

Evaluation of Technology Innovation Assistance Policy Implementation for MSMEs through an Evidence-Based Policy Approach

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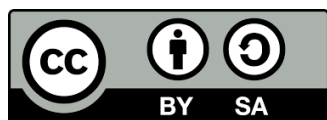
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Abstract

In accelerating the digitalization of the people's business sector, the Government of Indonesia has frequently implemented coaching and assistance policies to encourage technology-based innovation adoption among Micro, Small, and Medium Enterprises (MSMEs). This study aimed to evaluate the effectiveness of technology intervention implementation and formulate recommendations for improving policy direction through an evidence-based policy approach. A qualitative methodology was employed using data triangulation techniques by combining survey results from 237 beneficiary MSME actors across four regions, in-depth interviews with facilitators and program managers, and social media analytics from participants' business accounts on Instagram and TikTok throughout one year of program implementation. All data were analyzed using thematic analysis and cross-validated with digital platform engagement patterns. The findings revealed significant progress in technology adoption, particularly in digital payment transactions and digital marketing. However, disparities in achievement among regions remained evident, as existing interventions were generally limited to initial training stages without sustained post-training mentoring. Social media analytics identified a gap between administrative reports based on achievement claims and actual engagement dynamics observed in the field, highlighting limitations in conventional monitoring and evaluation mechanisms. Theoretically and practically, this study contributed a hybrid evaluation framework that integrated digital platform analytics as a policy validation instrument and proposed a staged, sustainable coaching model aligned with regional readiness levels.



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INTRODUCTION

The Micro, Small, and Medium Enterprise (MSME) sector plays a vital role in Indonesia's economy, contributing more than 60% of Gross Domestic Product and absorbing the majority of the national workforce. Therefore, its capacity for technological adaptation has become a key determinant of future domestic economic competitiveness (Statistics Indonesia [BPS], 2023; Ministry of Cooperatives and Small and Medium Enterprises, 2023). This transformation has become increasingly urgent alongside the rapid growth of the digital economy in Southeast Asia, where Indonesia has emerged as the largest market (Google et al., 2022). In response, the government, through various ministries and agencies, has launched technology-based innovation assistance programs

ranging from digital literacy initiatives and consultation clinics to tiered mentoring programs. These interventions were designed based on the assumption that structured assistance could accelerate technology adoption and improve business performance (Statistik, 2023).

However, this assumption has not always aligned with conditions observed in practice. Evaluations of digital-based MSME development policies have shown that assistance programs are frequently unstructured and limited to one-time outreach activities without continuous monitoring mechanisms after technology adoption within daily business operations (Mutiarra et al., 2025). Consequently, administrative success reports measured by the number of participants or frequency of activities may not accurately represent actual changes in business behavior at the grassroots level (Indonesia, 2022).

The fundamental issue lies not only in program implementation but also in the policy evaluation framework itself (Chaffey & Ellis-Chadwick, 2019). The principle of evidence-based policy requires policy formulation and evaluation to be supported by valid scientific evidence rather than normative assumptions or administrative considerations (Head, 2008; Solesbury, 2001). Nevertheless, evaluations of MSME assistance policies in Indonesia have generally emphasized output indicators, such as the number of training sessions, total participants, or the number of registered social media accounts, rather than outcome indicators capable of capturing actual digital engagement and behavioral changes among business actors after receiving assistance.

Furthermore, previous literature on MSME digitalization has predominantly adopted descriptive qualitative approaches based on self-reported perceptions obtained through interviews or literature reviews, without validating these claims against objective digital activity data generated from the platforms used (Hermanto & Susanti, 2023; Tambunan, 2019). This approach creates analytical limitations because claims of having implemented digital marketing do not necessarily indicate consistent and active utilization that contributes to measurable market outcomes (Kadji, 2015).

The urgency of this research is reinforced by the scale of public investment in MSME digitalization programs and the persistent gap between administrative reporting and actual implementation outcomes (Edwards III, 1980). Without a more rigorous evaluation framework, future policy cycles may continue to replicate ineffective interventions and result in inefficient resource allocation. This study offers novelty by developing a hybrid evaluation framework that integrates digital platform analytics as confirmatory evidence alongside conventional survey and interview methods, an approach that has not been widely applied in evaluating MSME technology assistance policies in Indonesia. The purpose of this study was to measure the effectiveness of technology innovation assistance policy implementation for MSMEs by comparing factual evidence with digital behavioral evidence and to formulate recommendations for a more adaptive policy direction based on integrated evidence patterns (Menengah, 2023)

Based on the literature review, no previous study evaluating MSME technology assistance policies in Indonesia has explicitly integrated three evidence sources

simultaneously: (1) business actors' perspectives obtained through surveys, (2) implementation perspectives from facilitators and program managers, and (3) objective digital activity records represented by Instagram and TikTok analytics from assisted MSMEs. The absence of such data integration may reduce the objectivity of policy evaluation, as program achievements are often assessed primarily through administrative indicators without sufficient confirmation of actual outcomes at the implementation level. This research gap forms the basis of the present study.

Based on this background, this study was designed to: (1) measure the effectiveness of technology innovation assistance policy implementation for MSMEs through a comparison between factual evidence and digital behavioral evidence, and (2) formulate recommendations for a more adaptive policy direction based on the combined evidence pattern.

METHOD

This study employed a qualitative approach with a policy evaluation design that emphasized multi-source data triangulation. Although some collected data were numerical, such as survey results and digital platform analytics metrics, the analysis focused on interpreting thematic patterns rather than conducting inferential statistical hypothesis testing. Data collection was conducted across four regional clusters implementing the MSME technology innovation assistance program in Indonesia, namely Java, Sulawesi, Sumatra, Kalimantan, and Eastern Indonesia.

Data were collected through three main sources. First, a semi-structured online survey was administered to 237 MSME actors who had participated in the assistance program for at least six months. The respondents were selected purposively from the four regional clusters. Second, in-depth interviews were conducted with 18 informants consisting of eight field facilitators, five program managers or policymakers, and five selected MSME owners involved in detailed case studies. Third, social media analytics were collected from Instagram and TikTok business accounts of 97 assisted MSMEs that had provided consent. The extracted metrics included follower growth, engagement rate, posting frequency, and content variation during one year of program implementation.

Data were analyzed using thematic analysis through the stages of data familiarization, coding, theme development, and theme refinement (Miles & Huberman, 2014; Sugiyono, 2019). Survey and interview findings were treated as self-reported evidence, while social media analytics metrics were used as observed behavioral evidence. These evidence sources were compared through triangulation to identify areas of consistency and discrepancy. Engagement data were presented descriptively to support thematic interpretation rather than statistical generalization. The confidentiality of all respondents and informants was maintained through anonymization during report preparation.

RESULTS AND DISCUSSION

Respondent Characteristics and Program Context

This survey involved 237 MSME actors as participants, with profile details shown in Table 1. The dominance of the food and beverage industry (39.2%) reflects the general sectoral structure of domestic MSMEs, while most respondents were business entities aged 2-5 years (42.3%) - a crucial stage in business stabilization where successful technology adoption becomes a key factor for business continuity. In terms of geographic distribution, program participants were dominated by business actors from Java Island (53.9%), while the Eastern Indonesia region contributed only 7.3%. This regional proportion disparity is an important note given the differences in achievement across regions discussed in the following section.

Table 1. Survey Respondent Characteristics (N = 237)

Category	Sub-Category	n	%
Business Sector	Culinary	96	39.2
	Fashion & Crafts	59	24.1
	Agribusiness	51	21.3
	Services & Other	33	13.5
Business Age	< 2 years	55	23
	2-5 years	101	42.3
	> 5 years	83	33.9
Regional Cluster	Java	132	53.9
	Sumatra	52	21.2
	Sulawesi & Kalimantan	37	15.1
	Eastern Indonesia	18	7.3
Business Manager	Female	149	60.8
	Male	90	36.7

Increased Technology Adoption Following Assistance

Data in Chart 1 show a comparison of adoption levels across five technology groups before and after the assistance intervention was implemented. The steepest increase is seen in social media marketing (rising from 33% to 80%) and digital payment systems (rising from 39% to 74%), while production process automation recorded the smallest increase (from 12% to 30%). This tendency is consistent with (Rogers, 2003) view that the pace of adoption is inversely related to an innovation's level of complexity and investment magnitude - compared with affordable, self-learnable technologies (such as promotional platforms and digital wallets), instruments requiring substantial capital expenditure and complex operational adjustment (such as POS systems and manufacturing automation) are absorbed far more slowly.

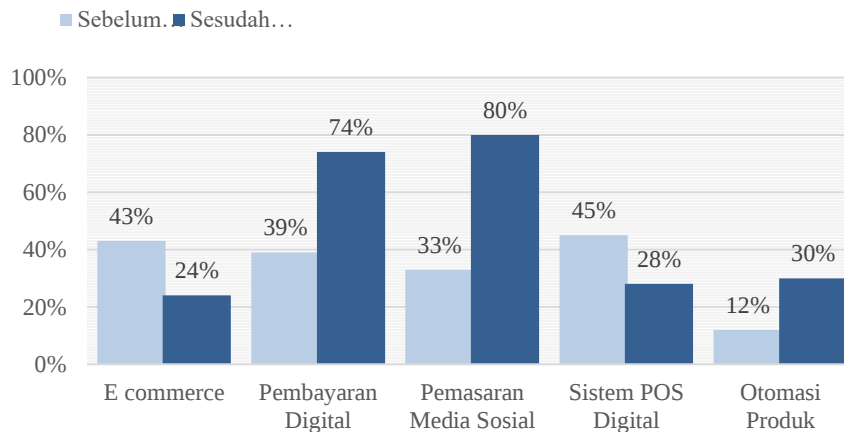


Figure 1. Technology Adoption Levels Before and After Assistance

This study's findings simultaneously reinforce and update the conclusions of Mutiara et al. (2025) regarding the irregular character of assistance intervention schemes. Program implementation proved successful in areas of low-capital technology adoption, but has yet to reach sectors that genuinely require intensive oversight, such as manufacturing automation and system integration. In short, the positive outcomes of the intervention so far are concentrated in areas that are not particularly dependent on the government's role; conversely, in the domain that constitutes the main urgency behind this policy's launch, the results are in fact at their lowest level (Nambisan, 2017; OECD, 2021; Vial, 2019). This condition indicates that the assistance scheme has not yet been able to penetrate the implementation and confirmation stages in the innovation diffusion process, and instead merely stops at the knowledge and persuasion stage.

The Gap between Administrative Claims and Digital Behavioral Evidence

Processing of social media analytics data for 97 assisted MSME accounts shows the movement of engagement rate figures throughout one year of program implementation,

as shown in Chart 2. The TikTok platform recorded a far more significant escalation (rising from 0.85% to 8.7%) compared with Instagram (rising from 1.3% to 3.7%). This pattern is strongly suspected to be related to TikTok's algorithmic mechanism, which provides space for content creators regardless of follower count, as well as its short-video format, which is more compatible with the content-creation capabilities of MSMEs, which typically rely on self-editing applications via smartphone.

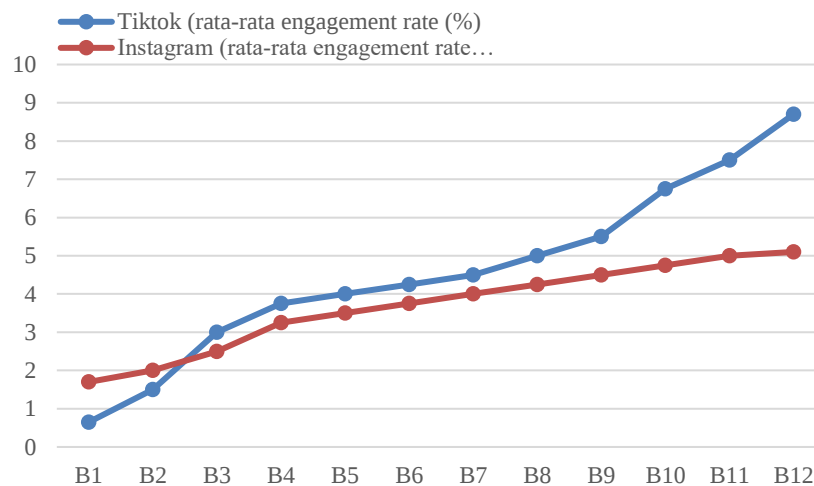


Figure 2. Average Engagement Rate Trend for Instagram and TikTok among Assisted MSMEs (12 Months)

A more fundamental impact emerged precisely when this data was compared with the organizers' monitoring documents. Internal program recapitulations claimed that as many as 80% of participants had “successfully implemented digital marketing,” with the passing benchmark limited to uploading promotional material at least once after training. However, from long-term observation of 97 business accounts, only around 47% managed to record an engagement rate above the reasonable threshold ($>3\%$) and maintain a consistent posting rhythm for a full year. This disparity of nearly double between the bureaucratic claim and the actual digital footprint is this study's core finding: an output indicator (i.e., merely having uploaded once) has been misinterpreted as an outcome indicator (i.e., active and sustained adoption) - an error that has thus far escaped correction due to traditional monitoring and evaluation schemes that do not include independent platform data validation.

Implementation Constraints: Issues Beyond the Technical Aspect

The information-gathering session with facilitators and program managers revealed the scope of implementation obstacles as summarized in Chart 3. Limited human resource quality and quantity ranked as the top constraint (32%), followed by limited funding access for technology adoption (24%), inconsistency of assistance modules with sector or regional characteristics (18%), limited local digital infrastructure (14%), and suboptimal post-implementation follow-up mentoring (12%).

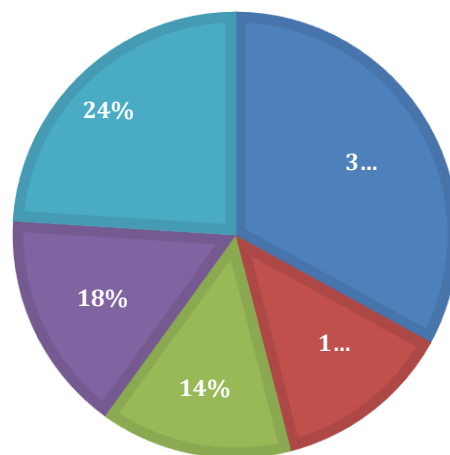


Figure 3. Percentage of Main Implementation Constraints (Facilitator and Program Manager Perspective)

These top three obstacles confirm prior studies highlighting issues of digital literacy and limited internal MSME capacity (Hakim & Oktaviani, 2021; Tambunan, 2019). However, the proportion attributed to mismatched assistance materials (18%) is a finding rarely discussed in prior literature, which generally focuses more on physical infrastructure and digital skill issues alone. Based on interview results, several facilitators stated that teaching modules were designed uniformly at the national level without accounting for the uniqueness of business sectors or regional infrastructure readiness - for example, urban culinary MSMEs were given an assistance curriculum identical to that of agribusiness MSMEs in remote areas. This finding confirms that the main obstacles do not solely originate from external factors affecting business actors, but are also rooted in the program design itself, which tends to be top-down and insufficiently flexible.

Regional Disparities and Their Implications for Policy Equity

Comparative data on program outputs across the four regional groups are summarized in Table 2. A pronounced disparity is evident when comparing the Java and Eastern Indonesia regions: average revenue growth of 39.3% versus 14.6%, assistance participation retention of 81% versus 55%, and a social media engagement growth index of 4.1 versus 2.3 on a 1-5 scale.

Table 2. Comparison of Program Achievement across Regional Clusters

Regional Cluster	Average Revenue Growth (%)	Assistance Participation Retention (%)	Social Media Engagement Growth Index (1-5)
Java	39.3	81	4.1
Sumatra	28.8	74	3.6
Sulawesi & Kalimantan	22.1	68	3.0
Eastern Indonesia	14.6	55	2.3

This disparity is consistent with the view of (Van Meter & Van Horn, 1975), who emphasize that socio-economic factors and the target group's baseline readiness play a key role in determining policy implementation success, regardless of how ideal the policy design may be. A critical point to highlight is that the assistance scheme applied thus far has been standardized (uniform) across all regional clusters, even though basic digital literacy levels, supporting infrastructure, and digital ecosystem maturity vary widely across regions. The one-size-fits-all approach practiced thus far has proven empirically flawed, as evidenced by this disparity in the data; therefore, evidence-based policy formulation should ideally move toward separate intervention schemes tailored to each region's readiness, rather than replicating uniform teaching materials at the national level.

Research Contribution and Novelty

Overall, this study makes three fundamental contributions. First, this research formulates a hybrid evaluation model that integrates digital platform analytics metrics as confirmatory evidence alongside survey and interview techniques - a formulation not previously applied in the evaluation of similar MSME assistance policy in Indonesia. Second, this study empirically demonstrates and measures the magnitude of the gap between administrative achievement claims and actual digital behavior realization, a policy measurement issue that has thus far been overlooked. Third, this study confirms that implementation obstacles are not merely confined to the technical realm or infrastructure availability, but also concern the alignment of program design with the characteristics of the target sector and region - a dimension that calls for more detailed application of evidence-based policy in the formulation of future assistance policy.

CONCLUSION

This study concluded that the effectiveness of technology innovation assistance policies for MSMEs varied across different adoption areas. Optimization was observed in relatively accessible areas, such as digital payment transactions and digital promotion, while adoption remained limited in areas requiring substantial capital investment and continuous mentoring, such as manufacturing automation. Administrative achievement reports consistently exceeded the actual outcomes identified through digital activity data. This gap was further influenced by regional disparities, as the assistance scheme was

implemented uniformly without sufficiently considering the baseline readiness and capacity of each target area.

Based on these findings, this study proposed four strategic recommendations. First, intervention schemes should be redesigned into a tiered structure following the technology adoption pathway, from initial introduction to reinforcement, rather than being limited to one-time training activities. Second, digital platform analytics metrics should be incorporated into formal policy monitoring and evaluation mechanisms to ensure that program success indicators are not based solely on administrative output reports. Third, differentiated mentoring models should be implemented based on regional clusters by adjusting resource allocation and assistance duration according to each region's initial capacity. Fourth, training modules should be tailored to industry characteristics and local conditions instead of relying on standardized materials applied uniformly at the national level. The application of evidence-based policy approaches that integrate digital behavioral evidence systematically is essential to ensuring that future MSME assistance policies become more adaptive, targeted, and accountable in achieving intended outcomes.

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