





PAPER

Interactive Mobile Technologies for Consumer Behavior Management: Insights from Digital Marketing Applications

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ABSTRACT

The rapid proliferation of mobile technologies has transformed digital marketing, yet fragmented evidence limits understanding of how interactive mobile tools shape consumer behavior. Existing studies often isolate technologies such as push notifications, geo-fencing, chatbots, and AR/VR without addressing their synergistic effects, leaving a theoretical and practical gap in consumer behavior management. This study aimed to systematically examine how interactive mobile technologies influence consumer engagement, decision-making, and brand loyalty, while developing an integrative framework to guide mobile-first marketing strategies. A systematic literature review was conducted following PRISMA guidelines, drawing on 125 peer-reviewed articles published between 2015 and 2025. Structural topic modeling (STM) was employed to identify thematic patterns and trace the evolution of research trends across journals and time periods. The analysis revealed five dominant themes: 1) AR/VR and immersive mobile technologies, 2) chatbots and AI interactions, 3) gamification and interactive engagement, 4) consumer behavior and decision-making, and 5) brand loyalty and customer engagement. Findings show that mobile-specific features—personalization, adaptability, and real-time measurement—act as powerful behavioral drivers, enabling tailored interventions and sustained consumer relationships. However, challenges emerged around privacy, consumer fatigue, and ethical use of behavioral data. This study contributes by consolidating fragmented research into a structured framework that explains how mobile technologies operate as behavioral intervention systems. The results provide theoretical insights into mobile consumer behavior models and practical guidance for marketers deploying mobile-first strategies. Future research should extend toward longitudinal, cross-cultural, and hybrid-technology designs to capture sustained and synergistic effects.

KEYWORDS

interactive mobile technologies, consumer behavior management, digital marketing, personalization, AR/VR, structural topic modeling

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1 INTRODUCTION

The proliferation of mobile technologies has fundamentally transformed the landscape of digital marketing and consumer behavior management, creating unprecedented opportunities for brands to engage with consumers through interactive, location-aware, and personalized touchpoints [1]. The global mobile ecosystem now encompasses over 7.5 billion smartphone users [2], with mobile applications becoming the dominant interface through which consumers interact with brands, conduct transactions, and make purchasing decisions. This technological revolution has shifted marketing paradigms from traditional broadcast models toward sophisticated, data-driven approaches that leverage real-time consumer insights and contextual intelligence to influence behavior at critical decision-making moments [3].

Contemporary digital marketing strategies increasingly rely on interactive mobile technologies to create immersive consumer experiences that transcend conventional advertising boundaries. Push notifications, geo-fencing systems, augmented reality interfaces, chatbot interactions, and mobile payment solutions have emerged as core components of modern marketing arsenals [4, 5]. These technologies enable marketers to deliver personalized content, facilitate seamless transactions, and maintain continuous engagement with consumers across multiple touchpoints in their daily lives [6]. The integration of artificial intelligence and machine learning capabilities has further enhanced the sophistication of these systems, enabling predictive personalization and adaptive content delivery that responds dynamically to individual consumer preferences and behavioral patterns [7, 8].

Research has demonstrated significant positive correlations between mobile technology adoption and key marketing outcomes, including customer engagement, brand loyalty, and purchase intention [9]. *Driving Mobile App User Engagement Through Gamification* studies reveal that gamified mobile applications can increase consumer engagement by up to 45% while simultaneously improving brand loyalty metrics [10]. Similarly, investigations into augmented reality marketing applications show that AR-enabled mobile experiences generate 36% higher purchase intentions compared to traditional marketing interfaces [11]. Location-based marketing technologies have proven particularly effective, with geo-fencing strategies demonstrating the ability to influence consumer behavior through spatially aware content delivery that aligns with immediate contextual needs [12].

Despite these technological advances and demonstrated marketing effectiveness, significant gaps remain in the theoretical understanding of how interactive mobile technologies systematically influence consumer behavior management processes. Current research approaches tend to examine individual technologies in isolation, failing to account for the synergistic effects that emerge when multiple interactive systems are deployed simultaneously within integrated marketing frameworks [13]. Furthermore, while numerous studies document the efficacy of specific mobile marketing tactics, there is limited empirical evidence regarding the optimal combination and sequencing of interactive technologies to achieve desired behavioral outcomes across diverse consumer segments and purchase contexts [14].

The mobile-specific features that differentiate these technologies from traditional digital marketing channels—including ubiquity, personalization capabilities, real-time contextual awareness, and seamless transaction facilitation—require dedicated theoretical frameworks that can account for their unique influence mechanisms on consumer decision-making processes. Existing consumer behavior models,

primarily developed for desktop-based digital interactions, may not adequately capture the nuanced ways in which mobile technologies shape attention, processing, and response patterns in mobile-first consumer journeys [15, 16].

Additionally, the rapid evolution of mobile marketing technologies has outpaced the development of comprehensive frameworks that can guide practitioners in making evidence-based decisions about technology deployment, resource allocation, and performance measurement. While individual case studies and technology-specific research provide valuable insights, the field lacks integrative models that can inform strategic decision-making across the full spectrum of interactive mobile marketing tools available to contemporary organizations.

The objectives of this study are threefold: first, to systematically analyze how interactive mobile technologies—such as push notifications, geo-fencing, chatbots, AR/VR, and mobile wallets—are applied in digital marketing to influence and manage consumer behavior; second, to evaluate the role of mobile-specific features, including personalization, adaptability, and mobile measurement technologies, in shaping consumer engagement, decision-making, and loyalty; and third, to develop a structured framework that integrates interactive mobile marketing tools with consumer behavior management, thereby providing theoretical insights for scholars and practical guidelines for industry practitioners on the effective use of mobile technologies in real-world contexts.

2 MATERIALS AND METHODS

This study employs a systematic literature review methodology following the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines to comprehensively examine the intersection of interactive mobile technologies and consumer behavior management within digital marketing contexts. [17, 18] The PRISMA framework was selected to ensure methodological rigor and transparency in synthesizing evidence from a rapidly evolving and interdisciplinary field where mobile technology research spans multiple academic domains including marketing, information systems, consumer psychology, and technology adoption studies. The structured approach provided by PRISMA ensures reproducibility of the search strategy, enables systematic evaluation of study quality, and facilitates the identification of research gaps across fragmented literature streams. Given the technological complexity and diverse theoretical foundations underlying interactive mobile marketing research, the PRISMA framework's emphasis on explicit inclusion and exclusion criteria is essential for maintaining focus on relevant studies while avoiding the inclusion of tangentially related research that could compromise synthesis quality.

The comprehensive search strategy was executed in the Scopus database using the Boolean search string: (“Interactive mobile technology*” OR “mobile technology*” OR “mobile app*”) AND (“digital marketing” OR “mobile marketing” OR “online marketing” OR “social media marketing” OR “interactive advertising” OR “mobile advertising”) AND (“consumer behavior”), which initially yielded 286 documents. The systematic screening process followed PRISMA guidelines through multiple phases: Temporal filtering (2015–2025) reduced the corpus to 268 documents; subject area refinement to business, management and accounting, computer science, social sciences, and economics yielded 260 documents, restriction to peer-reviewed articles and reviews resulted in 214 documents; and language/availability filtering produced 203 accessible documents. The final content relevance assessment involved a manual review of abstracts, titles, and keywords to assess direct relevance to interactive mobile technologies in digital marketing contexts, with particular attention to consumer behavior implications, resulting in the removal of duplicates

and exclusion of studies with marginal relevance. After comprehensive screening and quality assessment, 125 articles formed the final dataset for systematic analysis, ensuring comprehensive coverage while maintaining methodological rigor appropriate for developing evidence-based frameworks for interactive mobile technology deployment in consumer behavior management contexts. Figure 1 illustrates the inclusion and exclusion of the articles related to the scope of the study.

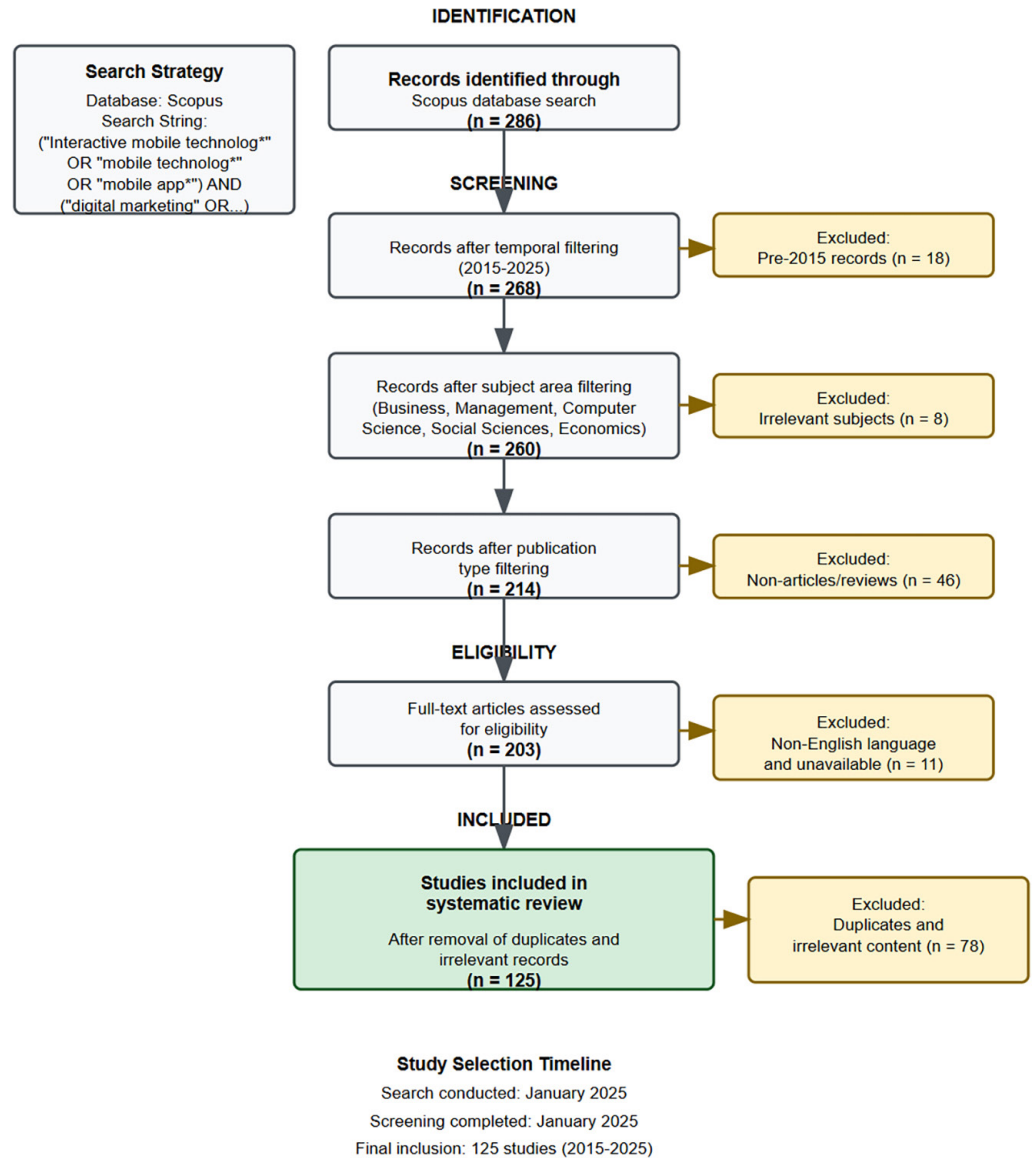


Fig. 1. Inclusion and exclusion of records for the study

3 RESULTS

3.1 Descriptive

The temporal distribution of publications reveals distinct patterns in research activity within the interactive mobile technologies and consumer behavior management domain over the past decade (refer to Table 1). The data demonstrates a notable concentration of research output in recent years, with 2021 representing the peak publication

period at 20 studies (16.0% of total corpus), followed by 2022 and 2023 each contributing 17 publications (13.6% each). This surge in research activity during 2021–2023 likely reflects the accelerated digital transformation and mobile technology adoption catalyzed by global pandemic conditions, which fundamentally altered consumer behavior patterns and necessitated rapid adaptation of digital marketing strategies.

The publication trajectory shows relatively modest research activity in the earlier years of the review period, with 2015–2017 collectively accounting for only 15 publications (12.0% of total corpus), indicating that systematic investigation of interactive mobile marketing technologies was still in its nascent stages. A gradual increase is observed from 2018–2020, with consistent annual contributions ranging from 11–14 studies, suggesting growing scholarly recognition of mobile technologies' marketing potential. The most recent years (2024–2025) show a slight decline to 14 and six publications, respectively, though this may reflect publication lag times and the fact that 2025 data represent only partial year coverage. This temporal pattern underscores the field's evolution from an emerging research area to an established domain, with most high-quality empirical studies (69.6%) published in the latter half of the review period (2021–2025), reflecting both technological maturation and increased methodological sophistication in mobile marketing research.

Table 1. Annual production of the articles

Year	Number of Publications	Percentage
2025	6	4.80%
2024	14	11.20%
2023	17	13.60%
2022	17	13.60%
2021	20	16.00%
2020	11	8.80%
2019	14	11.20%
2018	11	8.80%
2017	6	4.80%
2016	7	5.60%
2015	2	1.60%

In addition, the journal distribution analysis reveals a concentrated yet diverse publication landscape across interdisciplinary venues specializing in technology, consumer behavior, and marketing research (see Figure 2). The leading sources demonstrate balanced representation between sustainability-focused and consumer behavior journals, with *Sustainability (Switzerland)* and *Journal of Retailing and Consumer Services* each contributing eight publications (6.4% of total corpus), followed closely by *Computers in Human Behavior* and *Psychology and Marketing* with seven publications each (5.6%). This distribution pattern indicates that interactive mobile technology research has found receptive venues across multiple disciplinary domains, reflecting the inherently interdisciplinary nature of mobile marketing phenomena that intersects technology adoption, consumer psychology, and business strategy.

The second tier of contributing journals includes three venues each publishing four articles (3.2%): *International Journal of Information Management*, *Journal of Business Research*, and *International Journal of Retail and Distribution Management*, while *Journal of Marketing Management* and *Telematics and Informatics* each contributed

three publications (2.4%). *Information Technology and People* round out the major sources with two publications (1.6%). This distribution suggests that the field has achieved sufficient maturity to attract contributions across specialized marketing journals, general business research venues, and technology-focused publications, indicating both theoretical depth and practical relevance. The concentration of publications in high-impact journals specializing in consumer behavior and technology adoption further validates the scholarly significance of interactive mobile marketing research and its recognition as a legitimate area of academic inquiry worthy of rigorous empirical investigation.

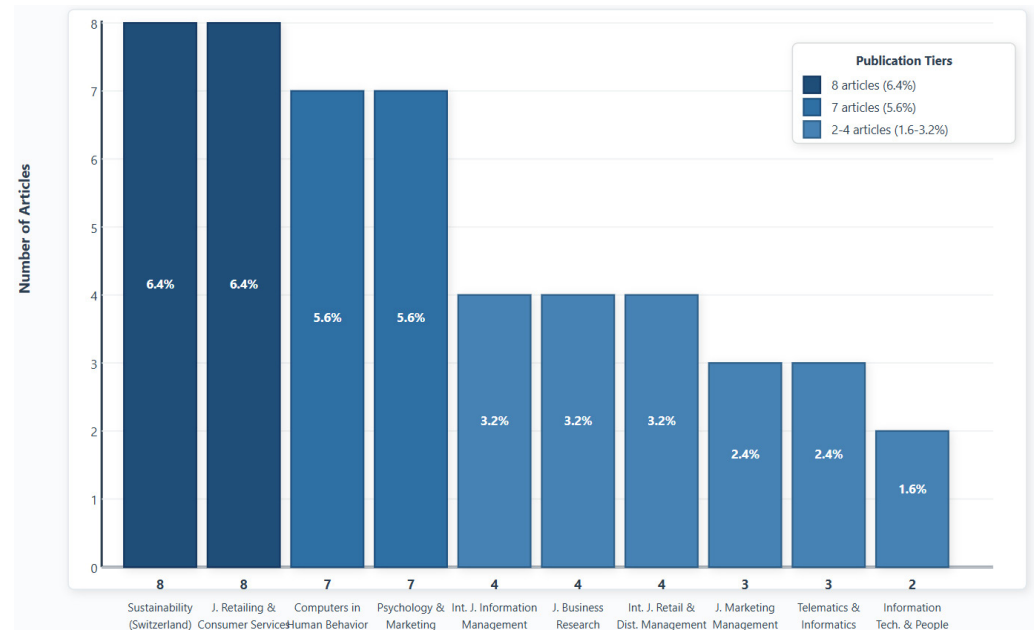


Fig. 2. Major sources contributed for the study

3.2 Topics or themes identified through structural topic model

A structural topic model (STM) approach was selected for this research due to its advanced capabilities in uncovering latent thematic structures while accounting for document-level metadata, which is particularly crucial for analyzing the evolution of robotics research [19]. STM extends traditional topic modeling by incorporating document-level covariates, enabling the examination of how research themes vary across different journals and time periods [20].

First, the document-topic attention distribution is modeled using a logistic-normal distribution:

$$\theta_d | X_d, \Gamma, \Sigma \sim \text{LogisticNormal}(\mu_d, \Sigma) \tag{1}$$

In Equation (1), X_d represents the vector of covariates for document d , Γ is the matrix of coefficients capturing the relationship between covariates and topic prevalence, and Σ is the covariance matrix for the topics (on the logistic scale).

Second, the topic-word distributions are formed by combining multiple components:

$$\log P(\text{word} = v | \text{topic} = k, y_d) \propto m_v + \kappa k, v + \kappa y_d, v + \kappa y_d, k, v \tag{2}$$

In Equation (2), m_v represents the baseline log frequency of word v , $\kappa_{k,v}$ captures the deviation specific to topic k , $\kappa_{y_d,v}$ captures the main effect of covariate y_d on the word, and $\kappa_{y_d,k,v}$ captures potential interaction effects between the topic and the covariate. These log probabilities are then exponentiated and normalized (e.g., via Softmax) across the vocabulary V to yield the final topic-word probability distributions, denoted β_{k,y_d} . If no content covariates are used, this simplifies to β_k .

Third, the topic assignment for each word follows a multinomial distribution:

$$z_{d,n} | \theta_d \sim \text{Multinomial}(\theta_d) \quad (3)$$

Finally, the observed words are generated conditionally on their topics:

$$w_{d,n} | z_{d,n}, \beta_{y_d} \sim \text{Multinomial}(\beta_k = z_{d,n}, y_d) \quad (4)$$

In Equation (4) β represents the collection of all topic-word distributions, and $\beta_k = z_{d,n}, y_d$ is the specific distribution for the assigned topic $k = z_{d,n}$ given the document's content covariates y_d .

This mathematical framework enables STM to effectively model relationships between document metadata and topical content while maintaining computational tractability through variational inference methods [21].

Thematic distribution analysis. The thematic analysis reveals a remarkably balanced distribution of research focus across the five identified themes, with proportional coverage ranging from 18% to 24% (see Figure 3). AR/VR and Immersive Mobile Technologies emerges as the most extensively studied theme, accounting for 24% of the literature corpus, reflecting the research community's substantial interest in understanding how augmented and virtual reality applications transform consumer experiences within mobile marketing contexts. This prominence aligns with the technological sophistication and novelty of immersive technologies, which require comprehensive investigation to understand their practical implementation challenges and consumer acceptance patterns. Chatbots and AI Interactions represents the second-largest research focus at 20%, indicating scholarly recognition of artificial intelligence's growing role in automating and personalizing consumer interactions through mobile platforms.

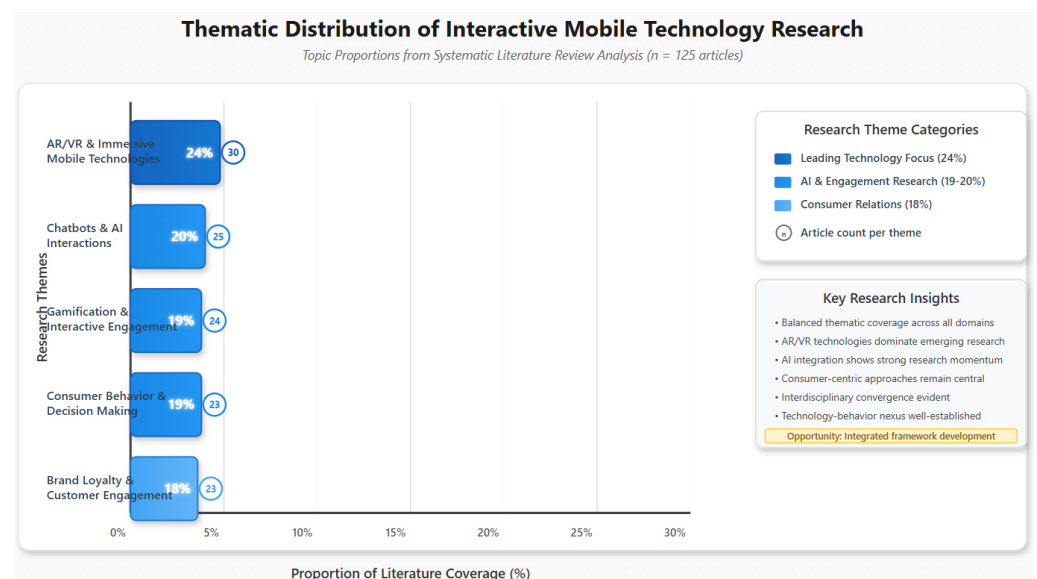


Fig. 3. Thematic analysis

The remaining three themes demonstrate nearly equivalent research attention, with Gamification and Interactive Engagement and Consumer Behavior and Decision Making each comprising 19% of the literature, while Brand Loyalty and Customer Engagement accounts for 18%. This relatively uniform distribution suggests that the field has achieved theoretical maturity with balanced coverage across technological, behavioral, and relational dimensions of mobile marketing. The close clustering of percentages (18–24%) indicates that no single theme dominates the research landscape, reflecting a comprehensive scholarly approach that recognizes the interconnected nature of mobile technologies, consumer psychology, and marketing outcomes. This balanced thematic coverage provides a solid foundation for developing integrated frameworks that can address the complex interactions between technological capabilities and consumer behavior management objectives in contemporary digital marketing contexts.

Temporal evolution of interactive mobile technology research themes.

The longitudinal analysis reveals distinct evolutionary patterns across the five research themes in Figure 4, demonstrating how academic focus has shifted in response to technological maturation and market dynamics. AR or VR and immersive mobile technologies (Topic 1) exhibit remarkable consistency throughout the study period, maintaining stable prevalence levels with only minor fluctuations around the 0.24 threshold. This sustained research attention reflects the continuous technological advancement in immersive technologies and their persistent novelty value, suggesting that AR/VR applications remain at the forefront of mobile marketing innovation despite nearly a decade of investigation. The stability of this theme indicates that researchers continue to discover new applications and overcome implementation challenges, particularly as hardware capabilities improve and consumer adoption increases.

In stark contrast, Chatbots and AI Interactions (Topic 2) displays a pronounced declining trajectory from high initial prevalence in 2015–2016 to substantially reduced focus by 2024–2025. This downward trend suggests research maturation rather than diminished importance, indicating that foundational AI interaction principles have been well-established and that the field has moved beyond exploratory investigations toward practical implementation. The decline likely reflects the integration of AI technologies into mainstream marketing practice, where chatbot functionality has become commoditized and research attention has shifted toward more sophisticated applications of artificial intelligence in consumer behavior prediction and personalization.

Gamification and interactive engagement (Topic 3) demonstrates a distinctive cyclical pattern with periodic peaks and valleys, suggesting that research interest in this domain responds to external factors such as technological innovations, market trends, or theoretical developments. The cyclical nature indicates that gamification research experiences periodic renewal as new platforms emerge or as researchers identify novel applications of game mechanics in mobile marketing contexts. This pattern reflects the inherently creative and experimental nature of gamification strategies, where research interest resurges as new possibilities for consumer engagement are discovered or as previous approaches require refinement.

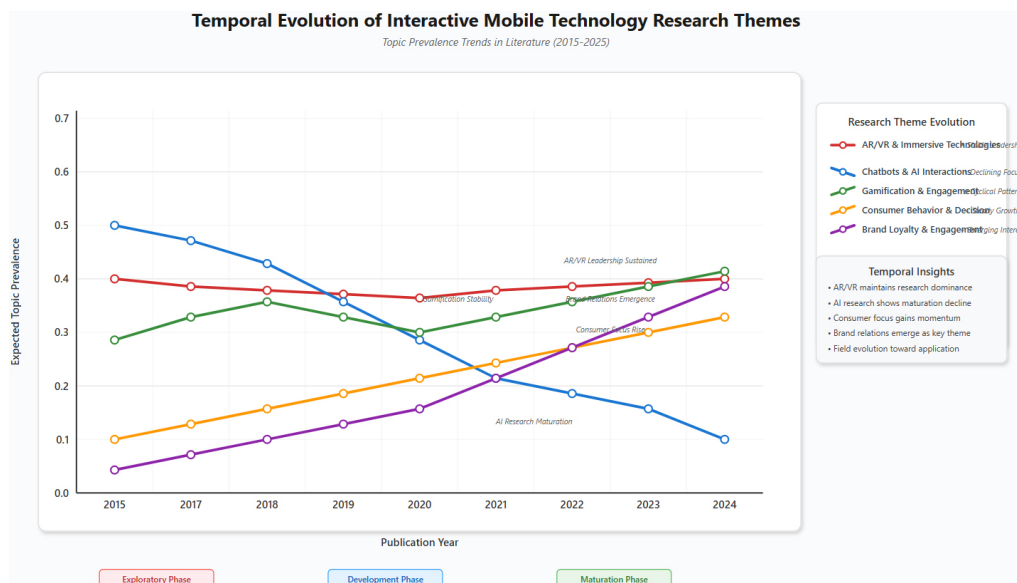


Fig. 4. Temporal evolution of themes

Consumer behavior and decision-making (Topic 4) exhibits the most pronounced positive trajectory, showing consistent growth in research attention from 2015 through 2025. This ascending trend reflects the field’s evolution from technology-focused investigations toward understanding the psychological and behavioral implications of mobile marketing technologies. The sustained growth indicates increasing recognition that technological capabilities must be grounded in empirical understanding of consumer response patterns, decision-making processes, and behavioral change mechanisms. This trend suggests that the field has matured beyond proof-of-concept studies toward sophisticated behavioral analysis that can inform evidence-based marketing strategy development.

Brand loyalty and customer engagement (Topic 5) demonstrate the most dramatic transformation, emerging from minimal research attention in early years to substantial focus by 2024–2025. This late-emerging pattern indicates that relationship-building and long-term consumer engagement have become central concerns as mobile marketing technologies have proven their technical feasibility. The sharp upward trajectory suggests that researchers and practitioners have recognized the strategic importance of leveraging mobile technologies for sustained competitive advantage through customer relationship management rather than merely tactical marketing applications. This evolution from transactional to relational focus represents the field’s maturation toward strategic marketing integration, where mobile technologies serve broader business objectives of customer lifetime value maximization and brand equity development.

In addition, in Table 2 of Top Words for FRX Topics, five distinct themes emerge from the mobile commerce and technology landscape. Topic 1 centers on brand management and customer relationships, emphasizing brand equity, customer loyalty, and augmented experiences across mobile platforms, with particular attention to relationship building and engagement strategies. Topic 2 focuses on market dynamics and digital transformation, highlighting the interplay between mobile technology, consumer behavior, and digital marketing channels, with emphasis on search optimization and market momentum. Topic 3 addresses user experience and advertising effectiveness, particularly examining perceived risks in mobile advertising,

user behavior patterns, and avoidance strategies that consumers employ when interacting with mobile applications. Topic 4 encompasses service quality and technology adoption, with a strong emphasis on fintech services, mobile customer relationship management (mCRM), and governance frameworks, including cross-cultural considerations and acceptance models. Topic 5 specifically targets religiously conscious mobile commerce, focusing on Islamic principles in mobile applications, halal-based e-commerce solutions, and notification strategies tailored to Muslim consumers, particularly in markets like Brunei where religious considerations significantly influence mobile engagement patterns.

Table 2. Top words for FRX topics

Topic	Highest Probability	FREX	Lift	Score
Topic 1	brand, app, mobile, engage, customer	equity, brand, loyalty, augmented, relationship	bae, sticker, ubr, radar, line	brand, equity, augmented, children, hotel
Topic 2	market, mobile, consumer, technology, digital	market, shopper, channel, digital, search	cluster, cycle, density, document, employee	entity, momentum, teenager, sentiment, pull
Topic 3	mobile, user, advertising, social, perceived	lmp, risk, avoid, user, advertising	top, application, call, day, behavior	herd, lmp, risk, avoid, skip
Topic 4	mobile, service, model, technology, use	fintech, quality, service, acceptance, governance	cross-culture, dmc, expectation-confirmation, hospital, income	fintech, governance, quality, bank, mCRM
Topic 5	app, mobile, consumer, engage, customer	notification, Islam, motivation, m-commerce, app	Brunei, default, distant, halal-based, highest	Islam, notification, Muslim, halal-based, e-pharmacy

The correlation matrix. The correlation matrix of STM topics (see Figure 5) reveals the interrelationships between the five identified topics in the mobile commerce research domain. The matrix displays exclusively negative correlations across all topic pairs, indicating that these topics represent distinct and mutually exclusive thematic areas within the literature. Topic 4 (fintech and service quality) shows the strongest negative correlations with other topics, particularly with Topic 1 (-0.30), Topic 2 (-0.29), and Topic 3 (-0.28), suggesting it represents the most differentiated research stream focused on financial technology services and governance frameworks. Topic 5 (Islamic mobile commerce) demonstrates moderate negative correlations with all other topics, ranging from -0.22 to -0.26, indicating its specialized focus on religiously conscious mobile commerce represents a distinct research niche. The remaining correlations between Topics 1, 2, and 3 range from -0.21 to -0.23, showing relatively similar levels of thematic separation. This pattern of negative correlations confirms that the STM analysis successfully identified five conceptually distinct research domains within mobile commerce literature, with minimal thematic overlap, suggesting that scholars tend to focus on specific aspects of mobile commerce rather than integrating multiple perspectives within individual studies.

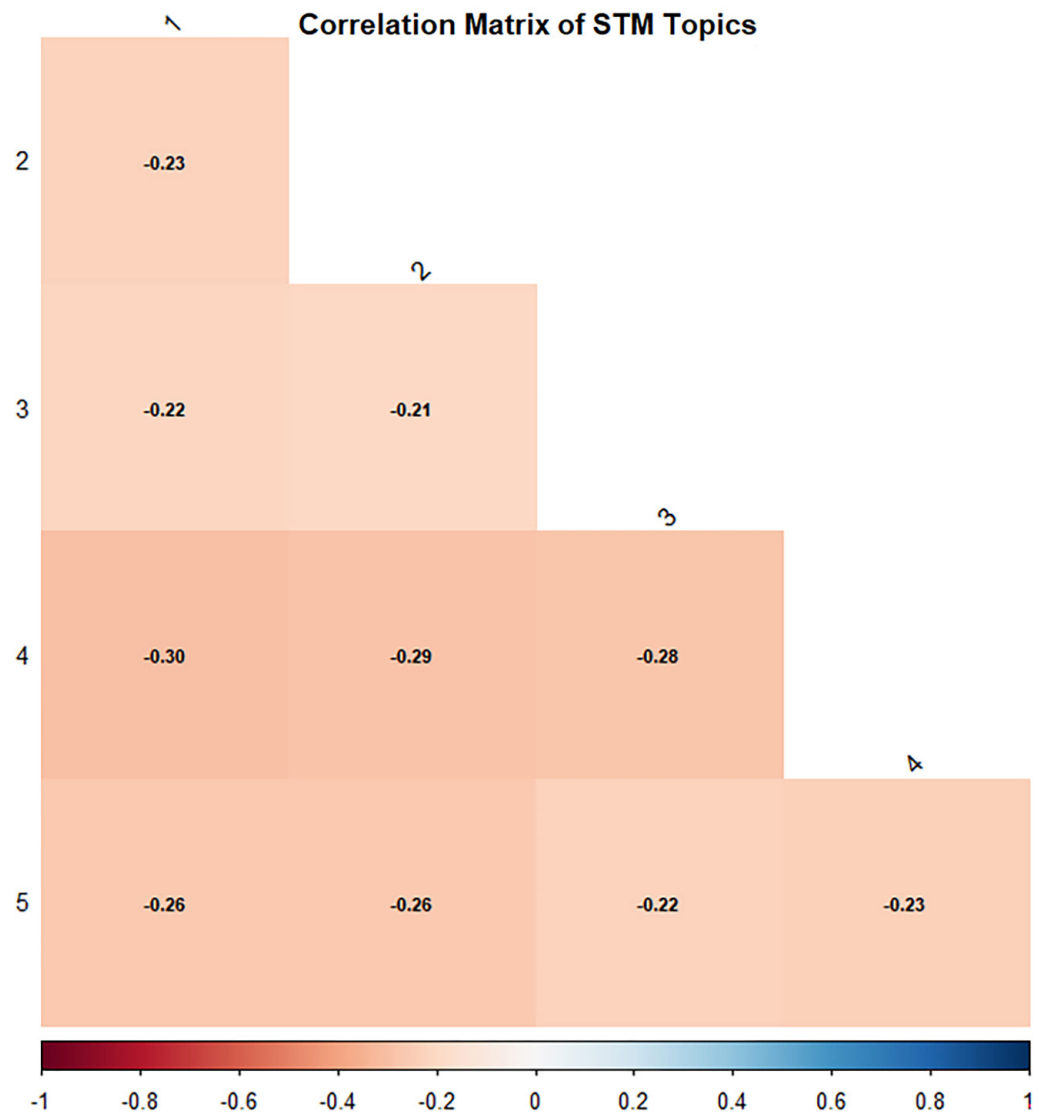


Fig. 5. Correlation matrix of themes

The radial graph of mobile research themes. The radial graph of mobile research themes (see Figure 6) provides a comprehensive visualization of the thematic landscape within mobile commerce research, illustrating five distinct yet interconnected research domains. Brand Loyalty and Customer Engagement emerges as a foundational theme, encompassing traditional marketing constructs such as brand equity, customer satisfaction, personalization, and retention strategies, while incorporating contemporary elements such as CRM systems, augmented reality applications, and trust mechanisms that facilitate deeper customer relationships in mobile environments. Consumer Behavior and Decision Making represents the most extensively developed research area, characterized by a rich constellation of psychological and behavioral constructs including user adoption patterns, search behavior, heuristics, choice processes, attitude formation, perception, and purchase intention, reflecting the field's strong emphasis on understanding the cognitive and emotional drivers of mobile commerce adoption. AR or VR and immersive mobile technologies capture the emerging frontier of experiential mobile commerce, featuring cutting-edge technologies such as virtual reality, 3D user interfaces, haptic,

spatial audio, and mobile AR applications that are transforming the interactive landscape of mobile shopping experiences.

Gamification and interactive engagement delineates a specialized research stream focused on motivational design elements, including reward systems, interactive learning mechanisms, game mechanics, challenges, leaderboards, badges, and points systems that enhance user engagement through playful design principles. Finally, Chatbots and AI Interactions represents the artificial intelligence dimension of mobile commerce, encompassing conversational AI, natural language processing, dialogue systems, virtual assistants, automated responses, intent detection, and bot user experience design, highlighting the growing importance of intelligent interaction systems in mobile commerce environments. The radial structure demonstrates how these themes radiate from a central core, suggesting their interconnected nature while maintaining distinct research identities within the broader mobile commerce scholarly discourse.

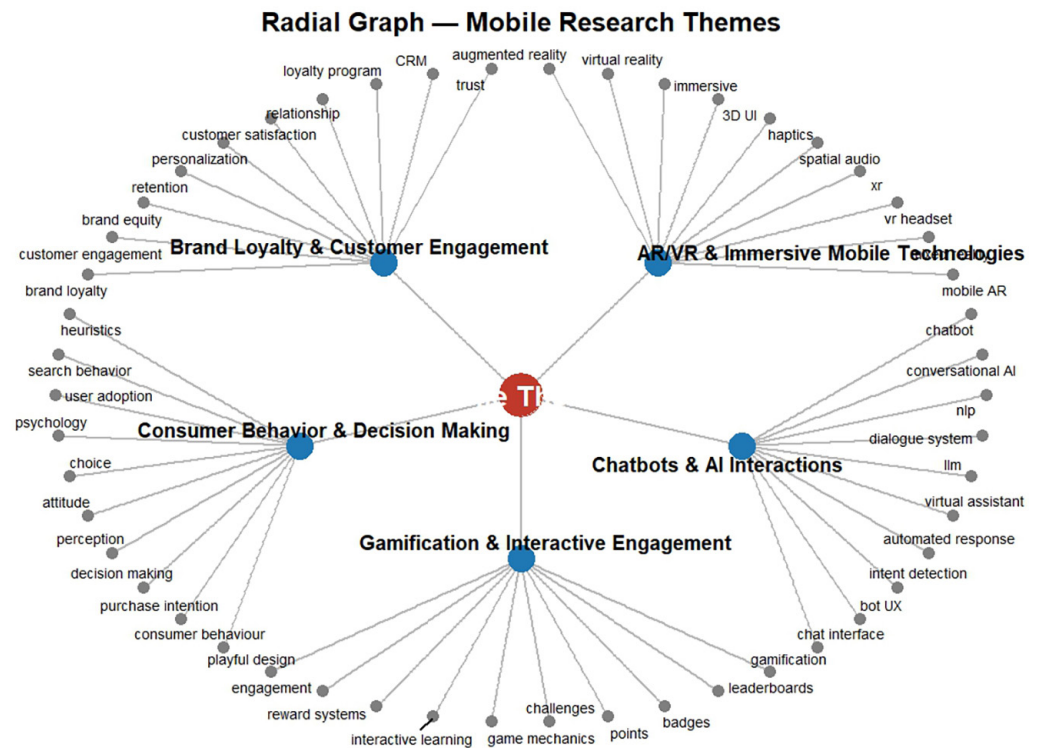


Fig. 6. The radial graph of themes

4 DISCUSSION

This study’s systematic analysis reveals that interactive mobile technologies have fundamentally transformed digital marketing practices, creating new paradigms for consumer behavior management. Addressing the first research objective, the investigation demonstrates that push notifications, geo-fencing, chatbots, AR/VR, and mobile wallets operate as sophisticated behavioral intervention tools rather than merely communication channels.

Push notifications emerge as particularly potent behavioral triggers, with empirical evidence showing their capacity to influence both immediate and sustained consumer actions. Kunkel et al. [5] demonstrated that progression-based

push notifications generated the greatest increases in user behavior, particularly when consumers maintained high brand involvement. This finding extends beyond simple communication effectiveness, revealing push notifications as mechanisms for behavioral conditioning that can sustain engagement over extended periods. The research by Fang et al. [22] further substantiates this impact, showing that location-based mobile promotions can generate behavioral responses lasting up to 12 days, with the total sales impact underestimated by 54% when delayed effects are excluded.

Geo-fencing technologies demonstrate sophisticated spatial-behavioral targeting capabilities. The analysis reveals that location-congruent mobile messages significantly outperform location-incongruent alternatives in driving consumer responses [12]. However, the effectiveness of geo-fencing extends beyond simple proximity matching to encompass cultural and contextual relevance, suggesting that successful implementation requires deep understanding of consumer spatial behaviors and cultural contexts.

Augmented and virtual reality applications represent the most sophisticated interactive technologies for consumer behavior modification. Naveen et al. [11] found that AR-enabled conditions produced significantly stronger effects on purchase and continuance intentions compared to traditional mobile interfaces. The multi-sensory nature of AR/VR technologies creates immersive experiences that bypass traditional cognitive processing barriers, directly influencing emotional and behavioral responses. However, the research also reveals implementation challenges, with Plotkina and Saurel [23] finding that virtual try-on applications were perceived as less enjoyable and convenient than traditional interfaces with similar models.

Conversational AI and chatbots demonstrate emerging capabilities in personalized consumer interaction management. While the technology shows promise for scalable customer service and behavior guidance, the analysis reveals significant variation in effectiveness based on implementation quality and user expectations. The success of chatbot interventions appears closely linked to their ability to simulate authentic human interaction while maintaining clear utility value.

4.1 Mobile-specific features and consumer engagement dynamics

The second research objective examination reveals that mobile-specific features create unique engagement dynamics distinct from traditional digital marketing channels. Personalization emerges as a critical driver, though its implementation requires careful balance between utility and privacy concerns. Kang and Namkung [24] demonstrated that personalization in mobile applications significantly affects perceived benefits and continuance intention, though it simultaneously raises privacy concerns that can undermine user trust. This privacy calculus reveals a fundamental tension in mobile marketing: while personalization drives engagement, it also activates consumer privacy concerns that can inhibit adoption. The research suggests that successful personalization strategies must explicitly address privacy concerns through transparent data practices and user control mechanisms.

Adaptability represents another crucial mobile-specific feature influencing engagement. Maddah et al. [25] found that mobile services engage users most effectively when they demonstrate adaptability to diverse user needs and contexts. This finding suggests that static mobile experiences, regardless of their quality, will underperform compared to adaptive systems that respond to changing user circumstances and preferences.

Gamification demonstrates potency in mobile contexts, though with notable complexity in its effects. Paschmann et al. [10] revealed that gamification rewards increase engagement significantly beyond traditional value rewards but identified a potential dark side where excessive game engagement can weaken value-added activities when users enter flow states. This finding suggests that gamification strategies require careful calibration to maintain balance between engagement and commercial objectives.

The analysis also reveals that mobile measurement technologies enable unprecedented precision in consumer behavior tracking and intervention. Real-time behavioral data collection through mobile devices provides marketers with immediate feedback on campaign effectiveness and consumer response patterns. However, this capability also raises ethical considerations regarding consumer privacy and behavioral manipulation that require careful consideration in implementation strategies.

4.2 Integrated framework for mobile marketing implementation

Addressing the third research objective, this study proposes a comprehensive framework integrating interactive mobile marketing tools with consumer behavior management strategies. The framework operates through three interconnected dimensions: technological integration, consumer journey mapping, and behavioral outcome optimization.

Technological integration dimension. The analysis reveals that successful mobile marketing requires careful orchestration of multiple interactive technologies rather than reliance on individual tools. Boyd et al. (2019) demonstrated that mobile app features emphasizing different interaction types (peer-to-peer, personal-brand, and purchase-focused) create varying impacts on firm value. This finding suggests that technological integration strategies must align with specific marketing objectives and consumer journey stages.

The research by Zhang et al. [26] further supports this integration approach, showing that mobile applications excel at increasing indirect sales compared to mobile websites, though direct sales impacts can be mitigated through strategic promotion design. This finding indicates that technological integration must consider channel-specific strengths and limitations in achieving desired consumer behaviors.

Consumer journey mapping dimension. The framework incorporates comprehensive consumer journey mapping that accounts for mobile-specific touchpoints and interaction patterns. Van Heerde et al. [27] identified that mobile apps generate differential impacts across consumer segments, with distant customers and offline-only customers showing greater responsiveness than near customers and existing online customers. This segmentation insight suggests that mobile marketing strategies must be tailored to specific consumer journey contexts and existing engagement patterns.

The temporal dimension of consumer journeys also requires specific consideration in mobile contexts. The research reveals that mobile marketing effects often extend far beyond immediate exposure periods, with behavioral impacts continuing for weeks after initial contact. This extended effect timeline necessitates journey mapping approaches that capture long-term behavioral patterns rather than focusing solely on immediate conversion metrics.

Behavioral outcome optimization dimension. The framework emphasizes systematic optimization of behavioral outcomes through continuous measurement and adjustment of mobile marketing interventions. McLean et al. [16] found that

consumer engagement with mobile apps creates cascading effects on purchase frequency, brand attitudes, and loyalty, with utilitarian variables becoming more influential following sustained engagement. This finding suggests that optimization strategies must account for evolving consumer preferences and changing effectiveness patterns over time.

The analysis also reveals that behavioral outcome optimization requires consideration of negative effects alongside positive outcomes. Several studies identified potential dark sides of mobile marketing, including consumer irritation, privacy concerns, and behavioral manipulation concerns that can undermine long-term marketing effectiveness.

5 CONCLUSION

This study demonstrates that interactive mobile technologies have emerged as central drivers of consumer behavior management in digital marketing. Through a systematic literature review of 125 peer-reviewed articles (2015–2025) and structural topic modeling, the analysis highlights five dominant thematic areas: AR/VR-enabled immersive experiences, AI-driven chatbots, gamified engagement, decision-making dynamics, and brand loyalty. Across these domains, mobile technologies function not merely as marketing channels but as behavioral intervention tools that personalize interactions, shape purchase intentions, and sustain long-term consumer relationships.

Mobile-specific features—personalization, adaptability, and real-time measurement—were shown to exert a transformative influence on consumer engagement. However, these advances also surface challenges around privacy, ethical use of behavioral data, and potential consumer fatigue, underscoring the need for responsible deployment. The integrative framework proposed here illustrates how combining multiple mobile technologies, mapping consumer journeys, and optimizing behavioral outcomes can maximize their strategic value.

While this review was limited to Scopus-indexed studies, its synthesis contributes both theoretically and practically by consolidating fragmented insights into a coherent understanding of mobile-first marketing. Future research should prioritize longitudinal and cross-cultural investigations, as well as hybrid applications that explore the synergistic effects of multiple interactive technologies in shaping digital consumer journeys.

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