Ethics in the Loop: Fashion Industry Perspectives on the Ethical Challenges of AI

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Introduction

As applications leveraged by artificial intelligence (AI) impact the overall fashion supply chain, ethical concerns on how and when it will be employed have gained urgency. For example, Levi's received consumer backlash as it announced plans to use AI-generated virtual models to promote diversity (Demopoulos, 2023). Scholars and industry professionals alike caution that rapid AI expansion without clear ethical boundaries risks undermining human-centered values (Birhane et al., 2022). Drawing on insights from fashion industry professionals, this study explores the ethical challenges that emerge as they implement AI into creative and operational practices.

Theoretical Background

The value-sensitive design (VSD) framework emphasizes the protection of user autonomy and freedom from bias as core objectives of technology, emphasizing human values rather than merely prioritizing efficiency (Friedman, 1996). As these values are influenced by stakeholder interests, the framework encourages ethical standards that are grounded in the specific domain context in which the technology is used (Jacobs & Huldtgren, 2021). User autonomy is defined as whether the user can control the technology and choose "means and ends" to fit their goals (Friedman, 1996). Adapting to the AI and user environment, user autonomy was conceptualized as the perception of being in control of decisions and outcomes as users navigate AI tools. Bias in technology is defined as the systematic discrimination against certain outcomes, and encompasses preexisting, technical, and emergent bias (Friedman, 1996). Thus, the VSD framework focuses on how technology shapes user autonomy and freedom from bias—two aspects that are critical in fashion, where AI-driven tools can reshape creative work processes and representation through visual content (Sands et al., 2024). Based on this framework, our research aimed to answer the following research questions:

- **RQ1.** What are the primary ethical concerns in AI implementation identified by professionals within the fashion supply chain?
- **RQ2.** How do these challenges align with key concepts of the value-sensitive design (VSD) framework (e.g., user autonomy, freedom from bias)?

Method

After obtaining IRB approval, we conducted semi-structured interviews with 5 fashion industry or education professionals that directly worked with AI in the fashion discipline, from the U.S. and South Korea. Interviews were conducted via Zoom or in person. Interview protocol included in what capacity they used AI, and difficulties or ethical concerns that arise in the process. Interview transcripts were analyzed using MAXQDA software both inductively and deductively, then codes were categorized according to the VSD theory framework for further thematic analysis.

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Results and Discussion

Regarding RQ1, two major themes of ethical concerns in AI implementation were identified; (a) loss of human control over outcomes and the (b) amplification of bias through AI systems. These concerns emerged from both technical characteristics of AI systems and structural dynamics within the fashion supply chain. First, participants mentioned how certain capabilities and complexities of AI limited their control of outcomes (RQ2). This limitation in autonomy arose from both the AI systems themselves (e.g., limited technical skills due to system complexity; Freedman, 1996) as well as inter-organizational dynamics (e.g., communicating user goals to outsourced experts). One participant mentioned existing systems' lack of compatibility (e.g., system fluidity) with fashion products, and expressed loss of creative control. Particularly, the participant noted that making subtle adjustments in images had technical limitations. For example, they stated, "*When we tried modifying the [AI-generated model's] expression [...] it would change the face entirely. [...] With a real model, we could just say "smile" or "lower your shoulder" during the shoot. But with AI, we had to explain everything."*

User autonomy was challenged not only by AI systems themselves, but also by the asymmetry between other actors of the fashion supply chain, such as outsourcing partners. Lack of concrete industry regulations caused new rules and contracts to be agreed upon relational norms. One participant shared their experience of anthropomorphic misrepresentation of AI (e.g., fees called "portrait rights" and "exclusivity rights" for AI-generated faces in images). The participant felt that outsourced partners held disproportionate power due to their technical expertise, leaving the participant and colleagues feeling dependent and disempowered. They stated, "*We had a clear reference image […] But since we're not technical experts, aligning our vision with [business partner] execution was hard.*" Conversely, limitations in expertise due to system complexity varied by the actors of the supply chain. One participant, who worked closely with AI-generated marketing content, stated, "*I don't have a data science degree, don't know how to code, not a requirement at all to do my job*." Additionally, delegation of ethical concerns was also attributed to system complexity. For example, one participant admitted, "*It's beyond my scope of expertise on how we can solve for that. There's [other] people who are working on those topics."* Overall, system complexity and limited system fluidity influenced participants perceived loss of autonomy.

Regarding freedom from bias (Theme 2), participants mentioned preexisting, technical, and emergent bias (*sub-themes: role dependent emergent bias, skill-dependent emergent bias*). One participant noted how technical bias caused AI to amplify preexisting biases, expressing concern about "*depictions of certain ethnic groups or certain populations*". They added, "*It's all scraped with public data, and our data is biased*," mentioning how preexisting biases existed independent of the technology (Friedman, 1996). Additionally, technical and emergent biases were frequently mentioned together, and went beyond representational biases to include the future of fairness and ownership in the fashion industry. One participant noted the inevitability for digitalization for supply chain partners, stating for manufacturers whose

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assets were "*defined and searchable, then, you'll probably get more new business*". One participant suggested that differences in digital readiness would skew future visibility of manufacturers. Overall, participants voiced the need to establish clear ethical boundaries while also reconsidering traditional systems (e.g., intellectual property rights) that they felt did not address recent developments in AI technology.

Conclusion and Implications

Through interviews with industry professionals, our findings provide insights on ethical challenges of AI in the fashion industry. Specifically, concerns focused on threats to user autonomy and bias, which were amplified by lack of regulatory standards. Findings indicate that while strategic AI use can enhance visibility for smaller or less-established suppliers, limited system fluidity may disadvantage less digitalized firms and limit future business opportunities. Moreover, emergent biases were role-dependent and skill-dependent, shaping unequal outcomes in the textile and apparel supply chain. These insights provide an initial framework for identifying ethical concerns that industry stakeholders must collectively address as AI adoption continues to expand.

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