

## A Study on the Relationship between Intolerance of Uncertainty and Mobile Shopping

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**ABSTRACT:** Mobile shopping, also known as m-commerce, has gained immense popularity due to its convenience and accessibility. The COVID-19 pandemic has encouraged people to shop from home and has contributed to the widespread adoption of mobile shopping. The aim of this study is to examine the impact of intolerance of uncertainty on mobile shopping behaviors and gain a better understanding of this relationship. A total of 484 valid data were collected through a survey using the simple random sampling technique from Uşak Province to assess participants' levels of intolerance of uncertainty and their mobile shopping habits. The research hypotheses were analyzed using structural equation modeling with SPSS and AMOS software. The results of the study indicate that fear, anxiety, and intolerance of uncertainty related to the pandemic significantly influence the intention to engage in mobile shopping. The research reveals that these factors continue to have a significant impact on mobile shopping intention even after the pandemic. The findings of this study are important in shedding light on the impact of mobile shopping on the behavior of individuals who are intolerant of uncertainty and can assist businesses in developing their marketing strategies and improving the customer experience.

**Anahtar Sözcükler:** Intolerance of Uncertainty, Mobile Shopping Intention, Anxiety

**JEL Kodu:** M30, M31

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### Belirsizliğe Tahammülsüzlük ve Mobil Alışveriş İlişkisi Üzerine Bir Araştırma

**ÖZ:** Teknolojinin hızlı ilerlemesi, insanların alışveriş yapma şeklini önemli ölçüde dönüştürmüştür. Mobil alışveriş, kolaylık ve erişilebilirlik nedeniyle büyük popülerlik kazanmıştır. COVID-19 pandemisi, insanların evden çıkmadan alışveriş yapmalarını teşvik etmiş ve mobil alışverişin yaygınlaşmasına katkıda bulunmuştur. Bu çalışmanın amacı, belirsizliğe tahammülsüzlüğün mobil alışveriş davranışlarına olan etkisini incelemek ve bu ilişkiyi daha iyi anlamaktır. Araştırmada anket yoluyla katılımcıların belirsizliğe tahammülsüzlük düzeyleri ile mobile alışveriş alışkanlıklarını değerlendirmek üzere Uşak İl'inden basit tesadüfi örneklem tekniği kullanılarak ile toplam 484 geçerli veriye ulaşılmıştır. Araştırma hipotezleri yapısal eşitlik modellemesi kullanılarak SPSS ve AMOS yazılımları ile analiz edilmiştir. Araştırmanın sonuçlarında pandemiye yönelik korku, kaygı ve belirsizliği tahammülsüzlük faktörlerinin mobil alışveriş niyetini önemli ölçüde etkilediği sonucuna ulaşılmıştır. Araştırma pandemi sonrası söz konusu pandemiye yönelik faktörlerin mobil alışveriş niyetini önemli ölçüde etkilemeye devam ettiğini ortaya koymaktadır. Bu çalışmanın bulguları, mobil alışverişin belirsizliğe tahammülsüz tüketicilerin davranışları üzerindeki etkisini aydınlatmaya ve işletmelerin pazarlama stratejilerini geliştirmelerine ve müşteri deneyimini iyileştirmelerine yardımcı olabilmesi açısından önemlidir.

**Keywords:** Belirsizliğe Tahammülsüzlük, Mobil Alışveriş Niyeti, Kaygı

**JEL Code:** M30, M31

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## **1. Introduction**

Epidemics that occur worldwide or in a very large area, cross international borders and usually affect large numbers of people are considered as pandemics. (Porta, 2014). The Coronavirus Disease (COVID-19), caused by the Severe Acute Respiratory Syndrome Coronavirus 2 (SARS-CoV-2), emerged as an infectious disease in the city of Wuhan, China, in December 2019 and has since evolved into a global pandemic. Despite the progress made in the fight against the virus over the last three years, the World Health Organization (WHO) continued to classify the virus as a global emergency until recently, announcing the end of the COVID-19 pandemic last May (BBC, 2023; TRT, 2023). In the period since, the pandemic has pushed people away from areas that require coexistence and has led to people doing almost everything but basic needs from their homes.

This behavioral change has had both positive and negative effects on various sectors. Internet-based applications, in particular, have experienced significant growth, with the mobile shopping sector being at the forefront. Even individuals who previously did not engage in shopping through mobile channels have started using companies' applications on their smartphones to make purchases without leaving their homes. While initially, purchases were primarily focused on specific product categories, the overall volume of trade has increased, resulting in a significant difference in the inclination towards mobile shopping compared to previous years. The uncertain environment created by the pressure and misinformation generated by social media has contributed to significant sales in numerous product categories, irrespective of their necessity or essential nature. Among the various factors underlying this shift towards mobile shopping, this study aims to explore the extent to which the fear, anxiety, and intolerance of uncertainty caused by the pandemic influence individuals' behavior.

According to the Household Use of Information Technologies Survey conducted by the Turkish Statistical Institute (TURKSTAT) in 2019 and 2022, significant differences can be observed in the usage rates of information technologies. The percentage of individuals using the internet increased from 75.3% in 2019 to 85% in 2022. Furthermore, the rate of ordering or purchasing goods and services online rose from 34.1% to 46.2%, according to TURKSTAT (2019, 2022). These changes can be attributed to the increased usage of internet-based applications, allowing individuals to meet their needs, particularly due to restrictions on going outside and traveling. Among consumers, 71.3% made purchases related to clothing, footwear, and accessories, 50.2% ordered from restaurants, fast food, and catering companies, 41.9% purchased food products, 27.4% bought health, cosmetics, and beauty products, and 28.7% purchased cleaning and personal care products (TURKSTAT, 2022). In the research conducted by Hepsiburada online shopping company together with Deloitte consulting company to evaluate the e-commerce ecosystem in Turkey during the pandemic period, e-commerce is expected to increase 2.3 times in four years (Ulukan, 2021). The COVID-19 pandemic has had a significant impact on e-commerce and online consumer behaviors worldwide. According to a global survey conducted by Statista (2021), comparing the pre-pandemic, peak pandemic, and current situations, countries heavily affected by the pandemic, such as Canada, Germany, Italy, the United Kingdom, Brazil, the United States, Argentina, Mexico, India, and Russia, experienced dramatic increases in e-commerce. For example, e-commerce in Argentina saw an increase of over 300%.

After the emergence of the COVID-19 pandemic, it has imposed various psychological burdens on individuals, including fear and anxiety (Ahorsu et. al., 2020; Parlapani et. al., 2020). In many countries where sufficient coordination to manage public health crises and alleviate public fears could not be achieved, unprecedented panic buying emerged alongside the crises. Although its impact has diminished, it is expected that the inclination towards shopping, especially mobile shopping, will continue to be influenced by the ongoing uncertainty of the pandemic. Research also indicates that consumers now have the ability to utilize and evaluate multiple channels for their purchases (Chua et. al., 2021).

## **2. Conceptual Framework**

### **2.1. Fear and Anxiety**

The concept of fear is a present-oriented, adaptive, and protective response to a recognizable, definable threat (e.g., being attacked), often accompanied by a powerful physiological fight-or-flight response (Barlow, 2004). Fear, typically described as a basic or primary emotion, is designed to protect an individual from a perceived immediate threat. It is often directed towards a specific stimulus, activity, or situation (Asmundson et. al., 2004). Fear is also a multifaceted phenomenon. Lang (1968) suggests that fear consists of three interconnected main components: cognitive, physiological, and behavioral.

The cognitive component involves negative thoughts such as danger, threat, and death (Beck et. al., 2005). The physiological component encompasses various physiological changes designed to enhance the likelihood of survival in the face of a threat. The behavioral component is described as a motivational response that provides the impetus to engage in defensive behavior. Defensive behaviors manifest directly in response to fear and aim to protect the individual from the perceived threat, triggering the individual's emotional state (Lang, 1968). Anxiety, on the other hand, is a more complex preparatory response involving concern about an unidentified or unrealized potential threat (e.g., a possible attack), and it is characterized by a weaker physiological response compared to fear (Asmundson et. al., 2004). Specifically, anxiety is a response to an uncertain or poorly defined danger, and its impact on behavior tends to be more widespread than fear. It often involves prolonged worry or deep thinking without a definite outcome (Blanchard and Blanchard, 2008).

Conceptually, anxiety is based on fear. For example, a consumer's anxiety about engaging with a business for the first time may be rooted in the fear of receiving poor treatment or being deceived. (Blumberg and Izard, 1986; Vohs et. al., 2007). Etymological analyses of the terms fear and anxiety demonstrate that while both describe responses to threats or dangers, they differ in terms of the triggering stimuli. Definitions of anxiety often associate it with fear, but anxiety has a distinct quality involving concern about uncertain events. Both fear and anxiety are emotional responses to threats, dangers, and aversive events. However, it has been widely accepted by psychiatrists and psychologists that anxiety is a response to potential rather than explicit threats (Freud, 1930; Estes and Skinner, 1941). Fear is a response to a known threat, whereas anxiety is a response to an unknown threat or internal conflict. Another distinction between fear and anxiety relates to the associated behavior. For instance, fear in animals helps them protect themselves and avoid the object of fear. Anxiety, on the other hand, involves subjective feelings of concern focused on potential or future negative outcomes or events. Another difference between fear and anxiety is the perceived controllability. Unlike fear, anxiety is characterized by a sense of uncontrollability, largely focused on future possible threats, dangers, or other impending negative events (Barlow, 2000). In the Diagnostic and Statistical Manual of Mental Disorders, anxiety disorders are recognized as a category rather than fear disorders (Blanchard and Blanchard, 2008).

## **2.2. Intolerance of Uncertainty**

Within the ordinary course of life, there are many situations of uncertainty regarding the present or the future. Uncertainty is described as a mental state involving both cognitive and emotional aspects. It is characterized by a sense of loss of control, feeling less certain, and a lack of security. Uncertainty is a cognitive state that arises from the inability to assign meaning to an experience (Crigger, 1996). Budner (1962) categorizes the causes of uncertainty as situations without cues, complex situations with cues, and conflicting situations where different cues contain different information.

In response to a perceived threatening situation, individuals may exhibit two types of reactions: acquiescence and denial. In acquiescence, individuals accept the situation as unchangeable, believing that they cannot alter the actual state of affairs. In denial, individuals alter the perceived reality of the situation according to their own perceptions. It is argued that individuals become intolerant of uncertainty when faced with novel, complex, or insoluble situations (Sarıçam, 2014). While life is filled with uncertainties every day, individuals who are intolerant of uncertainty easily find numerous reasons to worry. These individuals tend to focus on anxiety and therefore struggle with decision-making and finding solutions to escape from the uncertainty (Dugas et. al., 2004).

The level of uncertainty and individuals' ability to cope with it vary, leading to the phenomenon known as intolerance of uncertainty (IU) (Çelik and Köse, 2021). The concept of intolerance of uncertainty is based on the concept of intolerance of ambiguity, which was initially defined by Frenkel-Brunswik in 1948, and the terms have been used interchangeably for many years. This concept refers to the tendency to evaluate uncertainty as threatening (cognitive), causing anxiety, distress, and discomfort (emotional), and as a situation that should be avoided or rejected (behavioral), even if the probability of occurrence is low (Grenier et. al., 2005). According to Buhr and Dugas (2002), there are four sub-dimensions of intolerance of uncertainty: (1) perceiving uncertainty as stressful and distressing, (2) feeling inadequate in taking action and forming behavior, (3) viewing uncertain situations as negative and to be avoided, and (4) considering uncertainty as unfair. As the level of intolerance of uncertainty increases, it is inevitable that individuals will experience difficulties in their lives, which in turn negatively affects their psychological well-being (Dugas, 2005). This concept is considered a type of cognitive bias that affects individuals' perceptions and evaluations, representing an emotional state

related to the future. The level of intolerance of uncertainty is mainly associated with anxiety and anxiety disorders. Regardless of the probability of occurrence, individuals tend to perceive the possibility of a negative event as unacceptable (Dugas and Ladouceur, 2000; Grenier et. al., 2005; Kesby et. al., 2017).

### 2.3. Mobile Shopping

It is undeniable that technology has had significant effects on human life and, consequently, in the field of business. Tools such as wireless communication, the internet, computers, and smartphones play a crucial role in enabling many businesses to digitalize either their entire operations or a portion of them. This phenomenon signifies the digitalization of commerce. Particularly, the widespread use of the internet in almost every transaction provides substantial advantages both for buyers in purchasing products and for sellers in marketing their goods. As technology continues to advance and smartphones become more prevalent in our lives, a simpler form of electronic commerce has emerged known as mobile commerce. As a result, consumers increasingly conduct online purchasing activities through mobile devices (Sardjono et. al., 2021). This has led businesses to develop mobile apps instead of relying solely on mobile-friendly websites. Mobile applications allow consumers to compare products, categories, and brands before making a purchase using their mobile devices. This convenience helps enhance to customer trust (Sardjono et. al., 2020).

Mobile commerce involves the delivery of products and services through wireless technologies, enabling internet commerce activities without time or location constraints (Liao et. al., 1999). Mobile commerce refers to direct or indirect commercial transactions conducted through various mobile devices via wireless telecommunications. Mobile commerce applications are generally divided into two categories: content delivery (such as reporting, notifications, and consultations) and transactions (including data entry, purchases, and promotions) (Balasubramanian et. al., 2002).

The COVID-19 pandemic has prompted consumers who traditionally engaged in offline or in-person shopping activities to increasingly shift towards online shopping through various businesses offering e-commerce and mobile commerce services. Mobile marketing provides significant convenience and comfort for customers to obtain the desired products during the COVID-19 pandemic. Furthermore, there has been a shift in customer motivations towards online shopping, which initially became a necessity due to the pandemic. Previously, health-related products, support products for work-from-home arrangements, and food products were the primary focus of mobile commerce. However, mobile commerce is now gradually replacing many traditional marketing practices as customers' motivations evolve.

### 3. Methodology

Anxiety refers to the fear of unknown outcomes following a purchase and the lack of control over the consumption outcome (Bujisic et. al., 2017). Anxiety increases the attractiveness of low-risk and secure options (Raghunathan, Pham, and Corfman, 2006). Previous studies on online shopping have shown that anxiety significantly influences online purchase intention. As anxiety increases, individuals tend to exhibit a higher intention to shop online (Nagar and Gandotra, 2016). Furthermore, other studies indicate that the fear of an unknown deadly infectious virus can have a significant psychological impact on individuals and lead to an increase in anxiety and stress (Arumugam, 2020; Hyams et. al., 2002). This is because an individual's perception of risk associated with a new virus tends to be very high in the early stages of a pandemic, especially when there is no vaccine or antivirus available (Leppin and Aro, 2009).

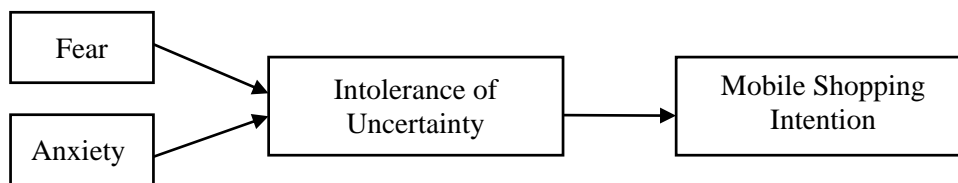
The COVID-19 pandemic introduces various uncertainties in individuals' lives, and when these uncertain situations are perceived as threatening, they can lead to negative reactions and anxiety (Kasapoğlu, 2020). Studies have indicated a significant positive relationship between anxiety and intolerance of uncertainty (Dugas et. al., 2001; Holaway et. al., 2006; Sari and Dağ, 2009). Therefore, it is suggested that the fear and anxiety encouraged by the media regarding the overall perception of the pandemic can alter rational consumer behavior and have broader implications for consumers' spending decisions (Loxton et. al., 2020).

The findings from the literature review were transformed into hypotheses, and a model was developed based on these hypotheses, as illustrated in Figure 1. The research hypotheses are listed as follows:

*H1: Fear has a positive effect on intolerance of uncertainty.*

*H2: Anxiety has a positive effect on intolerance of uncertainty.*

*H3: Intolerance of uncertainty has a positive effect on mobile shopping intention.*



**Figure 1.** Research Model

In this study, data collection was conducted through an online platform over a two-week period in the first week of April. The data were obtained using a questionnaire survey method. To ensure the reliability of the questionnaire, a pre-test was conducted with 40 participants, and necessary adjustments were made to finalize the questionnaire. A total of 484 participants were reached through simple random sampling method in the study conducted in the population of Uşak province of Turkey. For the measurement of the fear dimension, 7 items were adapted from Ahorsu et. al. (2020); for the measurement of the anxiety dimension, 11 items were adapted from Sachdeva (2022); for the measurement of intolerance of uncertainty dimension, 12 items were adapted from Carleton et. al. (2007); and for the measurement of mobile shopping intention dimension, 4 items were adapted from Davis (1989) studies. Structural equation modeling (SEM) was employed to test the proposed research model and hypotheses, and the analysis process utilized SPSS v.27 and AMOS v.24 software. Factor analysis was conducted to assess the reliability of the scales, considering their adaptation to the Turkish.

#### **4. Findings**

The questionnaire consists of two sections. The first section represents the participants' demographic characteristics, while the second section aims to measure the participants' attitudes towards fear, anxiety, intolerance of uncertainty, and mobile shopping intention through Likert-type questions ranging from 1 (strongly disagree) to 5 (strongly agree).

**Table 1.** The Demographic Characteristics of the Participants

<b>The Demographic Characteristics</b>	<b>Sampling %</b>
<i>Gender</i>	
Male	51,7
Female	48,3
<i>Age</i>	
15-19	16,3
20-24	62,5
25-35	20,4
36 and above	0,8
<i>Education</i>	
High school and below	19,2
Bachelor's degree	78,7
Graduate degree	2,1
<i>Monthly Income (Turkish Lira)</i>	
2000 and below	35,2
2001-4000	41,5
4001-6000	15,2
6001 and above	8,1
<i>Duration of Time Spent on Mobile Shopping (weekly)</i>	
Less than 1 hour	16,3
1-2 hours	61,5
3 hours and above	22,2

In terms of gender, the research participants consisted of 51.7% males and 48.3% females. Regarding age, 16.3% of the participants were in the 15-19 age group, 62.5% in the 20-24 age group, 20.4% in the 25-35 age group, and 0.8% were 36 years old and above. Based on these results, it can be stated that the majority of the participants were young individuals. In terms of monthly income, 35.2% of the participants reported having an income of 2000 TL or less. 41.5% had an income between 2001-4000 TL, 15.2% had an income between 4001-6000 TL, and 8.1% had an income of more than 6001 TL. Lastly, when asked about the amount of time they spend on mobile shopping within a week, 16.3% of the participants responded with less than 1 hour, 61.5% spent 1-2 hours, and 22.2% spent more than 3 hours on mobile shopping.

To test the suitability of the obtained data set for the research model, the Kaiser-Meyer-Olkin (KMO) measure and Bartlett's test of sphericity were conducted, as shown in Table 2. The results indicated a KMO value of 0.92 and a significant Bartlett's test result indicating that the correlation matrix is not an identity matrix and there are relationships among the variables. Therefore, it can be concluded that the data set is suitable for factor analysis.

**Table 2.** KMO (Kaiser-Meyer-Olkin) Sampling Adequacy Test and Bartlett's Sphericity Test

		Level of significance
<b>KMO Sampling Adequacy Test</b>	0,92	0,60<
<b>Bartlett's Sphericity Test</b>	0,000	<0,05 (Sig.)

Exploratory factor analysis was conducted on the scales used in the study to determine factor ranges for each item and Cronbach's alpha coefficients.

**Table 3.** Results of Factor Analysis

Structure	Factor Loadings	Items	Cronbach's Alpha Coefficients
Fear	0,583-0,718	7	0,902
Anxiety	0,673-0,812	11	0,932
Intolerance of Uncertainty	0,712-0,773	12	0,924
Mobile Shopping Intention	0,672-0,735	4	0,913

The fear dimension scale consists of 7 items with factor loadings ranging from 0.583 to 0.718. Similarly, the anxiety dimension scale, consisting of 11 items, has factor loadings ranging from 0.673 to 0.812. The intolerance of uncertainty dimension scale, consisting of 12 items, has factor loadings ranging from 0.712 to 0.773. Lastly, the mobile shopping intention dimension scale, consisting of 4 items, has factor loadings ranging from 0.672 to 0.735. The Cronbach's alpha coefficients for all four scales used in the study were found to be above the acceptable level (0.7<) (Cronbach and Shavelson, 2004).

**Table 4.** The Research Model Fit Indices

Index	Index Value	Model Fit Criterion Thresholds	Interpretation
$\chi^2$	435,112	-	-
df	310	-	-
SRMR	0,049	$0 \leq SRMR \leq 0,08$	Excellent
IFI	0,973	$0,95 < IFI \leq 1$	Excellent
TLI	0,971	$0,95 \leq TLI \leq 1$	Excellent
RMSEA	0,053	$0 \leq RMSEA \leq 0,06$	Excellent

The research model containing the research hypotheses demonstrated an adequate fit based on the accepted values of goodness-of-fit indices, indicating its suitability for path analysis. Through the

conducted path analysis, the standardized estimates, unstandardized estimates, standard errors (S.E.), critical values (C.R.), and results of statistical significance testing related to these findings were presented in Table 5.

**Table 5.** Results of Hypothesis Tests

Hypothesis	Std. Est.	Est	S.E	C.R.	P
H <sub>1</sub> : Fear →IU	0,325	0,362	0,092	4,002	***
H <sub>2</sub> : Anxiety →IU	0,528	0,554	0,094	6,834	***
H <sub>3</sub> : IU→MSI	0,421	0,434	0,081	4,874	***

According to the obtained results, it was observed that fear has a significant positive effect on intolerance of uncertainty ( $\beta=0.325$ ,  $p<0.05$ ), supporting H1 hypothesis. It was also determined that anxiety has a significant positive effect on intolerance of uncertainty ( $\beta=0.528$ ,  $p<0.05$ ), supporting the hypothesis. Lastly, it was observed that intolerance of uncertainty has a significant positive effect on mobile shopping intention ( $\beta=0.421$ ,  $p<0.05$ ), supporting H3 hypothesis.

## 5. Conclusion

This study specifically focuses on the impact of intolerance of uncertainty on mobile shopping intention. The main objective is to investigate the extent to which factors such as fear, anxiety, and intolerance of uncertainty influence individuals' intention to engage in mobile shopping, particularly in the context of negative events such as the pandemic. Research has shown that individuals' fear and anxiety resulting from the ongoing pandemic increase their addiction to and usage of smartphones (Kong, 2020; Chopdar, Paul, and Prodanova, 2022). The research findings indicate that fear, anxiety, and intolerance of uncertainty related to the pandemic have an impact on individuals' intention to engage in mobile shopping. Recognizing these relationships enhances understanding of the changes in mobile shopping habits since the pandemic.

Intolerance of uncertainty refers to an individual's response when faced with uncertainty. The uncertainty surrounding when the fear and anxiety caused by the pandemic will completely diminish affects individuals' shopping behaviors and shopping environments. The lack of a clear timeline for when pandemics will end or when a return to normalcy will occur makes it difficult for individuals to make future plans and manage their expectations (Müberra et. al., 2021; Yagil & Cohen, 2022). The necessity to stay at home during the pandemic and restrictions on visiting physical stores have encouraged people to use their mobile phones for mobile shopping (Wiścicka-Fernando, 2021). People prefer to engage in mobile shopping to purchase the products they need from the comfort of their homes (TURKSTAT, 2019). However, mobile shopping intention may continue to fluctuate even after the official end of the pandemic, as the relationship between intolerance of uncertainty and mobile shopping intention varies depending on individual characteristics and conditions. For example, while some individuals may cope better with uncertainty and their mobile shopping intentions remain unaffected, others may experience an increase in their mobile shopping intentions when they perceive higher levels of uncertainty (Chopdar, Paul, and Prodanova, 2022; Ramadan et. al., 2023).

The observed panic buying and increased inclination towards mobile shopping during the pandemic have resulted in sustained high rates of mobile shopping even as the impact of the pandemic diminishes (TURKSTAT, 2022). This situation has also influenced businesses to operate through mobile channels. Globally, more than half of online shoppers (55.5%) use their mobile phones to make online purchases at least once a week (DataReportal, 2023). Therefore, this situation compels companies to prioritize mobile commerce in order to meet consumer expectations. The contribution of this research provides important insights for companies to develop effective strategies to enhance customer satisfaction post-pandemic.

Changes in consumer behavior have been observed during the pandemic. In particular, consumers have become more concerned about safety and hygiene and may expect mobile shopping companies to take steps in this direction even after the pandemic. This situation may require changes in the way mobile shopping companies operate. Therefore, it is important for companies to create a flexible strategy that takes into account customer expectations and changing consumer behaviors and to continuously update this strategy.

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