

ORIGINAL ARTICLE**Scientometric Analysis of Neuro-Linguistic Programming (NLP) in Sports Goods Sales on the Instagram Social Media Platform**Leyla khosravi^{1*}, Mohammad Rasoul khodadadi², Fatemeh Abdavi³

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EXTENDED A B S T R A C T**Introduction**

In the digital age, social media has become one of the most powerful marketing tools. Established in October 2010, Instagram, with over 2.5 billion monthly active users in 2025, is recognized as a leading platform for digital marketing (Wirani et al., 2020). The primary and the most important role of social media is to provide an environment for connecting with others and fostering interactions. On the other hand, interactions and sports marketing represent one of the most complex tasks for a sports organization, with a particular emphasis on customer focus, aiming to fulfill the sports-related needs and desires of audiences (Alidoust Gahfarrokhi et al., 2025). With its visual and interactive features, including posts, stories, Reels, and direct shopping capabilities, Instagram provides a unique platform for selling sports goods (Teo et al, 2019). In marketing, NLP offers capabilities such as sentiment analysis (to understand customer opinions and feelings), interaction automation (with smart chatbots), content optimization (for designing engaging posts), and purchase behavior prediction (Saffanah, 2023). Given the above, the importance of applying NLP to the sale of sports goods on Instagram can be examined from several perspectives (Jamali et al., 2023). However, most studies have focused on the general aspects of digital marketing, and the application of NLP specifically to the sale of sports goods on Instagram has received less attention (Li et al., 2023). This research aims to fill this gap by conducting a bibliometric analysis of articles published from 2010 to 2025 and a systematic review of the key components of NLP application in this field. Using a mixed-methods approach (quantitative and qualitative), this study addresses the following questions: What are the most influential authors, articles and countries in the application of NLP to the sale of sports goods on Instagram? What are the key components of NLP application to the sale of sports goods on Instagram? The results can help sports brands, marketers, and researchers design effective strategies, increase sales, and improve customer interactions on Instagram. In addition, the findings of this study can contribute to the development of localized NLP models for regional markets, such as Iran, and the formulation of ethical frameworks for using user data.

Methodology

This study used a mixed-methods approach (quantitative and qualitative) to comprehensively investigate the application of NLP to the sale of sports goods on

Instagram. The quantitative method included a bibliometric analysis to identify research trends and article impact, while the qualitative method involved content analysis of top articles to extract key components. This research was a documentary (library-based) and applied study, conducted over the period from 2010 to 2025 (since Instagram's founding). In the quantitative part of the research, the statistical population included English-language scholarly articles published in the Scopus database between 2010 and 2025. The search was conducted on 2025, using the following keywords: NLP, sports goods sales, Instagram, and social media. This search identified 185 articles. Due to certain factors and criteria, some of the identified articles had to be disregarded. This reduced the number of articles that needed to be reviewed and evaluated. The number of identified articles was reduced. Subsequently, title and abstract screening was performed, and 38 articles were excluded due to a lack of relevance to the topic (e.g., focusing on NLP in non-marketing fields). Additionally, 12 articles were removed due to lack of access to the full text or insufficient focus on Instagram. In the end, 112 articles were selected for bibliometric analysis. In the present study, the software tools Publish or Perish, Excel, VOSviewer and R were used to measure the variables of interest. Furthermore, in the qualitative part of the research, MAXQDA 2020 software was used for content analysis of the top-ranked articles. The bibliometric indicators in this study included the articles, the annual growth rate of publications, the average citations per document, the H-index of authors and journals, international collaboration and keywords to identify hot topics. For the qualitative analysis, top articles (based on citation count) were selected from the 112 articles. These articles were analyzed using MAXQDA 2020 to extract the key components of NLP application in the sale of sports goods on Instagram.

Findings

This section presents the results of the bibliometric and content analyses in detail. These findings clarify the main components of NLP application in the sale of sports goods on Instagram. In the bibliometric analysis section, 112 articles published in Scopus between 2010 and 2025 were reviewed.

Discussion and Conclusion

The application of (NLP) to the sale of goods on Instagram emerged as a new field of interest starting in 2010, coinciding with the platform's founding. Its importance increased with the introduction of features like Stories and Reels (safana et al, 2023). This study used a bibliometric analysis to identify research trends, influential authors, articles and countries in this field, and it extracted 12 key components. In the content analysis, 12 key components were identified: sentiment analysis, personalized interactions, content optimization, purchase behavior prediction, ethical data management, technology use, digital marketing, customer relationship management, continuous improvement, content quality, visual content analysis, and targeted advertising. The findings of this study can help improve marketing strategies and are useful for brands, researchers, and decision-makers. The results not only provide a comprehensive framework for the application of NLP in digital marketing but also offer practical solutions for sports brands, marketers, and researchers to improve their digital marketing performance. The article by Teo et al (2023), stood out for providing an influential framework for using NLP in marketing. The qualitative content analysis identified 12 key components that are consistent with previous studies. This component allows brands to identify the strengths and weaknesses of their products by analyzing user comments on Instagram. For example, sentiment analysis can show that customers have a positive reaction to the design of a running shoe but are dissatisfied with its price, which helps adjust pricing strategies. The "personalized interactions" component is consistent with Werani et al (2023) research, which showed that NLP-based chatbots can increase customer loyalty by up to 25%. These chatbots improve the user experience by quickly responding to customer questions in Instagram DMs. The "content optimization" component uses techniques like topic modeling to allow brands to produce more engaging content. Saffanah et al. (2023)

showed that optimized content can increase post engagement rates by up to 40%. For instance, brands can produce posts that align with audience interests by analyzing popular hashtags and captions (Hijriansyah, 2024). The lack of research explicitly titled under neurolinguistic programming (NLP) in virtual sales underscores the need for deeper investigation and more precise elucidation of its role to identify the strengths of this domain in digital and virtual marketing. Implementing intelligent chatbots in Instagram direct messages for rapid customer responses can enhance customer loyalty. Furthermore, content optimization should focus on creating posts aligned with audience interests. Additionally, the application of NLP techniques for simultaneous analysis of textual and visual content should be pursued, alongside the development of ethical frameworks for the use of NLP in marketing and the evaluation of content impact. Based on the findings, it is evident that NLP holds significant potential to transform digital marketing on Instagram. The "purchase behavior prediction" component helps brands offer personalized suggestions by analyzing user data such as clicks and searches. Ultimately, this research showed that NLP has great potential to transform digital marketing on Instagram, but fully exploiting this potential requires overcoming technical, ethical, and cultural challenges. By providing a comprehensive framework, this study not only helps in better understanding the application of NLP to the sale of sports goods on Instagram but also offers guidance for brands and researchers to improve their digital marketing performance. Given the increasing growth of Instagram and the growing importance of digital technologies, NLP is expected to play an even more critical role in this field in the future.

KEY WORDS

Neurolinguistic Programming, Content Analysis, Sports Goods Sales, Instagram, Digital Marketing.

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