

The Impact of Social Media Marketing on Sports Consumer Behavior: A Systematic Review and Big Data Analysis

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Abstract

Background: Digital and social media technologies have transformed sports marketing, enabling real-time, interactive fan engagement on platforms like Instagram, TikTok, Facebook, and X (formerly known as Twitter). These changes have introduced AI, big data, and influencer marketing as key drivers of consumer behavior. **Objectives:** This study investigates how social media marketing influences sports consumer behavior, focusing on AI-powered personalization, influencer impact, and fan-brand interactions. **Methods:** A systematic review of 46 peer-reviewed studies was conducted using PRISMA 2020 guidelines across databases including Web of Science and PubMed. In parallel, big data was collected from social media platforms and analyzed using tools like Textom and VOSviewer, applying text mining, sentiment analysis, and network analysis. **Results:** The most influential keywords were “engagement,” “content,” and “influencer.” Social media fosters brand loyalty through user-generated content and personalized communication. AI enables real-time audience insights and enhances sponsorship effectiveness. Platform-specific effects were noted: Instagram and TikTok excel in brand storytelling, while X facilitates live interaction. **Conclusion:** Social media, when integrated with AI and big data analytics, enhances sports consumer behavior by promoting immersive and personalized engagement. Despite challenges like ROI tracking and content fatigue, leveraging these tools offers significant opportunities for deeper fan connections and sustainable brand growth.

Keywords: social media; sports marketing; consumer behavior; big data; fan engagement

1. Introduction

The global sports industry has experienced significant growth in recent years and is expected to continue expanding. A report from Research and Markets shows that the sports market was worth \$501.43 billion in 2022. It is expected to reach \$707.84 billion by 2026 (1). Technology and digitalization have developed quickly and have greatly changed sports over the past two decades. Fans desire victories and ways to connect and enjoy experiences with their clubs (2). This is why understanding consumer behavior is now of high interest for creating effective and targeted marketing strategies in the digital age (3). Traditional media, including television, radio, and newspapers, created a distinct separation between content producers and their audiences. The content is mainly controlled, produced, and distributed by large corporations, and hence, the audience becomes a passive consumer with little or almost no opportunity to interact with or influence the media they watch (4). This setup made it hard for consumers to join in and give their thoughts on the media scene.

With the help of social media, sports marketing faced a fast revolution by enabling teams, athletes, and brands to interact directly with fans, enhancing their emotional bonds and loyalty (5, 6). Prominent

platforms, including X (formerly known as Twitter), Instagram, TikTok, and Facebook, enable real-time engagement, facilitate personalized content distribution, and support viral campaigns, thereby establishing themselves as indispensable resources within contemporary sports marketing (7, 8). Contemporary sports consumers have transitioned from being passive spectators to active participants in online discussions. They show their engagement by liking stories, giving shares, commenting on their point of view, and directly interacting with the teams and athletes (9). This is the first study to combine a PRISMA-guided systematic review with big data analytics to explore social media's impact on sports consumer behavior, addressing a critical methodological gap in the literature. While recent research such as De Araujo et al. (2024) has explored influencer marketing in sports contexts, they do not integrate dual methodologies, highlighting the novelty of this approach (9). This is why marketers must be well aware of the evolution of consumer behavior and understand these changing aspects within the digital era (10).

The role of social media platforms is to connect all the time and instantly fans with teams, athletes, and other supporters (9). This connection is important, as it can strengthen emotional bonds and raise brand loyalty (7). Unlike traditional media (TV, newspapers), social media permits people to intercommunicate directly, interact immediately, and create their own content. This way, they feel they are part of their team. This shift was the starting point of what has led to a sports culture where fans engage beyond just attending games (11). Using tools like live streaming, fun polls, and catchy marketing campaigns can really boost fans' engagement, which helps strengthen their loyalty to specific teams and brands (12). Empirical studies indicate that organizations that adopt these engagement strategies witness elevated levels of fan retention, increased merchandise sales, and improved sponsorship valuations (8).

Nowadays, athletes have the role of being not just players; they have turned into their brands on social media, enhancing their capacity for sponsorships and endorsements (12, 13). The most trending platforms (X, Instagram, TikTok, and Facebook) let them share behind-the-scenes moments, training routines, and personal stories, helping them connect with their fans more personally. The sense of authenticity is important for building trust. When fans trust athletes, they are more likely to buy products that the athletes endorse (14). Athletes use social media to talk about important social issues, raise awareness about mental health, and promote diversity in sports. They also use it to build their brand identities (15). Recent studies show that social media marketing by athletes boosts fan loyalty and affects consumer choices. This highlights its importance as a new tool in sports marketing (9).

In today's digital world, being a fan means more than just watching sports; it shapes personal and group identities (16, 17). Fans connect in online communities, engage in discussions, and celebrate their teams through shared traditions (6). Social media plays a key role by offering a space for fans to talk, celebrate wins, and share feelings with others with similar interests (6, 18). The main features that increase fans' positive feelings are hashtags, virtual watch parties, digital merchandise, and non-fungible tokens (19). These and the sentiment of belonging to their virtual team's community allow a deeper connection with teams beyond attending live events (14, 20). In order to continue this emotional bond with fans, teams must engage in social media. Ticket sales get a big boost from that, as does merchandise buying. And it makes lasting brand loyalty possible, which is a priority both for sports teams themselves (16).

In sports marketing, big data analytics has become important. For instance, it helps us understand how fans feel about commercials and campaigns. On the one hand, this kind of information is advantageous because traditional surveys or focus group discussions don't give us anything concrete and only a few experts can understand it (6). The other advantage of big data marketing is its ability to break down the audience on the basis of what they are interested in and shop for. It is also easy to appraise success with engagement rates, conversion rates, and audience growth (21).

The most significant benefit of predictive analytics is that it enables teams to understand fields such as ticket sales, possible sponsorships, and content planning (16). On top of all that, artificial intelligence (AI) and machine learning (ML) have changed not just the way fans interact with their favorite athletes and teams but also how they connect with those teams. Using these technologies makes it possible to automate interactions immediately, go great guns on social media, and see what the audience wants much better (17). Despite growing academic interest in social media marketing and sports consumer behavior, there remains a notable research gap in the integration of advanced analytical methods.

Few studies integrate systematic reviews with big data analytics to examine social media's impact on sports consumer behavior, particularly using AI-driven insights. This gap is underscored by recent scholarship such as Cao and Matsuoka (2024), who emphasize the need for advanced methodologies like AI and machine learning in sports marketing research to capture evolving consumer engagement patterns in the digital age (8). Additionally, combining systematic reviews with big data analytics is essential to synthesize existing evidence and uncover real-time trends in sports consumer behavior, especially as digital engagement becomes more dynamic and platform-specific. This dual-method approach is supported by recent studies, such as Mohammadkazemi and Falahat (2024), who advocate for data-driven strategies to deepen fan engagement and inform decision-making in sports marketing (22). In response, this study explores how social media marketing influences sports consumer behavior by integrating evidence from scholarly literature and real-time social media data, with a specific focus on AI, influencer marketing, and platform-driven engagement.

This article examines how sports teams use social media to connect with fans. The first part will focus on the major platforms, such as Instagram, TikTok, X, Facebook, and YouTube, as well as how they interact with their own audience. The second part will examine the results of recent studies related to the impact of social media marketing on consumer behavior in sports. Using AI and big data can make marketing more effective by helping brands understand their audience better. Additionally, it is important to understand how influencer marketing and athlete branding affect consumer behavior. The purpose is to analyze and identify rising trends and future tendencies in social media marketing specifically tailored for the sports industry.

2. Materials and methods

2.1. Protocol and registration

This systematic review followed the PRISMA 2020 guidelines to ensure transparency, reproducibility, and methodological rigor. However, no protocol was registered in a public database prior to the review. This was due to the evolving and hybrid nature of the study, which uniquely combines a systematic literature review with big data analytics—an approach not easily accommodated by conventional protocol registries. However, the review process, including the search strategy, eligibility criteria, methods for data extraction, and analytical procedures, was defined in advance and consistently applied by the research team to reduce bias and ensure methodological uniformity.

2.2. Literature search strategy

This assessment includes a systematic review that follows the PRISMA 2020 guidelines (Figure 1). The search process yielded a total of 42 eligible peer-reviewed studies that met inclusion criteria based on the PICOS framework. These guidelines help make systematic reviews clear and reliable (improving transparency, applied methods, and reliability). The study organizes and evaluates data thoroughly using this framework. The review incorporates the latest suggestions from Page et al. (2021), which aim to make systematic reviews clearer and easier to replicate (23). These updates help ensure consistent reporting, making assessing research findings simpler for the scientific community.

2.2.1. Eligibility Criteria

The inclusion criteria for this systematic review were established using the PICOS framework to ensure methodological rigor and relevance. Studies were selected if they explored the interactions of sports fans or consumers with digital platforms, particularly those employing

social media marketing strategies such as influencer collaborations, AI-driven personalization, or interactive content. Eligible studies were required to provide insights into fan engagement, brand loyalty, consumer behavior, or purchase intentions. A total of 325 records were initially identified through database searches. Comparisons with traditional marketing approaches or minimal digital engagement were included where relevant. Only empirical studies and systematic reviews published in English-language, peer-reviewed journals were considered. Studies that did not address the intersection of social media, marketing, and sports consumer behavior or that lacked a clear methodological foundation were excluded from the analysis. After duplicate removal and screening, 46 peer-reviewed studies met the inclusion criteria and were included in the final synthesis.

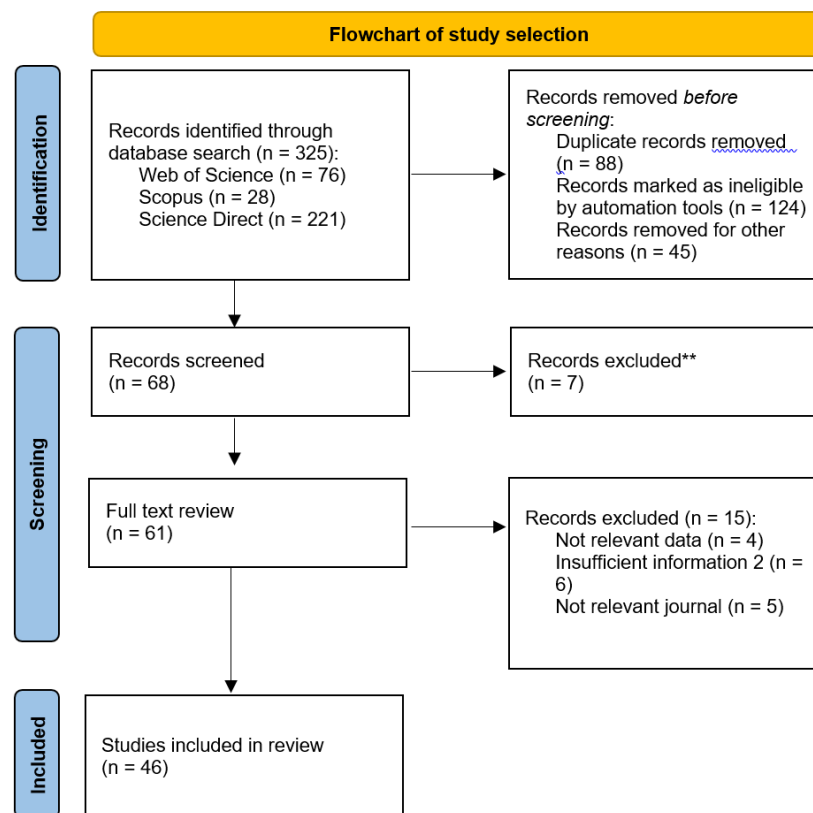


Figure 1. PRISMA flow diagram showing how studies were selected for the systematic review

2.1.2. Study selection

We thoroughly searched for relevant studies published up to March 1, 2025. The database search included Web of Science, PubMed, and Science Direct to gather various scholarly articles (23). The following search terms were used in the databases: "social media," "marketing," "sports," and "consumer behavior" to find the most suitable studies. This method allowed us to cover the important topics of social media, marketing strategies, sports engagement, and consumer behavior effectively.

A keyword co-occurrence network was generated using the Web of Science database (accessed on March 1, 2025) and developed using VOSviewer (Version 1.6.20). A ten-year

publication filter was applied, allowing for the identification of key research themes, interconnections, and dominant topics within the literature. The keyword co-occurrence network highlights the relationships between core concepts in social media marketing and sports consumer behavior research. The clusters depicted in the network represent distinct thematic areas, with each color-coded cluster indicating a specialized research domain.

2.1.3. Methodological quality assessment

A methodological quality assessment was conducted to ensure the included studies' reliability and validity. Using a set of established criteria tailored to the study design, two reviewers independently evaluated each selected study's quality. For empirical research articles, assessment focused on clarity of research objectives, methodological transparency, sample representativeness, data collection techniques, and the appropriateness of the analytical methods used. For systematic reviews, criteria included the comprehensiveness of the search strategy, inclusion/exclusion criteria, synthesis methods, and bias risk assessment.

Disagreements between reviewers were resolved through discussion and consensus. Studies rated as having low methodological quality, such as lacking clear outcome measures or failing to describe analytical procedures, were excluded from the final synthesis. This assessment process ensured that only studies with sufficient rigor and relevance were included in the final analysis, enhancing the credibility of the findings and conclusions drawn from this review.

2.1.4. Data extraction

Two independent researchers carried out the systematic review. The first step involved screening the titles and abstracts of articles to check their relevance. Studies that met our preliminary criteria moved on to the second step, a full-text review. In this stage, we carefully assessed each article for eligibility. Any disagreements between reviewers were resolved through discussion and consensus. To enhance the review's robustness, only English-language publications were considered. Additionally, reference lists of selected randomized controlled trials (RCTs) and other relevant studies were manually examined to identify additional articles that met the inclusion criteria.

2.2. Social media data collection

We used Textom, a Big Data processing tool, to collect and analyze large volumes of unstructured social media data (24). The selected keywords—"social media," "marketing," "sports," and "consumer behavior"—were used to extract data from Google, Facebook, YouTube, X, blogs, news articles, and web documents in the last three years specifically from March 1, 2022, to March 1, 2025.

Social media big data analytics can be categorized into two primary areas: text analysis and network analysis. Text analysis employs a variety of techniques, including text mining, which extracts valuable insights from extensive text datasets; sentiment analysis, which assesses public sentiments and opinions; topic modeling, which uncovers themes within the text; trend analysis, which monitors significant shifts over time; content analysis, which scrutinizes the context and meaning of the data; named entity recognition, which identifies and classifies key elements; and text classification, which organizes text into specific categories. This is how network analysis looks closely at connections. The methods include social

network analysis (studying user relationships), semantic network analysis (examining meanings of linked terms), text network analysis (mapping text relationships), topic network analysis (exploring connections between subjects), and time series analysis (showing data trend changes over time) (24, 25). These methods help us understand digital interactions and emerging trends. We used degree centrality analysis to study the relationships among key areas like "social media," "marketing," "sports," and "consumer behavior." This technique highlights how strongly these terms are connected in the digital space.

3. Results

3.1. Results of keyword mining

Table 1 summarizes the results of our semantic network analysis on 48 keywords, and Figure 2 shows their interconnections visually. It can be seen that the top 5 most frequently associated words with our keywords were "engagement" (6841), "content" (5352), "influencer" (4889), "audience" (3843), and strategy "3691).

Table 1. Results of word frequency from the semantic network analysis of the most prominent keywords

Rank	Word	Frequency	Rank	Word	Frequency
1	engagement	6841	25	social proof	348
2	content	5352	26	e-commerce	346
3	influencer	4889	27	hashtag	343
4	audience	3843	28	live streaming	289
5	strategy	3691	29	storytelling	265
6	platform	3329	30	lead generation	258
7	analytics	2517	31	customer journey	255
8	campaign	2266	32	brand awareness	240
9	metrics	2092	33	monetization	227
10	conversion	1812	34	cross-promotion	201
11	branding	1520	35	affiliate marketing	197
	advertising			community	195
12		1398	36	building	
	reach			audience	190
13		1245	37	engagement	
14	followers	1167	38	click-through rate	184
15	trends	1025	39	conversion funnel	182
16	promotion	992	40	retention rate	181
	sponsorship			ai-driven	167
17		861	41	marketing	
	customer			predictive	164
18		680	42	analytics	
19	virality	553	43	advocacy	158
20	interaction	484	44	customer loyalty	149
21	demographics	477	45	feedback	133
22	segmentation	464	46	market research	128
	personalization			multichannel	122
23		462	47	marketing	
	behavioral			user-generated	118
24	targeting	461	48	content	

In Figure 2 it is highlighted the keyword analysis with additional notable terms such as "marketing," "engagement," "analytics," and "customer," which are quite relevant to the changing world of sports consumer behavior.



Figure 2. Word cloud of the word frequency from table 1

3.2. Findings from the systematic analysis

Figure 3 shows the network structure with a visual representation generated by VOSviewer, where we can see different themed groups. These groups are well defined and also almost equal. The green group focuses on consumer engagement, marketing strategies, and buying behavior, utilizing key terms such as participant, marketer, purchase intention, data, and model. It also highlights the influence of social media marketing on consumer decision-making. On the other hand, the blue group focuses especially on brand perception and fan preservation, with key terms such as survey, social media, influence, marketing, and behavior. This section highlights why is social media so important recently in shaping brand image and also has a direct effect on the success stories in marketing. Meanwhile, the red cluster is more based on research related to data analysis, research methodologies, and content-driven marketing strategies, with a special highlight on the growing significance of data-driven insights in marketing approaches. This network shows effectively how the research scene is changing, highlighting new trends, popular topics, and the connections between ideas in sports consumer behavior and social media marketing. Based on this visualisation it can be seen how important social media marketing has become in understanding how sports consumers behave. It shows some key trends, new areas to explore, and how the academic conversation around this topic is changing. The network structure in Figure 2 indicates that the article breaks down into sections that match the main themes seen in the keyword co-occurrence network.

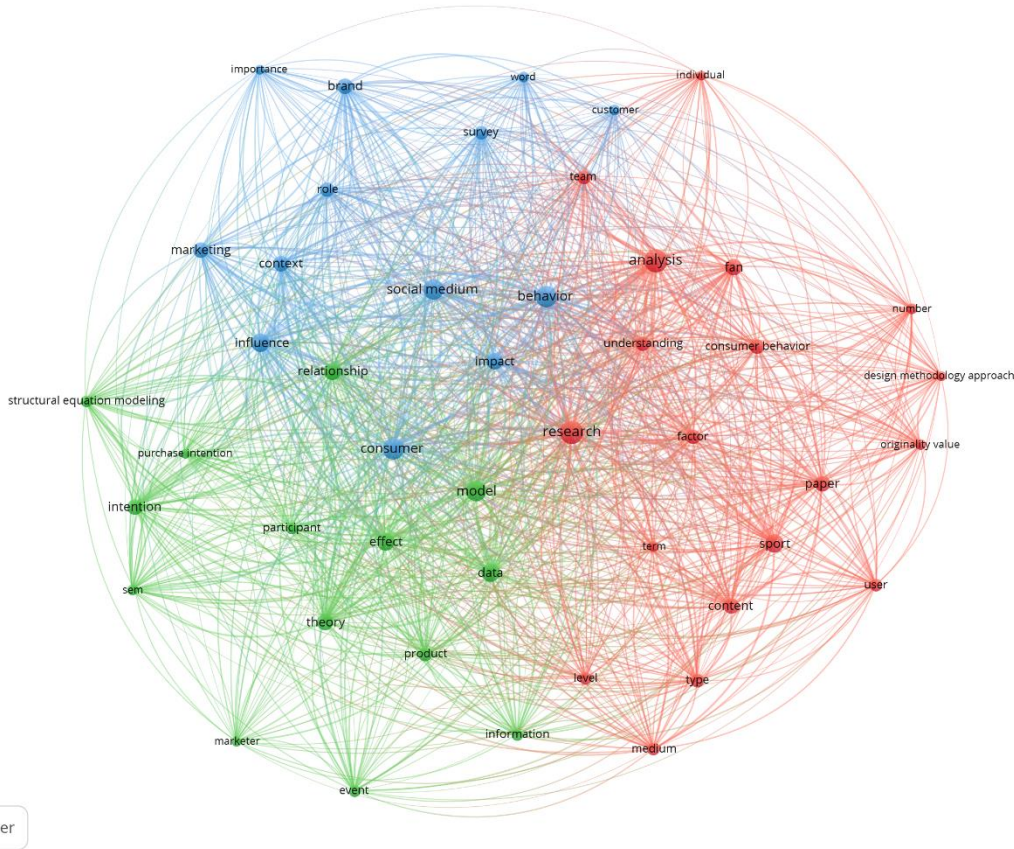


Figure 3. Keywords co-occurrence network related to "social media" AND "marketing" AND "sports" AND "consumer behavior"

Table 2 provides a broad introduction to how social media platforms let consumer engagement and brand perception influence through interaction types that vary in form. The specific methods in which each platform uses engagement vary; appealing requests include likes, shares, comments, and live videos. Major approaches deployed, such as engagement rates, sentiment analysis, watching time, etc, can be measured and assessed. These interactions have a significant impact on consumer behavior. They promote brand loyalty and help people participate in a community environment. They increase any trend-driven interaction. Based on the findings of this paper, corporations can refine their social media strategies further. In this way, they can extend their reach and enhance their influence.

Table 2. Results of social media interaction types and influence analysis

Social Media Platform	Interaction Type	Key Metrics for Influence Analysis	Statistical Context	Impact on Consumer Behavior
Instagram	Likes, Comments, Shares, Stories, Reels	Engagement Rate, Reach, Impressions	Average engagement rate: 1.5%–3% (sports brands)	Increases fan connection, drives brand loyalty through visuals and stories
Twitter/X	Tweets, Retweets, Hashtags, Mentions	Virality Index, Sentiment Analysis, Trend Tracking	Sentiment score: -1 (negative) to +1 (positive); average	Real-time engagement, direct interaction with fans, amplifies news

			sports sentiment \approx 0.3	
Facebook	Posts, Live Streams, Groups, Reactions	Follower Growth, Conversion Rate, Community Sentiment	Conversion rates range: 2%–4%; Group interaction boosts loyalty	Builds communities, enhances brand storytelling
TikTok	Short Videos, Duets, Challenges	Watch Time, Shares, Follower Retention	Average video completion rate: 15–25 seconds; challenges boost shares by 60%+	Drives trend-based engagement, boosts brand recall
YouTube	Long-form Videos, Live Streams, Shorts	Watch Hours, Subscription Growth, Click-Through Rate (CTR)	Avg. CTR: 2%–5%; High watch time correlates with content loyalty	Provides in-depth storytelling, high engagement for tutorials, match highlights

Digital technologies are providing sports marketers, brands, and industry stakeholders with new avenues to establish connections with fans. The vast amount of data generated on different digital platforms allows organizations to examine fan behavior, emotions, and habits in a non-invasive way (26). This enables them to develop more effective sponsorship strategies, expand their fan base, and enhance their online communities. This, in turn, can increase sales for sports organizations and associated brands (27). Figure 4 presents the publication trend from 2006 to 2025, illustrating the increasing academic interest in the field. The relevant studies have shown a steady upward trajectory, with a marked increase after 2015. The trendline equation ($y = 1.1152x - 1.8015$, $R^2 = 0.5656$) indicates a positive correlation between publication year and study count, suggesting sustained research interest and expansion of the field.

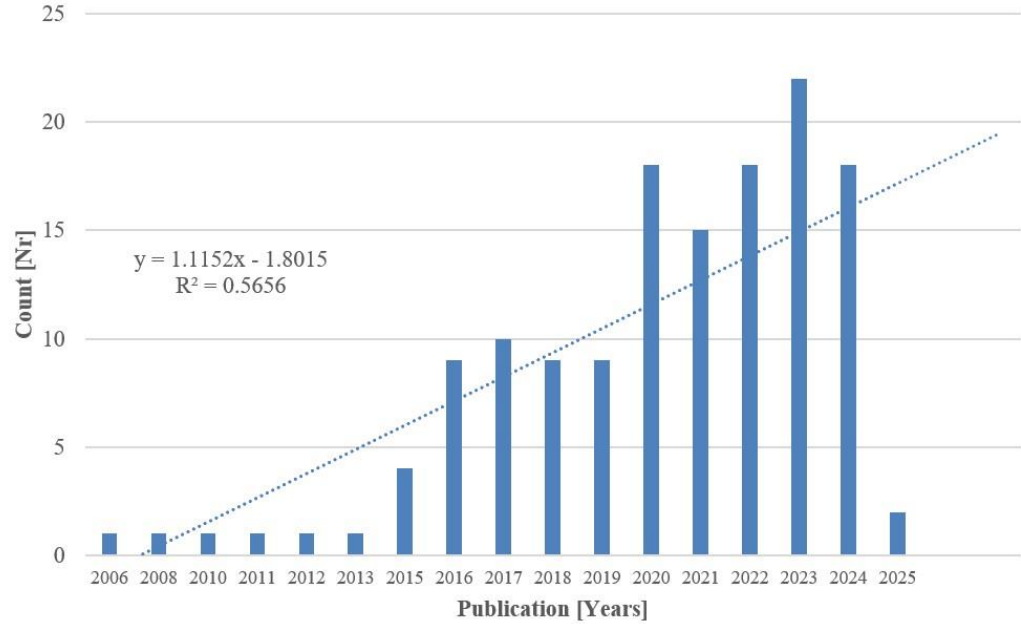


Figure 4. Publication trends from 2006 to 2025 related to "social media", "marketing", "sports", and "consumer behavior"

Data were limited to research relating to the role of social media in sports marketing, focusing on the year with the highest output, which was 2023, indicating heightened academic interest in how social media influences sports marketing and the manner in which consumers engage with these platforms. The slight dip in 2024 could reflect a saturation of these foundational studies, as future research will presumably move toward initiatives like advanced analytical models, AI-driven marketing, and personalized consumer engagement strategies. It is highly important in sports branding that influencer marketing is booming. Now, athletes, fitness influencers, and social media stars are setting the tone for how people view brands and what they choose to purchase. Besides, the research shows that consumers are more likely to buy if they view the influencer as reliable and genuine and if the influencer fits right with the brand (28). Even more, in the modern digital marketing era, people get up every day to see which idyll an "influencer" will be creating (29). Recently, much controversy has been around how good influencer advertising is and for what result (30). Where do different influences or effects show up? On different groups. Influencer action is particularly sensitive to culture, proving the necessity of developing localized influencer strategies (31). This is also consistent with earlier works which show that trust in the influencer is situated, and therefore shapes the perception of brands and willingness to buy (5).

4. Discussions

Artificial intelligence (AI)-powered sponsorship analytics enable precise predictions of return on investment (ROI), audience retention rate, and brand recall rate, paving the way for sponsors to optimize their activation plans, including audience targeting (27). The manuscript mainly focuses on degree centrality analysis, which can help us explore the connections between keywords collected from social media networks (24). Degree-centrality analysis can be used to see how a keyword is connected within the network to other terms. According to Palomba (2022), keywords with higher centrality are more influential points (32). They act as nodes in the network's structural fabric.

Social media marketing are one of the main factors that changed how sports fans behave and interact with their favorite teams, athletes, and brands. Leading social networks like Instagram, X, and TikTok are now key elements in connecting fans with their idols, sharing brand stories, and bringing sponsorships to life (3). Recent studies show that connecting meaningfully with fans on social media is important for building brand loyalty, creating team pride, and affecting shopping habits. This is especially true for younger people, who often look to social media for inspiration and a sense of community (22). Sports organizations and marketing teams should leverage platform-specific tools to deepen fan engagement. For example, Instagram Reels and TikTok challenges can be used to encourage user-generated content (UGC), while YouTube Shorts provide space for behind-the-scenes brand storytelling. Influencer-led campaigns should be adapted to each platform's culture and audience behavior—for instance, using X for real-time interactions during live events or Facebook Groups for community-building among loyal fanbases.

Digital platforms have transformed the way fans discuss sports. Nowadays, fans have a role not only in watching the content of brands, they are also one of the key elements in shaping these messages. This transition from simply consuming the content to actively participate in them is a great change in marketing strategy. Fans are now able to share their thoughts and experiences right away, instead of just reacting to old-school ads as before (33). This is how the user-generated content (UGC) term appeared that had a great role in this change, making sports brands feel more real and trustworthy. This aspect has managed to create a sense of community between fans, by letting them take part in marketing and deepen their connection to the brands and teams they love (34). This way, the brands are able to use fan photos, videos and fan testimonials, which helps them build trust and reach more people. Additionally this consistent engagement with fans through social media maintains the brands connection with them and enhances loyalty over time (35). As supporters scroll through their social media feeds, looking for the latest

updates, interactive chats, and interesting content, they begin to cultivate a sense of community and belonging with the brands, they support. This phenomenon is called the gratification theory, as outlined in a recent study by Ahiabor *et al*, 2023 (2). This continuous exchange not only enhances fan loyalty but also ignites discussions that can impact marketing tactics and consumer decisions. This ongoing interaction not only strengthens fan loyalty but also encourages conversations that can influence marketing strategies and purchasing decisions (36).

Over-The-Top (OTT) platforms have really changed how fans experience sports media, moving away from traditional broadcasting to on-demand, interactive, and AI-driven content (27, 37). As OTT services are able to offer custom-made sports content, live-streaming experiences, and real-time fan engagement, they enhance this way brand visibility and builds a stronger connection with audiences (27). Based on studies like Palomba *et al*, 2022 they show that these services not only make fans more loyal but also improve engagement when they're united with AI analytics and targeted ads (32). Through customizing content based on what individual fans want, a real benefit is made to the sports organizations, which is a key element in building brand equity (8). To influence consumer behavior and make them more and more loyal big data analytics, sentiment examination, trend forecasting and predictive modelling are all very important. Plus, AI-driven marketing strategies help improve engagement and audience targeting in real time, which boosts conversion rates and keeps fans coming back (16).

Current studies show that using algorithms for content recommendations and more personalized sport content is able to maintain and also bring closer fans (18, 37). Companies are using AI more and more as time goes by, which has changed the game for esports sponsorships and encourages fans to return to have more. This method creates tailored experiences that resonate better with fans (30). It highpoints how sports, technology, and digital collaboration are coming together. Innovative ideas are changing how athletes and fans connect. With the increasing use of wearable technology, mobile applications, and augmented reality by teams and athletes fans are able to be constantly in access with them, with their performance data, and exciting experiences (38). As more athletes and teams start using wearable tech, augmented reality, and mobile apps, fans get access to real-time stats, performance data, and immersive experiences like never before (2). These are the ways that fans are able to be connected to the games they love and appreciate (39). This intermingling of technology makes watching sports more exciting and real. Additionally this is one of the aspects that brings a change in how training and performance analysis is done. It is able to alert how fans appreciate sports and how professionals evaluate performance in today's digital world (40). Additionally, with the increasing reliance on AI and big data, it is critical to adopt GDPR-compliant data practices, including transparent data consent, anonymization protocols, and opt-out mechanisms. These measures ensure ethical personalization and protect user trust in a privacy-sensitive digital environment.

One of the main aspects that manages to keep people engaged and also assissting brands to expand is by utilizing social media marketing, by collaborating with influencers and by truly understanding consumer data (7). Even though using social media marketing is very beneficial momentarily this rapid transformation may also be short lived and come to the end, so it is very important to think on a longer term. This is why, to maintain people engaged, preserve their loyalty, and trust is should be constantly monitored (41). Understanding the long-term impact of celebrity endorsers and brand image helps brands improve social media strategies and marketing. Sports brands must use social media insights and consumer data to stay competitive in a changing digital landscape (42).

Throughout the evolution of digital media, social networking platforms, including Instagram, Facebook, X, and TikTok, have changed the media landscape in a new way by providing direct content distribution that goes through none of the conventional broadcast intermediaries (43). Such platforms provide access to an array of content that users can consume at their convenience from separate locations across the globe. Of course, they are not new either, as they provide content recommendations to users

explicitly tailored to their tastes, improving user experience while targeting engagement. With the power to provide real-time updates, interactive features, and trends that can go viral, they have changed the way audiences consume and engage with digital content, leading to substantial growth in the industry. Their real-time updates, interactive characteristics, and viral trends have significantly transformed how people engage with digital content and drive industry growth (44).

The rise of social media influencers has made them indispensable elements of firms' marketing communications, driving perceptions and behavior by supplying information about products and services to their expansive audiences. The field is of growing academic interest as it has already generated a significant amount of research on the determinants of their effectiveness, such as follower count (41), credibility, attractiveness (45), self-disclosure (46), brand compatibility (21), and parasocial relationships (47).

As with Big Data analytics, AI-driven marketing is revolutionizing sports marketing, offering unprecedented insights into consumer behavior, predictive customer analytics, and connecting consumers with targeted offers and partners in real time. Influencer marketing affects individuals based on their beliefs and backgrounds (15). Honing in on these joint decisions to engage in influencer-consumer relationships is of utmost importance as cultural values (28) are central in defining how consumers relate to influencers, thus making it imperative for brands to localize their strategies. Sponsorship activation effectiveness is further improved by AI-powered predictive analytics, ensuring that brands adjust how they engage with the audience and negotiate sponsorships and deliver them as content in the future, based on the trend (48). AI's transformative edge in large-scale processing of unstructured data, such as tweets, comments, and video engagements, allows brands to quickly identify fluctuations in consumer preferences and optimize sponsorship spend (5).

Gone are the days when a simple logo on a jersey sufficed. Sports sponsorships have evolved into interactive experiences powered by artificial intelligence (49). While traditional sponsorships might stick to showing logo placements, the future of sponsorships looks more like gamified ads, AR, and content that customizes and updates in real-time based on fan interaction (48). This trend is exemplified by integrating AI-driven programmatic advertising, where branded content can be optimized in real-time for maximum impact (28). This has particularly gripped esports, with a demand for hyper-personalized brand activations and real-time digital touchpoints that integrate AI-driven sponsorship innovations (30). AI tools, including chatbot integration, behavioral tracking, and brand in-game customization, seamlessly weave sponsorship into user experience, enhancing brand affinity. However, new challenges brought by ambush marketing tactics inspire some official sponsors to employ AI-powered and blockchain protections to defend against ambush marketing and uphold notions of exclusivity and brand integrity (27). As sports brands embrace AI-driven marketing and sponsorship innovations, their success will depend on how well they personalize content, anticipate fan behavior, and refine engagement strategies (4). In the digital sports world, staying competitive means keeping fans engaged and loyal (13).

It is one of the primary elements and plays a key role in building strong fan relationships and fostering audience interest (50). Recent research highlights the significance of team loyalty and social influence on consumer behavior; thus, it becomes pivotal for brands to adopt finely tuned engagement and interaction (40). Conversely, negative discussions in online anti-fan communities can damage a brand's reputation, compromise sponsorship agreements, and negatively impact the brand's overall image. Crisis management strategies are important for brands (34), enabling a reduction in negative sentiment/actions from consumers that could impact a brand's image. Moreover, sentiments expressed by fans on social media demonstrate that consumer sentiment toward brands generally varies with team success, sponsorship effectiveness, and brand fit into their community (28). However, such opportunities have added an ever-evolving list of new digital sports sponsorships, which are seen through AI-driven personalization, interactive marketing, and esports partnerships to drive engagement and build brand equity (27).

Team loyalty, brand affinity, and interactive sponsorship activations increase fan engagement and de facto sponsorship ROI, so digital sponsorships have become one of the key tactics in any marketer's modern sports marketing strategy (48). For instance, sentiment tracking and predictive analytics have emerged as staples to assess sponsorship effectiveness, enabling brands to refine marketing plans according to real-time audience response (5). The interplay between social media marketing strategies, AI-based consumer insights, influencer partnerships, and esports sponsorship is essential for long-term brand growth and consumer loyalty. Brands that adopt real-time engagement strategies and AI-driven personalization achieve higher audience retention, brand advocacy, and competitive market positioning (22). Influencers, sponsoring esports events, and activating data-driven sponsorships that maintain customer loyalty and develop brand equity in the increasingly digitalized sports world have proven successful methods (18).

4.1. Future Trends and Technological Advancements in Sports Marketing

As sports marketing evolves, the brands leading the industry in fan engagement and commercial success in the digital sports era will best adopt AI-driven insights, digital interactivity, and emerging technologies while responsively addressing privacy concerns, barriers to adoption, and ethical challenges.

There is no data, and your staff does not even have sufficient statistical expertise to begin analyzing the numbers. AI has bridged information gaps by analyzing large datasets that are millions of lines long. It also helps us frame better marketing strategy optimizations: What could be more important than getting that right? The evolution of sports marketing in the coming era will be driven by AI, automation, and persuasive interfaces that create a digital enchantment around you, as well as technologies like blockchain, allowing brands to connect more authentically and personally with fans. AI can track consumer behavior in real-time, resulting in hyper-personalized content delivery and sponsorship activations through predictive analytics and machine learning (37). Immersive experiences will eventually even include fan activity related to team games. Events with augmented reality and virtual reality technologies are well suited for this kind of expression, such as creating a virtual stadium or interactive brand activations (30).

Esports and gamification are expected to grow, leveraging AI-driven engagement, in-game sponsorships, and blockchain-based fan rewards, while establishing new revenue and loyalty programs (28). Social commerce with AI-driven chatbots and automation will improve ticketing, merchandising, and real-time fan assistance, making it easier for consumers to interact with teams and brands (27). But technology doesn't come without its restrictions. The increased use of artificial intelligence and machine learning brings concerns around data privacy, security, and ethical issues in digital marketing (5). Despite the promise of blockchain and NFT-based models of fan engagement, much about them remains unclear; they are both evolutionary and still figuring out how to be adopted, regulated, and mitigate significant volatility (37). Another limitation is that despite AR and VR technologies providing immersive experiences, the high development costs and the need for specific hardware may mean that it is unlikely to become mainstream or mass-market in the near term (30). While immersive technologies like AR/VR and influencer strategies present exciting opportunities, they also raise concerns around data privacy and user consent. As AI tools personalize fan experiences through behavioral tracking, ensuring compliance with data protection regulations such as GDPR is essential. This includes disclosing data use practices and providing fans with control over their digital footprint. Moreover, fan engagement strategies should be designed with platform-specific mechanisms. For example, Instagram Reels can drive UGC through branded challenges, while TikTok's duet feature supports participatory content formats. Tailoring content delivery to each platform not only increases effectiveness but also aligns better with user expectations and regulatory constraints.

While this study highlights the potential of AI in personalizing sports marketing, it is equally important to consider its limitations. AI algorithms are often trained on historical or biased datasets, which can reinforce existing inequalities or misrepresent certain fan segments. For example, overrepresentation of high-engagement users may skew personalization, leading to echo chambers or exclusion of casual fans. Furthermore, the opacity of algorithmic decision-making (black-box models) raises ethical concerns about transparency and fairness in content delivery. These limitations underscore the need for human oversight,

ethical auditing, and diverse data inputs when deploying AI in sports marketing. Additionally, numerous studies support the effectiveness of influencer marketing in driving engagement and brand loyalty, evidence also suggests variability based on cultural and demographic factors. For example, research by Kikumori *et al.* (2025) shows that influencer credibility and purchase intent differ significantly across countries like Japan, the UK, and Singapore, highlighting that trust is culturally situated (31). Similarly, follower count alone may not translate into perceived authenticity, as over-commercialization can reduce relatability, particularly among Gen Z audiences who value transparency. These inconsistencies suggest that influencer marketing strategies must be culturally localized and audience-specific rather than universally applied.

4.2. Challenges and Opportunities in Social Media Sports Marketing

The evolution of sports marketing and social media, AI, and Big Data analytics is proceeding at an incredible rate but brings to the table challenges and opportunities for brands in terms of fan engagement, sponsorship effectiveness, and consumer loyalty, which must be addressed. Although digital has opened up new levels of replication, interaction, and reach to the consumer, it brings its complexities, from detailed measurement to privacy and platform dependency, which means sports and entertainment organizations must constantly review how they interact in the space. The most significant challenge is determining the direct effect of a social influencer marketing campaign on consumer behavior and brand performance. Although AI-powered analytics can measure engagement metrics, sentiment analysis, and conversion rates, the causal link between digital campaigns and financial returns is still hard to determine (28). Most brands have challenges quantifying the effectiveness of influencer partnerships, content virality, and real-time fan engagement since digitally informed consumer decisions are made through myriad touchpoints and across platforms (48). Also, the intangibility of brand loyalty and emotional connections in sports marketing can make it difficult to link increased revenue to social media activations (27).

The regulatory landscape around data privacy, algorithmic changes, and audience saturation is another major challenge. As concerns for consumer data protection increase, social media platforms are tightening privacy policies, restricting brands from detailed consumer insights collection for targeted marketing (5). Platforms like Facebook, Instagram, and X use algorithms that determine organic reach and engagement, which challenge brands to maintain audience interactions without paid promotions (33). In addition, digital fatigue and content oversaturation are risks as audiences are bombarded with marketing messages, influencer endorsements, and branded content, which may lead to disengagement (30).

These challenges do not erase the significant opportunities for brands to rely on AI, machine learning, and personalized marketing strategies to stimulate consumer engagement and activation of sponsorship. For example, tools operated by AI can be used to monitor the "temperament" of fans in real time, predict how content will go viral, and tailor experiences to each viewer's taste (37). Meanwhile, machine learning models nowadays allow brands to re-optimize ad targeting, split up audiences on ever deeper levels of detail, and thus serve content that is dynamic and hyper-personalized in order to maximize user engagement (18). With predictive analytics in place as part of a marketing strategy, generated data lets companies watch consumer preferences and adjust their appeals accordingly (27).

New digital platforms might also be regarded as new sports industry disciplines shaping how people consume sports content. Twitch, TikTok, and the Metaverse are reinventing how fans watch sports—bringing about real-time engagement possibilities for followers, including virtual sponsorship activations with brands and gamified brand experiences (28). Esports, in turn, is the new heir to digital sponsorship models: brands can meld into interactive gaming environment settings, live-stream activations, and AI-led fan experiences (30). Moreover, it is possible that blockchain technology will bring this one step further: secure fan transactions, examples of NFT-based sports mementos, plus tokenized loyalty programs serving consumer habits while eventually bringing about brand loyalty (5). In conclusion, the task is to pry apart

these NIMBL people, switching points for social media sports marketing. In order to conquer these demons, brands need a branding approach based upon data and customer-centricity. In utilizing such capabilities, fans will become engaged, sponsors will find new value, and insight into analytics will grow also among staff members from firms operating in a digitized world.

Applicable remarks

- Sports organizations and marketing teams should use AI-driven personalization tools to create tailored content that boosts fan engagement and loyalty.
- Develop influencer and athlete-led campaigns that prioritize authenticity and transparency to build trust and connection with younger audiences.
- Encourage user-generated content (UGC) through interactive challenges and fan stories to foster community around sports brands.
- Incorporate immersive technologies, such as AR and VR, into fan engagement strategies to create memorable interactions.
- Maintain a balanced social media content approach to prevent fatigue while ensuring consistent communication.

Conclusion

This study highlights how social media marketing, when strategically combined with big data analytics and guided by AI technologies, enhances sports consumer behavior by enabling real-time, personalized, and immersive fan engagement. Through the integration of a PRISMA-guided systematic review and big data analysis, the research identified consistent themes across the literature and digital ecosystems, including the importance of influencer authenticity, content-driven engagement, and platform-specific strategies.

The findings demonstrate that visual platforms, such as Instagram, TikTok, and YouTube, are particularly effective for brand storytelling and emotional connection. At the same time, X excels in real-time interaction and community dialogue. AI-supported tools and big data techniques offer valuable insights into fan sentiment, content performance, and behavioral trends, enabling brands to tailor their strategies with greater precision. Moreover, the study reveals that influencer marketing and athlete branding are significant drivers of consumer loyalty and purchasing decisions, especially among younger, digitally native audiences. However, challenges remain in measuring ROI, maintaining content relevance, and adapting to evolving platform algorithms and privacy standards.

Overall, this dual-method approach not only fills a gap in the current literature but also provides a practical framework for sports marketers aiming to build stronger fan relationships and optimize digital strategies. Future research should further explore the long-term effects of AI-driven personalization and the ethical implications of data-intensive marketing practices in sports.

CONFLICT OF INTEREST

The authors reported no potential conflict of interest.

FINANCIAL DISCLOSURE

The authors declare that they have no financial interests or relationships that could influence the content or outcomes of this study. No financial conflicts of interest are associated with this research.

ETHICAL CONSIDERATION

No ethical approval was required for this narrative review as it involved synthesizing previously published data from peer-reviewed studies. All sources were properly cited to acknowledge original authorship.

ROLE OF THE SPONSOR

The sponsor had no role in the study design, data collection, data analysis, interpretation of results, manuscript preparation, or decision to submit the article for publication.

ARTIFICIAL INTELLIGENCE (AI) USE

Artificial intelligence tools were not utilized in this manuscript's conceptualization, data analysis, or writing, except for general-purpose language models used for proofreading or editing assistance, where applicable.

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