

Enhancing SME Competitiveness through E-Commerce Adoption: A Framework for Malang City

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Abstract

Small and Medium-Sized Enterprises (SMEs) play a crucial role in economic development; however, enhancing their competitiveness in the digital era remains challenging, particularly in effectively leveraging e-commerce as a digital transformation strategy. Although prior studies have explored determinants and outcomes of e-commerce adoption, the findings remain fragmented and insufficient in explaining how e-commerce contributes to sustainable SME competitiveness. This study aims to identify internal and external factors influencing e-commerce adoption, examine its impact on SME competitiveness, and develop an integrated conceptual framework relevant to SMEs in Malang City. A Systematic Literature Review (SLR) was conducted following PRISMA guidelines, analyzing 33 empirical studies published between 2015 and 2025 from Scopus, ScienceDirect, Emerald, SpringerLink, Wiley, Taylor & Francis, and Google Scholar. The data were analyzed using thematic and content analysis to identify patterns and relationships across studies. The findings reveal that e-commerce adoption is driven by internal factors such as managerial capability, digital capability, innovation capability, and entrepreneurial orientation, as well as external factors including competitive pressure, customer demand, government support, and the digital ecosystem. Furthermore, e-commerce adoption enhances SME competitiveness through sales growth, profitability improvement, market expansion, operational efficiency, and sustainable competitive advantage. The study's novelty lies in integrating the Resource-Based View (RBV), Dynamic Capability Theory (DCT), and Technology-Organization-Environment (TOE) framework into a unified model explaining how e-commerce translates into competitive advantage. The study provides both theoretical contributions to digital transformation literature and practical implications for strengthening SME competitiveness in Malang City through strategic e-commerce adoption.

1. Introduction

Small and Medium-Sized Enterprises (SMEs) constitute the backbone of many economies, including Indonesia. In addition to generating employment opportunities, SMEs contribute significantly to income distribution, local economic development, and national economic resilience. Within regional development contexts, SMEs serve as a strategic instrument for promoting inclusive and sustainable growth. However, the increasingly dynamic business environment requires SMEs not only to survive but also to enhance their competitiveness by leveraging resources and capabilities relevant to the digital era [1], [2]. Digital transformation has fundamentally changed how organizations create value, interact with customers, and manage business processes. The rapid development of internet technologies, digital platforms, and mobile device penetration has accelerated the adoption of digital business models across sectors. In this context, e-commerce has emerged as a critical instrument enabling firms to conduct transactions, marketing, distribution, and customer relationship management more effectively. For SMEs, e-commerce is no longer merely an alternative sales channel but an integral component of digital transformation strategies that enhance flexibility and resilience [3], [4], [5].

The strategic importance of e-commerce lies in its ability to expand market access, improve operational efficiency, and strengthen customer relationships. Prior studies show that e-commerce enables SMEs to reach customers beyond geographic limitations, reduce transaction costs, and improve marketing effectiveness. Furthermore, integration with digital technologies enhances service quality and customer experience, positioning e-commerce as a source of competitive advantage and long-term sustainability [6], [7], [8]. Empirical evidence also confirms its positive impact on SME performance, including financial improvement, sales growth, and market expansion in various countries such as Bangladesh, Vietnam, and Indonesia [7], [9], [10], [11]. Despite these benefits, the determinants of successful e-commerce adoption remain inconclusive. Some studies emphasize internal factors such as organizational readiness, managerial competence, and digital skills as key drivers [12], [13], [14], while others highlight external pressures such as competition, market dynamics, and government support [15], [16], [17]. In addition, contradictory findings exist regarding the role of government support, which appears significant in some contexts but insignificant in others [15], [18]. These inconsistencies indicate that the relationship between e-commerce adoption and SME competitiveness is still not fully understood.

Another limitation in prior research is its dominant focus on adoption intention and adoption factors, rather than explaining how e-commerce contributes to long-term competitive advantage. Although frameworks such as Technology–Organization–Environment (TOE), Diffusion of Innovation (DOI), and Unified Theory of Acceptance and Use of Technology (UTAUT) are widely used, they rarely integrate strategic perspectives such as the Resource-Based View (RBV) and Dynamic Capability Theory (DCT) to explain how digital adoption translates into sustainable competitiveness [19], [20], [21]. As a result, the linkage between digital readiness, organizational capabilities, environmental conditions, and competitiveness remains underexplored. From a theoretical perspective, SME competitiveness can be better understood through the integration of RBV, DCT, and TOE. RBV explains how valuable, rare, inimitable, and non-substitutable resources such as digital capability and managerial competence create competitive advantage [22], [23]. DCT emphasizes firms' ability to sense opportunities, seize them, and transform resources in response to environmental change, highlighting the importance of innovation capability and entrepreneurial orientation [24], [25]. Meanwhile, TOE explains that technology adoption is influenced by technological, organizational, and environmental contexts, including competitive pressure, customer demand, government support, and the digital ecosystem [15], [20]. Although each framework is valuable, their integration remains limited in explaining SME digital transformation comprehensively.

These research gaps are particularly relevant in the context of Malang City, one of the major centers of economic growth and entrepreneurship in East Java. The city hosts a large number of SMEs across diverse sectors with strong digitalization potential. However, successful e-commerce adoption depends not only on

technological availability but also on the ability of SMEs to transform digital tools into sustainable competitive advantage. Therefore, a comprehensive framework is needed to explain both the determinants of e-commerce adoption and its strategic contribution to SME competitiveness. Responding to this gap, this study develops an integrated conceptual framework based on a systematic synthesis of recent empirical literature on SMEs, digital transformation, and competitiveness. Unlike prior studies that treat adoption determinants and performance outcomes separately, this research integrates internal capabilities, external environmental factors, digital transformation processes, and competitive advantage into a unified model. This framework explains not only why SMEs adopt e-commerce but also how such adoption generates sustainable competitive advantage through capability development and business model innovation.

Accordingly, this study aims to identify and synthesize internal and external factors influencing e-commerce adoption among SMEs, analyze the impact of e-commerce adoption on business performance and competitiveness, and develop a conceptual framework for enhancing SME competitiveness in Malang City. Using a Systematic Literature Review (SLR) approach, this study contributes to digital business and strategic management literature while offering practical implications for SMEs and policymakers in accelerating digital transformation.

2. Research Methods

Methods contain information about the conduct of the research, including the flow of the research, the tools and materials used, the place of research and other matters deemed necessary. Methods should be written in detail, with the intention that readers who are interested in repeating this research, can do so with the information written in the 'Methods' section

2.1 Research Design

This study employed a Systematic Literature Review (SLR) approach to identify, evaluate, and synthesize empirical evidence regarding the determinants of e-commerce adoption and its implications for SME competitiveness. The SLR method was selected because it provides a rigorous, transparent, and replicable process for consolidating knowledge from diverse studies, thereby enabling a comprehensive understanding of complex research phenomena [26], [27]. The review process followed the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines, which consist of four sequential stages: identification, screening, eligibility assessment, and inclusion. The application of PRISMA enhances methodological transparency and reduces selection bias by ensuring a structured evaluation of relevant literature [28], [29].

The review focused on empirical studies examining the relationships among e-commerce adoption, digital transformation, organizational capabilities, and SME competitiveness. In addition to identifying the determinants of e-commerce adoption, the study investigated how e-commerce contributes to performance improvement and the development of sustainable competitive advantage. The ultimate objective was to develop a conceptual framework capable of explaining the mechanisms through which e-commerce adoption enhances SME competitiveness, particularly within the context of Malang City.

2.2 Research Search Strategy

The literature search was conducted across several reputable academic databases commonly used in business, management, entrepreneurship, and digital transformation research. These databases included Scopus, ScienceDirect, Emerald Insight, SpringerLink, Wiley Online Library, Taylor & Francis Online, and Google Scholar. The search process was performed between January and March 2026, with publication years restricted to 2015–2025 to capture recent developments in digital transformation and e-commerce adoption during the post-COVID-19 business environment. This period was considered particularly relevant because the pandemic accelerated digitalization initiatives and increased reliance on online business models among SMEs worldwide.

To ensure comprehensive coverage of relevant studies, search strings were constructed using Boolean operators (AND and OR) and combinations of keywords associated with e-commerce, SMEs, competitiveness, and organizational capabilities. The search query was formulated as follows:

("e-commerce adoption" OR "electronic commerce" OR "digital business" OR "digital transformation")
AND
("SMEs" OR "MSMEs" OR "small and medium enterprises")
AND
("competitiveness" OR "competitive advantage" OR "business performance" OR "firm performance")
AND
("dynamic capabilities" OR "digital capability" OR "entrepreneurial orientation" OR "innovation capability")

The search was conducted within the title, abstract, and keywords sections of each database to maximize relevance while maintaining adequate coverage of the literature.

Table 1. Search Strategy and Selection Criteria

Component	Description
Databases	Scopus, ScienceDirect, Emerald Insight, SpringerLink, Wiley Online Library, Taylor & Francis Online, Google Scholar
Publication Period	2015–2025
Language	English
Document Type	Peer-reviewed journal articles
Research Focus	E-commerce adoption, digital transformation, SME competitiveness
Analytical Approach	Thematic analysis and content analysis
Review Protocol	PRISMA

2.3 Inclusion and Exclusion Criteria

To ensure consistency and relevance, predefined inclusion and exclusion criteria were established before the screening process commenced. Studies were included in the review if they met all of the following criteria:

1. Empirical studies investigating the relationships among e-commerce adoption, digital transformation, organizational capabilities, and SME performance or competitiveness.
2. Published in peer-reviewed academic journals.
3. Written in English.
4. Published between 2015 and 2025.
5. Available in full-text format.
6. Focused on SMEs or MSMEs.
7. Provided a clearly described and evaluable research methodology.

Conversely, studies were excluded if they met one or more of the following conditions:

1. Editorials, conference abstracts, book reviews, or working papers.
2. Studies not focusing on SMEs or MSMEs.
3. Studies that did not examine e-commerce or digital transformation as a primary research variable.
4. Non-empirical studies lacking original data or evidence.
5. Duplicate records retrieved from multiple databases.
6. Articles without accessible full-text versions.
7. Studies with insufficient methodological explanations.

Table 2. Inclusion and Exclusion Criteria

Component	Description
Inclusion Criteria	Exclusion Criteria
Empirical studies	Editorials
Peer-reviewed journal articles	Conference abstracts

SME/MSME focus	Book reviews
English-language publications	Non-English publications
Published during 2015–2025	Duplicate records
Full-text availability	No full-text access
E-commerce or digital transformation focus	Irrelevant research topic

2.4 Screening and Selection Process

The study selection procedure followed the PRISMA framework and is illustrated in Figure 1. During the identification stage, a total of 312 records were retrieved from the selected databases. Following duplicate removal, 46 duplicate articles were excluded, resulting in 266 unique studies for further evaluation. The screening stage involved reviewing titles, abstracts, and keywords to assess their relevance to the research objectives. At this stage, 184 articles were excluded because they did not adequately address SME e-commerce adoption, digital transformation, or competitiveness. Consequently, 82 articles advanced to the eligibility assessment stage. During the eligibility stage, full-text reviews were conducted for all remaining articles. A further 49 studies were excluded because they failed to satisfy one or more inclusion criteria, including lack of SME focus, absence of empirical evidence, or insufficient discussion of the relationship between e-commerce adoption and business competitiveness. Following the final assessment, 33 empirical studies satisfied all selection criteria and were included in the synthesis and analysis process. This systematic screening procedure enhanced the reliability and transparency of the review by ensuring that only high-quality and directly relevant studies informed the development of the proposed conceptual framework.

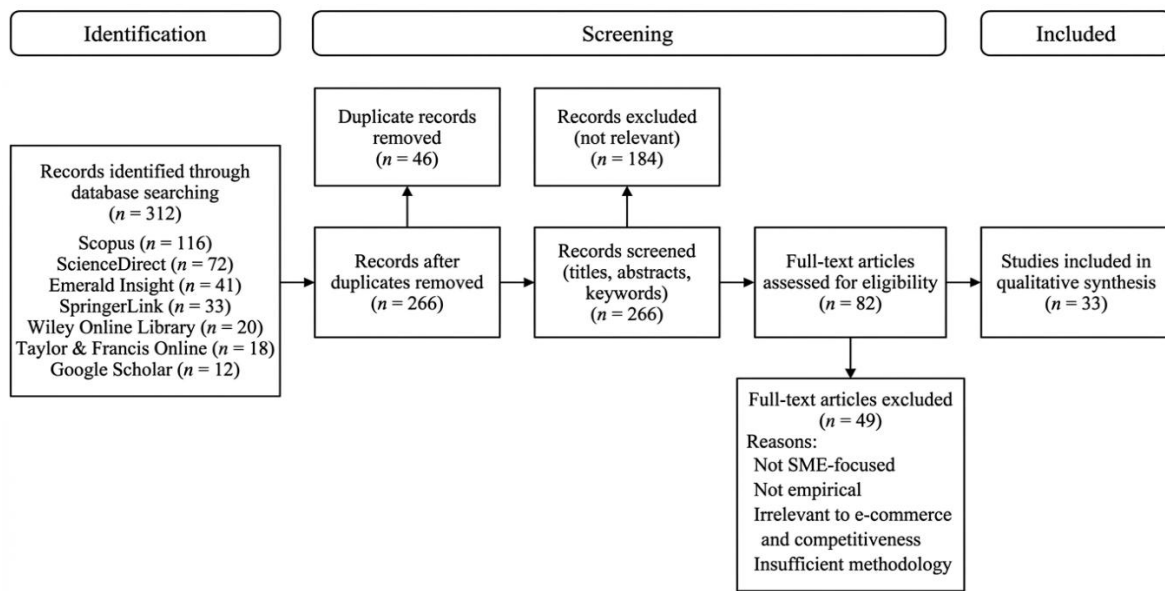


Fig. 1 PRISMA Flow Diagram for the Selection of Studies Included in the Systematic Literature Review

2.5 Quality Assessment

To ensure the robustness and credibility of the synthesized evidence, all selected studies underwent a quality assessment process. Each article was evaluated against four primary criteria:

1. Clarity of research objectives.
2. Appropriateness of the research methodology.
3. Relevance to e-commerce adoption and SME competitiveness.
4. Theoretical and practical contributions.

Articles demonstrating strong methodological rigor and clear relevance to the research topic were retained for synthesis. Studies that failed to meet minimum quality standards across these dimensions were excluded from the final review stage. This assessment process helped ensure that the conceptual framework developed in this study was grounded in reliable and theoretically meaningful evidence.

2.6 Data Extraction and Analysis

Data extraction was conducted using a structured extraction form designed to systematically capture key information from each selected study. The extracted data included:

- Author(s)
- Publication year
- Country or research context
- Industry sector
- Theoretical foundation
- Research methodology
- Key variables
- Major findings

The collected evidence was analyzed using a combination of thematic analysis and content analysis. Thematic analysis was employed to identify recurring patterns, themes, and conceptual relationships across the reviewed literature [26], [27]. This approach enabled the identification of dominant factors influencing e-commerce adoption and the mechanisms through which digital transformation contributes to SME competitiveness. Subsequently, content analysis was applied to systematically categorize findings and facilitate cross-study comparisons [30]. Through iterative coding and categorization, the evidence was organized into coherent analytical themes that reflected the current state of knowledge regarding e-commerce adoption and SME performance. The synthesis process resulted in the identification of three overarching themes:

1. Internal drivers of e-commerce adoption, including managerial capability, digital capability, innovation capability, and entrepreneurial orientation.
2. External drivers of e-commerce adoption, including competitive pressure, customer demand, government support, and the digital ecosystem.
3. The impact of e-commerce adoption on SME competitiveness, encompassing sales growth, profitability, market expansion, operational efficiency, and competitive advantage.

Based on the integration of these themes, a conceptual framework was developed to explain how e-commerce adoption enhances SME competitiveness through the interaction of organizational capabilities, environmental factors, and digital business transformation. The framework further integrates the perspectives of the Resource-Based View (RBV), Dynamic Capability Theory (DCT), and the Technology-Organization-Environment (TOE) framework, thereby providing a comprehensive explanation of the pathways linking e-commerce adoption to sustainable competitive advantage among SMEs in Malang City.

3. Result and Discussion

3.1 Results

3.1.1 *Characteristics of the Reviewed Studies*

A total of 33 empirical studies meeting the predefined inclusion criteria were analyzed to identify prevailing research patterns related to e-commerce adoption and SME competitiveness. The distribution of publications indicates a noticeable increase in scholarly attention during the period 2023–2025, reflecting the growing importance of digital transformation and e-commerce as strategic mechanisms for enhancing business competitiveness. This trend aligns with the accelerated digitalization observed in the post-COVID-19 environment, where SMEs increasingly adopted digital technologies to sustain operations, improve resilience, and capture new market opportunities [6], [7]. From a geographical perspective, most studies were conducted in developing economies, including Indonesia, Malaysia, Vietnam, Pakistan, Bangladesh, Ghana, and Nigeria. The predominance of developing-country contexts suggests that e-commerce adoption has become a critical strategy for improving productivity, market access, and competitiveness among SMEs operating under resource constraints. Meanwhile, studies from Italy, the United Kingdom, and other European countries provide complementary insights into the role of digital technologies in business model innovation and customer value creation [23], [25].

Regarding methodological approaches, quantitative methods dominated the reviewed literature. Structural Equation Modeling (SEM), Partial Least Squares Structural Equation Modeling (PLS-SEM), and regression analysis were the most frequently employed techniques to examine relationships among organizational factors, environmental conditions, digital capabilities, e-commerce adoption, and business performance. A smaller number of studies adopted qualitative and mixed-method approaches to explore digital transformation processes and capability development in greater depth [31], [32]. The theoretical analysis revealed that three frameworks consistently underpin research on e-commerce adoption and SME competitiveness: the Resource-Based View (RBV), Dynamic Capability Theory (DCT), and the Technology–Organization–Environment (TOE) framework. RBV emphasizes the strategic value of organizational resources and capabilities in creating competitive advantage, DCT explains how firms adapt and renew capabilities in response to environmental change, while TOE focuses on technological, organizational, and environmental determinants of technology adoption. The prevalence of these theories indicates that SME competitiveness depends not only on technology acquisition but also on the organization's ability to strategically deploy and leverage digital resources [22], [24], [33].

Table 3. Characteristics of Reviewed Studies

Characteristic	Dominant Findings
Publication period	2015–2025
Countries	Indonesia, Malaysia, Vietnam, Pakistan, Bangladesh, Ghana, Nigeria, Italy
Methods	PLS-SEM, SEM, Regression Analysis, Mixed Methods, Qualitative
Dominant theories	RBV, DCT, TOE
Research focus	E-commerce adoption, digital capability, competitiveness, SME performance
Sectors	Manufacturing, Services, Retail, Fashion, Cross-border Commerce

3.1.2 *Internal Drivers of E-Commerce Adoption*

The synthesis demonstrates that internal organizational factors constitute the primary foundation for successful e-commerce adoption among SMEs. Unlike large corporations with abundant resources, SMEs rely heavily on their internal capabilities to recognize opportunities, allocate resources effectively, and integrate digital technologies into daily business operations. Among the most frequently identified factors is managerial capability. Numerous studies indicate that managerial competence and leadership commitment significantly influence decisions regarding digital technology adoption. SME owners and managers with stronger digital awareness are generally more capable of recognizing technological opportunities, mitigating risks, and formulating strategies that support digital transformation initiatives [31], [32].

Another recurring determinant is digital capability, including digital literacy and technological competence. These capabilities enable firms to integrate digital technologies into operational processes, marketing activities, and customer relationship management. Studies suggest that digital capability serves as a critical enabler of digital business model innovation and organizational competitiveness [24]. Similarly, Nasir and Wen (2025) emphasize that organizational digital readiness contributes significantly to operational efficiency and technology utilization effectiveness [34]. The review also highlights the importance of innovation capability and entrepreneurial orientation. SMEs characterized by innovative cultures and entrepreneurial mindsets tend to adopt digital technologies more rapidly than conservative organizations. Their willingness to experiment with new business models, develop customer-oriented products, and respond proactively to market changes strengthens the benefits derived from e-commerce adoption [24], [25]. Collectively, these internal factors represent strategic resources that support digital transformation and competitiveness enhancement.

Table 4. Internal Drivers of E-Commerce Adoption

Internal Factors	Supporting Literature
Managerial capability	[31], [32]
Digital capability	[24], [34]
Digital literacy	[35]
Innovation capability	[24], [25]
Entrepreneurial orientation	[20]

3.1.3 External Drivers of E-Commerce Adoption

Beyond internal capabilities, the reviewed literature consistently demonstrates that external environmental conditions significantly influence SME decisions to adopt e-commerce. According to the TOE framework, environmental factors can either facilitate or hinder digital transformation depending on the characteristics of the business ecosystem. One of the most frequently reported determinants is competitive pressure. Increasing market competition encourages SMEs to seek innovative approaches to maintain customer loyalty and expand market reach. In such circumstances, e-commerce serves as a strategic mechanism that enhances market visibility, customer communication, and geographic expansion [15], [36].

Another critical factor is customer demand. Changes in consumer behavior toward digital channels require SMEs to adapt their business models accordingly. The growing preference for convenience, speed, and flexibility in purchasing processes has transformed e-commerce from an optional sales channel into a strategic necessity [33]. The literature further highlights the importance of government support and the broader digital ecosystem. Government initiatives such as digital training programs, infrastructure development, and digitalization incentives can reduce barriers to technology adoption. However, findings regarding government support remain mixed across different contexts, suggesting that institutional effectiveness varies substantially among countries and regions [15], [20]. Overall, the findings indicate that successful e-commerce adoption emerges from the interaction between internal readiness and external support mechanisms. SMEs are more likely to achieve meaningful digital transformation when organizational capabilities align with favorable environmental conditions.

Table 5. External Drivers of E-Commerce Adoption

External Factors	Supporting Literature
Competitive pressure	[15], [36]
Customer demand	[33]
Government support	[15], [20]
Digital ecosystem	[20], [34]
Relative advantage	[33], [36]

3.1.4 Impact of E-Commerce Adoption on SME Competitiveness

The reviewed studies consistently indicate that e-commerce adoption contributes positively to SME competitiveness through multiple strategic pathways. The most frequently reported outcomes include sales growth, profitability enhancement, market expansion, operational efficiency, and sustainable competitive advantage. Most studies suggest that e-commerce expands access to domestic and international markets, enabling SMEs to overcome geographical limitations and reach broader customer segments at relatively low costs. As a result, firms experience increases in sales volume and revenue generation [7], [11], [37].

In addition to revenue-related benefits, e-commerce enhances operational efficiency by reducing transaction costs, communication expenses, promotional expenditures, and distribution costs. These efficiencies create opportunities for firms to allocate resources more effectively and improve profitability [7], [38]. The literature also reveals that the most significant contribution of e-commerce lies in its capacity to generate sustainable competitive advantage. Digital technologies, when combined with organizational capabilities, create unique competencies that are difficult for competitors to replicate. Consequently, firms can achieve greater differentiation and deliver superior value to customers [22], [23].

Furthermore, several studies indicate that e-commerce facilitates digital business model innovation, enabling SMEs to redesign value creation and delivery processes in response to changing market conditions [24], [25]. Nevertheless, some studies report inconsistent findings regarding the relationship between digital capabilities and digital transformation outcomes. For example, [35] found that the strength of this relationship varies across business contexts, suggesting that organizational and environmental conditions moderate the effectiveness of digital transformation initiatives.

Table 6. Impact of E-Commerce Adoption on SME Competitiveness

Impact	Supporting Literature
Sales growth	[7], [11], [37]
Profitability	[7], [10]
Market expansion	[6], [39]
Operational efficiency	[7], [38]
Competitive advantage	[40], [41]
Business model innovation	[24], [25]

3.1.5 Proposed Framework for Enhancing SME Competitiveness in Malang City

The synthesis findings indicate that SME competitiveness is not enhanced through e-commerce adoption alone. Rather, competitiveness emerges from a complex interaction among organizational capabilities, environmental factors, digital transformation processes, and business model innovation. The proposed framework identifies managerial capability, digital capability, innovation capability, and entrepreneurial orientation as the primary internal antecedents that shape SMEs' digital readiness. Simultaneously, competitive pressure, customer demand, government support, and the digital ecosystem act as external stimuli that encourage digital transformation initiatives.

These internal and external drivers jointly influence the extent of e-commerce adoption. Subsequently, e-commerce functions as an enabling mechanism that supports digital business model innovation by facilitating new forms of value creation, value delivery, and customer engagement. Through these processes, SMEs achieve improved competitiveness reflected in higher sales growth, broader market reach, enhanced operational efficiency, and stronger business differentiation. The resulting framework integrates the perspectives of the Technology–Organization–Environment (TOE) framework, Resource-Based View (RBV), and Dynamic Capability Theory (DCT) into a unified conceptual model. This integration explains how SMEs can transform digital technologies into sustainable competitive advantage through the development of organizational capabilities and strategic adaptation.



Fig. 2 Proposed Framework for Enhancing SME Competitiveness through E-Commerce Adoption in Malang City

3.2 Discussion

The findings demonstrate that e-commerce adoption is a multidimensional phenomenon shaped by the interaction of internal capabilities and external environmental conditions. This result supports the central proposition of the TOE framework, which argues that technological adoption decisions cannot be explained solely by technological considerations but must also account for organizational readiness and environmental influences. The synthesis reveals that managerial capability, digital capability, innovation capability, and entrepreneurial orientation represent critical organizational resources that enable SMEs to effectively exploit digital technologies. Simultaneously, competitive pressure, customer demand, government support, and the digital ecosystem create the external conditions that encourage firms to pursue digital transformation initiatives.

From the perspective of the Resource-Based View (RBV), the findings suggest that digital technologies alone do not constitute a source of sustainable competitive advantage. Instead, competitive advantage emerges when technology is combined with valuable, rare, inimitable, and non-substitutable organizational resources. Managerial competence, digital knowledge, innovation capability, and entrepreneurial orientation represent intangible strategic assets that enable SMEs to derive value from e-commerce investments. This finding is consistent with studies emphasizing that firms possessing superior organizational capabilities are better positioned to convert digital resources into enhanced business performance and market competitiveness [22], [23].

The results also reinforce the relevance of Dynamic Capability Theory (DCT) in explaining digital transformation among SMEs. Dynamic capabilities refer to an organization's ability to sense opportunities, seize emerging possibilities, and continuously reconfigure resources in response to environmental changes. The reviewed studies indicate that successful e-commerce adoption requires more than technological implementation; it demands continuous organizational learning, innovation, and adaptation. SMEs that possess strong dynamic capabilities are better able to adjust their business models, develop new customer engagement strategies, and respond effectively to evolving market conditions. Consequently, digital transformation becomes an ongoing strategic process rather than a one-time technological investment.

The synthesis further reveals that the relationship between e-commerce adoption and competitiveness is mediated by business model innovation. E-commerce enables SMEs to redesign value creation and value delivery mechanisms, thereby improving customer experiences and operational effectiveness. This finding extends previous research by demonstrating that digital transformation generates competitive outcomes not directly through technology usage but through the organizational changes that technology facilitates. As such, the ability to innovate business models becomes a crucial mechanism linking digital transformation to long-term competitiveness.

An important contribution of this study lies in addressing inconsistencies identified in previous research. While earlier studies often focused separately on adoption determinants or performance outcomes, the present review demonstrates that these dimensions are interconnected. Internal organizational capabilities influence adoption decisions, external environmental factors shape adoption conditions, and e-commerce

adoption subsequently enables business model innovation that enhances competitiveness. This integrated perspective provides a more comprehensive explanation of how digital transformation contributes to SME performance.

From a theoretical standpoint, the integration of RBV, DCT, and TOE contributes to the development of a more holistic framework for understanding SME competitiveness in the digital economy. TOE explains why firms adopt digital technologies, RBV explains how internal resources create value, and DCT explains how organizations sustain competitiveness through continuous adaptation. The combination of these perspectives offers a comprehensive explanation of the mechanisms through which e-commerce adoption contributes to sustainable competitive advantage.

The findings also generate important managerial implications for SME owners and policymakers. For SME managers, the results indicate that investments in e-commerce platforms should be accompanied by efforts to strengthen digital competencies, managerial capabilities, innovation capacity, and entrepreneurial orientation. Simply adopting digital technologies is unlikely to generate significant competitive benefits unless firms develop the capabilities required to exploit those technologies effectively. Therefore, digital transformation strategies should emphasize organizational capability development alongside technological implementation.

For policymakers, the findings highlight the importance of creating a supportive digital ecosystem. Government initiatives focusing on digital infrastructure, digital literacy training, business mentoring, and innovation support programs can significantly reduce barriers to e-commerce adoption. Such interventions are particularly relevant in the context of Malang City, where SMEs represent a vital component of regional economic development. Strengthening the digital ecosystem can accelerate SME transformation, increase productivity, and improve regional competitiveness.

Finally, the proposed framework offers practical guidance for SME digital transformation. By emphasizing the interaction among internal capabilities, external drivers, e-commerce adoption, and business model innovation, the framework provides a roadmap for SMEs seeking to leverage digital technologies as a source of sustainable competitive advantage. In the context of increasingly dynamic and technology-driven markets, the ability to integrate digital resources with organizational capabilities will become a decisive factor in determining long-term SME competitiveness.

4. Conclusions

This study aimed to identify and synthesize the factors influencing e-commerce adoption among SMEs, examine its impact on business competitiveness, and develop a conceptual framework relevant to SMEs in Malang City. Based on a Systematic Literature Review of 33 empirical studies published between 2020 and 2025, the findings demonstrate that successful e-commerce adoption is influenced by the interaction of both internal and external factors. Internal factors include managerial capability, digital capability, innovation capability, and entrepreneurial orientation, whereas external factors comprise competitive pressure, customer demand, government support, and the digital ecosystem. These findings indicate that e-commerce adoption is not determined solely by the availability of technology but also by organizational readiness and supportive environmental conditions.

The review further reveals that e-commerce adoption contributes significantly to SME competitiveness through multiple performance-related outcomes, including sales growth, profitability improvement, market expansion, operational efficiency, and enhanced competitive advantage. However, the literature consistently suggests that these benefits are not achieved automatically through technology implementation alone. Rather, the ability of SMEs to integrate digital technologies into business processes, marketing activities, and value creation mechanisms determines whether digital investments can be transformed into sustainable business value. Consequently, e-commerce functions as an enabler of competitiveness, while organizational capabilities remain the critical factor that converts digital opportunities into long-term strategic advantages.

From a theoretical perspective, this study contributes to the digital business and strategic management literature by integrating the Resource-Based View (RBV), Dynamic Capability Theory (DCT), and the Technology–Organization–Environment (TOE) framework into a unified conceptual model. While previous studies have predominantly examined either the determinants of e-commerce adoption or its performance consequences, the present study demonstrates that SME competitiveness emerges through a broader process involving the interaction of organizational resources, dynamic capabilities, environmental influences, and digital business model innovation. The proposed framework therefore provides a more comprehensive explanation of the mechanisms linking e-commerce adoption to sustainable competitive advantage in the context of SMEs.

The study also offers practical implications for SME practitioners and policymakers. For SME owners and managers, enhancing competitiveness requires more than merely adopting e-commerce platforms. Equal attention should be given to strengthening digital competencies, managerial capabilities, innovation capacity, and entrepreneurial orientation to maximize the value derived from digital technologies. For policymakers and regional development stakeholders, the findings highlight the importance of fostering a supportive digital ecosystem through investments in digital infrastructure, capacity-building programs, business mentoring initiatives, and digital transformation policies. Such efforts are essential to accelerating SME digitalization and improving regional economic competitiveness, particularly in Malang City.

Despite its contributions, this study has several limitations. As a Systematic Literature Review, the research relies exclusively on previously published empirical studies and does not empirically test the proposed framework. Consequently, the conceptual relationships identified in this study remain subject to further empirical validation. Future research is therefore encouraged to examine the proposed framework quantitatively using data collected from SMEs in Malang City or comparable regional contexts. Additionally, future studies may investigate the roles of emerging factors such as digital leadership, organizational resilience, customer engagement, and artificial intelligence adoption in strengthening the relationship between e-commerce adoption and SME competitiveness. Such investigations would contribute to a deeper understanding of how SMEs can sustain competitive advantage in an increasingly dynamic and digitally driven business environment.

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