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Digital Decarbonisation and Fashion Industry'

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The fashion industry significantly contributes to global carbon emissions, accounting for 8 to 10 percent due to energy-intensive production processes and waste. In recent years, the sector has begun to leverage digital technologies such as blockchain, artificial intelligence (AI), and the Internet of Things (IoT) to enhance sustainability and optimise supply chains. However, the environmental costs associated with these technologies often remain overlooked. Specifically, energy consumption related to data storage, processing, and transmission, especially using emerging tools like AI and cloud computing, can exacerbate carbon emissions. This creates a paradox: while digital tools are intended to promote sustainability, their own environmental impacts may undermine these efforts if not suitably addressed. Consequently, digital decarbonisation, reducing the carbon footprint of digital technologies, has become a critical focus.

Fashion holds a unique position within the creative industries due to its substantive environmental impact and its potential for sustainable transformation. The industry carries significant cultural and economic weight, with global trends influencing consumer behaviour and production practices. This visibility and engagement offer a pivotal opportunity for the fashion sector to lead in digital decarbonisation and to explore how technology can genuinely drive sustainability. Developing an understanding of digital decarbonisation within fashion can enable targeted solutions that resonate across the wider creative sector, thereby influencing environmental strategies in design, media, and entertainment.

This paper conducts a comprehensive literature review to identify the existing research gap in digital decarbonisation within the fashion industry. It examines the environmental impacts of digital technologies, focusing on energy consumption and carbon emissions. Despite the potential of digital tools to enhance sustainability in fashion, there is limited research on the carbon emissions generated by these technologies. This critical omission necessitates addressing the carbon footprint of digital applications to ensure effective support for sustainability initiatives.

The review synthesises current research on the environmental impacts of digital technologies in fashion, highlighting the hidden costs and the urgent need for strategic approaches to reduce their carbon footprints. It investigates the roles of AI, blockchain, and cloud computing in promoting sustainability while acknowledging their environmental repercussions. Suggested strategies include adopting renewable energy for data centres, utilising energy-efficient cloud computing, and implementing responsible data management practices to mitigate these impacts.

The findings indicate a notable gap in the literature concerning digital decarbonisation in fashion. While considerable attention has been directed toward the potential of digital technologies for sustainability, a thorough examination of their environmental costs is necessary. This paper advocates for further research dedicated to decarbonising digital tools in the fashion sector, ensuring that innovations contribute positively to sustainability without escalating the industry's carbon footprint.

In conclusion, as digital technologies continue to influence the fashion industry, it is crucial to address their environmental impacts to align with global sustainability goals. By identifying these research gaps, this paper encourages future studies to focus on minimising the carbon footprint of digital tools, empowering the fashion industry to embrace technological advancements while remaining committed to sustainable practices.