SME REVIEW AND ANALYSIS

Volume: 6 Issue: 3

July-September, 2026

(ISSN:2791-2531)

KMF PUBLISHERS

www.kmf-publishers.com/sme-ra/

Contents lists available at KMF Publishers

SME Review and Analysis

journal homepage: www.kmf-publishers.com/sme-ra/

Research Article

Qualitative Insights into Risk Management Practices in Fashion Product Development

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ARTICLE INFO

Keywords:
risk management; fashion product development; dynamic capabilities; supply chain risk; sustainability; innovation management; qualitative research

ABSTRACT

The fashion industry operates in a highly volatile and fast-paced environment, making risk management a critical component of successful fashion product development (FPD). This study provides qualitative insights into risk management practices in FPD through a systematic analysis of secondary data, including peer-reviewed literature, industry reports, and case studies. Drawing on theoretical perspectives such as Enterprise Risk Management (ERM), Dynamic Capabilities Theory, and Innovation Management Theory, the study identifies key risk categories, including market uncertainty, operational inefficiencies, supply chain disruptions, financial constraints, and sustainability challenges. The findings reveal that effective risk management is proactive, integrated, and embedded across all stages of the product development lifecycle. Practices such as early risk identification, cross-functional collaboration, and the adoption of digital technologies significantly enhance risk mitigation capabilities. Furthermore, the study highlights the growing importance of sustainability as both a risk and an opportunity in fashion product development. By synthesising fragmented knowledge into a cohesive framework, this research contributes to both academic discourse and managerial practice, offering actionable insights for improving resilience, innovation, and competitiveness in the global fashion industry.

Received 20 May 2026; Received in revised form 25 June 2026; Accepted 30 June 2026

DOI: https://doi.org/10.64907/xkmf.v6i3.sme-ra.7

1. Introduction

The global fashion industry is widely recognised as one of the most dynamic and volatile sectors, characterised by rapid trend cycles, intense competition, and high levels of uncertainty. The emergence of fast fashion, digital retail platforms, and sustainability concerns has further intensified the complexity of fashion product development (FPD). In this context, risk management has become a critical strategic function, influencing not only operational efficiency but also long-term competitiveness and organisational resilience.

Fashion product development encompasses a series of interconnected activities, including trend analysis, design conceptualisation, material sourcing, prototyping, production, and distribution. Each of these stages involves inherent uncertainties that can disrupt the development process and negatively impact product success. For instance, inaccurate demand forecasting can result in overproduction or stockouts, while delays in material sourcing may lead to missed market opportunities (Dewi et al., 2015). These risks are compounded by the globalised nature of fashion supply chains, which expose firms to geopolitical, environmental, and logistical disruptions (McMaster et al., 2020).

The increasing pace of fashion cycles, particularly under fast fashion business models, has significantly reduced product development lead times. While shorter cycles enable firms to respond quickly to emerging trends, they also increase the likelihood of errors and reduce the margin for corrective actions. Consequently, firms must adopt proactive and integrated risk management practices to navigate these challenges effectively. As Christopher and Peck (2004) argue, supply chain vulnerability has become a central concern in industries characterised by speed and complexity, such as fashion.

Another critical dimension of risk in fashion product development is sustainability. Growing awareness of environmental and social issues has led to increased scrutiny from consumers, regulators, and stakeholders. Fashion companies are now expected to adopt sustainable practices, including ethical sourcing, eco-friendly materials, and responsible production processes. However, integrating sustainability into product development introduces additional risks, such as increased costs, supplier constraints, and technological challenges (Niinimäki et al., 2020). These factors necessitate a more holistic approach to risk management that balances economic, environmental, and social considerations.

Despite the evident importance of risk management in fashion product development, existing research remains fragmented. Much of the literature focuses on specific aspects such as supply chain risk, sustainability challenges, or innovation management, without providing a comprehensive understanding of how these dimensions interact within the product development process. Moreover, there is a lack of qualitative synthesis that integrates insights from diverse sources to identify common themes and best practices.

The theoretical foundations of risk management in product development are rooted in frameworks such as Enterprise Risk Management (ERM), dynamic capabilities theory, and innovation management theory. ERM emphasises a holistic approach to risk identification and mitigation across organisational levels, while dynamic capabilities theory highlights the importance of adaptability and responsiveness in uncertain environments (Teece et al., 1997). Innovation management theory, on the other hand, underscores the inherent risks associated with developing new products and the need for structured processes to manage these risks effectively.

In the context of fashion, these theoretical perspectives provide valuable insights into how organisations can enhance their risk management capabilities. For example, the ability to sense and respond to changing consumer preferences is critical for mitigating market risks, while strong coordination across functional units can reduce operational and supply chain risks. Furthermore, the integration of digital technologies such as data analytics and artificial intelligence offers new opportunities for improving risk assessment and decision-making processes.

This study aims to address the existing gaps in the literature by providing qualitative insights into risk management practices in fashion product development. By analysing secondary data from academic and industry sources, the research seeks to identify key risk factors, examine existing management strategies, and develop a conceptual framework that integrates multiple dimensions of risk.

The objectives of the study are threefold. First, it aims to identify and categorise the primary risks associated with fashion product development. Second, it seeks to analyse the strategies and practices employed by organisations to manage these risks. Third, it aims to contribute to the theoretical and practical understanding of risk management by proposing an integrated framework that can guide decision-making in the fashion industry.

The significance of this study lies in its ability to synthesise fragmented knowledge into a cohesive narrative, providing both academic and practical contributions. For scholars, the study offers a comprehensive overview of risk management in fashion product development, highlighting key themes and research gaps. For practitioners, it provides actionable insights into effective risk management practices, enabling firms to enhance their resilience and competitiveness in an increasingly uncertain environment.

2. Literature Review

Fashion product development (FPD) is a complex, iterative process that integrates creative design with technical and commercial considerations. Unlike traditional manufacturing industries, where product development cycles are relatively stable, fashion operates within a highly dynamic environment characterised by rapid trend changes and short product life cycles. This requires organisations to balance creativity with efficiency, ensuring that

products are not only innovative but also commercially viable (Aini et al., 2023).

The FPD process typically involves several stages, including trend forecasting, design development, material selection, prototyping, production planning, and market launch. Each stage is interconnected, meaning that decisions made in one phase can have significant implications for subsequent stages. For example, errors in trend forecasting can lead to misaligned product designs, while delays in material sourcing can disrupt production schedules.

Research indicates that successful FPD requires strong coordination across functional units, including design, marketing, and operations. This cross-functional integration is essential for aligning creative ideas with market demands and operational capabilities (Niinimäki et al., 2020). However, such integration also introduces complexity, increasing the potential for communication breakdowns and coordination failures.

2.1 Understanding Risk in Product Development

Risk in product development refers to the uncertainty associated with achieving desired outcomes in terms of cost, quality, time, and performance. In the fashion industry, risk is particularly pronounced due to the unpredictable nature of consumer preferences and the fast-paced nature of the market.

Dewi et al. (2015) highlight that risk in fashion product development can arise from multiple sources, including demand uncertainty, production constraints, and supply chain disruptions. These risks are often interrelated, meaning that a failure in one area can trigger cascading effects across the entire development process.

Moreover, the increasing globalisation of fashion supply chains has amplified risk exposure. Companies often rely on suppliers located in different countries, making them vulnerable to geopolitical instability, natural disasters, and regulatory changes (McMaster et al., 2020). The COVID-19 pandemic, for example, demonstrated how disruptions in one part of the world can have far-reaching impacts on global supply chains.

2.2 Classification of Risks in Fashion Product Development

2.2.1 Market Risk

Market risk is one of the most significant challenges in fashion product development. It arises from the difficulty of predicting consumer preferences and market trends. Fashion trends are influenced by a wide range of factors, including cultural shifts, social media, and economic conditions, making them highly volatile.

Inaccurate demand forecasting can result in overproduction, leading to excess inventory and financial losses, or underproduction, resulting in missed sales opportunities. To mitigate market risk, companies often rely on trend forecasting tools, consumer data analytics, and agile production systems.

2.2.2 Operational Risk

Operational risks are associated with internal processes and systems. These include production delays, quality issues, and technological failures. In the context of

fashion, operational risks are often exacerbated by tight deadlines and the need for rapid production.

Research suggests that adopting standardised processes and quality control measures can help reduce operational risks. However, the need for flexibility and creativity in fashion product development can sometimes conflict with the implementation of rigid processes (Almoslehy & Alkahtani, 2021).

2.2.3 Supply Chain Risk

Supply chain risk is a critical concern in the fashion industry due to the global nature of sourcing and production. Risks in this category include supplier reliability, transportation delays, and disruptions caused by external factors such as political instability or natural disasters.

Christopher and Peck (2004) emphasise the importance of building resilient supply chains to mitigate these risks. Strategies such as supplier diversification, strategic partnerships, and risk-sharing agreements can enhance supply chain resilience.

2.2.4 Financial Risk

Financial risks in fashion product development include cost overruns, pricing uncertainties, and investment losses. These risks are often linked to inaccurate demand forecasting and inefficient resource allocation.

Effective financial risk management requires accurate budgeting, cost control measures, and the use of financial forecasting tools. Additionally, companies must balance cost considerations with quality and sustainability requirements.

2.2.5 Sustainability Risk

Sustainability has emerged as a key concern in fashion product development, driven by increasing consumer awareness and regulatory pressures. Sustainability risks include environmental impacts, ethical issues, and reputational damage.

Niinimäki et al. (2020) argue that integrating sustainability into product development requires a systemic approach that considers the entire lifecycle of the product. While this can create new opportunities for innovation, it also introduces additional complexities and risks.

2.3 Risk Management Practices in Fashion Product Development

Risk management in fashion product development involves identifying, assessing, and mitigating risks throughout the development process. Traditional approaches often focus on reactive measures, addressing risks only after they have materialised. However, there is a growing emphasis on proactive and integrated approaches.

One widely used method is Failure Mode, Effects, and Criticality Analysis (FMECA), which helps identify potential failure points and assess their impact (Dewi et al., 2015). Risk mapping and scenario analysis are also commonly used to evaluate different risk scenarios and develop contingency plans.

Another important practice is cross-functional collaboration. By involving multiple stakeholders in the risk management process, organisations can gain a more comprehensive understanding of potential

risks and develop more effective mitigation strategies.

The use of digital technologies has also transformed risk management practices in fashion product development. Data analytics, for example, enables companies to analyse large volumes of data and identify patterns that can inform decision-making. Similarly, technologies such as blockchain can enhance transparency and traceability in supply chains, reducing the risk of fraud and inefficiencies.

2.4 Theoretical Perspectives on Risk Management

The literature on risk management in fashion product development is informed by several theoretical perspectives.

Enterprise Risk Management (ERM) provides a holistic framework for managing risks across organisational levels. It emphasises the integration of risk management into strategic decision-making processes, ensuring that risks are considered in all aspects of the organisation (Schulte & Hallstedt, 2018).

Dynamic capabilities theory focuses on an organisation's ability to adapt to changing environments. In the context of fashion, this involves sensing market trends, seizing opportunities, and transforming operations to respond to changing conditions (Teece et al., 1997).

Innovation management theory highlights the inherent risks associated with developing new products. It emphasises the importance of structured processes and continuous learning to manage these risks effectively.

2.5 Research Gap

Despite the growing body of literature on risk management in fashion, several gaps remain. First, existing studies often focus on specific types of risk, such as supply chain or sustainability risks, without considering their interrelationships. Second, there is a lack of qualitative synthesis that integrates insights from multiple sources to provide a comprehensive understanding of risk management practices.

This study addresses these gaps by providing a holistic analysis of risk management in fashion product development, drawing on multiple theoretical perspectives and secondary data sources.

3. Theoretical Framework

Understanding risk management practices in fashion product development (FPD) requires a robust theoretical grounding that captures the multidimensional nature of uncertainty, innovation, and organisational adaptability. This study adopts an integrative theoretical framework drawing on Enterprise Risk Management (ERM), Dynamic Capabilities Theory, and Innovation Management Theory. Together, these perspectives provide a comprehensive lens through which risks in fashion product development can be identified, assessed, and mitigated.

3.1 Enterprise Risk Management (ERM)

Enterprise Risk Management (ERM) is a holistic approach that emphasises the identification, assessment, and management of risks across all organisational levels.

Unlike traditional risk management, which often focuses on isolated risks, ERM integrates risk considerations into strategic decision-making processes (COSO, 2017). This integration is particularly relevant in the fashion industry, where risks are interconnected and span multiple functional areas, including design, sourcing, production, and distribution.

ERM frameworks advocate for a systematic process involving risk identification, risk assessment, risk response, and continuous monitoring. In the context of FPD, this implies that risk management should be embedded within each stage of the product development lifecycle. For example, during the design phase, firms can identify potential market risks by analysing consumer trends, while in the sourcing phase, they can assess supply chain vulnerabilities.

Schulte and Hallstedt (2018) argue that organisations adopting ERM practices are better equipped to manage uncertainties in product development, as they can align risk management with strategic objectives. Furthermore, ERM facilitates cross-functional collaboration, enabling different departments to share information and coordinate responses to emerging risks. This is particularly important in fashion product development, where decisions made by designers, marketers, and supply chain managers are highly interdependent.

3.2 Dynamic Capabilities Theory

Dynamic capabilities theory, developed by Teece et al. (1997), provides a valuable framework for understanding how organisations adapt to rapidly changing environments. The theory emphasises three core capabilities: sensing opportunities and threats, seizing opportunities, and transforming organisational processes.

In the fashion industry, where trends evolve quickly and consumer preferences are highly volatile, dynamic capabilities are essential for managing risks effectively. The ability to sense market trends allows firms to anticipate changes in consumer demand and reduce market risk. For instance, the use of data analytics and social media monitoring can enhance trend forecasting accuracy, enabling firms to make informed design decisions.

Seizing opportunities involves mobilising resources to capitalise on identified trends. This requires effective coordination across functional units, as well as the ability to make timely decisions. In FPD, this may involve rapidly prototyping new designs or adjusting production schedules to meet changing demand.

Transforming organisational processes refers to the ability to reconfigure resources and capabilities in response to changing conditions. This is particularly relevant in managing operational and supply chain risks. For example, firms may adopt flexible manufacturing systems or diversify their supplier base to enhance resilience (Teece, 2007).

Dynamic capabilities also play a crucial role in integrating sustainability into fashion product development. As sustainability becomes a key driver of consumer behaviour and regulatory requirements, firms must continuously adapt their practices to address environmental and social risks (Niinimäki et

al., 2020). This requires not only technological innovation but also organisational change.

3.3 Innovation Management Theory

Innovation is at the core of fashion product development, as firms must continuously introduce new products to remain competitive. However, innovation inherently involves uncertainty and risk. Innovation management theory provides a framework for understanding how organisations can manage these risks while fostering creativity and experimentation.

According to Tidd and Bessant (2018), effective innovation management involves structured processes that guide the development of new products, from idea generation to commercialisation. These processes help reduce uncertainty by providing a systematic approach to decision-making. In FPD, this may include stage-gate models, which divide the development process into distinct phases, each with specific evaluation criteria.

Risk management is an integral part of innovation management, as it enables organisations to identify potential challenges and develop strategies to address them. For example, firms can use techniques such as scenario analysis and prototyping to test new ideas and assess their feasibility before committing significant resources.

Moreover, innovation management emphasises the importance of organisational learning. By analysing past successes and failures, firms can improve their risk management practices and enhance their ability to develop successful products. This is particularly important in the fashion industry, where trends are constantly evolving, and past experiences may not always be directly applicable.

3.4 Integration of Theoretical Perspectives

While each of the above theories provides valuable insights, their integration offers a more comprehensive understanding of risk management in fashion product development. ERM provides a structured approach to managing risks across the organisation, dynamic capabilities theory highlights the importance of adaptability and responsiveness, and innovation management theory emphasises the role of structured processes and learning.

The integrated framework proposed in this study suggests that effective risk management in FPD involves:

- **Risk Identification and Assessment (ERM):** Systematically identifying risks across all stages of product development.
- **Adaptive Response (Dynamic Capabilities):** Developing the ability to respond quickly to changing conditions.
- **Structured Innovation Processes (Innovation Management):** Implementing processes that reduce uncertainty and support decision-making.

These elements are interconnected and mutually reinforcing. For example, the ability to sense market trends (dynamic capabilities) enhances risk identification (ERM), while

structured innovation processes facilitate effective risk mitigation.

3.5 Conceptual Framework

Based on the integration of these theories, the study proposes a conceptual framework in which risk management is embedded throughout the fashion product development process. The framework highlights the following key components:

- **Input:** Market data, design concepts, and organisational resources
- **Process:** Risk identification, assessment, and mitigation across FPD stages
- **Output:** Improved product quality, reduced costs, and enhanced competitiveness

This framework underscores the importance of a proactive and integrated approach to risk management, emphasising that effective risk management is not a standalone activity but a continuous process embedded within organisational practices.

4. Methodology

This study adopts a qualitative research design based on secondary data analysis to explore risk management practices in fashion product development. Qualitative research is particularly suitable for examining complex and context-dependent phenomena, as it allows for in-depth analysis and interpretation of existing knowledge (Creswell & Poth, 2018).

The use of secondary data enables the study to draw on a wide range of sources, including academic literature, industry reports, and case studies. This approach is appropriate for synthesising fragmented knowledge and identifying common themes and patterns across different contexts.

4.1 Research Approach

The study follows an interpretivist research paradigm, which emphasises understanding the meanings and perspectives underlying social phenomena. In the context of this research, the interpretivist approach allows for a deeper understanding of how organisations perceive and manage risks in fashion product development.

A systematic literature review (SLR) methodology is employed to ensure a rigorous and transparent data collection process. The SLR approach involves a structured process of identifying, selecting, and analysing relevant literature, minimising bias and enhancing the reliability of the findings (Tranfield et al., 2003).

4.2 Data Sources and Selection Criteria

The data for this study were collected from multiple secondary sources, including:

- Peer-reviewed journal articles
- Conference proceedings
- Industry reports
- Books and book chapters

The selection of sources was guided by the following criteria:

- **Relevance:** The study must focus on fashion product development, risk management, or related topics.

- **Credibility:** Preference was given to peer-reviewed publications and reputable industry reports.
- **Recency:** Emphasis was placed on studies published within the last 10–15 years to ensure up-to-date insights.

Databases such as Scopus, Web of Science, and Google Scholar were used to identify relevant literature. Keywords included "fashion product development," "risk management," "supply chain risk," and "sustainability in fashion."

4.3 Data Collection Process

The data collection process followed a systematic procedure:

- **Identification:** Initial search using keywords to generate a broad pool of studies.
- **Screening:** Removal of duplicates and irrelevant studies based on titles and abstracts.
- **Eligibility:** Full-text review of selected studies to ensure alignment with research objectives.
- **Inclusion:** Final selection of studies for analysis.

This process ensured that only high-quality and relevant studies were included in the analysis.

4.4 Data Analysis Method

The study **employs thematic analysis**, a widely used qualitative method for identifying and analysing patterns within data (Braun & Clarke, 2006). The analysis involved the following steps:

- **Familiarisation:** Reading and re-reading the selected studies to gain an overall understanding.
- **Coding:** Identifying key concepts and assigning codes to relevant data segments.
- **Theme Development:** Grouping codes into broader themes representing different aspects of risk management.
- **Interpretation:** Analysing the relationships between themes and concluding.

Thematic analysis is particularly suitable for this study, as it allows for the synthesis of diverse sources and the identification of recurring patterns.

4.5 Validity and Reliability

Ensuring the rigour of qualitative research is critical. This study adopts several strategies to enhance validity and reliability:

- **Triangulation:** Using multiple data sources to corroborate findings.
- **Transparency:** Clearly documenting the data collection and analysis.
- **Peer-reviewed sources:** Prioritising high-quality publications to ensure credibility.

Additionally, the use of a systematic literature review methodology enhances the reproducibility of the study.

4.6 Ethical Considerations

As the study is based on secondary data, it does not involve direct interaction with human participants. However, ethical

considerations were maintained by Mannan & Farhana (2026):

- Properly citing all sources
- Avoiding plagiarism
- Ensuring accurate representation of original findings

4.7 Limitations of the Methodology

While the use of secondary data offers several advantages, it also has limitations. The study relies on existing literature, which may not fully capture current industry practices. Additionally, the findings are influenced by the availability and quality of the selected sources.

Despite these limitations, the methodology provides a robust framework for exploring risk management practices in fashion product development and offers valuable insights for both academic and practical purposes.

5. Findings and Analysis

This section presents the key findings derived from the thematic analysis of secondary data sources, including peer-reviewed journal articles, industry reports, and case studies. The analysis reveals that risk management in fashion product development (FPD) is multidimensional and deeply embedded across all stages of the product lifecycle. The findings are organised into four major themes: key risk drivers, risk management practices, organisational capabilities, and impact on product development outcomes.

5.1 Key Risk Drivers in Fashion Product Development

5.1.1 Demand Uncertainty and Market Volatility

One of the most prominent findings is the centrality of demand uncertainty in shaping risk management practices. Fashion markets are characterised by rapidly shifting consumer preferences influenced by social media, cultural trends, and macroeconomic factors. As a result, forecasting demand with precision remains a persistent challenge.

Dewi et al. (2015) emphasise that inaccurate forecasting often leads to overproduction or underproduction, both of which have significant financial implications. Overproduction results in excess inventory, markdowns, and waste, while underproduction leads to missed sales opportunities and reduced customer satisfaction. The increasing influence of fast fashion exacerbates this issue by shortening product life cycles and increasing the frequency of product launches (Niinimäki et al., 2020).

Furthermore, the rise of digital platforms and e-commerce has intensified market volatility. Real-time consumer feedback and rapid trend dissemination require companies to respond quickly, often with limited information. This creates a paradox where speed is essential, but rapid decision-making increases the likelihood of errors.

5.1.2 Time Pressure and Compressed Development Cycles

Time pressure emerges as another critical risk driver. The fashion industry's reliance on

seasonal collections and fast fashion models necessitates rapid product development cycles. While shorter cycles enable firms to remain competitive, they also increase the risk of design flaws, production errors, and coordination failures.

Research indicates that time constraints often lead to compromises in quality and thoroughness, particularly during the design and prototyping stages (Almoslehy & Alkahtani, 2021). For instance, insufficient testing of materials or designs can result in defects that are only identified during production or after market launch, leading to costly recalls or reputational damage.

Additionally, compressed timelines limit the ability of organisations to conduct comprehensive risk assessments, forcing them to rely on heuristic decision-making. This increases the likelihood of overlooking critical risks, particularly in complex and uncertain environments.

5.1.3 Supply Chain Complexity and Vulnerability

The globalised nature of fashion supply chains introduces significant risks related to sourcing, logistics, and coordination. Companies often rely on multiple suppliers across different regions, making them vulnerable to disruptions caused by geopolitical instability, natural disasters, and pandemics.

McMaster et al. (2020) highlight that supply chain disruptions can have cascading effects on product development, delaying production schedules and increasing costs. The COVID-19 pandemic serves as a stark example, exposing the fragility of global supply chains and prompting firms to reconsider their sourcing strategies.

Supplier reliability is another critical concern. Variations in quality, lead times, and compliance with ethical standards can create significant risks. In addition, the lack of transparency in supply chains makes it difficult for firms to identify and mitigate potential risks effectively.

5.1.4 Sustainability and Regulatory Risks

Sustainability has emerged as a major source of risk in fashion product development. Increasing consumer awareness and regulatory pressures require companies to adopt environmentally and socially responsible practices. However, integrating sustainability into product development introduces new challenges, including higher costs, limited availability of sustainable materials, and technological constraints.

Niinimäki et al. (2020) argue that sustainability risks are not limited to environmental impacts but also include reputational risks associated with unethical practices. Failure to meet sustainability expectations can result in negative publicity, loss of consumer trust, and regulatory penalties.

Moreover, sustainability considerations often conflict with traditional performance metrics such as cost and speed. Balancing these competing objectives requires careful planning and innovative solutions.

5.2 Risk Management Practices in Fashion Product Development

5.2.1 Early-Stage Risk Identification

A key finding is the importance of identifying risks early in the product development process. Organisations that integrate risk assessment into the design phase are better equipped to anticipate and mitigate potential issues.

Techniques such as Failure Mode, Effects, and Criticality Analysis (FMECA) are widely used to identify potential failure points and assess their impact (Dewi et al., 2015). By addressing risks at an early stage, companies can reduce the likelihood of costly errors and improve overall efficiency.

5.2.2 Cross-Functional Collaboration

Effective risk management in FPD requires collaboration across different functional units, including design, marketing, and operations. Cross-functional teams enable the sharing of information and perspectives, leading to more comprehensive risk assessments.

Schulte and Hallstedt (2018) emphasise that collaboration enhances the organisation's ability to identify interdependencies and develop coordinated responses to risks. For example, designers can work closely with supply chain managers to ensure that material choices align with sourcing capabilities.

5.2.3 Adoption of Digital Technologies

The use of digital technologies is transforming risk management practices in fashion product development. Data analytics, artificial intelligence, and digital prototyping tools enable organisations to analyse large volumes of data and make informed decisions.

For instance, predictive analytics can improve demand forecasting, while digital twins can simulate product performance and identify potential issues before production. These technologies enhance the accuracy and efficiency of risk assessment processes.

5.2.4 Agile and Flexible Development Processes

Agility and flexibility are critical for managing risks in dynamic environments. Agile development approaches allow organisations to respond quickly to changes in market conditions and consumer preferences.

This includes practices such as iterative design, rapid prototyping, and flexible manufacturing systems. By adopting these approaches, companies can reduce the impact of uncertainties and improve their ability to adapt to changing conditions.

5.3 Role of Organisational Capabilities

The findings highlight the importance of organisational capabilities in effective risk management. Firms with strong capabilities in data analytics, innovation, and supply chain management are better positioned to manage risks.

Dynamic capabilities, in particular, play a crucial role in enabling organisations to sense, seize, and transform in response to changing conditions (Teece et al., 1997). These capabilities enhance the organisation's

ability to anticipate risks and develop proactive strategies.

Organisational culture is another important factor. A culture that encourages collaboration, learning, and innovation supports effective risk management by enabling employees to identify and address risks proactively.

5.4 Impact on Product Development Outcomes

Effective risk management has a significant impact on product development outcomes. The analysis reveals that organisations with robust risk management practices achieve:

- **Improved product quality:** Early identification and mitigation of risks reduces the likelihood of defects.
- **Reduced costs:** Efficient resource allocation and risk mitigation minimise cost overruns.
- **Faster time-to-market:** Agile processes enable quicker responses to market changes.
- **Enhanced customer satisfaction:** Products that meet consumer expectations lead to higher satisfaction and loyalty.

These outcomes contribute to overall organisational performance and competitiveness.

6. Discussion

The findings of this study provide important insights into the complex and multidimensional nature of risk management in fashion product development (FPD). This section interprets these findings in relation to existing theories and literature, highlighting their implications for both theory and practice.

6.1 Integration of Risk Management into Product Development

One of the key insights from the findings is the need to integrate risk management into all stages of the product development process. Traditional approaches that treat risk management as a separate function are insufficient in the context of fashion, where risks are interconnected and dynamic.

The findings support the principles of Enterprise Risk Management (ERM), which emphasise a holistic and integrated approach to risk management (COSO, 2017). By embedding risk management into the FPD process, organisations can ensure that risks are identified and addressed proactively rather than reactively.

This integration also aligns with innovation management theory, which highlights the importance of structured processes in managing uncertainty (Tidd & Bessant, 2018). By incorporating risk assessment into each stage of product development, organisations can reduce uncertainty and improve decision-making.

6.2 Dynamic Capabilities and Organisational Resilience

The role of dynamic capabilities in managing risks is a central theme in the findings. Organisations that possess strong dynamic capabilities are better equipped to respond to changing market conditions and mitigate risks effectively.

The ability to sense market trends, for example, enables firms to anticipate changes in consumer preferences and reduce market risk. Similarly, the ability to reconfigure resources allows organisations to adapt to supply chain disruptions and operational challenges.

These findings are consistent with the work of Teece et al. (1997), who argue that dynamic capabilities are essential for achieving competitive advantage in rapidly changing environments. In the context of fashion, dynamic capabilities enable firms to balance the need for speed and flexibility with the need for risk control.

6.3 The Role of Digital Transformation

The increasing adoption of digital technologies represents a significant shift in risk management practices. Technologies such as data analytics, artificial intelligence, and blockchain offer new opportunities for improving risk assessment and decision-making.

For instance, predictive analytics can enhance demand forecasting accuracy, reducing market risk. Similarly, blockchain technology can improve supply chain transparency, reducing the risk of fraud and inefficiencies.

However, the adoption of digital technologies also introduces new risks, including cybersecurity threats and data privacy concerns. This highlights the need for organisations to adopt a balanced approach to digital transformation, considering both its benefits and risks.

6.4 Sustainability as a Strategic Risk Dimension

Sustainability emerges as a critical dimension of risk management in fashion product development. The findings indicate that sustainability is not only a source of risk but also an opportunity for innovation and differentiation.

Integrating sustainability into FPD requires a systemic approach that considers the entire product lifecycle. This aligns with the concept of sustainable innovation, which emphasises the integration of environmental and social considerations into product development processes (Niinimäki et al., 2020).

However, the findings also highlight the challenges associated with sustainability, including increased costs and limited availability of sustainable materials. Addressing these challenges requires collaboration across the value chain and investment in new technologies.

6.5 Managerial Implications

The findings have several important implications for practitioners:

- **Adopt integrated risk management frameworks:** Organisations should embed risk management into all stages of product development.
- **Enhance cross-functional collaboration:** Collaboration across departments improves risk identification and mitigation.
- **Leverage digital technologies:** Data-driven decision-making enhances risk assessment accuracy.

- **Invest in dynamic capabilities:** Building adaptability and flexibility improves resilience.
- **Prioritise sustainability:** Integrating sustainability into FPD reduces long-term risks and enhances brand reputation.

6.6 Theoretical Contributions

This study contributes to the literature by integrating multiple theoretical perspectives into a cohesive framework for understanding risk management in fashion product development. By combining ERM, dynamic capabilities theory, and innovation management theory, the study provides a comprehensive understanding of how organisations can manage risks in dynamic environments.

6.7 Future Research Directions

Future research should focus on empirical validation of the proposed framework, using primary data from fashion companies. Additionally, the role of emerging technologies in risk management warrants further investigation.

7. Conclusion

This study set out to explore qualitative insights into risk management practices in fashion product development (FPD), a domain characterised by high uncertainty, rapid change, and increasing complexity. By synthesising secondary data from academic and industry sources, the research provides a comprehensive understanding of the key risks, management practices, and theoretical perspectives shaping FPD.

The findings demonstrate that risk management in fashion product development is inherently multidimensional, encompassing market, operational, supply chain, financial, and sustainability-related risks. Among these, demand uncertainty and market volatility emerge as the most significant challenges, driven by rapidly changing consumer preferences and shortened product life cycles. Additionally, globalised supply chains introduce vulnerabilities that can disrupt production and distribution processes, while sustainability concerns add a new layer of complexity to decision-making.

A key contribution of this study is the identification of effective risk management practices that enhance product development outcomes. These include early-stage risk identification, cross-functional collaboration, and the integration of digital technologies such as data analytics. The findings also underscore the importance of organisational capabilities, particularly dynamic capabilities, in enabling firms to sense, adapt, and respond to changing environments.

From a theoretical perspective, the study integrates Enterprise Risk Management (ERM), Dynamic Capabilities Theory, and Innovation Management Theory to provide a holistic framework for understanding risk management in FPD. This integrative approach highlights the need for proactive, continuous, and organisation-wide risk management strategies.

Practically, the study offers valuable implications for fashion industry practitioners. Firms are encouraged to embed risk management into all stages of product

development, invest in digital tools, and foster a culture of collaboration and innovation. Furthermore, integrating sustainability into product development is not only essential for compliance and reputation but also presents opportunities for differentiation and long-term value creation.

Despite its contributions, the study is limited by its reliance on secondary data, which may not fully capture real-time industry practices. Future research should focus on empirical validation using primary data and explore the role of emerging technologies such as artificial intelligence and blockchain in enhancing risk management.

In conclusion, effective risk management is a critical enabler of success in fashion product development. By adopting integrated and adaptive approaches, firms can navigate uncertainty, enhance resilience, and achieve sustainable competitive advantage in an increasingly dynamic global market.

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