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Beyond Financial Metrics: A Balanced Scorecard Approach To Measure Technology Business Incubation Performance

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Abstract

This study examines the causal relationships among the four perspectives of the Balanced Scorecard (BSC) and their impact on Business Incubation Centers (BICs) performance in Pakistan. Quantitative data analysis was conducted using Smart PLS software and independent-samples t-tests. Qualitative data analysis utilized Leximancer software. The findings reveal that innovation and learning positively influence financial performance and internal business performance. However, customer satisfaction does not directly impact financial performance. Notably, internal business performance mediates the relationship between innovation and learning, and financial performance. The research underscores the importance of collaboration between BICs and stakeholders, emphasizing that improved financial transparency fosters stakeholder trust. The BSC framework presents a valuable tool for the government to conduct comprehensive evaluations of BICs performance. The study's novelty lies in its application of the four-perspective BSC framework to measure BICs performance in Pakistan, where it has not been previously implemented.

Keywords: *Finance, Customers, Internal processes, Growth, Learning.*

1. INTRODUCTION

Organizational changes are constant for both government and private organizations, requiring creativity and efficient management to ensure their survival and growth. (Camilleri, 2021; De Jesus Alvares Mendes Junior & Alves, 2023; Javed et al., 2020; Lin et al., 2020; Rompho, 2020). Moreover, to secure a long-term competitive edge in the market, management focuses on adapting to the challenges implementing sustainable practices and fostering organizational resilience (Rompho, 2020; Smulowitz et al., 2019). By overcoming barriers embracing change and integrating sustainability into operations firms and government bodies can enhance their performance, anticipate emerging issues and drive innovation towards economically and environmentally sustainable outcomes (Aly & Mansour, 2017; Hair et al., 2019; Peris-Ortiz et al., 2019; Rompho, 2020; Shmueli et al., 2019). Furthermore, effective change management processes are essential for managing these changes in ensuring long-term survival and success in a competitive market. (Alolah et al., 2014; Hatry, 2016; Stewart, 2016; Wake & John, 2015).

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In order to improve management practices, organizations adjust their organizational processes and values in response to the changes. (Camilleri, 2021; De Jesus Alvares Mendes Junior & Alves, 2023; Javed et al., 2020; Lin et al., 2020). Managers should priorities organizational control initiatives in order to maintain a balance between performance and compliance requirements. Transforming organizational strategic objectives and mission into financial and non-financial performance indicators and dimensions is necessary for organizational performance evaluation and measurement, which is necessary for sustainable administrative control.(De Jesus Alvares Mendes Junior & Alves, 2023; Hair et al., 2019; Rompho, 2020; Shmueli et al., 2019; Velasco Burgos et al., 2019).

To maintain accountability and efficacy, performance measurement is a necessity for non-profit management organizations, especially BICs in HEIs (Alolah et al., 2014; Aly & Mansour, 2017; Hatry, 2016; Stewart, 2016; Wake & John, 2015; Zhoor et al., 2017). Financial and non-financial indicators, with a focus on organizational rules, legal commitments, and utilization of resources, can be used for performance evaluation. (Aly & Mansour, 2017; Hair et al., 2019; Kankaras, M., Stojkovic, D., & Kovac, 2014; Velasco Burgos et al., 2019; Yüksel & Coşkun, 2013). Moreover, strategic planning, decision-making, performance measurement and evaluation strategic risk management and continuous improvement are essential components of performance measurement (Hatry, 2016; Stewart, 2016; Wake & John, 2015; Zhoor et al., 2017) .

Critical thinking is a crucial skill for the startup founders, particularly in the 21st century, as it enables them to analyze information, evaluate solutions, and make informed decisions (Camilleri, 2021; De Jesus Alvares Mendes Junior & Alves, 2023; Javed et al., 2020; Lin et al., 2020; Rompho, 2020). Developing critical thinking skills in the entrepreneurs involves various strategies, including asking questions, encouraging decision-making, working in groups, incorporating different points of view, connecting different ideas, inspiring creativity, and brainstorming (Alolah et al., 2014; Kankaras, M., Stojkovic, D., & Kovac, 2014; Wake & John, 2015; Yüksel & Coşkun, 2013). Business Incubation is a critical driver of economic growth and success, making it essential to improve incubation centers performance and accountability (Alolah et al., 2014; Hatry, 2016; Stewart, 2016; Wake & John, 2015; Zhoor et al., 2017). This requires a focus on both financial and non-financial performance indicators, including resource utilization, regulatory compliance, and the achievement of organizational targets (Camilleri, 2021; De Jesus Alvares Mendes Junior & Alves, 2023; Javed et al., 2020; Lin et al., 2020; Rompho, 2020).

There are significant research gaps concerning the performance assessment of the incubation centers in Pakistan, which is consistent with the country's circumstances (Ali & Brandl, 2017; Farooq et al., 2017; Ismail, 2020; Mohsin et al., 2022; Muhammad et al., 2023). While there is a strong emphasis on academic aspects such as curriculum and the learning process in Higher Education Institutions (HEIs), there is limited research on business incubation center related to performance management (Farooq et al., 2017; Mohsin et al., 2022). Performance is a critical aspect of achieving high-quality impact, and optimizing financial management can enhance the quality of services (Cecere et al., 2020, 2020; Ruiz-Dotras & Lladós-Masllorens, 2022, 2022). The lack of comprehensive research on business incubation centers performance management in Pakistan, similar to other developing countries, highlights the need for further studies to develop effective management practices in Technology Business Incubation (De Jesus Alvares Mendes Junior & Alves, 2023; Kankaras, M., Stojkovic, D., & Kovac, 2014; Zhoor et al., 2017). This gap underscores the importance of

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exploring strategies to improve performance to ensure transparency, accountability, and ultimately enhance the quality of business incubation centers in Pakistan (Javed et al., 2020; Shmueli et al., 2019).

The Balanced Scorecard (BSC) model is a framework that guides organizational strategy by discussing each perspective and utilizing educational resources (Kankaras, M., Stojkovic, D., & Kovac, 2014; Zhoor et al., 2017). The BSC model provides multiple attributes of BICs performance by combining financial and non-financial metrics to assess effectiveness of the operations towards achieving outlined objectives (Hashemi Petrudi et al., 2022; Li & Guo, 2022; Mohsin et al., 2022; Muhammad et al., 2023). Hence, the BSC model includes four perspectives: financial, customer, internal process, and learning and growth (Camilleri, 2021; Hashemi Petrudi et al., 2022; Javed et al., 2020; Li & Guo, 2022; Slamet & Esha, 2022). The financial perspective focuses on financial performance and resource utilization (Li & Guo, 2022; Smulowitz et al., 2019, 2019). The customer perspective assesses how the organization meets the needs and expectations of its stakeholders (Li & Guo, 2022; Velasco Burgos et al., 2019). The internal process perspective evaluates the efficiency and effectiveness of the organization's operations (De Jesus Alvares Mendes Junior & Alves, 2023; Mohsin et al., 2022; Muhammad et al., 2023). The learning and growth perspective focuses on the organization's ability to learn, adapt, and improve (Rompho, 2020). By integrating these perspectives, the BSC model provides a comprehensive view of incubation Centre performance that helps the managers to make informed decisions to improve quality of services (De Jesus Alvares Mendes Junior & Alves, 2023; Li & Guo, 2022; Mohsin et al., 2022; Muhammad et al., 2023; Slamet & Esha, 2022).

Performance indicators are crucial for the evaluation, improvement, and innovation of actions that aimed at achieving key objectives, such as providing quality services and incorporating technology (Camilleri, 2021; Chauhan et al., 2022; Fachururaji & Fachururaji, 2023). The Balanced Scorecard (BSC) is a strategic management tool that has been widely adopted by private and public organizations, including those in the service industry such as banks, airlines, and hospitals since its introduction in 1992 (De Jesus Alvares Mendes Junior & Alves, 2023; Muhammad et al., 2023). The BSC provides a comprehensive framework for measuring organizational performance by combining financial and non-financial data to assess manager and students learning, program effectiveness, and incubation center operations (Camilleri, 2021; González-pérez & Ramírez-montoya, 2022; Javed et al., 2020; Li & Guo, 2022; Lin et al., 2020; Rompho, 2020). The Balanced Scorecard (BSC) has found extensive application in diverse sectors, including public-sector organizations, nonprofit organizations, armed forces, and educational institutions, as a tool for performance measurement and strategic management (Camilleri, 2021; De Jesus Alvares Mendes Junior & Alves, 2023; Rompho, 2020).

The BSC has been used to measure business incubation center performance in developing countries, where it has shown cause-and-effect relationships between the tenant firms, internal processes, and learning and growth perspectives (Fachururaji & Fachururaji, 2023; Ismail, 2020; Muhammad et al., 2023). However, the performance measurement framework of BICs involving BSC has not been extensively tested in developing countries like Pakistan, whereas incubation Centre managers lack the necessary skills to manage BICs due to lack of training (Farooq et al., 2017; Mohsin et al., 2022; Muhammad et al., 2023).

The study sought to examine the correlation between incubation Centre performance and the four perspectives of the Balanced Scorecard (BSC), including innovation and learning,

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internal processes, customers, and finance (Farooq et al., 2017; Karathanos & Karathanos, 2005; Park & Gagnon, 2006). Researchers conducted a comparative analysis of these perspectives across different business incubation centers (Hashemi Petrudi et al., 2022; Rompho, 2020). Furthermore, they investigated strategies and limitations aimed at enhancing the four perspectives of the BSC, along with exploring stakeholder engagement to boost overall performance (Camilleri, 2021; Hatry, 2016; Shmueli et al., 2019).

The research findings highlight the significance of evaluating business incubation Centre beyond academic aspects, emphasizing the importance of balanced performance in the business incubation (Chauhan et al., 2022; De Jesus Alvares Mendes Junior & Alves, 2023; Muhammad et al., 2023). The Balanced Scorecard (BSC) concept, although not new, remains relevant for measuring organizational performance while considering all the aspects (Karathanos & Karathanos, 2005; Park & Gagnon, 2006; Wake & John, 2015). However, researchers rarely study BSC implementation in business incubation centers.

Based on the Balanced Scorecard (BSC) perspective, the study investigation that attempts to create a performance measurement and evaluation system for business incubation centers at the national level (Alolah et al., 2014; Farooq et al., 2017; Peris-Ortiz et al., 2019). The research focuses on the applicability of the BSC in business incubation centers , considering its principle of "non-measured cannot be managed (Park & Gagnon, 2006; Peris-Ortiz et al., 2019; Smulowitz et al., 2019).

This study aimed to provide a comprehensive analysis of business incubation centers using the four perspectives of the Balanced Scorecard (BSC) framework, drawing from existing literature (De Jesus Alvares Mendes Junior & Alves, 2023; Park & Gagnon, 2006; Rompho, 2020). The study's results can serve as a foundation for evaluating and enhancing business incubation manager performances (Becker et al., 2012; Cepeda-Carrion et al., 2019; Gupta et al., 2023). The researcher examined the challenges and stakeholder interactions that impact business incubation manager performance, providing insights into how to improve it but further research is needed to explore its impact fully (Chauhan et al., 2022; Shmueli et al., 2019; Slamet & Esha, 2022).

2. THEORETICAL FRAMEWORK

2.1 Incubation Center Agency Relationship

The agency problem is a complex issue that arises in many different types of relationships, and can have significant consequences if not properly (González-pérez & Ramírez-montoya, 2022; Hashemi Petrudi et al., 2022; Tabassum & Zahid, 2017). By understanding the causes and potential solutions to the agency problem, principals can take steps to minimize the risk of agency costs and ensure that their agents are acting in their best interests (Antonius & Utama, 2023; Saka et al., 2022). The principal-agent problem is often caused by information asymmetry, where one party, the agent, has more or better information than the other party, the principal (González-pérez & Ramírez-montoya, 2022; Hooda et al., 2022) . This can lead to opportunistic behavior by the agent, who may take advantage of their access to information for their own benefit or that of specific groups. (Fachururaji & Fachururaji, 2023; Farooq et al., 2017; Mohsin et al., 2022)

According to the business incubation agency relationship, the principle is the one who receives the authority to act (González-pérez & Ramírez-montoya, 2022; Hair et al., 2019; Hooda et al., 2022; Shmueli et al., 2019; Slamet & Esha, 2022). In this context, the principal

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includes incubation center managers and other stake holders who have a vested interest in the business incubation center operations and financial management. Business incubation centers face various challenges due to increasing stakeholder demands and the need to maintain high-quality public services (González-pérez & Ramírez-montoya, 2022; Hair et al., 2019; Hashemi Petrudi et al., 2022; Hooda et al., 2022; Li & Guo, 2022; Shmueli et al., 2019; Slamet & Esha, 2022). According to Rahayu (2016), HEI's and their stakeholders are closely linked, with the actions and decisions of each impacting the other (Peris-Ortiz et al., 2019; Smulowitz et al., 2019; Zhoor et al., 2017). Good management practices in business incubation centers enable the effective use of resources to provide high-quality successful business startups, and BIC with autonomy and the ability to work with stakeholders are more likely to succeed (Ismail, 2020; Peris-Ortiz et al., 2019; Smulowitz et al., 2019; Zhoor et al., 2017). Hence, the relationship between BIC and their external environments are interconnected, with both influencing each other (De Jesus Alvares Mendes Junior & Alves, 2023; Ismail, 2020; Peris-Ortiz et al., 2019; Smulowitz et al., 2019; Stewart, 2016; Velasco Burgos et al., 2019; Zhoor et al., 2017).

2.2 Balanced scorecard

The Balanced Scorecard (BSC) was established in response to growing dissatisfaction with traditional management accounting and financial practices, as it serves as a strategic management tool to transform an organization's strategy into concrete actions for achieving goals (De Jesus Alvares Mendes Junior & Alves, 2023; Griggs et al., 2012; Ismail, 2020; Lawrence & Sharma, 2002; Park & Gagnon, 2006; Peris-Ortiz et al., 2019; Rompho, 2020; Smulowitz et al., 2019; Stewart, 2016; Velasco Burgos et al., 2019; Zhoor et al., 2017). In the BIC, conventional performance evaluation primarily focuses on financial metrics, while the Balanced Scorecard (BSC) introduces a more comprehensive approach by including additional perspectives such as internal business processes, learning and growth, and customer aspects (Alolah et al., 2014; Camilleri, 2021; De Jesus Alvares Mendes Junior & Alves, 2023; Griggs et al., 2012; Ismail, 2020; Lawrence & Sharma, 2002; Lin et al., 2020; Park & Gagnon, 2006; Peris-Ortiz et al., 2019; Rompho, 2020; Smulowitz et al., 2019; Stewart, 2016; Velasco Burgos et al., 2019; Zhoor et al., 2017). However, in BIC, financial considerations are not a central component of performance assessment (Aly & Mansour, 2017; Javed et al., 2020).

A Balanced Scorecard (BSC) framework is a critical component of the organizational strategic plans (Alles & Gupta, 2002; Alolah et al., 2014; Lin et al., 2020). This approach emphasizes the importance of aligning the organization's mission with its strategic objectives and performance measures, ensure that all efforts are directed toward achieving its social objective (Alles & Gupta, 2002; Alolah et al., 2014; Camilleri, 2021; Lin et al., 2020).

Before implementing strategic actions, a plan of action is created according to existing strategic research (Li & Guo, 2022; Shmueli et al., 2019). The Balanced Scorecard (BSC) works as a strategic measurement system and has developed into a full strategic management system (Hashemi Petrudi et al., 2022; Li & Guo, 2022; Tabassum & Zahid, 2017) . This system not only help to measures performance but also guides the organization's strategy development and execution, ensuring aligning with its mission and objectives (Chauhan et al., 2022; Hooda et al., 2022).

The Balanced Scorecard (BSC) is a strategic measurement system that links the measurement of an institution's performance with its vision, mission, and strategic goals (Smulowitz et al., 2019, 2019; Wake & John, 2015).The BSC is a valuable tool for BIC seeking

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to align their activities with their vision and strategy, improve communication, and monitor performance (Camilleri, 2021; Lin et al., 2020).

By using the BSC, business incubation centers can ensure that multi attribute factors are being considered for performance evaluation focusing continuously towards new ventures and the investor community while working towards long-term goals (González-pérez & Ramírez-montoya, 2022; Li & Guo, 2022; Slamet & Esha, 2022).

The researchers utilized the balanced scorecard (BSC) framework, which they adapted from previous studies, to evaluate BIC managers performance in Pakistan (Aly & Mansour, 2017; Zhoor et al., 2017). The adjustments made to the BSC were in accordance with the regulatory guidelines set by the Higher Education Commission (HEC) for business incubation centers (Ali & Brandl, 2017; Aly & Mansour, 2017; Ismail, 2020).

The Balanced Scorecard (BSC) has been proved to measure organizational performance in a balanced way using multiple opinions, rather than focusing mainly on a single indicator (Camilleri, 2021; Zhoor et al., 2017) . The Balanced Scorecard (BSC) examines and evaluates performance by addressing four key inquiries: (1) how customers perceive us (customer perspective), (2) what areas we need to excel in (internal processes perspective), (3) how to sustain improvement and generate value (innovation and learning perspective), and how we appear to shareholders (financial perspective) (Alolah et al., 2014; Aly & Mansour, 2017; Griggs et al., 2012).

2.3 Financial perspective

BIC in public HEI's receive funding from the government, which they manage autonomously (Usman & Ab Rahman, 2021; Yousafzai et al., 2021). Moreover, certain BIC have additional financial resources, like income generated by the itself with the help of government and HEI's (Yousafzai et al., 2021).

Business incubation centers have submitted proposals to concerned HEIs, and HEIs submit budget proposals to the Higher Education Commission and government agencies, which are customized to their projected expenses, and then get operational assistance funding based on the acknowledged request (Usman & Ab Rahman, 2021; Yousafzai et al., 2021).

The specific amount is not pre-determined, but depends on the HEI's projected budget meeting their financial needs (Li & Guo, 2022; Smulowitz et al., 2019, 2019). The financial assistance encompasses expenses related to equipment, transportation aid for students with financial constraints, supplies, and other related costs (Aly & Mansour, 2017; Camilleri, 2021). Financial objectives and performance measures different businesses because each business is unique, caused by factors such as business model and operational time constraints (Camilleri, 2021; Velasco Burgos et al., 2019).

However, to measure performance of business incubation, institutions may ensure that their resources are used effectively and efficiently to support intended mission and fulfill strategic objectives (Camilleri, 2021; Smulowitz et al., 2019).

The financial perspective of business incubation centers defined by budget allocations for new business ventures and activities, budget allocation policies, and the completion of reports accountability reports, plays a crucial role in determining the effectiveness and efficiency of incubation financial management. Implementing the Balanced Scorecard (BSC) enhances transparency and accountability in business incubation centers (Aly & Mansour, 2017; Smulowitz et al., 2019).

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2.4 Innovation and learning perspective

BIC require managers who are capable of independent thinking, creativity, innovation, and continuous learning to enhance their professional skills (Kateryna et al., 2020; Sultan et al., 2022). The innovation and learning perspectives in business incubation centers are essential for continuous improvement and value creation (Sultan et al., 2022; Usman & Ab Rahman, 2021). (Kateryna et al., 2020; Mbithi et al., 2021). Business incubation managers play a significant role in shaping the socio-economic aspects of the community by developing individuals and supporting their integration into society (Mbithi et al., 2021; Sultan et al., 2022).

Manager and trainers' quality encompasses various attributes, including specific qualifications, teaching experience, and professional development (Kateryna et al., 2020; Mbithi et al., 2021). Research indicates that measures of trainer and managers quality, like certification and preparation, are strong correlates of in cube achievement, even after controlling for individual in cube poverty and language status (Agasisti et al., 2021).

Managers and trainers' quality is a more important predictor of incubates achievement than other related factors, such as business size, trainers' education, and manager experience Employees' innovative work behavior is often linked to initiatives aimed at preventing service failures and implementing strategies for recovery in the event of failures (Agasisti et al., 2021; Wang et al., 2020).

2.5 Customer perspective

Customer perspective refers to the evaluation of the incubators from the viewpoint of its incubates taking into account their satisfaction and overall experience with the products or services provided (Wang et al., 2020). This perspective is crucial for the strategic success of a business, as it can significantly impact customer happiness and loyalty (Agasisti et al., 2021; Yousafzai et al., 2021). Customer perspective in incubation refers to the satisfaction of incubate in achieving their business ventures goals (Calma & Dickson-Deane, 2020; Gajewska et al., 2020) . It is crucial for non-profit organizations, including BIC, to prioritize customer satisfaction over profit (Gajewska et al., 2020). In the context of business incubation, delivering a strong customer experience is no longer optional, but a necessity (González-pérez & Ramírez-montoya, 2022; Smulowitz et al., 2019). Customer service in business incubations includes anticipating user experience issues and providing personalized support to help incubates stay focused on their ventures goals (Gajewska et al., 2020; Kateryna et al., 2020; Mbithi et al., 2021).

The customer perspective plays a crucial role in evaluating the performance of business incubation centers, particularly in the assessment of managers (Hong et al., 2020). Understanding and satisfying customer needs and expectations are the importance in this context (Calma & Dickson-Deane, 2020; Gajewska et al., 2020; Hong et al., 2020). These indicators are crucial for evaluating the performance of BIC and ensuring that they meet the needs and expectations of their customers (Calma & Dickson-Deane, 2020; Javed et al., 2020; Mbithi et al., 2021).

Hence, the customer perspective in incubation centers also encompasses non-academic achievement indicators, such as incubates engagement in extracurricular activities, spiritual development, and social competence (Calma & Dickson-Deane, 2020; Gajewska et al., 2020). These factors contribute to the overall managers experience and satisfaction incubates (Agasisti et al., 2021; Hong et al., 2020; Mbithi et al., 2021).

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2.6 Internal business perspective

The internal business perspective in a Balanced Scorecard framework focuses on the effectiveness of internal processes (Hegazy et al., 2022; Setiawan, 2020).This perspective uses indicators that measure activities that have the most significant influence on operational activity (Gajewska et al., 2020; Hong et al., 2020; Setiawan, 2020). Moreover, Efficient internal business processes are essential for delivering high-quality services while also meeting incubates needs (Rafiq et al., 2020). However, the internal business perspective in this study pertains to the development of services, facilities, and resources within BIC , with a focus on enhancing the learning environment for managers and staff (Hegazy et al., 2022; Rafiq et al., 2020; Setiawan, 2020). This perspective emphasizes the importance of efficient and effective internal processes to support the delivery of high-quality business outcomes (Noda et al., 2021). In terms of internal business performance, it also encompasses the business incubation centers responsiveness to incubates feedback and complaints (Hegazy et al., 2022; Rompho, 2020).

The Balanced Scorecard (BSC) is a widely used performance measurement system and control tool, particularly in companies, that is correlated in a cause-and-effect relationship through strategy plans (Slamet & Esha, 2022; Wake & John, 2015; Zhoor et al., 2017). A strategy plans serves as a tool that enhances the transparency and tangibility of an organization's strategy, aiding managers in gaining a clearer understanding of the strategic direction (Morgan et al., 2023). However, it implemented the Balanced Scorecard (BSC) methodology within business incubation centers settings to improve strategic management practices (Morgan et al., 2023; Noda et al., 2021; Rafiq et al., 2020).

BIC has the financial autonomy to successfully manage its existing funds (Petlenko et al., 2021). This financial independence allows them to utilize performance information for the purpose of managing financial accountability and planning (Morgan et al., 2023; Noda et al., 2021; Petlenko et al., 2021). Business incubation centers receive and manage varying levels of funding, with the amount often influenced by the number of incubates that enrolled in the incubation centers (Hegazy et al., 2022; Hong et al., 2020; Setiawan, 2020). The aforementioned information served as the foundation for conducting a more comprehensive evaluation (Morgan et al., 2023; Petlenko et al., 2021). The Customer perspective involves meeting the needs and expectations of incubates, and other stakeholders, while the financial perspective relates to the business incubation centers financial sustainability and resource management Performance measurement in nonprofit organizations is a critical aspect of demonstrating accountability and organizational effectiveness (Camilleri, 2021; Rafiq et al., 2020; Rompho, 2020). Nonprofit organizations have unique challenges in measuring performance due to the intangible nature of their goals and services (Camilleri, 2021; Li & Guo, 2022; Slamet & Esha, 2022). The Balanced Scorecard is a widely known performance measurement system that has been adapted to better fit nonprofit organizations. Likewise, the strategy map incorporated the financial perspective, customer perspective, internal processes perspective, and learning and growth perspective. This study employed a comparable model where the researcher adjusted the model to align with a business incubation center. Aly and Mansour (2017), Griggs et al. (2012), Rahayu et al. (2020), and Rompho (2020) formulated four BSC perspectives tailored for an organization.

The use of multiple measures in business incubation centers evaluation offers a strategy to overcome several problems by providing a more comprehensive and nuanced view of incubation performance (Kankaras, M., Stojkovic, D., & Kovac, 2014; Wake & John, 2015;

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Zhoor et al., 2017). The Balanced Scorecard (BSC) approach emphasizes nonfinancial performance indicators to encourage the achievement of financial performance (Hegazy et al., 2022; Setiawan, 2020). The Balanced Scorecard (BSC) is a performance measurement framework that complements financial measures from past activities with performance drivers of future activities (Hegazy et al., 2022; Setiawan, 2020; Slamet & Esha, 2022). The financial perspective is a crucial aspect of performance measurement and is often the primary focus of various stakeholders (Camilleri, 2021).

Based on the literature review, the researchers constructed the following research hypothesis

H1: Innovation and learning performance have a positive influence on financial performance.

H2: Innovation and learning performance have a positive influence on customer performance.

H3: Innovation and learning performance have a positive influence on internal business performance.

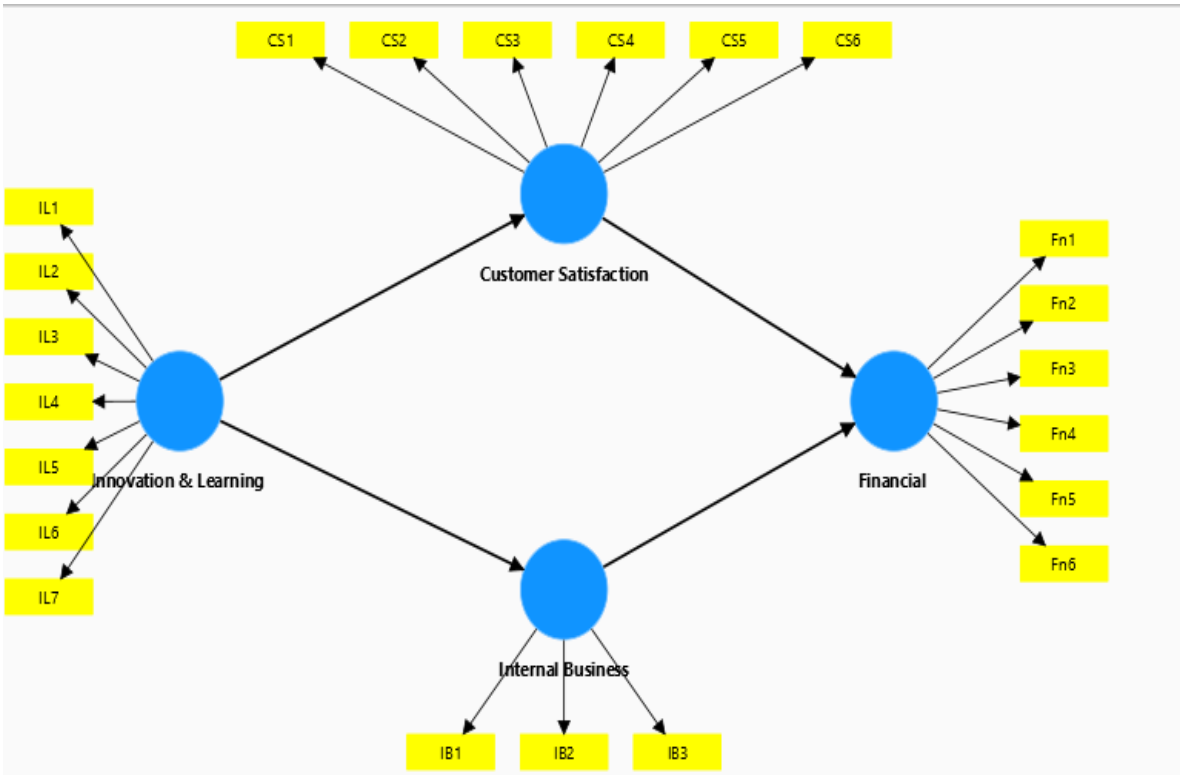
H4: Internal business performance has a positive influence on financial performance.

H5: Customer performance has a positive influence on financial performance.

H6: Internal business performance has a positive influence on customer performance.

H7: Innovation and learning performance have a positive influence on financial performance mediated by customer performance.

H8: Innovation and learning performance have a positive influence on financial performance mediated by internal business performance.



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3. METHODOLOGY

This research was conducted through research survey from managers incubation centers based in Public and private HEI's of Pakistan. The study was conducted with the permission of HEI's and a letter of recommendation was provided by the HEI', allowing researchers to perform data collection. This study used a survey design with close ended questionnaires to evaluate the performance of business incubation centers based on the Balanced Scorecard (BSC) framework.

The closed questions were used to investigate the four perspectives in BSC performance, including financial, customer, internal processes, and learning and growth. The questionnaire used a Likert scale with seven alternatives, ranging from very strongly disagreed (1) to strongly agreed (7), to measure the respondents' level of satisfaction with each perspective.

Research respondents included only the BIC managers. While analyzing incubation center performance, it was assumed that the incubation centers managers are mainly responsible for management of finances, assets and the startups with in the BICs. Therefore, in the first phase the researchers did not include the top management as respondents.

The unit analysis involved public and private HEI's across Pakistan. A sample of 57 managers of business incubators from Universities was employed in this study. These respondents were selected because they are involved in the daily operations of the incubator and have the necessary experience in managing the incubator and establishing relationships with tenant companies. Therefore, using this sample is expected to provide deeper insights into the relationship between incubators and tenant companies.

According to Kaplan and Norton (1992), the four viewpoints in BSC performance were the research variables. These perspectives were the financial perspective, customer perspective, internal business perspective, and innovation and learning perspective. SEM-PLS 4.0 analysis was employed to process quantitative data. Because SEM-PLS is so simple to use, researchers studying social phenomena frequently employ it (Hair et al., 2019).

The sample size is tiny, thus there are no issues with identification. PLS-SEM estimation's precision (consistency) level is raised with larger sample sizes (Shmueli et al., 2019). According to Hair et al. (2019), SEM-PLS has a greater statistical strength, is simple to use to analyse complex models, and is effective in evaluating mediation. With certain adjustments to fit Pakistani BICs, the current study additionally referred the BSC factors to Aly and Mansour (2017) and Rahayu et al. (2020).

The four BSC views of Aly and Mansour (2017) and Rahayu et al. (2020) are modified by incorporating BSC aspects. The achievement of the BICs vision, mission, and objectives is indicated by the correlation between the metrics. Indicators of each variable are different due to differing concepts and dimensions.

Financial variables consisted of six indicators, customer variables consisted of six indicators, internal business variables consisted of three indicators and innovation and learning variables consisted of seven indicators.

Hair et al. (2019) argue that the reliability and validity of the variable measures were examined through four approaches measurement; reflective indicator loadings, internal consistency reliability, convergent validity and discriminant validity. Reflective indicator loading needs to be higher than 0.700.

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Table 1: Construct reliability and validity

Construct Name	Coding	Loadings	Cronbach's alpha	rho_A	Composite reliability	AVE
Financial	Fn1	0.582	0.802	0.823	0.857	0.501
	Fn2	0.784				
	Fn3	0.724				
	Fn4	0.725				
	Fn5	0.722				
	Fn6	0.692				
Customer Satisfaction	CS1	0.754	0.904	0.906	0.926	0.678
	CS2	0.850				
	CS3	0.861				
	CS4	0.789				
	CS5	0.845				
	CS6	0.835				
Innovation & Learning	IL1	0.722	0.868	0.872	0.898	0.558
	IL2	0.780				
	IL3	0.691				
	IL4	0.738				
	IL5	0.764				
	IL6	0.767				
	IL7	0.762				
Internal business	IB1	0.824	0.767	0.768	0.866	0.682
	IB2	0.818				
	IB3	0.835				

The customer happiness, innovation, and learning variables had the lowest values (0.6), according to Table 1. With a score of 0.8, internal business variables had the highest value. When a construct's indicator loading value is higher than the loading values on other constructs, discriminant validity problems arise. There were no problems with cross-loading (Hair et al., 2019).

Using the Fornell-Larcker criterion, Table 2 demonstrates that there is no cross-loading problem. Cross-loading is not a problem in this investigation, as Table 3 indicates. The study's findings indicated that the outer loadings of every construct were greater than the cross-loadings. The discriminant validity was confirmed using the cross-loading assessment and the Fornell-Larcker criterion.

The NFI value for the fit model was 0.810 (81%). None of the values in the blindfolding test results (Q2) were less than 0. The range of values was 0.007–0.104. BICs were classified according to the presumption that they had varying buildings, infrastructure, staffing levels and varying amounts of funding. A 0.05 significance threshold was applied to an independent-sample t-test to evaluate the performance of the BICs.

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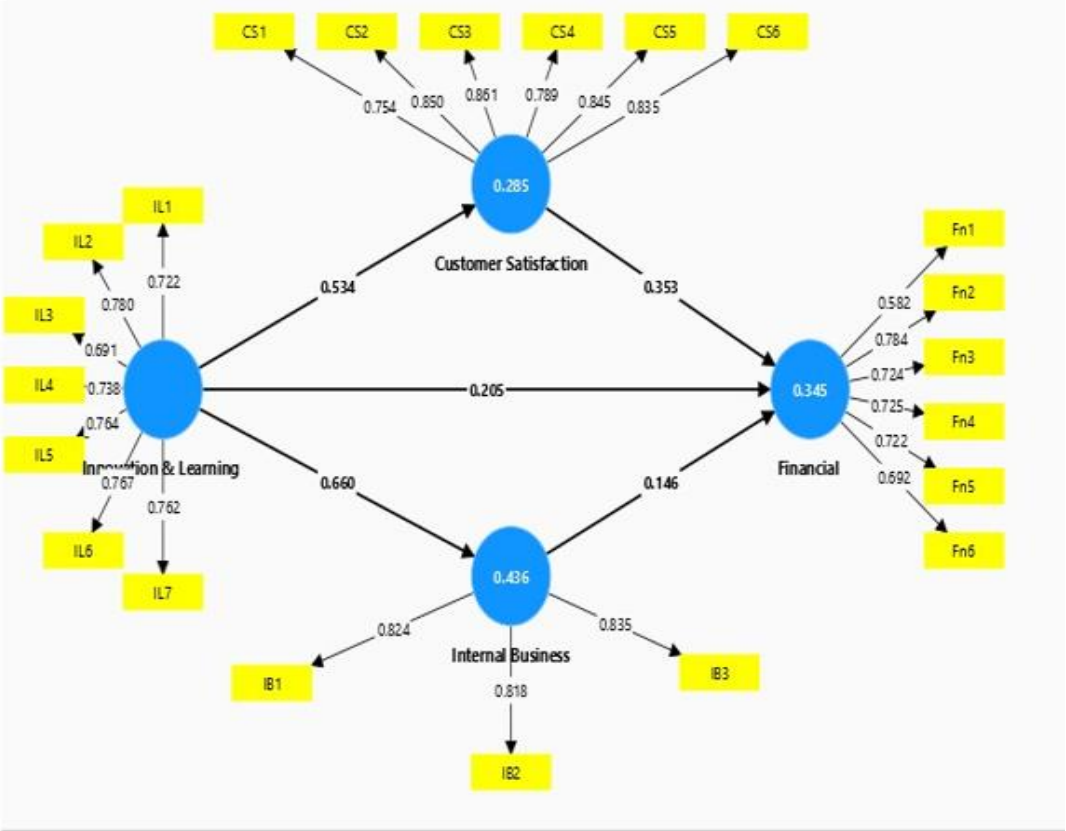

Figure 1: Measurement model

Table 2: Farnell-Larcker Criterion

Perspective	Customer satisfaction	Financial	Innovation and learning	Internal Business
Customer satisfaction	0.823			
Financial	0.520	0.708		
Innovation and learning	0.534	0.490	0.747	
Internal Business	0.390	0.419	0.660	0.826

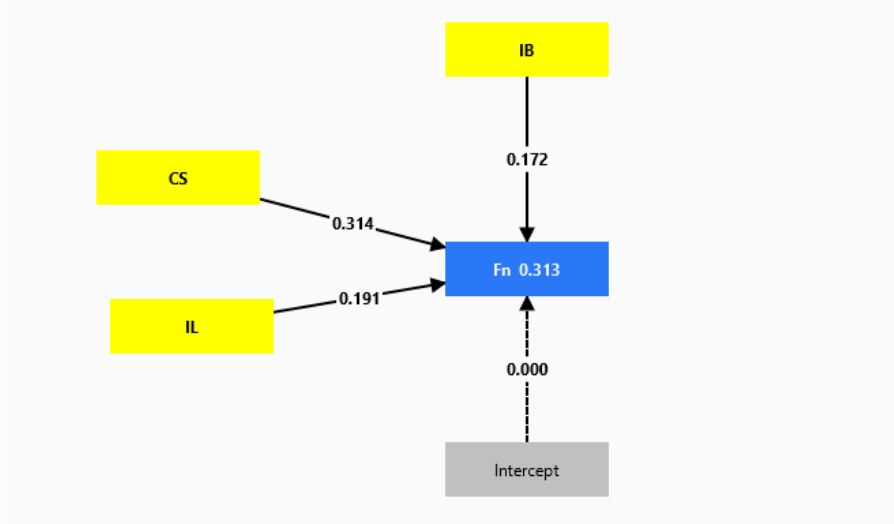

Fig 2: Regression Analysis

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Table 3: Cross-loadings

	Customer Satisfaction	Financial	Innovation & Learning	Internal Business
CS1	0.754	0.411	0.419	0.269
CS2	0.85	0.444	0.469	0.357
CS3	0.861	0.444	0.432	0.287
CS4	0.789	0.371	0.412	0.368
CS5	0.845	0.445	0.46	0.355
CS6	0.835	0.446	0.442	0.291
Fn1	0.395	0.582	0.294	0.198
Fn2	0.56	0.784	0.46	0.34
Fn3	0.316	0.724	0.404	0.284
Fn4	0.221	0.725	0.297	0.308
Fn5	0.303	0.722	0.298	0.318
Fn6	0.285	0.692	0.257	0.326
IB1	0.317	0.286	0.613	0.824
IB2	0.267	0.365	0.507	0.818
IB3	0.38	0.392	0.513	0.835
IL1	0.334	0.39	0.722	0.416
IL2	0.478	0.391	0.78	0.437
IL3	0.326	0.313	0.691	0.411
IL4	0.335	0.369	0.738	0.479
IL5	0.398	0.384	0.764	0.589
IL6	0.418	0.342	0.767	0.546
IL7	0.477	0.371	0.762	0.546

Self-administered questionnaire was used to gather quantitative data. 57 participants responded to the questions. The BSC viewpoint was applied in the questions to evaluate the barriers to and recommendations for improving BICs performance and accomplishment. Snowball method was applied in the study. In accordance with the data criteria, we added key informants (Rahayu, 2020, p. 65). Accurate data collection depends on the suitability and skill of informants (Rahayu, 2020, p. 66).

4. CONCLUSION, LIMITATIONS, AND IMPLICATIONS

According to the four Balanced Scorecard (BSC) perspectives, the BICs were in a favorable state. The research findings demonstrated a positive correlation between innovation and learning performance, and both financial performance and internal business performance. Nevertheless, the impact of innovation and learning performance of BICs on the customer satisfaction was negligible. Financial performance was influenced by internal business performance while the internal performance had little impact on the customer satisfaction. The research findings indicated that the impact of innovation and learning on financial performance was not mediated by customer performance while internal business performance acted as a mediator for the impact of innovation and learning on financial performance.

Startups currently enrolled at BICs are linked to their stakeholders communities, corporations, and other non-governmental organizations. The individuals employed as managers and staff members by the university BICs are part of the ORICs, the office overall responsible for managing the BICs. The positive correlation in the innovation and learning performance, and both financial performance and internal business performance is seen linked to the BICs location. The BICs located in Islamabad, Lahore and Karachi presumably with relatively mature innovation and startup eco system had superior performance in comparison to Peshawar, Quetta, Faisalabad, Hyderabad etc where startup eco system is a newer concept.

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However there was no discernible disparity in financial performance, clients, and internal business between the two groups. The primary limitation observed was related to the limited programs being offered due to lack of industrial clusters and the groups interested in engaging startups and founders in the corporate growth. BICs located in the cities with limited industrial options implement multiple measures to overcome limitations, including enhancing collaboration with diverse stakeholders, strengthening internal integration, and maximizing the utilization of current resources. Efforts to enhance transparency in grants / funds administration through developing a collaborative relationship with stakeholders, particularly the donors and the industrial associations was visible contributing towards confidence among different stakeholders.

This study conducted a comparative analysis of the performance of the BICs across four different perspectives. This study did not conduct a direct comparison of the structural characteristics of the BICs. The project aimed to provide a comprehensive methodology for assessing public funded BICs which are fast evolving in Pakistan. We proposed that the regional government priorities the innovation and learning outcomes of BICs, thereby benefiting in the quality of public services as a result of research and innovation activities besides promoting job creation through promoting entrepreneurship activities.

BICs must establish a strategic plan to address and overcome challenges. Furthermore, the research yielded a model depicting the interaction among actors. It is imperative for the BICs to retain a positive rapport with all parties involved, particularly the sponsors and the customers. For instance, BICs may establish collaborations to carry out programs and activities, as well as offer infrastructure and facilities to other actors who are linked to the broader eco system. BICs should engage in effective communication with donors and funding agencies, urging them to actively participate in promoting technology entrepreneurship culture. Subsequent investigations could employ varying levels of knowledge and expand the field of enquiry to encompass a wider range of topics. Subsequent studies could potentially enhance performance analysis by employing SWOT (Strengths, Weaknesses, Opportunities, and Threats) analysis.

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