

DEVELOPING SMALL AND MEDIUM ENTERPRISES IN DA NANG CITY USING ARTIFICIAL INTELLIGENCE: A BALANCED SCORECARD APPROACH WITH INSIGHTS FROM RUSSIA

PHÁT TRIỂN DOANH NGHIỆP NHỎ VÀ VỪA TẠI THÀNH PHỐ ĐÀ NẴNG BẰNG CÔNG NGHỆ TRÍ TUỆ NHÂN TẠO: TIẾP CẬN TỪ LÝ THUYẾT THẺ ĐIỂM CÂN BẰNG VÀ ỨNG DỤNG KINH NGHIỆM TỪ LIÊN BANG NGA

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(Received: March 01, 2026; Revised: April 01, 2026; Accepted: April 12, 2026)

DOI: 10.31130/ud-jst.2026.24(5B).268

Abstract - This study examines how AI adoption can support SME development in Da Nang within a structured capability-building framework. Drawing on the Balanced Scorecard, the study conceptualizes AI adoption not as a stand-alone technological intervention but as a sequenced transformation process in which capability building in Learning and Growth enables process transformation, which enhances customer value and ultimately drives financial performance. Using qualitative policy analysis and structured comparison, Russia's national AI strategy is employed as a reference case to demonstrate how coordinated investments in human capital, data infrastructure, and institutional alignment enable enterprise-level performance improvements. The findings indicate that financial incentives alone are insufficient. Effective AI adoption depends on investments in skills development, process standardization, and ecosystem integration. These findings provide policy implications for designing staged, capability-oriented SME support mechanisms in Da Nang. They also suggest that AI-enabled SME upgrading can contribute to Vietnam's economic diplomacy.

Key words - SME development; Artificial Intelligence; Balanced Scorecard; Russia; Da Nang.

1. Introduction

AI is increasingly framed as a general-purpose technology capable of reshaping productivity, business processes, and competitive dynamics across sectors. It can raise task-level productivity and output quality in knowledge-intensive work [1]. However, AI diffusion in organisations is uneven, especially in SMEs, due to constraints in skills, infrastructure, and finance [2]. In Vietnam, the policy salience of AI-enabled SME development is high in the city-regions. Vietnam's National Master Plan for 2021-2030 with vision to 2050 [3] sets out a territorial development logic combining socio-economic regions with national dynamic regions and growth poles. Within this framework, Da Nang is designated as the growth pole of the Central dynamic region [3]. This planning orientation is reinforced by recent policy instruments that operationalise the pole and corridor vision through platforms for trade, logistics, services, and the digital economy. Decision 1142/QĐ-TTg further establishes a Free Trade Zone supporting AI and digital industries [4]. This is an institutional set-up in which AI-enabled SMEs can plausibly become both users and suppliers of intelligent services.

Tóm tắt - Nghiên cứu phân tích vai trò của trí tuệ nhân tạo (AI) trong phát triển doanh nghiệp nhỏ và vừa tại thành phố Đà Nẵng thông qua khung phân tích Thẻ điểm cân bằng. Kết quả cho thấy, việc ứng dụng AI trong SMEs là một quá trình chuyển đổi có tính trình tự, trong đó năng lực học hỏi và phát triển tạo nền tảng cho cải tiến quy trình, nâng cao giá trị khách hàng và cuối cùng là tạo ra hiệu quả tài chính. Thông qua phân tích chính sách định tính và đối sánh với chiến lược AI quốc gia của Liên bang Nga, kết quả cho thấy hỗ trợ tài chính đơn thuần là chưa đủ, hiệu quả ứng dụng AI phụ thuộc vào đầu tư vào kỹ năng, chuẩn hóa quy trình và hệ sinh thái đổi mới. Kết quả này cung cấp hàm ý chính sách cho Đà Nẵng trong việc thiết kế các chương trình hỗ trợ SMEs theo hướng nâng cao năng lực và triển khai theo giai đoạn, đồng thời góp phần thúc đẩy năng lực cạnh tranh quốc tế và định hướng đổi mới kinh tế của Việt Nam.

Từ khóa - Doanh nghiệp nhỏ và vừa; Trí tuệ nhân tạo; Thẻ điểm cân bằng; Liên bang Nga; Đà Nẵng.

However, the current challenge is not only whether SMEs adopt AI, but whether AI adoption translates into multidimensional outcomes that align with the strategic objectives. Most research is about adoption drivers, barriers, and readiness constructs, with inconsistent conceptualisations and the need for more integrated frameworks that connect adoption to organisational outcomes [5]. Hence, even when AI pilots exist, SMEs and local governments often lack a coherent way to articulate how AI investments improve outcomes like productivity, innovation, and skills development, especially under typical constraints. To address this gap, this study adopts the BSC as the organising theory to evaluate AI-enabled SME development. The BSC translates strategy into a set of linked performance perspectives: financial, customer, internal business processes, and learning and growth [6]. Then, the study develops an analytical narrative that links AI adoption pathways in SMEs to multidimensional performance outcomes and city-regional development goals implied by national planning. Russia is used as a reference case to derive policy-relevant insights because it provides an analytically useful example of state-driven AI

strategy and capability building under constraints. For this study, Russia is not treated as institutionally equivalent to Vietnam or to Da Nang. Rather, it is a structured benchmark for how policy mixes can map onto the four BSC perspectives when a government prioritises AI diffusion. Accordingly, this study addresses this research question: What lessons can Da Nang draw from Russia's AI development strategy to strengthen SME performance across financial, customer, internal process, and learning dimensions?

This study's contribution is threefold. First, it combines strategic performance theory and regional policy analysis. Second, it offers a narrow comparative case study, which connects Russia's national AI plan to Da Nang's local growth objectives. Third, it converts these findings into policy implications for Da Nang.

2. Literature Review

2.1. *Balanced Scorecard (BSC) Framework*

The BSC [6] is a multidimensional performance framework linking strategy to four perspectives: Financial, Customer, Internal process and Learning and Growth. BSC incorporates intangible resources like organizational learning, innovation capacity, and customer values, unlike traditional performance measurement systems that dealt only with financial measures. The model focuses on the causal connections: investments in organizational capability and learning lead to improvement in the processes, which result in better customer value, and the outcome is better financial results [7]. Accordingly, sustainable competitive advantage relies on the integration of operational processes and learning capabilities with long-term financial outcomes. BSC can be applied in the digital transformation context, where the core drivers of value creation are technological capability and organizational learning [8].

2.2. *BSC's Adaptations in AI Adoption Contexts*

2.2.1. *Financial Perspective*

AI implementation results in efficiency gains, cost reduction, and 20.5% productivity increment [9]. These performance improvements are in the form of increased output and lower costs, the key points in the Financial perspective. Within performance measurement research, BSC implementations in technology firms improve financial alignment when non-financial drivers are integrated into strategic dashboards [10]. Thus, in AI contexts, financial perspectives incorporate indicators such as digital investment intensity, AI-enabled revenue ratio, and innovation output rather than relying solely on short-term profitability metrics.

2.2.2. *Customer Perspective*

Digital transformation alters the value propositions to customers based on customer personalizations using data and platform integration [11]. With the help of AI, predictive analytics, recommendation systems, and self-service interfaces can be created, leading to customer satisfaction and retention. The use of AI in SMEs helps to expand the market and internationalize, as it enables

informed decisions. Companies that use AI in the supply chain attain better customer service and agility [12, 13].

2.2.3. *Internal Process Perspective*

AI technologies transform operational processes by embedding automation and analytics into production and logistics systems. It makes the operations more flexible and productive, particularly when they are applied through organizational processes [14]. Process innovation with AI is one of the key factors that drives financial performance growth in SMEs, and internal digital integration plays a critical role in mediating performance outcomes [15].

2.2.4. *Learning and Growth Perspective*

The most essential dimension in the AI adoption environment is the learning and growth perspective [16]. AI adoption needs technical skills as well as managerial thinking and organisational flexibility. The main obstacles to the scaling of AI by SMEs are skill shortages and training gaps [2]. Digital training programs and innovation-oriented cultures significantly enhance AI implementation success [12].

3. Methodology

This study implements a conceptual, policy-analytical design based on document analysis and comparative case reference. It develops an analytical framework through document synthesis and structured comparison [17]. BSC is used as the main theory to map AI-related SME practices to 04 performance perspectives. From that, we draw a structured lesson from the Russian Federation to Da Nang.

3.1. *Research Design*

It is a conceptual/policy paper which aims to generate an analytical bridge between (1) Policy tools and AI capability-building and (2) Multidimensional performance outcomes of SMEs. We use document analysis as the qualitative approach to extract and analyse policy objectives and implementation measures from authoritative texts [18]. We then apply a structured comparison to match evidence in two contexts, with Russia as the reference benchmark to define transferable policy principles, not direct policy transplantation. AI-related policy tools and their alignment to the BSC performance dimensions are the unit of analysis [19]. A set of documents was systematically coded and categorized as per the four BSC perspectives. Coding is based on policy objectives, stated implementation mechanisms and empirical findings. This is to reduce subjective interpretation and ensure consistency.

3.2. *Reference Case Selection: Russia*

Russia is selected as a reference case for three reasons. The first is that Russia has implemented an official National AI Strategy which offers a clear structure of AI-based modernization [20]. Second, the plan directly addresses AI development with national competitiveness and technology sovereignty, as well as the SME innovation ecosystems. Third, the governance model in Russia focuses on high coordination of the state, which is similar to the development orientation of Vietnam.

Policy learning does not require direct transplantation

but requires selective adaptation based on contextual relevance [21]. In this study, Russia serves as a systematic reference case whereby the policy principles can be applied in the regional development strategy of Da Nang. In addition to the formal strategy, Russia has shown an institutional and technological improvements. The findings of international surveys show that Russia has a robust research foundation in mathematics and computer science and is one of the most prolific countries in scientific publications related to AI [20, 22]. Moreover, Russia has evolved nationally produced AI systems and big-data digital ecosystems through state-linked financial and tech organizations. Policy studies draw on the alignment of ecosystem-building initiatives within and between research institutes, universities, state-owned enterprises, and individual companies to speed up the adoption of AI in finance, government administration, and certain industrial domains [20]. Although SME-level adoption is uneven, these tangible developments prove how a state-led emerging economy can operationalize AI through coordinated policy design, infrastructure investment, and ecosystem integration under constraints. So, Russia is relevant since it represents a well-organized example of how the AI modernization strategies can be realigned to meet the requirements of the multidimensional performance goals.

3.3. Data Sources

The study uses secondary data and document analysis [18]. It allows methodological analysis of policy goals, implementation processes, and strategic alignment without the use of primary survey data.

Russia's analysis is based on the National AI Strategy (Decree No. 490) [20]. To avoid reliance on declarative policy alone, the study incorporates empirical studies regarding the phenomenon of digital transformation and the adoption of AI among Russian SMEs. Most research confirms that digital transformation can enhance SME productivity, although the implementation is uneven [23, 24, 25]. Meanwhile, there are gaps in digital preparedness between large firms and SMEs [26], unequal distribution of digital transformation in view of innovation possibilities [27], and limited AI readiness due to financial and skills constraints [28]. Another issue is the lack of data governance enablers, ignorance regarding the benefits of big data, absence of investment budget, and big-level data strategists [29].

In the Vietnam and Da Nang case, the analysis is based on the National Master Plan 2021- 2030 (Resolution No. 81/2023/QH15) [3] and the Prime Minister's Decision No. 1142/QĐ-TTg establishing the Da Nang Free Trade Zone [4]. This provides the institutional foundation for examining AI-enabled SME development within a regional development framework.

4. Results and Discussion

AI-related policy instruments and the SME-related empirical evidence of Russia are grouped under BSC's four perspectives. Table 1 presents their alignment. The Russian case indicates that there is a definite sequencing logic: capability development and process readiness lead to customer and financial performance.

Table 1. Policy instruments and the empirical support of AI in Russia based on BSC

BSC Angles	Policy Instrument	Empirical Evidence	Sources
Financial	<ul style="list-style-type: none"> - Integrate AI into the national programme with a federal budget and multi-source financing - Promote export and remove administrative barriers for AI products 	<ul style="list-style-type: none"> - AI grows SME productivity - SMEs show lower digital investment intensity than large firms - Financial constraints are key AI adoption barriers 	[20], [28], [29], [23]
Customer	<ul style="list-style-type: none"> - Grow AI products/services demand with the modernization of AI public and private services - Develop standardisation and compliance assessment systems 	<ul style="list-style-type: none"> - AI use-cases in SMEs are customer-facing - Digital competitiveness is uneven across firm sizes and regions - SMEs are using digital tools as accessibility growth 	[20], [28], [25], [27]
Internal Process	<ul style="list-style-type: none"> - Automate planning, forecasting, logistics, and production - Develop public data platforms and dataset labeling standards - Support domestic hardware and high-performing infrastructure - Require annual progress reports, define action plans with performance indicators 	<ul style="list-style-type: none"> - Difficulties integrating AI into existing business processes - Big-data readiness is weak due to poor benefit awareness, limited resources, and skills deficits - Digital maturity is low: small business 83% low maturity, micro 93% low maturity 	[20], [28], [29], [25]
Learning and Growth	<ul style="list-style-type: none"> - Introduce AI learning packages - Encourage applied research, develop research infrastructure and computing resources - Enhance publications, intellectual products and international exchanges - Support open-source AI libraries and expert attraction 	<ul style="list-style-type: none"> - Shortage of qualified staff, need educational initiatives - Lack of funds, low managerial interest and employee competence impede digitalisation - Need for objective assessment tools - Capability upgrading is a prerequisite for performance gains 	[20], [28], [24], [25]

4.1. Financial Perspective

Russia linked its AI strategy with a national delivery model and an investment in the budget. Decree No. 490 directs the government to revise the national program called Digital Economy and accept a federal AI project, and it needs budgetary allocations from 2020 to 2030. Practically, such financial obligation assists in the establishment of an enabling environment, but it does not eliminate the SME constraints separately. Only 14.4% of all-Russian SMEs in a large study have indicated that they were fully or partially ready to implement AI, and the main obstacles are the high costs of solutions and the lack of qualified personnel [28]. Efficiency and performance gains can be real, but they depend on access to tools and capabilities [23]. This fits the Financial perspective since it is the money aspect of change, who funds it, how constant is the funding stream, whether there are incentives to scale, and whether there are exports. The Russian strategy directly associates AI with national competitiveness and refers to the support of exports and international positions, which is a macro-level financial result [20]. At the same time, SMEs often lack the funding, resources, and digital infrastructure to adopt AI, so finance alone will not close the gap [2].

In the case of Da Nang, they ought to finance it as staged support and not grants alone. The city can initially begin with subsidies as basic preparation and readiness, such as low-cost, straightforward administration, followed by co-funding pilot deployments in priority fields, and then progressively increase larger subsidies when adoption has been established. Da Nang should focus on assistance instead of implementing a standardized scheme due to the range of needs of SMEs that differ by size, industry, and digital maturity [2].

4.2. Customer Perspective

Russia's AI plan has objectives related to enhancing the quality of life and maintaining the competitiveness of the economy, and the use of AI is suggested to improve personalised services [20]. Practically, before they become internal changes of operation, many early SME AI applications will probably be customer-facing and front office. This trend is backed by the Russian SME survey: CRM automation is the major use-case of SMEs (36.5%), then demand forecasting (19%) and pricing (12.7%) [28]. Also, capital and regional SMEs have an uneven digital maturity. This may restrict the proliferation of the benefits of the customer-facing AI [25]. This fits the Customer perspective since customer satisfaction, retention, market reach, and competitiveness are the key results. The policy lingo of Russia is compliant with this. The creation of demand, the competitiveness, and service enhancement with customer-facing personalisation are stated specifically. Nonetheless, low SME preparedness leads to a narrowing of customer results amongst more prepared firms and areas.

Da Nang should begin with customer-facing quick wins and connect them to internal data and processes. For example, Da Nang can support SMEs in tourism, retail, and services to adopt CRM, demand forecasting, and customer-service tools first, because these match what Russian SMEs prioritise. Many SMEs start with off-the-shelf tools before they move to customised systems [2], so Da Nang can encourage emerging standards of data hygiene and privacy in the maturity of firms.

4.3. Internal Process Perspective

Russia's policy focuses on domestic processes required to advance AI: data, computing, and the capacity to test and implement systems. It involves the availability of datasets via open-ended platforms, and the strategy demands the specified data collection, labelling, and adherence to data access regulations. It also involves the establishment of a favourable legal environment [20]. This internal focus is important since Russian SMEs face the challenges of incorporating AI in the current business processes, with data quality and integration as one of the key obstacles [28]. Research on big data analytics in SMEs finds that big data is not common for SMEs and that key problems include a lack of understanding of benefits, limited financial resources, and a shortage of qualified staff [29]. This fits the Internal Process perspective because it is about workflow, data management, operational integration, and the rules that allow systems to be tested safely. SMEs do

not have the resources to gather and process data to train AI, and bad data may even incur worse results. Access to computing is significant as the use of AI becomes more complex [2]. So, internal-process foundations are a practical gate that determines whether financial and customer benefits can actually appear.

Da Nang should prioritise a shared internal-process backbone that small firms cannot build alone. The practical solution would be to create a city-based data preparation service, which helps SMEs to digitalise records, structure simple data, and be familiar with simplistic governance, and a limited regulatory sandbox to exchange data safely and conduct pilot projects. The city ought to also encourage the use of clouds and open-source features to cut down on the cost and reduce the need for an in-house infrastructure.

4.4. Learning and Growth Perspective

Skills and research capacity are considered core pillars. The decree encourages the provision of skilled employees, raising awareness about the population regarding AI usage, and improving access to data and equipment. Other measures include enhancing the quality of education and increasing the level of competitions and Olympiads to develop students' skills [20]. All these steps are important since they establish forums where skills, policy learning, and pilots can support one another. Empirically, skills shortages are a key obstacle, where 21% of SMEs are not planning to use AI in the near future, or they lack awareness, or have a low perceived value [28]. Uneven digital maturity across regions can limit the process of skills and practices diffusion across the major hubs [25]. This fits the Learning and Growth perspective because it is all about human capital, organisational capacity, and environment for innovation. The obstacles to the implementation of AI are high since they are usually connected with the lack of skills, financial assistance, resources, and digital infrastructure within SMEs. The significance of such abilities as data analysis and interpretation may also be enhanced with the help of AI [2].

For Da Nang, the city should begin with a realistic skills-and-awareness program that is designed for SME reality. Vietnam's National Digital Transformation Program (Decision No. 749/QĐ-TTg) includes training goals like training at least 1,000 digital transformation experts and piloting regular training formats. Da Nang can adapt this locally through universities, vocational schools, and SME associations. Also, we should consider pairing training with simple use-cases like CRM, forecasting, and quality control so SMEs see value quickly and build toward deeper internal integration over time.

Relevant evidence supports the proposed capability-based approach. In Vietnam, evidence on SME ERP adoption shows that while training can generate high initial uptake, sustained use depends on internal champions and workflow integration, which means finance or tool provision alone is insufficient [30]. The same programme logic also links process and practice improvements to subsequent productivity, sales, and profit outcomes. At the local level, evidence from Da Nang shows that SMEs continue to face practical digital-transformation barriers,

while existing city-level training and pilot support activities suggest that staged capability-building interventions are feasible at the institutional level [31].

5. Conclusion

This study develops a structured analytical framework for examining AI-enabled SME development in Da Nang through the combination of the BSC and comparative policy benchmarking in Russia. The BSC analysis recommends that Russia does not position AI as an individual technology program but rather as a broader agenda of modernization including financing and governance measures, data infrastructure, skill and implementation monitoring. This pattern aligns with BSC's causal logic: the empowerment of capabilities and internal preparedness is followed by customer and financial benefits. Across the four perspectives, there are three findings. First, on the Financial side, Russia associates AI with national programs and multi-source financing, yet SME data still indicates binding provisions so financing will not guarantee diffusion. Second, Russia focuses on the development of demand and the modernization of the services. Third, the greatest focus is on Internal Process and Learning and Growth foundations.

The contribution is clear. It customizes BSC to a policy-analytical system that aligns with the regional SME AI strategy. It also draws comparative inferences based upon a state-coordinated reference case without assuming institutional equalities. For Da Nang, the most actionable recommendations are to prioritize Learning and Growth, then build an Internal Process backbone, then deploy Customer pilots in high-demand sectors, and finally scale Financial support through staged vouchers and co-funding tied to verified readiness and measurable results. The following step that can be taken practically is a scaled-down BSC dashboard to allow Da Nang pilots to see their progress and ensure that the acceptance of AI tools is not confused with competitiveness enhancement.

However, this study has its own limits. It is conceptual and document-based, thus making no estimates of causal effect at the firm level. Russia is considered to be a reference as opposed to a directly similar model. In addition, the SME evidence base is based on accessibility of studies that might not reflect all gaps in the implementation. The BSC in Da Nang should be empirically tested in the future by carrying out a pilot test and baseline survey of SMEs in the area in order to measure the indicators of the four perspectives.

In conclusion, the vision of AI-based SME development in Da Nang should be developed as a coordinated, competency-based change inherent in the regional planning strategy. This is in line with the causal structure of the BSC, which makes the adoption of AI not only a technological destination but a tool of enhancing the capacity to innovate, modernize operations and enhance competitiveness in the region over time. From a foreign policy perspective, AI-enabled SME upgrading can also be interpreted as part of Vietnam's economic diplomacy strategy. Strengthening SME competitiveness through AI

adoption contributes to enhancing Vietnam's position in global value chains and supports deeper international economic integration. In this context, policy learning from Russia reflects not only technological exchange but also the diversification of development pathways within Vietnam's broader foreign economic relations. For Da Nang as a regional growth pole, aligning AI-driven SME development with economic diplomacy objectives may facilitate greater participation in international markets, attract technology-oriented investment, and reinforce the city's role in Vietnam's global economic positioning.

Acknowledgement: This paper is developed as part of the author's doctoral research project in Development Economics at the University of Danang - University of Economics. The research is conducted under the officially approved dissertation topic titled "Developing Small and Medium Enterprises in Da Nang City Using Artificial Intelligence", which was approved under Decision No. 2035/QĐ-ĐHKT dated May 28, 2025, issued by the Rector of the University of Economics.

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