Artificial Intelligence for the Fashion and Retail Industry: Insights From Network Analysis of the Current Literature

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Introduction Artificial Intelligence (AI) is transforming all industries including the fashion and retail industry. While the application of AI in the industry is relatively new, the usage of AI in the industry has rapidly increased. To advance our knowledge on the topic, it is timely to systematically analyze and critically evaluate the existing literature. Therefore, this study aimed to delineate the state of the art AI literature and advance theoretical development by providing a systematic review of the literature using big data analysis methods.

Literature Review Since collecting and analyzing large data sets enable researchers to build connections within the data set so that the information it contains becomes usable (Erevelles et al., 2016), utilization of big data is prevalent in recent years to obtain a more accurate understanding of issues in various fields. Researchers have developed new techniques to capture, process, analyze and visualize large amounts of data with statistics, optimization methods, data mining, machine learning, visualization approaches, and social network analysis (Amado et al., 2018). While it is still new, researchers in the retail field began to use big data to understand relationships among the key concepts in market trends and develop strategies. Text mining and topic modeling are useful to explore hidden semantic structures in the body of the texts and to provide a logical overview of the essential topics in consumer behavior, customer experiences, and retail trends (Lang & Zhao, 2020; Sachdeva et al., 2019). The network analysis, another commonly used approach, has been effective to identify and interpret the potential meanings based on the relationships of concepts in consumer behaviors and the retail industry (Kim & Oh, 2020; Hoffmann et al., 2020). The current study employs network analysis methods to examine the previous literature and understand the meanings in the data.

Method Articles were extracted from the Web of Science (WoS) database which is a well-recognized and reputable database of academic publications with a long history (Vanhala et al., 2020). Relevant articles were searched using search word combinations using "artificial intelligence," "consumer," "store," "retail," "apparel," and "fashion" for the title, abstract, and keywords of articles. After eliminating irrelevant articles, 231 articles remained for the analysis. Frequency analysis and network analysis were used to reveal the dominant streams of research in the literature. Prior to the main analysis, the text data was cleaned using basic text processing (i.e., tokenization, stop words removal, and lemmatization) to eliminate insignificant words, symbols or characters. Then, all the text documents were combined to create the corpus (i.e., the body of text used for further statistical analysis) (Schütze et al., 2008). Python programming

language (Version 3) was used for algorithm development. CONCOR analysis and network visualization were conducted using UCINET for Windows (Borgatti et al., 2002).

Results The number of publications per year grew exponentially with the highest number of publications (n=114) in 2020 and the USA was the most productive country (n=63). Keyword frequency analysis showed that research has been most active in the area of consumer (408) usage (375) and design/development (86) of products (143) and services(259), especially in the context of chatbot (67) and robots (75). This finding is corroborated by the results of the network analysis. An examination of closeness centrality, which identifies central words in the network (i.e., core keywords that relate to all other words in the network), revealed that keywords such as 'chatbot,' 'robot,' 'fashion,' 'device,' and 'algorithm' were of high importance. Together, it can be concluded that a large proportion of research has been on the development of algorithms of chatbots and robots to facilitate consumer purchase of fashion products. The importance of keywords in the overall network of themes was examined through betweenness centrality of a node, the number of times the node is included in the shortest paths of any pair of nodes in the keyword network (Radhakrishnan et al., 2017). The most diagnostic keyword among the top 30 keywords was "social". Further examinations of the literature revealed that social was an important word in service/product development and in the innovation acceptance process of consumers. Phrases such as 'social-robot,' 'social-service,' 'social-oriented,' and 'social-role,' reveal that the development of AI-enabled services/products with social functions is actively progressing. In addition, through words such as 'social-consideration,' 'social-perception,' 'social-influence,' and 'social-contextual,' it was found that social is an important factor when AI-related products or services are evaluated by consumers. Then, CONCOR analysis was conducted to reveal concurrently appearing words because this technique can reveal hidden subgroups and the semantic structure of text (Breiger et al., 1975). Four themes emerged from the analysis: 'System development & application,' 'Perception of robots,' 'Role of AI,' and 'Healthcare.' The greatest number of articles on AI dealt with the system development and application. Popular keywords ('machine-learning,' 'management,' 'algorithm,' 'system,' 'application,' 'design') suggest that attention has been given to the development of AI-based systems and applications. Another notable topic was consumer perception of robots and chatbots ('social', 'robot', 'trust', 'chatbot', 'perceived.'), suggesting the research interests in the level of consumer trust in AI. Meanwhile, words such as 'consumer,' 'market,' 'service,' 'marketing,' 'role,' 'retail,' 'fashion,' and 'IoT,' indicate that research on the diverse role of AI creates another stream of research. Lastly, the heightened anticipation and excitement for AI-enabled products and services have been most visible in the healthcare sector ('healthcare,' 'mobile-apps,' 'health'). The studies in this theme revealed AI-enabled products and services such as consumer-oriented self-diagnosis apps and algorithms that can complement doctors' diagnosis are actively developed/used in the healthcare field. The AI research specific to the fashion industry is still in its infancy, mostly focusing on consumer perceptions and intention to adopt the AI-empowered products and services. Based on the development in the research stream in the healthcare sector, it is anticipated that future research will focus on specific problem solving such as enhancement of business efficiency (e.g., fast market research and trend forecasting) and consumer support for purchase processes (e.g., fit diagnostics).

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