



JOURNAL OF EMERGING TECHNOLOGIES AND INNOVATIVE RESEARCH (JETIR)

An International Scholarly Open Access, Peer-reviewed, Refereed Journal

ACQUIRING INTERESTS BASED ON CONTEXT OF CUSTOMER NEEDS ON ONLINE PRODUCT REVIEWS

¹R.Shreya, ²S.ManiShankar, ³S.Harshitha, ⁴MRS .V. Swathi

^{1,2,3}UG Scholars, ⁴Asst. Professor

^{1,2,3,4}Department of Computer Science and Engineering,
Guru Nanak Institutions Technical Campus (Autonomous), Hyderabad, India.

Abstract : In today's digital economy, customers express their product experiences and concerns through online reviews. Extracting improvement ideas from these reviews offers valuable insights into market expectations. While previous studies have focused on identifying customer needs from reviews, they often overlook the specific usage context. This study introduces a novel method that considers both context and product functions derived from reviews. By mining linguistic patterns, customer needs are determined by combining context information and product functions using semantic embedding and clustering. A case study on the Amazon Echo series validates this approach, identifying 1430 distinct customer needs, offering valuable input for product enhancement. This study pioneers integrating context information into identifying customer needs, providing a promising approach for future product planning in the e-commerce industry..

I. INTRODUCTION

Online product reviews serve as crucial sources of information influencing customer decisions and product sales, offering a platform for customers to share their experiences and expectations. Potential buyers mitigate risks by processing review information, which often includes context details for specific use cases. Manufacturers benefit from mining these reviews for innovative ideas to meet customer needs, essential for market success and competitive advantage. Text mining techniques assess the impact of reviews on business performance, highlighting the importance of translating latent customer needs into unique products and experiences. Despite previous studies extracting customer needs from reviews, limitations arise from neglecting context information, crucial for understanding varying customer needs even with unchanged product functions. This study proposes a systematic approach to identify context-aware customer needs from online reviews, employing linguistic pattern mining to extract context and product function expressions. By clustering these elements, customer needs are identified, bridging the gap between product functionality and contextual usage. A case study on Amazon Echo series validates this approach, emphasizing the importance of considering both context and product functions for effective product improvement..

LITERATURE REVIEW

Description: With the increasing application and utility of automatic identification systems (AISs), large volumes of AIS data are collected to record vessel navigation. In recent years, the prediction of vessel trajectories has become one of the hottest research issues. In contrast to existing studies, most researchers have focused on the single-trajectory prediction of vessels. This article proposes a multiple-trajectory prediction model and makes two main contributions. First, we propose a novel method of trajectory feature representation that uses a hierarchical clustering algorithm to analyze and extract the vessel navigation behavior for multiple trajectories. Compared with the classic methods, e.g., Douglas–Peucker (DP) and least-squares cubic spline curve approximation (LCSCA) algorithms, the mean loss of trajectory features extracted by our method is approximately 0.005, and it is reduced by 50% and 30% compared to the DP and LCSCA algorithms, respectively. Second, we design an integrated model for simultaneous prediction of multiple trajectories using the proposed features and employ the long short-term memory (LSTM)-based neural network and recurrent neural network (RNN) to pursue this time series task. Furthermore, the comparative experiments prove that the mean value and standard deviation of root mean squared error (RMSE) using the LSTM are 4% and 14% lower than those using the RNN, respectively..

II. RESEARCH METHODOLOGY

Data Preparation is a fundamental step in the data analysis process, encompassing tasks to refine raw data into a structured format suitable for analysis. This involves cleaning, integrating, and enriching the data to ensure its integrity and reliability. Sentiment Analysis, a branch of Natural Language Processing (NLP), categorizes text opinions as positive, negative, or neutral, providing valuable insights into public sentiment across various industries. NLP models leverage machine learning to understand and

generate human language, facilitating tasks like sentiment analysis and text summarization. Extractive Summarization condenses text by selecting key passages, aiding in the extraction of relevant information from large volumes of text. Clustering is an unsupervised machine learning technique that organizes unlabeled data into meaningful groups based on similarities, enabling efficient data organization and analysis.

Customer recommendations wield significant influence in today's digital landscape, as online platforms and social media empower consumers with access to peer and expert reviews. These recommendations heavily influence purchasing decisions and shape brand perception, providing consumers with valuable insights into product quality and user experiences. Meanwhile, businesses leverage recommendation systems fueled by data analytics and machine learning to personalize customer experiences, tailor product offerings, and drive sales. In essence, customer recommendations bridge the gap between consumers and businesses, facilitating informed decision-making and enhancing the overall customer experience.

III. TECHNIQUE USED OR ALGORITHM USED

3.1 EXISTING TECHNIQUE: -

The current methods for customer needs analysis using online reviews often fail to capture the diverse and context-dependent nature of consumer preferences and requirements. Typically, these methods rely on language pattern mining to extract information about product functionalities from review texts. However, focusing solely on language patterns may overlook the broader context in which consumers express their opinions. Consequently, the insights derived may lack depth, hindering a comprehensive understanding of consumer demands. This limitation underscores the need for an advanced approach that integrates context data from online product evaluations with language pattern analysis. Such an approach would enable a more holistic and accurate portrayal of consumer needs, thereby enhancing decision-making in the design and development of new products.

3.2 PROPOSED TECHNIQUE USED OR ALGORITHM USED:

Linguistic pattern mining of human language involves the extraction of information using the grammatical or structural features of the language. Depending on the purpose, significant variations in patterns can be gleaned from the text. In general, linguistic patterns are extracted by tagging parts of speech (POS), which involves labeling words in a corpus according to the context and word definition.

Linguistic pattern mining has been applied to a variety of research applications, such as the question answering system, sentiment analysis, and customer-aspect extraction. In particular, mining of linguistic pattern has been useful in processing patent documents to perform a property-function network analysis. In this regard, a property represents a specific characteristic of the patented product, and its function is the useful action of that product. The “adjective + noun” pairs are identified as properties, whereas “verb + noun” pairs are referred to as functions. For finding word pairs grammatically related to the forms “adjective + noun” or “verb + noun,” Stanford typed dependencies (SDs) can be adopted. These dependencies capture grammatical relationships in a sentence and can be used by individuals who have no special linguistic expertise.

IV . CONCLUSION

This study proposed a context-aware approach for the identification of customer needs from online product reviews. It differs from other studies in that it combines context information with the product function for deriving customer needs. The improved insights are particularly useful for addressing new feature development from a customer's perspective. Based on a real-life case, this study showed that the proposed approach is capable of assisting the idea generation phase in the course of product improvement. The following paragraphs pinpoint the individual contributions of this study in more detail, which are characterized by the following theoretical and managerial contributions

V. FUTURE ENHANCEMENTS

Feature enhancement involves enhancing a product or service's functionality, usability, or performance based on customer feedback and market trends. This iterative process entails identifying improvement areas, brainstorming new features, and implementing changes to elevate the user experience. Enhancements may encompass adding capabilities, refining existing features, optimizing performance, or enhancing user interface design. By consistently refining features in response to feedback and market demands, businesses stay competitive and relevant. Additionally, feature enhancement is pivotal for sustaining customer satisfaction, fostering brand loyalty, and ensuring long-term success.

VIII. REFERENCES

- [1] M. M. Ali, M. B. Doumbouya, T. Louge, R. Rai, and M. H. Karray, “Ontology-based approach to extract product's design features from online customers' reviews,” *Comput. Ind.*, vol. 116, Apr. 2020, Art. no. 103175.
- [2] M. Zhang, B. Fan, N. Zhang, W. Wang, and W. Fan, “Mining product innovation ideas from online reviews,” *Inf. Process. Manage.*, vol. 58, no. 1, Jan. 2021, Art. no. 102389.
- [3] J. Qi and Z. S. Y. Zhang Jeon Zhou, “Mining customer requirements from online reviews: A product improvement perspective,” *Inf. Manage.*, vol. 53, no. 8, pp. 951–963, 2016.

- [4] H. Hwangbo and J. Kim, “A text mining approach for sustainable performance in the film industry,” *Sustainability*, vol. 11, no. 11, p. 3207, Jun. 2019.
- [5] A. Timoshenko and J. R. Hauser, “Identifying customer needs from user-generated content,” *Marketing Sci.*, vol. 38, no. 1, pp. 1–20, 2019.
- [6] H. Zhang, H. Rao, and J. Feng, “Product innovation based on online review data mining: A case study of Huawei phones,” *Electron. Commerce Res.*, vol. 18, no. 1, pp. 3–22, 2018.
- [7] Y. Zhao and X. M. Xu Wang, “Predicting overall customer satisfaction: Big data evidence from hotel online textual reviews,” *Int. J. Hospitality Manage.*, vol. 76, pp. 111–121, Jan. 2019.
- [8] A. Carrera-Rivera, F. Larrinaga, and G. Lasa, “Context-awareness for the design of smart-product service systems: Literature review,” *Comput. Ind.*, vol. 142, Nov. 2022, Art. no. 103730.

