Exploring Fashion Digital Intelligence: Analysis of Knowledge Domains and Digital Competency in Fashion Merchandising

Xun (Catherine) Sun, Yuhui Liu, and Li Zhao, University of Missouri, USA

Keywords: fashion digital intelligence, merchandising, digital competency, topic modeling, content analysis

Digital Intelligence (aka. DQ) is defined as a prerequisite of digital competency and consists of a set of digital competencies to foster "a new way of thinking" in the digital era (Kampakaki and Papahristou, 2020, p.36). The emergence of digital innovation is revolutionizing fashion merchandising. In this dynamic landscape, the demand for new competencies and the recognition of the growing importance of digital proficiency among fashion merchandising students and fashion industry leaders have become increasingly apparent (Wang & Ha-Brookshire, 2018). As a result, fashion digital intelligence must respond proactively to the industry's technological changes and digital environments. However, despite this need, there is very limited research on digital intelligence in fashion merchandising. Therefore, the study aims to understand and explore fashion digital intelligence focusing on merchandising knowledge domains and digital competencies. We raised two research questions (RQs): (1) What skills and knowledge domains are required in current fashion merchandising jobs? (2) In what ways are digital competencies manifested in fashion merchandising roles?

The Apparel Merchandising Competency (AMC) (Jacobs & Karpova, 2019) was used as the main theoretical framework in this study. Competence is defined as a "combination of knowledge, skills, and attitudes"(Oberländer et al., 2020, p.2) that is required to meet the complex requirements of specific positions (Collet et al., 2015). The AMC framework defines the domain-specific overall competencies that competent merchandising professionals should possess and illustrates how knowledge and skills are constructed (Jacobs & Karpova, 2019). In addition, the Digital Competency Framework (DigComp) (Vuorikari et al., 2022) was used as a supplementary theory to identify key digital competencies within the AMC framework. DigComp is a combination of knowledge, abilities, and skills that encompass the "confident, critical, responsible use, and engagement with digital technologies"(Vuorikari et al., 2022, p.3). Through the combination of two frameworks, five DigComp areas were identified (Vuorikari et al., 2022): (a) communication and collaboration, (b) information and data literacy, (c) digital content creation, (d) safety, and (e) problem-solving.

LDA-Topic modeling, a computational technique (Blei et al.,2003), was used to identify key themes and relevant terms related to fashion digital intelligence from unstructured job advertisements on indeed.com in February 2023. A total of 20,015 job postings were collected by employing ethical web scraping techniques and were filtered based on the presence of keywords "fashion and apparel" in combination with merchandising job functions, such as "buying, merchandising and planning," "sourcing" "product management" "marketing" "E-Commerce" "content creating" and "retailing". Through the analysis of the dataset, 18 topics emerged and were named inductively based on keyword frequency. The skills associated with each topic were mapped into the AMC domains, and DigComp within AMC was deductively coded and mapped based on the DigComp framework, utilizing a content analysis approach.

For RQ1, the top five knowledge and skills required in fashion merchandising roles were identified as teamwork (19.3%), account management (13.3%), retail and industry experience (10.5%), branding (7%), and sales (6.2%). All 18 topics were mapped into six AMC areas: marketing knowledge (28.5%), work style (23.3%), business knowledge (15.3%), merchandising knowledge (11.6%), professional experience (10.5%), and soft skills (10.5%). The findings of the RQ1 suggested that AMC comprises a wide range of cross-functional and discipline-specific knowledge and skills. Furthermore, RQ1 provided a holistic recognition and foundation of AMC to investigate FDQ. Having a great comprehension of RQ1, RQ2 can be built upon. Table 1 showed a conceptual framework of FDQ within the AMC emphasis on digital competency. The top three main digital competencies were professional empowerment (21.3%), digital collaboration and communication (21.1%), creativity, and digital adaptability (19.4%). These digital competencies describe job requirements for subject knowledge foundation, searching and communicating information, cross-functional collaboration, and developing solutions using data and digital technologies to address merchandising/market needs, enhance overall merchandising performance, and equip personnel with digital intelligence.

This study has several implications. First, the study contributes to the theoretical literature by highlighting the importance of digital competencies within AMC and proposing the foundation for future fashion digital intelligence. Second, the priority of fashion merchandising and digital competencies can provide direction for fashion educators and employer trainers to construct better fashion merchandising guidelines. Moving forward, the value of this study can be extended by exploring and identifying any gaps that may exist between curricula design, competency training, and job expectations. Qualitative studies can be conducted to foster fashion digital intelligence and better prepare fashion students for the technological advancements within the merchandising industry.

Table 1: *Fashion Digital Intelligence within Fashion Merchandising*

Context: Fashion Merchandising
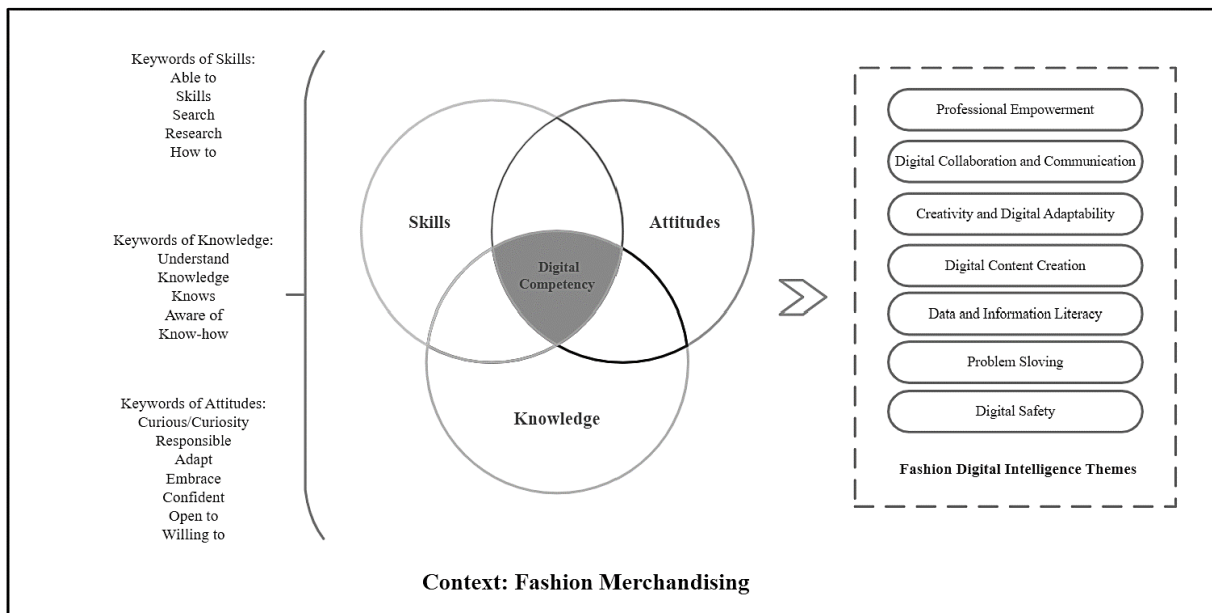
References

Alzahrani, S. G., & Kozar, J. M. (2017). Promoting the professional development of Saudi female students in the apparel and textiles discipline. *International Journal of Fashion Design, Technology and Education*, *10*(1), 81-90.

Blei, D. M., Ng, A. Y., & Jordan, M. I. (2003). Latent Dirichlet Allocation. *Journal of Machine Learning Research*, *3*(Jan), 993-1022.

Collet, C., Hine, D., & du Plessis, K. (2015). Employability skills: Perspectives from a knowledge-intensive industry. *Education + Training*, *57*(5), 532–559. https://doi.org/10.1108/et-07-2014-0076

Jacobs, B., & Karpova, E. (2019). What do merchandisers need to succeed?: Development of an apparel merchandising competency framework. *International Journal of Fashion Design, Technology and Education*, *12*(3), 272–282. https://doi.org/10.1080/17543266.2019.1587791

Kampakaki, E., & Papahristou, E. (2020). Digital Intelligence as Prerequisite of Artificial Intelligence's Integration in the Clothing Industry 4.0. In *SETN Workshops* (pp. 36-41).

Oberländer, M., Beinicke, A., & Bipp, T. (2020). Digital competencies: A review of the literature and applications in the workplace. *Computers & Education*, *146*, 103752.

https://doi.org/10.1016/j.compedu.2019.103752

Vuorikari, R., Kluzer, S., & Punie, Y. (2022, March 17). *DigComp 2.2: The Digital Competence Framework for Citizens - With new examples of knowledge, skills and attitudes*. JRC Publications Repository. https://doi.org/10.2760/115376

Wang, B., & Ha-Brookshire, J. (2018). Exploration of Digital Competency Requirements within the Fashion Supply Chain with an Anticipation of Industry 4.0. *International Journal of Fashion Design, Technology and Education*, *11*, 1–10. https://doi.org/10.1080/17543266.2018.1448459