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Research Article

Understanding Managerial Support for Technological Adoption in Fashion Design Studios

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ABSTRACT

The integration of advanced digital technologies is reshaping fashion design studios, transforming traditional creative practices into technologically enhanced processes. This study examines the role of managerial support in facilitating technological adoption within fashion design studios. Using a qualitative research approach based on secondary data, the study synthesises existing literature on innovation, organisational behaviour, and fashion technology. The analysis is grounded in an integrated theoretical framework combining the Technology, Organisation, Environment (TOE) framework, Diffusion of Innovation (DOI) theory, and Technology Acceptance Model (TAM). The findings reveal that managerial support plays a pivotal role in influencing adoption by shaping organisational readiness, allocating resources, fostering an innovation-oriented culture, and enhancing employee acceptance. Key determinants include leadership vision, training and skill development, and effective change management strategies. The study further highlights that in creative environments, managerial support is essential for balancing technological efficiency with artistic expression. The research contributes to the literature by contextualising technology adoption within fashion design studios and proposes a conceptual model linking managerial support with successful technological integration.

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1. Introduction

The global fashion industry is currently undergoing a profound transformation driven by rapid technological advancement and digital innovation. Once predominantly reliant on manual craftsmanship, traditional sketching, and physical prototyping, fashion design studios are increasingly integrating advanced digital tools such as computer-aided design (CAD), artificial intelligence (AI), 3D modelling, and virtual prototyping systems. These technologies have redefined how designers conceptualise, develop, and communicate their ideas, enabling faster design cycles, enhanced creativity, and improved sustainability outcomes (Miah et al., 2023; Xiaoli et al., 2024).

The emergence of “Fashion 4.0” reflects the broader digital transformation across industries, emphasising the integration of smart technologies, data analytics, and interconnected systems into fashion ecosystems (Rockett et al., 2025). In this context, fashion design studios are no longer isolated creative spaces but are increasingly becoming technologically driven environments that rely on digital infrastructure to remain competitive. Technologies such as AI-powered design assistants, virtual try-on systems, and digital textile printing have not only improved efficiency but also transformed consumer engagement and customisation capabilities.

Despite the evident advantages of technological innovation, the adoption of these technologies within fashion design studios remains uneven and often slow. This

inconsistency can be attributed to a range of factors, including financial constraints, lack of technical expertise, resistance to change, and concerns about the potential impact of technology on creativity (Hoque et al., 2021; Zahra et al., 2021). Among these factors, managerial support has emerged as a critical determinant influencing whether and how technologies are adopted within organisations.

Managerial support encompasses the strategic, financial, and cultural backing provided by organisational leaders to facilitate technological change. It includes elements such as leadership vision, resource allocation, employee training, and the creation of an innovation-friendly organisational culture (Abrahamson, 1991). In fashion design studios, where creativity and artistic expression are central, managerial support becomes particularly significant. Managers must navigate the delicate balance between preserving creative autonomy and encouraging technological integration.

The role of management in technological adoption has been widely recognised in organisational and innovation studies. The Technology, Organisation, Environment (TOE) framework highlights managerial support as a key organisational factor influencing adoption decisions (Tornatzky & Fleischer, 1990). Similarly, the Diffusion of Innovation (DOI) theory emphasises the importance of leadership in promoting awareness and acceptance of new technologies (Rogers, 2003). At the individual level, the Technology Acceptance Model (TAM) underscores how perceptions

of usefulness and ease of use shape users' willingness to adopt technology (Davis, 1989). Together, these theoretical perspectives provide a comprehensive understanding of the multi-level dynamics involved in technological adoption.

In the specific context of fashion design studios, managerial support is not merely a facilitating factor but a transformative force that can shape organisational readiness and innovation capacity. Leaders who actively promote technological adoption can foster a culture of experimentation and learning, enabling designers to explore new creative possibilities. Conversely, a lack of managerial support can result in resistance to change, underutilization of technological resources, and missed opportunities for innovation.

Furthermore, the increasing complexity of fashion supply chains and the growing demand for sustainable practices have heightened the need for technological integration. Digital tools enable better resource management, waste reduction, and transparency, aligning with global sustainability goals (Xiaoli et al., 2024). Managers play a crucial role in aligning technological adoption with these broader strategic objectives, ensuring that innovation contributes to both economic and environmental performance.

In developing economies such as Bangladesh, where the fashion and apparel sector is a major contributor to economic growth, the importance of managerial support becomes even more pronounced. Limited access to resources, infrastructural challenges, and skill gaps can hinder

technological adoption. However, proactive managerial strategies can help overcome these barriers and facilitate the transition toward digitalisation (Iqbal & Su, 2025).

Despite the growing body of literature on technology adoption in the fashion industry, there remains a gap in understanding the specific role of managerial support within fashion design studios. Most existing studies focus on manufacturing processes or supply chain management, with limited attention to the creative aspects of design environments. This study seeks to address this gap by exploring how managerial support influences technological adoption in fashion design studios.

The objectives of this study are threefold: to identify key managerial factors influencing technological adoption, to examine how managerial support shapes organisational readiness and employee acceptance, and to develop a conceptual framework integrating established theories of technology adoption within the context of fashion design studios. By focusing on the intersection of management, technology, and creativity, this research contributes to both academic literature and practical understanding of innovation in the fashion industry.

2. Literature Review

Technological innovation has fundamentally reshaped the fashion industry, particularly in the domain of design. The transition from manual to digital design processes has enabled designers to experiment with new forms, materials, and concepts that were previously difficult or impossible to achieve.

Technologies such as CAD systems, 3D modelling software, and virtual prototyping tools have become integral components of modern design studios (Miah et al., 2023).

These technologies enhance efficiency by reducing the time and cost associated with physical sampling and prototyping. Designers can create and modify digital garments in real time, visualise them in different environments, and test various design iterations without the need for physical materials. This not only accelerates the design process but also contributes to sustainability by minimising waste (Xiaoli et al., 2024).

Artificial intelligence has further expanded the possibilities of fashion design. AI-powered tools can analyse consumer preferences, predict trends, and generate design suggestions, enabling designers to make data-driven decisions. However, the integration of AI into creative processes has also raised concerns about the potential loss of human creativity and originality (Zhou & George, 2001).

2.1 Managerial Support and Organisational Innovation

Managerial support is widely recognised as a critical factor in fostering innovation and technological adoption. It involves not only providing financial resources but also creating a supportive organisational environment that encourages experimentation and learning (Abrahamson, 1991).

Leadership plays a central role in shaping organisational culture and influencing employee behaviour. Managers who

demonstrate commitment to innovation can inspire employees to embrace new technologies and overcome resistance to change. This is particularly important in creative industries, where individuals may be hesitant to adopt technologies perceived as limiting their artistic freedom.

Training and skill development are also essential components of managerial support. By investing in employee training, managers can enhance technological competence and reduce perceived complexity, thereby facilitating adoption (Zahra et al., 2021).

2.2 Barriers to Technological Adoption

Despite the benefits of technological innovation, several barriers hinder its adoption in fashion design studios. Financial constraints are a major challenge, particularly for small and medium-sized enterprises (SMEs). The high cost of acquiring and maintaining advanced technologies can limit adoption.

Another significant barrier is the lack of technical expertise. Designers may lack the skills required to use digital tools effectively, leading to resistance or underutilization. Managerial support in providing training and resources is crucial in addressing this issue.

Cultural resistance is also a key factor. In creative environments, designers may perceive technology as a threat to their artistic identity. Overcoming this resistance requires effective communication and leadership.

2.3 Technological Adoption in Developing Economies

In developing countries, technological adoption is influenced by additional factors such as infrastructural limitations, limited access to resources, and skill gaps. The apparel industry in Bangladesh, for example, faces challenges related to technological readiness and workforce capability (Iqbal & Su, 2025).

However, managerial support can play a transformative role in overcoming these challenges. By adopting strategic approaches and leveraging external partnerships, organisations can enhance their technological capabilities and competitiveness.

2.4 Research Gap

While existing literature provides valuable insights into technology adoption in the fashion industry, there is limited research focusing specifically on fashion design studios. Most studies emphasise manufacturing and supply chain processes, overlooking the unique characteristics of creative environments.

Furthermore, the role of managerial support in shaping technological adoption within design studios remains underexplored. This study addresses this gap by integrating multiple theoretical perspectives and focusing on the intersection of management, technology, and creativity.

3. Theoretical Framework

Understanding technological adoption in fashion design studios requires a multidimensional theoretical approach that

captures both organisational and individual dynamics within creative environments. This study adopts an integrative theoretical framework combining the Technology, Organisation, Environment (TOE) framework, the Diffusion of Innovation (DOI) theory, and the Technology Acceptance Model (TAM). These frameworks collectively provide a comprehensive lens through which managerial support and its influence on technological adoption can be examined.

3.1 Technology, Organisation, Environment (TOE) Framework

The TOE framework, developed by Tornatzky and Fleischer (1990), is one of the most widely used models for analysing technological adoption at the organisational level. It posits that adoption decisions are influenced by three contextual dimensions: technological, organisational, and environmental.

The technological context refers to the characteristics of the technology itself, including its perceived benefits, complexity, compatibility, and cost. In fashion design studios, technologies such as CAD software, AI-driven design platforms, and 3D modelling tools must align with designers' creative workflows to be effectively adopted (Miah et al., 2023). If these technologies are perceived as overly complex or incompatible with existing practices, adoption is likely to be hindered.

The organisational context encompasses internal factors such as firm size, resource availability, organisational structure, and, most importantly, managerial support.

Managerial support is central within this dimension, as leaders influence strategic priorities, allocate resources, and shape organisational culture. Empirical studies have demonstrated that organisations with strong managerial support are more likely to adopt new technologies successfully (Hoque et al., 2021; Iqbal & Su, 2025).

The environmental context includes external factors such as market competition, technological trends, regulatory pressures, and customer expectations. In the fashion industry, increasing competition and rapidly changing consumer preferences have intensified the need for technological innovation. Managers must respond to these external pressures by facilitating the adoption of relevant technologies to maintain competitiveness.

Within this framework, managerial support acts as a bridging mechanism that connects technological opportunities with organisational capabilities and environmental demands. It enables organisations to align internal processes with external changes, thereby enhancing adoption outcomes.

3.2 Diffusion of Innovation (DOI) Theory

The Diffusion of Innovation (DOI) theory, proposed by Rogers (2003), provides a process-oriented perspective on how innovations spread within organisations and social systems. According to this theory, the adoption of innovation is influenced by five key attributes: relative advantage, compatibility, complexity, trialability, and observability.

In fashion design studios, the relative advantage of technology is often linked to improved efficiency, enhanced creativity, and reduced production time. For instance, 3D modelling tools allow designers to visualise garments without physical prototypes, offering a clear advantage over traditional methods (Xiaoli et al., 2024).

Compatibility refers to the extent to which a technology aligns with existing values, practices, and workflows. Designers are more likely to adopt technologies that complement their creative processes rather than disrupt them. Managerial support plays a crucial role in ensuring compatibility by selecting appropriate technologies and facilitating their integration into existing systems.

Complexity is another critical factor influencing adoption. Technologies perceived as difficult to use may face resistance, particularly in creative environments where users prioritise intuitive and flexible tools. Managers can mitigate this barrier by providing training and technical support.

Trialability and observability further influence adoption decisions. The ability to experiment with a technology on a limited basis and observe its benefits can encourage adoption. Managers can facilitate this process by implementing pilot projects and showcasing successful use cases.

Importantly, DOI theory highlights the role of change agents, often represented by organisational leaders, in promoting innovation. Managers act as catalysts who influence attitudes, reduce uncertainty, and

accelerate the diffusion process within fashion design studios.

3.3 Technology Acceptance Model (TAM)

While TOE and DOI focus on organisational and process-level factors, the Technology Acceptance Model (TAM) provides insight into individual-level adoption behaviour. Developed by Davis (1989), TAM identifies two primary determinants of technology acceptance: perceived usefulness and perceived ease of use.

In the context of fashion design studios, perceived usefulness refers to the extent to which designers believe that a technology enhances their creative output or productivity. For example, AI-based design tools that generate pattern suggestions or predict trends may be perceived as highly useful if they contribute to innovative design outcomes.

Perceived ease of use relates to the degree to which a technology is considered user-friendly. Designers are more likely to adopt technologies that are intuitive and require minimal effort to learn. Complex interfaces or steep learning curves can deter adoption, even if the technology offers significant benefits.

Managerial support plays a critical role in shaping these perceptions. Through training programs, technical assistance, and continuous support, managers can enhance users' confidence and reduce perceived barriers to adoption (Zahra et al., 2021). Additionally, managerial encouragement and recognition can positively influence attitudes

toward technology, further promoting acceptance.

3.4 Integrated Conceptual Model

This study integrates TOE, DOI, and TAM into a unified conceptual framework that positions managerial support as a central mediating variable influencing technological adoption in fashion design studios.

- From the **TOE perspective**, managerial support is a key organisational factor that determines readiness and resource availability.
- From the **DOI perspective**, managers act as change agents who facilitate the diffusion of innovation.
- From the **TAM perspective**, managerial support influences individual perceptions of usefulness and ease of use.

The integrated model suggests that managerial support affects technological adoption through multiple pathways:

- Enhancing organisational readiness and resource allocation
- Facilitating knowledge sharing and training
- Reducing resistance to change
- Promoting positive attitudes toward technology

This multidimensional approach provides a robust theoretical foundation for analysing technological adoption in creative environments such as fashion design studios.

4. Methodology

This study adopts a qualitative research design based on the analysis of secondary data. Qualitative research is particularly suitable for exploring complex social phenomena, such as technological adoption and managerial support, where contextual understanding and interpretive analysis are essential (Creswell & Poth, 2018).

The use of secondary data allows for a comprehensive examination of existing knowledge and provides insights into patterns, trends, and relationships that have been documented in prior studies. This approach is appropriate for theory-building and conceptual analysis, especially in areas where empirical data may be limited or fragmented.

4.1 Research Approach

The study employs an interpretivist research paradigm, which emphasises understanding social phenomena from the perspectives of individuals and organisations. This approach is well-suited to the study of fashion design studios, where creativity, culture, and human behaviour play significant roles.

An inductive approach is used to develop themes and insights from the data. Rather than testing predefined hypotheses, the study seeks to generate new understandings of how managerial support influences technological adoption.

4.2 Data Collection

Secondary data were collected from a wide range of sources to ensure depth and diversity of perspectives. These sources include:

- Peer-reviewed academic journals
- Books and book chapters
- Industry reports and white papers
- Conference proceedings

Databases such as Google Scholar, ScienceDirect, and ResearchGate were used to identify relevant literature. Keywords included “technology adoption,” “fashion design,” “managerial support,” “innovation,” and “digital transformation.” The selection criteria for sources included:

- Relevance to the research topic
- Academic credibility (peer-reviewed publications)
- Recency (preferably within the last 10,15 years, with some foundational works included)
- Theoretical and empirical contributions

4.3 Data Analysis

The study employs thematic analysis, a widely used qualitative method for identifying, analysing, and interpreting patterns within data (Braun & Clarke, 2006).

The analysis followed a systematic process:

Step 1: Familiarisation

The researcher reviewed and re-read the collected literature to gain an overall understanding of the content.

Step 2: Coding

Relevant sections of the data were coded based on key themes such as managerial support, technological adoption, organisational culture, and innovation.

Step 3: Theme Development

Codes were grouped into broader themes that captured recurring patterns and relationships. For example, themes such as “leadership vision,” “training and skill development,” and “resistance to change” emerged.

Step 4: Interpretation

The identified themes were analysed in relation to the theoretical framework, allowing for the development of insights and conclusions.

4.4 Validity and Reliability

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

- **Triangulation:** Multiple sources of data were used to validate findings and ensure consistency (Creswell & Poth, 2018).
- **Theoretical grounding:** The use of established frameworks (TOE, DOI, TAM) provides a strong conceptual foundation.
- **Systematic analysis:** The structured approach to thematic analysis ensures transparency and reproducibility.

4.5 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 authors’ ideas

4.6 Limitations of the Methodology

While secondary data analysis offers several advantages, it also has limitations:

- **Lack of primary data:** The study relies on existing literature, which may not fully capture current practices in fashion design studios.
- **Contextual limitations:** Findings may be influenced by the contexts in which the original studies were conducted.
- **Potential bias:** The selection of sources may introduce bias, although efforts were made to include diverse perspectives.

Despite these limitations, the methodology provides a robust foundation for exploring the role of managerial support in technological adoption.

4.7 Justification of Methodological Choice

The choice of a qualitative, secondary data-based methodology is justified by the exploratory nature of the study. Given the limited research specifically focusing on fashion design studios, a literature-based approach allows for the integration of insights from multiple disciplines, including management, technology, and design.

This approach also facilitates the development of a conceptual framework that can be tested in future empirical studies.

5. Findings and Analysis

The analysis of secondary data reveals that managerial support is a multidimensional

construct that significantly influences technological adoption in fashion design studios. The findings are organised into key thematic areas: managerial vision and leadership, resource allocation, organisational culture, training and skill development, resistance to change, and external environmental pressures. These themes are interpreted through the integrated theoretical lens of the TOE framework, DOI theory, and TAM.

5.1 Managerial Vision and Strategic Leadership

A central finding across the literature is that managerial vision plays a decisive role in shaping technological adoption. Leaders who possess a forward-looking vision and recognise the strategic importance of digital transformation are more likely to champion technological initiatives. In fashion design studios, where creative processes dominate, such vision is critical in aligning artistic practices with technological innovation.

Studies indicate that managerial vision influences the perceived relative advantage of technology, a key determinant in the Diffusion of Innovation (DOI) theory (Rogers, 2003). When managers articulate clear benefits, such as improved efficiency, enhanced creativity, and reduced time-to-market, employees are more likely to perceive technology as valuable and worth adopting.

Moreover, strategic leadership facilitates the alignment of technological adoption with organisational goals. For example, adopting 3D prototyping tools can be linked to sustainability objectives by reducing fabric

waste and minimising the need for physical samples (Xiaoli et al., 2024). This alignment not only justifies investment but also reinforces the organisational commitment to innovation.

From the TOE perspective, managerial vision strengthens the organisational context by establishing clear priorities and direction (Tornatzky & Fleischer, 1990). Without such vision, technological initiatives may lack coherence and fail to gain organisational support.

5.2 Resource Allocation and Financial Commitment

Resource availability is another critical factor influencing technological adoption. The adoption of advanced technologies in fashion design studios often requires substantial financial investment in software, hardware, and training. Managerial support is essential in allocating these resources effectively.

Empirical studies highlight that financial constraints are a major barrier to technological adoption, particularly for small and medium-sized enterprises (SMEs) (Hoque et al., 2021). Managers who prioritise technological investment demonstrate commitment to innovation and create an enabling environment for adoption.

In addition to financial resources, human resources play a crucial role. The availability of skilled personnel who can operate and maintain technological systems is essential for successful implementation. Managers must therefore invest in hiring and developing talent with the necessary technical expertise.

From the perspective of the Technology Acceptance Model (TAM), resource allocation influences perceived ease of use. Adequate resources for training and support reduce the complexity associated with new technologies, thereby increasing user acceptance (Davis, 1989).

5.3 Organisational Culture and Innovation Climate

Organisational culture emerges as a key determinant of technological adoption. An innovation-friendly culture that encourages experimentation, learning, and risk-taking is essential for integrating new technologies into creative workflows.

In fashion design studios, where creativity is central, cultural resistance to technology can be significant. Designers may perceive digital tools as constraints on their artistic freedom. Managerial support is crucial in addressing these concerns and fostering a culture that views technology as an enabler rather than a threat.

Research suggests that supportive leadership can cultivate a positive innovation climate by promoting open communication, collaboration, and knowledge sharing (Zhou & George, 2001). Managers who encourage employees to explore new tools and experiment with digital technologies contribute to a more adaptive and resilient organisation.

Within the TOE framework, organisational culture is a critical component of the organisational context. A culture that values innovation enhances organisational readiness and facilitates the adoption process (Tornatzky & Fleischer, 1990).

5.4 Training and Skill Development

Training and skill development are essential for overcoming barriers to technological adoption. The introduction of new technologies often requires employees to acquire new skills and competencies. Without adequate training, users may feel overwhelmed and resist adoption.

Managerial support in providing training programs significantly influences perceived ease of use, a key determinant in TAM (Davis, 1989). Training reduces uncertainty and builds confidence, enabling designers to use technology effectively.

Furthermore, continuous learning opportunities are important in keeping pace with rapid technological advancements. Managers must invest in ongoing professional development to ensure that employees remain up-to-date with emerging tools and trends.

Studies indicate that organisations that prioritise training and skill development are more successful in implementing technological innovations (Zahra et al., 2021). In fashion design studios, training programs that integrate technical skills with creative applications are particularly effective.

5.5 Resistance to Change and Psychological Barriers

Resistance to change is a common challenge in technological adoption, particularly in creative environments. Designers may resist new technologies due to fear of losing creative control, lack of confidence in their

ability to use digital tools, or scepticism about the benefits of technology.

Managerial support plays a critical role in addressing these psychological barriers. Effective communication is essential in explaining the benefits of technology and addressing concerns. Managers must also involve employees in the adoption process, allowing them to participate in decision-making and experimentation.

The DOI theory highlights the importance of trialability and observability in reducing resistance (Rogers, 2003). Managers can facilitate these processes by implementing pilot projects and showcasing successful use cases. Seeing tangible benefits can help overcome scepticism and encourage adoption.

From a TAM perspective, resistance is closely linked to perceptions of usefulness and ease of use. Managerial interventions that enhance these perceptions can significantly reduce resistance and promote acceptance.

5.6 Influence of External Environmental Pressures

External environmental factors, such as market competition, technological trends, and customer expectations, also influence technological adoption. The fashion industry is characterised by rapid change and intense competition, requiring organisations to continuously innovate.

Managers must respond to these external pressures by adopting relevant technologies that enhance competitiveness. For example, digital design tools enable faster product

development, allowing firms to respond quickly to changing trends.

In developing economies, additional challenges such as infrastructural limitations and resource constraints further complicate technological adoption (Iqbal & Su, 2025). Managerial support is essential in navigating these challenges and leveraging available opportunities.

The TOE framework emphasises the role of environmental context in shaping adoption decisions. Managers act as intermediaries who interpret external pressures and translate them into organisational strategies.

The findings highlight that managerial support is a central factor influencing technological adoption in fashion design studios. It operates through multiple mechanisms:

- Enhancing organisational readiness
- Shaping employee perceptions
- Facilitating resource allocation
- Promoting innovation culture

The integration of TOE, DOI, and TAM provides a comprehensive understanding of these dynamics. Managerial support acts as a bridge between technological potential and organisational capability, enabling successful adoption.

6. Discussion

The findings of this study provide significant insights into the role of managerial support in facilitating technological adoption in fashion design studios. By integrating the TOE framework, DOI theory, and TAM, the discussion offers a deeper interpretation of

how managerial support operates across organisational and individual levels.

6.1 Managerial Support as a Strategic Enabler

One of the key contributions of this study is the identification of managerial support as a strategic enabler of technological adoption. Rather than being a passive factor, managerial support actively shapes the adoption process by influencing organisational priorities, resource allocation, and employee behaviour.

From a strategic perspective, managers play a critical role in aligning technological adoption with organisational goals. This alignment is particularly important in fashion design studios, where creativity and innovation are central. Managers must ensure that technological initiatives enhance, rather than hinder, creative processes.

The findings support the TOE framework's emphasis on organisational factors, highlighting that managerial support is a key determinant of adoption success (Tornatzky & Fleischer, 1990). Without strong leadership, technological initiatives may lack direction and fail to achieve desired outcomes.

6.2 Bridging Creativity and Technology

A unique aspect of fashion design studios is the interplay between creativity and technology. Unlike traditional industries, where efficiency and productivity are primary concerns, fashion design studios prioritise artistic expression and innovation.

The findings suggest that managerial support plays a crucial role in bridging this gap. By fostering a culture that values both creativity and technology, managers can create an environment where digital tools are seen as enablers of innovation.

This aligns with the DOI theory, which emphasises compatibility as a key factor in adoption (Rogers, 2003). Technologies that align with creative processes are more likely to be accepted. Managers must therefore carefully select and implement technologies that complement, rather than disrupt, existing workflows.

6.3 Enhancing Employee Acceptance through Managerial Support

The discussion highlights the importance of managerial support in shaping employee perceptions of technology. According to TAM, perceived usefulness and ease of use are critical determinants of adoption (Davis, 1989).

Managerial interventions, such as training programs, technical support, and communication strategies, can enhance these perceptions. For example, demonstrating how digital tools improve design efficiency and creativity can increase perceived usefulness.

Furthermore, providing user-friendly interfaces and adequate training can reduce perceived complexity, thereby enhancing ease of use. These findings underscore the importance of a user-centred approach to technological adoption.

6.4 Overcoming Resistance to Change

Resistance to change is a significant barrier to technological adoption in fashion design studios. The findings indicate that managerial support is essential in addressing this challenge.

Managers must adopt a proactive approach to change management, involving employees in the adoption process and addressing their concerns. This includes:

- Communicating the benefits of technology
- Providing opportunities for experimentation
- Recognising and rewarding adoption efforts

The DOI theory's emphasis on trialability and observability provides useful insights into overcoming resistance (Rogers, 2003). By allowing employees to experiment with new technologies and observe their benefits, managers can reduce uncertainty and build confidence.

6.5 Implications for Developing Economies

The findings have important implications for fashion design studios in developing economies such as Bangladesh. These contexts are characterised by resource constraints, skill gaps, and infrastructural challenges.

Managerial support becomes even more critical in such environments. By adopting strategic approaches, such as leveraging partnerships, investing in training, and

prioritising cost-effective technologies, managers can overcome these challenges and facilitate adoption.

The findings align with previous research indicating that managerial support is a key driver of technological adoption in developing economies (Iqbal & Su, 2025).

6.6 Theoretical Contributions

This study contributes to the literature by integrating TOE, DOI, and TAM into a unified framework for understanding technological adoption in fashion design studios. While these theories have been widely used in other contexts, their application to creative industries provides new insights.

The study highlights the central role of managerial support as a mediating variable that connects organisational and individual-level factors. This integrated approach enhances our understanding of the complex dynamics involved in technological adoption.

6.7 Practical Implications

The findings offer several practical implications for managers in fashion design studios:

- Develop a clear strategic vision for technological adoption
- Invest in training and skill development
- Foster an innovation-friendly organisational culture
- Engage employees in the adoption process
- Align technological initiatives with creative goals

By implementing these strategies, managers can enhance technological adoption and drive innovation.

6.8 Future Research Directions

Future research should focus on empirical validation of the proposed framework through case studies or surveys. Additionally, the role of emerging technologies such as AI, virtual reality, and blockchain in fashion design studios warrants further investigation.

7. Conclusion

This study provides a comprehensive examination of the role of managerial support in facilitating technological adoption within fashion design studios. By integrating insights from the Technology, Organisation, Environment (TOE) framework, Diffusion of Innovation (DOI) theory, and Technology Acceptance Model (TAM), the research highlights the multidimensional nature of technological adoption in creative environments.

The findings demonstrate that managerial support is not merely a supplementary factor but a central driver of successful technological integration. Leadership vision emerges as a critical element in aligning technological initiatives with organisational goals and creative processes. Managers who actively promote innovation and articulate clear strategic objectives can significantly influence organisational readiness and employee engagement. Furthermore, resource allocation—both financial and human—plays a crucial role in enabling the adoption of advanced technologies such as

CAD systems, AI-based design tools, and 3D modelling platforms.

The study also underscores the importance of organisational culture in shaping attitudes toward technology. In fashion design studios, where creativity and artistic expression are paramount, resistance to technological change can be pronounced. Managerial support is essential in fostering a culture that views technology as an enabler of creativity rather than a constraint. Training and skill development initiatives further enhance employees' confidence and competence, thereby reducing perceived complexity and increasing acceptance.

Additionally, the research highlights the significance of external environmental factors, particularly in the context of developing economies. In countries such as Bangladesh, where resource constraints and skill gaps present challenges, managerial support becomes even more critical in driving digital transformation and maintaining competitiveness in the global fashion industry.

From a theoretical perspective, the study contributes to existing literature by integrating multiple frameworks to provide a holistic understanding of technological adoption in fashion design studios. Practically, it offers valuable insights for managers seeking to navigate the complexities of digital transformation in creative industries.

Future research should focus on empirical validation of the proposed conceptual model and explore the impact of emerging technologies such as artificial intelligence,

virtual reality, and blockchain on design practices. Overall, the study emphasises that effective managerial support is indispensable for achieving sustainable technological innovation in fashion design studios.

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