

## **Between Data and Emotions: A Systematic Review on the Use of Sentiment Analysis in IVAs**

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## Introdução

Intelligent Virtual Assistants (IVAs) are increasingly integrated into daily life, offering convenience, personalization, and automation through machine learning (Jones, 2018; Chattaraman et al., 2019). These systems enable hands-free interaction and smart environments, enhancing user experience. Emotions such as joy or frustration emerge from perceived usability, shaping attitudes and reinforcing IVAs' strategic role in consumer-brand interactions (Ekman, 1992; Kumar et al., 2020).

## Problema de Pesquisa e Objetivo

Despite the growing number of studies on IVAs and sentiment analysis, no systematic review integrates both domains. Existing reviews remain fragmented, addressing isolated issues like privacy, sustainability, or consumer behavior (Buil-Gil et al., 2023; Manzo et al., 2024). This study aims to map the intellectual structure and development of sentiment analysis applied to IVAs using the SPAR-4-SLR protocol and bibliometric techniques to identify trends, gaps, and future research opportunities.

## Fundamentação Teórica

Research on IVAs intersects Technology Adoption and Affective Computing. Traditional models (TAM, UTAUT) stress perceived usefulness and ease of use but omit affective dynamics (Chattaraman et al., 2019). Affective Computing shows that emotions—joy, surprise, frustration—shape system evaluations (Ekman, 1992; Parrott, 2001). Machine learning-driven personalization enhances user engagement yet raises "Privacy Paradox" tensions, requiring trust and anthropomorphism (Maier et al., 2023). Cultural discourse also shapes acceptance (Arifin & Lennerfors, 2022).

## Discussão

From 88 articles analyzed, 56% were published after 2022, indicating recent growth. Political Psychology leads in citations, while Computers in Human Behavior is most prolific. Key authors like Lopatovska and Dizon contribute significantly. Keyword mapping revealed four clusters: (1) human-IVA interaction, trust, privacy; (2) AI and NLP in user experience; (3) opinion mining and predictive models; and (4) social and ethical implications. MCA showed divergence between technical and sociocultural approaches and revealed new trends like "social conformity".

## Conclusão

This review systematically connects sentiment analysis and IVA research using a multimethod bibliometric approach. It highlights the field's evolution, key contributions, and structural gaps, proposing a reconceptualization of IVAs as socio-emotional agents. By mapping the intersection of affective, ethical, and technological dimensions, the study advances theoretical understanding and sets directions for integrated models that go beyond functionalist views of technology adoption.

## Contribuição / Impacto

Theoretical: Expands adoption models by incorporating affective, ethical, and social factors—trust, privacy, anthropomorphism. Bridges Affective Computing and consumer behavior.

Managerial: Informs empathetic design, ethical data practices, and predictive analytics for real-time consumer insight. Enhances strategic use of IVAs in brand engagement, reinforcing their role as emotionally intelligent brand interfaces.

## Referências Bibliográficas

- Chattaraman, V., Kwon, W.-S., Gilbert, J.E. and Ross, K. (2019), "Should AI-Based, conversational digital assistants employ social- or task-oriented interaction style?", *Computers in Human Behavior*, Vol. 90, pp. 315-330.
- De Keyser, A., Köcher, S., Alkire (née Nasr), L., Verbeeck, C. and Kandampully, J. (2019), "Frontline Service Technology infusion: conceptual archetypes and future research directions", *Journal of Service Management*, Vol. 30 No. 1, pp. 156-183.
- Ekman, P. (1992), "An argument for basic emotions", *Cognition and Emotion*, Vol. 6 No. 3-4, pp. 169-200.