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Designing a user interaction model in online shopping through adaptive advertising

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Abstract This study aimed to develop a model of user interaction through adaptive advertising. The research adopted an inductive qualitative approach. Data were collected through a review of the literature and semi-structured interviews with 15 experts in digital marketing, data science, and user behavior analysis. The data were analyzed using thematic analysis. The findings indicate that user interaction through adaptive advertising is shaped by four main categories of factors: user-related factors, technology and infrastructure factors, advertising-related factors, and environmental factors. Based on these dimensions, the study proposes a conceptual model in which privacy protection, transparency, personalization, targeted advertising, interactive content, and AI-based optimization play central roles in strengthening user engagement. The study contributes to the literature by providing an integrated and context-sensitive model of user interaction through adaptive advertising. The proposed framework offers both theoretical insight and practical guidance for designing more effective, user-centered digital advertising strategies, particularly in emerging markets.

Keyword: User Interaction, Online Shopping, Adaptive Advertising, Advertising Personalization.

1 Introduction

With the emergence and rapid expansion of digital technologies, advertising methods have undergone significant changes, and adaptive advertising has been recognized as one of the effective strategies for increasing user interaction with brands and products [1]. Adaptive advertising refers to the use of user data and behavioral patterns to deliver advertising messages that are specifically tailored to each individual [2]. This type of advertising is personalized based on users' behaviors, interests, and needs, and attempts to deliver specific content and messages to target audiences. Given the explosion of information and increasing competition in markets, a better understanding of how users interact with adaptive advertising can not only improve user experience but also help brands and companies achieve their marketing objectives [3]. Adaptive advertising is a process in which advertising content is

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adjusted based on users' behaviors, interests, and preferences. Unlike traditional advertising, which delivers a single fixed message to all audiences, adaptive advertising is designed to provide a personalized experience tailored to each user [4]. The importance of adaptive advertising lies in increasing the efficiency of advertising campaigns and improving the user experience [5]. By utilizing user data, companies can respond more accurately to users' needs and demands, which leads to increased user engagement with content and ultimately improves marketing outcomes [6]. Moreover, modern users respond more positively to messages that are personalized for them. Adaptive advertising, designed based on the analysis of individual behavior, needs, and preferences, can lead to increased engagement and improved conversion rates [7].

Furthermore, appropriate and continuous interaction with users through adaptive advertising can create deeper and longer-term relationships with customers. When advertisements respond to the personal needs and concerns of audiences, greater trust and loyalty toward the brand are formed [8]. Therefore, the main issue in adaptive advertising is identifying the best methods for interacting with users in a way that not only enhances user experience but also increases advertising effectiveness and conversion rates [9]

As a result of such interaction, users should engage with advertisements in a manner that not only avoids feelings of intrusion or annoyance but also welcomes advertisements as a valuable service or useful information [10]. Although many studies have been conducted on user interaction, a comprehensive model for user interaction based on an adaptive advertising approach has not yet been presented. Meanwhile, in our country, user interaction faces challenges due to factors such as legal and privacy restrictions, lack of trust in brands and online advertising, access to high-quality data, internet infrastructure and filtering, cultural and demographic diversity, sanctions and international limitations, and rapid changes in the market and user behavior.

Therefore, the present study aims to address the existing research gap and provide a model for user interaction through adaptive advertising that is more effective and compatible with the business ecosystem and Iranian users. Accordingly, it seeks to answer the main research question: What does the model of user interaction through adaptive advertising look like?

Recent studies have shown that adaptive and personalized advertising can improve user engagement; however, the literature still lacks a comprehensive framework that explains how user-related, technological, advertising, and environmental factors jointly shape such engagement [9-10-11]. Recent research has increasingly emphasized the role of privacy concerns, transparency, algorithmic relevance, and interactive content in determining users' responses to digital advertising [4-6-10-12] but most studies remain fragmented and focus on isolated variables rather than an integrated model. In addition, the rapid development of AI-based advertising technologies and the growing importance of ethical data use have made user trust and contextual fit more critical than ever [1-2-3-5]. Therefore, there is still a need for research that explains adaptive advertising not only as a targeting mechanism but also as a strategic and relational process that supports sustained interaction, especially in emerging markets such as Iran, where cultural diversity, infrastructure limitations, and regulatory concerns can significantly influence user behavior.

The present study contributes to the literature in several ways. First, unlike previous studies that have mainly examined personalized or adaptive advertising from the perspective of campaign effectiveness, purchase intention, or user response, this study develops an integrated model of user interaction through adaptive advertising. This model goes beyond describing research objectives and provides a structured explanation of the factors that shape

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engagement with adaptive advertising. Second, the study identifies a set of interconnected dimensions' user-related factors, technology and infrastructure factors, advertising-related factors, and environmental factors that together explain how adaptive advertising can be designed to foster meaningful user interaction. By organizing these factors into a coherent conceptual framework, the study clarifies the mechanism through which adaptive advertising influences trust, satisfaction, loyalty, and responsiveness. Third, the study extends existing theory by showing that effective user interaction is not only a result of personalization, but also depends on privacy protection, transparency, contextual relevance, and continuous data-driven adaptation. In this way, the study adds a more comprehensive and context-sensitive understanding of adaptive advertising, particularly in the Iranian business environment. From a practical perspective, the proposed model offers guidance for marketers, digital platforms, and business managers on how to design advertising strategies that are more interactive, less intrusive, and more aligned with user expectations. The model can help practitioners improve audience targeting, strengthen user trust, and increase the effectiveness of digital advertising campaigns.

2 Theoretical foundations and research background

2.1 User interaction: Dimensions and influencing components

User interaction in the field of computer science and digital system design refers to the activities that users perform while interacting with a system, application, or website. These interactions may take the form of clicking, entering information, using keyboard shortcuts, navigating through pages, or even hand and body gestures in systems equipped with modern technologies [13]. User interaction refers to the reciprocal communication and influence between an organization, system, or individual and the user. This interaction can occur in various forms such as customer service, technical support, or even everyday interactions with systems and software. The primary goal of user interaction is to achieve user satisfaction and create a positive experience that can lead to customer loyalty, increased sales, or improved service quality [10]. User interaction is recognized as a part of user interface (UI) and user experience (UX) design. Scientifically, interaction refers to the exchange of information between humans and machines, which usually occurs through a physical or software interface [14]. In other words, user interaction is a component of user experience design that refers to the way users communicate with a digital product or service. The goal of positive user interaction is to create a user experience that is simple, intuitive, and satisfying. User experience seeks to establish the most optimal interaction methods through which users can easily achieve their goals [15]. User interaction includes dimensions such as ease of use, response speed, and attractive visual design, all of which influence the overall user experience. Security and privacy also play an important role in creating trust and reassurance for continued interaction. Providing efficient support and rapid feedback can increase users' motivation to use the system more frequently and improve their interactions [16]. The interaction that users have with a system is influenced by a set of factors and dimensions, each of which can directly affect their overall experience (See Table 1).

User interaction, especially in the digital era and with the wide variety of communication channels available, requires attention to multiple dimensions. From accurate messaging and rapid responsiveness to user-friendly design and a precise understanding of users' needs, all of these are components that can significantly enhance the quality of interactions. Therefore, any brand or organization that pays adequate attention to these dimensions will be able to

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establish effective and beneficial interactions with its users and build long-term relationships that contribute to its growth and development.

Table 1 Factors Affecting User Interaction (Agrawal and Zhou, 2023)

Description	Influencing Factors
The content and type of message sent to the user is one of the most important influencing factors. The message should always be clear, concise, and relevant to users' needs and expectations. Additionally, the language and tone of the message must be chosen carefully so that the user feels respected and valued.	Content and Message
In today's world, the response time to users' requests and problems is highly important. Users expect their needs to be addressed as quickly as possible. This issue is particularly prominent in online support channels such as chat or social media.	Quick and Effective Response
Personalizing interactions can have a significant impact on creating a sense of trust and loyalty in users. When a system or brand can identify each user's specific needs and preferences and respond or provide recommendations accordingly, it can have a deep impact on user satisfaction.	Personalization of Experience
The type and number of communication channels also influence interactions	Communication Channels
Accurately identifying users' needs and desires and striving to address them is one of the important dimensions of user interaction. Systems and brands must be able to precisely identify and analyze these needs in order to provide appropriate services and products.	Responding to Users' Needs
Psychological factors play a significant role in interactions	Human and Psychological Components

2.2 Adaptive advertising and its influencing factors

Adaptive advertising refers to strategies in which advertising content is personalized based on users' behavioral patterns and environmental changes in order to increase its effectiveness [17]. This type of advertising improves the efficiency of advertising campaigns and increases the rate at which users convert into customers, since the advertising content is more closely aligned with their needs [5]. The main objective of adaptive advertising is to match advertising content with the user and their specific conditions as effectively as possible to achieve maximum impact.

One of the key characteristics of adaptive advertising is its ability to deliver personalized content [8]. This means that advertisements are designed and delivered to audiences based on information such as geographic location, time, previous user behavior, search history, and even prior interactions with a brand. Due to its strong ability to capture attention, this type of advertising is considerably more effective than general and standard advertising [9]. Since these advertisements continuously adapt to changes in user behavior and market conditions, they can achieve higher efficiency and create a better user experience. For example, advertisements designed for a specific user are likely to have higher engagement and conversion rates compared with advertisements shown to a broad group of users [11]. In this regard, the use of machine learning technologies and data analytics enables the improvement of adaptive advertising performance, as intelligent systems can continuously identify users' behavioral patterns and deliver advertisements more accurately to them [12].

Adaptive advertising depends on several factors that contribute to improving the efficiency and effectiveness of advertisements among users. Some of these factors include:

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1. **User Data:** Information obtained from users, such as search history, interests, purchasing behavior, and real-time data collection. These data help personalize advertisements and deliver con tent that matches individual needs.
2. **Artificial Intelligence and Machine Learning Technologies:** These technologies can quickly analyze user data in real time and, based on past behaviors, deliver relevant and appropriate advertisements [5].
3. **Geographical Location and Time:** Adaptive advertisements can be adjusted according to users' location and time. For example, advertisements related to nearby places or special discounts offered at certain times can be more effective.
4. **User Profile:** Personal and social characteristics of users, such as age, gender, education level, and socio-economic status, play an important role in personalizing adaptive advertisements.
5. **Environmental and Social Changes:** Adaptive advertising must be able to respond to changes in users' social and personal environments. For example, advertisements can be adjusted according to seasonal changes or special events such as holidays and celebrations [6].
6. **Advertising Content and Design:** The quality and attractiveness of content, along with the design of the advertisement, are factors that can improve the user experience and increase the advertisement's impact.
7. **Different Platforms:** Advertisements should be optimized according to the devices users utilize (such as mobile phones, tablets, and computers), and the display of advertisements across different platforms should be properly configured [7-8].

These factors help adaptive advertising respond more effectively and intelligently to users' needs and create a better advertising experience for them.

2.3 Research background

Patnaik et al. [18] investigated the impact of AI-driven personalized recommendations on consumer psychology and behavior. Given the existing ambiguity regarding how these recommendations influence motivation and online purchase intention, this study proposed a new conceptual model by utilizing Self-Determination Theory (SDT), Cognitive Evaluation Theory (CET), and Basic Psychological Needs Theory (BPNT). The findings revealed that intrinsic motivation, by fostering a sense of enjoyment and addressing individuals' psychological needs, has a positive impact on the willingness to purchase online. By extending the SDT research paradigm, this study elucidates how intelligent personalized recommendations can guide consumer motivation toward purchase completion. Roy et al. [19] examined the strategic importance of sociable gamification, defined as the integration of gamification and social media, in enhancing social media promotions. Using a qualitative approach and insights from 42 practitioners, the research found that this integration contributes to personalization, secure user interaction, and less intrusive promotional practices. The findings also indicate that competitive gaming elements based on gestural patterns can reduce reliance on performance marketing while increasing organic visibility on social media platforms. In addition, the study offers an interdisciplinary framework for future academic research and emphasizes the managerial value of optimization, personification, and effective channeling in consumer-oriented businesses. Bhat et al. [20] investigated consumers' attitudes toward biometric authentication technologies and examines how these attitudes influence their future intention to use such technologies in banking services. Based

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on survey data collected from 610 bank customers and analyzed through confirmatory factor analysis and structural equation modeling, the findings show that a positive attitude toward biometric authentication significantly enhances perceived ease of use and perceived security. These factors, in turn, strengthen perceived usefulness, which ultimately increases users' intention to adopt biometric technologies in banking applications. The study highlights the practical value of integrating biometric methods such as facial recognition, fingerprint scanning, and iris recognition into banking services and contributes to the literature by extending the Technology Acceptance Model (TAM) in the context of emerging economies. Kumar and Shah [13], in examining modern advertising trends including short video ads and shoppable video ads investigated new advertising approaches. The results showed that the use of short video advertisements with direct purchase capability leads to increased user engagement and significantly higher conversion rates. These methods enhance user experience and strengthen users' connection with brands. Cho et al. [9], in their study on the dynamics of consumer engagement in influencer marketing on social media from the perspective of self-determination theory, used a stimulus–organism–response framework to develop an integrated model for evaluating the influence of influencers, advertising information, and social factors on consumer engagement. Their findings include: Social media influencers are effective in generating initial online traffic but have limited impact on deeper levels of consumer engagement, cautioning advertisers not to overestimate their influence. The core of high-level engagement lies in advertising information, confirming that in the new media era, content remains "king." Interpersonal factors also matter, as influencing consumer social groups is an effective way to enhance advertising impact. Khan and Lee [14], in examining the mediating effect of source appearance and self–influencer congruence on the relationship between visual content and customer engagement, found that the congruence between the appearance of advertising sources and influencer personality has a positive impact on consumer behavior. When users perceive greater alignment between themselves and social influencers, they show a stronger tendency to engage with advertisements. This suggests that brands should be more cautious in selecting influencers and ensure alignment with the characteristics of the target audience. Thus, creating congruence between source appearance and influencers can enhance customer engagement with advertisements. Agrawal and Zhou [6], in their research examining an offline reinforcement learning framework to optimize ad sequencing for increased user engagement, demonstrated that using an offline reinforcement learning framework to optimize ad sequences can significantly increase user engagement. Optimized sequences result in longer interaction time with advertising content and improved click-through rates (CTR). This optimization also reduces user bounce rates in ads. Therefore, the use of optimized advertising sequences leads to considerable improvement in user engagement levels. Azizi-Nia et al. [3], in a mixed-method study aimed at identifying components and presenting a personalized advertising model, found that the effects of contextual factors (individual-related and advertisement-related factors) were not significant, and the effects of intervening factors (avoidance and environmental factors) on the outcomes of personalized advertising (cost–benefit analysis) were also insignificant. They also found that causal factors (perceived usefulness and perceived costs) had the greatest impact on market management strategy, and that market management strategy had the strongest effect on attitudinal outcomes. Ghahremanzadeh [5], in a study aimed at investigating the effect of social media interactions on purchase intention and behavioral engagement among customers of the Ofogh Kourosh chain stores in Tabriz, found that social media interactions have a positive and significant effect on customers' purchase intention and behavioral engagement. Furthermore, social media interactions were found to have a significant relationship with

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customers' purchase intention, and also a positive, significant effect on their behavioral engagement. Bashkouh et al. [1], in a study aimed at explaining the impact of social media use on dimensions of customer engagement, communication quality during the COVID-19 conditions, and brand value co-creation while considering the moderating role of perceived vulnerability found that social media has a positive and significant effect on cognitive, emotional, and behavioral engagement. Additionally, cognitive, emotional, and behavioral engagement positively and significantly influence communication quality during COVID-19, and communication quality positively and significantly influences brand value co-creation. Perceived vulnerability was found to moderate the effect of communication quality on brand value co-creation. Azizi-Nia et al. [4], in research aimed at presenting a personalized advertising model, identified individual factors, advertisement-related factors, behavioral, motivational, and attitudinal factors, as well as social and environmental factors, market management, and cost–benefit analysis as influential components in shaping personalized advertising models.

2.4 Research gap

A review of previous studies shows that although the relationship between user engagement and adaptive advertising has been addressed, no model has yet been presented regarding user engagement through adaptive advertising. Therefore, this study provides valuable knowledge and insight into user engagement and the importance of adaptive advertising, making it a novel and innovative topic.

3 Methods

The present study is a type of fundamental research with an inductive approach. In terms of purpose, it is categorized as exploratory research, and in terms of outcomes, it is considered developmental–applied. On the one hand, the study aims to propose a model for user interaction through the use of adaptive advertising; therefore, it is developmental. On the other hand, its findings can be utilized by business owners, marketers, advertising providers, and researchers in the field of marketing management, which makes it applied in nature.

Accordingly, the present study was conducted using a qualitative approach (thematic analysis). The data required to identify the components and dimensions of each variable were collected through the analysis and review of texts, articles, and concepts related to user interaction and adaptive advertising, as well as through in-depth semi-structured interviews with experts relevant to the research field. These experts included 15 individuals consisting of university faculty members, managers, and senior specialists in the areas of digital marketing, data science, and user behavior analysis.

Subsequently, the collected data were analyzed using the thematic analysis method. In this method, the data were first subjected to initial coding and then analyzed by grouping the codes into main concepts. To enhance the credibility of the findings, repeated coding by two researchers, documentation of the analysis process, and review of the interviews were employed. In the present study, thematic analysis and the mapping of the thematic network were carried out in three stages and six steps, as illustrated in Figure (1).

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Fig. 1 The Process of implementing the thematic analysis method in the study

The present study was conducted using a qualitative approach based on thematic analysis. The required data were collected through a review of texts, articles, and concepts related to user interaction and adaptive advertising, as well as semi-structured interviews with 15 experts in digital marketing, data science, and user behavior analysis.

The choice of thematic analysis was grounded in the research objective, which sought to identify, analyze, and report patterns (themes) within the qualitative data. Unlike Delphi, which relies on iterative consensus among experts to reach a single aggregated judgment, thematic analysis allowed for a more flexible, interpretive, and in-depth exploration of the participants' diverse experiences and perspectives. This approach was deemed most appropriate for capturing the complexities of user interaction in the evolving digital advertising landscape.

4 Results

In this section, the results of the inductive thematic analysis of the data obtained from in-depth interviews with 15 prominent experts in the fields of digital marketing, data science, and user behavior analysis are presented. These experts consist of university faculty members as well as senior managers working in digital industries and information technology. The process of thematic analysis of the expert interviews is described as follows:

-Review of interview texts: In this stage, to initiate the thematic analysis, all interviews were carefully reviewed and read line by line.

-Data coding: Marking and removing irrelevant items. At this stage, the texts extracted from each interview were reviewed line by line. Accordingly, sections related to the research questions and objectives were marked, and texts lacking relevant codes were removed. Subsequently, both the marked and unmarked texts were re-examined, and new data suitable for coding were identified.

-Searching for and identifying themes: In this stage, similar codes were organized in order to form themes, and decisions were made regarding how different codes should be combined and integrated to create basic themes. Some codes were not assigned to any potential theme and were temporarily placed under the category "miscellaneous" until an appropriate position could be identified for them within specific themes if necessary.

-Re-review of sources: The basic themes and codes were reviewed and reorganized several times to reach a final conclusion. In this step, in addition to selecting preliminary names for the basic themes, the relevance of each theme to the identified codes and the research questions was also examined. Finally, some similar or overlapping themes were merged, while others were divided into two separate themes.

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-Definition and labeling of themes: The basic themes and codes were reviewed and organized multiple times to reach a final summary. In this step, in addition to selecting initial names for the basic themes, the relevance of each theme to the identified codes and the research questions was also examined. Ultimately, some similar or overlapping themes were merged, while others were divided into two separate themes. See Table 2.

Table 2 Main concepts and sub-concepts influencing user engagement in online shopping via adaptive advertising.

Basic Theme	Initial Codes	Interview Sample
User-related factors	Attitudes, preferences, and interests / User behaviors and expectations / Privacy concerns / Demographic data	Today's users have become highly knowledgeable. They expect advertisements to be relevant, but they fear intrusive and repetitive ads. Their privacy concerns are very serious. If a company wants to use users' data, it must clearly explain what information is being collected, what it will be used for, and how its security will be ensured.
Technology- and infrastructure-related factors	Technological advancements in advertising / Processing and cloud infrastructures / Augmented reality, virtual reality, and the Internet of Things	Technological advancements in advertising, especially with the emergence of artificial intelligence and machine learning, have created a major transformation. Today, advertisements can be personalized in real time. AI algorithms can analyze user behavior instantly and deliver relevant ads. This not only increases engagement but also improves return on investment.
Business marketing and advertising strategy factors	Accuracy of advertising targeting based on user needs / Diversity in advertising formats / Advertising appeal and user attention	Success in today's digital advertising depends on the diversity and flexibility of advertising formats. From video ads on social platforms to text ads on search engines and display ads on websites, each format must match users' consumption patterns and communication context. This diversity enables message delivery at the right place and time, increasing user attraction and attention.
Environmental and social factors affecting engagement	Environmental and social changes / Advertising laws and regulations / Market and competitor conditions	Economic changes such as inflation, recession, or interest rate fluctuations directly affect consumers' purchasing power and their advertising behavior. In recessionary conditions, advertising should emphasize value and savings, while in prosperous times, the focus can shift toward innovation and luxury.
Strategies for user engagement through adaptive advertising	Privacy protection and transparency / Personalization of content and user experience / Targeted advertising using modern technologies / Using modern technologies to enhance engagement and attractiveness / Using data analytics and AI to improve strategy	When using data-driven advertising, targeting accuracy must be aligned with privacy and ethical considerations. Ads should not appear suddenly or intrusively. Transparency in data usage and giving the user control over advertisements are key factors in building trust.
User interaction in online shopping through adaptive advertising	Receiving and evaluating feedback / Building a user community / Being active in user interactions	Building an active and interactive user community allows companies to maintain continuous communication with users and receive direct feedback. This interaction can occur through online forums, social networks, and in-person events. This approach increases customer loyalty and reduces the cost of

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		acquiring new customers.
Increasing user satisfaction and loyalty	Enhancing positive user experience / Providing quick and effective solutions / Delivering strong and responsive customer service	Enhancing a positive user experience is the foundation of satisfaction and loyalty. Advertising should not focus only on selling products but should provide added value to users. This value may be offered in the form of educational, entertaining, or helpful content. The more positive the user experience, the higher the likelihood of brand loyalty.
Increasing user trust in the brand	Transparency in brand communication / Ensuring product and service quality / Respecting users' rights and opinions	Ensuring the quality of products and services demonstrates the brand's commitment to value and safety. When users feel that they receive what they expect, trust in the brand increases. This trust leads not only to loyalty but also to word-of-mouth promotion."
Increasing advertising effectiveness and reducing costs	Effective after-sales services / Increasing customer retention and referral rates / Reducing unnecessary advertising costs / Return on investment	Creating direct communication channels with users enables quick and accurate feedback collection. This feedback can be used to analyze user behavior and improve advertising strategies. This leads to increased advertising effectiveness and reduced unnecessary advertising costs.
Improving communication and feedback management	Creating direct communication channels with users / Conducting surveys and collecting feedback / Analyzing feedback data for continuous improvement	Conducting surveys and collecting user feedback makes it possible to understand their needs and expectations. This information can be used to design targeted and relevant advertisements. This not only increases the effectiveness of advertising but also reduces unnecessary advertising expenses.

4.1 Reporting (final organization of themes and codes and synthesis for extracting results):

At this stage, after determining the aspects of the topic and the research framework, all codes and their related summaries were compiled. Then, to ensure the validity of the research, stages two to five of the thematic analysis were carried out again. In addition, in order to examine the accuracy and credibility of the findings, the research results were presented to five experts in a semi-structured interview so that they could provide their opinions and suggested revisions regarding the relationships and naming of the identified themes. After receiving the feedback, the basic themes were reviewed again and the experts' suggested modifications were applied.

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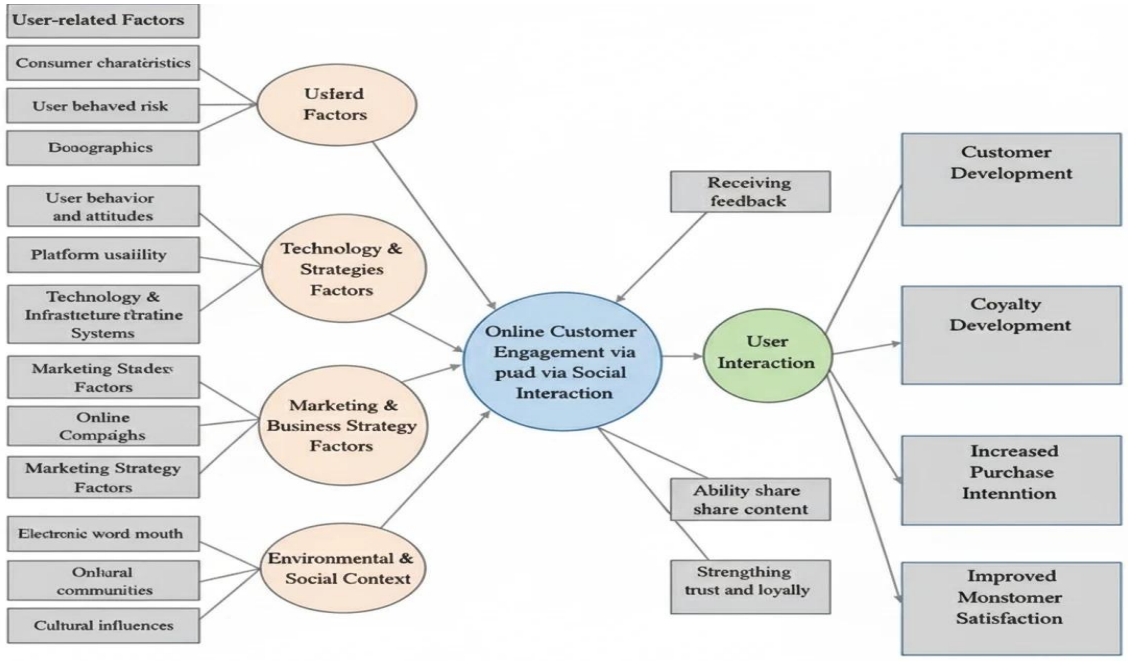


Fig. 2 The conceptual model of the research derived from the thematic analysis method

The thematic analysis of the data obtained from expert interviews outlines a conceptual framework for guiding adaptive advertising strategies. Within this framework, five key components of interaction in adaptive advertising were identified as the main drivers: users' cognitive and motivational characteristics, technological factors and user experience design, environmental and social factors influencing interaction, factors related to business marketing and advertising strategies, and strategies for engaging users through adaptive advertising.

Through the interaction of these components, evidence of several key positive outcomes was extracted, including increased user satisfaction and loyalty, strengthened user trust in the brand, improved advertising effectiveness and cost reduction, and ultimately enhanced communication management and feedback processes. These findings emphasize that the careful integration of these components is the key to success in the strategic use of adaptive advertising. The conceptual model derived from the thematic analysis approach is presented in Figure 2.

5 Discussion and conclusion

In the digital era, adaptive advertising has emerged as one of the most important tools of modern marketing, fundamentally transforming how brands interact with audiences. This shift has moved the focus from mass, one-size-fits-all advertising toward personalized experiences based on user data. However, success in this field is not limited to technology and personalization techniques alone; it also requires a deep understanding of the factors influencing the interaction between users and advertising content.

This study aims to identify and organize the key factors influencing engagement in adaptive advertising by applying thematic analysis to interview data collected from experts in digital marketing. This approach enables the development of an evidence-based conceptual

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framework that not only strengthens theoretical concepts but also provides a practical tool for designing effective advertising strategies.

Based on the analysis of the research findings, a framework consisting of four main categories of factors users, technology, advertising strategies, and environment/society has been proposed. These factors ultimately lead to the final objective: user engagement. Each of these factors is interpreted and discussed below.

User-related factors (the core of advertising success)

User-related factors include demographics, attitudes, preferences, privacy concerns, and the level of access to technology. In the interviews, experts emphasized that today's users are more aware and have higher expectations of advertising. Privacy concerns particularly regarding the collection and use of personal data represent one of the most significant barriers to creating positive engagement with advertising. For instance, one interviewee stated: *"I am afraid of personalized advertising because I feel my data are being tracked."*

This attitude indicates that users are more likely to support brands that demonstrate transparency in how they use data. Demographic factors also play an important role in determining advertising preferences; for example, younger audiences tend to engage more with video and Instagram advertising, while older generations are more receptive to text-based and email advertising. This component is closely related to trust building and strategy optimization, as brands must consider user needs and expectations when designing advertisements.

Technology and infrastructure factors (the main drivers of transformation in digital advertising)

This component includes technologies such as artificial intelligence, augmented reality, the Internet of Things, and big data analytics. Technological advancements enable more precise targeting, content personalization, interactive content creation, and campaign optimization. Experts emphasize that the use of intelligent algorithms not only increases conversion rates but also reduces advertising costs. As one expert noted: *"Artificial intelligence helps us deliver the right message to the right audience at the right time."*

Within the proposed model, this component functions as the technical foundation and enabler that makes advanced strategies possible. Without such technologies, implementing concepts such as precise targeting or content personalization would be impossible. Technology also allows for the analysis of user behavior and the delivery of relevant advertisements. This component is therefore closely linked to strategy optimization and algorithmic adaptation, as technological tools enable both the analysis and execution of advanced marketing strategies. Furthermore, big data analytics help brands evaluate campaign performance and continuously refine their strategies.

Business marketing and advertising strategy factors: content, format, and strategy

According to the findings derived from thematic analysis, advertising-related factors represent the operational and visible dimension of marketing strategy. This component includes advertising content (text, images, video), advertising formats (display advertising, search-based advertising, and social media advertising), and overall advertising strategy (targeting, budgeting, and scheduling).

Experts emphasized that successful advertising should be engaging, relevant, and informative, providing value rather than focusing solely on sales. As one expert explained: *"Advertisements should tell a story instead of simply promoting a product."*

Within the framework, this component represents the implementation stage and determines the ultimate outcome of other strategies. Without this element, even the best data and technologies cannot produce the desired impact. It also highlights the importance of

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delivering useful, non-intrusive content. This component contributes to increasing user satisfaction and advertising effectiveness by improving the user experience. Additionally, the diversity of advertising formats enables messages to be delivered at the right time and in the right context.

Environmental and social factors influencing user engagement: dynamics and uncertainty

Environmental factors refer to external conditions and market dynamics. This component includes economic conditions, legal regulations, market competition, and social and cultural trends. Experts emphasized that brands must continuously monitor these factors and adjust their strategies accordingly. As one expert stated: *"The advertising market is constantly changing, and brands must remain flexible and respond quickly to these changes."*

Analysis of this theme indicates that environmental factors function as the contextual background and challenge within the model, shaping how other components should be aligned. Ignoring these factors may result in strategies that are ineffective in real-world environments. This component is closely linked to strategic optimization and continuous adaptation to change, as the advertising environment is highly dynamic. For instance, during periods of economic hardship, users tend to respond more positively to advertisements highlighting affordable prices and special discounts. Considering environmental conditions can also increase advertising effectiveness while reducing costs.

User engagement strategies for online purchasing through adaptive advertising

User engagement strategies in online purchasing through adaptive advertising are centered on balancing advanced personalization with user trust. The core of these strategies involves safeguarding privacy and ensuring full transparency in the collection and use of data, as any breach of trust may undermine the effectiveness of personalization.

Such transparency creates the foundation for delivering highly personalized content and user experiences, allowing users to receive recommendations aligned with their purchase history, current interests, and even emotional states. Achieving this requires the strategic use of modern technologies for targeted advertising, particularly the application of artificial intelligence for deeper analytical insights.

Moreover, to increase engagement rates, innovative technologies should be used creatively to enhance interaction and attractiveness such as interactive content and augmented reality experiences. Continuous use of data analytics and artificial intelligence to dynamically refine strategies ensures that adaptive advertising models remain aligned with evolving consumer purchasing patterns.

User engagement in online purchasing through adaptive advertising

Effective engagement with users in adaptive online advertising goes beyond merely sending personalized messages; it focuses on establishing an active two-way feedback loop. Key strategies include continuously collecting and evaluating user feedback regarding received advertisements. These feedback signals both explicit and implicit are crucial for fine-tuning adaptive algorithms and improving predictive accuracy.

At the same time, building a strong user community provides a space for discussion, peer recommendations, and a sense of belonging, which indirectly enhances advertising acceptance and brand engagement. Finally, maintaining active interaction with users such as responding quickly to inquiries, managing complaints in real time, and participating in relevant conversations demonstrates a brand's commitment to listening to its customers. This strengthens trust and fosters long-term loyalty in the online shopping environment.

The findings of this research indicate that effective user engagement through adaptive advertising requires a balance among technology (AI-driven personalization), strategy

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(valuable content and storytelling), and environmental factors (flexibility and adaptability). Transparency in protecting user privacy is the key to building trust and sustaining engagement. Success in this domain requires a comprehensive approach and strategic alignment aimed at meeting the expectations of the digital audience. In other words, effective adaptive advertising depends on strategic alignment, investment in transparency, and the delivery of engaging content that respects user privacy while fostering sustainable user engagement.

Overall, this study shows that effective user interaction through adaptive advertising depends on the simultaneous alignment of user characteristics, technological capabilities, advertising strategies, and environmental conditions. The findings suggest that adaptive advertising is most effective when it is perceived as relevant, transparent, and valuable rather than intrusive or overly commercial. Accordingly, privacy protection, personalized content, interactive design, and continuous data-driven optimization should be treated as complementary rather than separate elements of advertising strategy.

The study also offers practical implications for digital marketers and business managers. To strengthen engagement, organizations should design adaptive advertising systems that respect user privacy, communicate clearly how data are used, and provide content that is contextually meaningful and behaviorally relevant. In addition, the use of AI, data analytics, and interactive technologies can improve targeting precision and campaign performance, but only when these tools are applied in a responsible and user-centered manner.

This study has some limitations. First, the model was developed through qualitative analysis and expert interviews, so its generalizability should be tested in different industries and user groups. Second, the present research focuses on the Iranian context, and future studies may compare the model across countries or cultural settings. Third, future research could validate the proposed framework using quantitative methods such as structural equation modeling and examine the relative importance of each dimension in predicting engagement outcomes.

Furthermore, adaptive advertising should be understood not merely as a technological tool but as a strategic and relational process that builds trust, supports meaningful interaction, and enhances long-term user engagement.

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