

Jan 17th, 12:00 AM

Conversational User Interfaces for Searching Fashion Products Based on Product Reviews

René Götz

FAU Erlangen-Nürnberg, School of Business, Economics and Society, Germany, rene.goetz@fau.de

Alexander Piazza

Ansbach University of Applied Sciences, Department of Business Administration, Germany, alexander.piazza@hs-ansbach.de

Follow this and additional works at: <https://aisel.aisnet.org/wi2022>

Recommended Citation

Götz, René and Piazza, Alexander, "Conversational User Interfaces for Searching Fashion Products Based on Product Reviews" (2022). *Wirtschaftsinformatik 2022 Proceedings*. 9.
<https://aisel.aisnet.org/wi2022/workshops/workshops/9>

This material is brought to you by the Wirtschaftsinformatik at AIS Electronic Library (AISeL). It has been accepted for inclusion in Wirtschaftsinformatik 2022 Proceedings by an authorized administrator of AIS Electronic Library (AISeL). For more information, please contact elibrary@aisnet.org.

Conversational User Interfaces for Searching Fashion Products Based on Product Reviews

René Götz¹, Alexander Piazza²

¹ FAU Erlangen-Nürnberg, School of Business, Economics and Society, Nürnberg, Germany
rene.goetz@fau.de

² Ansbach University of Applied Sciences, Department of Business Administration, Ansbach, Germany
alexander.piazza@hs-ansbach.de

Keywords: *Conversational User Interfaces, Natural Language Processing, Product Recommendation System, Fashion Industry, Product Reviews*

1 Extended Abstract

The fashion industry belongs to the largest consumer industries worldwide. More and more people purchase product via e-commerce retailer like Zalando or Amazon where they can find very large and frequently changing product offerings including several thousand of different articles¹. Large product offerings can cause choice overload which leads to customer unsatisfaction [1] and potential loss of sale [2]. In general, recommendation systems and intelligent search mechanisms like Conversational User Interfaces (CUI) are applied to mitigate choice overload situations by limiting the number of choices [3,4].

To enable CUI for fashion products, a product profile is needed where product characteristics are described as textual knowledge e.g., in the form of tags. Product descriptions and product meta-data are potential sources of such knowledge. Nevertheless, the customers' perception and usage of a product frequently differs from the way products are getting advertised (e.g., a company positions a shoe as running product, but customers rather use it as fashion product in everyday situations). To ask customers explicitly about their opinion and usage of the products is in general too expensive, especially as the offered products are changing several times per year. As alternative, product reviews are an attractive source of customer-oriented product descriptions which can augment companies' official product meta-data.

The article aims for answering the following research question: how can insights from product reviews be used to design a conversational user interface for fashion products?

To answer this research question, a prototype CUI has been developed which leverages product meta-data from the manufacturer as well as insights from

¹ <https://corporate.zalando.com/en/company/zalando-at-a-glance>

product reviews for searching products in the context of fashion. In the first step, the product reviews are analyzed using a hybrid text classification approach introduced by Goetz et al [5,6] based on the Word2Vec algorithm [7]. This approach extracts keywords that are related to the material, design, size and fit, color, and purpose of use for each of the products. Based on a term frequency - inverse document frequency (TF-IDF) approach, the relevance of each of these keywords for every product is determined. The resulting TF-IDF matrix serves as basis for providing product proposals based on the given search query. Relevant products are determined by considering the following two steps:

The meta-data gender, age group, and color serve as a filter for narrowing down the product range to a desired sub-set of products. The TF-IDF matrix is then used to retrieve the best matching product. For example, the CUI prototype handles the search query “I am looking for a green shoe in a classic design to wear in office” as follows:

1. Select a sub-set of products that meet the requirements based on the mentioned product meta-data (Remove products that do not meet the attribute of the color "green")
2. Search for aspects, which are included in the TF-IDF matrix and add up the corresponding values for each product (From the search query, the aspects "classic" and "office" can be assigned to the data)
3. Select the product that achieves the highest value from step 2 as the result of the search query. If there are several matching shoes, randomly select one of them.

For the evaluation of this approach, a prototype is built using 300.000 reviews in English language about footwear products from an online retailer. In addition, the meta-data gender, age group and color of the products are extracted. In the first step of the evaluation, the authors conduct a visual inspection of search results for several example queries like “classic shoe”, “shoes for gym”, and “blue shoes for office” which overall appeared to be meaningful and util. Then, the authors asked 21 participants to use the CUI and to report their satisfaction and overall impression. This user tests indicated that users that are rather interested in getting inspiration for new products gave positive feedback, whereas users who were searching for a specific article did not show a lot of interest at all. Furthermore, a quantitative study with 184 participants has been conducted using an extended version of the TAM and a seven-point Likert scale. The survey states high user acceptance in terms of perceived usefulness and intention to use.

The overall results indicate that the CUI is rather relevant for user who want to explore the product range and those who are looking for inspiration. For the users who are looking for a specific type of product, a classical filter-based approach might be more suitable whereby users can filter products based on known categories that fulfill their needs. In future research, an evaluation of the CUI for different user types and shopping situations is needed.

References

1. Schwartz, B. 2016: The paradox of choice: Why more is less. Ecco Press, New York (2016)
2. Iyengar, S.S., Lepper, M.R.: When choice is demotivating: Can one desire too much of a good thing? *Journal of personality and social psychology* Vol. 79, No. 6, 995-1006 (2000)
3. Nagar, K., Gandotra, P.: Exploring Choice Overload, Internet Shopping Anxiety, Variety Seeking and Online Shopping Adoption Relationship: Evidence from Online Fashion Stores. *Global Business Review* 17, 4, 851–869 (2016)
4. Guan, C., Qin, S., Ling, W., Ding, G.: Apparel recommendation system evolution: an empirical review. *International Journal of Clothing Science and Technology*. 28, 6 (2016)
5. Götz, R., Piazza, A., Bodendorf, F: Hybrider Ansatz zur automatisierten Themen-Klassifizierung von Produktrezensionen. *HMD* 56, 932–946 (2019)
6. Götz R., Piazza A., Bodendorf F.: Entscheidungsunterstützung im Online-Handel. In: D'Onofrio S., Meier A. (eds) *Big Data Analytics*. Edition HMD. Springer Vieweg, Wiesbaden. (2021)
7. Mikolov, T., Chen, K., Corrado, G., Dean, J.: Efficient estimation of word representations in vector space. In: *International Conference on Learning Representations*, S 1–12, (2013)