

Data-Driven AI Techniques for Fashion and Apparel Retailing

Chandadevi Giri

Department of Business Administration and Textile Management

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Faculty opponent is

Maria Riveiro, Professor at the School of Engineering at Jönköping University.

The grading committee is

Tomas Müllern, Professor at Jönköping International Business School, Sweden,
Malin Sundström, docent at Malmö University, Sweden and **Christine Balague**, Professor at IMT-Business School, France.

PhD thesis is available at the Swedish School of Textiles University of Borås SE-501 90 Borås, Sweden. +46(0) 33 435 4000



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Abstract

Digitalisation allows companies to develop many new ways of interacting with customers and other stakeholders. These digital interactions typically generate data that can be stored and later processed for different objectives. Currently, the fashion and apparel industry is undergoing a disruptive transformation due to digitalisation, including a rapid increase in the generation of data in various parts of the supply chain. While most data may not be stored with data mining or other analyses in mind, collected data frequently contain very valuable information that can be exploited. Analytics, in particular the use of data-driven AI techniques, is therefore becoming a pervasive tool that is used for a large variety of purposes and in many different processes. While the popularity of Artificial Intelligence (AI) as an advanced tool for improved decision support is increasing, applications of AI within the fashion and apparel industry have historically been rather limited.

With this in mind, the overall purpose of this thesis is to, after presenting an overview of research on applications of data-driven AI in the fashion and apparel industry, demonstrate how various data sets and AI techniques can be utilised for improved decision support in different scenarios.

Whilst the thesis first investigates the impact of AI on different parts of the supply chain, the empirical work focuses on fashion and apparel retailing. Here, different AI techniques are explored in a set of case studies covering several applications in fashion and apparel retailing, thus showing the potential of data-driven AI for decision support in that domain.

One important learning outcome, found in several of the studies, is the need to combine several data sources and techniques in the projects. Another takeaway is the benefit of interpretable models, which allow for inspection and analysis of the discovered relationships. From an applied perspective, approaches like RFM modelling can be utilised as a pre-step to predict customer churn, add sentiment analysis to short-term sales forecasting and build campaign and simulation engines from historical data, which could potentially be used by many retailers.

In conclusion, this thesis has, mainly through a set of case studies addressing real-world problems and utilising real-world data sets, demonstrated how data-driven AI techniques can support and improve fashion and apparel retailers' decision-making.

Keywords: Digitalisation, artificial intelligence, fashion and apparel industry, churn prediction, sales forecasting, campaign analysis, data-driven AI decision-making