. However, they do not determine the strength of the relationships between the constructs, which the structural model addresses.

© This is an open access article distributed under the Creative Commons Attribution - Non-Commercial - Share Alike 4.0 International License.

Measurement Model Assessment

The measurement model met the principal reliability and convergent-validity requirements. Digital transformation achieved a Cronbach's alpha of 0.965, composite reliability of 0.974, and AVE of 0.904. Community empowerment achieved a Cronbach's alpha of 0.957, composite reliability of 0.967, and AVE of 0.855. At the higher-order level, the loadings of the digital transformation dimensions ranged from 0.928 to 0.970, while the community empowerment dimensions ranged from 0.805 to 0.971. These values indicate that the dimensions represented their respective constructs adequately. The HTMT value between digital transformation and community empowerment was 0.174, providing evidence that the two constructs were empirically distinct.

Table 5. Reliability and Convergent Validity Assessment

Construct	Cronbach's alpha	Composite reliability	AVE	Higher-order loading range
Digital Transformation	0.965	0.974	0.904	0.928–0.970
Community Empowerment	0.957	0.967	0.855	0.805–0.971

Source: SmartPLS Output, Processed Research Data (2026)

Table 5 confirms that both constructs satisfy the principal reliability and convergent-validity criteria. Cronbach's alpha and composite reliability values exceed 0.90, while AVE values are well above 0.50, indicating strong internal consistency and explained a substantial proportion of variance in their respective constructs. The very high internal-consistency coefficients should nevertheless be interpreted together with the multidimensional construct specification rather than as evidence of measurement quality in isolation.

Table 6. Dimension-Level Measurement Assessment for the Focal Constructs

Construct / dimension	Outer loading	Outer weight	VIF
Digital Transformation			
Technology Scope	0.937	0.202	3.749
Digital Capabilities	0.967	0.270	4.410
Ecosystem Coordination	0.970	0.302	4.586
Digital Architecture	0.928	0.277	3.633
Community Empowerment			
Economic Empowerment	0.805	0.147	3.447
Psychological Empowerment	0.971	0.202	4.377
Social Empowerment	0.964	0.228	2.611
Political Empowerment	0.939	0.211	4.444
Environmental Empowerment	0.935	0.285	4.809

Source: SmartPLS Output, Processed Research Data (2026)

Table 6 shows that all higher-order dimensions have substantial loadings on their specified constructs. Ecosystem coordination has the highest loading for digital transformation

© This is an open access article distributed under the Creative Commons Attribution - Non-Commercial - Share Alike 4.0 International License.

(0.970), while psychological empowerment has the highest loading for community empowerment (0.971); even the lowest loading, economic empowerment (0.805), remains above the commonly accepted loading threshold. These results support the adequacy of the multidimensional specification used in the present model.

Structural Model and Hypothesis Testing

Bootstrapping analysis demonstrated that digital transformation was positively and statistically significantly associated with community empowerment (β = 0.168, t = 2.454, p = 0.014), thereby supporting H_1. However, this relationship was modest. Digital transformation accounted for only 2.8% of the variance in community empowerment (R^2 = 0.028; adjusted R^2 = 0.025), and the effect size was small (f^2 = 0.029). Thus, this path's statistical significance should be considered in light of its limited explanatory power. These results indicate an association rather than temporal causality and show that most variance in community empowerment remains unexplained by digital transformation alone, leaving substantial scope for other social, institutional, and contextual factors.

Table 7. Structural Model and Hypothesis Test

Relationship	β	t	p	R^2 (CE)	f^2	Decision
Digital Transformation → Community Empowerment	0.168	2.454	0.014	0.028	0.029	H_1 supported

Source: SmartPLS Output, Processed Research Data (2026)

Table 7 presents the direct statistical test of the study hypothesis. The positive coefficient (β = 0.168) and a p-value below 0.05 indicate a significant positive association between digital transformation and community empowerment, thereby supporting H_1. However, R^2 = 0.028 and f^2 = 0.029 demonstrate that the explanatory power and effect size are small. This finding indicates that digital transformation alone explains only a limited share of variation in empowerment and that additional community, institutional, and contextual factors warrant examination.

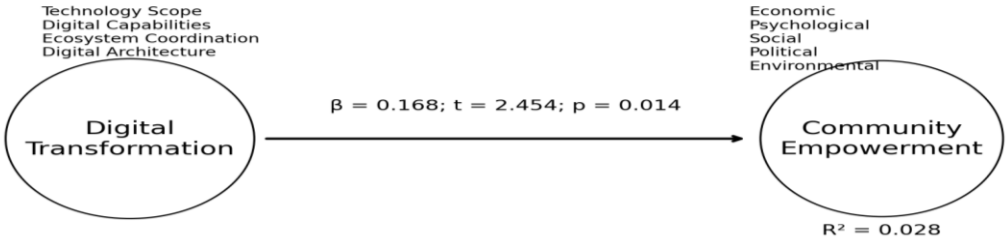


Figure 1. Focused PLS-SEM Result for Digital Transformation → Community Empowerment

Source: Adapted from the SmartPLS Output in the Research Analysis, Processed for the Focal Relationship (2026)

© This is an open access article distributed under the Creative Commons Attribution - Non-Commercial - Share Alike 4.0 International License.

Figure 1 delineates the specific relationship examined in this article within the broader PLS-SEM model. The positive path coefficient ($\beta = 0.168$) is statistically significant ($t = 2.454$; $p = 0.014$; 95% bootstrap CI for $\beta = 0.032–0.296$). However, $R^2 = 0.028$ indicates limited explanatory power, while $f^2 = 0.029$ indicates a small effect size. These results support a positive association while also showing that substantial variance in community empowerment remains unexplained by digital transformation, warranting examination of additional social, institutional, and contextual factors.

Discussion

The positive relationship supports the argument that digital transformation can function as an enabling condition for community empowerment in tourism villages. Greater technology scope, stronger digital capabilities, digital coordination among actors, and more integrated information architecture may provide residents with additional opportunities to access information, communicate with markets, coordinate tourism activities, and participate in destination management. In this sense, digital transformation can expand the resources and channels through which local actors may exercise agency, without implying that these opportunities automatically translate into empowerment.

This interpretation is consistent with Lapuz (2023), whose study in Technology in Society showed that engagement in rural-tourism digital transformation was associated with improvements in residents' technical capability, social networks, political influence, and decision-making roles. The present study extends that qualitative evidence by demonstrating a statistically significant association between multidimensional digital transformation and multidimensional community empowerment constructs. The finding is also compatible with the broader empowerment literature. Boley and McGehee (2014), in Tourism Management, established that tourism empowerment is inherently multidimensional rather than reducible to economic gains, while Boley et al. (2014), in Annals of Tourism Research, showed that psychological, social, and political empowerment shape how residents evaluate and support tourism development. Taken together, these studies support the interpretation that digital transformation can create new resources and channels for agency, but empowerment occurs only when residents are able to convert those opportunities into capability, influence, participation, and collective benefit. This interpretation is also consistent with Adekuajo et al. (2025), who found that digital platforms can enhance rural tourism visibility, market access, and local economic participation, while limitations in digital literacy, connectivity, and infrastructure constrain communities' ability to realize these benefits. Accordingly, digital transformation is better understood as an enabling condition whose empowering potential depends on communities' capacity to access and use digital opportunities effectively.

© This is an open access article distributed under the Creative Commons Attribution - Non-Commercial - Share Alike 4.0 International License.

At the same time, the small coefficient and low R^2 caution against a technology-centred interpretation. Only 2.8% of the variation in community empowerment was explained by digital transformation. This finding is important because it indicates that technological advancement is neither synonymous with empowerment nor sufficient to account for differences in empowerment. Moreira dos Santos et al. (2024), through RETS 2.0, reinforce this multidimensional view by extending resident empowerment beyond psychological, social, and political domains to include economic and environmental dimensions. The present result therefore suggests that digital systems may facilitate empowerment, but substantial variation may be associated with non-technological conditions such as control over economic opportunities, community confidence, collective cohesion, influence over tourism decisions, and environmental agencies. The modest R^2 is thus substantively meaningful rather than simply a statistical limitation.

Participation research highlights the limitations of direct digital relationships. Rasoolimanesh et al. (2017a) found that residents' involvement in tourism development is influenced by motivation, opportunity, and ability, with opportunity being especially significant for higher participation levels. In a subsequent study, Rasoolimanesh et al. (2017b) showed that the relationships among residents' perceptions, community participation, and support for tourism development vary between rural and urban destinations. These results indicate that access to digital tools alone does not guarantee empowerment; residents must possess the capacity to use these tools and be provided with authentic institutional opportunities for participation. While digital transformation can improve communication and access to information, substantive community influence is likely to depend on how decision-making processes are structured and how digital resources are incorporated into those processes.

The descriptive evidence in Malang Raya strengthens this interpretation. Although 87.0% of respondents assessed digital transformation as very high, 41.0% had never participated in tourism or digital training. This contrast suggests that visible digitalization may advance faster than the diffusion of human capability. A tourism village may operate social-media accounts, online information channels, digital payments, or reservation systems while some local actors remain unable to use those systems strategically. This pattern resonates with Lapuz (2023), who identified technical capability as an important component of empowerment in digitally transforming rural tourism. It also accords with Rasoolimanesh et al. (2017a), whose opportunity-and-ability perspective indicates that participation becomes more substantive when residents possess the knowledge and opportunities required for deeper involvement. Therefore, digital inclusion in Malang Raya should be assessed not only by technology availability but also by who can use, manage, interpret, and the benefits.

The findings further clarify the theoretical application of digital orientation within community-based destinations. Kindermann et al. (2021) defined digital orientation in terms

© This is an open access article distributed under the Creative Commons Attribution - Non-Commercial - Share Alike 4.0 International License.

of technology scope, digital capabilities, ecosystem coordination, and digital architecture. In tourism villages, organizational boundaries are more permeable than in conventional firms, as village governments, *Pokdarwis*, *BUMDes*, MSMEs, residents, cultural groups, and tourism service providers operate within a shared destination ecosystem. The higher-order loadings observed in this study support the representation of digital transformation through these four dimensions in the specified measurement model. However, the modest structural association with community empowerment indicates that a strong digital orientation alone is not sufficient to account for differences in empowerment. This finding aligns with Lapuz (2023), who suggests a socio-technical relationship in which technology provides enabling infrastructure, while empowerment depends on the distribution, governance, and integration of digital resources within local participation processes.

From an empowerment perspective, the strong loadings of psychological, social, political, and environmental dimensions support conceptualizing community empowerment as a comprehensive community outcome rather than a limited economic effect. This interpretation aligns with the original RETS framework developed by Boley and McGehee (2014) and its subsequent extension in RETS 2.0 by Moreira dos Santos et al. (2024). The small effect size for digital transformation ($f^2 = 0.029$) is consistent with the interpretation that digital tools may enhance information flows, promotion, coordination, and market connectivity but are not, by themselves, sufficient to account for community pride, solidarity, political voice, equitable economic opportunities, or environmental stewardship. These outcomes are likely to depend on additional institutional and social mechanisms that were not directly tested in the present model.

Tourism-village empowerment strategies in Malang Raya should prioritize human capital development, institutional strengthening, inclusive participation, local entrepreneurship, and equitable benefit distribution. Digitalization should serve as complementary infrastructure that enhances these processes by expanding information access, improving coordination, increasing market connectivity, and facilitating access to destination data. Digital platforms, booking links, QR codes, and integrated systems should therefore be assessed based on their effectiveness in strengthening residents' capacity to participate, exercise agency, and benefit from tourism, rather than solely on the extent of technological adoption.

Institutional design is particularly important for understanding how digital transformation may be associated with political and social empowerment. Digital communication can widen information access and facilitate coordination, but participation becomes empowering only when community input has consequences for planning and management. The finding of a significant but modest digital transformation on community empowerment path is compatible with the evidence of Rasoolimanesh et al. (2017b), which shows that participation and tourism-support relationships are context dependent, especially across rural and urban settings. For

© This is an open access article distributed under the Creative Commons Attribution - Non-Commercial - Share Alike 4.0 International License.

Malang Raya, this means that a single digitalization model should not be assumed to produce identical empowerment outcomes across tourism villages. Future research should examine whether local institutional maturity, leadership, stakeholder relationships, digital literacy, and existing opportunities for participation conditions are how technology is translated into community agency.

Digital transformation demonstrates a positive association with community empowerment; however, this relationship is incremental rather than dominant. This finding is consistent with tourism scholarship that conceptualizes empowerment as a multidimensional social process (Boley & McGehee, 2014; Boley et al., 2014; Moreira dos Santos et al., 2024) and views participation as contingent upon residents' motivation, opportunity, ability, and the destination context (Rasoolimanesh et al., 2017a, 2017b). The main implication is that digital transformation offers technological and coordinating affordances, while the extent to which these affordances are associated with empowerment is likely to depend on communities' capabilities, institutional voice, and equitable access to digital opportunities.

4. CONCLUSION

This study examined the relationship between digital transformation and community empowerment in tourism villages in Malang Raya. The main finding indicates that digital transformation is positively and statistically significantly associated with community empowerment, although the relationship has limited explanatory power and a small effect size. This finding indicates that digital transformation should not be regarded as an automatic pathway to empowerment. Rather, it provides technological and coordinating affordances that can support empowerment when communities possess the capabilities, institutional voice, equitable access, and opportunities required to translate these affordances into agency.

The primary theoretical contribution of this study lies in connecting digital orientation with multidimensional resident empowerment within a socio-technical perspective on tourism-village development. By integrating technology scope, digital capabilities, ecosystem coordination, and digital architecture with the economic, psychological, social, political, and environmental dimensions of empowerment, the study extends the discussion of tourism digitalization beyond technology adoption. The findings demonstrate that the relevance of digital transformation lies not merely in whether tourism villages become more digital, but in whether digital resources and capabilities are associated with stronger community agency, participation, and access to tourism benefits.

The findings also provide practical implications for tourism-village managers, local governments, *Pokdarwis*, *BUMDes*, and other stakeholders. Human-capital development, institutional strengthening, inclusive participation, and equitable benefit distribution should remain the primary foundations of community-empowerment strategies. Digitalization should

© This is an open access article distributed under the Creative Commons Attribution - Non-Commercial - Share Alike 4.0 International License.

therefore be positioned as complementary infrastructure rather than as the principal strategy for empowerment. Digital initiatives should support these foundations by strengthening digital literacy, improving information access and stakeholder coordination, expanding market connectivity, and facilitating meaningful community participation. Increased digital investment alone should not be regarded as sufficient to strengthen community empowerment unless accompanied by capacity building, inclusive institutional arrangements, and equitable access to digital opportunities and tourism benefits. This implication is consistent with the study's empirical finding that digital transformation alone explains only a limited proportion of variation in community empowerment.

Several limitations should be acknowledged. The cross-sectional design captures the relationship between digital transformation and community empowerment within a single research period and therefore does not establish temporal causality. The use of purposive sampling also limits statistical generalization beyond the key stakeholders and tourism-village contexts represented in the study. In addition, both focal constructs were assessed through self-reported key-informant perceptions collected in the same survey, which may introduce common-method and perceptual-response bias. Moreover, the limited explanatory power of digital transformation indicates that substantial variation in community empowerment remains unexplained by the present model. The findings should be interpreted within the specific geographical, institutional, and stakeholder context of tourism villages in Malang Raya.

Future research should extend the present model by examining additional social, institutional, and contextual factors that may help explain community empowerment, including local leadership, institutional support, social capital, digital inclusion, collaborative governance, access to resources, and benefit-sharing mechanisms. Longitudinal studies could examine how digital transformation and community empowerment evolve over time, while multigroup analysis could determine whether their relationship differs across administrative areas, stages of tourism-village development, attraction types, stakeholder groups, and levels of digital maturity. Future studies could also combine key-informant surveys with resident-level data, objective indicators, or qualitative evidence to reduce reliance on a single perceptual data source. Relevant mediating and moderating mechanisms should also be investigated to clarify how, when, and under what conditions digital transformation is associated with stronger community empowerment.

5. ACKNOWLEDGEMENTS

The authors gratefully acknowledge the Faculty of Vocational Studies, Universitas Brawijaya, for providing financial support for this research. Appreciation is also extended to Forum Desa Wisata (FORDEWI) for its assistance during the research process. The authors sincerely thank all respondents and tourism-village stakeholders across Malang Raya (Batu

© This is an open access article distributed under the Creative Commons Attribution - Non-Commercial - Share Alike 4.0 International License.

City, Malang City, Malang Regency) who generously contributed their time, information, and insights to this study. Finally, the authors express their appreciation to the research team for their valuable contributions, constructive discussions, and support throughout the research and preparation of this article.

6. REFERENCES

Adekuajo, I. O., Otokiti, B. O., & Okpeke, F. (2025). Digital platforms and rural tourism transformation: A case study of e-tourism innovation in underserved regions. *Gyanshauryam: International Scientific Refereed Research Journal, 8*(3), 25–60. https://doi.org/10.32628/GISRRJ258320

Boley, B. B., & McGehee, N. G. (2014). Measuring empowerment: Developing and validating the Resident Empowerment through Tourism Scale (RETS). *Tourism Management, 45*, 85–94. https://doi.org/10.1016/j.tourman.2014.04.003

Boley, B. B., McGehee, N. G., Perdue, R. R., & Long, P. (2014). Empowerment and resident attitudes toward tourism: Strengthening the theoretical foundation through a Weberian lens. *Annals of Tourism Research, 49*, 33–50. https://doi.org/10.1016/j.annals.2014.08.005

Boudebouz, A., Amorim Carvalho, J., & Tavares, A. F. (2025). E-participation for community empowerment: A systematic literature review. *Transforming Government: People, Process and Policy, 19*(4), 748–774. https://doi.org/10.1108/TG-01-2025-0008

Buhalis, D., & Foerste, M. (2015). SoCoMo marketing for travel and tourism: Empowering co-creation of value. *Journal of Destination Marketing & Management, 4*(3), 151–161. https://doi.org/10.1016/j.jdmm.2015.04.001

Bühler, M. M., Calzada, I., Cane, I., Jelinek, T., Kapoor, A., Mannan, M., Mehta, S., Mookerje, V., Nübel, K., Pentland, A., Scholz, T., Siddarth, D., Tait, J., Vaitla, B., & Zhu, J. (2023). Unlocking the power of digital commons: Data cooperatives as a pathway for data sovereign, innovative and equitable digital communities. *Digital, 3*(3), 146–171. https://doi.org/10.3390/digital3030011

Conrad, C. C., & Hilchey, K. G. (2011). A review of citizen science and community-based environmental monitoring: Issues and opportunities. *Environmental Monitoring and Assessment, 176*(1), 273–291. https://doi.org/10.1007/s10661-010-1582-5

Daryana, A. P., & Waluyo, B. D. (2025). Integrating digital technology and local wisdom in smart ecotourism: A community-based approach in Brastagi. *Journal of Tourism, Culinary, and Entrepreneurship (JTCE)*, *5*(2), 355–370. https://doi.org/10.37715/jtce.v5i2.5734

Gretzel, U., Sigala, M., Xiang, Z., & Koo, C. (2015). Smart tourism: Foundations and developments. *Electronic Markets, 25*, 179–188. https://doi.org/10.1007/s12525-015-0196-8

Hair, J. F., Hult, G. T. M., Ringle, C. M., & Sarstedt, M. (2022). *A primer on partial least squares structural equation modeling (PLS-SEM)* (3rd ed.). SAGE Publications.

Hair, J. F., Risher, J. J., Sarstedt, M., & Ringle, C. M. (2019). When to use and how to report the results of PLS-SEM. *European Business Review, 31*(1), 2–24. https://doi.org/10.1108/EBR-11-2018-0203

Indrianto, A. T. L., Oktavio, A., Azmi, A., Abdullah, A., Isa, N. M., Adityaji, R., & Subadi, L. C. (2024). Exploration of the teaching and learning model using the design thinking method in developing community-based tourism. *Revista de Gestão Social e Ambiental, 18*(1), e04740. https://doi.org/10.24857/rgsa.v18n1-061

James, R., & Suryani. (2025). The role of local communities in social-based economic empowerment. *Journal of Social, Culture & Humanitarian Research, 1*(1), 28–36. https://pub.muzulab.com/index.php/SocioCult/article/view/58

Kindermann, B., Beutel, S., Garcia de Lomana, G., Strese, S., Bendig, D., & Brettel, M. (2021). Digital orientation: Conceptualization and operationalization of a new strategic

© This is an open access article distributed under the Creative Commons Attribution - Non-Commercial - Share Alike 4.0 International License.

orientation. *European Management Journal, 39*(5), 645–657. https://doi.org/10.1016/j.emj.2020.10.009

Kusumawidjaya, E., Wijaya, V., & Oktavio, A. (2021). Impulsive buying behavior in mobile apps Online Travel Agent (OTA) users: The role of apps browsing and sales promotion. *Procedia Business and Financial Technology, 1*(2). https://doi.org/10.47494/pbft.2021.1.4

Lapuz, M. C. M. (2023). The role of local community empowerment in the digital transformation of rural tourism development in the Philippines. *Technology in Society, 74*, Article 102308. https://doi.org/10.1016/j.techsoc.2023.102308

Mariën, I., & Prodnik, J. A. (2014). Digital inclusion and user (dis)empowerment: A critical perspective. *Info, 16*(6), 35–47. https://doi.org/10.1108/info-07-2014-0030

Minghetti, V., & Buhalis, D. (2010). Digital divide in tourism. *Journal of Travel Research, 49*(3), 267–281. https://doi.org/10.1177/0047287509346843

Moreira dos Santos, E. R., Pereira, L. N., Pinto, P., & Boley, B. B. (2024). Development and validation of the new Resident Empowerment through Tourism Scale: RETS 2.0. *Tourism Management, 104*, Article 104915. https://doi.org/10.1016/j.tourman.2024.104915

Neuhofer, B., Buhalis, D., & Ladkin, A. (2015). Smart technologies for personalized experiences: A case study in the hospitality domain. *Electronic Markets, 25*(3), 243–254. https://doi.org/10.1007/s12525-015-0182-1

Rahman, A. F., Wardana, A. A., & Mufarrohah. (2025). Measuring community empowerment in the development of tourism village: Evidence from Batu City, Indonesia. *Journal of Tourism, Culinary, and Entrepreneurship (JTCE), 5*(1), 1–18. https://doi.org/10.37715/jtce.v5i1.5551

Rasoolimanesh, S. M., Jaafar, M., Ahmad, A. G., & Barghi, R. (2017a). Community participation in World Heritage Site conservation and tourism development. *Tourism Management, 58*, 142–153. https://doi.org/10.1016/j.tourman.2016.10.016

Rasoolimanesh, S. M., Ringle, C. M., Jaafar, M., & Ramayah, T. (2017b). Urban vs. rural destinations: Residents' perceptions, community participation and support for tourism development. *Tourism Management, 60*, 147–158. https://doi.org/10.1016/j.tourman.2016.11.019

Verhoef, P. C., Broekhuizen, T., Bart, Y., Bhattacharya, A., Dong, J. Q., Fabian, N., & Haenlein, M. (2021). Digital transformation: A multidisciplinary reflection and research agenda. *Journal of Business Research, 122*, 889–901. https://doi.org/10.1016/j.jbusres.2019.09.022

Vial, G. (2019). Understanding digital transformation: A review and a research agenda. *The Journal of Strategic Information Systems, 28*(2), 118–144. https://doi.org/10.1016/j.jsis.2019.01.003

Vinodan, A., & Meera, S. (2022). Case study on self-help groups intervention and destination sustainability in Kerala: Input-output-outcome model. *Tourism: An International Interdisciplinary Journal, 70*(2), 201–222. https://doi.org/10.37741/t.70.2.4

Wardani, P. A., Farhan, M., Rachman, N. A., Rahmanita, M., & Lamoren, D. S. (2026). Stakeholders' interaction in emerging Tourism Awareness Group as a community-based tourism management. *Journal of Tourism, Culinary, and Entrepreneurship (JTCE), 6*(1), 12–27. https://doi.org/10.37715/jtce.v6i1.6049

Wiramatika, I. G., & Suryawati, D. A. (2026). Local community participation manifests sustainable tourism in the Batur Geopark Tourism Area. *Journal of Tourism, Culinary, and Entrepreneurship (JTCE), 6*(1), 105–124. https://doi.org/10.37715/jtce.v6i1.6169

© This is an open access article distributed under the Creative Commons Attribution - Non-Commercial - Share Alike 4.0 International License.