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Research Article

The mediating roles of customer evaluation and user motivation in the effect of mobile marketing on customer engagement[1]

Mobil pazarlamanın müşteri katılımına etkisinde müşteri değerlemesi ve kullanıcı motivasyonunun aracılık rolleri

[1]. This study is derived from the doctoral thesis "A Study on the Mediation Roles of Customer Evaluation and User Motivation in Regard to the Effect of Mobile Marketing Application Related Perception on Customer Engagement," conducted by the first author under the supervision of the second author within the Istanbul Beykent University Institute of Social Sciences Department of Business Administration.

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Abstract

This study mainly aims to investigate the mediation effects of user motivation and customer evaluation regarding the effect of the perception related to mobile marketing applications on customer engagement. The recommended conceptual model is tested by collecting data from 627 mobile application users living in Istanbul via an online survey. This study reveals that perceived advantage and perceived challenge positively affect the four dimensions of customer engagement, which are co-developing, influencing, augmenting and mobilizing behaviours and also with domain-specific interest, need for cognition and cognition satisfaction, perceived enjoyment, and perceived control positively affect customer engagement, and mediate the relationship of the perception related to the mobile marketing applications with customer engagement. It has significantly contributed to understanding customer behaviours against the technological features of mobile applications.

Keywords: Mobile Marketing, Customer Engagement, User Motivation, Customer Evaluation

Jel Codes: M30, M310

Öz

Bu çalışmanın temel amacı, mobil pazarlama uygulamalarına ilişkin algının müşteri katılımına olan etkisinde kullanıcı motivasyonu ve müşteri değerlemesinin aracılık etkilerini araştırmaktır. Önerilen kavramsal model, çevrimiçi anket aracılığıyla, İstanbul'da yaşayan 627 mobil uygulama kullanıcısından veriler toplanarak test edilmiştir. Bu çalışma, algılanan göreli fayda ve algılanan zorluğun, müşteri katılımının dört boyutu olan birlikte geliştirme, etkileme, zenginleştirme ve harekete geçirme davranışlarını olumlu yönde etkilediğini ve aynı zamanda; alana özel ilgi, biliş ihtiyacı ve biliş memnuniyeti ile algılanan keyif ve algılanan kontrolün müşteri katılımını olumlu yönde etkileyerek, mobil pazarlama uygulamalarına ilişkin algının müşteri katılımı ile olan ilişkisine aracılık ettiğini ortaya koymuştur. Müşterilerin mobil uygulamaların teknolojik özelliklerine karşı göstermiş oldukları davranışların anlaşılması açısından önemli bir katkı sağlamaktadır.

Anahtar Kelimeler: Mobil Pazarlama, Müşteri Katılımı, Kullanıcı Motivasyonu, Müşteri Değerlemesi

JEL Kodları: M30, M310

Introduction

Increasing product and service demand, increasing mobile devices in number, and their ever-developing technologies day by day significantly change the way consumers interact with brands (Yang, Tang, Men and Zheng, 2021). Today, in platforms where traditional marketing fails to reach customers, companies use mobile marketing applications to gain essential advantages. In this way, they can actively communicate with their customers. Mobile marketing, compared to other marketing channels, provides a more dynamic shopping environment for their customers thanks to the technological features of the platform (Japutra, Molinillo, Utami and Ekaputra, 2022).

Easy access to mobile applications also increases customer engagement. According to a mobile application trend report in 2023, it is estimated that 6.84 billion smartphone users will exceed 7 billion by the end of 2024 (Exploding Topics, 2024). Besides, 155 billion mobile application download numbers in 2021 reached 257 billion in 2023 (Statista, 2024), 58% of which is constituted by mobile marketing applications (Adjust, 2024). Daily mobile application time has reached almost five hours, an increase of 30% in the last two years. While in the past, it used to be adequate to look at the number of downloads in order to understand if a mobile marketing application is successful, today it is not reasonably possible to make such a comparison since the number of applications put on the market and downloaded is far too much. About 25% of mobile applications are abandoned after a single use, and about 80% of users stop using a new application within 90 days (Commencis, 2022). Thus, a question arises: What are the primary factors that provide continuous use of mobile applications? In order to provide a quality and pleasant application experience to create positive emotional experiences, understanding how mobile marketing applications create perception reaching the customers using their technology and their reaction is essential in terms of figuring out how the customers can develop their experiences while using mobile marketing applications and how the customer engagement can be provided. Therefore, the driving forces of the behaviours that create customer perception and customer engagement are thought to be examined in this regard. A model is formed showing the relationship between the elements that enrich the benefits customers will gain by using these applications and the features that provide the functionality of mobile applications. How customers perceive these elements is tried to be understood. Thanks to the data obtained from experiences with mobile marketing applications, developing complete and quality new mobile marketing applications will be possible.

Theoretical background

Mobile marketing application characteristics

For customers to achieve significant efficiency using a mobile marketing application, their experience should give them a feeling of real shopping (Hilken, Ruyter, Chylinski, Mahr and Keeling, 2017). The feeling of realism is significant for the customers to participate actively (Hilken et al., 2017; Lee and Overby, 2004). Virtual store atmosphere should have qualities that will affect the customers in visual and sensory terms, create positive feelings and enable the customers to participate again (Temel and Armağan, 2022). In this regard, mobile marketing application features must comprehensively represent virtual platforms' products and services (Yim, Chu and Sauer, 2017). To this end, it is necessary to present supporting elements such as explanatory information and vivid visuals, logos, video, and music belonging to the company, as well as the product and services, with a specific design.

It is stated that the five components of mobile marketing application features (vividness, interactivity, active control, two-way communication and synchronicity) increase the feeling of realism and are closely related to customer perception (Ho, Nguyen, Cheng and Le, 2022).

"Vividness" is defined as the way of presenting the richness of a virtual platform in visual terms to the perceptions of customers (Coyle and Thorson, 2021; Hwang and Oh, 2020; Yim et al., 2017; Klein, 2003). It is expressed that the supporting features of the application, like quality product images and background music, help to create a clearer product image for customers (Hsieh, Lee and Tseng, 2021; Kim, 2019) and facilitate to integrate the products into the natural environment (Hilken, Heller, Chylinski, Keeling, Mahr and Ruyter, 2018).

"Interactivity" means that users can synchronously change the design features of mobile marketing applications (Arghashi and Yuksel, 2022; Ho et al., 2022; Coyle et al., 2021; Fang, 2017). These features allow customers to explore (Ho et al., 2022; Arghashi et al., 2022), enabling them to participate (Yim et al., 2017) actively. When customers establish real-time physical interactivity using features such as moving images, touch screens, clickable buttons, zoom, drag and rotate, they provide "active control" (Ho et al., 2022; Ou, Pavlou and Davison, 2014; Fang, 2017). This, in turn, enables customers to

concentrate more on virtual platforms and makes their online shopping experiences unique and accurate by turning into an experience similar to physically actual stores (Hilken et al., 2017).

"Two-way communication" is characterized by communication between customers, service providers, and other customers (Fang, 2017). Features like discussion forums and sending e-mail options facilitate two-way communication (Ho et al., 2022; Van Noort, Voorveld and Reijmersdal, 2012). "Synchronicity", thanks to interactive design features, enables customers to receive instant answers from the related mobile marketing applications with chat and message boxes and effectively contribute through feedback and online reviews. It indicates the extent to which two-way communication is rapidly developing (Ou et al., 2014; Fang, 2017; Van Noort et al., 2012).

Perception of a mobile marketing application

According to cognitive appraisal theory, individuals like the activities they find interesting, providing optimal challenges (Deci and Ryan, 2000). This is because one of the elements that provide internal motivation for individuals is to be successful in challenging activities (Deci et al., 2000). When individuals exhibit the best of their talents to gain pleasant and advantageous results from interactivity, they feel challenged (Novak, Hoffman and Yung, 2000). Individuals who receive positive feedback mostly enjoy challenging activities more than easy ones (Mulcahy, Russell-Bennett and Iacobucci, 2020; Baumann, Lürig and Engeser, 2016). "Perceived challenge" means an individual's personal experience using their talent and skill during the interactivity (Merikivi, Tuunainen and Nguyen, 2017). It is stated that individuals perceiving an online experience as challenging more intensely concentrate on interactivity (Novak et al., 2000).

"Perceived advantage" is a behavioural feature characterized by quality, superior usability, comfort, and consistent results over time (Japutra et al., 2022; Roy, Balaji, Sadequ, Nguyen, and Melewar, 2017). The motivational satisfaction feeling provided by an easy-to-use and perceived mobile marketing application can lead to more positive customer evaluation (Japutra et al., 2022; Moon and Kim, 2001; Pe-Than, Goh, and Lee, 2014).

User motivation

The conceptual model's "user motivation" aims to understand the emotional and cognitive behaviours of individuals during their use of mobile applications and reveal the effects of emotions (Ho et al., 2022) and experiences that emerge during the customer's interactivity with the mobile application on customer evaluation and engagement.

"Domain-specific interest" is the relationship between the motivational dispositions of an individual and the content of the object and is a motivational tendency appearing with the needs of the individual (Hofer, Wirth, Kuehne, Schramm and Sacau, 2012; Zaichkowsky, 1985). Researches demonstrate that when individuals find a mobile application interesting, it has a positive effect on engagement and leads to downloading and using mobile applications (Kim, Wang and Malthouse, 2015).

Another component, "need for cognition", forming user motivation means that individuals make an effort to get information (Cacioppo, Petty, Feinstein and Jarvis, 1996), while "cognition satisfaction" means their tendency to enjoy it. It represents an emotional state in which an individual enjoys thinking (Cacioppo and Petty, 1982; Cacioppo et al., 1996).

It is stated that individuals with a high level of need for cognition and cognition satisfaction are liable to solve more challenging, high-effort problems, think abstractly and enjoy it and are interested more in systematic data processing (Cacioppo et al., 1996; Kim 2019).

Customer evaluation

It is considered that components of the customer evaluation variable, "perceived enjoyment" and "perceived control", will help to understand the decision processes of customers (Japutra et al., 2022). It is stated that many customers use online platforms not only to get information but also to enjoy getting information. While using mobile applications, they also pay attention to emotional and entertainment value. When online customers believe that their purchase is entertaining and enjoyable, they obtain experiential advantages from their shopping activities, and this motivates their shopping activities more (Babin and Attaway, 2000).

"Perceived enjoyment" is the feeling of pleasant experience or joy the individuals experience while using an application (Kim, Kankanhalli and Lee, 2016). For example, an easy-to-use, high-performance system enables more positive results and thus enjoys more interactivity (Moon et al., 2001; Kim et al., 2016; PeThan et al., 2014).

"Perceived control" is the belief that a user has enough resources to control the application (Japutra et al., 2022; Roy et al., 2017). Upon an interaction with a mobile application, if individuals think they have enough resources to achieve their goal and believe they can reach the desired result, these individuals will feel they have control over the situation more (Wang and Hsiao, 2012). When the user feels himself or herself in control, he or she can concentrate more on the application instead of maintaining the control (Japutra et al., 2022; Koufaris, 2002; Wang et al., 2012). Such control can increase the satisfaction obtained from the application in time and provide its continuous use (San-Martin, Prodanova and Catalan, 2016; Roy, Shekhar, Lassar and Roy, 2018b).

Customer engagement

Customer engagement refers to customers' reactions to companies' offers for their services or products (Jacoby, 2002). This study conceptualises customer engagement as a four-dimensional structure (co-developing, influencing, augmenting, and mobilizing) (Jaakkola and Alexander, 2014).

"Co-developing" behaviour is a typical process in which customers contribute and create value together to solve or facilitate the problem of a product or service (Jaakkola and Alexander, 2014). By including the customers in this process, companies can obtain more productive results and better respond to the customers' needs (Hoyer, Chandy, Dorotic, Krafft and Singh 2010).

"Influencing" behaviour comprises customers' positive word-of-mouth communication activities and product and service recommendations (Van Doorn, Lemon, Mittal, Nass, Doreen, Pirner and Verhoef 2010). It mainly develops when the customers are satisfied with the product and service (Currás-Pérez, Ruiz-Mafé and Sanz-Blas, 2013). Customers sharing their favourable experiences with mobile marketing applications in various online platforms can make them more attractive for other users and reveal exploratory behaviours (Eroglu, Machleit and Davis, 2003).

"Augmenting" behaviour is the direct contribution of customers to companies' offers with their time, effort, and knowledge (Jaakkola et al., 2014). Customers share their positive experiences with mobile marketing applications on online platforms when they are satisfied with their shopping experiences, and thereby, they can enable other customers who share the same common interest to create an interactive platform (Brodie, Ilic, Juric and Hollebeek 2013).

"Mobilizing" behaviour means that customers share their knowledge and experiences with other customers, which mobilizes the other customers to be engaged with the companies' products and services (Jaakkola et al., 2014). Perceived enjoyment and perceived control are said to be essential driving forces for customers' sharing intentions with other customers (Japutra et al., 2022; Carlson, Rahman, Voola, and De Vries, 2018).

Hypotheses development

The research model is presented in Fig. 1 as a foundation for developing direct and moderating hypotheses.

Effects of mobile marketing application features on the perception of mobile marketing applications

When the literature regarding mobile marketing applications is reviewed, it is seen that visual appeal can affect customer perception and behaviours of online shopping (Ho et al., 2022). For this reason, considering that it can affect the attitudes directing the customers to mobile marketing applications and can be the premises for customer engagement, the hypotheses below are defined:

H1a: *Mobile marketing application features positively affect perceived advantage, one of the components of the perception related to mobile marketing applications.*

H1b: *Mobile marketing application features positively affect perceived challenge, one of the components of the perception related to mobile marketing applications.*

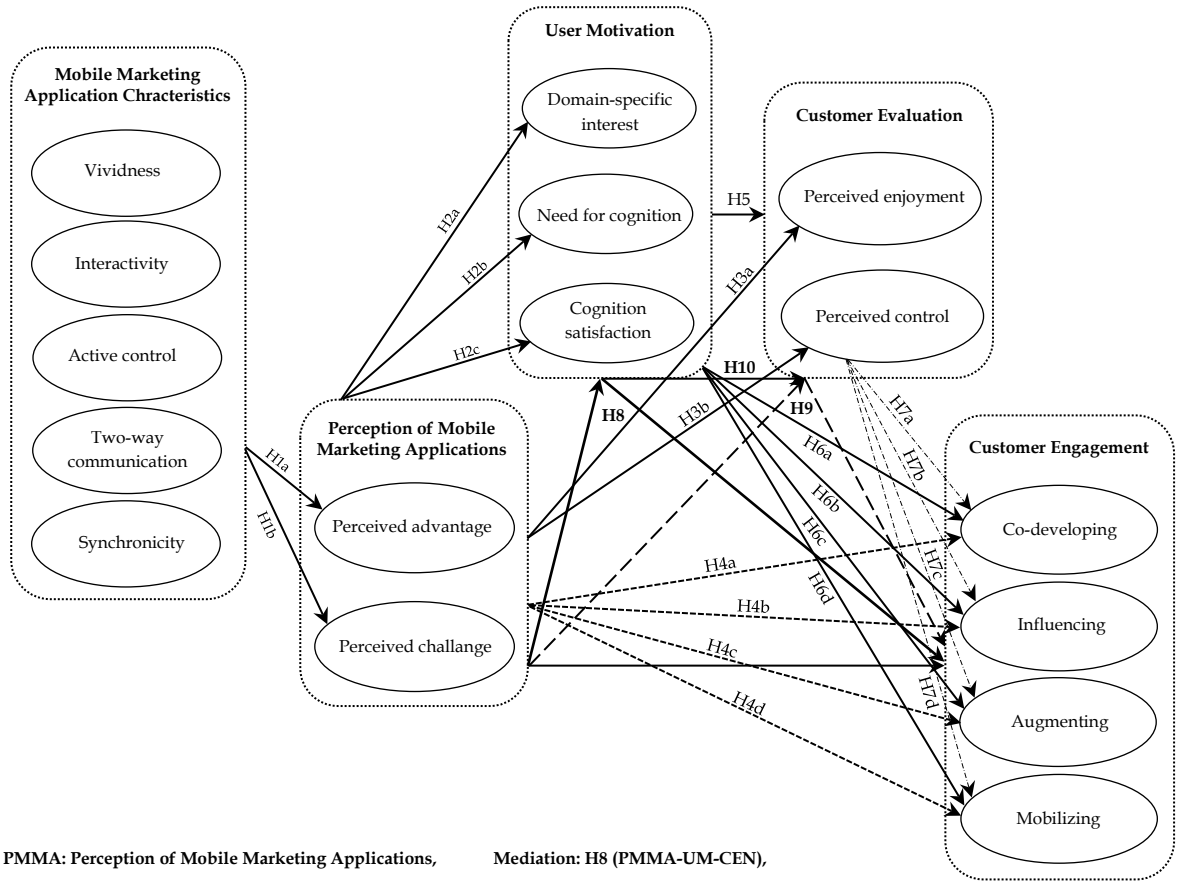

Fig. 1: Research Model and Proposed Hypotheses

Source: Created by the authors

Effects of the perception related to mobile marketing applications on user motivation

In general, customers who are closely interested in mobile applications spend time being informed of the content or topics using multiple formats and maintaining communication with other customers and application providers. Individuals with high user motivation are expected to have a high tendency to discover all the potential of mobile applications (Hartmann, Wirth, Schramm, Klimmt, Vorderer, Gysbers, Böcking, Ravaja, Laarni, Saari, Gouveia and Sacau 2016; Wirth, Hartmann, Böcking, Vorderer, Klimmt, Schramm, Saari, Laarni, Ravaja, Gouveia, Biocca and Sacau, 2007). In this framework, the following hypotheses are defined:

H2a: *The perception related to mobile marketing applications positively affects domain-specific interest, one of the components of user motivation.*

H2b: *The perception related to mobile marketing applications positively affects the need for cognition, one of the components of user motivation.*

H2c: *The perception related to mobile marketing applications positively affects cognition satisfaction, one of the components of user motivation.*

Effects of the perception related to mobile marketing applications on customer evaluation

It is thought that sensory and intellectual processes, which enable customers to be satisfied, will strengthen the positive emotions regarding the applications during the customers' interaction with mobile applications. Therefore, it is considered that the perception of control to support customers to take pleasure in their shopping experiences, to enable the customers to achieve their goals or to help them overcome a challenge can be affected by perceived advantage and perceived challenge (Ward and Barnes, 2001). Thus, the following hypotheses are determined:

H3a: *The perception related to mobile marketing applications positively affects perceived enjoyment, one of the components of customer evaluation.*

H3b: *The perception of mobile marketing applications positively affects perceived control, one of the components of customer evaluation.*

Effects of the perception related to mobile marketing applications on customer engagement

It is stated that the more customers' needs and satisfaction are met due to their interaction with mobile applications, the more they will be satisfied and the higher the possibility of recommending the mobile applications (San-Martin et al., 2016). For this reason, it is indicated that a higher customer perception will result in higher customer engagement. Thus, the following hypotheses are presented:

H4a: *The perception related to mobile marketing applications positively affects co-developing, one of the components of customer engagement.*

H4b: *The perception related to mobile marketing applications positively affects influence, which is one of the components of customer engagement.*

H4c: *The perception related to mobile marketing applications positively affects augmenting, one of the components of customer engagement.*

H4d: *The perception related to mobile marketing applications positively affects mobilizing, one of the components of customer engagement.*

Effects of user motivation on customer evaluation

As long as individuals gain from experiences in mobile marketing applications, they tend to contribute positively to companies through shares such as repurchases, positive recommendations, and evaluations on social media. Customers who take more intrinsic pleasure have a more apparent mental state, and, as a result, more specific virtual shopping experiences tend to actively answer back and support more (Inman and Nikolova, 2017). These manifest themselves through repurchases, sharing positive words on social network sites, recommending such services to other customers and developing a relationship with companies by giving positive feedback/suggestions (Kumar, Rajan, Gupta and Dalla Pozza 2019; Kumar and Reinartz, 2016). In this framework, the hypotheses below are determined:

H5: *User Motivation positively affects customer evaluation.*

Effects of user motivation on customer engagement

Cognitive behaviour is the perception of an individual about products and services. User motivation, which comprises hedonic motives and needs, can enable individuals to show a desire to engage in activities for continuous use (Kim, Kim and Wachter, 2013). It is stated that users spend more time forming an interactive approach to product and service presentations more carefully and more endeavours (Japutra et al., 2022). Thus, the following hypotheses are presented:

H6a: *User motivation positively affects co-development, one of the components of customer engagement.*

H6b: *User motivation positively affects influencing, one of the components of customer engagement.*

H6c: *User motivation positively affects augmenting, one of the components of customer engagement.*

H6d: *User motivation positively affects mobilizing, one of the components of customer engagement.*

Effects of customer evaluation on customer engagement

According to literature, when individuals show the necessary motivation, they can develop positive thoughts for products or services, which can enable them to engage in activities like sharing and creating value (Claffey and Brady, 2014; Yang, Asaad and Dwivedi, 2017; Carlson et al., 2018). The fact that customers enjoy and access the information they need while using mobile applications is among the essential driving forces of individuals' attitudes toward mobile services (Cyr, Head and Ivanov, 2006). It is argued that the positive emotional states of the customers lead them to actively introduce and share their information and experiences (Prentice, Wang and Lin, 2020). The related hypotheses are determined as follows:

H7a: *Customer evaluation positively affects co-development, one of the components of customer engagement.*

H7b: *Customer evaluation positively affects influencing, one of the components of customer engagement.*

H7c: *Customer evaluation positively affects augmenting, one of the components of customer engagement.*

H7d: *Customer evaluation positively affects mobilizing, one of the components of customer engagement.*

Mediation effects of customer evaluation and user motivation regarding the effect of the perception related to mobile marketing applications on customer engagement

It is indicated that individuals with high User Motivation also have a higher degree of attention (Fortin and Dholakia, 2005; Kim, 2019) and mainly, when compared to the individuals with low user motivation, they are focused more while using interactive applications and position the products in the mobile applications in reality better (Kim, 2019).

Most of the customers using current mobile marketing applications take pleasure in using the applications thanks to the excellent and user-friendly user interfaces, and these applications also provide a perception of a challenging experience (Pe-Than et al., 2014). During their interaction with the applications, they can simultaneously respond and thus obtain the perception of control (Roy et al., 2017).

Increasing the perception of mobile marketing applications can also increase customers' developing, influencing, augmenting and mobilizing desires. It is considered that the feeling of enjoyment and control in shopping activities mediates the customers' evaluations regarding the stimuli of the object they are interested in and provides an internal driving force for their behavioural decisions (Brom, Déchtérenko, Frollová, Stárková, Bromová and D'Mello, 2017). Customer evaluation as a mediating variable is critical in customer engagement (Trevinal and Stenger, 2014; Chang, Chen and Huang, 2009). Thus, it is aimed to test the following hypotheses:

H8: *User motivation has a mediation effect regarding the effect of the mobile marketing application-related perception on customer engagement.*

H9: *Customer evaluation has a mediation effect on the perception of mobile marketing application-related engagement.*

H10: *User motivation and customer evaluation have mediation effects regarding the effect of the mobile marketing application-related perception on customer engagement.*

Research methodology

SPSS program and exploratory factor analysis, reliability analysis, ANOVA, correlation and regression analysis are made for data analysis. However, Baron and Kenny's Model and Hayes Test (Process 3.5) are utilized for the mediation test.

Measures

The "interactivity" component is measured with 18 questions forming a three-dimensional scale of Liu (2003, 23) and Ho et al. (2022, 6); the "vividness" component with six questions of the scale developed by Yim et al. (2017, 94); "need for cognition" and "domain-specific interest" components with 19-question scale of Vanwesenbeeck, Ponnet and Walrave (2016, 6); "control variables" with the scale of Wang, Malthouse and Krishnamurthi (2015, 222); "perceived advantage", "perceived enjoyment", and "perceived control" components with nine-question scale of Roy et al. (2017, 264); "perceived challenge" component with three-question scale of Novak et al. (2000, 10); "co-developing", "influencing", "augmenting" and "mobilizing", the components forming the four dimensions of "customer engagement", with 16-question scale developed by Roy, Balaji, Soutar, Lassar and Roy (2018a, 285).

Data collection and sample

The research collects data using an online survey method (2023). The research population comprises users above 18 years old who live in Istanbul and do shopping with mobile marketing applications. Convenience sampling is one of the nonrandom sampling methods used in sample size calculation for analysis. The sample size is determined as follows (Yükselen, 2017, 67):

p: is the rate of the users positively affected regarding customer engagement (0.50); q: 1 – p; Z: 95% confidence level (±1,96); e: tolerance (±0.04),

$n = p * q * (Z/e)^2 = 0.50 * 0.50 * (1.96/0.04)^2 = 601$ individuals are calculated, and the data of 627 participants are obtained.

The participants answered the questions according to a seven-point Likert scale. Females constitute 61.7%, while males 38.3% of the sample. Participants between the ages of 24-43 constitute 58.9% of the sample. "Associate and Bachelor's Degree" graduates constitute about 42.4% of the participants. When income status is examined, it is observed that 59% have an income of "20.000 TL and lower". When the participants' daily mobile application use frequency is considered, it is determined that 59.1% use mobile applications "lower than four hours" daily (Table 1).

Table 1: Demographic Characteristics of the Participants

Gender	Freq.	%	**Income***	Freq.	%
Female	387	61.7	<8.500 TL	125	19.9
Male	240	38.3	8.501-20.000 TL	245	39.1
Total	627	100.0	20.001-30.000 TL	131	20.9
Age	Freq.	%	30.001-40.000 TL	53	8.5
18-23	92	14.7	>40.000 TL	73	11.6
24-43	369	58.9	Total	627	100.0
44-58	104	16.6	**Daily Mobile App Usage Frequency**		
>59	62	9.9		Freq.	%
Total	627	100.0	<2 hours	130	20.7
Education	Freq.	%	2-4 hours	241	38.4
Primary	37	5.9	4-6 hours	159	25.4
High school	128	20.4	>6 hours	97	15.5
Undergraduate	266	42.4	Total	627	100.0
Post-graduate	196	31.3			
Total	627	100.0			

*Monthly income, based on Turkish Lira (TL); exchange rate at 1TL = 0.031 USD

Source: Created by the authors

Research results

Exploratory factor analysis

The conceptual model's mobile marketing application features variable comprises two components with a specific scale structure. This structure is tested with exploratory factor analysis. Kaiser Meyer Olkin value, which measures the adequacy of the sample size, is determined as 0.850, and Bartlett's Test of Sphericity, which indicates if the distribution is suitable to the multivariate normal distribution, is determined as $\chi^2 = 2803.611$, $p<0.01$, which reveals that the conditions are met. The optimal structure is obtained with Eigenvalue>1; the total explained variance is 60.408%. Since factor loads of five of the question items included in the study fall below 0.50, they are excluded from the structure (see Table 2). Vividness, active control, two-way communication, interactivity, and synchronicity are factors.

The specific scale structure of the mobile marketing application-related perception variable included in the conceptual model comprises two components tested with exploratory factor analysis. Kaiser Meyer Olkin value, which measures the adequacy of the sample size, is determined as 0.771, and Bartlett's Test of Sphericity, which indicates if the distribution is suitable to the multivariate normal distribution, is determined as $\chi^2 = 2803.611$, $p<0.01$, which reveals that the conditions are met. The optimal structure is obtained with Eigenvalue>1; the total explained variance is 56.738%. Since the factor load of one of the question items included in the study falls below 0.50, it is excluded from the structure (see Table 2).

The specific scale structure of the user motivation variable is composed of two components, and this structure is tested with exploratory factor analysis. Kaiser Meyer Olkin value, which measures the

adequacy of the sample size, is determined as 0.899, and Bartlett's Test of Sphericity, which indicates if the distribution is suitable to the multivariate normal distribution, is determined as χ^2 = 2803.611, p<0.01, which reveals that the conditions are met. The optimal structure is obtained with Eigenvalue>1, and the total explained variance is 54.883%. Factors are named domain-specific interest, need for cognition, and cognition satisfaction.

The specific scale structure of the customer evaluation variable is composed of two components, and this structure is tested with exploratory factor analysis. Kaiser Meyer Olkin value, which measures the adequacy of the sample size, is determined as 0.843, and Bartlett's Test of Sphericity, which indicates if the distribution is suitable to the multivariate normal distribution, is determined as χ^2 = 2803.611, p<0.01, which reveals that the conditions are met. The optimal structure is obtained with Eigenvalue>1; the variance explained is 73.201%. Factors are named as perceived enjoyment and perceived control.

The specific scale structure of the customer engagement variable is composed of four components, and this structure is tested with exploratory factor analysis. Kaiser Meyer Olkin value, which measures the adequacy of the sample size, is determined as 0.933, and Bartlett's Test of Sphericity, which indicates if the distribution is suitable to the multivariate normal distribution, is determined as χ^2 = 2803.611, p<0.01, which reveals that the conditions are met. The optimal structure is obtained with Eigenvalue>1, and the total explained variance is 68.917%. Factors are named as mobilizing, influencing, augmenting, and co-developing.

Table 2: Measurement Items

Variables	Number of Items		Factor Loading	Cronbach's Alpha
	Initial	Final		
Mobile Marketing Application Characteristic	**18**	**13**		**0.787**
Vividness	**6**	**4**		**0.733**
The retail mobile app was very clear.*			**0.494**	
The retail mobile app was very detailed.			0.633	
The retail mobile app was very vague. ---**second-order construct, "Interactivity"**			0.683	
The retail mobile app was very vivid.			0.724	
The retail mobile app was very sharp.			0.711	
The retail mobile app was very well-defined.			0.716	
Active control	**4**	**3**		**0.611**
I felt that I had a lot of control over my experience with the retail mobile app.			0.815	
While I used the retail mobile app, I could freely choose what I wanted to see.			0.808	
While I used the retail mobile app, I had absolutely no control over what I could do on the retail mobile app. ---**second-order construct, "Interactivity"**			0.702	
While I used the retail mobile app, my actions decided which kind of experiences I had.*			**0.481**	
Two-way communication	**4**	**2**		**0.740**
The retail mobile app facilitated two-way communication between the retailer and their consumers.			0.701	
The retail mobile app gave consumers the opportunity to talk to the retailer.			0.806	
The retail mobile app did not at all encourage visitors to talk back. ---**second-order construct, "Interactivity".**			0.706	
The retail mobile app made me feel the retailer wants to listen to their customers.*			**-0.033**	
Synchronicity	**4**	**2**		**0.651**
The retail mobile app processed my input very quickly.			0.731	
I was able to get information from the retail mobile app very rapidly.			0.742	
When I clicked on the retail mobile app, I felt I was getting the instantaneous information I expected.*			**-0.164**	
The retail mobile app was very slow in responding to my requests.*			0.025	
Interactivity ---**second-order construct**		**2**		**0.690**
Perception of Mobile Marketing Applications	**6**	**5**		**0.779**
Perceived challenge	**3**	**2**		**0.839**
Using the m-commerce app challenges me to perform to the best of my ability.*			**-0.434**	
Using the m-commerce app provides a good test of my skills.			0.885	
I find that using the m-commerce app stretches my capabilities to my limits.			0.816	
Perceived advantage	**3**	**3**		**0.775**
Using m-commerce apps is more convenient than other retail technologies.			0.731	
M-commerce apps offers consistent results over time.			0.722	
It is easier to use m-commerce apps compared to other retail technologies.			0.744	
User Motivation	**19**	**19**		**0.876**
Domain-specific interest	**8**	**8**		**0.869**
I am generally interested in the topic of retail mobile apps.			0.726	
Retail mobile apps corresponded very well with what I normally prefer.			0.597	
I have felt a strong affinity to the theme of retail mobile apps for a long time.			0.734	
There was already a fondness in me for the topic of retail mobile apps before I was exposed to them.			0.765	
Whenever I made a purchase, I would decide to deal with it via retail mobile apps.			0.583	
Things like those in retail mobile apps have often attracted my attention in the past.			0.798	
I just love to think about the topic of retail mobile apps.			0.771	
In the past, I have spent a lot of time dealing with the topic of retail mobile apps.			0.676	
Need for cognition	**11**	**8**		**0.834**
I enjoy thinking of solutions to problems. ---**second-order construct, "Cognition satisfaction"**			0.664	
I prefer solving a complex question that is difficult and requires thought, compared to a question that is important but does not require thought.			0.506	
I like situations where I can achieve something by thoroughly thinking things through. ---**second-order construct,**			0.709	
I love it when my life is full of difficult tasks that I have to solve. **"Cognition satisfaction"**			0.772	
It is especially fun for me if I have completed an important task that requires a lot of thinking.			0.524	
I prefer complex problems over simple problems.			0.752	
I like to do tasks in which one has to think a great deal.			0.763	
I often say to myself that people should think long and carefully to find the best solution to a problem.			0.542	
I am someone who enjoys thinking.			0.501	
I like to think about a problem, even when I know that my thinking will change nothing about the problem.			0.575	
When I put my mind to solving a difficult problem, I usually succeed. ---**second-order construct, "Cognition satisfaction"**			0.596	
Cognition satisfaction ---**second-order construct**		**3**		**0.658**
Customer Evaluation	**6**	**6**		**0.857**
Perceived enjoyment	**3**	**3**		**0.916**
I have fun interacting with m-commerce apps.			0.893	
Using m-commerce apps provides me with a lot of enjoyment.			0.903	
I enjoy using m-commerce apps.			0.846	
Perceived control	**3**	**3**		**0.663**
When using m-commerce apps, I feel in control.			0.656	
When using m-commerce apps my attention is focused totally on using it.			0.774	
I have the necessary means and resources to use m-commerce apps.			0.740	
Customer Engagement	**16**	**16**		**0.928**
Co-developing	**3**	**3**		**0.745**
I proactively communicate with the m-commerce apps about potential service-related problems.			0.556	
I make constructive suggestions to the m-commerce apps about how to improve its services.			0.728	
I let the m-commerce apps know of ways that can better serve my needs.			0.666	
Influencing	**3**	**3**		**0.824**
I said positive things about this m-commerce apps and its employees to others.			0.725	
I recommend this m-commerce apps and its employees to others.			0.747	
I encourage friends and relatives to use this m-commerce apps in the future**.**			0.721	
Augmenting	**4**	**4**		**0.787**
I post photographs of my activity with the m-commerce apps on social media.			0.761	
I would write blogs about my positive experience with the m-commerce apps.			0.595	
The m-commerce apps provides opportunities to share my experience with others via social media.			0.685	
I engage in forwarding the promotions offered by this m-commerce apps to others.			0.541	
Mobilizing	**4**	**4**		**0.898**
I assist other customers if they need my help.			0.690	
I give advice to other customers regarding the services of the m-commerce apps.			0.607	
I teach other customers to use services correctly.			0.759	
I help other customers if they seem to have problems.			0.822	
I am willing to stand to protect the reputation of the m-commerce apps.			0.682	
I am willing to clarify other customers or outsiders misunderstanding regarding the m-commerce apps.			0.706	

Notes: *Factor loadings are below 0.50. (**Source:** Created by the author)

Reliability and validity analysis

Considering the correlation values between all variables included in the scale, Cronbach's Alpha is used to measure reliability, and when the data are assessed, it is above 0.7 for all the variables (Table 2). Accordingly, each factor group is internally consistent, and the reliability of the entire scale is high (Nunnally, 1978; Hair, Sarstedt, Matthews, and Ringle 2016).

Table 3 demonstrates the correlation coefficients between the variables forming the conceptual model. The correlations between the variables are positively significant, with a significance level of 1% (Schober, Schober, and Schwarte, 2018).

Table 3: Correlation Analysis

Variable	Correlation Matrix				
	1	2	3	4	5
1. Mobile Marketing Application Characteristics	1				
2. Perception of Mobile Marketing Applications	0.506**	1			
3. User Motivations	0.453**	0.578**	1		
4. Customer Evaluation	0.581**	0.683**	0.614**	1	
5. Customer Engagement	0.445**	0.612**	0.594**	0.614**	1

Notes: **The correlation is significant at 0.01 (2-tailed).

Source: Created by the authors

Hypotheses testing

The effect of mobile marketing application features on the components of application-related perception is separately tested with simple regression analysis.

Based on the primary variable, the correlation coefficient between mobile marketing application features and "perceived advantage", one of the components of mobile marketing application-related perception, is R=0.560, indicating a moderate correlation. The determination coefficient is 0.314, and mobile marketing application features explain 31.4% of the "perceived advantage". However, the correlation coefficient between mobile marketing application features and another perception component of mobile marketing applications, "perceived challenge", is R=0.343, indicating a weak correlation. The determination coefficient is 0.117, and mobile marketing application features explain 11.7% of the "perceived challenge" (Table 4). ANOVA results indicate that the effect is positively significant. H1a and H1b hypotheses are supported.

Based on the primary variable, the correlation coefficient between the perception related to mobile marketing applications and "domain-specific interest", one of the components of user motivation, is R=0.682, indicating a strong correlation. The determination coefficient is 0.465, and the perception of mobile marketing applications explains 46.5% of the "domain-specific interest". The correlation coefficient between the perception related to mobile marketing applications and the "need for cognition", one of the components of user motivation, is R=0.297, indicating a weak correlation. The determination coefficient is 0.88. The perception related to mobile marketing applications explains 8.8% of the "need for cognition". The correlation coefficient between the perception related to mobile marketing applications and another component of user motivation, "cognition satisfaction", is R=0.338, indicating a weak correlation. The determination coefficient is 0.114. The perception related to mobile marketing applications explains 11.4% of the "cognition satisfaction" (Table 4). ANOVA results indicate that the effect is positively significant. H2a, H2b and H2c hypotheses are supported.

Based on the main variable, the correlation coefficient between the perception related to mobile marketing applications and "perceived enjoyment", one of the components of the customer evaluation, is R=0.636, indicating a strong correlation. The determination coefficient is 0.404, and the perception related to mobile marketing applications explains 40.4% of the "perceived enjoyment". The correlation coefficient between the perception related to mobile marketing applications and "perceived control", one of the components of the customer evaluation, is R=0.583, indicating a moderate correlation. The determination coefficient is 0.340, and the perception related to mobile marketing applications explains 34% of the "perceived control" (Table 4). ANOVA results indicate that the effect is positively significant. H3a and H3b hypotheses are supported.

Table 4: Structural Parameter Estimates

Hypotheses	Path Relationships	Model				
		Std. Beta	Std. Error	t-value	p-value	R^2
H1a: supported	MMAC → Perceived advantage	0.799	0.047	16.917	0.000	0.314
H1b: supported	MMAC → Perceived challenge	0.743	0.082	9.115	0.000	0.117
H2a: supported	PMMA → Domain-specific interest	0.689	0.030	23.293	0.000	0.465
H2b: supported	PMMA → Need for cognition	0.289	0.037	7.786	0.000	0.088
H2c: supported	PMMA → Cognition satisfaction	0.260	0.029	8.975	0.000	0.114
H3a: supported	PMMA → Perceived enjoyment	0.761	0.037	20.582	0.000	0.404
H3b: supported	PMMA → Perceived control	0.550	0.031	17.947	0.000	0.340
H4a: supported	PMMA → Co-developing	0.665	0.041	16.061	0.000	0.292
H4b: supported	PMMA → Influencing	0.658	0.041	15.961	0.000	0.290
H4c: supported	PMMA → Augmenting	0.620	0.045	13.670	0.000	0.230
H4d: supported	PMMA → Mobilizing	0.625	0.042	14.994	0.000	0.265
H5 : supported	UM → Customer engagement	0.825	0.042	19.439	0.000	0.377
H6a: supported	UM → Co-developing	0.910	0.058	15,573	0.000	0.280
H6b: supported	UM → Influencing	0.903	0.058	15,526	0.000	0.278
H6c: supported	UM → Augmenting	0.855	0.064	13.387	0.000	0.223
H6d: supported	UM → Mobilizing	0.823	0.060	13.827	0.000	0.234
H7a: supported	CEV → Co-developing	0.650	0.044	14.712	0.000	0.257
H7b: supported	CEV → Influencing	0.726	0.042	17.337	0.000	0.325
H7c: supported	CEV → Augmenting	0.675	0.047	14.479	0.000	0.251
H7d: supported	CEV → Mobilizing	0.637	0.044	14.559	0.000	0.253

Notes: MMAC: Mobile Marketing Application Characteristics, PMMA: Perception of Mobile Marketing Applications, UM: User Motivation, CEV: Customer Evaluation.

Source: Created by the authors

Based on the main variable, the correlation coefficient between the perception related to mobile marketing applications and "co-developing", one of the components of customer engagement, is R=0.541, indicating a moderate correlation. The determination coefficient is 0.292, and the perception related to mobile marketing applications explains 29.2% of the "co-developing". The correlation coefficient between the perception of mobile marketing applications and another customer engagement component, "influencing", is R=0.538, indicating a moderate correlation. The determination coefficient is 0.290, and the perception related to mobile marketing applications explains 29% of the "influencing". The correlation coefficient between the perception of mobile marketing applications and the third component, "augmenting", is R=0.480, indicating a moderate correlation. The determination coefficient is 0.230, and the perception related to mobile marketing applications explains 23% of the "augmenting". The correlation coefficient between the perception of mobile marketing applications and the last component, "mobilizing", is R=0.514, indicating a moderate correlation. The determination coefficient is 0.265, and the perception of mobile marketing applications explains 26.5% of the "mobilizing" (Table 4). ANOVA results indicate that all the effects are positively significant, and H4a, H4b, H4c and H4d hypotheses are supported.

Based on the primary variable, the correlation coefficient between user motivation and customer evaluation is R=0.614, indicating a strong correlation. The determination coefficient is 0.377; user motivation explains 37.7% of the customer evaluation (Table 4). ANOVA results indicate that the effect is positively significant. The H5 hypothesis is supported.

Based on the primary variable, the correlation coefficient between user motivation and "co-developing", one of the components of customer engagement, is R=0.529, indicating a moderate correlation. The determination coefficient is 0.280, and user motivation explains 28% of the "co-developing". The correlation coefficient between user motivation and "influencing", one of the components of customer engagement, is R=0.528, indicating a moderate correlation. The determination coefficient is 0.278, and the user motivation explains 27.8% of the "influencing". The correlation coefficient between user motivation and "augmenting", one of the components of customer engagement, is R=0.472, indicating a moderate correlation. The determination coefficient is 0.223, and user motivation explains 22.3% of the "augmenting". The correlation coefficient between user motivation and "mobilizing", one of the components of customer engagement, is R=0.484, indicating a moderate correlation. The determination coefficient is 0.234, and the user motivation explains 23.4% of the "mobilizing" (Table 4). ANOVA results indicate that all the effects are positively significant. H6a, H6b, H6c and H6d hypotheses are supported.

Based on a main variable, the correlation coefficient between the customer evaluation and "co-developing", one of the components of customer engagement, is R=0.507, indicating a moderate correlation. The determination coefficient is 0.257, and customer evaluation explains 25.7% of the "co-developing". The correlation coefficient between customer evaluation and "influencing", one of the components of customer engagement, is R=0.570, indicating a moderate correlation. The determination coefficient is 0.325, and customer evaluation explains 32.5% of the "influencing". The correlation coefficient between customer evaluation and "augmenting", one of the components of customer engagement, is R=0.501, indicating a moderate correlation. The determination coefficient is 0.251, and the customer evaluation explains 25.1% of the "augmenting". The correlation coefficient between the customer evaluation and "mobilizing", one of the components of customer engagement, is R=0.503, indicating a moderate correlation. The determination coefficient is 0.253; customer evaluation explains 25.3% of the "mobilizing" (Table 4). ANOVA results indicate that all the effects are positively significant. H7a, H7b, H7c and H7d hypotheses are supported.

Mediation analysis

For the H8 and H9 hypotheses, Baron and Kenny's (1986) and Hayes' (2018; Model 4) mediation analyses and to examine the H10 hypothesis, Hayes' (2018; Model 6) and multiple mediation tests are conducted (Table 5). The results indicate that the effect of user motivation and customer evaluation on customer engagement is significant.

Table 5: Results of Mediation Analysis

Relationship	Indirect Effect	SE	t-value	R^2	Bias Corrected Confidence		Direct Effect	Type
					LLCI	ULCI		
PMMA → UM → CEN	0.2189	0.0279	11.1922	0.423	0.1630	0.1630	0.4230	Partial Mediation
PMMA → CEV → CEN	0.2644	0.0428	8.8216	0.378	0.2011	0.3337	0.3776	Partial Mediation
PMMA → UM + CEV → CEN	0.0817	0.0427	6.8154	0.490	0.0489	0.1202	0.2912	Partial Mediation

Notes: PMMA: Perception of Mobile Marketing Applications, UM: User Motivation, CEV: Customer Evaluation, CEN: Customer Engagement, LLCI: Lower Limit Confidence Interval, ULCI: Upper Limit Confidence Interval, SE: Standart error, p<0.001.

Source: Created by the authors

The regression coefficient showing the direct effect of the perception related to mobile marketing applications on customer engagement is B=0.642. After the user motivation is included in the model, it becomes B=0.423; when analyzed along with the direct effect of customer evaluation, however, the regression coefficient value is B=0.378. According to the analysis result, due to being p<0.05, both user motivation and customer evaluation have partial mediation effects; for H8 and H9, hypotheses are confirmed.

Analysis result reveals that regarding the direct effect of the perception related to mobile marketing applications on customer engagement, the significance level is p<0.05. When user motivation and customer evaluation show a mediation effect, it is still p<0.05, meaning a significant effect. Since there is no "zero" between the lower and upper limits, BootLLCI=0.0489 and BootULCI=0.1202, of the 95% confidence interval, user motivation and customer evaluation together have a partial mediation effect regarding the effect of the perception related to the mobile marketing applications on the customer engagement, and H10 hypothesis is accepted.

Discussion

Managerial implications

The findings of the research provide various contributions to the current literature. First of all, it is asserted that the components "vividness", "interactivity", "active control", "two-way communication", and "synchronicity", examined in the scope of mobile marketing application features, enabling the feeling of realism experienced in virtual environment, namely the interactivity similar to the physical stores to be offered to customers can change and develop customer engagement behaviour and is consistent with existing literature (Fang, 2017; Hilken et al., 2017, 2018; Arghashi et al., 2022; Ho et al., 2022). These emerging cognitions significantly affect the experience of the customers in a virtual environment, which, in turn, allows companies to gain value from customer interaction behaviour. Since former studies on mobile applications focus on acceptance (Wang, 2020; Lim, Xie and Haruvy, 2022) more than user behaviour (Agrebi and Jallais, 2015), the findings obtained are very important.

Secondly, the correlations between "perceived advantage" and "perceived challenge" and the enjoyment and control perception of customers are confirmed, and it is presented that by analyzing various behavioural forms of customer engagement and the driving forces of each behaviour separately,

this relation can affect and increase co-developing, influencing, augmenting and mobilizing behaviours. These findings support the customer participation behaviours Van Doorn et al. (2010) suggested. At the same time, a new perspective is presented by examining the effects of mobile marketing application features on the "perceived advantage" and "perceived challenge" variables. This study, by indicating a mediation effect of "perceived enjoyment" in regard to the effect on "augmenting", one of the customer engagement behaviours, and to the examination of "perceived advantage" and "perceived challenge" as the driving forces of each participation behaviour, expands the scope of the studies by Japutra et al. (2022).

Thirdly, the current study indicates that by analyzing mediation effects of the "perceived enjoyment" and "perceived control" components, in case the perception related to mobile marketing applications increases the feeling of perceived enjoyment and perceived control, it can increase co-developing, influencing, augmenting and mobilizing desires of the customers (Moon et al., 2001; Kim et al., 2016). These results provide an essential contribution since previous studies individually analyzed the mediation role of perceived enjoyment (Pe-Than et al., 2014; Brom et al., 2017) and perceived control (Roy et al., 2017; Uphill, Rossato, Swain and O'Driscoll, 2019). It is determined that while using mobile applications, customers enjoy getting information and pay regard to the emotional and entertainment value of shopping. It has been proven to affect customers' behavioural decisions (Babin et al., 2000).

Finally, it is presented that "domain-specific interest", "need for cognition", and "cognition satisfaction" components representing personal tendencies and context-specific motivations of the customers affect the perceived enjoyment and perceived control of the customers, positively affect customer engagement and have mediation effects in terms of increasing customer engagement. The more customers benefit from their experiences in mobile marketing applications, the more they tend to reciprocate the benefits they receive, allowing them to contribute positively to companies (Kumar et al., 2016; Kumar et al., 2019). Supporting the arguments by Kim (2019) and Ho et al. (2022), this study presents the effect of the perception related to mobile marketing applications on user motivation by examining and empirically verifying with a new understanding. Besides, by adding the "cognition satisfaction" component to the conceptual model, the study by Ho et al. (2022) is expanded.

Limitations and directions for further studies

It is necessary to consider that the findings included in the study are obtained with some limitations. The study was conducted only with the participation of respondents living in Istanbul. Besides, the scales in the study comprise all mobile applications in general, and their types and intended uses are considered the same. For this reason, it should be taken into consideration that future studies can be conducted with different sample groups and mobile applications divided according to their intended use, and thus, the generalizability of the current study can be increased.

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