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Original Article

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Digital-Driven Sustainable Innovation in Local Apparel Firms: A Case Study of PT. Tactical Outdoor

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Abstract

The rapid digital transformation of the fashion industry and increasing environmental concerns have encouraged apparel companies to adopt sustainable innovation strategies to remain competitive. However, most studies on digital innovation and sustainability in the fashion sector focus on large multinational corporations, while empirical evidence from local creative industry firms in developing countries remains limited. This study aims to analyze sustainable innovation management practices in a digitally driven local apparel company, PT Tactical Outdoor, in Bandung, Indonesia. Specifically, the research explores how the company integrates market-based innovation, digital technology utilization, and leadership practices to support sustainable business development. The study employs a qualitative case study approach, with data collected through purposive in-depth interviews with the company owner and key staff members involved in innovation decision-making, technology management, and product development, conducted on January 6, 2025. Additional supporting data were obtained from company documentation, social media platforms, and relevant academic literature. The data were analyzed using thematic coding in NVIVO, complemented by SWOT and TOWS strategic analyses. The findings reveal that PT Tactical Outdoor manages innovation through three interconnected elements: market-based innovation, technology, and innovative leadership. Market intelligence derived from social media analytics, e-commerce data, and community engagement enables the company to identify emerging consumer needs and develop relevant products. Digital technologies such as ERP systems, digital design tools, and e-commerce platforms accelerate product development and support data-driven decision-making. Leadership plays a crucial role in fostering a culture of experimentation, collaboration, and sustainability within the organization. The study concludes that even small or local apparel firms can successfully implement sustainable innovation management when supported by digital technology, collaborative ecosystems, and adaptive leadership. These findings contribute to the literature by providing empirical insights into how digitally oriented local fashion brands can integrate innovation, sustainability, and digital transformation to achieve long-term competitiveness.

1. Introduction

PT. Tactical Outdoor is a local apparel company based in Bandung, West Java, Indonesia. Established in 2012, the company focuses on tactical-style outdoor clothing and equipment designed for both nature enthusiasts and urban consumers. Inspired by one of Indonesia's highest mountains, the brand represents the spirit of resilience, exploration, and adventure through functional, durable, and stylish products. Through its slogan, "Proudly Made in Indonesia," PT Tactical Outdoor emphasizes its commitment to promoting the capabilities of the local textile and manufacturing industry in the global market. The development of local apparel companies reflects the broader transformation occurring in the fashion industry, where innovation and sustainability increasingly shape business competitiveness (Casciani et al., 2022; Glogar et al., 2025).

In its design philosophy, PT Tactical Outdoor emphasizes values such as courage, exploration, and

pride in local culture. At the production stage, the company collaborates with local fabric manufacturers and garment suppliers in Bandung and its surrounding areas. In addition, it actively involves young creative talents in product design and digital marketing activities. These collaborative efforts contribute to creating a more inclusive and sustainable local economic value chain within Indonesia's creative industry sector. Collaboration across supply chains and stakeholder networks is widely recognized as an important mechanism for enhancing sustainability and innovation in the apparel industry (Hasan & Shehun, 2022; Nureen et al., 2023).

In the era of digital transformation, PT Tactical Outdoor has adopted various digital technologies to strengthen its business operations and market reach. Marketing and sales activities are conducted on social media platforms such as Instagram, TikTok, and YouTube, as well as on e-commerce platforms such as Shopee, Tokopedia, and Lazada. The utilization of these digital platforms allows the company to expand its market access and reach consumers across Indonesia more effectively. Digital transformation has become a key driver of innovation in the fashion and textile industries, enabling companies to improve operational efficiency, shorten product development cycles, and enhance customer engagement (Casciani et al., 2022; Wang, 2024; Glogar et al., 2025).

Beyond digital adoption, collaboration also plays an important role in strengthening the brand's credibility and innovation capability. PT Tactical Outdoor has established strategic partnerships with several organizations and communities that share similar values and interests. One example is its collaboration with the ARMY community to develop tactical clothing and outdoor equipment that emphasize protection, durability, and comfort. Another partnership involves the Downhill Community (DC), which contributes to the development of functional products designed for outdoor activities such as hiking, cycling, and nature exploration. The integration of ARMY's discipline, DC's adventurous spirit, and the creativity of the PT Tactical Outdoor design team has produced products that are both functionally strong and visually appealing to urban consumers. Such collaborative innovation processes are increasingly emphasized in modern manufacturing industries as organizations seek to integrate external knowledge and stakeholder participation into product development (Nureen et al., 2023; Zhou & Wu, 2010).

In addition to technological and collaborative initiatives, PT Tactical Outdoor has begun to integrate sustainability principles into its production processes. These initiatives include using more environmentally friendly materials, reducing textile waste, and adopting recyclable packaging. Such practices reflect the company's long-term commitment to balancing economic performance with social responsibility and environmental sustainability. In the fashion industry, sustainability-oriented innovations have become increasingly important as firms attempt to reduce environmental impacts while maintaining competitiveness (Orisadare et al., 2025; Wiegand & Wynn, 2023; Oliveira Neto et al., 2023).

Although innovation management and sustainability have been widely discussed in the academic literature, most empirical studies focus primarily on large corporations or multinational companies. Research examining how local creative industry firms in developing countries manage innovation, particularly those driven by digital technology and community collaboration, remains relatively limited. Studies on digital transformation and sustainability in the apparel sector highlight that small and medium-sized enterprises often face structural constraints in implementing technological and sustainable innovations (Gunaratne et al., 2023; Li, 2025). Therefore, this study seeks to address this gap by examining sustainable innovation management practices at PT Tactical Outdoor, a community-based and digitally driven local brand.

This research contributes to the development of innovation management studies in Indonesia in several ways. First, it enriches the literature on innovation management in local creative industries by demonstrating that sustainable innovation can be systematically managed even with limited organizational resources. Second, this study integrates several theoretical perspectives, including dynamic capabilities, data-driven innovation, and creating shared value, within the context of local digital-based apparel companies. Third, the study provides contextual empirical evidence from Indonesia, which remains relatively underrepresented in international innovation management research (Casciani & D'Itria, 2024; Huynh, 2022).

Innovation management is a systematic process for generating, developing, and implementing new ideas to enhance organizational value and sustain long-term competitiveness. Schumpeter emphasized the role of innovation as a primary driver of economic growth through the introduction of new products, new production processes, and new markets. In contemporary industries, innovation increasingly involves integrating digital technologies and sustainable practices into organizational strategies (Schmiedle, 2023; Wiegand & Wynn, 2024).

In modern organizations, innovation is no longer viewed as an individual activity but rather as an integrated organizational capability. The concept of dynamic capabilities, introduced by Teece, highlights that a firm's ability to sense opportunities, seize them, and transform organizational resources is essential for successful innovation (Teece, 2018). Consequently, effective innovation management requires strong integration between organizational strategy, structure, and operational processes.

Technology plays a crucial role as an enabler of innovation. Digital systems such as Enterprise Resource

Planning (ERP), data analytics, and digital platforms enable organizations to accelerate the innovation cycle, improve operational efficiency, and support data-driven decision-making. Technology functions not only as an operational tool but also as a mechanism to reduce uncertainty and risk in the development of new products and services. Firms with strong technological capabilities are better positioned to enhance both exploitative and exploratory innovation activities (Zhou & Wu, 2010; Wang, 2024).

Furthermore, contemporary innovation is increasingly focused on creating sustainable value. The concept of Creating Shared Value (CSV) emphasizes that companies can enhance their competitiveness by generating economic value while simultaneously addressing social and environmental challenges. In the fashion and manufacturing industries, sustainable innovation may involve the use of environmentally friendly materials, improved supply chain efficiency, and durable product design (Hasan & Shehun, 2022; Orisadare et al., 2025; Heim & Hopper, 2022).

The success of sustainable innovation management is also strongly influenced by leadership. Innovative leadership plays a critical role in defining strategic vision, encouraging experimentation, and integrating digital technology and sustainability into organizational strategy. Adaptive and visionary leaders can foster an environment that supports continuous learning and intrapreneurship, enabling innovation to become an embedded and sustainable organizational culture (Schmiedle, 2023; Nureen et al., 2023).

On this theoretical foundation, this study views innovation management as a dynamic process influenced by an organization's ability to leverage digital technology, collaborate with stakeholders, and develop leadership capable of integrating sustainability values into business strategy. This framework forms the basis for the empirical analysis of PT. Tactical Outdoor. Therefore, this study not only draws on established innovation management theories but also uses them as an analytical lens to understand sustainable innovation practices within local creative industry firms, an area that has received limited empirical attention in previous studies (Gunaratne et al., 2023; Li, 2025).

2. Literature Review

The global apparel and textile industry has undergone significant transformation over the past few decades due to rapid technological advances, growing environmental concerns, and evolving consumer expectations. Traditionally characterized by linear production systems and resource-intensive processes, the industry is now transitioning toward more sustainable, digitally enabled business models. Digital transformation has become a central driver of this transition, enabling firms to redesign their production processes, supply chains, and customer engagement strategies (Casciani et al., 2022). Emerging digital technologies such as data analytics, virtual modeling, digital platforms, and Industry 4.0 systems have significantly altered how fashion companies design products, manage production, and interact with consumers. These technologies allow firms to shorten product development cycles, improve operational efficiency, and create more flexible and responsive business models (Glogar et al., 2025; Wang, 2024).

At the same time, sustainability has become a critical concern in the apparel industry due to its substantial environmental footprint. The textile and fashion sectors contribute significantly to global pollution through intensive water consumption, chemical usage, and waste generation (Orisadare et al., 2025). As a result, researchers and practitioners increasingly emphasize integrating sustainability principles into production systems and business strategies. Sustainable innovation in the apparel sector may include the use of environmentally friendly materials, circular production systems, waste reduction practices, and improved supply chain transparency (Hasan & Shehun, 2022). Furthermore, the concept of circular economy has gained considerable attention as a strategy to reduce resource consumption and extend product life cycles through reuse, recycling, and regeneration processes (Wiegand & Wynn, 2024). Digital technologies play a crucial role in facilitating this transition, enabling firms to monitor material flows, optimize resource use, and support circular business models in fashion supply chains (Huynh, 2022).

Recent studies highlight that digitalization and sustainability are increasingly interconnected within the fashion industry. The adoption of Industry 4.0 technologies, such as artificial intelligence, big data, the Internet of Things (IoT), and digital design systems, has created new opportunities for environmentally responsible production and supply chain management (Glogar et al., 2025; Oliveira Neto et al., 2023). These technologies can support sustainable design processes, improve resource efficiency, and reduce production waste by enabling more accurate forecasting, product customization, and demand-driven manufacturing systems (Casciani et al., 2022). However, despite the potential benefits of digital technologies, the transition toward sustainable production systems remains uneven across regions and firm sizes. Large multinational companies often possess greater financial resources and technological capabilities to adopt advanced digital systems, while smaller firms frequently face structural barriers such as limited capital, technological expertise, and institutional support (Gunaratne et al., 2023; Li, 2025).

The literature on sustainable technology adoption in the apparel industry further highlights the importance of organizational and environmental factors in shaping firms' innovation strategies. Studies based on stakeholder and technology–organization–environment perspectives demonstrate that sustainable technology

adoption is influenced by factors such as customer pressure, competitive dynamics, technological compatibility, and government support (Hoque et al., 2023; Hoque et al., 2025). These findings indicate that sustainability-oriented innovation does not occur in isolation but is embedded within broader institutional, technological, and market contexts. Firms that successfully integrate sustainability practices often rely on collaborative networks involving suppliers, customers, and external partners to facilitate knowledge exchange and resource sharing (Nureen et al., 2023).

Collaboration is particularly important in industries characterized by complex supply chains, such as the apparel sector. Sustainable supply chain practices increasingly require coordination among multiple stakeholders, including manufacturers, designers, retailers, and consumers (Hasan & Shehun, 2022). Digital technologies can enhance this coordination by improving transparency, traceability, and communication across supply networks. For example, blockchain-based systems and digital product tracking technologies can support circular fashion systems by ensuring accurate information flows throughout the product life cycle (Heim & Hopper, 2022). In addition, digital platforms enable firms to engage directly with consumer communities and co-create innovative products and services (Casciani & D'Itria, 2024). Such collaborative ecosystems not only strengthen innovation capabilities but also contribute to the development of more resilient and sustainable business models.

From a theoretical perspective, innovation management plays a critical role in enabling firms to adapt to these technological and environmental changes. Innovation management refers to the systematic process through which organizations generate, develop, and implement new ideas to improve competitiveness and create value (Schmiedle, 2023). In modern organizations, innovation is increasingly viewed as a collective and dynamic capability rather than an isolated activity. The dynamic capabilities framework provides an important theoretical lens for understanding how firms develop and sustain innovative capabilities in rapidly changing environments. According to Teece (2018), dynamic capabilities refer to a firm's ability to sense emerging opportunities, seize them through appropriate strategic actions, and transform organizational resources to maintain competitiveness. This perspective highlights the importance of organizational learning, strategic flexibility, and resource reconfiguration in innovation processes.

Technological capability also plays a crucial role in shaping firms' innovative outcomes. Firms that possess strong technological capabilities are better able to develop new products and improve existing production processes (Zhou & Wu, 2010). However, technological capability alone does not guarantee successful innovation. Zhou and Wu (2010) demonstrate that firms must balance exploitative and explorative innovation activities to sustain long-term competitiveness. While exploitative innovation focuses on improving existing technologies and products, explorative innovation involves experimenting with new technologies and market opportunities. Strategic flexibility enables firms to balance these innovative activities while adapting to rapidly changing market conditions.

In the apparel industry, technological capabilities are increasingly associated with the adoption of digital systems and Industry 4.0 technologies. Digital technologies enable firms to collect and analyze large volumes of data, allowing them to make more informed strategic decisions and develop innovative products that meet evolving consumer demands (Wang, 2024). Moreover, digital transformation supports the development of new business models that integrate sustainability principles into core organizational strategies. These business model innovations may involve circular production systems, product-service models, or digitally enabled platforms that facilitate product sharing and recycling (Huynh, 2022).

Despite the growing body of literature on digital transformation and sustainability in the fashion industry, several research gaps remain. First, many existing studies primarily focus on large multinational corporations operating in developed economies, where technological resources and institutional support are relatively abundant (Gunaratne et al., 2023). As a result, there is limited empirical evidence on how smaller firms in developing countries adopt digital technologies and sustainability practices within resource-constrained environments. Second, while previous studies have examined technological adoption and sustainable supply chain practices, fewer studies have explored how these elements are integrated within innovation management frameworks at the firm level (Orisadare et al., 2025).

Third, the role of community collaboration and local creative ecosystems in shaping sustainable innovation practices has received relatively limited attention in the literature. Many studies emphasize technological adoption and supply chain management but overlook the social and cultural dimensions of innovation within local creative industries (Casciani & D'Itria, 2024). In emerging economies such as Indonesia, local apparel companies often rely on community networks, creative collaboration, and digital platforms to develop innovative products and maintain competitiveness. Understanding how these firms manage innovation under resource constraints represents an important research opportunity.

To address these gaps, further empirical research is needed to explore how local apparel firms integrate digital technologies, collaborative networks, and sustainability practices into their innovative management processes. Examining digitally driven local brands can provide valuable insights into how innovation capabilities are developed in emerging creative industries. By investigating the case of PT Tactical

Outdoor, this study aims to contribute to the literature by providing empirical evidence on sustainable innovation management within a local, digitally oriented apparel company. This perspective helps bridge the gap between theoretical discussions of digital transformation and sustainability and the practical realities faced by local creative industry firms in developing economies.

3. Materials and Methods

This study examines a community-based, digitally driven local apparel company, PT. Tactical Outdoor, with the analysis focusing on innovation management practices, the use of technology as an enabler of innovation, and the role of leadership in fostering a culture of sustainable innovation. The research adopts a qualitative case study approach to obtain an in-depth understanding of how innovation and sustainability are managed within a local creative industry firm. A qualitative approach was selected because it allows the researcher to explore organizational processes, meanings, and contextual dynamics associated with innovation practices within the company and its broader environment. The study follows a descriptive–exploratory design to examine three main aspects: the innovation management process, the role of digital technology in supporting innovation activities, and leadership practices that foster a sustainable innovation culture within the organization.

Data were collected through multiple qualitative techniques to ensure a comprehensive understanding of the case. Primary data were obtained through in-depth interviews conducted on January 6, 2025, with the owner of PT Tactical Outdoor and key staff members. These interviews explored innovation strategies, digital technology adoption, leadership roles, and the company's commitment to sustainability practices. Secondary data were collected from various sources, including the official website and social media platforms of PT Tactical Outdoor, industry reports on fashion and sustainability, and relevant academic literature on innovation management and sustainable business practices.

The collected data were analyzed using a thematic analysis approach supported by NVIVO software. The analysis began with transcribing the interview data, followed by open coding to identify key concepts emerging from the empirical material. These concepts were then grouped through axial coding, resulting in three primary analytical themes: market-based innovation, technology as an enabler of innovation, and innovative and sustainable leadership. Finally, the findings were interpreted by linking the identified themes with relevant theoretical perspectives in innovation management and sustainability. In addition, SWOT and TOWS analyses were applied as strategic tools to identify internal and external factors and to formulate strategic recommendations for PT Tactical Outdoor's innovation and sustainability initiatives.

To enhance the validity and reliability of the research findings, the study applied source triangulation by comparing information obtained from interviews with documentation and secondary data. The analysis also ensured consistency between empirical findings and theoretical frameworks, particularly those related to dynamic capabilities, data-driven innovation, and the creation of shared value. Ethical considerations were maintained throughout the research process by obtaining consent from interview participants and ensuring that confidential company information was used solely for academic purposes.

Despite these efforts, this study has certain limitations. The research focuses on a single case study, namely PT Tactical Outdoor, and thus the findings are not intended to be generalized. Instead, the study aims to provide contextual insights and strategic lessons that may be relevant for other local companies and creative industry firms seeking to develop sustainable innovation practices in similar environments.

4. Results and Discussions

The findings show that PT Tactical Outdoor manages innovation through a structured, data-driven, and collaborative process that integrates market intelligence, digital technology, and community engagement. One of the primary mechanisms for identifying innovation opportunities is the continuous monitoring of market trends and consumer behavior. The company actively analyzes information from social media platforms such as Instagram, TikTok, and YouTube, as well as sales data from e-commerce platforms, to identify emerging preferences in product design, functionality, and color trends.

Customer feedback collected through digital reviews and interactions with brand communities is also incorporated into this process. The integration of digital market data enables the company to transform dispersed information into actionable market intelligence, allowing it to detect unmet consumer needs and potential market gaps. This approach reflects the growing role of digital transformation in the fashion industry, where firms increasingly rely on data analytics and digital platforms to understand consumer behavior and accelerate innovation (Casciani et al., 2022; Wang, 2024).

In addition to market data, PT Tactical Outdoor uses community collaboration as an important source of innovative ideas. The company actively engages with outdoor and tactical communities through product trials, open discussions, and direct user interaction. These activities allow the firm to identify practical product requirements such as durability, comfort, and multifunctionality that may not yet be fully addressed by competing products. Such engagement reflects a user-

driven innovation approach, where innovation emerges from the real experiences and needs of product users. Previous studies emphasize that collaboration between firms and user communities can significantly enhance innovation capability by facilitating knowledge exchange and co-creation of products (Nureen et al., 2023; Casciani & D'Itria, 2024). In the apparel industry, such collaborative innovation ecosystems are increasingly important as companies seek to develop products that combine functionality, user experience, and sustainability values.

Internally, PT Tactical Outdoor also relies on digital management systems, including Enterprise Resource Planning (ERP), to support innovation decisions. Operational data derived from these systems allows the company to analyze production efficiency, evaluate product margins, and monitor product life cycles. By integrating production, inventory, and sales information, the system provides real-time insights to guide strategic decisions on product redesign or the development of new product lines. This reflects the broader role of digital technologies as enablers of organizational innovation, in which integrated information systems support more efficient resource allocation and reduce decision-making uncertainty (Glogar et al., 2025; Zhou & Wu, 2010).

Another important feature of the company's innovation process is the implementation of small-scale product experimentation based on lean innovation principles. PT Tactical Outdoor frequently introduces products in limited quantities to test market responses before moving to large-scale production. Market feedback obtained from early product releases allows the company to refine product features, improve designs, or discontinue products that fail to meet consumer expectations. This approach minimizes innovation risk while ensuring that product development remains strongly aligned with market demand. Such experimentation strategies are consistent with the principles of adaptive innovation and strategic flexibility, which emphasize the importance of iterative learning and rapid feedback loops in innovation management (Zhou & Wu, 2010).

Sustainability considerations also play an increasingly important role in the company's innovative strategy. PT Tactical Outdoor increasingly integrates sustainability principles into product design and production processes by using environmentally friendly materials, reducing textile waste through durable designs, and adopting recyclable packaging solutions. These initiatives demonstrate how sustainability can function not only as an environmental responsibility but also as a source of competitive differentiation and value creation. In the global fashion industry, sustainability-oriented innovation has become an essential component of corporate strategies as firms attempt to reduce environmental impact while maintaining long-term competitiveness (Orisadare et al., 2025; Wiegand & Wynn, 2023). Digital technologies further support this transition by improving supply chain transparency, enabling more efficient resource use, and facilitating circular production models (Huynh, 2022).

Leadership plays a central role in coordinating these innovation activities. The leadership of PT Tactical Outdoor actively promotes data-driven decision making, encourages experimentation within design and product development teams, and integrates market analysis into strategic planning. This leadership approach reflects the concept of intrapreneurial leadership, in which organizational leaders foster an environment that supports experimentation, collaboration, and continuous learning. The ability of leaders to foster such an adaptive innovation climate is consistent with the dynamic capabilities perspective, which emphasizes the role of managerial capabilities in sensing opportunities, seizing them through strategic actions, and transforming organizational resources to sustain competitive advantage (Teece, 2018).

Technology plays a fundamental role in enabling these innovation processes. PT Tactical Outdoor utilizes a variety of digital tools to capture market signals and translate them into actionable insights. Social media analytics allow the company to monitor engagement patterns, trending hashtags, and consumer comments, while e-commerce data provides insights into purchasing behavior and product popularity. In addition, digital customer relationship management (CRM) systems record consumer complaints, suggestions, and experiences, allowing the company to systematically incorporate customer feedback into product development. These technologies effectively function as an early-warning system for market changes, ensuring that innovation initiatives are grounded in real-time data rather than managerial intuition. Such practices reflect broader trends in the digital transformation of the fashion industry, where data-driven decision-making is increasingly central to product innovation and market responsiveness (Casciani et al., 2022; Wang, 2024).

The company's ERP system further supports innovation by integrating operational data across departments, including production, finance, inventory, and sales. This integration enables management to evaluate the feasibility of innovation ideas across both technical capability and financial viability. By identifying production bottlenecks and efficiency opportunities, the ERP system ensures that new product innovations can be implemented without disrupting core operational processes. Previous studies highlight that digital enterprise systems, such as ERP, can significantly improve organizational efficiency and support innovation by enabling real-time data integration and enhanced strategic decision-making (Glogar et al., 2025).

Product development at PT Tactical Outdoor also benefits from digital design and prototyping technologies, including computer-aided design (CAD) and digital modeling tools. These technologies allow designers to rapidly explore new product concepts,

simulate functionality and comfort, and test design alternatives before physical prototypes are produced. Rapid sampling techniques enable quick revisions during early product development, reducing development costs and shortening time-to-market. In the apparel industry, digital design technologies have been widely recognized as tools that enhance innovation speed while minimizing material waste and production inefficiencies (Glogar et al., 2025; Casciani et al., 2022).

At the production level, technology also enables operational efficiency and quality control. Digital quality monitoring systems help standardize production quality, while data-driven production planning optimizes the use of raw materials and manufacturing resources. Such technological integration ensures that innovative product designs can be manufactured consistently without compromising efficiency. These practices align with broader developments in Industry 4.0 manufacturing systems, where digital technologies are used to improve productivity, flexibility, and sustainability in industrial production processes (Oliveira Neto et al., 2023).

Digital marketing and distribution technologies further play a crucial role in translating product innovations into market success. E-commerce platforms function not only as sales channels but also as mechanisms for validating product concepts through consumer purchasing behavior. Meanwhile, social media platforms serve as storytelling tools that communicate the functional and symbolic value of innovative products. Digital marketing analytics allow the company to evaluate campaign performance and measure consumer responses, thereby supporting more effective marketing strategies. These technologies effectively bridge the gap between product innovation and market adoption by providing real-time feedback on consumer acceptance (Casciani et al., 2022).

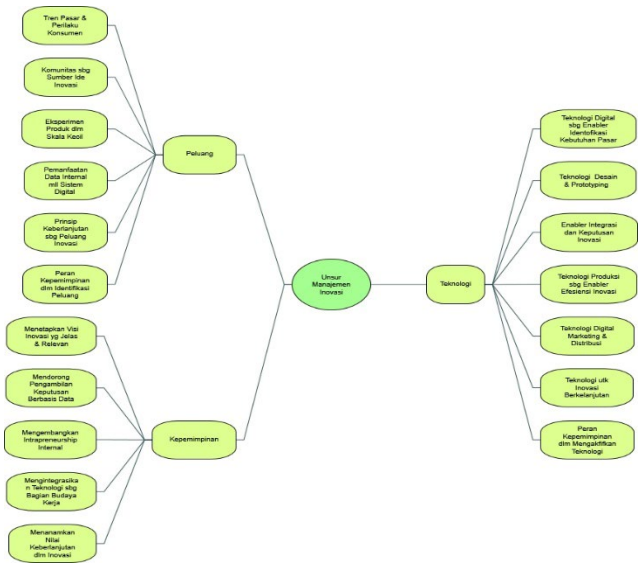

Figure 1. Summary of thematic coding using NVIVO

The analysis in Figure 1 identifies three key elements that shape innovation management at PT Tactical Outdoor. The first element shows that a market-based innovation approach enables the company to produce innovations that are relevant, efficient, and competitive within the dynamic outdoor fashion industry. By continuously monitoring market trends, consumer behavior, and community feedback, the company can identify emerging opportunities and respond quickly to changing customer needs. The second element highlights technology as a core enabler of innovation. At PT. Tactical Outdoor: technology is not merely an operational tool; it is a primary driver of innovation, supporting market analysis, product development, operational efficiency, and digital marketing activities. The third element emphasizes the role of leadership in fostering a sustainable, innovative culture. Through adaptive and supportive leadership, innovation within the organization does not occur sporadically but becomes an internalized and continuous organizational practice.

Data collection for this study was conducted through purposive interviews with the company owner and key staff members who are directly involved in innovative decision-making, technology management, and product development at PT Tactical Outdoor on January 6, 2025. The interview data were subsequently coded and analyzed using NVIVO software. The NVIVO mapping results reveal that the three elements are systemically interconnected: market-based innovation acts as the initial trigger for identifying opportunities, technology functions as an accelerator that facilitates the innovation process, and leadership serves as a binding force that maintains the continuity of innovation and organizational sustainability. Together, these interconnected elements form an integrated innovation management system that supports PT. Tactical Outdoor's ability to sustain competitiveness while integrating technological advancement and sustainability principles.

Technology also supports PT. Tactical Outdoor's sustainability initiatives. Digital tools enable the company to monitor the traceability of environmentally friendly materials, measure energy consumption and waste generation, and increase transparency within its supply chain. Such practices contribute to the development of more responsible production systems and support the integration of sustainability principles into business strategy. In the apparel industry, digital technologies have increasingly been recognized as key enablers of circular economy practices and sustainable supply chain management (Wiegand & Wynn, 2024; Heim & Hopper, 2022).

The role of leadership remains critical in activating these technological capabilities. Leaders at PT Tactical Outdoor initiate the adoption of new digital systems, encourage a culture of data-driven innovation, and provide training to improve employees' digital literacy. Without such adaptive leadership, technological investments may fail to generate meaningful innovation outcomes. This observation aligns with previous studies

highlighting that leadership plays a decisive role in translating technological capabilities into effective innovation performance (Zhou & Wu, 2010; Teece, 2018).

More broadly, leadership at PT Tactical Outdoor helps build an organizational culture that supports innovation, creativity, and continuous learning. The company's leadership articulates a clear strategic vision emphasizing functional product innovation, technological integration, and sustainability as core brand values. This vision provides a shared direction for employees across departments and ensures that innovative initiatives remain aligned with the organization's long-term goals. Strategic leadership is particularly important in dynamic industries such as fashion, where rapid technological change and evolving consumer preferences require organizations to remain flexible and adaptive (Schmiedle, 2023).

The leadership also promotes data-driven decision-making, encouraging the use of digital systems, such as ERP and sales analytics, to evaluate innovation opportunities. By reducing reliance on intuition alone, this approach strengthens the strategic rigor of innovation decisions and improves the company's ability to assess market, technical, and financial feasibility. Furthermore, leadership encourages the development of internal intrapreneurship, empowering employees to propose innovative ideas, collaborate across functions, and actively participate in problem-solving. Such organizational practices help transform innovation from a sporadic activity into a continuous organizational capability.

Finally, the leadership of PT Tactical Outdoor integrates sustainability values into the company's innovation agenda. Innovation initiatives are expected not only to generate economic value but also to contribute to social and environmental responsibility. By emphasizing sustainable materials, ethical production practices, and environmentally responsible design, leadership connects innovation with the company's broader identity and values. This integration reflects a growing trend in the fashion industry, where sustainability increasingly functions as a strategic driver of innovation and brand differentiation (Orisadare et al., 2025; Wiegand & Wynn, 2023).

The qualitative analysis conducted using NVIVO supports these findings by identifying three major thematic clusters: market-based innovation, technology as an enabler of innovation, and innovative leadership. Together, these themes illustrate how PT Tactical Outdoor integrates digital technology, collaborative networks, and leadership capabilities to build a sustainable innovation system within a local apparel company. These findings provide empirical evidence that even small or locally oriented firms can develop systematic innovation management practices when supported by digital technologies, collaborative ecosystems, and adaptive leadership.

4.1. SWOT and TOWS analyses

The SWOT and TOWS analyses were applied as strategic tools to translate the qualitative findings of this study into practical strategic recommendations for sustainable innovation development at PT Tactical Outdoor. The analysis indicates that the company possesses several internal strengths that support its innovative capacity and market competitiveness. One of the main strengths is its strong brand identity built around the narrative of national pride and locally produced goods, which resonates strongly with young consumers and supports brand loyalty. This positioning aligns with the increasing recognition of local creative industries and the role of branding and storytelling in strengthening competitiveness in the fashion sector (Casciani et al., 2022; Wiegand & Wynn, 2023).

In addition, PT Tactical Outdoor maintains high product quality by using durable materials and strict quality control, ensuring its products meet the functional and aesthetic standards expected in the outdoor apparel market. The company also benefits from flexible digital marketing practices, particularly through social media platforms and creative collaborations that expand brand visibility and customer engagement. Digital platforms are increasingly recognized as important tools that enable fashion firms to reach wider markets, improve customer interaction, and accelerate the diffusion of innovation (Glogar et al., 2025; Wang, 2024). Furthermore, the company's extensive community network, particularly within outdoor and tactical communities, strengthens its brand presence while simultaneously supporting user-driven innovation through continuous feedback and product testing. Collaborative networks and stakeholder engagement have been widely identified as critical factors in sustainable innovation and green supply chain practices (Nureen et al., 2023; Hasan & Shehun, 2022).

Despite these strengths, the SWOT analysis also reveals several internal weaknesses that may limit the company's growth potential. One major limitation is the company's relatively restricted production capacity due to its reliance on local manufacturing partners. This dependency can constrain production volume and reduce operational flexibility when responding to rapidly changing market demand. In addition, the company faces challenges associated with the highly dynamic nature of streetwear and outdoor fashion trends, which require continuous design innovation and rapid product development cycles.

Such conditions reflect the broader characteristics of the apparel industry, where firms must constantly adapt to shifting consumer preferences and technological developments (Orisadare et al., 2025). Another challenge lies in the efficiency of the company's distribution and logistics systems, which still require further digital integration to support supply chain coordination and inventory management. Previous research suggests that digitalization of supply chains and

the integration of digital information systems are essential for improving operational efficiency and responsiveness in the fashion industry (Huynh, 2022; Glogar et al., 2025).

Externally, PT Tactical Outdoor operates in an environment that offers several promising opportunities. The growing popularity of local brands and national campaigns promoting domestic products have strengthened consumer interest in locally produced fashion items. At the same time, the rapid expansion of e-commerce platforms and digital marketing ecosystems enables small and medium-sized enterprises to access broader markets without relying heavily on physical retail infrastructure. Digital transformation has significantly reduced entry barriers for smaller fashion brands by providing new channels for marketing, distribution, and customer interaction (Casciani et al., 2022; Wang, 2024).

Additionally, there are emerging export opportunities as international consumers increasingly show interest in Southeast Asian urban fashion products. Another important opportunity lies in the rising global awareness of sustainability and ethical production practices. Consumers are increasingly demanding environmentally responsible products and transparent supply chains, creating incentives for companies to integrate sustainability principles into their innovation strategies (Orisadare et al., 2025; Wiegand & Wynn, 2024).

However, the company also faces several external threats that may affect its long-term competitiveness. The outdoor and streetwear fashion market is highly competitive, with both local and international brands competing for similar consumer segments. Such competitive pressures require companies to continuously innovate and differentiate their products. In addition, fluctuations in textile raw material prices may create instability in production costs, particularly for small firms with limited bargaining power within supply chains. Rapid changes in fashion trends also present a risk of unsold inventory or excess stock if firms fail to anticipate shifts in consumer preferences. Another concern is design piracy and product imitation by unauthorized manufacturers, which can erode brand differentiation and reduce market exclusivity. These challenges reflect broader structural issues within the global fashion industry, where intellectual property protection and rapid trend cycles often create competitive pressures for innovative brands (Gunaratne et al., 2023; Li, 2025).

Based on the SWOT analysis, PT Tactical Outdoor's strategic position falls within a growth and innovation orientation, where the company's strong brand identity, product creativity, and digital marketing capabilities provide a solid foundation for expanding market reach and strengthening business sustainability. To maintain this strategic position, medium-term development should focus on improving production efficiency, integrating digital supply chain systems, and strengthening the adoption of environmentally responsible production practices. Such strategies are consistent with the broader transformation of the fashion industry toward digitally enabled and sustainability-oriented business models (Casciani et al., 2022; Wiegand & Wynn, 2024).

The TOWS matrix further translates these findings into four strategic directions. The SO (Strength–Opportunity) strategy focuses on leveraging the company's internal strengths, particularly its strong brand identity, product quality, and flexible digital marketing, to capture external opportunities related to the increasing popularity of local products, the rapid growth of e-commerce, and expanding export markets. By combining these strengths and opportunities, PT Tactical Outdoor can expand its market reach while strengthening its reputation as a competitive, sustainable local outdoor fashion brand. Such strategies align with research highlighting how digital technologies and collaborative networks enable smaller fashion firms to enhance market competitiveness and innovation performance (Casciani et al., 2022; Nureen et al., 2023).

The WO (Weakness–Opportunity) strategy aims to address internal limitations by utilizing emerging technological and sustainability opportunities. In particular, the digitalization of supply chains, the adoption of integrated ERP systems, and partnerships with strategic manufacturing collaborators can improve production capacity and distribution efficiency. These initiatives allow the company to respond more effectively to increasing market demand while maintaining operational efficiency. Previous studies emphasize that digital supply chain integration and technological capability development are essential for improving innovation performance and sustainability in the apparel industry (Glogar et al., 2025; Zhou & Wu, 2010).

The ST (Strength–Threat) strategy focuses on utilizing the company's strengths to mitigate external threats. PT Tactical Outdoor can leverage its high product quality, strong brand narrative, and active community engagement to differentiate itself from competitors. Product differentiation based on functionality, distinctive designs, and sustainability values can strengthen customer loyalty and reduce competitive pressure from similar brands. Such differentiation strategies are widely recommended in the fashion industry as a means to maintain brand uniqueness and long-term competitiveness (Orisadare et al., 2025).

Finally, the WT (Weakness–Threat) strategy is a defensive approach that aims to minimize internal weaknesses while anticipating external risks. The company can strengthen its production control systems, enhance intellectual property protection for product designs, and implement data-driven demand forecasting to reduce risks related to excess inventory, raw material price volatility, and product imitation. The use of digital data analytics and integrated planning systems can significantly improve demand planning and inventory management, enabling firms to respond more effectively

to market uncertainties (Wang, 2024; Glogar et al., 2025).

The SWOT and TOWS analyses demonstrate that PT Tactical Outdoor has a strong strategic foundation for sustainable innovation. By leveraging its brand identity, digital capabilities, and collaborative networks while addressing operational limitations through technological integration and sustainability practices, the company can strengthen its competitiveness within the rapidly evolving digital fashion ecosystem.

4.2. Core Strategy

The core strategy serves as the foundation for organizational decision-making aimed at achieving long-term business success. Within the context of sustainability management, core strategies emphasize how companies can generate balanced economic, social, and environmental value through innovation, efficiency, and responsible business practices. The concept of Creating Shared Value (CSV) emphasizes that corporate success should not be measured solely by financial performance but also by a company's ability to create positive societal and environmental impacts (Porter & Kramer, 2019). In the contemporary business landscape, especially in the fashion and textile industries, integrating sustainability into business strategy has become increasingly important as firms face growing pressure from regulators, consumers, and stakeholders to operate responsibly (Orisadare et al., 2025; Wiegand & Wynn, 2023).

Based on the SWOT analysis and the company's sustainability objectives, PT Tactical Outdoor has formulated a core strategy that focuses on three key development areas: environmentally friendly product innovation, supply chain digitalization, and sustainable collaboration. These strategic pillars reflect the company's efforts to integrate sustainability principles with digital transformation and innovation management practices to strengthen long-term competitiveness.

First, PT Tactical Outdoor prioritizes environmentally friendly product innovation by developing products made from sustainable materials, such as recycled polyester, organic cotton, and natural fiber–based waterproof fabrics. In addition, the company applies the principle of design for durability, meaning products are designed to be long-lasting and multifunctional, suitable for use in various outdoor conditions. This design philosophy not only improves product functionality but also helps reduce textile waste by extending product life cycles. Sustainable material innovation has been widely recognized as a critical strategy for reducing the textile industry's environmental footprint, which is among the largest contributors to global pollution (Orisadare et al., 2025).

Furthermore, digital design technologies and advanced material innovations are increasingly used in the fashion industry to enhance product durability, improve resource efficiency, and support sustainable production systems (Glogar et al., 2025). By adopting these practices, PT Tactical Outdoor strengthens its positioning as an environmentally responsible local brand while responding to increasing consumer demand for sustainable fashion products.

Second, PT Tactical Outdoor implements digitalization of its supply chain to improve operational efficiency and transparency across its production and distribution processes. The company uses digital management systems that integrate inventory control, quality monitoring, and logistics. Technologies such as barcode tracking, data analytics, and Enterprise Resource Planning (ERP) systems enable the company to monitor production flows, inventory levels, and distribution activities in real time. The integration of digital technologies into supply chain management supports more accurate decision-making, reduces operational inefficiencies, and minimizes material waste.

In the context of the fashion industry, digital supply chain systems are increasingly recognized as key tools for improving resource management and enhancing sustainability performance (Casciani et al., 2022; Huynh, 2022). Digitalization also contributes to reducing carbon emissions by optimizing logistics planning and minimizing unnecessary transportation and storage activities. Such initiatives align with the concept of green supply chain management, which emphasizes integrating environmental considerations into supply chain operations and fostering technological innovation (Nureen et al., 2023).

Third, PT Tactical Outdoor promotes sustainable collaboration as a strategic approach to strengthen innovation capability and social impact. Collaboration with communities and external partners plays an important role in developing functional product designs and enhancing user experience. For instance, collaboration with the ARMY community supports the development of apparel designed for extreme conditions while maintaining comfort and durability, while partnerships with the Downhill Community (DC) contribute to the development of functional outdoor products tailored to real user needs.

Collaborative innovation ecosystems are increasingly important in the fashion industry because they allow firms to integrate external knowledge and user feedback into product development processes (Casciani & D'Itria, 2024). In addition to product innovation, PT Tactical Outdoor also engages consumers through sustainability-oriented digital campaigns, such as #PTTacticalOutdoorForEarth, which encourage customers to recycle used clothing or exchange it for new products. These initiatives serve not only as marketing strategies but also as social programs to raise public awareness of responsible fashion consumption.

The integration of these three strategic pillars, including sustainable product innovation, supply chain digitalization, and collaborative sustainability, forms the foundation of PT Tactical Outdoor's digital sustainability

framework. Through this framework, the company seeks to achieve several strategic objectives. First, it aims to improve energy efficiency and raw material utilization throughout the production process by adopting sustainable materials and optimized production planning. Second, it seeks to enhance data-driven distribution systems to enable faster, more efficient logistics operations with reduced resource consumption. Third, the company aims to strengthen its local brand identity by emphasizing ethical production practices, product quality, and social responsibility.

By implementing this integrated strategy, PT Tactical Outdoor not only adapts to the evolving demands of the modern digital market but also contributes to broader sustainable development objectives. These efforts align particularly with the United Nations Sustainable Development Goals (SDGs), including SDG 8 (Decent Work and Economic Growth) and SDG 12 (Responsible Consumption and Production), which encourage businesses to promote inclusive economic growth while adopting sustainable production and consumption patterns. The company's strategy also reflects the broader transformation of the global fashion industry toward sustainable and digitally enabled business models (Casciani et al., 2022; Wiegand & Wynn, 2024).

PT Tactical Outdoor's core strategy demonstrates a strong commitment to becoming a pioneer of digital-based sustainable fashion in Indonesia. By integrating innovation, technological transformation, and collaborative sustainability initiatives, the company seeks to ensure that its business growth generates not only economic benefits but also meaningful social and environmental value for the broader community.

4.3. Action Plan

An action plan is the operational translation of a company's core strategy into concrete, measurable activities. In sustainability management, action plans serve as implementation guidelines that specify objectives, responsible actors, timelines, locations, and methods required to achieve sustainability targets. The effectiveness of sustainability initiatives largely depends on the clarity of implementation steps and the consistency of monitoring and evaluation processes over time (Johnson et al., 2020). In industries such as fashion and textiles—where environmental impact, supply chain complexity, and rapid product cycles are significant challenges—well-structured action plans are essential for ensuring that sustainability strategies are translated into operational practices (Orisadare et al., 2025; Wiegand & Wynn, 2023).

To support its vision of becoming a digitally driven, sustainable local fashion brand, PT Tactical Outdoor has formulated several strategic operational programs that integrate product innovation, digital transformation, and organizational sustainability culture. These programs include green product development, digital supply chain integration, consumer sustainability campaigns, employee sustainability training, and environmentally friendly packaging initiatives.

The first program focuses on green product development, which aims to design and produce new outdoor apparel products using sustainable materials such as recycled polyester and organic cotton. The research and development (R&D) team and product designers are responsible for conducting material research, product testing, and eco-material certification processes in collaboration with manufacturing partners located in Bandung. The implementation is scheduled for the first and third quarters of 2025. This initiative reflects the growing importance of sustainable material innovation in the fashion industry, as companies seek to reduce environmental impacts by adopting recycled fibers, biodegradable materials, and environmentally responsible design practices (Glogar et al., 2025; Orisadare et al., 2025).

The second program focuses on digital supply chain integration to improve transparency and operational efficiency across the company's production and distribution systems. The Operations and Information Technology divisions are responsible for implementing an integrated Enterprise Resource Planning (ERP) system, combined with barcode tracking technology, to monitor raw material usage, production processes, and product inventory. This program will be implemented during the second quarter of 2025 at the company's warehouse and production facilities in Bandung. The implementation process includes system integration, staff training, and periodic evaluations of operational performance. Digital supply chain technologies have been widely recognized as effective tools for improving resource efficiency, enabling real-time monitoring of production activities, and reducing material waste within manufacturing systems (Casciani et al., 2022; Huynh, 2022).

The third initiative is the #PTTacticalOutdoorForEarth campaign, which focuses on educating consumers about sustainable fashion practices and encouraging responsible consumption. The campaign is organized by the Marketing and Corporate Social Responsibility (CSR) teams and will be conducted throughout 2025 via online marketplaces and social media platforms. Key activities include digital awareness campaigns, collaborations with the Downhill Community (DC), and a clothing "trade-in" program that allows consumers to recycle used garments in exchange for new products. Consumer education programs such as this play a crucial role in promoting circular fashion systems by encouraging clothing reuse, recycling, and responsible purchasing decisions (Heim & Hopper, 2022; Wiegand & Wynn, 2024).

Another important initiative is employee sustainability training, which aims to strengthen the organization's internal sustainability culture. The Human Resource Development (HRD) division will conduct training programs between the second and fourth quarters of

2025 at the company's headquarters in Bandung. These programs include workshops on energy efficiency, waste management, and corporate social responsibility, as well as evaluations of employee behavior related to sustainable workplace practices. Building sustainability awareness within organizations is essential for ensuring that sustainability strategies are embedded within daily operational practices and supported by employees at all organizational levels (Schmiedle, 2023).

The final program involves the Green Packaging Initiative, which aims to replace conventional plastic packaging with biodegradable or recycled packaging materials across all distribution channels. The Production and Procurement divisions will implement this initiative in the third quarter of 2025 by sourcing environmentally friendly packaging materials from local suppliers and integrating them into product distribution systems across all warehouses and retail outlets. Sustainable packaging has become an increasingly important component of environmentally responsible supply chains, particularly in industries such as fashion, where packaging waste contributes significantly to environmental pollution (Orisadare et al., 2025).

Table 1. Summary of strategic operational steps of PT Tactical Outdoor

No	Program/Activity	What (Objectives & Activities)	Who (Responsible Party)	When (Implementation Time)	Where (Location)	How (Implementation Method
1.	Green Product Development	Develop new products made from recycled polyester and organic cotton for the outdoor jacket and pants line	R&D Team and Product Designers	Q1-Q3 2025	Bandung partner factory	Material research, quality testing, and eco-friendly material certification
2.	Digital Supply Chain Integration	Implementing an ERP system and barcode tracking to monitor raw materials and product stock	Operations and IT Division	Q2	Bandung Warehouse and Production	Digital system integration, staff training, and monthly evaluations
3.	PT Tactical OutdoorFor Earth Campaign	Campaign to recycle old clothes and educate consumers about sustainable fashion	Marketing and CSR Team	Throughout 2025	Marketplace and Social Media	Digital promotions, DC community collaborations, and old clothes "trade-in" program
4.	Employee Sustainability Training	Employee training on energy efficiency, waste management, and social responsibility	HRD Division	Q2-Q4 2025	PT Tactical Headquarters, Bandung	Internal workshops and evaluation of sustainable work behavior
5.	Green Packaging Initiative	Replacing all plastic packaging with biodegradable and recycled materials	Production and Procurement Division	Q3 2025	All outlets and warehouses	All outlets and warehouses Procurement of new packaging materials and collaboration with local environmentally friendly vendors

By implementing these coordinated initiatives, PT Tactical Outdoor aims to achieve several measurable sustainability targets. By the end of 2025, the company expects to increase production efficiency by approximately 15 percent and reduce plastic packaging waste by 30 percent. In addition, the #PTTacticalOutdoorForEarth campaign is expected to reach and educate at least 10,000 digital consumers through social media platforms and online marketplaces. The implementation of digital supply chain technologies is also projected to reduce raw material waste by up to 20 percent per production cycle by improving monitoring accuracy and operational coordination.

Beyond environmental improvements, the Employee Sustainability Training program also aims to cultivate a sustainable organizational culture characterized by discipline, responsibility, and innovation. Organizational learning and sustainability-oriented leadership are widely recognized as critical drivers of sustainable innovation in modern manufacturing firms (Nureen et al., 2023; Teece, 2018). By strengthening employees' awareness of sustainability principles, the company seeks to embed

sustainability practices within everyday operational activities.

In general, this action plan in Table 1 demonstrates that PT Tactical Outdoor's sustainability strategy extends beyond conceptual commitment and is translated into structured, measurable, and time-bound operational programs. The integration of technological systems, collaborative networks, and sustainability-oriented innovation enables the company to move toward a more efficient, environmentally responsible, and digitally integrated business model. Through coordinated implementation across multiple organizational divisions, PT Tactical Outdoor establishes a clear roadmap for achieving long-term sustainable growth within the increasingly competitive digital fashion industry.

5. Conclusions

This study examined sustainable innovation management practices at PT Tactical Outdoor, a digitally driven local apparel company operating in Indonesia's creative industry sector. The findings reveal that the company has developed an integrated innovation management approach that combines market-based innovation, digital technologies, and a leadership-driven organizational culture. Market intelligence derived from social media analytics, e-commerce platforms, and community interactions enables the company to identify consumer needs and emerging fashion trends more accurately. This market-based approach allows PT Tactical Outdoor to produce product innovations that are relevant, efficient, and responsive to the rapidly evolving outdoor fashion market. The results also demonstrate that digital technologies, including ERP systems, data analytics, digital design tools, and e-commerce platforms, play a critical role as enablers of innovation, accelerating product development, improving operational efficiency, and facilitating data-driven decision-making.

In addition to technological capabilities, the study highlights the importance of collaboration and leadership in sustaining innovation. Partnerships with user communities and external stakeholders provide valuable knowledge inputs that enhance product functionality and strengthen brand engagement. At the same time, adaptive leadership within the organization fosters a culture of experimentation, continuous learning, and intelligence. Such leadership practices enable innovation to become an embedded organizational capability rather than sporadic initiatives. The integration of sustainability principles into product design, production processes, and supply chain management further demonstrates how local creative industry firms can align business innovation with environmental and social responsibility.

The study also provides practical insights through the application of SWOT and TOWS analyses, which identify strategic directions for PT Tactical Outdoor's long-term development. The results suggest that the company's strengths in brand identity, product quality, digital marketing, and community engagement position within a growth-and-innovation strategic orientation. Strategic initiatives such as environmentally friendly product development, supply chain digitalization, and collaborative sustainability campaigns can enhance operational efficiency while strengthening the company's competitiveness in the digital fashion market. These initiatives also contribute to broader sustainability objectives, particularly responsible consumption and production practices within the fashion industry.

Despite these contributions, the study has several limitations. First, the research focuses on a single case study, which limits the generalizability of the findings to other firms or industries. Although the case of PT Tactical Outdoor provides valuable insights into sustainable innovation management within a local apparel company, the results may not fully represent the diversity of practices across the broader fashion sector. Second, the study relies primarily on qualitative data obtained from interviews and documentation, which may introduce subjective interpretations despite efforts to ensure validity through data triangulation.

Future research could expand this study in several directions. Comparative studies involving multiple fashion companies or creative industry firms could provide broader insights into how sustainable innovation practices vary across organizational contexts. Quantitative research could also be conducted to examine the relationship between digital transformation, innovation capability, and sustainability performance in the apparel industry. In addition, further research may explore the role of digital ecosystems, community-based innovation networks, and circular economy practices in strengthening sustainable business models within emerging fashion markets. Such studies would contribute to a deeper understanding of how local creative industry firms can leverage technology, collaboration, and sustainability principles to achieve long-term competitive advantage in the evolving global fashion industry.

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