

“Identifying resource-based determinants of technology business incubator performance in Indonesia”

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IDENTIFYING RESOURCE-BASED DETERMINANTS OF TECHNOLOGY BUSINESS INCUBATOR PERFORMANCE IN INDONESIA

Abstract

This study investigates the determinants of technology business incubator (TBI) performance in Indonesia using the Resource-Based View (RBV) framework. Startups play a vital role in fostering innovation, yet their sustainability is often challenged by weak managerial capacity, limited access to finance, and fragile networks. Business incubators are designed to mitigate these barriers by providing infrastructure, mentoring, and strategic connections, but their performance varies widely. This research aims to identify which internal and external resources most strongly influence incubator outcomes in the Indonesian context. A quantitative design was employed, with data collected from 100 incubators across government, university, and private institutions. Structured questionnaires were administered to incubator leaders and managers, and responses were analyzed using Partial Least Squares Structural Equation Modeling (PLS-SEM). The constructs examined included infrastructure, networking, incubator capabilities, and linkages with universities, with measurement validity and reliability confirmed through composite reliability, average variance extracted (AVE), and discriminant validity tests. The findings show that networking ($\beta = 0.417$, $p = 0.001$) and infrastructure ($\beta = 0.342$, $p = 0.012$) have significant positive effects on incubator performance. In contrast, incubator capabilities ($\beta = 0.162$, $p = 0.119$) and linkages with universities ($\beta = 0.087$, $p = 0.263$) were statistically insignificant, indicating these resources may not directly enhance performance in the current Indonesian setting. The study contributes theoretically by reaffirming RBV as a robust framework for explaining incubator success in emerging economies. Practically, it highlights the priority of investing in strong networks and quality infrastructure to strengthen incubators and accelerate the growth of Indonesia's startup ecosystem.

Keywords

technology business incubator, resource-based view,
networking, infrastructure, performance

JEL Classification

L21, L26, M13, O32

INTRODUCTION

Startups are central to driving innovation and competitiveness within the global business ecosystem (Donaldson et al., 2025). However, despite their potential, startups face high failure rates due to weak planning, limited business skills, and unstable cash flow, with global estimates reaching up to 95% (Sarjono et al., 2024). In Indonesia, the problem is equally critical, as most startups fail to survive beyond their early stages (Lachlan & Smith, 2024). This condition underscores the urgent challenge of ensuring the sustainability of new ventures in emerging economies.

Business incubators have emerged as strategic mechanisms to address these challenges by providing infrastructure, mentoring, and access to networks. Nonetheless, the effectiveness of incubators differs widely depending on governance, facilities, and institutional support (Pattanasak et al., 2022; Sohail et al., 2023; Leitão et al., 2022; Han et al.,

2022; Flanschger et al., 2023). This inconsistency raises an important issue: while incubators are designed to strengthen startups, there is still a limited understanding of which resources and relationships most significantly drive incubator performance, particularly in Indonesia. Incubators act as a “bridge” that transmits the impact of the digital economy to incubated companies through resource support (capital, technology, human resources, knowledge) (Chen et al., 2023). Within the global context, business incubators play a vital role in guiding startups through their growth process and thus constitute a strong instrument to promote innovation and entrepreneurship (Aerts et al., 2007).

Empirical evidence from Europe illustrates this dynamic. Aerts et al. (2007) examined the European business incubator landscape and compared its screening practices with those of American incubators in the 1980s. Their findings revealed that most incubators do not screen potential tenants based on a balanced set of factors, often focusing solely on either market characteristics or the management team. However, they also found that tenant survival rates are positively related to more balanced screening profiles. Based on these insights, they recommended that authorities, incubators, and innovative entrepreneurs adopt comprehensive screening and governance mechanisms to enhance incubator performance and startup sustainability.

The relevance of this study lies in the recognition that incubator performance is essential for producing high-quality startups and for supporting broader economic development (Jimainal et al., 2022; Fithri et al., 2025). Cheng and Schaffer (2011) criticize many studies and evaluation practices for being inconsistent or biased, particularly when using success indicators such as the number of companies “graduating” from an incubator, startup survival rates, or the number of jobs created. They argue that these indicators often underrepresent the incubator’s true contribution because they fail to consider external factors such as local economic conditions, entrepreneur characteristics, and the initial selection of incubator participants. From a theoretical perspective, incubator performance can be explained through the Resource-Based View (RBV) and the Knowledge-Based View (KBV). The RBV emphasizes the importance of strategic internal assets, such as financial, infrastructure, human resources, and organizational capabilities, as sources of competitive advantage (Hanif et al., 2022; Wasdani et al., 2022; Yasin et al., 2021). Meanwhile, the KBV highlights knowledge creation, absorption, and dissemination as critical success factors (Fithri et al., 2024).

Although research on incubator performance has been conducted in various countries, including China (Yuan et al., 2022), Asia, Europe, and America (Pattanasak et al., 2022; Sohail et al., 2023), such research is still limited in Indonesia and fragmented, with many lacking a standardized evaluation framework for measuring incubator performance across contexts (Fithri et al., 2025). More importantly, there is a gap in comprehensively applying the RBV framework to examine how incubator resources and external relationships, such as networking and university involvement, shape outcomes.

Therefore, this study aims to fill the gap by applying the RBV framework to identify the resource-based determinants of technology business incubator performance in Indonesia. The focus is directed toward the roles of infrastructure, networks, incubator capabilities, and university linkages, with the expectation of generating both theoretical contributions and practical implications for strengthening the local startup ecosystem.

1. LITERATURE REVIEW AND HYPOTHESES

Understanding the determinants of technology business incubator (TBI) performance has attracted increasing scholarly attention, particularly in developing economies where startup ecosys-

tems are still evolving. Prior research has highlighted that incubators contribute to innovation and competitiveness by providing access to strategic resources and reducing early-stage business risks (Pattanasak et al., 2022; Sohail et al., 2023). However, empirical findings on which resources matter most remain fragmented and often con-

text-dependent. To build a comprehensive perspective, two theoretical frameworks are central: the Resource-Based View (RBV) and the Knowledge-Based View (KBV).

The RBV posits that organizations achieve sustained performance by leveraging valuable, rare, inimitable, and non-substitutable resources (Hitt et al., 2001). Within the incubator context, these resources include both tangible assets, such as facilities, funding, and infrastructure, and intangible assets, such as networks and reputation. Complementarily, the KBV positions knowledge as a core strategic asset, emphasizing an incubator's ability to create, absorb, and transfer knowledge as a determinant of success (Fithri et al., 2024). These perspectives converge in highlighting that incubator performance depends not merely on resources owned but on how effectively they are developed and utilized.

Empirical evidence confirms the critical role of infrastructure as a foundational resource. Well-equipped physical facilities, such as co-working spaces, laboratories, and business support services, directly enhance startup productivity and incubator legitimacy (Kumar & Ravindran, 2012; Chan et al., 2003; Lalkaka, 2002). In Indonesia, infrastructure also mediates the relationship between university linkages and incubator outcomes (Kiran & Bose, 2020). Access to technology, market information, and capital availability further strengthens incubator performance (Nuraisyah, 2017). These findings suggest that infrastructure acts as both a tangible asset and an enabler of other resources.

Networking has been consistently identified as another strategic resource. Strong external networks provide incubators with legitimacy, facilitate access to partnerships, and enhance financing opportunities (Alpenidze et al., 2019; Zhang & Ayele, 2022). Social and institutional networks are particularly influential in emerging ecosystems, where formal mechanisms of resource access may be underdeveloped (Khayesi & George, 2011). Previous studies confirm that networking intensity is positively associated with incubator performance in multiple contexts, including Indonesia (Gozali et al., 2018; Pattanasak et al., 2022; Lee Hong et al., 2008). Thus, networking

emerges as a critical intangible resource that supports both incubator capabilities and long-term sustainability.

Incubator capabilities encompassing managerial, financial, and service delivery competencies are equally important. These capabilities evolve through continuous learning and interaction with tenant firms (Phan et al., 2005). Prior studies demonstrate that strong capabilities positively influence startup outcomes and incubator performance (Sedyoningsih et al., 2022; Zhang & Yi, 2024; Hu et al., 2023). However, capabilities are not static; they require systematic investment in human capital, organizational routines, and performance measurement systems.

University linkages have also been widely discussed as potential drivers of incubator performance. Such collaborations provide access to academic knowledge, specialized facilities, and mentoring resources (Buys & Mbewana, 2007; Rothaermel & Thursby, 2005). Strong ties with universities and government institutions enhance institutional legitimacy and improve access to resources (Tsai et al., 2009). In Indonesia, university incubators have played a central role in supporting startups, but their actual impact on performance remains underexplored (Hasbullah et al., 2014; Kiran & Bose, 2020).

The existing literature thus reveals a complex but incomplete picture. While infrastructure and networks have been consistently validated as key success factors, the influence of incubator capabilities and university linkages shows more mixed results. In emerging economies such as Indonesia, further research is required to understand how these factors interact, and which resources are most decisive for incubator success.

In summary, the literature suggests that incubator performance is shaped by a combination of tangible resources (e.g., infrastructure), intangible assets (e.g., networks and capabilities), and institutional linkages. However, there is no consensus on their relative importance in the Indonesian context. This study addresses this gap by applying the RBV framework to examine the influence of infrastructure, networking, in-

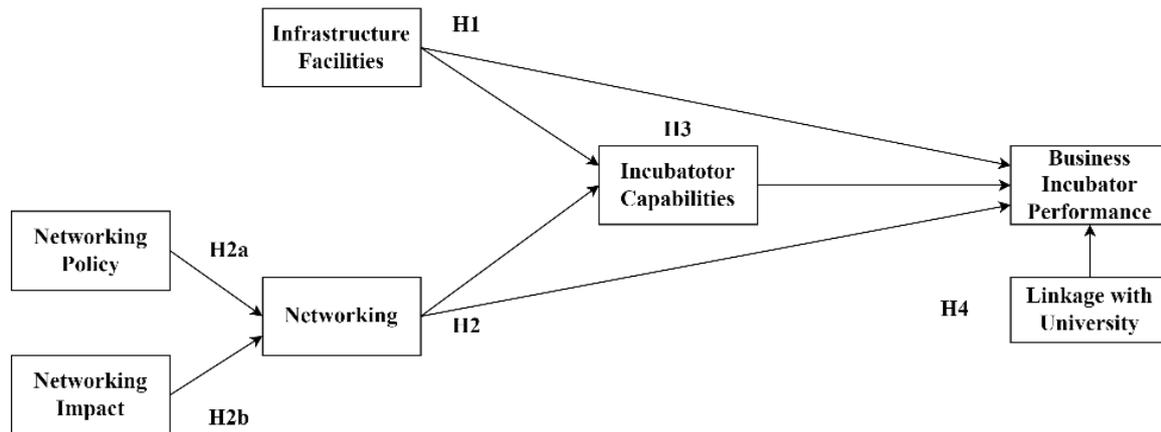


Figure 1. Conceptual framework

incubator capabilities, and university linkages on TBI performance in Indonesia.

Based on theoretical and empirical foundations, this study aims to identify resource-based determinants of incubator performance in Indonesia. Therefore, the following hypotheses are developed from previous research:

- H1: *Infrastructure facilities positively affect incubator performance.*
- H2: *Networking positively affects incubator performance.*
- H3: *Incubator capabilities positively affect incubator performance.*
- H4: *Linkages with universities positively affect incubator performance.*
- H5: *Linkages with universities moderate the relationship between incubator capabilities and performance.*

Drawing on RBV, the conceptual model (Figure 1) positions infrastructure, networking, and incubator capabilities as independent variables influencing incubator performance, with university linkages examined both as a direct predictor and as a moderating variable. This model reflects the theoretical logic that incubator success depends on the effective mobilization of internal and external resources.

2. METHODS

This study employed a quantitative research design to analyze the resource-based determinants of technology business incubator (TBI) performance in Indonesia. The theoretical foundation was the Resource-Based View (RBV), with linkages with universities tested as a potential moderating variable.

2.1. Population and sample

The population consisted of incubators affiliated with the Association of Indonesian Business Incubators (AIBI) and those registered under the Ministry of Research, Technology, and Higher Education (Kemristekdikti). A total of 100 incubators were identified and included in the study. These organizations represented diverse governance models: 62 university-based, 27 government-managed, and 11 privately owned incubators.

Respondents were selected purposively, ensuring that they held strategic or managerial roles within the incubators. The final sample consisted of 48 incubator heads (48%), 41 managers (41%), six directors (6%), four secretaries (4%), and one vice head (1%). The gender distribution was 68% male and 32% female. The respondents' ages ranged from 20 to 65 years, with 54% between 25 and 45 years and 42% between 45 and 65 years. This careful characterization of respondents ensured that the data reflected individuals with direct operational and strategic knowledge of incubator performance.

2.2. Data collection and instruments

Primary data were obtained through structured questionnaires distributed in 2024. The unit of analysis was the incubator organization, with responses collected from key leaders. The instrument measured constructs for infrastructure, networking, incubator capabilities, university linkages, and performance indicators, using a five-point Likert scale. The items were adapted from validated instruments in prior studies (Chan et al., 2003; Lalkaka, 2002; Kiran & Bose, 2020; Gozali et al., 2018).

2.3. Data transparency and availability

Given the breadth of input data, the full dataset, including questionnaire items and anonymized responses, has been uploaded to an open-access repository (Zenodo, 2025) to enhance transparency and replicability. The dataset can be accessed at: <https://doi.org/10.5281/zenodo.17015743>. To our knowledge, this dataset has not been previously published or analyzed in other studies by the authors or external researchers. The exclusive use in this study ensures that the findings are novel and context-specific.

2.4. Data analysis

The data were analyzed using Partial Least Squares Structural Equation Modeling (PLS-SEM) with SmartPLS 4. According to Sarstedt, Ringle, and Hair (2021), the Partial Least Squares Structural Equation Modeling (PLS-SEM) method is a prediction-oriented multi-

variate analysis approach suitable for complex models with non-normal data, small sample sizes, and a combination of reflective and formative indicators. Reliability and validity were assessed through Cronbach’s alpha, composite reliability (CR), average variance extracted (AVE), and discriminant validity tests, following the guidelines of Hair et al. (2014). Bootstrapping with 10,000 resamples was conducted to test the significance of hypothesized relationships.

Table 1 presents the demographic and organizational profile of respondents. The majority of participants were incubator heads (48%) and managers (41%), reflecting a strong representation of strategic leadership positions. This ensures that the data collected reflect informed perspectives on incubator operations and performance. Regarding gender, 68% of respondents were male and 32% female, which is consistent with previous findings that leadership roles in Indonesian incubators remain male-dominated (Gozali et al., 2018). In terms of incubator type, most respondents were affiliated with university-based incubators (62%), followed by government (27%) and private incubators (11%). This distribution reflects the dominant role of higher education institutions in the Indonesian incubation landscape. Age distribution showed that 54% of respondents were between 25 and 45 years, representing early-to-mid career professionals, while 42% were 45-65 years, representing experienced leadership. This diversity enhances the reliability of the dataset by capturing perspectives across different stages of managerial experience.

Table 1. Respondents’ profiles

Variable	Description	Frequency	Percentage (%)
Position	Head of Business Incubator	48	48%
	Manager	41	41
	Director	6	6
	Secretary	4	4
	Vice head of business incubator	1	1
Gender	Male	68	68
	Female	32	32
Type of Incubator	Government	27	27
	Private	11	11
	University	62	62
Age	20-25	4	4
	25-45	54	54
	45-65	42	42

3. RESULTS

A total of one hundred respondents were selected through purposive sampling based on predefined criteria aligned with the study’s objectives. Each participant completed a structured questionnaire using a five-point Likert scale to assess their agreement levels on incubator facilities, networking, capabilities, linkages with universities, and performance.

As detailed in Table 1, the majority of respondents were incubator heads (48%) and managers (41%), with the remaining holding positions as directors (6%), secretaries (4%), and a vice head (1%). The gender distribution was predominantly male (68%), with female respondents comprising 32%. In terms of incubator type, most were university-affiliated (62%), followed by government-operated (27%) and privately managed (11%). The diverse age range of respondents, from 20 to 65 years, indicates a broad spectrum of experience and tenure within the sample.

The study employed Partial Least Squares Structural Equation Modeling (PLS-SEM) using SmartPLS 4 to evaluate the measurement model. The analysis began with tests of reliability and validity, as summarized in Table 2. All item outer loadings exceeded 0.60, except one indicator (F1 = 0.655), which was retained due to its theoretical relevance. One item (FS1) was removed because its factor loading was below 0.5. The model demonstrated strong internal consistency, as evidenced by Cronbach’s alpha values ranging from 0.799 to 0.933 and composite reliability (CR) values exceeding 0.8 for all constructs. Convergent validity was also confirmed, with Average Variance Extracted (AVE) values ranging from 0.5828 to 0.7155, all surpassing the 0.5 threshold.

To further ensure the distinctiveness of the constructs, discriminant validity was assessed using the Fornell-Larcker criterion and the Heterotrait-Monotrait (HTMT) ratio. As shown in Table 3, the square root of AVE for each construct ex-

Table 2. Structural model validity and reliability test

Variable	Indicator	Outer Loading	Cronbach’s Alpha	Composite Reliability	AVE
Business Incubator Performance	BIB1	0.853	0.9325	0.9452	0.7116
	BIB2	0.859			
	BIB3	0.838			
	BIB4	0.803			
	BIB5	0.837			
	BIB6	0.886			
	BIB7	0.826			
Facilities	F1	0.655	0.8298	0.8805	0.5985
	F2	0.836			
	F3	0.682			
	F4	0.833			
	F5	0.841			
Incubator Capabilities	IC1	0.916	0.7990	0.8825	0.7155
	IC2	0.840			
	IC3	0.776			
Linkage With the University	LU1	0.700	0.9077	0.9267	0.6446
	LU2	0.816			
	LU3	0.864			
	LU4	0.860			
	LU5	0.815			
	LU6	0.755			
	LU7	0.796			
Networking	N1	0.906	0.8765	0.9058	0.5828
	N2	0.866			
	N3	0.549			
	N4	0.778			
	N5	0.822			
	N6	0.899			
	N7	0.874			

Table 3. Discriminant validity – Fornell-Larcker criterion

Variables	Business Incubator Performance	Facilities	Incubator Capabilities	Linkage With the University	Networking Impact	Networking Policy	Networking
Business Incubator Performance	0.844	–	–	–	–	–	–
Facilities	0.541	0.774	–	–	–	–	–
Incubator Capabilities	0.345	0.586	0.846	–	–	–	–
Linkage With the University	0.484	0.455	0.563	0.803	–	–	–
Networking Impact	0.611	0.585	0.512	0.620	0.845	–	–
Networking Policy	0.545	0.634	0.595	0.657	0.714	0.790	–
Networking	0.631	0.650	0.586	0.683	0.956	0.887	0.763

Table 4. Discriminant validity – HTMT

Variables	Business Incubator Performance	Facilities	Incubator Capabilities	Linkage With the University	Networking Impact	Networking Policy	Networking
Business Incubator Performance	–	–	–	–	–	–	–
Facilities	0.603	–	–	–	–	–	–
Incubator Capabilities	0.394	0.695	–	–	–	–	–
Linkage With the University	0.506	0.496	0.668	–	–	–	–
Networking Impact	0.669	0.672	0.617	0.695	–	–	–
Networking Policy	0.679	0.828	0.808	0.857	0.939	–	–
Networking	0.685	0.745	0.702	0.770	1.093	1.165	–

ceeded its correlations with other constructs, satisfying the Fornell-Larcker criterion. Meanwhile, HTMT ratios, displayed in Table 4, were all below the threshold of 0.85-0.90 (Hair et al., 2014), indicating that the constructs are conceptually distinct. These results confirm that the measurement model demonstrates convergent and discriminant validity, supporting the robustness of the latent constructs.

The structural model was then tested to evaluate the hypothesized relationships among variables. Bootstrapping with 10,000 resamples was con-

ducted, and the results are illustrated in Figure 2. The analysis revealed that networking substantially affected incubator performance ($\beta = 0.417, p = 0.001, T\text{-statistic} = 6.668$). Facilities also significantly influenced performance ($\beta = 0.342, p = 0.012$). However, incubator capabilities ($\beta = 0.162, p = 0.119$) and linkages with universities ($\beta = 0.087, p = 0.263$) did not directly affect performance statistically significantly. Furthermore, the moderating effect of linkages with universities on the relationship between capabilities and performance was also insignificant ($\beta = 0.091, p = 0.217$).

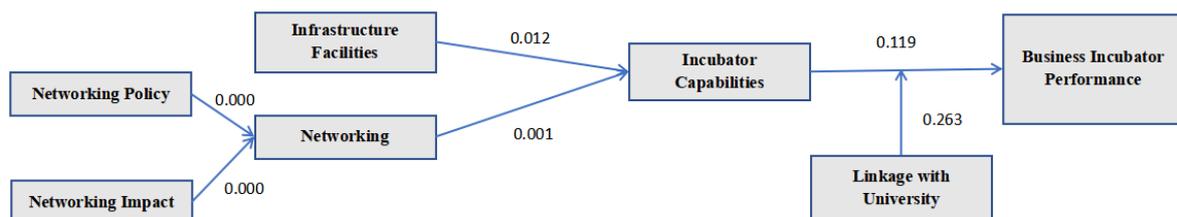


Figure 2. Hypothesis path analysis model

The results demonstrate that networking and infrastructure facilities significantly predict incubator performance. Meanwhile, although theoretically relevant, internal capabilities and university linkages did not show significant direct or moderating effects in this study. The findings underscore the importance of external relational resources and tangible support infrastructure in enhancing the performance of technology business incubators in Indonesia.

4. DISCUSSION

The findings of this study provide empirical evidence regarding the factors that influence the performance of technology business incubators (TBIs) in Indonesia. The analysis revealed a complex interplay between resource-based factors and incubator performance, with some results aligning with previous literature and others presenting unique insights for the Indonesian context.

The most significant finding is the strong positive effect of networking on incubator performance ($\beta = 0.417, p = 0.001$). This result is consistent with a vast body of literature that identifies networks as a strategic resource that enhances an incubator’s legitimacy and ability to acquire other resources. Previous studies by Gozali et al. (2018), Pattanasak et al. (2022), and Lee Hong et al. (2008) have similarly confirmed a positive relationship between networking intensity and incubator performance, which our findings support and strengthen in the context of Indonesia’s maturing startup ecosystem. This suggests that the ability of an incubator to facilitate connections with stakeholders, financing, and partnerships is a primary driver of its success.

The significant impact of infrastructure on incubator performance ($p = 0.012$; see Table 5) confirms that well-developed facilities are not only a physical resource but also an enabler of incubator capabilities. This aligns with previous literature stating that infrastructure, such as co-working spaces, meeting rooms, prototyping labs, and reliable internet, supports incubator activities like mentoring, training, networking, and innovation development (Chan et al., 2003; Lalkaka, 2002; Kiran & Bose, 2020). Strategically located and well-equipped facilities can enhance networking by enabling partnerships with universities, investors, and industries. These findings reinforce that physical resources are a foundation upon which intangible support services can be effectively delivered.

Similarly, the results confirm that infrastructure facilities significantly influence performance ($\beta = 0.342, p = 0.012$). This aligns with prior research by Kumar and Ravindran (2012), Chan et al. (2003), and Lalkaka (2002), which emphasizes the foundational role of physical infrastructure, such as office space and shared laboratories, in incubator success. The finding underscores that tangible support infrastructure is a critical resource that contributes to startups’ productivity and the incubator’s strategic positioning. The study’s results align with the Indonesian-specific finding of Kiran & Bose (2020), which highlighted the mediating role of infrastructure in the relationship between university linkages and incubator outcomes.

However, some of the study’s findings diverge from established literature. The analysis showed that incubator capabilities ($\beta = 0.162, p = 0.119$) and linkages with universities ($\beta = 0.087, p =$

Table 5. Hypothesis test path results

	Hypothesis	Mean	STDEV	T Statistics (O/STDEV)	P Values	Description
H1	Infrastructure Facilities → Business Incubator Performance	0.286	0.111	2.526	0.012	supported
H2	Networking → Business Incubator Performance	0.432	0.126	3.468	0.001	supported
H2a	Networking Policy → Networking_	0.409	0.031	13.660	0.000	supported
H2b	Networking Impact → Networking_	0.671	0.041	16.006	0.000	supported
H3	Incubator Capabilities → Business Incubator Performance	-0.174	0.103	1.560	0.119	unsupported
H4	Linkage With University → Business Incubator Performance	0.157	0.124	1.121	0.263	unsupported
H5	IC*LU → Business Incubator Performance	0.005	0.071	0.093	0.926	unsupported

0.263) did not have a statistically significant direct effect on performance. This contradicts studies by Sedyoningsih et al. (2022), Zhang and Yi (2024), and Hu et al. (2023), who found a positive relationship between strong internal capabilities and startup performance. In contrast, Li et al. (2020) found that incubator capability acts as a full mediator between incubator resources and incubator performance. This means that incubator resources do not directly influence performance, but rather their influence on performance is through the incubator's capabilities.

It also challenges the findings of Buys and Mbewana (2007), Rothaermel and Thursby (2005), and Tsai et al. (2009), who argued that strong ties with universities provide enhanced institutional legitimacy and superior resource access. The insignificance of the direct effect of university link-

ages in this study is noteworthy. It suggests that while a university connection may be theoretically advantageous, its impact on performance is not directly measurable in this sample. Furthermore, the moderating effect of university linkages on the relationship between capabilities and performance was also insignificant ($\beta = 0.091$, $p = 0.217$). This contradicts the idea that university ties necessarily amplify the benefits of internal capabilities.

These findings suggest that in the Indonesian context, external relational resources (networking) and tangible infrastructure are more immediate and impactful drivers of incubator performance than internal capabilities or formal university linkages. The results underscore the importance of external resources and tangible support infrastructure in enhancing the performance of technology business incubators in Indonesia.

CONCLUSION

This study aimed to examine the influence of resource-based factors – specifically infrastructure, networking, and capabilities – on the performance of technology business incubators in Indonesia, using the Resource-Based View (RBV) framework. It also explored whether linkages with universities moderated these relationships. The results demonstrate that infrastructure and networking significantly positively affect incubator performance, while internal capabilities and university linkages were not found to be statistically significant in this context.

These findings suggest that the most critical drivers of incubator performance lie in the availability of high-quality facilities and the strength of relational resources. Infrastructure is a foundational enabler for incubator operations, while strong external networks provide strategic access to knowledge, partnerships, funding, and legitimacy. On the other hand, the limited impact of incubator capabilities and university collaborations may reflect contextual limitations, such as insufficient internal resourcing or weak institutional integration, which reduce their effectiveness.

From a theoretical perspective, the findings reinforce the importance of tangible and intangible resources emphasized in RBV theory. Practically, incubators should focus on enhancing their infrastructure and cultivating strategic partnerships to boost their value proposition to startups. This includes improving physical facilities, designing structured networking initiatives, and optimizing service delivery systems.

Despite these contributions, the study is constrained by the limited number of respondents and the predominance of university-affiliated incubators in the sample. Future research should expand the respondent base to include more incubators from the private and government sectors to deepen the understanding of incubator performance. In addition, incorporating a qualitative or mixed-methods approach is recommended to uncover nuanced insights into the internal dynamics of incubators, contextual barriers, and long-term performance impacts. Such research will provide a more holistic and grounded foundation for designing policies and practices that enhance the sustainability and effectiveness of technology business incubators.

AUTHOR CONTRIBUTIONS

Conceptualization: Syafrizal, Prima Fithri, Alizar Hasan, Donard Games.

Data curation: Prima Fithri.

Formal analysis: Syafrizal, Prima Fithri, Alizar Hasan, Donard Games.

Funding acquisition: Prima Fithri.

Investigation: Syafrizal, Prima Fithri, Donard Games.

Methodology: Syafrizal, Prima Fithri, Alizar Hasan, Donard Games.

Project administration: Prima Fithri.

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