

## Usage and Impact of Hotel Mobile Applications on Customer Loyalty: The Mediating Role of Customer Satisfaction

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### Abstract

Customer loyalty and customer satisfaction are very important elements for a hotel to remain in the industry. The use of advanced mobile technology and mobile applications became essential to achieve customer satisfaction. However, existing literature and previous studies on the impact of hotel mobile applications have mainly focused on the acceptance of mobile technology. This study aims at empirically testing the influence of mobile applications usage on customer loyalty, taking into account the attributes of the three variables of the study. The researchers used mobile applications as the targeted tools under investigation. To measure and identify the results of these applications, a self-survey tool was adopted in the form of a questionnaire. The questionnaire was divided into three sections, each section devoted to measuring one of the study variables, and for measuring the three variables in the study. Furthermore, previous studies were used to ensure the reliability of the measuring tools. The hotel mobile applications usage variable was measured by using 21 sentences that seek to evaluate the dimensions of the six variables (Effectiveness, Efficiency, Learnability, Memorability, Errors, Cognitive load). In addition, the study provides decision makers in the hotels business with insight on the effect of mobile applications on their customers' loyalty and gives them ways to increase the level of customer satisfaction. Moreover, the mediating effect of customer satisfaction is identified in this study within the context of hotels mobile applications. Therefore, this study recommends improving the process of using mobile phone applications in hotels due to its great impact on increasing customer satisfaction and loyalty.

**Keywords:** hotel mobile applications, customer loyalty, customer satisfaction

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### Introduction

The use of mobile applications is becoming increasingly essential for people's businesses and personal lives. In the field of tourism and travel, mobile applications play an especially important role that is critical to the success of the travel industry. According to Statista's initial forecasts, (2020), the industry was expected to generate a revenue of 712 billion dollars by the year 2020. Due to the pandemic, the tourism industry revenue forecasts will be decrease by 42.1 percent. After recovering from the pandemic, tourism is expected to recover as well. Most travelers own mobile phones and use travel-related applications to book flights, hotels, trips, etc.

Tourism in Jordan is the fifth most contributing sector to the country's GDP, covering 10% of the national economy. Even though Jordan lies amid instability, it continues to be a safe and secure travel destination. Jordan was ranked 38th globally in the Travel and Tourism Competitiveness report of 2017 -safety and security index component- next to Malaysia, Germany, and Greece. In addition, Jordan received in 2016 around 6.4 million guests, 33.5% higher than the numbers of visitors in 2015 (WORLD ECONOMIC FORUM, 2017).

The multiple types of tourism Jordan offers has a significant impact on other sectors in the country. For example, the World Bank ranked Jordan as the leading country in the field of medical tourism in the Arab region, and the fifth country globally (Innovative Jordan, 2021).

As the tourism industry in Jordan becomes more active, the use of travel applications plays a prominent role on a large scale. These applications offer travelers many services. For instance, a traveler receives special prices exclusive to application users. He or she can use cash, points or both for payments; is able to change or update hotel-booking details; can explore food and entertainment options in the city; and has access to information such as the hotel's contact details, directions to get there, the weather in the city, and so on. Furthermore, travelers have real-time access to their budget on their smartphones. They can have an email copy of their bill, convert the hotel currency to theirs, receive offers and reward points such as free hotel nights and goods.

There are many motivating reasons for creating a mobile application such as boosting customer loyalty, marketing special offers, providing clients with destination information and increasing business-customer interaction (Adukaite et al., 2014).

Due to the lack of sufficient research in this field, this study comes to shed light on this aspect of the industry with the purpose of creating a reference to be used in the future.

### **Literature review**

#### **Previous studies**

A study by Gomachab (2018) used a quantitative design to define the mobile banking elements that boost satisfaction among customers. A small random sample that constitutes of 60 respondents was created to collect data through a questionnaire. The study found that the Keetmamshoop mobile banking services created a 75% customer satisfaction percentage. The elements that play a role in motivating customers to use mobile banking services include the application being reliable, convenient, cost effective, adaptable to all mobile networks, compatible with all mobile devices and containing encouraging ads.

AsfourandHaddad (2014) created another related study that adopted seven dimensions considered essential for any mobile banking services. The dimensions are: reliability, flexibility, privacy, accessibility, ease of navigation, efficiency, and safety. The main objective of the study is exploring the level of impact mobile banking services have on customer satisfaction. The outcomes revealed that the abovementioned dimensions have an overall impact on customer satisfaction, with privacy and accessibility being the elements with the most influence.

Another study carried out in 2018 by Hammoud, Bizri, and El Baba (2018) studied the correlation between the quality of e-banking services and customer satisfaction. They wanted to know the most influential element that plays the largest role in creating satisfaction among customers. A survey instrument was designed to collect data from the Lebanese banking industry and therefore was distributed among bank clients in the sector. The structural equation modelling method was used with SPSS and Amos (20) to analyze the data. The study's results found that the services' efficiency, reliability, ease of use, responsiveness, security and privacy have a significant influence on customers' satisfaction. The study highlighted the 'reliability' element as the one with the most impact.

#### **Mobile applications' usability dimensions**

The 'usability' dimension can be defined as the term that describes how easy it is to use an application. It also describes the level of a system's suitability for a specific group of users who perform specific tasks in a specific situation (Camilleri, 2018). The domain of information technology is witnessing a growing movement aimed at evaluating mobile applications on the market. As the use of mobile phones is spreading wider across the globe, we are now able to find an application that covers almost every part of our daily life.

Becerril, Stahlmann, Beck, and Lindemann (2017) carried out a literature review that identified 60 usability features. The researchers decided to identify with the Center of Mobile Application Development (PACMAD) usability model for their study. This model collects specific elements from multiple usability models and creates a comprehensive one. This model stands out with the fact that it added the cognitive load attribute. It appears that mobile phones are especially sensitive to the effects of cognitive overload. That is because they are probably used in different task settings and size limitations. It is noteworthy to mention here that existing usability models usually overlook this aspect (Harrison, Flood, & Duce, 2013).

The PACMAD model defines seven features that determine the usability level of an application. These are: Effectiveness, Efficiency, Satisfaction, Learnability, Memorability, Errors and Cognitive load. The deployment of questionnaires as a tool to calculate the level of usability was examined in literature and practice. Taking into consideration the definitions found in (Harrison, Flood, & Duce, 2013) and (Az-zahra, Fauzi, & Kharisma, 2019), we can define the element of usability as per seven aspects: effectiveness, efficiency, satisfaction, learnability, flexibility, memorability and errors. For our research, and in order to use the PACMAD model, we limited these aspects to the following six: effectiveness, efficiency, learnability, memorability, errors and Cognitive load (Az-zahra, Fauzi, & Kharisma, 2019). In the paragraph below, we present a definition for each aspect (Harrison, Flood, & Duce, 2013).

**Effectiveness** is the level to which a user is able to perform a task in a specific context. This aspect is usually calculated by evaluating if a user is capable of completing a group of specific tasks.

**Efficiency** is the accuracy and speed with which a user can complete a task. This part measures the level of a user’s productivity when using the application.

**Learnability** reflects how easy it is for a user to master the use of the application. It usually measures how fast a user can use the application in an effective manner.

**Memorability** measures the user’s ability to remember how to use an application. Given the fact that a software might not be regularly used, it is important to ensure that users will still be able to remember after time how to use the application without having to relearn every step.

**Errors** is the aspect that measures how well a user can perform a task without encountering any errors. According to Aguilar-Illescas, Anaya-Sanchez, Alvarez-Frias, & Molinillo (2020), it is important that users are able to use the application with as few errors as possible; and if they happen to encounter errors, they should be able to move past them easily. This aspect also reflects how simple the system design is for users. The PACMAD model explores the error’s nature and frequency.

**Cognitive load** is the aspect added by the PACMAD model as an element to measure usability. This aspect can be defined as the level of cognitive processing that is needed by the user while using the application. There is an assumption in previous usability researches assuming that a user performs one task at a time and, hence, is able to focus on this specific task. However, in many cases users are performing another task while using their mobile phones (Zahra, Hussain, & Mohd, 2017). An example to that is a car driver often operates the car stereo while driving. Therefore, it is essential that the cognitive load needed to use the mobile application does not disturb the main task performed by the user (Az-zahra, Fauzi, & Kharisma, 2019)

**Customer Satisfaction and Customer Loyalty**

According to Oliver (1997), customer satisfaction reflects to what level a consumer believes his or her needs are fulfilled. They normally express their satisfaction when a service or a product fulfills their expectations (Khairawati, 2019). It is understood that customer satisfaction is essential for sustaining a business because a customer’s impression of a product or a service influences the potential of them buying or using the product or service again in the future (Kamran-Disfani et al., 2017).

Because of that, it is critical that companies explore the impressions their customers have about their products and services. In addition, the level of customer satisfaction is a deciding factor in creating customer loyalty (Eggert & Ulaga, 2002).

In this regard, customer loyalty is defined as the commitment a customer shows to repeatedly buy a product or service regardless of any marketing influence that aims to change the customer’s purchase behavior (Oliver, 1997). Businesses carry out multiple types of activities to win and maintain customer loyalty, which directly contributes to their business sustainability. As stated by Shafiee & Bazargan (2018), customer loyalty is a factor that creates sustainable revenues and profits and decreases the amount of funds allocated to win new customers. To boost customer loyalty, it is important for a company to maintain customer satisfaction by offering quality services.

**Study Model**

Based on the literature above, the following model was developed for the purpose of this study.

Mobile applications usability dimensions

This study empirically tests the influence of mobile applications usage along with the attributes of the three variables in the study on customer loyalty. The researchers used mobile applications as the targeted tools under investigation. The researchers hypothesized that (Effectiveness, Efficiency, Learnability, Memorability, Errors, Cognitive load) have an influence on customer satisfaction and loyalty

The research model for this study is shown in Figure 1.

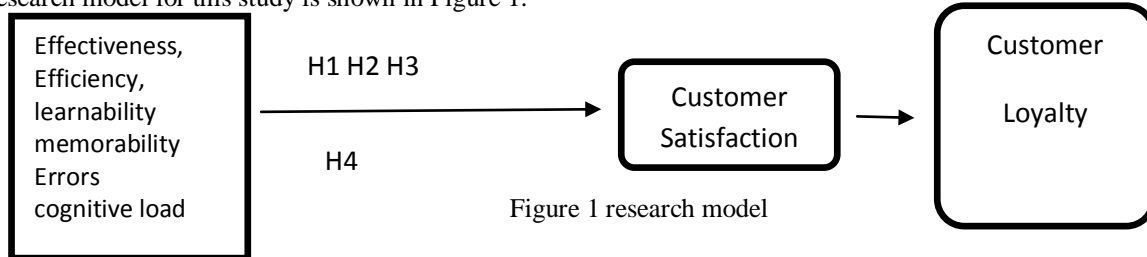


Figure 1 research model

**Research hypotheses formulated in this study:**

**H1:** There is NO statistically significant relationship between mobile applications and the customer loyalty in Jordan.

**H2:** There is NO statistically significant relationship between mobile applications and on the customer satisfaction in Jordan.

**H3:** There is NO statistically significant relationship between customer satisfaction and the customer loyalty in Jordan.

**H4:** There is NO statistically significant relationship between mobile applications and customer loyalty in Jordan through the intermediary role of customer satisfaction.

**Study Objective:**

The study seeks to achieve the following objectives:

- 1- Analyzing the reality of using hotel mobile phone applications in terms of (Effectiveness, Efficiency, Learnability, Memorability, Errors, Cognitive load) and their impact on customer satisfaction and loyalty.
- 2- Measuring the impact of customer satisfaction on the experience they have when using hotel mobile applications.

**Methodology**

The study population consists of consumers aged 18 and above, specifically clients who use their mobile phones to manage their reservations or inquire about hotel services. All items intended to measure the variables in this study were adopted from previously validated instruments. Regression analysis was used to analyze the data. A confirmatory factor analysis was performed to assess the reliability and validity of the measurement model before the regression analysis was performed.

**Statistical Analysis****Descriptive Data**Table (1): **Descriptive Statistics**

	N	Minimum	Maximum	Mean	Std. Deviation
a1	468	1	5	3.24	1.457
a2	468	1	5	3.39	1.499
a3	468	1	5	3.34	1.424
a4	468	1	5	3.20	1.390
b5	468	1	5	3.17	1.427
b6	468	1	5	3.29	1.447
b7	468	1	5	3.07	1.389
b8	468	1	5	3.27	1.433
c9	468	1	5	3.19	1.438
c10	468	1	5	3.12	1.335
c11	468	1	5	3.17	1.434
c12	468	1	5	3.32	1.462
d13	468	1	5	3.26	1.441
d14	468	1	5	3.35	1.482
d15	468	1	5	3.16	1.446
e16	468	1	5	3.48	1.465

e17	468	1	5	3.07	1.376
e18	468	1	5	3.02	1.351
f19	468	1	5	3.21	1.398
f20	468	1	5	3.23	1.432
f21	468	1	5	3.07	1.406
g22	468	1	5	3.47	1.291
g23	468	1	5	3.58	1.351
g24	468	1	5	3.63	1.318
g25	468	1	5	3.67	1.379
g26	468	1	5	3.74	1.347
h27	468	1	5	3.44	1.308
h28	468	1	5	3.63	1.323
h29	468	1	5	3.64	1.347
h30	468	1	5	3.44	1.394
Valid N (listwise)	468				

The table above illustrates the mean and standard deviation of questionnaire answers as received from the respondents. The analysis shows that all respondents reacted positively to the items of the questionnaire. This is seen in the fact that all questionnaire items and statements scored a mean higher than (3.00), and this represents a statistically positive reaction.

The table below also shows that respondents had a positive reaction towards the study’s variables. The numbers show that all the variables of the study scored a mean higher than (3.00), and this is a positive result statistically.

Table (2): **Descriptive Statistics**

	N	Minimum	Maximum	Mean	Std. Deviation
Effectiveness	468	1.00	5.00	3.2949	1.36661
Efficiency	468	1.00	5.00	3.1998	1.32192
Learnability	468	1.00	5.00	3.1998	1.33391
Memorability	468	1.00	5.00	3.2564	1.40975
Errors	468	1.00	5.00	3.1887	1.32447
Cognitive	468	1.00	5.00	3.1724	1.33234
Satisfaction	468	1.00	5.00	3.6179	1.26762
Loyalty	468	1.00	5.00	3.5358	1.26672
Valid N (listwise)	468				

**Reliability Test**

For this part, the researchers adopted the Cronbach Alpha scale to measure the reliability of the study. The value of alpha was 0.964 reflecting an excellent ration because it scored higher than the acceptable level of 0.60.

**Hypothesis testing:**

It is necessary that the adopted study model be validated before starting the structural analysis. The validation process is carried out using a set of indicators to check the suitability of the study’s model.

Table (3): Fit model

Indicator	AGFI	$\frac{X^2}{df}$	GFI	RMSEA	CFI
<b>Value Recommended</b>	<b>&gt; 0.8</b>	<b>&lt; 5</b>	<b>&gt; 0.90</b>	<b>≤0.10</b>	<b>&gt; 0.9</b>

<b>Value of Model</b>	0.898	4.56	0.946	0.087	0.903
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Table (4) demonstrates that the indicators above pass the values recommended by the relevant references, and this takes us to testing the hypothesis.

To test that research hypothesis, the researchers used the structural equation analysis where the hypothesis is considered accepted if p-value is less than 0.05:

Table (4 ): The Results of Testing Hypotheses

			<b>Path Coefficients (β)</b>	<b>T-value</b>	<b>P</b>
Satisfaction	<---	hotel mobile applications	0.61	12.770	***
Loyalty	<---	Satisfaction	.72	13.200	***
Loyalty	<---	hotel mobile applications	.24	3.965	***

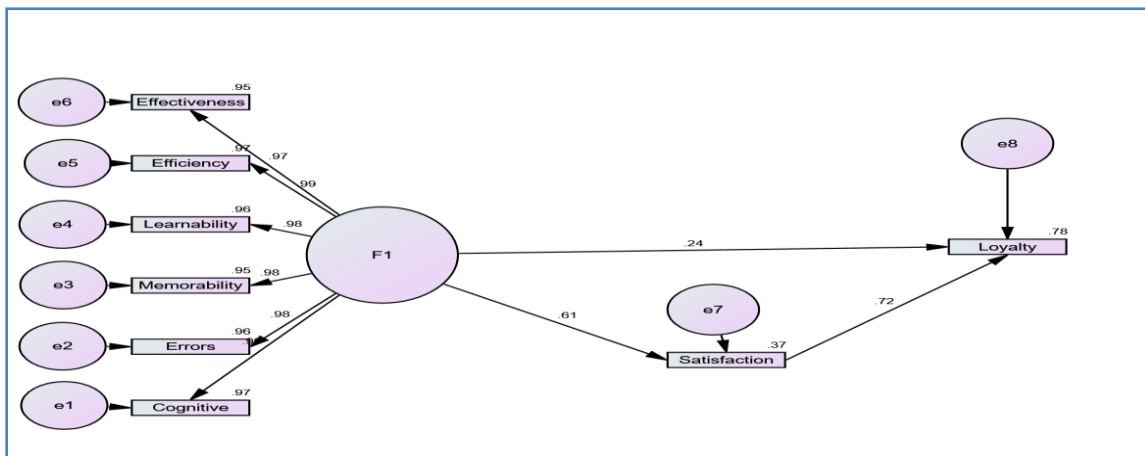


Figure 2: Chart for path analysis results

**FINDINGS AND PRACTICAL IMPLICATIONS**

The coefficients for the final model are reported above and the model is represented by:

**H<sub>01</sub>: The hotel mobile applications usability dimensions have no impact at the level of significance ( $\alpha \leq 0.05$ ) on the customer loyalty in Jordan.**

The table above shows that ( $\beta = 0.24$ ;  $P < 0.05$ ; = 0.000). This indicates that the usability dimensions of hotel mobile applications have an impact at the level of significance ( $\alpha \leq 0.05$ ) on the customer loyalty in Jordan.

**H<sub>02</sub>: The hotel mobile applications usability dimensions at the level of significance ( $\alpha \leq 0.05$ ) have no impact on the customer satisfaction in Jordan.**

In this hypothesis as well, the table shows that ( $\beta = 0.62$ ;  $P < 0.05$ ; = 0.000), which suggests that that the usability dimensions of hotel mobile applications at the level of significance ( $\alpha \leq 0.05$ ) have an impact on the customer satisfaction in Jordan.

**H<sub>03</sub>: The customer satisfaction at the level of ( $\alpha \leq 0.05$ ) has no impact on the customer loyalty in Jordan.**

The table above tells that ( $\beta = 0.436$ ;  $P < 0.05$ ; = 0.000), and this indicates that customer satisfaction at the level of ( $\alpha \leq 0.05$ ) has an impact on the customer loyalty in Jordan.

**H<sub>04</sub>: The hotel mobile applications usability dimensions have no impact at the level of ( $\alpha \leq 0.05$ ) on the customer loyalty in Jordan through the intermediary role of customer satisfaction.**

The table above also shows that ( $\beta = 0.62$ ;  $P < 0.05$ ;  $= 0.000$ ), meaning that usability dimensions of hotel mobile applications have an impact at the level of ( $\alpha \leq 0.05$ ) on the customer loyalty in Jordan through the intermediary role of customer satisfaction

### **Conclusions**

The study's main theme was developed based on the model of the impact of hotel mobile applications. The researchers added customer satisfaction as a third construct of the model in addition to the main variables (Effectiveness, Efficiency, Learnability, Memorability) to measure their impact on customer loyalty. These constructs were found to be significant in determining their effects.

There are many factors that influence customer loyalty as a result of using mobile applications, according to many of researchers. Loyalty is one of the crucial keys to selecting and using successful mobile apps. The regression results indicated that effectiveness and (Effectiveness, Efficiency, Learnability, Memorability) have a strong positive impact on customer satisfaction. Therefore, the findings of this study strongly support the hypothesis designed in the research model that an application's effectiveness, efficiency, learnability, and memorability are the key attributes that affect customer satisfaction and that they reflect positively on customer loyalty. This leads to the conclusion that the use of mobile applications is a successful and influencing factor for achieving customer satisfaction and loyalty.

### **Future work**

Evaluation of an application is important to measure the level of its accuracy and usefulness. Yet, evaluating an existing application is more challenging due to the limitation of the mobile device on which the application runs. It is also considered more challenging because there are very few software systems that can help in collecting the needed data to evaluate an application's usability. That is why most studies ask users to give their own evaluation of a specific application, mainly because they are the end beneficiaries.

Therefore, more studies are needed in this field especially with the increasing spread of such applications around the world. We need an approved effective method to evaluate and compare applications, and we hope that the more researchers will engage in active participation in this arena in the future.

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