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The Role of Product Innovation in MSME Sustainability: A Review from an Entrepreneurial Perspective

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Abstract. This study aims to analyze the role of product innovation in supporting the sustainability of Micro, Small, and Medium Enterprises (MSMEs) from an entrepreneurial perspective. The study employs a literature review method using a qualitative approach and descriptive analysis. Data were collected from Google Scholar, ScienceDirect, MDPI, and publications from credible institutions covering the period 1964–2026. A total of 68 articles were identified during the initial stage and subsequently screened based on relevance, quality, and topic suitability, resulting in 43 articles being selected as the primary sources for analysis. The findings indicate that product innovation plays a significant role in enhancing competitiveness, strengthening customer loyalty, expanding market opportunities, and improving MSMEs' adaptive capacity to changes in the business environment. From an entrepreneurial perspective, creativity, innovation orientation, dynamic capabilities, and collaboration are identified as key factors that reinforce business sustainability. This review confirms that product innovation is a strategic instrument for MSMEs to maintain business continuity while fostering sustainable growth.

Keywords: Product Innovation, MSME Sustainability, Entrepreneurship, Competitiveness.

1. Introduction

Micro, Small, and Medium Enterprises (MSMEs) constitute a fundamental pillar of the national economy by contributing significantly to employment generation, income distribution, and the stimulation of economic activities across various regions. The increasingly competitive business environment has compelled MSME owners to continuously adjust their business strategies in order to sustain their long-term existence. Changes in consumer preferences, rapid advances in digital technology, and intensifying market competition have positioned business sustainability as one of the central issues discussed in entrepreneurship studies. MSME sustainability is no longer viewed merely as the ability to generate profits within a specific period but also as the enterprise's capacity to adapt to market changes, create value for customers, maintain operational efficiency, and build competitiveness capable of withstanding diverse business challenges [1]. These conditions indicate that business sustainability is strongly influenced by entrepreneurs' ability to generate new ideas that strengthen their products' market position. From an entrepreneurial perspective, innovation is regarded as one of the defining characteristics distinguishing enterprises that achieve sustainable growth from those experiencing stagnation.

Product innovation has become one of the primary strategies adopted by MSMEs to respond to changing market demands while simultaneously increasing the value added of their products. Innovation may be realized through product design development, quality improvement, product diversification, the adoption of more efficient production technologies, and the creation of new product benefits that align with consumer expectations. These initiatives provide MSMEs with opportunities to expand their market share while strengthening customer loyalty in an increasingly dynamic competitive environment. Entrepreneurship literature explains that product innovation results from entrepreneurs' ability to identify opportunities, combine available resources, and transform creative ideas into products with economic value [2]. This perspective demonstrates

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that successful innovation is determined not by business size but by entrepreneurs' capability to understand changes in the business environment and translate them into relevant solutions for consumers.

The entrepreneurial perspective considers innovation as an integral component of strategic orientation that drives business growth through the creation of competitive advantage [3]. Entrepreneurs possessing strong innovation orientation tend to be more willing to take risks, more receptive to change, and more proactive in exploring market opportunities than those who maintain conventional business models. Such characteristics enable MSMEs to develop differentiated products capable of competing in increasingly complex markets. Product innovation subsequently functions as a mechanism for enhancing customer satisfaction, strengthening brand image, and creating value that is difficult for competitors to imitate. The relationship between entrepreneurial orientation and product innovation has received considerable scholarly attention because both complement one another in building business sustainability through improved adaptive capacity, organizational learning, and more productive resource development.

Empirical studies consistently demonstrate that product innovation is positively associated with MSME sustainability through improvements in business performance, sales growth, and customer retention. Products that continuously undergo renewal generally possess stronger market appeal because they are better able to accommodate evolving consumer preferences and changing market trends [4]. Such conditions provide MSMEs with opportunities to sustain business operations while simultaneously expanding their marketing networks. Previous studies also indicate that innovation success is strongly influenced by entrepreneurs' creativity, knowledge management capabilities, access to market information, and willingness to experiment with new products [5]. Differences in the internal conditions of MSMEs contribute to varying levels of innovation success, making discussions regarding the factors that strengthen the relationship between product innovation and business sustainability an evolving area within entrepreneurship literature.

The advancement of digital technology has further expanded opportunities for product innovation through the utilization of social media, e-commerce platforms, customer preference analysis, and various digital applications supporting business operations. Digital transformation provides MSMEs with broader access to information regarding market trends, consumer behavior, and competitors' strategies in a more timely manner. Such information serves as a valuable foundation for designing products that better meet customer needs while offering greater added value. Consequently, the innovation process becomes more flexible, as entrepreneurs can obtain customer feedback within relatively short periods. From an entrepreneurial perspective, the ability to leverage technology is regarded as an innovative competency that strengthens business capacity to sustain long-term operations through the continuous development of products that are more adaptive to environmental changes [6].

Ultimately, MSME sustainability is influenced by the ability to establish a balance between innovation, operational efficiency, and the creation of economic value for all stakeholders involved in business activities. Product innovation contributes to enhanced competitiveness by generating products that are more relevant, of higher quality, and capable of delivering superior customer experiences. Entrepreneurs who consistently renew their products have greater opportunities to maintain long-term customer relationships while simultaneously expanding their market segments. Entrepreneurship literature further explains that continuous innovation reflects an organization's capability to develop organizational learning, enhance creativity, and establish an adaptive culture that supports business growth under various economic conditions [7].

Although numerous studies have examined the relationship between product innovation and MSME sustainability, the findings remain diverse due to differences in industrial sectors, business environments, and theoretical approaches employed. Some studies emphasize technological advancement as the primary driver of innovation, whereas others place greater emphasis on entrepreneurial orientation, individual creativity, or resource management capabilities. These variations indicate that product innovation is a multidimensional phenomenon influenced by both internal and external factors. This research gap provides opportunities to deepen understanding of how the entrepreneurial perspective explains product innovation as a mechanism supporting MSME sustainability across diverse and continuously evolving business contexts.

Based on the foregoing discussion, examining the role of product innovation in MSME sustainability from an entrepreneurial perspective possesses increasing academic and practical significance. A literature review is therefore necessary to develop a comprehensive understanding of the evolution of product innovation, entrepreneurial orientation, and MSME sustainability based on findings from previous studies. Such a review is expected to identify patterns among these concepts, reveal prevailing research trends, and identify opportunities for future investigations. The findings of this literature review may subsequently serve as a conceptual foundation for future research focusing on strategies to enhance MSME sustainability through strengthening product innovation capabilities as part of entrepreneurial practices that remain adaptive to changes in the business environment and evolving market demands.

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1.1. Product Innovation

Product innovation refers to the process of developing, improving, or creating new products aimed at generating added value for consumers while enhancing a firm's competitive advantage [8]. Innovation is not limited to the creation of entirely new products but also includes design modifications, quality improvements, feature enhancements, product diversification, packaging changes, and the adoption of technologies that increase product value. From an entrepreneurial perspective, product innovation is viewed as the outcome of creativity, the ability to identify market opportunities, and the willingness to take risks in producing solutions that are superior to existing products. For MSMEs, product innovation serves as a strategic response to changes in consumer preferences, technological advancements, and the dynamic nature of business competition, enabling enterprises to maintain product relevance while continuously expanding market opportunities.

1.2. MSME Sustainability

MSME sustainability refers to the ability of micro, small, and medium enterprises to maintain business continuity, growth, and competitiveness over the long term through effective resource management and the capacity to adapt to changes in the business environment [9]. The concept of sustainability reflects an enterprise's capability to maintain customer relationships, improve product quality, foster innovation, manage risks, and capitalize on business opportunities arising from economic, social, and technological changes. From an entrepreneurial perspective, MSME sustainability demonstrates entrepreneurs' ability to continuously create economic value through learning, innovation, and adaptive decision-making, thereby enabling businesses to grow despite facing various challenges and uncertainties.

1.3. Entrepreneurship

Entrepreneurship is the process of creating, developing, and managing business opportunities through creativity, innovation, risk-taking, and the ability to combine various resources into activities that generate economic value [10]. This concept positions entrepreneurs as individuals who are capable of recognizing market opportunities, developing new ideas, and transforming them into products, services, or business models that create value for both consumers and organizations. The entrepreneurial perspective emphasizes the importance of innovation orientation, proactive behavior, adaptability, and responsive decision-making in addressing changes in the business environment. Within the context of MSMEs, entrepreneurship serves as the fundamental driver of product innovation, enhanced competitiveness, and business sustainability through the ability to effectively respond to market dynamics.

1.4. Competitiveness

Competitiveness refers to an enterprise's ability to produce products or services that offer greater value than those of its competitors, thereby enabling the business to retain existing customers, attract new consumers, and achieve sustainable business performance [11]. Competitiveness is built upon a combination of product quality, innovation, operational efficiency, competitive pricing, excellent customer service, technology utilization, and the ability to respond effectively to changing market demands. In the context of MSMEs, competitiveness reflects entrepreneurs' ability to create product differentiation that is difficult for competitors to imitate while delivering superior customer experiences. From an entrepreneurial perspective, competitiveness is regarded as the result of organizational learning, continuous innovation, and effective resource management, enabling enterprises to maintain a strong competitive position and achieve long-term growth.

2. Method

This study employed a literature review method using a qualitative approach with descriptive analysis. This approach was selected because it aims to synthesize, interpret, and explain the development of concepts concerning the role of product innovation in MSME sustainability from an entrepreneurial perspective based on findings from previous studies. A literature review enables researchers to obtain a comprehensive understanding of the relationships among concepts, identify prevailing research trends, and recognize research gaps that remain open for further investigation. This approach followed a systematic literature review process, beginning with topic formulation, literature searching, article screening, source quality evaluation, synthesis of findings, and concluding with the development of a narrative interpretation.

The research data consisted of secondary data collected from various reputable scientific sources. The literature search was primarily conducted through Google Scholar because of its extensive coverage of academic publications. The search process was further complemented by articles retrieved from ScienceDirect,

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SpringerLink, Taylor & Francis Online, ResearchGate, Emerald Insight, MDPI, as well as supporting documents published on the official websites of companies such as Apple Inc, Toyota Motor Corporation, and Kopi Kenangan, whenever they were relevant to the discussion. The literature included in this review covered publications from 1964 to 2026 in order to comprehensively capture the development of research on product innovation, entrepreneurship, and MSME sustainability.

The initial literature search employed keywords including product innovation, MSME sustainability, SME sustainability, entrepreneurship, innovation capability, business sustainability, inovasi produk, keberlanjutan UMKM, and kewirausahaan, resulting in 68 articles that were considered relevant based on their titles and abstracts. A subsequent screening process was conducted using predefined inclusion and exclusion criteria. The inclusion criteria were: (1) articles published between 1964 and 2026; (2) publications appearing in peer-reviewed journals, conference proceedings, or official reports issued by credible institutions; (3) studies addressing product innovation, entrepreneurship, MSME sustainability, or the relationships among these three concepts; (4) availability of the complete full-text article; and (5) provision of sufficient discussion to support the objectives of this study. The exclusion criteria included duplicate articles, publications containing only abstracts, studies unrelated to the research focus, non-scholarly popular publications, and publications lacking adequate methodological information.

The screening process was conducted systematically through duplicate identification, assessment of title relevance, abstract evaluation, full-text review, source quality assessment, and examination of each article's relevance to the research objectives. From a total of 68 articles initially identified, 12 articles were excluded because their content was not aligned with the focus on product innovation and MSME sustainability, 7 articles were removed due to duplication across multiple databases, and 6 articles were excluded because they failed to meet the quality criteria, as they provided only abstracts or contained very limited discussion. Consequently, 43 articles satisfied all selection criteria and were included as the primary sources for analysis. Data analysis was conducted using a qualitative descriptive analysis technique involving thematic categorization, comparison of previous research findings, identification of relationships among key concepts, interpretation of the findings, and the development of a comprehensive synthesis explaining the role of product innovation in supporting MSME sustainability from an entrepreneurial perspective.

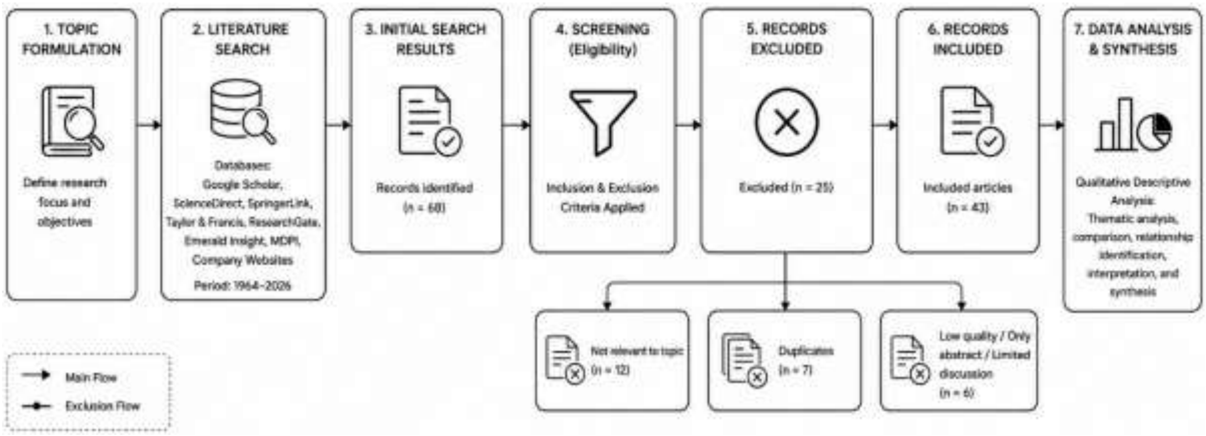

Figure 1. Research Methodology Flowchart

3. Result and Discussion

Product innovation occupies a central position in entrepreneurship studies because it reflects entrepreneurs' ability to create new value capable of responding to evolving market demands. The sustainability of Micro, Small, and Medium Enterprises (MSMEs) in an increasingly dynamic competitive environment depends on entrepreneurs' capacity to develop products characterized by uniqueness, quality, and continuously evolving benefits that align with consumer preferences. From an entrepreneurial perspective, changes in the business environment are regarded as opportunities that should be addressed through creativity and innovation rather than merely challenges to be overcome. This perspective is consistent with innovation theory, which explains that innovation serves as the primary engine of economic growth through the creation of new combinations in the form of products, processes, markets, sources of raw materials, and organizational models [12]. The concept of creative destruction, introduced by Schumpeter, suggests that firms capable of continuously introducing

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innovations have greater opportunities to sustain their competitiveness than those relying on conventional business practices [13]. Within the context of MSMEs, product innovation represents a tangible manifestation of entrepreneurial spirit because it enables entrepreneurs to develop product differentiation that delivers value to consumers. Contemporary entrepreneurship literature further expands this perspective by defining innovation as an organizational capability to manage knowledge, identify market opportunities, and integrate resources into products possessing competitive advantages. Previous studies indicate that the success of MSMEs is increasingly determined by their ability to adapt rapidly to change rather than by the amount of capital they possess [14]. These findings demonstrate that product innovation has evolved into a strategic foundation for achieving business sustainability by enhancing value creation, strengthening customer loyalty, and improving the capacity to respond to continuously changing business environments.

The relationship between product innovation and MSME sustainability is strongly supported by the conceptual foundation of the Resource-Based View (RBV). This theory argues that competitive advantage originates from resources that are valuable, rare, difficult to imitate, and difficult to substitute [15]. Product innovation is considered one of the strategic capabilities that fulfills these characteristics because it emerges from the combination of experience, creativity, market knowledge, and organizational learning capabilities that differ across business actors. From the RBV perspective, innovation success is not determined by ownership of expensive technologies but rather by the ability to transform available resources into products that create greater value than those offered by competitors. This perspective is particularly relevant for MSMEs, which generally operate under constraints related to capital, human resources, and production capacity. Previous studies have shown that many MSMEs achieve significant growth through simple innovations focused on consumer needs, including design modifications, improvements in raw material quality, more attractive packaging, and the addition of new product functions [16]. These findings demonstrate that competitive advantage can be built through creativity and continuous learning. Earlier research has also revealed that product innovation contributes to increased customer satisfaction, sales growth, market expansion, and enhanced business reputation [17]. This relationship reinforces the argument that product innovation represents an intangible strategic asset that plays a vital role in maintaining MSME sustainability amid increasingly rapid changes in the business environment.

From an entrepreneurial perspective, product innovation is closely associated with Entrepreneurial Orientation Theory. This theory identifies innovativeness, proactiveness, and risk-taking as the primary dimensions determining business success [18]. MSME entrepreneurs with strong entrepreneurial orientation tend to identify business opportunities more quickly, remain more open to new ideas, and demonstrate greater willingness to experiment in product development. These characteristics enable enterprises to develop stronger product differentiation, thereby sustaining their competitive position in dynamic markets. Previous studies have demonstrated that entrepreneurial orientation is positively associated with both innovation capability and business sustainability [19]. Entrepreneurs who actively seek new opportunities are generally more responsive to changing consumer preferences than those who maintain conventional production practices. This analysis indicates that product innovation is not merely the outcome of individual creativity but also a component of an organizational culture that encourages continuous learning, collaboration, and value creation. This perspective further clarifies that MSME sustainability is strongly influenced by the quality of entrepreneurial decision-making in managing market uncertainty through innovations that are relevant, economically valuable, and more capable of meeting consumer needs than existing alternatives.

Previous empirical studies further reinforce the relationship between product innovation and MSME sustainability across different countries and industrial sectors. Numerous studies have demonstrated that product innovation positively influences business performance by increasing sales growth, expanding market reach, strengthening customer loyalty, and enhancing the ability to sustain long-term profitability. Research conducted by [20] on organizational creativity explains that environments encouraging the exploration of new ideas produce higher-quality innovations, thereby increasing the likelihood of business success. Other studies examining innovation in MSMEs have likewise shown that continuous product improvement enhances consumers' perceptions of quality, strengthens brand image, and creates competitive barriers for rivals [21]. These findings reveal a consistent pattern indicating that product innovation is one of the primary determinants of business sustainability. Nevertheless, several studies also report variations in outcomes due to differences in factors such as human resource capacity, the level of digital technology adoption, access to market information, financing availability, and industry characteristics [22], [23]. These variations suggest that product innovation is a multidimensional process shaped by interactions between internal and external factors. This analysis demonstrates that innovation success requires strong managerial capabilities, organizational learning, and entrepreneurial orientation capable of transforming business opportunities into sustainable competitive advantages.

The discussion of product innovation from an entrepreneurial perspective ultimately demonstrates that MSME sustainability is the outcome of a continuous adaptation process to changes in the business environment. Technological advancements, increasing consumer expectations, the expansion of the digital economy, and intensifying global competition require entrepreneurs to continuously update their products to maintain market relevance. The literature on Dynamic Capabilities Theory explains that organizations capable of surviving over the long term are those possessing the ability to integrate, build, and reconfigure resources in response to environmental changes [24]. This theory suggests that product innovation is not an occasional activity but rather a continuous learning process involving opportunity identification, idea development, innovation implementation, performance evaluation, and product refinement based on customer feedback. Such capabilities enable MSMEs to develop strategic flexibility, making them better prepared to cope with economic uncertainty and changing market behavior. Previous studies have demonstrated that product innovation occupies a highly strategic position in sustaining MSMEs because it creates economic value, enhances competitiveness, strengthens customer relationships, and establishes a more adaptive foundation for business growth [25]. This analysis provides a strong conceptual basis for understanding how innovation-oriented entrepreneurial practices can generate more consistent business sustainability across diverse business environments.

The role of product innovation in MSME sustainability becomes increasingly evident when examined in relation to rapid technological advancement and evolving consumer behavior. Modern consumers no longer regard price as the sole criterion in purchasing decisions but increasingly consider product quality, uniqueness, ease of use, environmental sustainability, and the overall experience gained from using a product. These changes encourage MSMEs to develop innovations that emphasize value creation rather than merely increasing production volume. The Value Innovation perspective argues that competitive advantage can be achieved by creating new value capable of reducing direct competition [26]. This approach demonstrates that product innovation provides MSMEs with opportunities to enter new market spaces through a combination of creativity, technological utilization, and a deep understanding of continuously evolving customer needs. Previous studies have also shown that MSMEs that consistently introduce product improvements exhibit higher levels of adaptability to changes in the business environment than enterprises maintaining static product characteristics [27]. This capability contributes to stronger customer loyalty, increased repeat purchases, and greater business resilience during periods of economic pressure and shifting market trends. This analysis indicates that product innovation is inherently dynamic because it is continuously shaped by the interaction between technological developments, changing consumer preferences, and entrepreneurs' ability to recognize business opportunities emerging from such changes.

The relationship between product innovation and business sustainability can be clearly observed through the success of Apple Inc. in maintaining its global competitiveness for more than two decades. The company's strategy demonstrates that continuous product innovation can simultaneously foster strong customer loyalty and deliver outstanding financial performance. According to the Apple Annual Report 2024, the company generated revenue of US$391.0 billion during the 2024 fiscal year, with the iPhone product line remaining its largest revenue contributor, generating approximately US$201.2 billion, representing more than half of the company's total sales [28]. This success has not been driven solely by the introduction of new products but also by continuous improvements in product design, processor performance, security features, hardware-software integration, and the development of a digital ecosystem that consistently enhances the user experience. This pattern demonstrates that product innovation is a cumulative process achieved through continuous enhancement of the value perceived by consumers over time. Although the scale of innovation undertaken by MSMEs differs substantially from that of multinational corporations, the underlying principle remains the same: creating product differentiation that competitors find difficult to imitate through improvements in product quality, design development, packaging innovation, and the effective utilization of digital technologies. The analysis of Apple's experience illustrates that business sustainability is strongly influenced by an organization's ability to maintain product relevance through consistent innovation that remains closely aligned with customer needs.

Another relevant case study can be found in Toyota Motor Corporation through the development of Hybrid Electric Vehicle (HEV) technology, which has significantly reshaped competition within the global automotive industry. This innovation emerged from long-term investments in research and development, production efficiency, and a comprehensive understanding of consumer demand for energy efficiency and environmental sustainability. According to the Toyota Global Sales Results 2024, Toyota sold approximately 10.82 million vehicles worldwide in 2024, while sales of electrified vehicles—including hybrid, plug-in hybrid, battery electric, fuel cell, and mild hybrid models—reached approximately 4.53 million units, representing an increase compared with the previous year [29], [30]. These achievements demonstrate that continuous product innovation can reinforce a company's competitive position even as the automotive industry undergoes a major transition toward low-emission vehicles. From an entrepreneurial perspective, Toyota's success is attributed not only to

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technological excellence but also to its culture of continuous improvement (kaizen), which promotes organizational learning, experimentation, and ongoing product refinement. This concept is highly relevant to MSMEs because innovation does not necessarily require substantial financial investment; rather, it can be achieved through incremental product quality improvements, feature modifications based on customer needs, and continuous evaluation of market changes.

Within the Indonesian context, a notable example of successful product innovation can be observed in Kopi Kenangan. The company has evolved from a startup into one of the largest coffee chains in Southeast Asia by combining product innovation with digital transformation. Kopi Kenangan has consistently developed a wide variety of beverages tailored to local consumer preferences, continuously updated its packaging design, utilized digital applications for ordering, and integrated technology-based customer loyalty programs. According to the company's official information, by 2024 Kopi Kenangan had operated more than 900 outlets across Indonesia, Malaysia, and Singapore. The company has also served millions of customers through both its physical store network and digital applications [31]. This growth demonstrates that the integration of product innovation and service innovation can simultaneously strengthen customer loyalty and expand market reach. For MSMEs, this case illustrates that innovation does not necessarily require the creation of entirely new products but can instead be achieved through improvements in product flavor, packaging differentiation, service quality enhancement, the utilization of digital technology, and the strengthening of brand identity. The synthesis of these three case studies reveals a consistent pattern indicating that business sustainability is built upon continuous innovation, supported by entrepreneurs' ability to identify market opportunities and reinforced by organizational learning processes that enable products to evolve in response to changing consumer needs.

The synthesis of various theories, previous empirical findings, and case studies demonstrates that product innovation cannot be separated from the process of establishing MSME sustainability. This relationship can be explained through the perspective of Diffusion of Innovation Theory. The theory argues that an innovation generates meaningful impact only when it is accepted, adopted, and continuously utilized by both individuals and organizations [32]. Within the MSME context, the success of product innovation should not be assessed solely by the ability to introduce new products but also by the level of consumer acceptance, the speed of adaptation to market changes, and entrepreneurs' capability to continuously refine products based on customer feedback. Previous studies have shown that MSMEs actively evaluating consumer responses to newly introduced products exhibit higher levels of business sustainability than those that rarely conduct market evaluations. This analysis suggests that innovation represents a continuous learning cycle encompassing customer needs assessment, idea generation, product implementation, performance evaluation, and subsequent innovation refinement. This perspective indicates that business sustainability originates from an organization's ability to establish adaptive learning mechanisms, ensuring that innovation evolves beyond an occasional activity into an organizational culture embedded throughout business operations. This condition explains why many MSMEs have remained sustainable for decades despite limited resources, as their success stems from consistently improving products in response to changes in the business environment.

Nevertheless, numerous studies have also indicated that the implementation of product innovation within MSMEs continues to face several challenges that may hinder business sustainability. The first challenge concerns limited resources, particularly financial capital, technology, and human resource competencies, which often slow the product development process [33], [34], [35]. The second challenge arises from inadequate market research capabilities, resulting in innovations that do not fully correspond to consumer needs [36]. Another challenge is the limited utilization of digital technology in product design, promotion, and evaluation, thereby restricting opportunities to obtain timely and comprehensive market information [37]. These conditions are further supported by previous studies indicating that most MSMEs continue to prioritize daily operational activities over long-term innovation development. One potential solution is to strengthen entrepreneurial capacity through product innovation training, enhancement of design competencies, mastery of digital technologies, and the continuous development of market analysis capabilities. From the perspective of Human Capital Theory, investments in entrepreneurs' knowledge, skills, and competencies increase productivity while improving their ability to generate innovations with greater economic value [38]. Strengthening the quality of human resources therefore increases the likelihood that MSMEs will develop more competitive products while enhancing their capacity to respond effectively to increasingly dynamic business environments.

Another frequently identified issue is the limited access of MSMEs to innovation networks, technological information, and collaboration with various stakeholders. Many entrepreneurs continue to develop products primarily based on personal experience without taking advantage of opportunities for collaboration with universities, research institutions, business communities, or government agencies [39]. This situation slows the innovation process because of limited knowledge transfer and inadequate access to emerging technologies. The literature on Open Innovation argues that organizations achieve more effective innovation outcomes when they

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are able to utilize external sources of knowledge through mutually beneficial collaboration [40]. From this perspective, a second strategic solution is to strengthen the innovation ecosystem through partnerships among MSMEs, universities, business incubators, local governments, financial institutions, and companies possessing more advanced technological capabilities. Such collaborations enable MSMEs to gain access to market research, production technologies, product design expertise, quality certification, and more effective digital marketing strategies. Previous studies have demonstrated that MSMEs participating in collaborative networks exhibit higher levels of innovation because they benefit from broader learning opportunities and are able to accelerate their adaptation to market changes [41], [42]. This approach demonstrates that product innovation develops more effectively when supported by an entrepreneurial ecosystem that promotes knowledge exchange, collective learning, and synergy among multiple stakeholders.

Overall, the discussion demonstrates that MSME sustainability is not determined by a single factor but rather results from the interaction between entrepreneurial orientation, product innovation capability, human resource quality, technology utilization, and the support of a conducive business ecosystem. The synthesis of theories, previous empirical studies, and various case studies reveals a consistent pattern indicating that MSMEs capable of sustaining their existence are those that regard innovation as an integral component of their long-term strategy rather than merely a response to competitive pressure. A third strategic solution is to establish a sustainable innovation system through regular product evaluation, the utilization of customer data as the basis for decision-making, the implementation of digital transformation throughout business processes, and the development of an organizational culture that promotes creativity and continuous learning. This approach is consistent with Dynamic Capabilities Theory, which emphasizes an organization's ability to integrate, develop, and reconfigure resources in order to remain relevant in response to environmental changes [43]. This analysis also indicates that considerable opportunities remain for future research to investigate mechanisms that strengthen the relationship between product innovation and MSME sustainability, including the roles of digital transformation, market orientation, organizational resilience, organizational learning capability, and innovation collaboration. These research opportunities provide a foundation for developing more comprehensive conceptual models that explain how entrepreneurial practices can enhance MSME sustainability through adaptive, value-creating, and customer-oriented product innovation.

Table 1. Role of Product Innovation in MSME Sustainability from an Entrepreneurial Perspective

Theme	Key Findings	Theoretical Perspective / Evidence	Implications for MSMEs
Product Innovation as a Strategic Foundation	Product innovation is a core driver of MSME sustainability by creating customer value, product differentiation, and competitive advantage.	Innovation Theory; Creative Destruction (Schumpeter)	MSMEs should continuously innovate to remain competitive and sustain long-term business growth.
Resource-Based View (RBV)	Innovation capability represents a valuable, rare, inimitable, and non-substitutable strategic resource that strengthens competitive advantage.	Resource-Based View (RBV)	Competitive advantage depends more on effective resource utilization than on financial capital.
Entrepreneurial Orientation	Innovativeness, proactiveness, and risk-taking positively influence innovation capability and business sustainability.	Entrepreneurial Orientation Theory	Entrepreneurial mindset enhances adaptability, opportunity recognition, and long-term competitiveness.
Empirical Evidence	Product innovation consistently improves sales growth, customer satisfaction, market expansion, profitability, and brand reputation.	Previous empirical studies across countries and industries	Continuous product improvement contributes directly to sustainable business performance.
Dynamic Capabilities	Sustainable innovation requires continuous learning, opportunity recognition, implementation, evaluation, and product refinement.	Dynamic Capabilities Theory	MSMEs should build strategic flexibility to respond effectively to environmental changes.
Digital Transformation and Value	Digital technology enables MSMEs to develop customer-oriented innovations focused on	Value Innovation Perspective	Digital transformation strengthens adaptability, customer loyalty, and

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Creation	value creation rather than production volume.		market competitiveness.
Business Case: Apple Inc.	Continuous innovation in design, technology, and ecosystem integration strengthens customer loyalty and financial performance.	Apple Annual Report 2024	Consistent product improvement is more important than occasional radical innovation.
Business Case: Toyota Motor Corporation	Continuous improvement (Kaizen) and incremental innovation sustain competitiveness during industrial transformation.	Toyota Global Sales Results 2024	Incremental innovation can generate long-term competitive advantages even with limited resources.
Business Case: Kopi Kenangan	Combining product innovation with digital transformation accelerates market expansion and customer loyalty.	Company Official Information	MSMEs can innovate through packaging, service quality, branding, digital applications, and product diversification.
Diffusion of Innovation	Innovation contributes to sustainability only when accepted, adopted, and continuously improved based on customer feedback.	Diffusion of Innovation Theory	Regular customer evaluation and product refinement increase long-term business sustainability.
Innovation Challenges	Major barriers include limited capital, technology, human resources, market research capability, and digital adoption.	Previous empirical studies	MSMEs require capacity building and technological support to sustain innovation activities.
Human Capital Development	Entrepreneurial knowledge, skills, and competencies significantly improve innovation capability and productivity.	Human Capital Theory	Continuous training and competency development should become strategic priorities.
Innovation Ecosystem	Collaboration with universities, government, business incubators, financial institutions, and industry strengthens innovation performance.	Open Innovation Theory	Building collaborative innovation networks accelerates knowledge transfer and market adaptation.
Overall Synthesis	MSME sustainability results from the interaction among entrepreneurial orientation, product innovation capability, human capital, technology utilization, and a supportive innovation ecosystem.	Integrated theoretical synthesis	Sustainable product innovation should become a long-term strategic orientation rather than merely a response to competitive pressures.
Future Research Opportunities	Future studies should examine digital transformation, market orientation, organizational resilience, organizational learning, and innovation collaboration as mechanisms strengthening MSME sustainability.	Research gap identified in literature review	Future empirical research can develop more comprehensive conceptual models explaining sustainable MSME innovation.

4. Conclusion

This review demonstrates that product innovation plays a highly strategic role in supporting MSME sustainability from an entrepreneurial perspective. The synthesis of various theories, previous empirical studies, and case studies indicates that product innovation functions as a primary mechanism for creating competitive advantage, increasing product value, strengthening customer loyalty, and expanding market opportunities. The entrepreneurial perspective explains that MSME entrepreneurs' ability to identify opportunities, foster creativity, make adaptive decisions, and utilize resources effectively constitutes the driving force behind sustainable innovation. The discussion also reveals that product innovation extends beyond the creation of entirely new products to include design improvement, quality enhancement, product diversification, the utilization of digital technologies, and the development of customer experiences that enhance long-term business competitiveness. The findings of this literature review consistently demonstrate that MSMEs implementing continuous product innovation possess greater adaptive capacity in responding to changes in the business environment than enterprises maintaining conventional business practices. Various theoretical perspectives, including Innovation Theory, Resource-Based View, Entrepreneurial Orientation Theory, Dynamic Capabilities Theory, Diffusion of Innovation Theory, and Open Innovation, complement one another in explaining the relationship between product innovation and business sustainability. This review further confirms that MSME sustainability results from the interaction among entrepreneurial orientation, innovation capability, human resource quality, technology utilization, and the support of a conducive business ecosystem. These findings reinforce the view that product innovation should be positioned as a continuous business strategy, enabling MSMEs not only to maintain their market presence but also to strengthen their competitiveness within an increasingly dynamic business environment.

This study provides theoretical implications by strengthening the understanding of the relationship between product innovation and MSME sustainability through the integration of multiple entrepreneurial perspectives. The synthesis demonstrates that business sustainability cannot be adequately explained by a single theoretical framework but instead emerges from the interaction of innovation capability, entrepreneurial orientation, strategic resources, and organizational adaptability. This integrated perspective provides a more comprehensive conceptual foundation for future research on product innovation in MSMEs. From a practical perspective, the findings are relevant to MSME entrepreneurs, government agencies, business support institutions, and educational organizations. MSME entrepreneurs should position product innovation as a long-term strategic priority by continuously improving product quality, diversifying product variants, adopting digital technologies, and periodically evaluating consumer needs. Governments and supporting institutions are expected to strengthen the innovation ecosystem through entrepreneurship training, support for product research and development, access to innovation financing, digital transformation assistance, and expanded collaborative networks among MSMEs, universities, and industry. These initiatives are expected to accelerate the enhancement of MSME competitiveness while simultaneously strengthening business sustainability at both the local and national levels.

This study has several limitations that should be considered when interpreting its findings. First, the study employed a literature review methodology; therefore, all findings were derived from the synthesis of previous studies without collecting primary data directly from MSME practitioners. Second, the literature sources were limited to publications from the 1964–2026 period, making it possible that relevant studies published outside this timeframe could further enrich the discussion. Third, this review did not differentiate the characteristics of product innovation across business sectors, MSME sizes, or geographical contexts, thereby limiting a more in-depth understanding of contextual variations in innovation implementation. Fourth, the discussion primarily focused on the entrepreneurial perspective, while other influential factors, such as public policy, macroeconomic conditions, organizational culture, and supply chain dynamics, were not comprehensively examined.

Future research is recommended to adopt empirical approaches using quantitative, qualitative, or mixed-methods designs to directly examine the relationship between product innovation and MSME sustainability across various industrial sectors. Future research models may also incorporate mediating or moderating variables such as digital transformation, market orientation, organizational learning capability, business resilience, innovation collaboration, and dynamic capabilities to develop more comprehensive explanatory models. Comparative studies across regions or countries are also recommended to improve understanding of how differences in business environments influence the success of product innovation. For MSME practitioners, product innovation should be implemented systematically through the identification of consumer needs, the adoption of digital technologies, continuous improvements in product design and quality, and periodic market evaluations to ensure that innovation consistently generates sustainable added value. Governments and supporting institutions are encouraged to further expand innovation mentoring programs, business incubation initiatives, access to financing, and collaborative partnerships between MSMEs and universities in order to establish an entrepreneurial ecosystem capable of continuously fostering product innovation. Such synergy will strengthen the competitiveness of MSMEs while enhancing their contribution to economic growth and sustainable development.

References

[1] P. A. Priya and M. Mathew, "Business model innovation as a driver of sustainability and resilience in MSMEs: A systematic review and research agenda," *Environmental and Sustainability Indicators*, vol. 31, p. 101344, Sep. 2026, doi: 10.1016/j.indic.2026.101344.

ISSN: 2988-0394 Print / 2988-3121 Online
Vol 4, Issue 2, August 2026, Page 723-735
DOI: https://doi.org/10.61100/adman.v4i2.349

[2] P. Vettik-Leemet and T. Mets, "Entrepreneurship and Innovation—Process Overlap or the Same? Systematic Overview and Converging Process-Dynamic Model," *Adm. Sci.*, vol. 14, no. 2, p. 38, Feb. 2024, doi: 10.3390/admsci14020038.

[3] S. Wu, Y. Luo, H. Zhang, and P. Cheng, "Entrepreneurial bricolage and entrepreneurial performance: The role of business model innovation and market orientation," *Heliyon*, vol. 10, no. 4, p. e26600, Feb. 2024, doi: 10.1016/j.heliyon.2024.e26600.

[4] L. Sierra-Fontalvo, A. Gonzalez-Quiroga, and J. A. Mesa, "A deep dive into addressing obsolescence in product design: A review," *Heliyon*, vol. 9, no. 11, p. e21856, Nov. 2023, doi: 10.1016/j.heliyon.2023.e21856.

[5] S. Ahmad, Q. Zhang, M. A. Hussain, and S. Mahmood, "Entrepreneurial success through learning, capital, and work engagement: Market and service orientation perspective," *Acta Psychol. (Amst).*, vol. 258, p. 105188, Aug. 2025, doi: 10.1016/j.actpsy.2025.105188.

[6] Nuryakin and I. N. Qamari, "The mediating role of innovation capability and technological capability in the relationship between absorptive capacity and SMEs' business performance," *International Journal of Innovation Studies*, vol. 10, no. 1, pp. 65–79, Mar. 2026, doi: 10.1016/j.ijis.2025.09.004.

[7] Z. M. Reshi, N. Saqib, and H. Nazir, "Entrepreneurial orientation: a systematic literature review and future research," *Journal of Management History*, pp. 1–34, Dec. 2025, doi: 10.1108/JMH-10-2024-0167.

[8] W. Kuncoro and W. O. Suriani, "Achieving sustainable competitive advantage through product innovation and market driving," *Asia Pacific Management Review*, vol. 23, no. 3, pp. 186–192, Sep. 2018, doi: 10.1016/j.apmrv.2017.07.006.

[9] B. Israel and V. Rutainurwa, "Dynamic Skills for Achieving Profitability and Long-term Sustainability of Start-up MSMEs," *Management Dynamics in the Knowledge Economy*, vol. 13, no. 1, pp. 85–104, Mar. 2025, doi: 10.2478/mdke-2025-0006.

[10] M. Karami, C. F. Araujo, J. Tang, and L. B. Roldan, "Creativity, alertness, and entrepreneurship: A multilevel meta-analysis," *Journal of Small Business Management*, vol. 63, no. 5, pp. 2079–2116, Sep. 2025, doi: 10.1080/00472778.2024.2418030.

[11] A. S. Hosseini, S. Soltani, and M. Mehdizadeh, "Competitive Advantage and Its Impact on New Product Development Strategy (Case Study: Toos Nirro Technical Firm)," *Journal of Open Innovation: Technology, Market, and Complexity*, vol. 4, no. 2, p. 17, Jun. 2018, doi: 10.3390/joitmc4020017.

[12] C. Ziemnowicz, "Joseph A. Schumpeter and Innovation," in *Encyclopedia of Creativity, Invention, Innovation and Entrepreneurship*, New York, NY: Springer New York, 2013, pp. 1171–1176. doi: 10.1007/978-1-4614-3858-8_476.

[13] J. Gupta, A. Srivastava, and B. Alzugaiby, "Schumpeterian creative destruction and temporal changes in business models of US banks," *International Review of Financial Analysis*, vol. 91, p. 102951, Jan. 2024, doi: 10.1016/j.irfa.2023.102951.

[14] M. Arraya, "Distinctive capabilities system in MSME's business model adaptation: evidence of the moderating and mediating effect of adaptive capability," *Central European Management Journal*, vol. 33, no. 2, pp. 183–198, Jun. 2025, doi: 10.1108/CEMJ-11-2023-0438.

[15] J. Barney, "Firm Resources and Sustained Competitive Advantage," *J. Manage.*, vol. 17, no. 1, pp. 99–120, Mar. 1991, doi: 10.1177/014920639101700108.

[16] R. Hurdawaty and M. Tukiran, "Strategies to Increase the Competitiveness of Micro, Small and Medium Enterprises (MSMEs): A Narrative Literature Review," *South Asian Journal of Social Studies and Economics*, vol. 21, no. 1, pp. 112–125, Jan. 2024, doi: 10.9734/sajsse/2024/v21i1768.

[17] A. Johri, R. K. Singh, B. P. Kushwaha, H. Alhumoudi, A. Alakkas, and M. Khoja, "Leveraging open innovation for e-commerce success: The contingent role of accounting information systems and artificial intelligence," *Journal of Innovation & Knowledge*, vol. 10, no. 4, p. 100737, Jul. 2025, doi: 10.1016/j.jik.2025.100737.

[18] G. T. Lumpkin and G. G. Dess, "Clarifying the Entrepreneurial Orientation Construct and Linking It to Performance," *The Academy of Management Review*, vol. 21, no. 1, pp. 135–172, Jan. 1996, doi: 10.2307/258632.

[19] M. Waqar, A. Riaz, F. H. Ali, J. Baig, and Z. Cai, "Bridging innovation and sustainability: The impact of entrepreneurial practices on ESG outcomes," *Journal of Innovation & Knowledge*, vol. 15, p. 101005, Jul. 2026, doi: 10.1016/j.jik.2026.101005.

[20] T. M. Amabile and M. G. Pratt, "The dynamic componential model of creativity and innovation in organizations: Making progress, making meaning," *Res. Organ. Behav.*, vol. 36, pp. 157–183, 2016, doi: 10.1016/j.riob.2016.10.001.

[21] A. Monfort, B. López-Vázquez, and A. Sebastián-Morillas, "Building trust in sustainable brands: Revisiting perceived value, satisfaction, customer service, and brand image," *Sustainable Technology and Entrepreneurship*, vol. 4, no. 3, p. 100105, Sep. 2025, doi: 10.1016/j.stae.2025.100105.

[22] L. Anatan and Nur, "Micro, Small, and Medium Enterprises' Readiness for Digital Transformation in Indonesia," *Economies*, vol. 11, no. 6, p. 156, May 2023, doi: 10.3390/economies11060156.

[23] A. R. Asa, J. P. Nautwima, and H. N. Johannes, "The transformative impact of digital technology on SME performance: a review and framework for digital transformation," *Cogent Business & Management*, vol. 13, no. 1, Dec. 2026, doi: 10.1080/23311975.2026.2643949.

[24] D. Teece and G. Pisano, "The Dynamic Capabilities of Firms: an Introduction," *Industrial and Corporate Change*, vol. 3, no. 3, pp. 537–556, 1994, doi: 10.1093/icc/3.3.537-a.

[25] M. Tsakalerou, A. Abil, V. Ribiere, Y. Lukhmanov, and N. Tynybayeva, "The innovation capability equation: A systematic review of global determinants of SME's success," *Journal of Innovation & Knowledge*, vol. 10, no. 4, p. 100757, Jul. 2025, doi: 10.1016/j.jik.2025.100757.

[26] M. A. Hajar, A. A. Alkahtani, D. N. Ibrahim, M. R. Darun, M. A. Al-Sharafi, and S. K. Tiong, "The Approach of Value Innovation towards Superior Performance, Competitive Advantage, and Sustainable Growth: A Systematic Literature Review," *Sustainability*, vol. 13, no. 18, p. 10131, Sep. 2021, doi: 10.3390/su131810131.

[27] L. L. Evinita, J. E. M. Tangkau, P. J. Pesak, and S. Cahyono, "Policy Framework to Improve MSME Competitiveness and Financial Performance with Indonesia's Asta Cita Vision Goals," *Journal of Risk and Financial Management*, vol. 18, no. 12, p. 692, Dec. 2025, doi: 10.3390/jrfm18120692.

[28] Apple Inc, "Annual report 2024 (Form 10-K)," Apple Investor Relations. Accessed: Jul. 05, 2026. [Online]. Available: https://investor.apple.com/investor-relations/sec-filings/sec-filings-details/default.aspx?FilingId=17933082

[29] Toyota Motor Corporation, "Production and sales figures," Toyota Motor Corporation. Accessed: Jul. 05, 2026. [Online]. Available: https://global.toyota/en/company/profile/production-sales-figures/

[30] Toyota Motor Corporation, "Integrated report 2024," Toyota Motor Corporation. Accessed: Jul. 05, 2026. [Online]. Available: https://global.toyota/en/ir/library/annual/

[31] Kopi Kenangan, "Official website," https://kopikenangan.com/.

[32] E. M. Rogers, A. Singhal, and M. M. Quinlan, "Diffusion of Innovations 1," in *An Integrated Approach to Communication Theory and Research*, Routledge, 2019, pp. 415–434. doi: 10.4324/9780203710753-35.

[33] B. M. Omowole, Amarachi Queen Olufemi-Phillips, Onyeka Chrisanctus Ofodile, Nsisong Louis Eyo-Udo, and Somto Emmanuel Ewim, "Barriers and drivers of digital transformation in SMEs: A conceptual analysis," *International Journal of Scholarly Research in Science and Technology*, vol. 5, no. 2, pp. 019–036, Nov. 2024, doi: 10.56781/ijsrst.2024.5.2.0037.

[34] M. Hamdouna and M. Khmelyarchuk, "Technological Innovations Shaping Sustainable Competitiveness—A Systematic Review," *Sustainability*, vol. 17, no. 5, p. 1953, Feb. 2025, doi: 10.3390/su17051953.

[35] R. Alexandro, "Strategic human resource management in the digital economy era: an empirical study of challenges and opportunities among MSMEs and startups in Indonesia," *Cogent Business & Management*, vol. 12, no. 1, Dec. 2025, doi: 10.1080/23311975.2025.2528436.

[36] S. Ram and J. N. Sheth, "Consumer Resistance to Innovations: The Marketing Problem and its solutions," *Journal of Consumer Marketing*, vol. 6, no. 2, pp. 5–14, Feb. 1989, doi: 10.1108/EUM0000000002542.

[37] T. N. A. A. Jalil, R. A. Hamid, and M. A. Z. Abidin, "Digital technology in SMEs: A bibliometric analysis of Scopus data (2002–2025) using R-tool," *Multidisciplinary Reviews*, vol. 9, no. 9, p. 2026439, Feb. 2026, doi: 10.31893/multirev.2026439.

[38] G. S. Becker, *Human Capital: A Theoretical and Empirical Analysis, with Special Reference to Education*. New York: National Bureau of Economic Results, 1964.

[39] E. Tereshchenko, E. Salmela, E. Melkko, S. K. Phang, and A. Happonen, "Emerging best strategies and capabilities for university–industry cooperation: opportunities for MSMEs and universities to improve collaboration. A literature review 2000–2023," *J. Innov. Entrep.*, vol. 13, no. 1, p. 28, May 2024, doi: 10.1186/s13731-024-00386-4.

[40] D. B. Audretsch, M. Belitski, R. Caiazza, and D. Siegel, "Effects of open innovation in startups: Theory and evidence," *Technol. Forecast. Soc. Change*, vol. 194, p. 122694, Sep. 2023, doi: 10.1016/j.techfore.2023.122694.

ISSN: 2988-0394 Print / 2988-3121 Online
Vol 4, Issue 2, August 2026, Page 723-735
DOI: https://doi.org/10.61100/adman.v4i2.349

[41] L. Benhayoun, N. F. Ayala, and M.-A. Le Dain, "SMEs innovating in collaborative networks: how does absorptive capacity matter for innovation performance in times of good partnership quality?," *Journal of Manufacturing Technology Management*, vol. 32, no. 8, pp. 1578–1598, Oct. 2021, doi: 10.1108/JMTM-11-2020-0439.

[42] F. Almeida, "Causes of Failure of Open Innovation Practices in Small- and Medium-Sized Enterprises," *Adm. Sci.*, vol. 14, no. 3, p. 50, Mar. 2024, doi: 10.3390/admsci14030050.

[43] D. J. Teece, G. Pisano, and A. Shuen, "Dynamic capabilities and strategic management," *Strategic Management Journal*, vol. 18, no. 7, pp. 509–533, Aug. 1997, doi: 10.1002/(SICI)1097-0266(199708)18:7<509::AID-SMJ882>3.0.CO;2-Z.