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Designing a Data-Driven Model of Mobile Marketing in Iran with an Emphasis on Decision-Making Information on Purchasing Behavior

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ABSTRACT

Due to the increasing exchange of information and data through the use of cell phones, this research aims to design a data-driven model of mobile marketing in Iran. The focus is on decision-making information related to purchasing behavior. By studying customers' decision-making information, businesses can collectively form antecedents that enable them to predict customers' behaviors and reactions. A mixed exploratory methodology (qualitative-quantitative) was used to collect and analyze the research data. For this purpose, the qualitative phase utilized the theme analysis method, while the quantitative phase employed the fuzzy Delphi and fuzzy hierarchical analysis methods.

Therefore, it was determined that the mobile marketing model, based on decision-making information of purchasing behavior, includes 98 indicators, 18 components, and four general categories (dimensions) of influencing factors. These categories are decision-making styles, individual factors, social factors, and technical factors.

The results of the quantitative phase showed that the most important factors in decision-making, from the customer's perspective, were sensitivity to price and value of goods, social pressures, user concerns and worries, and utilitarian factors related to the message. Mobile marketing can be effective among Iranian users and consumers when it aligns with the various aspects of consumer purchasing behavior decision-making information and enhances perceptions. It instilled a desire in people to prioritize safety and usefulness in their field. **©authors**

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1. Introduction

Understanding the purchase decision process of customers involves analyzing data and information related to them. Contrary to its initial uses, the mobile phone has evolved into a multifunctional tool with various capabilities and customer behavior databases (Guerrero-Velástegui et al., 2023). Over the past few decades, the definition of "mobile" has expanded to encompass a diverse array of portable devices and tools, including tablets, wearables, and smart speakers, as well as mobile services like applications and virtual assistants (Fürst). et al., 2023). Accordingly, the mobile phone has revolutionized the way customers and marketers interact. Its diverse and expanding information capabilities have caught the attention of marketers as a powerful tool for advertising and promotions (Munawar et al., 2022). Statistics show that the exchange of financial information through mobile marketing has exceeded billion in recent years. Furthermore, it is projected that by 2025, approximately sixty percent of the global population will possess at least one smart mobile device. (Tong et al., 2020).

According to the definitions, mobile marketing refers to the distribution and publication of messages or advertisements that provide value to customers based on the analysis of their behavior and needs assessment, ultimately leading to increased business income (Bernritter et al., 2022). Also, this concept refers to the utilization of wireless media to deliver customized information to customers, without any limitations of time and location, in order to promote goods, services, and ideas, and ultimately benefit all stakeholders (Akhtartale, 2014).

According to Gao (2010), marketing and business managers are increasingly recognizing mobile as an appealing tool for interacting with consumers through various forms of marketing communication. In the last decade, there has been an increase in data analysis approaches, which has led to higher expectations for the growth of mobile advertising and marketing (Bentley et al., 2015).

Mobile marketing is a form of marketing that allows for the closest means of communication with the target customer. Mobile marketing, based on transparent data analysis and accurate information related to customer behavior, can help develop and promote products, services, and managers' ideas effectively. Out of the 4 billion mobile phones being used worldwide, 1.8 billion of them are smartphones capable of connecting to the Internet.

The capabilities of smartphones, which record customer behavior information on the Internet, allow marketers to employ various strategies in the field of marketing communications (Shin et al., 2020).

On the other hand, when designing a marketing plan and strategy, it is crucial to conduct a thorough assessment based on accurate information. Paying attention to the behavioral and personality characteristics of the target market is of undeniable importance in this process (Zolloa et al., 2020). Consumer decision-making information is a cognitive inclination that characterizes the consumer's inclination towards making a choice. Each consumer has a relatively stable purchase personality that can be predicted using methods such as data recording (Weng et al., 2018). Different decision-making styles determine the consumer's approach to the purchase process. For example, an individual's approach to searching for information shapes their evaluation and choice, ultimately influencing their buying behavior. The information and data on consumer decision-making are crucial tools for marketers to select the appropriate market segments. In other words, accurately segmenting markets and effectively implementing marketing programs for specific market segments is one of the most important strategies for success in competitive markets that rely on data processing (Mansouri Muayed et al., 2017). Therefore, when establishing and choosing a marketing strategy, it is highly important to pay attention to the decision-making information of consumers. The integration of marketing tools and consumer decision-making data facilitates the acceptance of

purchasing a product or service. This is because decision-making information includes details about an individual's behavior towards a brand and its marketing activities. The sale of products and consumer performance can be influenced by this information (Aydin et al., 2022). According to the materials mentioned, the current research aims to address the following questions:

- What is the data-oriented model of mobile marketing in Iran, with a focus on decision-making information regarding the purchasing behavior of young consumers?
- What are the factors that affect the data-driven model of mobile marketing in Iran, with a focus on the decision-making information of young consumers' purchasing behavior?

2. Literature Review

Mobile Marketing

The expansion of the Internet and a changing business environment have given rise to a form of marketing known as electronic marketing (Yin et al., 2019; Jan et al., 2022). The widespread availability of mobile phones in the early 21st century, coupled with the invention and popularity of large-screen phones and the rapid expansion of high-speed internet worldwide, has paved the way for a new form of marketing known as mobile marketing (Sharma, 2022). Marketing based on the daily exchange of mobile information has brought great prosperity to businesses. This process achieved greater speed by utilizing mobile information processing applications in marketing activities. Currently, mobile marketing platforms have increased interactions and business communication between customers and marketers, making them an important distribution channel in marketing. The emergence of advanced mobile phone technology has increased business opportunities and enabled marketers and customers to stay connected regardless of time and location limitations (Eze et al., 2020). Thus, due to the data-oriented features of smartphones, mobile marketing has found a unique place in business marketing measures (Singh, 2019).

Mobile marketing has emerged as a prominent and successful strategy by focusing on personalized information delivery. In other words, marketers can create personalized content through mobile phone channels such as text messages, applications, and notifications, using precise location, time, and environmental data. and provide communication with their customers (Wang & Lee, 2020). In the era of the influx of various data-driven marketing strategies, marketers have utilized traditional marketing channels such as television and newspapers with various advertising tactics. However, with the emergence of the Internet, marketers now have a more powerful tool that allows them to segment their consumers based on their online behavior (Belanche et al., 2019). In addition, the widespread use of mobile phones has enabled marketers to gather precise data on consumer behavior and their surroundings through the GPS, accelerometer, sensors, and gyroscope features of these devices. This detailed information has enabled marketers to enhance their pricing and sales strategies, allowing them to present their offerings more accurately and personally to users (Berman, 2016). Mobile channels and services, such as applications, mobile-responsive websites, and media and social networks, have advanced the interactive capabilities of mobile phones. This has also increased the level of engagement between customers and businesses (Maduku, 2021). In addition, marketers can determine the locations where consumers use their mobile phones through the location feature. What time are they looking to purchase products? How do they search for information to make a purchase? Are they alone or with someone else when using a mobile phone? Marketers can accurately predict consumer behavior using data obtained from mobile phones and artificial intelligence algorithms (Florido-Benítez, 2022). In this way, the probability of the effectiveness of mobile marketing measures can be significantly higher than the measures taken on one-way platforms such as television (Münzel et al., 2018).

Consumer Decision-Making Information

Today, passing the paradigm of mass production, consumer information plays an essential role in achieving the economic success of brands (Kumar et al., 2017). Therefore, consumer information is considered a major factor in stagnation or streamlining all commercial activities in societies. Therefore, the key point in the success of the marketing strategy, both locally and internationally, is to understand consumer behavior (Alavi et al., 2016). According to the findings of Erasmus et al. (2001), in general, a consumer goes through 5 stages until making a decision to buy and records his information. Of course, some purchases are so important that they force the consumer to do all these steps with great care and obsession (Erikson et al., 2017). To create the model, Sproles & Kendall (1986) focused on three different approaches based on the history of studies conducted in this field. These approaches are powerful components in determining the decision related to purchasing a product (Prakash et al., 2018). Based on these approaches, the three key factors shaping the consumer's purchase decision-making process include the consumer's personality traits, typology, and lifestyle (Sarkar et al., 2020).

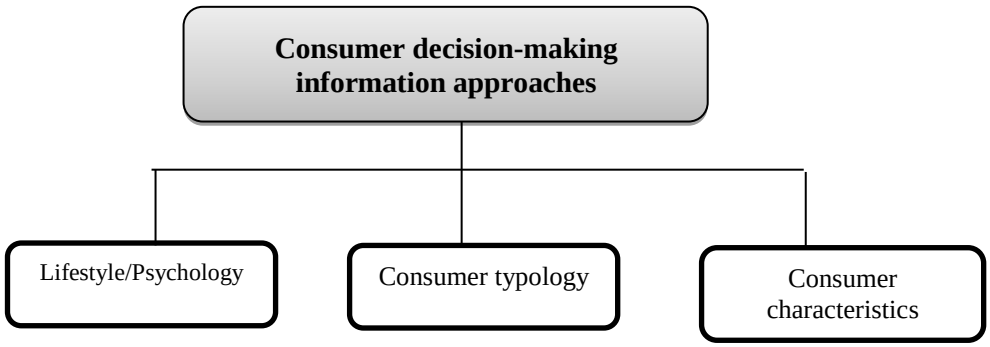

Figure 1. *Consumer decision-making information approaches (Prakash et al., 2019)*

The historical review of studies in mobile marketing, including its dimensions, components, factors affecting it, and consequences, reveals that this field of study has been gaining increasing attention from researchers. Available statistics indicate that the focus on mobile marketing is expanding. Mohammadi (2019) introduced mobile marketing as an effective process in Iran for marketing and increasing customer purchase intention. Mishra et al. (2021) confirmed the essential role of mobile-based social media in consumer decision-making. John et al. (2022) introduced mobile marketing as an effective method for enhancing the efficiency of sales techniques. Homburg & Wielgos (2022) identified mobile marketing as a significant tool in digital marketing due to its ability to provide easy access to information. Despite the wide range of studies in the field of antecedents that influence consumer behavior and behavioral reactions towards mobile marketing and similar platforms, such as digital marketing, there is a noticeable gap in current research. This gap pertains to the lack of comprehensive studies on the various factors that affect the field of mobile marketing, specifically focusing on the role of consumer decision-making style among young customers. Therefore, on one hand, there is a need to expand the knowledge base in this area, as evident from the identified gap. On the other hand, the study scope of the current research is focused on up-to-date and highly interesting topics for researchers. Based on the investigations conducted and the analysis of research literature, it can be concluded that there is a strong need to develop knowledge in the field of mobile marketing. This need is particularly pronounced in Iran, where domestic research in this field is extremely limited.

3. Methodology

The current research uses a mixed method to address its problem. In other words, this study utilizes a combination of quantitative and qualitative data to accomplish the research objectives.

The current research is considered practical and developmental in nature. The current study is considered a cross-sectional study in terms of its time period. Finally, the tools and methods used for data collection in

this study are based on semi-structured interview protocols and standard survey forms that are relevant to fuzzy Delphi methods and the fuzzy hierarchical analysis process. Figure 3 describes the steps of the research. The analysis tool used in the qualitative part of the research is thematic analysis. In summary, the steps of this method are as follows (Guest et al., 2011).

- Primary (open) coding is used to extract the most important data, signs, and patterns from the interview texts. It helps determine the key clauses and provide basic explanations.

- Reviewing, adjusting, categorizing, and clustering the extracted open codes to identify the main themes of the research.

- Categorizing or clustering the extracted main themes to achieve the organizational themes of the research;

Categorizing or clustering the extracted organizing themes to achieve comprehensive themes for the research.

In the present study, these steps have been carried out consistently and under the supervision of research experts. Also, in the quantitative step of the research and in line with data analysis, fuzzy Delphi approaches and fuzzy hierarchical analysis processes were used. These two approaches are briefly introduced below. The steps of this method are as follows (Jassbi et al., 2015).

The first step in collecting experts' opinions is to ask them to provide their fuzzy scores, based on Table (1), regarding the desirability and appropriateness of each advantage derived from the research literature. These scores are assigned to each advantage derived from the literature.

Table 1. *Fuzzy values and verbal expressions in the fuzzy Delphi method*

Verbal phrases	**Fuzzy values**
Totally inappropriate	(0.1, 0, 0)
Inappropriate	(0.3, 0.1, 0)
A little inappropriate	(0.5, 0.3, 0.1)
in between	(0.7, 0.5, 0.3)
slightly suitable	(0.9, 0.7, 0.5)
Appropriate	(1, 0.9, 0.7)
Perfectly fit	(1, 1, 0.9)

The third step in summarizing experts' opinions involved using the arithmetic mean approach in the present study, which was necessary because there were zero values in the fuzzy numbers. The formula used to calculate the arithmetic mean of fuzzy numbers in the fuzzy Delphi method section of the present study is as follows (Zhang, 2017):

(1)

$$a_{ij\,1} = min\{a^{1}_{ij\,1}, a^{2}_{ij\,1}, \dots, a^{K}_{ij\,1}\},$$
$$a_{ij\,2} = \frac{\sum_{ij=1}^{n} a_{ij2}}{n},$$
$$a_{ij\,3} = max\{a^{1}_{ij\,3}, a^{2}_{ij\,3}, \dots, a^{K}_{ij\,3}\}$$

The third step of de-fuzzifying fuzzy aggregated comments involves assuming that = (a,b,c) represents a triangular fuzzy number. In this step, the following formula is used (Gou and Zhao, 2017):

:

(2)

$$V = \frac{a + 4b + c}{6}$$

The fourth step of screening indicators involves applying a threshold limit. This step aims to eliminate less significant indicators and select the most important ones. To achieve this objective, a threshold limit is utilized, and indicators with numbers lower than this threshold limit are eliminated. In this study, the maximum threshold limit is 0.8. Also, in this study, the hierarchical analysis process method was implemented using the developmental analysis approach provided by Chang (1996).

Consider two triangular fuzzy numbers $\widetilde{M}_1$=(l_1,m_1,u_1) and $\widetilde{M}_2$=(l_2,m_2,u_2); ***Step one***: For each row of the matrix of pairwise comparisons, the value, which is a triangular fuzzy number, is calculated as follows:

(3)

$$\tilde{S}_k = \sum_{j=1}^{n} \tilde{M}_{kj} \otimes \left[\sum_{i=1}^{m} \sum_{j=1}^{n} \tilde{M}_{ij} \right]^{-1}$$

where k represents the line number and i and j represent the options and indicators, respectively.

Step two: After calculating the $\tilde{S}_k$, their relative magnitude should be obtained. In general, if $\tilde{M}_1$and $\tilde{M}_2$ are two triangular fuzzy numbers, the degree of magnitude of $\tilde{M}_1$ over $\tilde{M}_2$ which is indicated by the symbol, is defined as the following relationship. This conditional equation is also known as the degree of feasibility:

(4)

$$V(\tilde{M}_i \geq \tilde{M}_j) = \begin{cases} 1 & if\ m_i \geq m_j \\ \dfrac{u_i - l_j}{(u_i - m_i) + (m_j - l_j)} & if\ l_j \leq u_i \\ 0 & otherwise \end{cases}$$

The magnitude of a triangular fuzzy number from k other triangular fuzzy numbers is obtained from the following equation:

(5)

$$V(\tilde{M}_1 \geq \tilde{M}_2 \geq \cdots \geq \tilde{M}_K) = V(\tilde{M}_1 \geq \tilde{M}_2), \ldots, V(\tilde{M}_1 \geq \tilde{M}_K)$$

To calculate the weights of indicators in the matrix of pairwise comparisons, we use the following relationship:

(6)

$$W'(x_i) = Min\{V(S_i \geq S_k)\} \qquad k = 1,2,\ldots,n. \quad k \neq i$$

Therefore, the weight vector of the indicators will be as follows:

(12)

$$W'(x_i) = \left[W'(c_1), W'(c_2), \ldots, W'(c_n)\right]^T$$

which is the vector of non-normal coefficients of the fuzzy hierarchical analysis process. With the help of the following relationship, the obtained non-normal results are normalized and form the non-phase weights vector W.

(8)

$$W_j = \frac{W_j'}{\sum W_j'}$$

4. Findings

Qualitative Analysis

In this research, during the qualitative phase, the method of theme analysis was employed to uncover the underlying themes in the interview texts related to the elements that constitute the indicators (factors influencing) mobile marketing in Iran. This analysis was conducted using MAXQDA software. Thematic analysis is a method used to identify, analyze, and report patterns in qualitative data (Kiger & Varpio, 2017). Based on the results, a total of 111 open codes with a frequency of 279 occurrences were extracted. In the next stage, the main themes were grouped into a new category called organizing themes, based on their fundamental and semantic similarities or their internal connections. The new classification, based on the opinions of the experts, was reviewed, adjusted, and necessary changes were made to place each main theme in the appropriate category. This process continued until the final organizing themes were formed. In the following, the organizing themes were categorized, and the overarching themes were formed. For this purpose, if it is possible to create a new categorization, the topics of the organizer are classified based on their gender and similar characteristics. In this way, comprehensive themes were also formed based on the classification and organization of themes. It should be noted that the categories were finalized based on the opinions of the expert panel members. In Table 6, the main themes, organizing themes, and overarching themes extracted from open codes in the field of shaping elements that influence consumers' behaviors and reactions towards mobile marketing are introduced.

Table 2. *Final classification of factors*

Overarching themes	Organizing themes	Main themes
Purchase decision information	Idealism and sensitivity to the quality of goods	Focus on the information provided
		Sensitivity to the transparency of the message
		Sensitivity to message-shaping elements
		Sensitivity to content quality
	The desire to buy without prior planning and intention	Ready to accept offers immediately
		Pursuit for instant arousal
		Pursuing a wide range of products
		View various purchase offers
	Focus on hedonism and having fun	Seeking pleasure and happiness
		Fun in advertising
		The pleasure-centeredness of one's involvement
		Focused on pleasure and excitement
	Sensitive on the brand name	The importance of being famous for a brand for an individual
		Focus on the brand instead of the quality of the message
		Interest in the messages of unfamiliar brands
	Sensitive to the new and up-to-dateness of the product	Importance of product advantages over other competitors
		High level of knowledge and awareness of products
		High power of comparison
		Focused on information on product innovations
		Focused on message innovations
	Sensitivity to the price and value of goods	Value-oriented product reviews
		Follow up on product discounts
		Follow up on product related gifts
		Attention to offers and suggestions
	Confusion due to high choices	Continuously updating knowledge
		Focus on information acquisition
		Trying to identify correct information from false information
		Strong interest in transparent information
		Strong interest in easy to understand information
	Habituation and long-term loyalty	Low risk tolerance
		High level of conservatism
		Not switching brands for the long term
		tend to depend on a brand
Social factors	-	Social influences (pressures).
		Recommendations of relatives and friends
		The degree of influence of the person on others
Individual factors	User perceptions	perceived value
		Perceived complexity
		Perceived attractiveness
		Perceived benevolence
		Perceived risk
		Perceived compatibility
		Perceived entertainment
		Perceived usefulness
		Perceived honesty
		Perceived pleasure
		Perceived comparative advantages
		Feeling unique
	Beliefs and feelings of users	User trust in the brand
		Emotional links with the brand
		Reliability measures
		Attitude towards advertising
	Cognitive and experiential factors of users	User performance expectations
		Previous user experiences
		The level of knowledge and awareness of the user
	Worries and concerns	Compulsion to provide personal information
		being annoying
		Security concerns
		Violation of privacy
	Personality traits and habits	The level of extroversion and introversion
		The level of neuroticism of the user
		User's risk tolerance level
		Work protection level
		The level of individual innovation
		The amount of daily use of the phone
Technical factors	Effectiveness strategies and measures	Using up-to-date methods
		Event-driven actions

Overarching themes	Organizing themes	Main themes
		Location-based actions
		Compatibility with the technical characteristics of the phone
		Production of quality content
		Personalize actions
		Do not overdo it in sending messages
		The desirability of sending messages
		Targeting the message
		Existence of engaging incentives
	Meeting basic needs	Providing interactive needs between the customer and the brand
		Providing customer information needs
		Focus on real customer needs
	Demographic and individual factors	Attention to demographic diversity of target customers
		Attention to the gender of the audience
		Attention to the age group of the audience
		Identifying the buying decision style of customers
		Designing actions covering different styles
		Coordination with customers' lifestyles
		Coordination with the client's mental tendencies
	Utilitarian factors related to the message (from the customer's point of view)	Being an informant
		Match the message with the capabilities of the brand
		to be comprehensive
		The brevity of the message
		to be transparent
	Hedonic factors related to the message (from the customer's point of view)	Use of symbolism
		Making the user feel good
		Stimulate the sense of pleasure
		Attracting the attention of the audience
		Message creativity
		The fun of the message
		Being uncomplicated
		User-friendliness of message design

As shown in Table 6, the factors affecting consumer behavior and reactions towards mobile marketing can be classified into four overarching themes or general dimensions. These include social factors, individual factors, decision-making styles, and technical factors. These overarching themes include 18 organizing themes and 98 main themes or indicators. Additionally, the results obtained in terms of indicator frequency showed that the five indicators with the highest frequency among the identified indicators are the existence of engaging incentives, the possibility of privacy violation, the user's previous experiences, the perceived value, and the message's fun factor. In addition, based on the obtained results, the dimensions of purchase decision-making styles include 33 indicators, social factors include 3 indicators, individual factors include 29 indicators, and finally, the dimension of technical factors includes 33 indicators. Kendall's coefficient is 0.877, and it has been confirmed.

Quantitative Analysis

As shown in Table 5, these factors were classified into four general categories. However, the quantitative phase of the current research includes measures to address the second research question.

The Analytic Hierarchy Process (AHP) is a decision-making technique that helps prioritize and compare alternatives based on a set of criteria. If you want to implement a fuzzy version of AHP in Excel, you can utilize a combination of fuzzy logic and mathematical formulas. Here is a step-by-step guide on how to create a fuzzy AHP formula in Excel.

Step 1: Set up your AHP hierarchy. Create a table in Excel that represents the hierarchy of criteria and alternatives. Typically, you will have a matrix where the rows represent the criteria, the columns represent the alternatives, and the cells contain the pairwise comparison values.

Step 2: Define fuzzy linguistic terms. Assign fuzzy linguistic terms to represent the comparison values. For example, you can use terms such as "Very Low," "Low," "Medium," "High," and "Very High" to

indicate the relative importance of criteria or the performance of alternatives.

Step 3: Convert fuzzy terms to numerical values. Assign numerical values to the fuzzy linguistic terms. You can use a scale of 1 to 9, where 1 represents the lowest value and 9 represents the highest value. Assign appropriate values to each fuzzy term based on their relative importance or performance.

Step 4: Calculate the fuzzy comparison matrix. Create a matrix that represents the pairwise comparison values using the assigned numerical values from step 3. Multiply the assigned values of the fuzzy terms for each criterion and alternative to obtain the fuzzy comparison matrix.

Step 5: Calculate the weighted sum You can use the SUMPRODUCT function in Excel to perform this calculation.

Step 6: Normalize the weighted sum. Normalize the weighted sum values by dividing each value by the sum of all weighted sum values. This step ensures that the values are within the range of 0 to 1 and represents the final fuzzy AHP scores.

Implementing fuzzy AHP in Excel can be complex, and it may require advanced formulas and VBA programming, depending on the level of fuzziness you want to incorporate. Consider utilizing third-party add-ons or specialized software that offer fuzzy logic functionality for smoother implementation.

Remember to keep in mind that the steps mentioned above serve as a general framework for implementing fuzzy AHP in Excel. However, it is important to note that you may need to modify these steps to suit your specific requirements and data structure.

This step was based on the results of a qualitative approach, fuzzy Delphi methods, and a fuzzy hierarchical analysis process. Table 3 refers to the final output of the fuzzy Delphi method.

Table 3. Key indicators affecting mobile marketing from the perspective of experts

Dimensions	Components	Indicators	Non-fuzzy weights
Purchase decision information	Idealism and sensitivity to the quality of goods	Focus on the information provided	0.843
		Sensitivity to the transparency of the message	0.81
		Sensitivity to message-shaping elements	0.81
		Sensitivity to content quality	0.856
	The desire to buy without prior planning and intention	Ready to accept offers immediately	0.83
		Pursuit for instant arousal	0.843
		Pursuing a wide range of products	0.803
		View various purchase offers	0.836
	Focus on hedonism and having fun	Seeking pleasure and happiness	0.816
		Fun in advertising	0.816
		The pleasure-centeredness of one's involvement	0.816
		Focused on pleasure and excitement	0.836
	Sensitive on the brand name	The importance of being famous for a brand for an individual	0.803
		Focus on the brand instead of the quality of the message	0.91
		Interest in the messages of unfamiliar brands	0.863
	Sensitive to the new and up-to-dateness of the product	Importance of product advantages over other competitors	0.816
		High level of knowledge and awareness of products	0.823

Dimensions	Components	Indicators	Non-fuzzy weights
		Focused on information on product innovations	0.843
		Focused on message innovations	0.803
	Sensitivity to the price and value of goods	Value-oriented product reviews	0.85
		Follow up on product discounts	0.83
		Follow up on product related gifts	0.816
		Attention to offers and suggestions	0.81
	Confusion due to high choices	Continuously updating knowledge	0.816
		Focus on information acquisition	0.803
		Trying to identify correct information from false information	0.85
		Strong interest in easy to understand information	0.823
	Habituation and long-term loyalty	Low risk tolerance	0.836
		High level of conservatism	0.803
		tend to depend on a brand	0.85
social factors	-	Social influences (pressures).	0.863
		Recommendations of relatives and friends	0.81
		The degree of influence of the person on others	0.843
Individual factors	User perceptions	perceived value	0.81
		Perceived attractiveness	0.836
		Perceived risk	0.856
		Perceived usefulness	0.816
		Perceived pleasure	0.863
		Perceived comparative advantages	0.823
	Beliefs and feelings of users	User trust in the brand	0.85
		Emotional links with the brand	0.81
		Reliability measures	0.85
		Attitude towards advertising	0.803
	Cognitive and experiential factors of users	User performance expectations	0.823
		Previous user experiences	0.81
		The level of knowledge and awareness of the user	0.823
	Worries and concerns	Compulsion to provide personal information	0.816
		being annoying	0.823
		Security concerns	0.803
		Violation of privacy	0.843
	Personality traits and habits	The level of extroversion and introversion	0.81
		User's risk tolerance level	0.816
		Work protection level	0.85
		The level of individual innovation	0.85
		The amount of daily use of the phone	0.816
Technical factors	Effectiveness strategies and measures	Using up-to-date methods	0.816
		Compatibility with the technical characteristics of the phone	0.803
		Production of quality content	0.85
		Personalize actions	0.85
		Do not overdo it in sending	0.81

Dimensions	Components	Indicators	Non-fuzzy weights
		messages	
		Targeting the message	0.816
	Meeting basic needs	Providing interactive needs between the customer and the brand	0.803
		Providing customer information needs	0.85
		Focus on real customer needs	0.816
	Demographic and individual factors	Attention to demographic diversity of target customers	0.85
		Attention to the gender of the audience	0.85
		Attention to the age group of the audience	0.816
		Identifying the buying decision style of customers	0.816
		Designing actions covering different styles	0.823
	Utilitarian factors related to the message (from the customer's point of view)	Being an informant	0.843
		Match the message with the capabilities of the brand	0.803
		to be comprehensive	0.863
		The brevity of the message	0.83
		to be transparent	0.916
		Making the user feel good	0.823
		Stimulate the sense of pleasure	0.816
		Attracting the attention of the audience	0.83
		Message creativity	0.803
		Being uncomplicated	0.85
		User-friendliness of message design	0.823

Then, these 80 indicators in the four general dimensions of the research were weighted using the fuzzy hierarchical analysis process to determine the relative importance of each indicator within each dimension. Due to the extensive nature of the tables containing the results of the hierarchical analysis process method, Table 4 presents the key components and indicators that have been identified as the most significant and crucial through the implementation of this method.

Table 4. The most important components of research dimensions

Dimension	Components	Weight	Indicators	Relative weight	Final weight
Individual	Worries and concerns	0.219	Compulsion to provide personal information	0.2633	0.0576
			being annoying	2365/0 z	0.0517
			Security concerns	0.2525	0.0552
			Violation of privacy	0.2475	0.0542
Social	-	-	Social influences (pressures).	-	0.3684
			Recommendations of relatives and friends	-	0.3305
			The degree of influence of the person on others	-	0.3009
Technical	Utilitarian factors related to the message (from the customer's point of view)	0.2252	Being an informant	0.183	0.0412
			Match the message with the capabilities of the brand	0.1565	0.0352

			to be comprehensive	0.2276	0.0512
			The brevity of the message	0.2332	0.0525
			to be transparent	0.1995	0.0449

Also, in this study, there was a special emphasis on the decision-making styles of consumers. The qualitative phase in this section focused on identifying the specific indicators of young customers, which were categorized into eight components. Therefore, the results of implementing the steps of the hierarchical analysis process to determine the importance weights of the indicators and components of the decision-making style dimension of young consumers are presented in a separate tabular format (Table 5).

Table 5. Importance weights of indicators and components related to the dimension of decision-making styles of young consumers

Components	Weight	Indicators	Relative weight	Final weight
Idealism and sensitivity to the quality of goods	0.1182	Focus on the information provided	0.2555	0.0302
		Sensitivity to the transparency of the message	0.2597	0.0306
		Sensitivity to message-shaping elements	0.2565	0.0303
		Sensitivity to content quality	0.2282	0.0269
The desire to buy without prior planning and intention	0.1239	Ready to accept offers immediately	0.2099	0.026
		Pursuit for instant arousal	0.2369	0.0293
		Pursuing a wide range of products	0.2911	0.036
		View various purchase offers	0.2619	0.0324
Focus on hedonism and having fun	0.1218	Seeking pleasure and happiness	0.1991	0.0242
		Fun in advertising	0.2513	0.0306
		The pleasure-centeredness of one's involvement	0.3092	0.0376
		Focused on pleasure and excitement	0.2403	0.0292
Sensitive on the brand name	0.1199	The importance of being famous for a brand for an individual	0.3652	0.0437
		Focus on the brand instead of the quality of the message	0.3341	0.040
		Interest in the messages of unfamiliar brands	0.3006	0.036
Sensitive to the new and up-to-dateness of the product	0.1258	Importance of product advantages over other competitors	0.2421	0.0304
		High level of knowledge and awareness of products	0.2245	0.0282
		Focused on information on product innovations	0.2671	0.0336
		Focused on message innovations	0.2661	0.0334
Sensitivity to the price and value of goods	0.1324	Value-oriented product reviews	0.267	0.0353
		Follow up on product discounts	0.2191	0.029
		Follow up on product related gifts	0.215	0.0284
		Attention to offers and suggestions	0.2987	0.0395
Confusion due to high choices	0.1274	Continuously updating knowledge	0.243	0.0309
		Focus on information acquisition	0.233	0.0296
		Trying to identify correct information from false information	0.2405	0.0306
		Strong interest in easy to understand information	0.2833	0.0360
Habituation and long-term loyalty	0.1305	Low risk tolerance	0.3251	0.0424
		High level of conservatism	0.2529	0.033
		tend to depend on a brand	0.4219	0.055

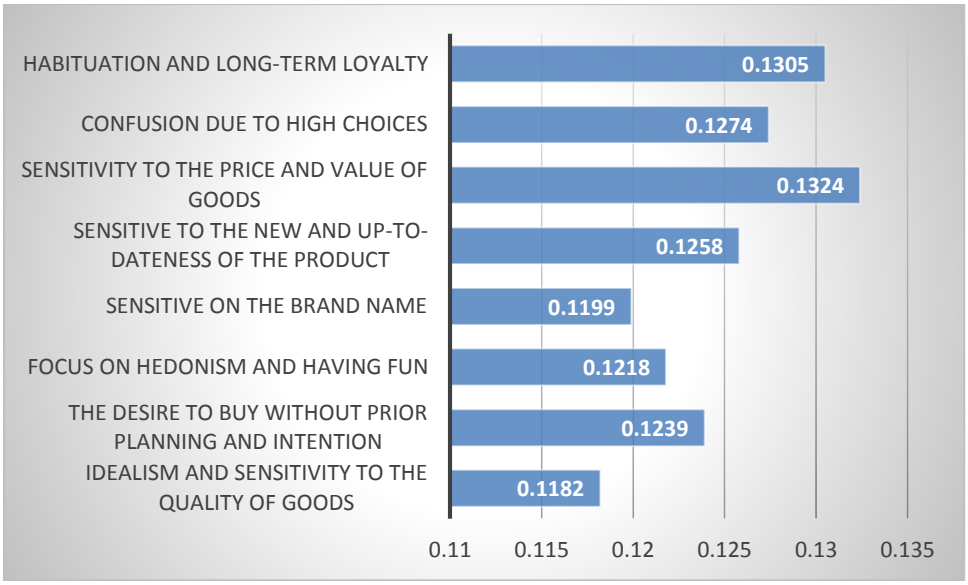

Fig1. *Importance weights of indicators and components related to the dimension of decision-making styles of young consumers*

Based on the obtained results, the most important and effective decision-making style of young consumers in influencing their behavior and reactions towards mobile marketing actions of businesses is the style of sensitivity to price and value. Goods were identified as the most important and heaviest decision-making style among the eight styles. In more detail, three indicators of the tendency to rely on a brand are the individual's perception of the brand's fame, their level of risk aversion, and their decision-making style. These indicators heavily influence the behaviors and reactions of young consumers towards mobile marketing actions taken by businesses.

5. Discussion

The present study aims to propose a data-driven model of mobile marketing in Iran, with a focus on the decision-making process and information influencing consumers' purchasing behavior. In this study, the researcher aimed to identify the factors that can influence consumers' behaviors and reactions towards mobile marketing actions of businesses, in addition to the decision-making information of their purchasing behavior. In this research, the collected data were analyzed using thematic analysis, fuzzy Delphi, and fuzzy hierarchical analysis methods. The qualitative phase involved semi-structured interviews, while the quantitative phase utilized standard questionnaires. On one hand, the influencing factors on mobile marketing were identified by emphasizing and relying on the leadership style of customers. On the other hand, these factors were refined and weighted to determine which one has the most impact on mobile marketing. Based on the obtained results, these factors can be classified into five general dimensions, 18 components, and 98 different indicators. These 98 indicators were reduced to 80 indicators during the quantitative phase. The screening process, which utilized the fuzzy Delphi method, determined the importance of each indicator within its respective dimension through weighting. Based on the results, the researcher concludes that effective mobile marketing is not only dependent on technical and specialized factors in the field of marketing, but also highly influenced by personal, internal, and social factors surrounding the user.

The results of the qualitative phase of the research (Table 6) showed that the mobile marketing indicators, based on the consumer information considered, can be classified into 18 components and four general dimensions. In this study, interviews were conducted with experts in the field of mobile and electronic marketing in manufacturing and industrial companies, as well as marketing and branding consulting companies. The analysis of these interviews revealed changes in the elements that shape the indicators (factors affecting) of mobile marketing in Iran. These changes can be categorized into four general dimensions, which represent the most important indicators of mobile marketing in Iran. It is classified into social, technical, and individual factors that influence purchase decision-making information. According to expert opinions and the results obtained, no specific index related to social factors has been identified in this field. However, three important and influential components on mobile marketing in Iran have been identified. Another category is related to technical factors, which also includes five main and important criteria. These criteria include strategies and effectiveness measures, meeting basic needs, demographic and individual factors, and utilitarian factors related to the message from the customer's point of view. And hedonic factors related to the message (from the customer's point of view) (Matke et al., 2021).

The third classification is related to individual factors, which also consist of various elements such as users' beliefs, beliefs emotions, users' cognitive and experiential factors, worries and personality traits, habits, formed habits. formed.

Finally, the last category is related to the purchase decision information. The relevant indicators include idealism, sensitivity to the quality of goods, the desire to buy without planning and prior intention, focus on hedonism, and the desire for having fun and sensitivity. On the brand name, sensitivity to the novelty and currency of the product, sensitivity to the price and value of the product, confusion caused by a wide range of options, and long-term loyalty.

Based on the results of the quantitative phase of the research and utilizing the fuzzy Delphi methods and the fuzzy hierarchical analysis process, this question can be answered. As stated, the current study includes four main dimensions of decision-making styles among young consumers: individual factors, social factors, and technical factors. Among the eight components related to decision-making style (Table 5), the components of habituation and long-term loyalty, sensitivity to price and value of goods, and confusion due to a high number of choices are three components of the same decision-making style. It was recognized as important and influential in the field of mobile marketing. Also, in the context of the social factors dimension, this dimension lacks components and includes only three indicators. The results showed that social influences, recommendations from relatives and friends, and the degree of influence of the individual from others are key indicators, respectively. and are effective in mobile marketing in the country from the perspective of social factors. In addition, among the five components related to the dimension of individual factors, three important and powerful individual components in the field of mobile marketing were identified: users' worries and concerns, users' beliefs and feelings, and users' cognitive and experiential factors. Finally, among the five components related to technical factors, three important and powerful technical components were identified in the field of mobile marketing: utilitarian factors related to the message from the customer's point of view, pleasure-oriented factors related to the message from the customer's point of view, and strategies and effectiveness measures.

6. Conclusion

The results of this study showed that the data-driven model of mobile marketing can

be effective and useful among Iranian users and consumers when it is aligned with the various aspects of purchase behavior decision-making information. Consumers, on one hand, are able to develop favorable perceptions regarding appropriateness, safety, and usefulness. On the other hand, the influence of mobile marketing on consumer behavior is determined by environmental factors and how people perceive it. In addition, several key technical factors can influence user response to mobile advertising, either positively or negatively. This is because mobile marketing relies on the functions and capabilities of smartphones, which can vary greatly across different devices. Based on the findings of the research conducted in two qualitative and quantitative phases, it is suggested that brand marketing units should focus on two key aspects. Firstly, they should prioritize the design and production of relevant content as part of their marketing strategies. Secondly, they should ensure that the produced content is compatible with the tools available to customers, taking into consideration their power and quality. Based on the obtained results, marketers should, on one hand, capitalize on strategies and measures to enhance the effectiveness of mobile marketing, taking cues from successful business owners in this field. On the other hand, they should strive to fulfill customers' basic needs and meet their expectations by facilitating interactive communication between customers and brands, providing relevant information, and addressing genuine customer needs. In addition, marketers should know that customers pay attention to marketing content when they perceive it as useful and when the content provides pleasure and entertainment. Two issues of utilitarian and hedonistic perceptions were identified as important factors affecting the behavior and reactions of customers towards mobile marketing. It is suggested that future studies focus on understanding the behavior and reactions of customers towards this important category of mobile marketing actions. Another limitation of the present study is its focus on young customers and the identification of indicators related to the decision-making styles of the eight purchasing behaviors based on this customer category. It is suggested that future studies explore additional categories and identify specific indicators for each decision-making style. For example, examining the separation between men and women or exploring the issue among elderly customers can effectively demonstrate the differences in decision-making styles between young customers and other age groups, as well as the disparities between male and female customers in this field. The same suggestion can be made in the field of identifying factors that affect behavioral reactions to mobile marketing and differences between various age or gender categories.

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The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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