

A Comparative Case Study on Performance Management System in Architecture, Engineering, and Construction Start-up Enterprises in Indonesia

Bernardus Ariono*, Meditya Wasesa, Dina Dellyana, and Wawan Dhewanto
School of Business and Management, Bandung Institute of Technology

Abstract. *Despite a growing sense that start-up enterprise is critical to economic growth, the topic of performance management affects strategic and organizational processes remains largely understudied. In Indonesia, as a sphere where the entrepreneurial ecosystem is on the rise, we explored the strategy of Architecture, Engineering, and Construction (AEC) start-up firms using a Balanced Scorecard (BSC). This research aims to determine how suitable the BSC is applied to AEC start-ups and how this tool is implemented as the enterprise evolves. We conduct in-depth case studies using multiple data sources, including interviews and field observation. By performing the comparative analysis, we identified managerial practices that enable the networking of BSC perspectives – learning and growth, internal process, customer, and financial – during the start-up lifecycle. From the contribution to the literature perspective, this study provides empirical evidence that the BSC is a valuable performance management tool for early-stage firms. However, the BSC must be reconfigured regularly to reflect the current development stage's objectives throughout implementation. As the business implications, this research helps AEC entrepreneurs see the significance of achieving organizational balance to drive growth and transition from agile start-ups to sustainable companies. Future research may examine the interconnection between managerial control systems and leadership attributes in different business contexts.*

Keywords: *AEC firms, Balanced Scorecard, Performance Management System, Start-up Lifecycle*

1. Introduction

The performance management system is an essential element of the Architecture, Engineering, and Construction (AEC) (Underwood & Isikdag, 2010) start-up firms that provide directions and establish potential goals. Not to mention, it supports the implementation of business strategies (Costa & Formoso, 2003). Unfortunately, although the overall construction industry contributes significantly to a country's economy, many companies frequently have inconsistent performance (Chan & Chan, 2004). One of the critical issues is the lack of performance measurement that affects the AEC industry.

The AEC industry is a project-based sector with its workers organized around projects. Companies form project teams that operate outside of the organization's formal structure.

They are quasi-organizations, subsisting collaborating project teams from various organizations (Dubois & Gadde, 2002; Eccles, 1981; Hartmann et al., 2008).

AEC projects are primarily distressed with constructing particular facilities and, as a result, operate in unpredictable, dynamic, and rapidly evolving environments (Kreiner, 1995). Consequently, knowledge from and about the setting is contradictory and sometimes changes. As a result, the needs and goals of various project stakeholders become hazy and vague. It is not easy to formally consider a single or multiple stakeholder's needs, account for business strategies.

A business strategy could be described as the actions that a company aims to perform to reach its objectives, and performance measurement is a tool to oversee the strategy implementation. The most used performance

*Corresponding author. Email: bernardus_ariono@sbm-itb.ac.id
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measurement system in a business entity is Balanced Scorecard (BSC) (Kaplan & Norton, 1992). When the strategy is implemented, the BSC provides insight into benefits for decision-making, assessing, and rewarding performance. In addition, it raises the early warning system whether the strategy is working or not, and it also guides actions to improve the strategy's performance (Atkinson et al., 2012).

Measuring the start-up's performance as a business and its various organizational processes is crucial for building long-term success. Adequate performance assessment ensures that decisions are consistent with company goals and priorities, which serves as the foundation for evaluating and improving performance (Kennerley & Neely, 2002). Based on this discussion, it could be argued that the BSC would prove to be the essential structure that entrepreneurship experts see for measuring AEC start-up efficiency.

BSC as the strategic management tool has been well implemented in developed countries (Fernandes et al., 2006; Henschel, 2006) and established companies (Malina & Selto, 2001; Micheli & Mura, 2017). However, there still limited articles are discussing the implementation of BSC in developing countries, especially in start-ups. So, it would be valuable to investigate how to implement and fit the start-ups in Indonesia.

This paper aims to explore and provide knowledge about performance management in Indonesian AEC start-ups. An in-depth comparative case study was conducted. This paper highlights the most critical areas that drive growth and should be monitored throughout the development to succeed in the short and long term. This study, hence, sets out to learn how AEC start-ups can use BSC to measure and manage their performance efficaciously.

With a comparative case study, this paper contributes by providing a better understanding of performance management in construction service start-ups in Indonesia.

In particular, this study looks at how suitable the BSC is for AEC start-ups and how performance management evolves during the early stages of their development.

This article also aims to contribute with practical recommendations for AEC start-up managers on working with performance management, especially with the Balanced Scorecard to benefit from it. Therefore, we state the following research questions: How suitable is the balanced scorecard as a performance measurement for AEC start-ups? If so, how should AEC start-ups implement it as they evolve?

2 Literature Review

2.1. Performance Management and Balanced Scorecard

Several scholars argue that most research and literature on performance management have focused on large organizations, with only a few studies affecting small and medium businesses (SMEs) (Tan & Smyrnios, 2011). Hudson et al. (2001) argue that there is a need to investigate the validity of current performance management methods for SMEs, such as the Balanced Scorecard (BSC), to determine the most suitable planning and action fulfillment.

The application of BSC to SMEs in developed countries has attracted the interest of several researchers. Fernandes et al. (2006) studied the use of BSC in the manufacturing sector in the UK. Meanwhile, Henschel (2006) conducted BSC research for SME's risk management in Germany. Gumbus and Lussier (2006) also explained how US entrepreneurs use the BSC to translate business strategies into performance measures.

Tan and Smyrnios (2011) are raising an argument that fast-growing SMEs can emphasize different performance measures at various stages of their organizational growth, a topic that is argued to require further study. Lonbani et al. (2016), Gumbus and Lussier

(2006) raised advanced research into the BSC in the context of small entrepreneurial organizations, which is particularly important for start-ups. BSC's universal and comprehensive viewpoint makes it suitable for all industries.

Kaplan and Norton (2004) stated that an organization's strategy explains how it generates value for its owners, consumers, and people. In the development process, they also mentioned other examples of intangible assets for generating long-term value, e.g., human capital; databases and information systems; responsive, high-quality processes; consumer relationships and brand images; creative capabilities; and culture.

Many studies have centered on large private companies in terms of analytical contexts, mainly to determine the planning, fulfillment, and use of BSC (Malina & Selto, 2001; Micheli & Mura, 2017). Some argued that scorecards could be correspondingly helpful in small and large businesses (Basuony, 2014; Giannopoulos et al., 2013; Gumbus & Lussier, 2006).

For illustration, Basuony (2014) claims that the key advantage of using the BSC is that it emphasizes the company's vision and strategic goals. It starts a discourse about the business model's underlying assumptions. Similar to the case study undertaken by Bianchi and Cosenz (2013), it concludes that effective performance management system design and implementation will contribute to the recognition of strategic resources that drive performance and long-term growth.

Measurement is crucial for successful decision-making to analyze progress against defined goals and objectives in a quantifiable method, leading to business effectiveness and efficiency (Baluch et al., 2010). Suprpto et al. (2009) investigated the BSC as a performance monitoring system in small firms. SME performance must be measured to improve service to customers, employees, societies, and stakeholders. Start-ups as innovation-driven enterprises are closely related to

performance measurement to support their business sustainability (Rijanto, 2018).

Since the development of start-ups affects their strategies, the literature review also appears to look at organizational growth. BSC must be tailored to development stages because different stages need different approaches. As a result, this literature review addresses start-up lifecycle models, which divide organizational growth into different advancement stages to demonstrate how BSC implementation can evolve.

2.2. Start-up Lifecycle Models

Entrepreneurship is concerned with idea generation, creativity and innovation, new products or services development, and opportunity. As a result, entrepreneurship theories are more likely to be considered in any business or organization's early stages. A start-up is typically characterized as a new and underdeveloped company with limited resources. It is vital in entrepreneurship studies such as new venture growth, value creation, opportunity identification, assessment, and exploitation to understand how to transform ideas into businesses.

Start-ups are diverse and dynamic, and they have a lifecycle of their own. Salamzadeh and Kawamorita (2015) present a holistic perspective to better understand the lifecycle of start-ups. The first stage (Bootstrapping) can be described as an innovative approach to obtaining capital without borrowing. The second stage (Seed) can be characterized as initial capital for a product or service. Finally, the start-ups (Creation) stage is described, whereas the business sells its products or services, enters the market, and recruits its first employees.

An organization/firm is founded at the end of this point, and corporate finance is considered the primary financing method. However, entrepreneurs face some challenges throughout this lifecycle process (Salamzadeh & Kawamorita, 2015). The typical challenges are financial, human resources, support mechanisms, and environmental elements.

From our literature review findings, it became apparent that the performance management system, BSC as a performance measurement tool with its strategy map, and start-up lifecycle models can generally apply to various stages or sizes of the companies and different types of industries. However, despite these apparent linkages, a gap needs to be investigated further, particularly for empirical inquiry of start-ups in the AEC sector. We address this gap by developing a theory on how AEC firms manage performance during their start-up lifecycle by implementing the BSC and designing the strategy map.

3. Methodology

3.1. Research Design and Strategy

We adopt a qualitative approach based on the

comparative in-depth case study to build an AEC start-up's balanced scorecard theory. It aligns with this research's focus on understanding how the synergy between BSC perspectives facilitates start-ups to manage performance effectively. The direct experiences of start-up managers operating within the targeted industry are devoted to a better perceptive of the AEC sector's typical characteristics, traits, and owners/entrepreneurs.

Figure 1 portrays a flowchart of this study's research design. This study applies the case study analysis to answer the research question due to its relevance and suitability for studying contemporary phenomena within real-life contexts. The researchers have no control over the research objects' behavior (Yin, 2009).

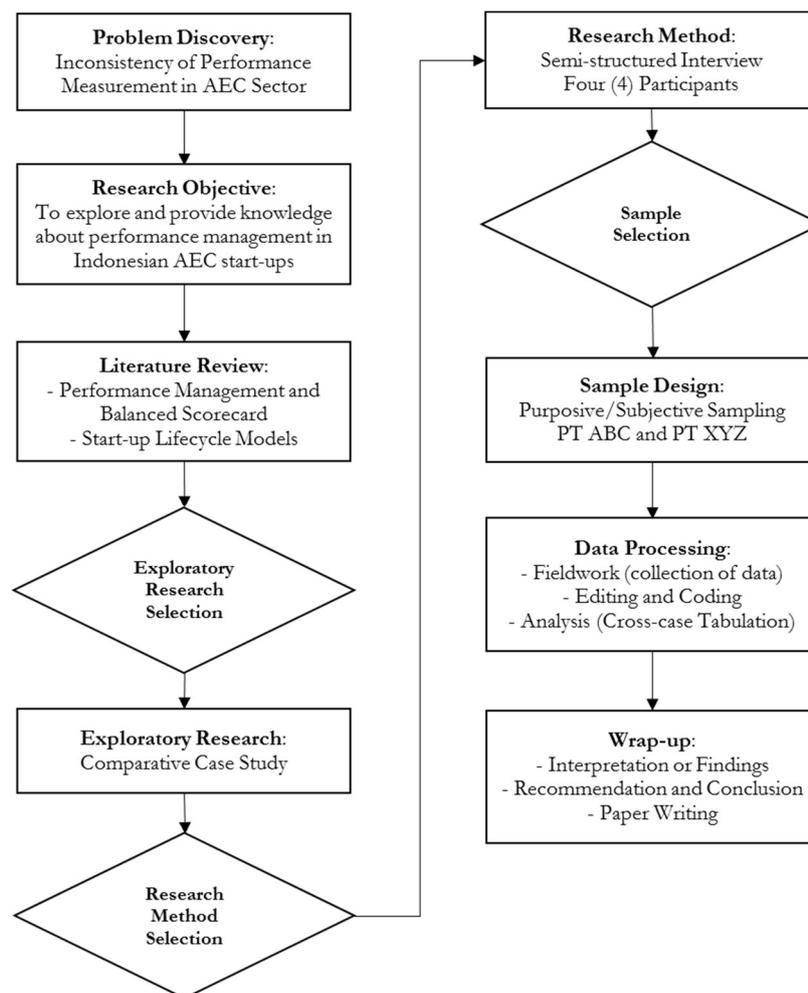


Figure 1.
Research Design Flowchart

We investigated two start-ups, PT ABC and PT XYZ. Three criteria were used to select these firms for our study. First, the company must be new and underdeveloped to meet the criteria of a start-up. Thus, we selected 2-3 years old firms listed within AEC's business association in Indonesia. Second, the firm had to be active in doing some AEC projects. Finally, certified engineers must support the start-ups so that performance management investigation becomes relevant to the company's competencies. The researchers are aware of this sampling's associated limitations. Since we only interviewed two companies interested, the analytical results could be biased. The AEC start-up managers who took part in this study are interested in this area because they have extensive expertise in this domain. Thus, ambiguous findings in well-implemented or inadequately performance management can be avoided.

3.2. Data Collection

The study employed an exploratory approach with semi-structured interviews to learn how the AEC start-ups perform with BSC assessment tools. Start-up assessment usually begins with the researcher asking the participant to explain the business and its path since its founding. The interviewer then diverts the discussion toward how performance appraisal has been carried out in the company's journey.

Next, the investigator asks open-ended questions and allows respondents to reply by explaining their terms. Finally, after the case studies are completed and summarized as BSC models, the authors contact the participants to review and ensure correct information. Data were collected through online semi-structured interviews with the company's board members (see Table 1).

Table 1.
Research Participants and Data Collection

Sample	Position	Interview	Duration
PT ABC	CEO	Semi-structured (online)	51 min
	COO	Semi-structured (online)	53 min
PT XYZ	CEO	Semi-structured (online)	46 min
	COO	Semi-structured (online)	58 min

PT ABC and PT XYZ were established in 2019. Since its establishment until today, PT ABC has worked on six projects. The project types vary from industrial, commercial, and port buildings with a total project value of IDR 1.2 billion. At the same time, PT XYZ has worked in four oil and gas infrastructures with a cumulative project value of IDR 3.5 billion. Thus, these two companies have played a significant role in Indonesia's construction sector within two years.

The case studies written to the management team focus on identifying AEC start-ups' lifecycle, challenges, strategic objectives, and key performance indicators (KPIs). Observation data consists of internal files, business plans, and companies' reports.

3.3. Data Analysis

By proposing the BSC development for PT ABC and PT XYZ, it will identify the strategy, KPIs, and how it can create value. BSC development for strategic use is started from the company's vision. The vision represents the ultimate goal of start-up creation in AEC firms. As the vision's subset, the BSC four perspectives serve as the mission guide, representing the organization's pursuing value explicitly. These essential perspectives of BSC are the foundation for performance measurement. However, they could be revised and reconstituted according to the start-up life cycle stages to define the objectives and KPIs progressively.

For data analysis, the interviews were transcribed. The researcher then organized the records and notes from each meeting to analyze them. The critical interpretive procedures involved coding text from distinct antecedents into themes in the literature on performance management, BSC perspectives, and start-ups' lifecycle models.

The coding results are used to develop the BSC of both PT ABC and PT XYZ. Finally, the BSCs are discussed using comparative viewpoints to assess and consider similar or contrary explanations by looking at the constructs of the empirical evidence. It is done by conceptualizing and generalizing the categories or themes that emerged.

The entire research interrelates between data collection, analysis, and interpretation, with the participants' initial findings being discussed and validated regularly. In many ways, the amount was taken with the company, the research design's participatory nature, and the variety of data collection methods improved the data analysis's trustworthiness and reliability.

The data were first triangulated through different sources and methods to minimize bias. Second, the results were continually checked through discussions with the participants. The case study, for example, was presented to all executives, and their input influenced the subsequent review. Lastly, the deep entanglement to the case made it possible for researchers to understand PT ABC and PT XYZ's organizational dynamic cultures, thereby creating an interpretive basis for analyzing the results.

4. Finding and Discussion

4.1. Vision and Mission of PT ABC and PT XYZ
Analyzing the organization's vision with the performance management framework enables the development of a growth strategy. Based on transcription coding, the interpretative start-ups' vision as a strategic guide is then deployed into missions that cover all of the business perspectives from the Balanced Scorecard (see Table 2):

Table 2.
Vision and Mission of PT ABC and PT XYZ

Balanced Scorecard	PT ABC	PT XYZ
Strategic Guide	Vision To become a leading national company providing design engineering and project management services through innovation and sustainability development in Indonesia.	To become a multinational company in providing integrated services (Engineering, Procurement, and Construction/EPC) through the application of science and technology.
Perspective Financial	Mission Fulfilling shareholders' value by achieving business growth and productivity above the industry average	Achieving growth through steadily increased sales, profits, asset utilization, and business value
Customer	Getting customer satisfaction by producing high-quality services, competitive, and environmentally friendly	Realizing customer satisfaction by working timely, with high quality and accuracy manner, focus on budget efficiency and effectiveness

Table 2. (Continued)
Vision and Mission of PT ABC and PT XYZ

Balanced Scorecard	PT ABC	PT XYZ
Internal Business Process	Using a multidisciplinary approach to examine and manage project lifecycle from a feasibility study, design engineering, construction, and concerning for bio-enviro economic impact	Completing each challenge, maintaining the quality standard, improving technology development, innovating, empowering the community, and protecting the environment
Learning & Growth	Developing fully dedicated, competent, and outstanding human resources, continuous improvement as organizational culture	Developing firm organization capability, trained human resources, building cooperation mutually, and growing with partners

Driven by the construction market in Indonesia, the two founders saw opportunities to develop their own company. Both of them have similar engineering education and services backgrounds. However, these two companies' focus has different in services profile, purpose, and target market.

"I created the engineering consultant. Our competencies in engineering, right. They are some former clients of our previous company, some retail industries that still need our services. They do know me, and they know my team. That is what we are trying. Taking the chance to make a start-up with PT ABC." **(CEO, PT ABC)**

PT ABC focuses as a consultant (construction planner and supervisor), while PT XYZ focuses as a contractor (construction builder). PT ABC's vision is to be an independent company operating on a national market. Meanwhile, PT XYZ's vision is to attract foreign investors to invest in the Indonesian construction sector.

"A construction company that started from a medium-scale. Because as a start-up, it was allowed to make a company in medium class, no need to be from small. With the hope that the goal is within the next five years, this company can sustain growth. We have an intention that we will sell this company. After that, we offer the foreign companies to invest here in Indonesia." **(CEO, PT XYZ)**

As start-up companies, these differences have an impact on their life cycle. However, at the bootstrapping stage, the role and effort of PT ABC's founder are immense.

"Well, now I am at the managerial level. When I got a project, I tried hard to find the executor level for the start-up. I am assisted by some friends I know and with all kinds of backgrounds. Yes, we also went down to the executor level." **(CEO, PT ABC)**

Forms of consulting services are still possible using low investment. However, on the other hand, the contractor service chosen by PT XYZ is more capital intensive. Thus, an angel investor and partnering scheme's role becomes more significant than the individual efforts.

"At PT ABC, the principle is to survive. With consulting services, we can still survive and work. It is not as risky as a construction company that requires a large amount of capital." **(COO, PT ABC)**

"Construction work is capital intensive. Our network finds orders. Financially, we are backed up by a foreign investor." **(COO, PT XYZ)**

We portray the comparative analysis between PT ABC and PT XYZ's vision and mission based on five dimensions: the service, original purpose, target market, prominent role in bootstrapping stage, and investment in Table 3.

Table 3.
Vision and Mission Comparative Study

Themes	PT ABC	PT XYZ
Services offered	Consultant (construction planner and supervisor)	Contractor (construction builder)
Original purpose	Independent company	Attract foreign investors to invest in Indonesia
Target market	National	Multinational
Prominent role	Founder – an individual effort to some extent	Angel investor and partner
Investment	Low investment	Capital intensive

4.2. Balanced Scorecard of PT ABC and PT XYZ throughout the Start-up Lifecycle

The BSC translates the organization’s plan into specific goals. The start-up manager must restructure the program according to its current growth objectives to determine the expected performance. Therefore, the critical problem around the BSC is identifying areas in which the start-up would excel in achieving its current strategic goals. Both PT ABC and PT XYZ have minimum knowledge of implementing a performance measurement system. However, they have similar awareness to investigate this system further.

“We have not measured our start-up performance yet. Our orientation is only making money and how to make a portfolio

for the company, as well as adding to our experience” (COO, PT ABC)

“From my perspective, it is essential to have this measurement system like a balanced scorecard and so on. One important thing is to measure the performance itself.” (COO, PT XYZ)

The researcher then helped present a balanced scorecard in Table 4. It can be noticed that performance measurements surge as the AEC start-up evolves. It happens because, during the bootstrapping phase, all start-ups are primarily determined by the internal business process’s goals and are, to some degree, driven by the consumer perspective.

Table 4.
BSC Development Throughout the Start-up Lifecycle

Balanced Scorecard		Start-up Lifecycle Stages					
BSC Perspectives		Bootstrapping		Seed		Creation	
		PT ABC	PT XYZ	PT ABC	PT XYZ	PT ABC	PT XYZ
Financial	Objective	Seek funding from the internal team	Seek funding from external parties	Monetize Bootstrapping activities	Monetize Bootstrapping activities	Sustainable business model, scale-up	Sustainable business model, scale-up
	Challenge	Persuade friends or families	Propose good teaser	Manage income properly	Get sufficient working capital.	Maintain recurring income	Establish financing
Customer	KPI	Minimum Net Worth 300 Mio IDR	Minimum Net Worth 1 Bio IDR	Operational revenues and costs	Operational revenues and costs	ROI, profitability, cash flow	ROI, profitability, cash flow
	Objective	Build a customer base	Assess market demands	Get repeat order and develop an image	High interaction with the market segment	Increase Market share	Increase Market share and expand to other markets
	Challenge	Maintain a good relationship	Find advance networking	Build trust with existing customers	Compete with existing competitors	Service availability	Maintain service and partnership

Table 4. (Continued)
BSC Development Throughout the Start-up Lifecycle

Balanced Scorecard		Start-up Lifecycle Stages					
BSC Perspectives		Bootstrapping		Seed		Creation	
		PT ABC	PT XYZ	PT ABC	PT XYZ	PT ABC	PT XYZ
Customer	KPI	Service experience	Market activities	Customer complain handling	Customer outcome measures and market activities	Market share, Customer satisfaction	Market activities, Customer satisfaction
	Objective	R&D according to the customer base and service quality	R&D according to market demands	Enhance innovation and customer management processes	Enhance operation management, regulatory, and social processes	Prepare the organizational infrastructure for the upcoming growth	Prepare the organizational infrastructure for the forthcoming growth
Internal Business Process	Challenge	Design service innovation	Develop supply chain	Teamwork alignment	Establish standard quality	Advance technology	Coordination, risk management
	KPI	Service attributes, price, quality, time	Service attributes, price, quality, time	Internal work processes	Commercial capacity	Efficiency of the organizational operations	Efficiency of the organizational operations
Learning & Growth	Objective	Develop a working culture	Information and business skill mastery	Recruitment	Organization development	Keep & attract competent talent	Keep functional business resources
	Challenge	Leadership management	Knowledge management	Talent search	Complete managerial function	Reward and achievement	Sufficient payment and agreement
	KPI	Collective spirit and motivation	Managerial capability	Recruitment process	Organization development process	Number of employees, HR competencies	High-quality organization alignment

“The role of our leaders in my previous company was brought to me. To run this start-up, we take whatever the work is. It is still true that the character of my old company shapes my character. I make a new company almost the same as the old company.” (CEO, PT XYZ)

“PT ABC’s principle is to survive and make money. There are several potential clients that we still know and have good relations with them. That is what we protect and maintain.” (CEO, PT ABC)

They are followed by the seed period, in which the customer and internal perspectives become the driving forces behind good financial results.

“It means that when we get a job, we can make the process follow the client, follow the sequence or flow, or follow the client’s culture. It is like that which will build our internals.” (COO, PT XYZ)

Finally, the stage of creation represents the goal of the start-up to create a profitable company that performs well in the short and the long term, shown in Figure.2.

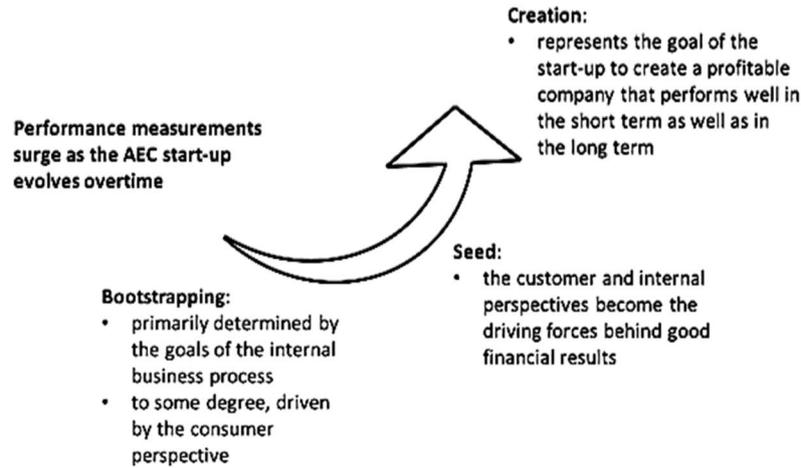


Figure 2.
Performance Measurement during Start-up

The difference between PT ABC and PT XYZ during this start-up development is evident in resource utilization. PT ABC is more dominated by internal resources, while PT XYZ by external resources. PT ABC puts forward a focus strategy to improve core competencies. The gradual improvement reduces the impact of business risks, so they have the opportunity to achieve sustainability.

Meanwhile, PT XYZ plays the role of an agent in a larger business ecosystem. The differentiation strategy makes it possible to expand the scope and scale of their business even further. The speed of growth supported by the network and supply chain system will increase the valuation and attractiveness for high investment and venture capital. The comparative study between PT ABC and PT XYZ based on the Balanced Scorecard throughout the Start-up Lifecycle is portrayed in Table 5.

Table 5.
Balanced Scorecard Comparative Study

Themes	PT ABC	PT XYZ
Resources utilization	Internal (e.g., contributor, customer base, service quality)	External (e.g., angel investor, market demands, supply chain network)
Strategy management	Focus strategy: to improve core competencies	Differentiation strategy: to expand the scope and scale
Capabilities development	Gradually in a solid consumer base	Speed of growth in a large business ecosystem
Risk profile	Low risk	Medium to high risk
Target orientation	Sustainability	High valuation and attractiveness

The literature reveals that using the BSC has numerous advantages, especially for small businesses taking a longer-term view (Basuony, 2014), supporting the innovation and strategy implementation (Tan & Smyrniotis, 2011). The empirical findings correlate to some part of the BSC's supporting position. The advantages of performance assessment are well understood

by all start-ups in this study (Atkinson et al., 2012). Both start-ups employ measurements relevant to several BSC viewpoints, but none has a solid vision of using them appropriately. As start-ups merely track the most pertinent indicators from their primary activity, monitoring is still not complex. PT ABC and PT XYZ have similar KPIs for financial and internal business processes.

Related to the customer perspective, PT ABC emphasizes customer satisfaction which is expected to drive market share expansion. At PT XYZ, market activities have become the main agenda since the business operation is built on many strategic partnerships.

“We are explaining to our customers that we are a start-up. We are a small company, right. However, we have a background from a large company that initially had a pretty good quality of work and networking. So yes, there are several potential projects that we can get and work on in the future. That is what we do.” (CEO, PT ABC)

“PT XYZ was initially founded to create large-scale engineering, procurement, and construction (EPC) contractor company. It would later be offered to purchase by investors. Our background is never specific, a specialist or expert in one field. We have

project management skills, and we manage people and teams. Yes, that is how it can still be done.” (CEO, PT XYZ)

Likewise, PT ABC encourages employees’ competency from the learning and growth perspective. At the same time, at PT XYZ, it is more about high-quality organization alignment, as portrayed in Table 6.

“To create an engineering company, it needs to complement each other’s personnel skills. Maybe some are good at electrical, and some are good at mechanical, or anything, right.” (COO, PT ABC)

“The resource was an organization. An organization to run and execute. The strategy was to combine the employees we hired with several engineers who were not employees but only as subcontractors of professional experts.” (COO, PT XYZ)

Table 6.
KPI and Strategy Map Comparative Study

Themes	PT ABC	PT XYZ
Customer perspective	Emphasizes customer satisfaction which is expected to be a driver of market share expansion	Market activities become one of the main agenda since the business operation is built on many strategic partnerships
Learning and Growth perspective	Encourages more on employees’ competency	Develops high-quality organization alignment

The BSC emphasizes non-financial drivers when making strategic decisions (Kaplan & Norton, 2004). This study confirms that AEC start-ups’ growth is more important than profitability during the early years. With time, the necessity of profitability grows simultaneously with a balance between expansion, profitability, and control, which is enabled by the BSC.

As stated in the previous section, there were challenges during the start-up experienced by PT ABC and PT XYZ.

“I manage this company myself. I run on my own, and it is not smooth because of the

obstacles in the start-up stages. It is still rare or difficult to find the people or parties who can become accelerators that provide engineering skills, business training, networking, and support the development of my company faster.” (CEO, PT ABC)

“The constraints during the initial phase did occur. They must be acknowledged, passed, and carried out. It is mostly on financial, as well as human resources. Also, do not forget the pandemic. Just as we were starting a business, Covid-19 suddenly appears.” (COO, PT XYZ)

The study results showed that PT ABC and PT XYZ experienced similar challenges, such as human resources, financial, support mechanism, and environmental (Salamzadeh & Kawamorita, 2015).

5. Conclusion

This study explores performance management practices in Indonesian AEC start-up firms. It investigates the use of the balanced scorecard (BSC) model during the start-up lifecycle phase. In these cases, BSC's interdependence and complementarity aided the organization in balancing many contrasting perspectives: the quest for new opportunities, internal and external climate, direction, and innovation (Gumbus & Lussier, 2006; Lonbani et al., 2016; Tan & Smyrnios, 2011). In addition, the BSC also serves as a tool for organizing intellectual thinking processes to examine the relevancy of the organization's fundamental goal, strategy, and operation assumptions (Bianchi & Cosenz, 2013).

In response to the research question: "How suitable is the balanced scorecard as a performance measurement for AEC start-ups?" this study contributes to the literature by providing empirical findings. It supports the claim that the BSC can indeed be implemented as an effective management tool for early-stage AEC companies. To successfully execute the desired strategy, start-up managers must translate their plan into specific financial and non-financial measurements.

For the following question: "How should AEC start-ups implement it as they evolve?" it should be understood that the BSC must be tailored to the current and specific needs of the start-up. The BSC must be continually restructured and aligned according to the objectives of the current stage of the company's development.

The different types of services and risk profiles selected by several AEC start-ups in Indonesia lead to different performance

management approaches. For example, in the PT ABC case, the strategic path that must be taken during the start-up process is more influenced by internal factors, e.g., founder, employee competencies, and service innovation. On the other hand, in the PT XYZ case, the performance management process is heavily influenced by external factors, e.g., angel investors, market demands, and supply-chain systems. These factors will have an impact on their achievement targets in the future.

Start-up managers can use the findings of this study as a practical reference in implementing BSC, particularly in the AEC business contexts. The model provides a tool that can guide developing and implementing the BSC throughout the start-up process, but it must be carefully tailored to the firm's specific strategy. It will enable AEC entrepreneurs to understand better their firm and how their current efforts affect their short-term performance. Finally, AEC entrepreneurs will see the importance of balancing organizational operations to drive growth and transition from an agile start-up to a long-term enterprise stage.

This paper expands awareness of the value of using BSC in start-ups as a tool to achieve strategic orientation, supplemented by an assessment of the company's vision and mission for the next few years. Building an AEC business from a start-up requires a high level of commitment. This study provides insights that specialization in the early stages will help entrepreneurs plan better. AEC entrepreneurs are strongly recommended for the business process to build good projects experience and relationships with other parties, especially clients and suppliers.

As previously stated, there is a lack of research on the adoption of the BSC in start-ups. Tan and Smyrnios (2011) advocate for more research on how fast-growing small and medium-sized businesses employ performance assessments at different stages of their organizational development. With empirical findings from start-ups in the

Indonesian AEC industry, this study fills the literature gaps by giving empirical insights into the suitability of adopting the BSC in AEC start-up enterprises.

More qualitative, quantitative, or mixed-method studies are required for future research to see whether the BSC viewpoints explored in this study are also applicable in other business contexts. The managing director's prominent position in a start-up company indicates that examining the relationships between managerial control systems and leadership attributes can be a prospective topic for future research.

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