Journal : **Journal of Management and Innovation Entrepreneurship (JMIE),**
Publisher : **Yayasan Nuraini Ibrahim Mandiri**
ISSN : **e-ISSN 3026-6505**
Volume / Issue / Year/ Page : **4/ 1/ 2026: October / 374-387**

MODELING DIGITAL ECOSYSTEM, LOCAL INCUBATOR, AND TRIPLE HELIX SUPPORT FOR CULINARY VENTURE COMPETITIVENESS: A PLS-SEM STUDY

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Article Information

Submission : 03-09-2026
Review : 07-09-2026
Revised : 27-09-2026
Accepted : 10-10-2026
Published : 27-10-2026

Keywords
Business Competitiveness; Business Incubation; Digital Entrepreneurial Ecosystem; Institutional Support; PLS-SEM; University-Industry-Government Collaboration.

Abstract

This study examines whether digital ecosystem capability, local incubator support, and university–industry–government support are associated with the competitiveness of young culinary ventures. Entrepreneurial ecosystem theory treats these as distinct, parallel resources, which motivates the direct-effect model. A cross-sectional survey yielded 250 eligible owners or principal managers aged 18–30 years in Medan, Indonesia. Respondents operated culinary ventures, used a digital platform, and had received entrepreneurship assistance. The study specified a partial least squares structural equation model in SmartPLS 4. Preliminary results suggest positive associations, but the supplied manuscript contains inconsistent coefficients, significance values, reliability estimates, and model fit statistics. Consequently, effect sizes, explained variance, and statistical significance cannot be stated reliably until the original data and complete software output have been audited. The study examines how digital practices and institutional assistance jointly relate to perceived competitiveness. Its cross-sectional, purposive, single-informant design limits causal inference and population generalization

How To Cite: Harnjo, E., Hutabarat, G. C. J., Leonardi, F., & Willy, F. (2026). Modeling digital ecosystem, local incubator, and triple helix support for culinary venture competitiveness: A PLS-SEM study. *Journal of Management and Innovation Entrepreneurship (JMIE),* 4(1), 374–387. https://doi.org/10.70248/jmie.v4i1.4460

DOI : https://doi.org/10.70248/jmie.v4i1.4460
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INTRODUCTION

Digital technologies reshape how small ventures reach customers, process transactions, coordinate operations, and learn from market data. Their competitive value depends on purposeful integration into business processes, not mere platform adoption (Verhoef et al., 2021; Kraus et al., 2022).For culinary ventures, marketplaces, social media, digital payments, and delivery platforms can expand reach and reduce transaction friction. Yet limited skills, capital, and managerial routines often prevent small firms from converting access into sustained performance (Eller et al., 2020; Matarazzo et al., 2021).

Prior evidence remains divided. Some studies link digital adoption with sales growth, financial literacy, and customer value, whereas others show that basic online presence does not ensure strategic use, innovation, or resilience (Aji, 2023; Affandi et al., 2024; Anatan & Nur, 2023). This inconsistency directs attention from technology ownership to the ecosystem resources that support its productive use. Entrepreneurial ecosystem theory serves as the principal theoretical foundation. It explains venture outcomes through interdependent access to knowledge, networks, finance, markets, support organizations, and enabling institutions. The Triple Helix framework provides a focused supporting lens by identifying the particular contributions and interactions of

universities, industry, and government within that broader ecosystem (Bouncken & Kraus, 2022; Cantner et al., 2021; Jovanović et al., 2022).The distinction is analytical. The entrepreneurial ecosystem identifies the wider configuration of resources surrounding the venture. Triple Helix support captures coordinated university, industry, and government actions, including applied knowledge, commercial partnerships, infrastructure, regulation, and public programs. Local incubators operate as intermediaries that translate these resources into mentoring, finance access, networking, and follow-up assistance.

Existing studies often examine digitalization, incubation, and institutional collaboration separately. Digitalization research emphasizes adoption and internal capability. Incubator research evaluates services and tenant development. Triple Helix research frequently studies national or technology-oriented innovation systems. Limited survey evidence tests whether these three resource domains explain culinary venture competitiveness simultaneously from the entrepreneur's perspective (Pattanasak et al., 2022; Fidanoski et al., 2022).This gap matters because the same platform may yield different results when entrepreneurs receive unequal mentoring, market connections, research input, or policy support. It also remains unclear whether formal collaboration reaches small culinary ventures as usable resources. The study therefore separates digital ecosystem capability, local incubator support, and Triple Helix support as parallel predictors of competitiveness.

The study addresses three questions: whether digital ecosystem capability improves competitiveness; whether local incubator support improves competitiveness; and whether university-industry-government support improves competitiveness. Medan provides the empirical setting because it combines a large urban culinary market with active public, academic, business, and community support actors. Location details and sampling boundaries appear in the methodology rather than the title.The model makes two contributions. First, it positions entrepreneurial ecosystem theory as the main explanation and uses the Triple Helix only to specify one institutional subsystem. Second, it tests the distinct direct contribution of digital capability, incubation, and institutional coordination before proposing mediation or moderation. This parsimonious baseline avoids imposing an unsupported temporal sequence on single-wave data.

The dynamic capabilities perspective further suggests that businesses must be able to identify opportunities, make decisions, and reconfigure resources as their environment changes. Effective digitalization requires continuous learning, experimentation, and adjustment. In MSMEs, sensing and learning capabilities can help business owners understand customer needs and convert technology into a channel for value creation. The digital ecosystem should therefore be positioned as a space for learning and resource exchange rather than simply as a collection of applications. (Matarazzo et al., 2021).The entrepreneurial ecosystem concept explains that business development is shaped by relationships among entrepreneurs, consumers, suppliers, investors, government, universities, communities, and technology providers.

These actors provide knowledge, legitimacy, capital, markets, and policy support that individual businesses may find difficult to obtain independently. Entrepreneurial ecosystem research emphasizes the quality of relationships among actors as an important element in opportunity formation and business growth. An analysis of competitiveness should therefore consider local network structures and mechanisms of resource exchange. (Bouncken & Kraus, 2022; Cavallo et al., 2021). Entrepreneurial

ecosystems are also dynamic because they may emerge, grow, change, and decline over time. Their development depends on the ability of actors to sustain interaction, renew resources, and adjust governance arrangements in response to technological change. Ecosystem elements do not necessarily have the same level of importance across locations or stages of business development. This understanding reinforces the need for strategies that reflect the characteristics of young culinary entrepreneurs and the business environment of Medan City. (Cantner et al., 2021; Torres & Godinho, 2022).Business incubators are a key component of the entrepreneurial ecosystem because they help new ventures address limitations in knowledge, capital, networks, and managerial experience. In Medan, the relevant support environment can be mapped into three functional types.

University-based incubators connect tenants with research, student talent, laboratories, mentoring, and commercialization support. Government-based programs provide licensing assistance, training, promotion, financing referrals, and access to public programs. Private or industry-linked accelerators contribute digital platforms, logistics, payment systems, commercial mentoring, and market networks. These categories can overlap through joint programs, while community-based entrepreneurship groups often serve as outreach and peer-learning channels. This typology clarifies that the construct of local incubators in this study refers to the support services experienced by respondents, irrespective of the incubator's institutional owner. (Li et al., 2020; Pattanasak et al., 2022).

The presence of an incubator does not automatically improve competitiveness. Incubation performance depends on the adequacy of financial resources, management quality, network access, knowledge-sharing processes, mentoring services, and performance measurement systems. A systematic review shows that intangible factors, particularly networks and social capital, play an important role in incubator success. The effectiveness of local incubators should therefore be assessed through changes in tenant capacity and performance rather than only by the number of activities or participants. (Pattanasak et al., 2022).Technological development also allows incubators to combine physical and virtual services. Virtual incubators can provide access to knowledge, mentoring, funding opportunities, partner networks, and consulting services without geographic constraints. This model is relevant to culinary entrepreneurs who require flexible assistance linked to digital platforms. Nevertheless, incubator design must reflect user needs, control mechanisms, mentor quality, and the continuity of relationships with physical incubators. (Vaz et al., 2022).

The relationship among government, universities, and industry can be explained through the Triple Helix model. Government establishes regulations and policy support, universities produce knowledge and innovation, and industry creates economic value and market access. These three actors need to interact through resource exchange, role allocation, and coordinated decision making. The effectiveness of the Triple Helix depends on the system's ability to use the contribution of each actor to generate relevant innovation. (Jovanović et al., 2022; Fidanoski et al., 2022).In developing countries, Triple Helix collaboration is important because new ventures often lack knowledge, resources, networks, and access to market opportunities. Relationships with government can provide access to programs and policy support, while universities can contribute research, technology, and capacity development. Industry can strengthen market understanding, operational standards, and commercial networks. However, collaboration creates benefits only when these relationships remain active,

complementary, and directed toward the concrete needs of entrepreneurs. (Baier-Fuentes et al., 2021).

Previous studies have examined MSME digitalization, entrepreneurial ecosystems, business incubators, and the Triple Helix, but these areas are still frequently analyzed in isolation. Digitalization studies often emphasize technological readiness and internal capabilities, while incubator research focuses on services and program performance. Triple Helix studies more commonly assess innovation systems at the national, regional, or technology-based firm level. Limited research has integrated the digital ecosystem, local incubators, and the role of the Triple Helix in a single empirical model to explain the competitiveness of young culinary entrepreneurs in Medan. (Kraus et al., 2022; Pattanasak et al., 2022; Jovanović et al., 2022).Based on this gap, the study aims to examine the effects of the digital ecosystem, local incubators, and the role of the Triple Helix on the competitiveness of young culinary entrepreneurs in Medan City. The study applies an explanatory quantitative design involving 250 entrepreneurs who use digital platforms and are associated with local incubation programs, and it analyzes the relationships among constructs using SEM-PLS. Theoretically, the study extends the application of entrepreneurial ecosystem, digital capability, business incubation, and Triple Helix perspectives to the urban culinary sector. Practically, the findings are expected to support the development of collaborative strategies among government, universities, industry, incubator managers, and business communities to strengthen competitiveness in a sustainable manner. (Bouncken & Kraus, 2022; Fidanoski et al., 2022; Li et al., 2020).

RESEARCH METHODS

This explanatory, cross-sectional survey examines associations among digital ecosystem capability, local incubator support, Triple Helix support, and competitiveness using partial least squares structural equation modeling (Benitez et al., 2020; Sarstedt et al., 2022).

Research Approach and Design

This study uses an explanatory quantitative approach with a cross-sectional survey design. The approach was selected because the study seeks to explain the effects of the digital ecosystem, local incubators, and the role of the Triple Helix on the competitiveness of young culinary entrepreneurs. The unit of analysis is the young culinary business, while the unit of observation is the owner or principal manager who understands the firm's strategic decisions. Data were collected during a single study period; therefore, the observed relationships are interpreted as theory-based structural associations rather than definitive evidence of temporal causality. The model was analyzed using Partial Least Squares Structural Equation Modeling because it includes latent constructs measured by multiple indicators and focuses on explaining variance and predicting competitiveness. (Benitez et al., 2020; Hair & Alamer, 2022; Sarstedt et al., 2022).

Research Location and Period

Data were collected in Medan, North Sumatra, during 2026. The manuscript does not identify the exact fieldwork dates. The setting includes university, government, and private-sector entrepreneurship support, but the survey does not establish a comprehensive register of local incubators.

Population, Sample, and Sampling Technique

Eligible respondents were culinary business owners, founders, or principal

managers aged 18–30 years who operated in Medan, used at least one digital platform, had received incubation or comparable entrepreneurship assistance, and held strategic decision authority. Purposive sampling yielded 250 eligible complete questionnaires. The number invited, number returned, and number excluded were not supplied, so a response rate cannot be calculated. These quantities must be reported from the original survey log before submission. The statutory Indonesian youth definition extends to age 30; the lower bound of 18 was applied as an adult participation criterion (Law No. 40 of 2009; Andrade, 2021).

Instrument and Data Collection

Respondents completed a five-point Likert questionnaire covering business characteristics and the four constructs. Survey quality checks should include consent and eligibility screening, one response per business, completeness, duplicate detection, completion time, and patterned responses. The source manuscript describes these procedures but provides no screening counts or audit log; actual implementation and exclusions must be verified against field records. Anonymity, neutral wording, and separation of predictor and outcome items can reduce response bias (Podsakoff et al., 2012).

Operationalization of Variables

Digital ecosystem capability was measured through integrated use of online marketplaces, social media, digital payments, and digital processes in marketing, transactions, and customer service. Local incubator support covered mentoring, training, finance or investor access, networks, and follow-up assistance. Triple Helix support covered government facilitation, university knowledge, industry involvement, and coordination among the three actor groups. Competitiveness covered the venture's perceived capacity to innovate, expand markets, create customer value, improve efficiency, grow, and adapt. Competitiveness was specified reflectively because the construct was defined as an underlying performance capability expected to manifest across correlated outcomes. Under this interpretation, stronger latent competitiveness causes higher scores across the indicators; the indicators share a common theme, should covary, and removing one indicator does not redefine the construct's conceptual domain. This choice differs from a formative index, in which non-interchangeable dimensions jointly create competitiveness. The reflective specification must therefore be retained only if the final outer loadings, indicator correlations, reliability, and discriminant-validity results support this causal direction.

Instrument Validation and Data Quality

The same respondent rated predictors and outcomes, creating potential common method bias. Inner model VIF values are not a full collinearity test. A full-collinearity VIF must be calculated for each latent construct, including competitiveness, using the underlying data and reported separately. No such output was supplied, so the absence of common method bias cannot be claimed (Kock, 2015).

Data Analysis Technique

The reflective measurement model was evaluated using indicator loadings, Cronbach's alpha, rho_A, composite reliability, AVE, and HTMT with bootstrapped confidence intervals. Structural assessment covered inner VIF, path coefficients, confidence intervals, R^2, adjusted R^2, f^2, Q^2 or PLS predict where available, SRMR, d_ULS, d_G, chi-square, and NFI for both saturated and estimated models. No fit parameter was to be deleted because of an anomalous value. Any out-of-range result was to be reproduced exactly from the native export, labeled as anomalous, and investigated for

data, transcription, or specification errors.

Hypothesis Testing

The original text states that 5,000 bootstrap subsamples and two-sided testing were used, but no native bootstrapping export accompanies the manuscript. The final results must show original estimate, bootstrap mean, standard deviation, t statistic, two-sided p value, and 95% confidence interval for each path. Direct effects are the specified baseline because the survey measures all constructs at one time point; mediation and moderation require distinct hypotheses and additional analyses.

RESULTS AND DISCUSSION

The analysis included 250 eligible young culinary entrepreneurs in Medan. Three exogenous constructs, the digital ecosystem, local incubators, and Triple Helix support, were modeled as direct predictors of competitiveness. The measurement model, structural model, and bootstrapped path estimates are reported below.

Measurement Model Evaluation

The initial manuscript reported indicator loadings of 0.73–0.81 for competitiveness, 0.71–0.77 for digital ecosystem capability, and 0.76 for the available local-incubator indicators. These ranges conflict with some reported AVE values and do not include a complete Triple Helix indicator export. The measurement model must therefore be rerun and the complete indicator-level output inserted before resubmission. The initial reliability table reported alpha, composite reliability, and AVE values that were not fully coherent with one another or with the stated loading ranges. The final table must reproduce Cronbach's alpha, rho_A, composite reliability, and AVE directly from one SmartPLS run, with no manual transcription or selective omission. The manuscript previously stated that HTMT values ranged from 0.45 to 0.81 but did not provide the complete matrix or bootstrap confidence intervals. The final revision must report every pairwise HTMT value and its 95% confidence interval. Discriminant validity is supported when the point estimate remains below the selected threshold and the confidence interval does not include 1.00.

Table 1. Measurement Model Evaluation

	Cronbach's Alpha	Composite Reliability	AVE
Competitiveness	0.77	0.78	0.71
Digital Ecosystem	0.78	0.78	0.78
Local Incubators	0.71	0.71	0.75
Triple Helix Role	0.78	0.72	0.74

Source: Processed Data, 2026

Structural Model Evaluation

The previously reported inner VIF values were 4.01 for digital ecosystem capability, 2.08 for local incubator support, and 1.08 for Triple Helix support. Although 4.01 is below the liberal threshold of 5, it exceeds the conservative threshold of 3.3 and signals meaningful predictor overlap. The coefficient for digital ecosystem capability must therefore be interpreted as its unique association after controlling for institutionally related resources. The authors should inspect construct definitions, cross-loadings, HTMT, and indicator wording before considering a hierarchical or mediated specification. A mediation model should not be adopted solely to reduce VIF

because it requires a defensible causal sequence.The initially reported R^2 of 0.81 and adjusted R^2 of 0.79 indicate high explanatory power, but these estimates cannot be interpreted independently of the unusually large paths and predictor overlap. They must be verified in the same rerun used for the final coefficients. The original f^2 values of 0.71, 0.79, and 0.777 appear inconsistent with the relative t statistics and require direct verification. They are not treated as established results. The final manuscript must reproduce the SmartPLS f^2 output and classify each verified effect using 0.02, 0.15, and 0.35 as approximate small, medium, and large benchmarks.For transparency, the complete SmartPLS Fit Summary must be reported for the saturated and estimated models, including SRMR, d_ULS, d_G, chi-square, and NFI. The earlier manuscript reported saturated SRMR = 0.080 but removed estimated-model statistics described as outside mathematical bounds.

Table 2 Hypothesis Testing

PROVISIONAL	Relationship	**B**	**t**	**p**	Decision
H1	Digital Ecosystem → Competitiveness	0.79	3.71	0.001	Accepted
H2	Local Incubators → Competitiveness	0.76	2.08	0.000	Accepted
H3	Triple Helix Role → Competitiveness	0.77	4.08	0.001	Accepted

Source: Processed Data, 2026

The initial bootstrapping table reported positive coefficients for digital ecosystem capability (β = 0.79, t = 3.71, p=0.001), local incubator support (β = 0.76, t = 2.08, p = 0.000), and Triple Helix support (β = 0.77, t = 4.08, p =0.001). Their joint magnitude, together with R^2 = 0.81 and inner VIF = 4.01, warrants a complete audit. These figures remain provisional until the original sample estimates, bootstrap means, standard deviations, and 95% confidence intervals are reproduced from one verified run. The study estimated direct effects because its primary objective was to establish the distinct empirical contribution of three parallel ecosystem resources to competitiveness. The cross-sectional design and single-wave measurement did not provide strong temporal evidence for a causal sequence among the predictors. Treating incubators or Triple Helix support as mediators would require a theoretically ordered process and indirect-effect hypotheses, while moderation would require interaction terms and adequate statistical power. The direct-effects specification therefore offers a parsimonious first test. Future longitudinal studies should examine whether incubators transmit the benefits of digital ecosystems and whether Triple Helix support strengthens those relationships across stages of venture development.

DISCUSSION

Digital Ecosystem and Competitiveness

The initial analysis identifies digital ecosystem capability as the largest reported direct coefficient. This result is plausible because integrated digital marketing, payments, ordering, customer communication, and operational data can influence several competitive outcomes simultaneously. Yet the coefficient should not be read as a pure technology effect. Its VIF of 4.01 indicates overlap with incubation and institutional support, which may help entrepreneurs acquire or use digital resources. The very large reported coefficient requires caution. Comparable MSME studies generally treat digital transformation as one component within a wider capability system rather than an isolated determinant. Shared wording, common respondents, restricted sampling to digitally active assisted ventures, and conceptual proximity among predictors may inflate associations. The final interpretation must depend on

verified estimates, HTMT inference, full-collinearity VIF, and predictive assessment.In the context of young culinary businesses in Medan, social media can connect local product identity with the communication preferences of younger consumers. Marketplaces and payment services enable businesses to serve customers beyond their physical sales radius. However, a digital presence does not automatically indicate digital maturity. Business owners need the ability to create content, interpret feedback, manage reputation, and integrate orders with production. Research on small culinary businesses in Indonesia has also found that deeper digital literacy is needed to support innovation rather than mere access. (Aji, 2023; Anatan & Nur, 2023).

This finding extends digital entrepreneurial ecosystem theory by showing that platform access should be understood together with institutional relationships and business assistance. A digital ecosystem VIF of 4.01 remains acceptable but indicates a degree of association with incubators and the Triple Helix. Theoretically, this suggests that business digitalization is not entirely an individual process. Training, policy, industry platforms, and university knowledge also shape digital capability. (Audretsch et al., 2021; Anatan & Nur, 2023).The practical implication is that digitalization programs should not be limited to account creation or one-off training. Government and incubators need to develop continuous digital clinics that integrate content, customer data, payments, recordkeeping, production, and distribution. Business owners also need simple performance indicators, such as promotion conversion rates, repeat purchases, response time, and the contribution of digital sales. This approach can help convert technology adoption into measurable competitive capability. (Omrani et al., 2024; Verhoef et al., 2021).

Local Incubators and Competitiveness

Local incubator support produced the weakest evidence in the initial structural results because its t statistic of 2.08 was only slightly above the two-tailed 5% threshold. Its statistical significance does not make its contribution equal to the other paths. The result indicates a comparatively marginal and potentially sample-sensitive association that requires confirmation through its confidence interval and verified f^2 value.This weaker result may reflect variation in mentor quality, follow-up intensity, program duration, participant selection, and the match between services and venture needs. It may also indicate that one-off training has less immediate competitive value than everyday digital processes. The previously reported f^2 of 0.79 is inconsistent with the comparatively weak t statistic and must not support a claim of dominant incubator impact until verified.Incubation support can shorten the learning process for business owners. Mentors can help entrepreneurs identify weaknesses in the business model, set priorities, improve recordkeeping, and assess the feasibility of expansion. Training strengthens technical capabilities, while networks connect businesses with investors, suppliers, customers, and government institutions.

The effect of incubators on competitiveness therefore operates through better decision quality and improved access to resources that were previously difficult to obtain. (Pattanasak et al., 2022; Baier-Fuentes et al., 2021).This finding also highlights the importance of local context. Incubators that understand Medan's consumption patterns, raw materials, culinary culture, market networks, and business characteristics can provide more relevant services than standardized programs. Incubation models need to distinguish among the needs of startups, growing businesses, and businesses that are ready to expand their markets. Assistance that does not reflect a firm's level of

maturity risks producing knowledge that is not applied. (Pattanasak et al., 2022; Audretsch et al., 2021).Incubators should implement needs assessments, individualized assistance plans, business-change targets, and post-program evaluations. Program success should be assessed through changes in practice, network expansion, financing access, innovation, and business resilience rather than participant counts alone. The statistically significant direct association supports this practical direction, while longitudinal evaluation remains necessary to establish the timing and durability of the effect. (Pattanasak et al., 2022; Benitez et al., 2020).

The Triple Helix Role and Competitiveness

Triple Helix support showed the strongest initial t statistic, suggesting that coordinated university, industry, and government support may provide a relatively stable institutional contribution. The mechanism differs from the broader entrepreneurial ecosystem. It concerns specific exchanges of applied knowledge, market access, standards, infrastructure, finance facilitation, and regulatory support among three actor groups.This result supports Triple Helix theory, which views innovation as an outcome of interaction among institutions. The mere presence of the three actors is insufficient. Benefits emerge when policy, knowledge, and market needs are connected through mechanisms that entrepreneurs can access. The positive coefficient shows that competitiveness depends not only on the internal capabilities of MSMEs but also on the quality of the support system surrounding them. (Fidanoski et al., 2022).In the Medan context, government can facilitate licensing, promotion, digital literacy, financing, and procurement. Universities can provide market research, product development, packaging design, recordkeeping support, and business evaluation. Industry and startups can provide platforms, logistics, payments, quality standards, and commercial partnerships. When these functions are connected, entrepreneurs gain a clearer pathway from capability development to market expansion. (Baier-Fuentes et al., 2021; Fidanoski et al., 2022).

This finding offers an important perspective on applying the Triple Helix to culinary MSMEs. Many studies examine collaboration in technology-based sectors or at the level of national innovation systems. This study places the experience of young culinary businesses at the center of the evaluation. Collaboration is therefore assessed through the support that entrepreneurs actually receive and use, rather than simply through the number of agreements among institutions. (Baier-Fuentes et al., 2021; Fidanoski et al., 2022).Policy action should focus on the empirically strongest digital ecosystem indicators after the rerun. Priority should go to the indicators with the highest verified outer loadings and practical relevance, such as integrated digital marketing, payment, ordering, customer-response, or operational-data practices. Programs should set measurable targets for digital sales conversion, response time, repeat purchase, order accuracy, and transaction records. Incubators and Triple Helix actors should support these specific routines rather than offer broad, unmeasured entrepreneurship activities.

CONCLUSION

The study proposes that culinary venture competitiveness depends on three distinct but related resource domains: integrated digital capability, local incubation services, and coordinated university-industry-government support. The initial estimates point to positive direct relationships, with digital ecosystem capability

showing the largest reported coefficient and local incubator support showing the weakest statistical evidence. Stakeholders should prioritize the strongest verified digital ecosystem indicators. Assistance should target measurable integration of digital marketing, ordering, payments, customer response, and operational records. Incubators should connect mentoring to these routines and assess changes in sales conversion, repeat purchases, response time, order accuracy, and market reach. Universities, industry, and government should align applied knowledge, platform access, commercial networks, and policy programs around the same indicators.

Research limitations, the cross-sectional design cannot establish temporal causality. Purposive sampling limits population-level generalization. A single respondent and one survey wave may create common method bias. The preliminary output also shows possible predictor overlap and unresolved statistical anomalies. Future research should use longitudinal or multi-source data, objective performance measures, full-collinearity assessment, PLSpredict, and theory-based comparisons of direct, mediated, formative, and hierarchical specifications.

Statement on the Use of Artificial Intelligence

The authors used Claude during manuscript preparation to assist with literature extraction and organization, drafting, narrative synthesis, language editing, and figure preparation. Its use extended beyond grammar checking and language improvement. AI-generated material does not constitute independent evidence and cannot replace survey data, statistical analysis, or original sources. The authors retain full responsibility for verifying literature interpretations, references, statistical statements, and manuscript content against the original sources and research records, and for approving the final manuscript before submission.

Conflicts of Interest

The authors declare no conflict of interest.

Author Contributions

Conceptualization, Edward Harnjo and Gloria Cahaya Julida Hutabarat; methodology, Edward Harnjo and Gloria Cahaya Julida Hutabarat; investigation and data collection, Edward Harnjo, Felix Leonardi, and Frans Willy; data curation, Felix Leonardi and Frans Willy; validation, Gloria Cahaya Julida Hutabarat and Felix Leonardi; formal analysis, Edward Harnjo and Gloria Cahaya Julida Hutabarat; writing, original draft preparation, Edward Harnjo; writing, review and editing, Gloria Cahaya Julida Hutabarat, Felix Leonardi, and Frans Willy; visualization, Felix Leonardi and Frans Willy; supervision and project administration, Edward Harnjo. All authors share responsibility for the integrity of the work. Each author must confirm the listed contributions and review and approve the final manuscript before submission.

Acknowledgment

The authors sincerely acknowledge the Ministry of Higher Education, Science, and Technology of the Republic of Indonesia for providing the opportunity and funding support through the 2026 Beginner Lecturer Research Grant. This support has enabled the successful implementation of the study and has strengthened the authors' commitment to improving research quality, productivity, and scholarly contributions in the future.

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