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PAPER

Future Trends of Smartphone Application Intention to Use: Expansion of the Technology Acceptance Model

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ABSTRACT

The emergence of smartphone applications has affected all types of industries. Rapid smartphone adoption has introduced a variety of mobile applications into the consumer market, transforming the way consumers perform various daily tasks and activities. As is the case in the tourism industry, through the positive features provided by smart phone applications, the tourism sector constitutes a major factor in Jordanian national income. Today, Jordan has the highest percentage of mobile application users, with high usage rates of mobile application features. However, tourism in Jordan is still suffering. Therefore, this study was conducted to examine the influence of smartphone application features, perceived usefulness, ease of use, and word of mouth (WOM) on the intention to use mobile applications in the Jordanian tourism industry. This study adopted a quantitative approach. It was based on a sample collected from tourists in Jordan using a self-administered questionnaire. A total of 420 copies of the questionnaires were distributed. The research model was empirically tested using structural equation modeling (SEM). SEM findings revealed that approximately 80% of the variance in intention to use mobile apps was accounted for by mobile app features, perceived usefulness, perceived ease of use, and positive WOM. The results showed that perceived usefulness and perceived ease of use were significantly related to WOM. The results of this research provide managerial guidelines for developing effective strategies for mobile applications in the Jordanian tourism industry.

KEYWORDS

future trends, M-technologies, real world experience, industrial applications

1 INTRODUCTION

The smartphone application evolution, primarily known as a modern information technology that combines the web and the phone to provide updated services and information, is today's new channel of communication and marketing for us [1], [2]. Smartphones provide functional and distinctive services such as satisfaction,

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communication, and information to serve all sectors [3], [4]. Due to the increased use of mobile phones, not only individuals but also institutions rely on mobile applications for all businesses [5], [6]. Businesses use these applications differently to connect with consumers, promote their goods or services, and market their packages [7]. These applications have a higher potential to attract consumers, and their types and natures are increasing day by day, depending mainly on their usage purposes [8], [9]. The emergence of new technology, particularly mobile applications, has affected all types of industries, as well as the tourism industry. As in the tourism industry, through the positive features offered by smartphone applications, tourists can customize the services they want through word of mouth (WOM) [10]. Amazingly, today there are many ways to support the tourism sector through the use of mobile applications as an effective marketing strategy [11]. According to [12], mobile application usage in the tourism industry is very useful for promoting tourist locations. The use of mobile applications is constantly increasing, which in turn allows for tourism marketing and provides customers with better and better services [13]. Regarding the advanced and improved services, determining the customers' intentions is now of greater importance. This step cannot only help the tourism industry flourish; even potential tourists can avail themselves of the maximum benefits through mobile application developers [14].

The rapid progress in smartphone-based internet use has resulted in heightened penetration and the creation of new applications. Several studies have focused on the influence of WOM via mobile apps on customer intent and perceived utility, with WOM playing a mediating role in online consumer behavior [15]. Mobile apps also have an impact on perceived utility (PU), perceived ease of use (PEOU), and mobile users' beliefs about applications via WOM. This research developed an integrative model that included the key variables of technology acceptance model (TAM), namely perceived utility and perceived ease of use, together with smartphone app characteristics such as abundance of information (AI) and WOM. This research aims to examine the moderating and mediating factors that impact visitors' desire to use mobile apps in Jordan. The goal is to have a comprehensive understanding of how tourists in Jordan use mobile applications.

2 LITERATURE REVIEW

2.1 Abundance of information

Given the functional benefits of perceived information, the importance of having access to information via smartphone apps increases [16]. The availability of information for smartphone apps, in particular, facilitates practical encounters in presenting information on certain items and services [17], [18]. The researchers revealed the favorable characteristics of smartphone apps that might improve customer attitudes towards companies and their behaviors. In addition, research conducted by Labanauskaitė et al. (2020) [19] provided more evidence that the usage of mobile apps and their capacity leads to a rise in information, hence demonstrating the wealth of information and the availability of different possibilities. The main goal of an advertisement is to provide information to the target customers so that when these messages reach them, they enjoy viewing the details. False information can manipulate some ads, so it is crucial to provide accurate information to attract and retain consumers, particularly those related to the price and quality of

the product or service [20]. Based on the aforementioned findings, we proposed the following hypotheses:

H1: AI has a positive and direct influence on PEU.
H2: AI has a positive and direct influence on PU.

2.2 Technology acceptance model

The TAM is a system that gives a practical methodological picture of the mechanism to accept modern information technology [21]. The logical work theory holds that an individual's experiences shape their behavior. These actions determine the personal possibility that an individual can follow in his behavior to accomplish a specific task. This model explains the individual's acceptance of any technology system based on two important factors: perceived usefulness and ease of use [22]. Perceived usefulness is the mediating variable in the current study. Hua and Wang (2019) [23] define perceived usefulness as the extent to which a user believes a particular system can improve their performance on a specific task. The concept of usefulness influences how customers or consumers perceive a product or service, how they introduce it via a mobile application, and what suggestions they receive from these applications [24]. Previous studies have shown that perceived usefulness is the main determinant of customers' attitudes and behaviors towards relying on any system or programmer in the future.

According to Kim et al. (2016) [25], usefulness is defined as perceived priority for the characteristics of the product or service, as well as the display features and results expected through the use of mobile applications. In this study, perceived ease of use is another mediating variable. According to [26], [27]. Perceived ease of use is the degree to which the individual believes that, when using a particular system or program, he or she will complete his task without effort. Several previous studies have also shown that perceived ease of use is one of the main factors in consumer attitudes and has a major influence on the behavioral intention to use any system or program in the future [24], [28]. Davis stressed that perceived ease of use and PU are two key factors affecting the attitudes of users of any technology.

The TAM is one of the most popular models that highlights the relationship between user acceptance and information technology systems. Numerous types of technology have undergone testing and study. Researchers in information systems are now using it (see Figure 1).

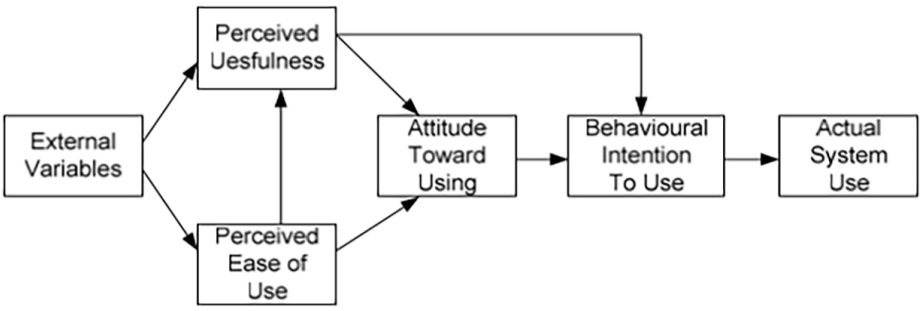

Fig. 1. Technology acceptance model [22]

As explained previously, the TAM is based on two main factors: perceived ease of use and perceived usefulness. To determine the intention of consumer behavior

towards electronic services, the TAM model is believed to be more accurate when used for prediction of acceptance of technology while using mobile applications. Tests have proven the comprehensiveness of the TAM model across all technology systems. This study integrated smart phone applications into its domain for the tourism industry's benefit. We proposed the following hypotheses based on the aforementioned findings:

H3: PU has a positive and direct influence on world of mouth.
H4: Perceived Ease of Use has a positive and direct influence on world of mouth.

2.3 Word of Mouth

Mobile applications' positive WOM is one more moderating variable in the current study. Smartphone applications leverage spoken word as a catalyst, enabling the transmission of speech. Even if there is no Internet supply, smart phones are a catalyst for the transmission of spoken word. Individuals can easily transmit information anytime and anywhere [29]. According to Lai et al. (2018) [30], individuals are interested in writing their opinions about a product or service on social media, with about 20% and 16% using smartphones to write these views on social networking platforms. For example, many individuals are interested in reading about any application before downloading it. Also, the spoken word through the Internet increases the importance of these smart phone applications, which further helps to find a new application or through the application store [31]. We proposed the following hypotheses based on the aforementioned findings:

H5: WOM has a positive and direct influence on smartphone app usage.
H6: WOM mediates the relationship between PU and smartphone app usage.
H7: WOM mediates the relationship between PEU and smartphone app usage.

3 RESEARCH FRAMEWORK

The quality of information and the amount of information are two important matters for consumers during their adoption of services, especially if the service is electronic, so here comes the importance of the information feature [32]. Smart phone applications provide advantages that influence users' acceptance of electronic services, and these informational benefits are closely linked to perceived ease of use, leading to their permanent acceptance and use [25], [33]. Despite some studies supporting the direct association between perceived usefulness and mobile app usage intention, the empirical evidence is totally consistent. Other important constructs, as illustrated in TAM theory [34], [35], may mediate the effect of features and intention. Furthermore, the previous study confirmed a strong, positive correlation between perceived ease of use and perceived usefulness in the direct relationship between mobile apps' generation of positive WOM and the intention to use them. Besides, the researchers also found a significant effect of perceived ease of use and perceived usefulness on the relationship between mobile application usage and positive WOM [15], [25], [36]. Potential visitors perceive the mobile app as a source of positive WOM on the Internet, perceiving this communication as more enjoyable and reliable than travel companies' information [37]. This study posits that the use of mobile applications, particularly for professional and group services, necessitates positive WOM, especially for services provided over phone applications [15], [36]. The role of positive WOM also gains support from past studies, such as [15], [36]. WOM played an important role for

tourists in the relationship between perceived ease of use and perceived usefulness in understanding tourists' behavioral intentions as it positively affected them [38]. Figure 2 illustrates the proposed variables for the current study model, which were based on previously discussed studies that addressed these relationships.

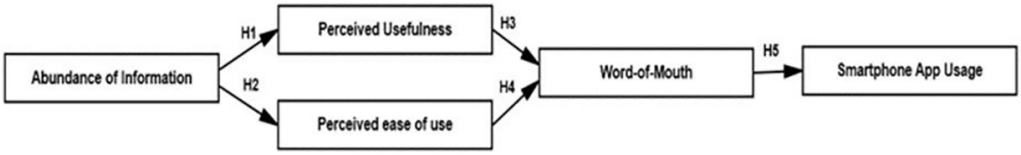

Fig. 2. Research framework

4 RESEARCH METHODOLOGY

This study employed the quantitative research setting and the survey process, as the quantitative research methodology sets out a model of the experiment [39]. The quantitative research exhibits a high degree of external validity, allowing for the generalization of the findings [40]. The study seeks to examine the background, current concerns, and prospects of the research problem as a descriptive study without identifying the causes [41]. This study employs a quantitative approach in its research design. Its goal is to collect relevant data from the questions and investigate the study's objectives. In this study, we describe quantitative research as a method of collecting data through a survey by applying the self-administered questionnaires at one specific point (a cross-sectional study).

4.1 Sampling

The study population is the total number of individuals to whom the research would be generalized. On the other hand, the sample refers to a selected group from a similar population, which aids in data collection and results attainment [42]. Hence, sampling is the process of selecting units from a chosen population. The sample selection process is one of the most important stages of research. Therefore, the target population of this study is individuals (tourists) visiting Jordan. The study focused on the main tourist places in Jordan: the city of Jerash in the north, the Dead Sea in the middle, and Petra in the south. According to statistics from the Jordanian Ministry of Tourism, the number of tourists coming to Jordan in 2019 was 5,360,587, and in 2020 it was 1,239,910 [42]. Therefore, we carefully selected a sample size of 420 questionnaires for this study to minimize the error rate. According to [43], the larger the sample size, the smaller the error rate, which provides us with accurate statistical results. While Hair et al. (2010) [44] emphasized in a more recent study that the sample size should not be less than 200 in equation modeling analysis, Thus, the researcher selected a sample of 420 tourists.

4.2 Data collection

Data collection is known as the systematic method of gathering and measuring data and facts on factors of interest. Data collection involves gathering data from one person to provide answers to the declared hypotheses, estimate outcomes, and study questions [45]. This study employed a specific method for convenience sampling,

which enhances the effectiveness of population outreach and data collection [46]. We collected the data over a 14-day period, from September 10th, 2018 to October 24th, 2018, during the weekend. The researcher was keen to focus on a distribution during the weekend since most of the tourist groups' visit these tourist places. Using the convenience sampling method, we collected data from 420 tourists from various nationalities and regions in the cities of Jerash in the north, Dead Sea in the middle, and Petra in the south. We recovered a total of 384 questionnaires. According to [47], the proportion of missing data ranging from 5% to 10% is considered small and unlikely to be problematic for analyzing the research results. Thus, with a response rate of 91.3% within the normal range of n = 36, we excluded 8.6% of the questionnaires due to their missing values.

4.3 Instrument development and measurement of scale

To achieve the study objectives, the researcher used field survey-based questionnaires. Data collection is necessary [48]. Hence, these questionnaires facilitated the data collection, i.e., responses from the respondents. This helped to identify the effect of mobile application features, perceived usefulness and ease of use, and mobile application by positive WOM on mobile application usage intention in the Jordanian tourism industry. The researcher used a 5-point Likert scale (1-strongly disagree, 5-strongly agree) for the measurement of items.

5 DATA ANALYSIS

Hypothesis testing is the final, most crucial step in results analysis. We develop the hypothesis based on previous work in the area of study. We tested the hypothesis in this study using appropriate statistical tests. The analysis was adopted using the data of this study using smart partial least squares (PLS), a widely used program for partial least squares structural equation modelling (PLS-SEM) in BM SPSS Statistics ver. 23 [49].

5.1 Pilot study

Distributed a total of n = 65 questionnaires, of which only n = 50 (31 males and 19 females) returned and underwent exploratory factor analysis. We also executed Cronbach's alpha to verify the internal validity of the variables and found that all variables had values higher than 0.7, as shown in Table 1. We deem a reliability coefficient of 0.70 or above acceptable." Therefore, we consider all the reliability results of this study acceptable [50] and can incorporate them into the final study to further research and accomplish its objectives.

Table 1. Questionnaire pilot study scale Cronbach's alpha

Construct	Cronbach's Alpha
Abundance of information (AI)	0.766
Perceived Usefulness (PU)	0.861
Perceived Ease of use (PEOU)	0.823
Word of Mouth (WOM)	0.755
Smartphone App Usage	0.893

5.2 Tourist demographic data

The percentage of female tourists was 51%, while only 49% were males. Moreover, 37% of the tourists' ages range between 31 and 40. 27% of the tourists' ages ranged between 41 and 50. 2% of tourists are between the ages of 20 and 30, and 13% are 51 or older. Similarly, 33% of the tourists' income fell within the $2000 range. 23% of the tourists' income ranged between 2001 and 3000 dollars; 18% of the tourists' income ranged between 3001 and 45000 dollars; 12% of the tourists' income ranged between 1000 and less; 9% of the tourists' income was above 5000 dollars; and 5% of the tourists' income ranged between 1001 and 2000 dollars. Furthermore, 41% of the tourists were from the Arab region, while tourists from Europe, Russia, and America were 22%, 15%, 14%, and 9%, respectively as shown in Table 2 below.

Table 2. Demographic data

Variables	Answers	Frequency	Percentage %
Gender	Female	193	50%
	Male	191	49%
	TOTAL	384	100%
Your age	31–40	141	37%
	41–50	105	27%
	20–30	89	23%
	51 and above	49	13%
	TOTAL	384	100%
Income	3001–4000 $	126	33%
	2001–3000 $	89	23%
	4001–5000 $	70	18%
	$1,000–or less	45	12%
	5,000 $ or more	33	9%
	1001–2000 $	21	5%
	TOTAL	384	100%
Nationality	Arabian	156	41%
	Jordanian	84	22%
	European	57	15%
	Russian	52	14%
	American	35	9%
	TOTAL	384	100%

5.3 Measurement model

The higher level of Alpha Cronbach value (CA) between the elements means that elements within the construct have the same meaning and value. In PLS-SEM, composite reliability (CR) helps to determine the internal consistency [51]. Accordingly, the internal consistency of the scale is satisfactory if the value is ≥.70, whereas a value < 0.60 [52].

Table 3. Result of measurement model

Model Construct	Measurement Items	Factor Loading	Cronbach's Alpha	CR	AVE
Abundance of information (AI)	AI1	0.545	0.874	0.879	0.624
	AI2	0.581			
	AI3	0.676			
	AI4	0.683			
	AI5	0.601			
	AI6	0.573			
Perceived usefulness	PU1	0.681	0.784	0.843	0.535
	PU2	0.612			
	PU3	0.615			
	PU4	0.691			
	PU5	0.648			
	PU6	0.700			
	PU7	0.633			
Perceived Ease of Use	PEOU1	0.531	0.746	0.826	0.645
	PEOU2	0.694			
	PEOU3	0.690			
	PEOU4	0.738			
	PEOU5	0.739			
	PEOU6	0.582			
Word of Mouth (WOM)	WOM1	0.728	0.841	0.877	0.713
	WOM2	0.685			
	WOM3	0.684			
	WOM4	0.694			
	WOM5	0.734			
	WOM6	0.615			
	WOM7	0.701			
	WOM8	0.653			
Smartphone Apps Usage Intention	SAUI1	0.670	0.838	0.876	0.670
	SAUI2	0.660			
	SAUI3	0.710			
	SAUI4	0.683			
	SAUI5	0.693			
	SAUI6	0.769			
	SAUI7	0.722			
	SAUI8	0.559			

This study follows the convergent validity analysis by examining the average variance extracted (AVE) values recommended by [53]. The convergent validity must be with the individual elements of the converging, which reflect the close combination compared to elements that are measured with constructs.

Smart PLS ver. 3.2.7 uses two types of analysis to determine loadings, AVE, weighted t-values, and composite reliabilities for each measurement item. Each of these fits with the hypothesized construct [54]. For this study, the composite reliability (CR) of all constructs ranges from 0.826 to 0.903; this ratio is considered higher than the acceptable ratio of 0.70. As suggested by Nunnally and Bernstein (1994) [55], where the internal consistency is acceptable with a value of ≥.70, this confirms the availability of reliability and internal consistency. Table 3 shows the loadings and cross-loadings for each measurement, which are mostly based on the structures underneath them and not on other combinations [51]. Fornell and Larcker (1981) [56] measured it by clarifying the relationship between measures of possible overlapping structures. The diagonally underlined components of Table 4 display the square root of the average variance, extracted from AVE scores. The overloaded country components display the different connections between the fittings.

Table 4. Fornell-Larcker scales

Content	Smartphone Apps Usage Intention	Perceived Ease of Use	Abundance of Information (AI)	Perceived Usefulness	WOM
MAUI	**0.686**				
PEOU	0.514	**0.667**			
AI	0.607	0.665	**0.651**		
PU	0.588	0.686	0.717	**0.659**	
WOM	0.696	0.546	0.616	0.549	**0.688**

[52] state that the Smart PLS version 3.2.7 of the construct achieves the convergent validity AVE when the extracted average variance is less than 0.50. The table shows the square root of the AVE. In this test, we compare the loads with the building correlations based on the comparison of external loads, ensuring they exceed the load with other structures [57]. The attached Table 4 confirms the validity of the discriminant by showing all the variables to be higher than the external variables.

Table 5. Cross-loading results

Factor	Smartphone Apps Usage Intention	Perceived Ease of Use	Abundance of Information (AI)	Perceived Usefulness	WOM
MAU1	**0.670**	0.354	0.413	0.363	0.530
MAU2	**0.660**	0.330	0.355	0.310	0.452
MAU3	**0.710**	0.381	0.416	0.412	0.457
MAU4	**0.683**	0.335	0.341	0.365	0.484
MAU5	**0.693**	0.312	0.388	0.419	0.506
MAU6	**0.769**	0.421	0.548	0.507	0.551
MAU7	**0.722**	0.366	0.449	0.442	0.444
MAU8	**0.559**	0.316	0.410	0.406	0.355
PEOU11	0.286	**0.531**	0.359	0.364	0.330
PEOU12	0.372	**0.694**	0.493	0.404	0.407

(Continued)

Table 5. Cross-loading results *(Continued)*

Factor	Smartphone Apps Usage Intention	Perceived Ease of Use	Abundance of Information (AI)	Perceived Usefulness	WOM
PEOU13	0.366	**0.690**	0.464	0.457	0.391
PEOU14	0.334	**0.738**	0.443	0.469	0.382
PEOU15	0.463	**0.739**	0.514	0.580	0.443
PEOU16	0.182	**0.582**	0.359	0.446	0.187
AI1	0.251	0.378	**0.545**	0.380	0.225
AI2	0.344	0.304	**0.581**	0.439	0.292
AI3	0.455	0.472	**0.676**	0.480	0.410
AI4	0.438	0.479	**0.683**	0.528	0.422
AI5	0.317	0.389	**0.601**	0.417	0.371
AI6	0.360	0.389	**0.573**	0.497	0.330
PU1	0.449	0.550	0.608	**0.681**	0.468
PU2	0.392	0.451	0.415	**0.612**	0.393
PU3	0.331	0.396	0.396	**0.615**	0.299
PU4	0.360	0.465	0.430	**0.691**	0.241
PU5	0.341	0.337	0.403	**0.648**	0.289
PU6	0.437	0.436	0.497	**0.700**	0.393
PU7	0.369	0.482	0.501	**0.663**	0.391
WOM1	0.541	0.466	0.511	0.476	**0.728**
WOM2	0.496	0.466	0.519	0.523	**0.685**
WOM3	0.445	0.344	0.350	0.359	**0.684**
WOM4	0.436	0.277	0.395	0.264	**0.694**
WOM5	0.498	0.392	0.431	0.371	**0.734**
WOM6	0.432	0.308	0.358	0.348	**0.615**
WOM7	0.479	0.421	0.435	0.388	**0.701**
WOM8	0.482	0.334	0.345	0.278	**0.653**

Table 6 shows the heterotrait-monotrait ratio of the correlation values (HTMT) technique. According to this reference, Hair Jr. et al. (2016) [60], Henseler et al. (2016) [59], Wong (2013) [58], all the HTMT values in their model are acceptable.

Table 6. Heterotrait-monotrait ratios

	Smartphone Apps Usage Intention	Perceived Ease of Use	Abundance of Information (AI)	Perceived Usefulness	WOM
MAUI					
PEOU	**0.636**				
PI	0.715	0.827			
PU	0.717	0.879	**0.863**		
WOM	0.818	0.668	0.714	**0.644**	

5.4 Structural model

Some hypotheses (H2, H3, H4, H5, H6, H7, H8, H9, and H10) are supported by the data from the PLS-SEM. H1 is not supported (see Table 7), and the direct hypotheses as suggested by Tenenhaus et al. (2005) [61] are supported. The analysis of the current study hypotheses is based on SEM [60]. According to Kline (2011) [62], the calculated values model suggested is helpful to estimate the direction and strength of the proposed relationships (see Table 6). In addition, the researcher must examine the track transactions that represent the supposed variables linking the relationships. In simple terms, the path coefficient also helps a researcher know the strength of the relationship between the two latent variables. If the values are suitable, we will have appropriate indicators and structural models that fit the research model's data [63]. Schedules the direct effects of the n = 10 hypotheses using Smart-PLS. Figure 2 further shows the tracked transactions resulting from the proposed research model. Overall, the data support the direct relationships of 9 out of 10 proposed hypotheses.

Table 7. Path coefficient assessment

HY.	Relationship	Path	t-value	p-value	Direction	Decision
H1	Perceived Informativeness –> Perceived Ease of Use	0.496	4.826	0.000	Positive	Supported*
H2	Perceived Informativeness –> Perceived Usefulness	0.487	5.719	0.000	Positive	Supported**
H3	Perceived Usefulness –> Mobile App Positive Word of Mouth	0.630	4.905	0.000	Positive	Supported*
H4	Perceived Ease of Use –> Mobile App Positive Word of Mouth	0.320	5.265	0.000	Positive	Supported**
H5	Mobile App Positive Word of Mouth –> Mobile App Usage Intention	0.696	24.627	0.000	Positive	Supported**

Note: *p < 0.05; **p < 0.01(one-tailed).

The prediction accuracy is determined by the value of R^2, as well as the value of Q2, according to Hair Jr. et al. (2016) [60] and Stone (1974) [64]. The significance of R^2 is well recognized as a prominent benchmark in the examination of structural models (Hsia and Tseng 2008; Ramayah et al. 2016) [51], [90]. The predictive accuracy of the structural model is assessed by using the measurement as the value of R^2, which is calculated as a quadratic relationship between the actual values of endogenous variables and the expected values of internal construction, specifically [51], [65]. Chin (1998) [66], suggests that the degree of variance may be determined by calculating the R^2 value of the endogenous structures, which is then validated by each external exogenous combination.

According to Chin (1998) [66], when the value of R^2 is between 0.19 and 0.33, they are considered weak; when the value of R^2 is between 0.33 and 0.67, they are considered medium relationships; and if it is higher than 0.67, they are high and have a strong relationship. The table displays the R^2 values for the following variables: mobile app usage intention, perceived ease of use, perceived usefulness, and WOM. These values range from 0.356 to 0.662, indicating a moderate predictive value. The value of smartphone app usage intention explains 48.5% of the variance; the value of perceived ease of use explains 46.5% of the variance; the value of perceived

usefulness explains 62.2% of the variance; and WOM explains 35.6% of the variance. Overall, the predictive power of this structure is moderate.

Table 8. R^2 of the endogenous latent variables

Constructs	R^2	Results
Mobile App Usage Intention	0.485	Moderate
Perceived Ease of Use	0.465	Moderate
Perceived Usefulness	0.622	Moderate
Word of Mouth	0.356	Moderate

Table 9. Effect size analysis

Construct Code	Construct	f^2	Result
PEOU, PU1	Perceived Ease of Use –> Perceived Usefulness	0.156	Medium effect size
PEOU, WM2	Perceived Ease of Use –> Word of Mouth	0.085	Small effect size
PI, PEOU3	Perceived Informativeness –> Perceived Ease of Use	0.076	Small effect size
PI, PU4	Perceived Informativeness –> Perceived Usefulness	0.097	Small effect size
PU, WOM9	Perceived Usefulness –> Word of Mouth	0.089	Small effect size
WOM, MAUI11	Word of Mouth –> Mobile App Usage Intention	0.940	Large effect size

5.5 Mediator analysis

When a mediator variable exists or interferes with an independent variable and a dependent variable, mediation takes place. Then the interference is used to explain the mediator variable or interpret the relationship between two original constructs [67]. Links that involve a series of relationships with at least one other construction or more indirect effects are considered. To discover the relationship between these links, the researcher must follow the designated steps to study the impact of mediation. Additionally, the researcher must consider the distribution of indirect impact samples [68].

Table 10. Mediation calculation-indirect effect

Hypo	Relationship	Path a	Path p	Indirect Effect	SE	t-value	p-value	Bootstrapped Confidence Interval LL	UL
H6	PEOU*WOM–>MAUI	0.699	0.701	0.490	0.119	4.118	0.000	0.257	0.723
H7	PU*WOM–>MAU	0.438	0.716	0.314	0.104	3.015	0.000	0.110	0.517

Notes: LL, lower limit; UL, upper limit at 95 percent confidence interval. *p < 0.05; **p < 0.01.

H6 PEOU*WOM–>MAU Mobile apps' positive WOM mediates the positive relationship between perceived ease of use and mobile app usage intention. The bootstrap results in Table 9 showed that the indirect effect (PEOU*WOM–>MAUI^2 = 0.490 t-values of 4.118) was significant at p < 0.0.1. We also proved that there is mediation because the indirect effect of 0.490, 95% Boot CI (LL: 0.275, UL: 0.723), doesn't go

over or under zero (H11 of the study). The findings indicate that positive WOM from mobile apps mediates the relationship between perceived usefulness and the intention to use mobile apps. Therefore, the greater the ease of use of a mobile app for the purpose of facilitating positive WOM, the higher the behavioral intention to use a smartphone for promoting tourism in Jordan. This factor consistently establishes a positive mediating relationship between perceived ease of use and the intention to use mobile apps.

H7 PU*WOM–>MAUI: Mobile apps use positive WOM to mediate the positive relationship between perceived usefulness and usage.

The bootstrap results in Table 9 showed that the indirect effect (PU*WOM–> MAUI^2 = 0.314 t-values of 3.015) was significant at $p < 0.01$. This study also proved that there is mediation because the indirect effect (0.314, 95% Boot CI (LL: 0.110, UL: 0.517)) does not lie on a zero, which supports H12. The findings indicate that positive WOM from mobile apps mediates the relationship between perceived usefulness and the intention to use mobile apps. Therefore, the higher the perceived usefulness, as mediated by positive WOM from mobile apps, the higher the behavioral intention to use a smartphone for tourism promotion in Jordan. Thus, it is a reliable factor that has a positive mediating relationship with perceived usefulness and mobile app usage intention.

6 DISCUSSION

The evolution of tourism in all its fields, such as services and activities with technological information systems, demands technology usage [14], [19], [20]. Smart phones, as facilitating usage, accessibility, and cost-effective solutions, can work to improve the existing tourist experience in Jordan. assume that if Jordanian tourism undergoes a technological revolution, smart phone applications will have a positive and beneficial impact on both the tourism sector and tourist satisfaction [69–71]. Several researchers have also witnessed the benefits of mobile tourism application acceptance and highlighted tourism applications as beneficial for all the involved parties [72–76]. However, despite the potential benefits of tourism applications, the underutilization of tourism applications needs strong consideration [42], [77]. Furthermore, it is crucial to investigate the factors that influence the acceptance or rejection of modern technology, as well as the ongoing intention to use tourism applications in Jordan. Thus, the proposed conceptual causal model incorporates factors underlying the TAM, such as perceived usefulness and perceived ease of use. The results of this study provide robust theoretical and practical support for the integrated TAM. Furthermore, the integrated TAM reveals that usefulness and ease of use were the most important factors that influenced the user's intention to accept tourism application usage in Jordan. In line with the study objectives, the proposed integrated model has a direct and indirect impact on users accepting tourism application usage [15], [25], [36], [78], [79].

The abundance of information positively and directly influences the perceived ease of use of smart phones in the promotion of tourist destinations. Thus, the study's findings demonstrated that an abundance of information directly and positively influences the perceived ease of use for adopting smartphone applications in tourism, as well as the intention to use these applications. The study's findings are strongly consistent with previous studies conducted by [80], [81], S. Kim et al. (2016) [25]. Litvin et al. (2018) [36] and Roy and Moorthi (2017) [82]. The abundance of information has a positive and direct influence on usefulness through the use of smart

phones in the promotion of tourist places. Thus, the results of this study showed that the abundance of information has a direct positive influence on perceived usefulness. The adoption of smartphone applications in tourism has a positive, direct effect on intention. These results are strongly consistent with the studies previously conducted by [83–85], Alamri (2019) [86], and Hussain et al. (2017) [87]. The features offered by smartphones in the promotion of tourist places have a positive and direct impact on the usefulness of mobile apps, leading to positive WOM. These results are strongly consistent with the studies previously conducted by [15], [36]. Regarding ease of use, the features offered by smartphones in the promotion of tourist places have a positive and direct influence on positive WOM generated by mobile apps. Thus, the study's results demonstrated a direct positive influence of perceived ease of use on positive WOM generated by mobile apps, encouraging the adoption of smartphone applications for tourism promotion in Jordan. These results are strongly consistent with the studies previously conducted by [15], [36]. Word of mouth from mobile apps positively and directly influences the intention to use these apps on smartphones for the promotion of tourist destinations in Jordan. The results demonstrated that positive WOM from mobile apps directly influences mobile app usage and the intention to use smartphone applications for promoting tourism in Jordan. These results are strongly consistent with the studies previously conducted by [15], [36]. Positive WOM from mobile apps mediates perceived ease of use and the intention to use them. These results are strongly consistent with the studies previously conducted by [15], [25], [36], [78], [88], [89]. This study found that positive WOM from mobile apps mediates the relationship between perceived usefulness and mobile app usage intention. These results are strongly consistent with the studies previously conducted [15], [25], [36], [78], [88], [89].

7 CONCLUSION

This study reveals determinants of users' technology acceptance, such as perceived usefulness and ease of use, to provide a better explanation and understanding of the influential factors. The structural model also demonstrated that smartphone applications' features have a significant impact on their perceived usefulness and ease of use, thereby influencing the WOM generated by these applications. The use of smartphone applications in tourism is growing. By looking at these results, we validate the proposed integrated model to achieve the objective of this research. This study not only integrated the TAM but also discovered that smartphone apps' WOM mediated the relationship between users' perceived usefulness and ease of use. These findings provided additional support for the newly developed integrated model, especially in smartphone application acceptance and usage intention.

Finally, previous studies have claimed that perceived usefulness and perceived ease of use are the most important determinants of acceptance of a smartphone application. As a result, the antecedents of perceived usefulness and ease of use receive minimal attention. This study has revealed that the abundance of information is one of the key factors that enhances users' perceived usefulness and ease of use towards smartphone application technology acceptance and use. The findings show that the proposed integrated model is valid and works well to reach the study goals. It looks at how smartphone features, perceived usefulness and ease of use, and WOM from mobile apps affect people's plans to use smartphone apps in the Jordanian tourism industry.

7.1 Contribution of the study

Theoretically, this study adds to the knowledge regarding smartphone application WOM through the use of web-based applications and their impact on the tourism industry in Jordan. As this study also involves an organized conceptual model, modified under the TAM, it will also help to extend the existing TAM and increase its applicability.

7.2 Practical contribution

Given that Jordan is well-known for its tourism and has a rich archaeological past, this study has a lot of practical applications. Initially, this research will emphasize the significance of tourism as a means of generating income in Jordan. Second, it will enable readers to expand on what they already know about Jordan's status as one of the Arab world's top travel destinations. Third, by analyzing the acceptance, integration, and significance of technology in the Jordanian tourism sector, this study will enable stakeholders and policymakers to make more significant decisions that will improve Jordanian tourism.

7.3 Research limitation

Even though the study yielded significant results and future recommendations, it is crucial to acknowledge its limitations. The primary one is the lack of demographic variables in the study model, which could have revealed more important facts and outcomes. Additionally, the study selected respondents using an appropriate sample method, which may have created biases due to the small percentage of respondents. Finally, this study concentrated on gathering data from three tourist sites, but it could also incorporate data from other tourist areas or different seasonal periods, given that tourism is contingent on specific time periods, thereby allowing for various scenarios.

7.4 Future research

Considering the results and limitations, we conclude that further research is necessary. Although the researcher has developed the concept of continuity in smartphone application usage, we still need to conduct additional research to identify the factors that influence technology acceptance in the tourism sector. Furthermore, future research and studies can be used to highlight other smartphone applications across various sectors.

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