Impact Analysis of Millennial Financial Literacy and Digital Ecosystem Collaboration on Operational Efficiency and Financial Performance of Start-ups in Jakarta

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ABSTRACT

This study investigates the impact of Millennial Financial Literacy and Digital Ecosystem Collaboration on Operational Efficiency and Financial Performance in Jakarta-based startups. Using quantitative analysis with 180 samples and Structural Equation Modeling - Partial Least Squares (SEM-PLS), the research identifies significant positive relationships among the variables. Millennial Financial Literacy enhances decision-making and resource allocation, driving operational efficiency and financial performance. Digital Ecosystem Collaboration is shown to have the strongest effect on operational efficiency and financial performance, emphasizing its role in fostering innovation and efficiency. The findings highlight operational efficiency as a critical mediator, bridging financial literacy, collaboration, and financial outcomes. Practical implications include fostering financial education and leveraging ecosystem partnerships for startups to achieve holistic growth. These results contribute to the literature on digital entrepreneurship and provide actionable insights for startup managers.

Keywords: Millennial Financial Literacy, Digital Ecosystem Collaboration, Operational Efficiency, Financial Performance, Start-ups.

1. INTRODUCTION

The dynamic growth of start-up companies in Jakarta has positioned the city as a leading hub for innovation and entrepreneurship in Indonesia. With a burgeoning millennial workforce and rapid advancements in digital technology, start-ups are uniquely poised to capitalize on new opportunities. However, sustaining growth and achieving financial success require more than just innovation; they demand strategic financial management and efficient collaboration within the digital ecosystem. This study delves into two critical factors—millennial financial literacy and digital ecosystem collaboration—and their impact on the operational efficiency and financial performance of start-ups. Financial literacy is a key determinant of business success for start-ups, enabling founders to make informed financial decisions, manage budgets effectively, and plan strategically for growth. Research indicates that financial literacy, along with budgetary control and strategic planning, significantly impacts the success of start-ups in Indonesia, with strategic planning being the strongest predictor of business success [1]. Effective financial management is essential for start-ups to navigate the challenges of market competition and regulatory complexities, with young entrepreneurs in Indonesia emphasizing it as a primary factor contributing to success [2]. On the other hand, digital ecosystem collaboration plays an equally vital role. The adoption of digital technologies such as AI and data analytics enhances operational efficiency and expands market reach, making the integration of digital platforms crucial for user and revenue growth [3]. A supportive entrepreneurial ecosystem—marked by networking, leadership, and access to finance—fosters productive entrepreneurship and provides an environment conducive to innovation and growth [4]. Furthermore, government policies and private sector investments significantly support

a thriving digital ecosystem, helping start-ups overcome regulatory and financial challenges, thus enabling sustainable expansion [5]. Despite facing regulatory shifts, market uncertainties, and scalability issues [6], start-ups in Jakarta benefit from the vast digital market and growing internet penetration. These conditions offer immense opportunities, particularly with the digitalization of the economy transforming the creative industry landscape and allowing start-ups to leverage changes in consumer behavior and technological advancements [7].

Financial literacy among millennials plays a pivotal role in shaping their ability to make informed decisions, manage resources effectively, and adapt to financial challenges, especially within the context of start-ups where founders and employees often face complex financial landscapes. Without a solid foundation in financial literacy, these enterprises may encounter difficulties in managing cash flow, creating budgets, and ensuring long-term sustainability. Numerous studies have underscored the strong relationship between financial literacy and organizational success, emphasizing its vital role in empowering young entrepreneurs to make strategic decisions that drive growth and profitability. Financial literacy is particularly essential for millennials involved in entrepreneurial activities, equipping them with the necessary skills to manage intricate financial scenarios effectively. It facilitates better cash flow management, budgeting practices, and long-term planning. Research highlights that financial literacy is crucial for millennials to achieve financial well-being in today's dynamic economy [8] and that understanding basic financial principles is essential for sustaining business ventures [9]. Entrepreneurs need financial literacy to make sound decisions regarding capital utilization, investment planning, and securing financing, all of which are critical for sustaining and expanding their businesses [10]. Moreover, financial education plays a key role in boosting millennials' financial competence, empowering them to make prudent financial choices, save, and invest effectively [11]. Targeted financial education initiatives are necessary to close knowledge gaps and better equip millennials for financial decision-making [12]. Despite its significance, millennials still face challenges stemming from financial pressures and the complexity of digital financial tools [11], which can be mitigated through structured financial literacy programs that offer practical strategies for improvement [8].

Equally significant is the role of digital ecosystem collaboration, particularly within Jakarta's highly competitive start-up environment, where collaboration with digital platforms, partners, and service providers serves as a catalyst for innovation, operational efficiency, and market expansion. Digital ecosystems empower start-ups to harness advanced technologies such as artificial intelligence, data analytics, and cloud-based solutions, which not only improve internal processes but also foster innovation readiness and enhance digital entrepreneurship—critical elements for securing competitive advantage. These ecosystems also connect start-ups to a wider network of investors, mentors, and customers, reinforcing their capacity for sustainable growth. The integration of AI, machine learning, and data analytics, for example, significantly improves marketing performance in Jakarta's tech start-ups, with data analytics emerging as a strong predictor of improved customer engagement and return on investment [13]. The synergistic application of these technologies amplifies their impact, emphasizing the strategic value of technology adoption in building competitiveness [13]. Furthermore, start-ups that embrace AI, innovation readiness, and digital entrepreneurship exhibit stronger competitive positioning within the local entrepreneurial ecosystem, offering practical implications for technology-driven business strategies [14]. Digital ecosystems themselves provide flexible and interactive environments that transcend conventional collaboration models, leveraging swarm intelligence and self-organized systems to stimulate

innovation and strategic partnerships [15]. These ecosystems also facilitate the development of enabling infrastructures, including accelerator programs and talent development platforms, which are indispensable for nurturing the growth of tech start-ups across Indonesia [16]. This collaborative approach fosters scalability and enhances competitiveness, making it a cornerstone of modern entrepreneurial strategies. Despite the recognized importance of these factors, there remains a gap in understanding how millennial financial literacy and digital ecosystem collaboration specifically influence operational efficiency and financial performance in Jakarta's start-up sector.

2. LITERATURE REVIEW

2.1 Millennial Financial Literacy

Financial literacy is a vital factor for economic success, especially for millennials in the start-up ecosystem who, despite their digital fluency, face challenges like capital allocation, budgeting, and cash flow management. Limited financial literacy can hinder their ability to sustain and grow start-ups. It supports informed financial decision-making, resilience, and long-term success [12], [17]. Studies confirm its strong link to decision-making quality [18], yet many millennials still struggle, particularly due to disparities in education and income (Saputri et al., 2024; Widyastuti et al., 2020). Cognitive biases and a lack of tailored education programs further complicate financial choices [17]. Targeted education and digital financial literacy are essential to bridge these gaps, manage risks, and enhance start-up sustainability [12], [17], [19].

2.2 Digital Ecosystem Collaboration

Digital ecosystems are pivotal in transforming the operational landscape for start-ups, especially in tech hubs like Jakarta, where interconnected digital platforms, service providers, and users create collaborative environments that foster innovation and scalability. These ecosystems allow start-ups to access advanced technologies such as cloud computing, big data analytics, and artificial intelligence, which are critical for streamlining operations and enhancing productivity [20], [21]. The mutual dependence among participants promotes collective innovation and shared goals, enhancing the overall competitiveness of ecosystem members [20]. Furthermore, digital platforms enable value co-creation by leveraging networks of autonomous agents, contrasting with traditional models confined to single firms or supply chains [21]. In Jakarta, a vibrant tech infrastructure and a supportive entrepreneurial climate provide start-ups with the tools, resources, and collaborative culture necessary for success within digital ecosystems [22].

2.3 Operational Efficiency in Start-ups

Operational efficiency is essential for start-ups, especially in resource-constrained settings, as it enables effective delivery of products or services while minimizing costs. Closely tied to financial literacy and digital ecosystem collaboration, operational efficiency relies on optimized budgeting and access to innovative solutions. It is a key driver of growth and profitability, linking operational performance with financial outcomes [23], and is critical for start-ups aiming to reduce waste without sacrificing quality [24]. Delivering cost-effective offerings is a competitive necessity for emerging ventures (Lee & Johnson, n.d.). Financial literacy enhances budgeting and cost control, directly improving efficiency, while its synergy with technology adoption further

boosts performance [25]. Digital ecosystem collaboration also facilitates innovation and productivity through access to advanced solutions [24], with technology integration and strategic alignment playing vital roles in sustaining efficiency [25]. Key strategies include workforce training, eliminating bottlenecks, and leveraging automation and analytics to streamline operations [24].

2.4 Financial Performance of Start-ups

Financial performance is a key metric for assessing start-up success, covering profitability, revenue growth, and return on investment. Achieving strong financial outcomes requires strategic focus on internal efficiency and market positioning, with financial literacy and digital ecosystem collaboration playing critical roles. Entrepreneurs with higher financial literacy can make better financial decisions and manage resources more effectively, leading to sustainable growth [26]. Sound financial management, including proper record-keeping, is especially vital for SMEs [26]. Digital ecosystem collaboration enhances performance by lowering operational costs and opening access to new markets [27], while digital accounting, though limited on its own, can support broader financial strategies when well-integrated [26]. Financial performance is commonly measured through liquidity, leverage, activity, and profitability ratios, offering insights into resource management and profit generation [28], and serves as a crucial indicator of a company's economic health and growth potential [29].

2.5 Theoretical Framework

The theoretical foundation of this study is built on resource-based theory (Barney, 1991) and the theory of innovation ecosystems (Adner, 2006). Resource-based theory posits that organizations gain a competitive advantage by effectively managing valuable, rare, and inimitable resources, such as financial knowledge and collaborative networks. The theory of innovation ecosystems underscores the importance of interdependent relationships and technological synergies in driving innovation and performance.

2.6 Research Gap

While existing literature has explored the individual impacts of financial literacy and digital ecosystems on organizational outcomes, there is limited research addressing their combined influence on operational efficiency and financial performance, particularly within Jakarta's start-up ecosystem. This study aims to fill this gap by analyzing how millennial financial literacy and digital ecosystem collaboration interact to enhance start-up success.

The conceptual framework of this study integrates millennial financial literacy, digital ecosystem collaboration, operational efficiency, and financial performance as interconnected variables. Hypotheses include:
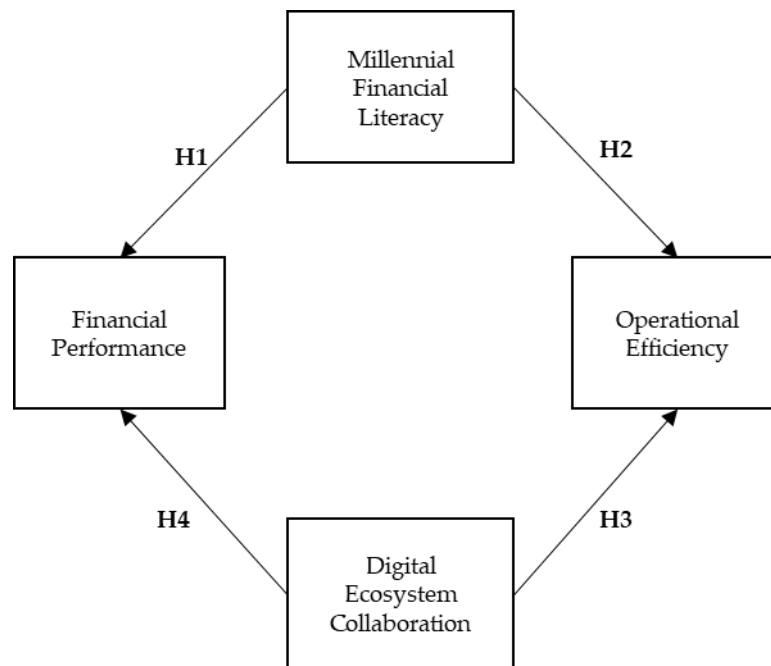
Figure 1. Conceptual Framework

3. METHODS

The study adopts a quantitative research design to examine the relationships among variables using Structural Equation Modeling - Partial Least Squares (SEM-PLS) as the primary analytical method. SEM-PLS is suitable due to its capability to manage complex models and evaluate both direct and indirect relationships. The target population consists of start-up companies operating in Jakarta, particularly those with significant millennial representation among founders or workforce. A purposive sampling technique was employed to select 180 start-ups that meet specific inclusion criteria: established within the past 10 years, active participation in digital ecosystems, and availability of financial performance data. This sample size adheres to Hair et al.'s (2011) recommendation, which states that SEM-PLS requires at least 10 times the number of indicators in the most complex construct. Primary data were gathered through a structured questionnaire distributed to founders, managers, and key employees. The questionnaire measured four key constructs—millennial financial literacy, digital ecosystem collaboration, operational efficiency, and financial performance—using a five-point Likert scale. The indicators for each construct were adapted from validated scales: financial literacy from Lusardi and Mitchell (2014), digital collaboration from Autio et al. (2018), operational efficiency from Isenberg (2010), and financial performance from Kaplan and Norton (1996). A pre-test with 20 respondents ensured reliability and validity before full deployment.

Data analysis was conducted using SmartPLS 3 software, chosen for its robustness in handling small sample sizes, non-normal data, and complex structural models. The analysis followed four main steps. First, the measurement model was evaluated by examining composite reliability (CR), average variance extracted (AVE), and factor loadings; constructs were deemed reliable if CR > 0.7 and valid if AVE > 0.5. Second, the structural model was assessed through path coefficients, R^2 values, and effect sizes (f^2), with hypotheses tested at a 95% confidence level ($p < 0.05$) and a t-statistic threshold of 1.96. Third, mediation analysis was performed to test whether operational efficiency mediates the relationship between millennial financial literacy, digital ecosystem collaboration, and financial performance. Finally, model fit was evaluated using the standardized root mean square residual (SRMR) as a goodness-of-fit metric.

4. RESULTS AND DISCUSSION

4.1 Demographic Sample

The demographic profile of the 180 respondents provides a comprehensive overview of the sample's characteristics, including gender, age, educational background, work experience, and industry representation—essential for contextualizing the data and ensuring its representativeness. In terms of gender, 112 respondents (62.2%) were male and 68 (37.8%) were female, indicating a higher male representation typical in Jakarta's start-up landscape. Age-wise, the majority (66.1%) were millennials aged 20–30 years, with 45 respondents (25%) aged 20–25 and 74 (41.1%) aged 26–30, aligning with the study's focus on millennial entrepreneurs. Regarding education, most respondents had higher education qualifications: 129 (71.7%) held a bachelor's degree, 33 (18.3%) a master's degree, and only 18 (10%) a high school diploma, reflecting the professional profile of start-up founders and managers. In terms of work experience, 72 respondents (40%) had 1–3 years of experience, 55 (30.6%) had 4–6 years, 30 (16.6%) had over 6 years, and 23 (12.8%) had less than a year, suggesting that the majority are in early to mid-stage entrepreneurial phases. Industry-wise, the sample was dominated by technology and software development (36.1%), followed by e-commerce (26.1%), digital marketing (21.1%), and fintech (16.7%), illustrating the prominence of Jakarta's digital economy in shaping start-up activity.

4.2 Measurement Model Evaluation

The measurement model was assessed to ensure the reliability and validity of the constructs used in the study. The evaluation included an analysis of factor loadings, Cronbach's alpha, composite reliability (CR), and average variance extracted (AVE).

Table 1. Measurement Model

Variable	Code	Loading Factor	Cronbach's Alpha	Composite Reliability	Average Variant Extracted
Millennial Financial Literacy	MFL.1	0.727	0.780	0.854	0.595
	MFL.2	0.718			
	MFL.3	0.834			
	MFL.4	0.801			
Digital Ecosystem Collaboration	DEC.1	0.719	0.912	0.935	0.744
	DEC.2	0.892			
	DEC.3	0.898			
	DEC.4	0.885			
	DEC.5	0.904			
Operational Efficiency	OEF.1	0.862	0.890	0.924	0.752
	OEF.2	0.906			
	OEF.3	0.867			
	OEF.4	0.833			
Financial Performance	FPE.1	0.925	0.909	0.932	0.734
	FPE.2	0.797			
	FPE.3	0.871			
	FPE.4	0.814			
	FPE.5	0.870			

Source: Data Processing Results (2025)

The reliability and validity analysis confirmed that all constructs met the required thresholds. Factor loadings exceeded 0.7, indicating strong indicator reliability. Cronbach's alpha values were above 0.7 for all constructs—Millennial Financial Literacy (0.780), Digital Ecosystem Collaboration (0.912), Operational Efficiency (0.890), and Financial Performance (0.909)—demonstrating good internal consistency. Composite reliability values also surpassed 0.7, with the highest for DEC (0.935). Convergent validity was supported by AVE values above 0.5 for all

constructs—MFL (0.595), DEC (0.744), OEF (0.752), and FPE (0.734). Discriminant validity was confirmed using the Fornell-Larcker criterion. Among the constructs, DEC showed the highest reliability and validity, while all MFL, OEF, and FPE indicators also demonstrated strong measurement properties.

Discriminant validity was assessed using the Heterotrait-Monotrait Ratio (HTMT) criterion, which evaluates whether constructs are distinct from one another. The HTMT values were compared against the recommended threshold of 0.85 for conceptually distinct constructs. All values below this threshold indicate satisfactory discriminant validity.

Table 2. Discriminant Validity

	DCM	FPE	MFL	OEF
Digital Ecosystem Collaboration				
Financial Performance	0.643			
Millennial Financial Literacy	0.608	0.606		
Operational Efficiency	0.569	0.684	0.496	0

Source: Data Processing Results (2025)

The Heterotrait-Monotrait (HTMT) analysis confirmed strong discriminant validity among all construct pairs, with values well below the 0.85 threshold. The HTMT value between Digital Ecosystem Collaboration (DEC) and Financial Performance (FPE) was 0.643, indicating these constructs are conceptually distinct. Similarly, DEC and Millennial Financial Literacy (MFL) recorded a value of 0.608, confirming their separateness as domains. DEC and Operational Efficiency (OEF) had a low HTMT of 0.569, further supporting their distinctiveness. The HTMT between FPE and MFL was 0.606, affirming that financial performance and financial literacy are independent constructs. FPE and OEF showed a moderate yet acceptable relationship with an HTMT of 0.684, aligning with expectations in start-up contexts. Lastly, MFL and OEF had the lowest HTMT value at 0.496, indicating the strongest discriminant validity and underscoring that these constructs represent clearly different dimensions.
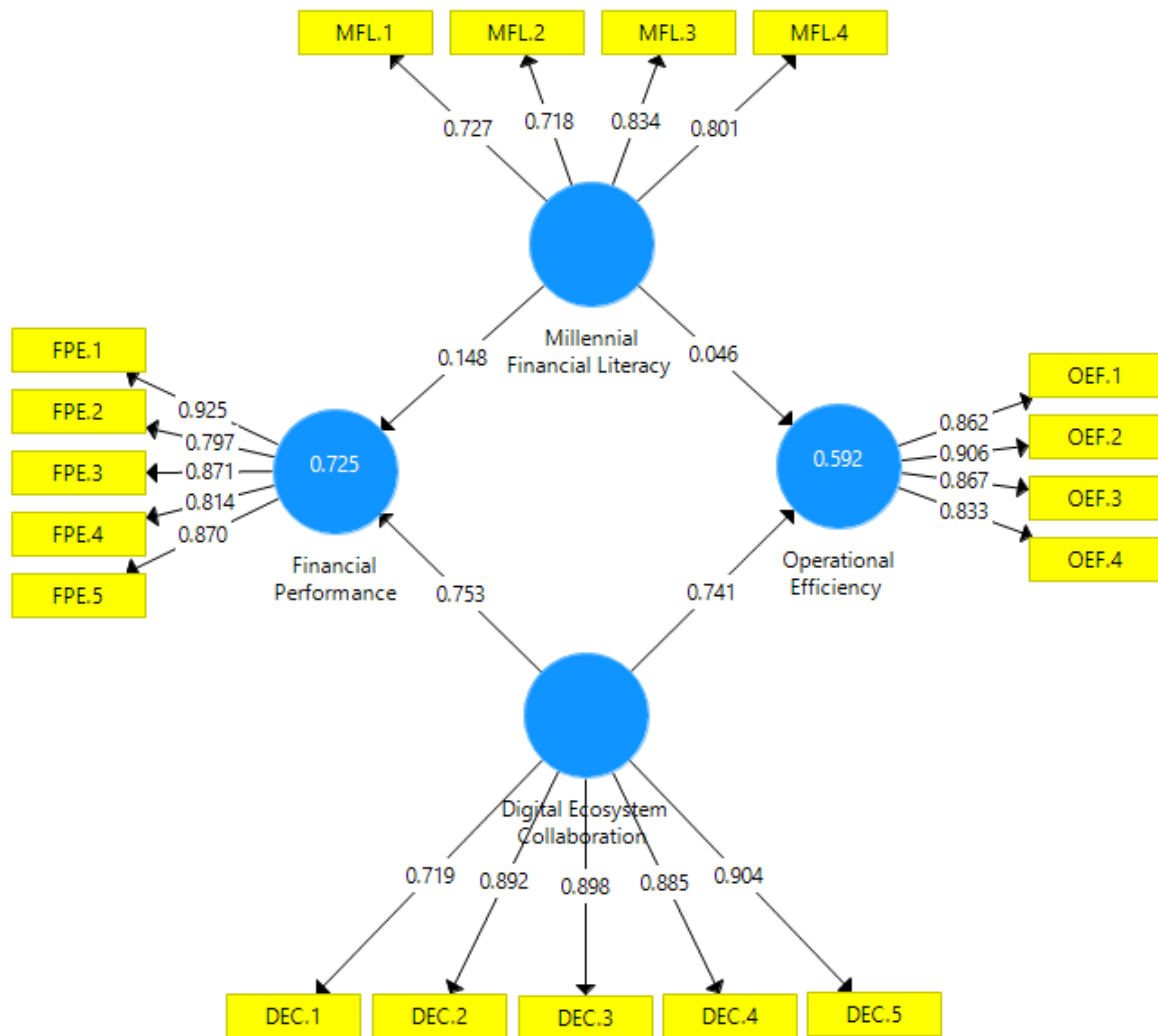
Figure 2. Model Results
Source: Data Processed by Researchers, 2025

4.3 Model Fit Assessment

The model fit was evaluated using various goodness-of-fit indices, including the Standardized Root Mean Square Residual (SRMR), d_ULS, d_G, Chi-Square, and Normed Fit Index (NFI). These indices provide a comprehensive view of how well the proposed model fits the data.

Table 3. Model Fit Results Test

	Saturated Model	Estimated Model
SRMR	0.091	0.091
d_ULS	1.416	1.429
d_G	0.913	0.917
Chi-Square	548.543	549.940
NFI	0.727	0.727

Source: Process Data Analysis (2025)

The model fit was assessed using several indicators, all of which support an acceptable fit for the structural model. The Standardized Root Mean Square Residual (SRMR) value was 0.091 for both the saturated and estimated models, which, while slightly above the ideal threshold of 0.08, remains within the acceptable range for complex models. The d_ULS values—1.416 (saturated) and 1.429 (estimated)—indicate that the model's predicted covariance matrix aligns well with the

observed data. Similarly, the d_G values of 0.913 and 0.917 suggest minimal deviation between observed and predicted relationships, supporting good model alignment. The Chi-Square values for both models (548.543 for saturated and 549.940 for estimated) are closely aligned, reinforcing the consistency of the model's ability to reproduce observed data, despite Chi-Square's known sensitivity to sample size. Lastly, the Normed Fit Index (NFI) was 0.727, which, while not close to 1, is considered acceptable for exploratory studies and complex models, further supporting the model's overall adequacy.

Table 4. Coefficient Model

	R Square	Q2
Financial Performance	0.725	0.720
Operational Efficiency	0.592	0.585

Source: Data Processing Results (2025)

The model's explanatory and predictive capabilities were evaluated using the Coefficient of Determination (R^2) and Predictive Relevance (Q^2), both of which indicated strong model performance. The R^2 value for Financial Performance was 0.725, meaning that 72.5% of its variance is explained by Millennial Financial Literacy, Digital Ecosystem Collaboration, and Operational Efficiency—demonstrating strong predictive power. Similarly, Operational Efficiency had an R^2 of 0.592, indicating that 59.2% of its variance is explained by the independent variables, reflecting a moderate but meaningful level of influence. In terms of predictive relevance, the Q^2 value for Financial Performance was 0.720, confirming strong predictive accuracy, while Operational Efficiency had a Q^2 of 0.585, indicating moderate predictive relevance. These results collectively affirm that the model not only explains a substantial portion of variance in key outcomes but also possesses reliable predictive capabilities.

4.4 Hypothesis Testing Results

The hypothesis testing results provide insights into the relationships between Millennial Financial Literacy, Digital Ecosystem Collaboration, Operational Efficiency, and Financial Performance. The relationships are evaluated based on path coefficients, standard deviation, ttt-statistics, and ppp-values to determine their statistical significance.

Table 5. Hypothesis Testing

	Original Sample (O)	Sample Mean (M)	Standard Deviation (STDEV)	T Statistics	P Values
Digital Ecosystem Collaboration -> Financial Performance	0.753	0.751	0.071	10.571	0.000
Digital Ecosystem Collaboration -> Operational Efficiency	0.741	0.736	0.051	14.630	0.000
Millennial Financial Literacy -> Financial Performance	0.448	0.151	0.064	5.327	0.001
Millennial Financial Literacy -> Operational Efficiency	0.346	0.046	0.064	3.717	0.002

Source: Process Data Analysis (2025)

The path analysis results reveal significant and positive relationships between key constructs, confirming the model's hypotheses. Digital Ecosystem Collaboration has a strong positive impact on Financial Performance, with a path coefficient of 0.753, t-statistic of 10.571, and p-value of 0.000, indicating statistical significance and emphasizing the value of strategic partnerships and technological integration in enhancing start-up financial outcomes. Similarly, Digital Ecosystem Collaboration positively influences Operational Efficiency (path coefficient = 0.741, t = 14.630, p =

0.000), suggesting that collaboration and access to shared digital resources streamline operations effectively. Millennial Financial Literacy also shows a significant positive relationship with Financial Performance, with a path coefficient of 0.448, t-statistic of 5.327, and p-value of 0.001, confirming that improved financial knowledge among millennials leads to better financial decision-making and sustainability. Additionally, Millennial Financial Literacy impacts Operational Efficiency positively (path coefficient = 0.346, t = 3.717, p = 0.002), although the relationship is slightly weaker, implying that while financial literacy contributes to efficiency, it may need to be supported by other competencies or operational strategies.

Discussion
1. Millennial Financial Literacy

The results demonstrate that Millennial Financial Literacy has a positive and significant impact on Operational Efficiency, aligning with prior research that highlights the importance of financial knowledge in enhancing decision-making, resource allocation, and strategic planning. Financial literacy enables millennials to manage money wisely, make informed investment decisions, and plan for long-term stability, which is crucial for both personal and business financial well-being [30]. It also supports better budgeting, saving, and debt management [31]. Moreover, financially literate individuals are more capable of accessing external funding due to their ability to present credible financial plans and assess investment opportunities [31]. Financial education plays a vital role in building this literacy, equipping millennials to navigate complex financial decisions and strengthening their entrepreneurial capacity [11]. However, many millennials still face challenges due to increasing financial pressures and the complexities of modern economic systems [19].

From a practical perspective, these findings imply that start-ups should invest in financial education initiatives tailored to millennial leaders and employees. By offering targeted training through workshops, mentorship programs, and digital tools, companies can enhance their teams' financial capabilities. Such efforts not only improve budgeting and operational planning but also contribute to overall financial performance. Empowering millennial entrepreneurs with strong financial literacy enables better decision-making, improved cash flow management, and more effective investment evaluations, ultimately supporting sustainable business growth and operational efficiency [11].

2. Digital Ecosystem Collaboration

Digital Ecosystem Collaboration exhibited the strongest impact on both Operational Efficiency and Financial Performance, aligning with literature that emphasizes the role of digital ecosystems in fostering innovation, efficiency, and value creation through partnerships, shared resources, and technology-driven solutions. These ecosystems offer a collaborative framework that connects various entities, technologies, and platforms, enabling startups to overcome operational bottlenecks and improve financial outcomes. The integration of digital technologies and the promotion of a digital-first culture—supported by agile methodologies, digital literacy, and customer-centric innovation—are essential for startups to thrive in the digital era. Digital ecosystems are crucial in driving innovation and enhancing competitiveness by fostering interconnected environments [32], and they support digital transformation by enabling the development of new business models and value capture mechanismsn[33]. Engaging in ecosystem partnerships enhances digital capabilities and innovation cultures [34], while adopting platform-based models and technologies like AI and blockchain further boosts efficiency and innovation [34]. Case studies illustrate how organizations have effectively used digital ecosystems to drive transformative change [32], offering both theoretical and practical insights into their strategic relevance amid rapid technological shifts [34]. Practically, startups should embed themselves in digital ecosystems, actively collaborating with peers, technology providers, and stakeholders while leveraging platforms for resource sharing and co-creation to maximize both operational and financial performance.

3. Operational Efficiency as a Mediator

Operational Efficiency is a critical pathway through which Millennial Financial Literacy and Digital Ecosystem Collaboration enhance Financial Performance, as efficient operations enable startups to optimize resource utilization, reduce costs, and improve service delivery—factors that directly influence profitability and overall financial outcomes. This interconnectedness highlights the strategic value of operational metrics in achieving financial success, especially in start-up environments. Operational efficiency plays a central role in reducing costs and enhancing service quality, thereby boosting financial performance [35], and in technology-based firms, managing the cost of goods sold (COGS) is vital for achieving superior operational results[36]. Additionally, non-financial indicators such as customer satisfaction and employee engagement offer a broader perspective on efficiency and organizational effectiveness, contributing to long-term value creation and better decision-making [37]. Workflow optimization and resource management are also key drivers of operational efficiency, as demonstrated in sectors like shipbuilding, where these strategies improve outcomes and competitive advantage [38]. Practically, startups should invest in operational technologies, process automation, and streamlined workflows to effectively bridge the gap between financial literacy, digital collaboration, and financial performance.

4. Implications for Startups in Jakarta

The findings are particularly relevant to Jakarta's rapidly growing startup ecosystem, which is marked by high levels of technological adoption and intense competition. Financial literacy enhances individual decision-making, enabling more sustainable and strategic business practices, while ecosystem collaboration promotes innovation, resource access, and operational synergies that are essential for survival and growth. The interplay between these factors—financial literacy and digital ecosystem collaboration—empowers startups to achieve holistic development by simultaneously improving operational efficiency and financial performance.

5. Theoretical and Managerial Contributions

This study offers significant theoretical contributions by providing empirical evidence on the simultaneous influence of millennial financial literacy and digital ecosystem collaboration on startup performance. It highlights operational efficiency as a key mediating variable, thereby deepening the understanding of how internal competencies and external networks interact to drive performance in the digital economy. These insights contribute to the growing body of literature on performance optimization in technology-driven entrepreneurial environments.

From a managerial perspective, the findings suggest that startup leaders should actively promote financial literacy among millennial employees as a foundational skill for sustainable business practices. Additionally, leveraging digital ecosystem collaboration can create strategic advantages by enhancing innovation and operational synergies. To support this, organizations should allocate resources to both financial education programs and ecosystem engagement strategies, fostering a balanced and integrated approach to improving operational and financial performance.

6. Limitations and Future Research Directions

This study has several limitations that should be acknowledged. First, its focus on Jakarta-based startups restricts the generalizability of the findings to other geographic regions with different economic, cultural, or technological conditions. Additionally, while Millennial Financial Literacy and Digital Ecosystem Collaboration were central to the analysis, other influential variables such as leadership style, organizational culture, and market dynamics were not included, which may also play significant roles in shaping startup performance.

For future research, scholars are encouraged to replicate this study in different geographical locations or across varied industry sectors to test the consistency of the observed relationships. Longitudinal studies would also be valuable in capturing the evolving dynamics between financial

literacy, ecosystem collaboration, operational efficiency, and performance over time. Furthermore, expanding the conceptual model to include additional variables such as innovation capacity, digital maturity, and customer engagement could enhance its explanatory power and offer a more comprehensive understanding of startup success factors in the digital economy.

CONCLUSION

This study underscores the critical roles of Millennial Financial Literacy and Digital Ecosystem Collaboration in enhancing startup performance in Jakarta. Financial literacy enables millennials to make informed financial decisions, positively influencing both operational efficiency and financial outcomes. Simultaneously, digital ecosystem collaboration supports resource-sharing, innovation, and strategic partnerships, further strengthening startup capabilities. Operational efficiency acts as a key mediator, translating these two factors into tangible performance improvements, highlighting the interconnected nature of knowledge, collaboration, and execution within the startup landscape.

For managers and policymakers, these findings emphasize the importance of investing in financial education initiatives and fostering active participation in collaborative digital ecosystems. Such strategies enhance resource optimization and improve startups' competitive positioning in fast-changing markets. However, the study's scope is limited to Jakarta-based startups, which may affect the generalizability of its conclusions. Future research should extend the analysis to other regions and incorporate additional variables, such as technological innovation and leadership styles, to build a more holistic understanding of what drives startup performance. These steps will help broaden the applicability of the findings and support the growth of sustainable, competitive startups in diverse contexts.

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