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MODERATING EFFECT OF AGE ON THE ADOPTION OF DIGITAL MARKETING TOOLS AND PLATFORMS IN DOMESTIC LEISURE TRAVEL

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Abstract: Despite many studies exploring the factors that influence the use of technology in tourism, research focusing on the moderating effect of age on the use of digital marketing tools and platforms for domestic leisure travel purposes remains elusive. Using dimensions from the Technology Acceptance Model and motivation as an additional construct, this study examined the moderating effects of age on digital marketing tools and platform adoption. A sample of 401 domestic tourists and a self-administered questionnaire were used for data collection. Regression analysis was used to analyze the relationships between the proposed variables and the moderating effect of age on these relationships. The findings revealed that perceived usefulness and motivation significantly influenced the use of digital marketing tools and platforms, and the effect of motivation was more significant. Tourists' age played a notable role in contributing to the strength of the relationships. Tourism marketers, managers, business owners, and web developers can use these results as tools to make more effective marketing decisions to promote leisure travel.

Key words: Moderating effect, motivation, perceived ease of use, perceived usefulness, Technology Acceptance Model

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INTRODUCTION

In recent years, tourism has made tremendous advancements in technology adoption for marketing. Digital technologies have transformed the way people communicate and are kept informed. They have opened avenues for audiovisual media and resulted in a shift in the way content is disseminated on digital platforms (websites, blogs, online sharing platforms and social networking sites such as Twitter, Facebook, Instagram, and TikTok) (Zeng et al., 2023). People of all ages are reaping the benefits of the technology boom (Buhalis and Karatay, 2022; Monaco, 2018; Zhang et al., 2023). This research identifies tourists as individuals who utilise digital marketing tools and platforms for their benefit in their travel decisions. Tourists are increasingly pressured to use digital marketing tools and platforms for fear of missing out (FOMO). At the same time, destination marketers embrace digital technologies to avoid falling behind in the ongoing digital transformation. Dinhopl and Gretzel (2016) posit that today's travellers are hybrid tourists who use different technologies to obtain the necessary information. This provides unprecedented opportunities for tourism marketing (Buhalis et al., 2023).

New technologies have caused users to change their travel behaviour and habits, with others investing more time connected to the Internet (Yousaf and Xiucheng, 2018). Any business that wishes to succeed and survive must understand the factors that influence customer behaviour (Etale and Uranta, 2022). Understanding factors influencing consumer travel behaviour helps marketers understand customer preferences (Chamboko-Mpotaringa and Tichaawa, 2021). Times have radically changed to the extent that within two decades, some media have become antiquated and obsolete because of changes in consumer preferences. Upon entering the marketing field, digital technologies triggered unprecedented changes in tourism marketing, shaping a highly dynamic environment that facilitates the networked connectivity of people, processes, data, and things. As digital technologies proliferate, tourism marketers have become increasingly reliant on digital marketing as consumers increasingly turn to digital platforms to research and make travel bookings online. Digital marketing empowers destination branding, positioning, awareness, and marketing. In addition, digital marketing tools and platforms provide opportunities to support tourists' travel decisions in travel planning and booking, during a trip and after a trip to gain maximum enjoyment from their travel experiences (Gajdošík, 2022), thereby effectively transforming consumer behaviour (Rauschnabel et al., 2022). The efficacy of digital marketing strategies cannot be argued.

As a result of the advent of digital technologies, the tourism market has become much more competitive and technology-based. Tourists no longer conform to the rules of tourism destinations. As expected, many tourism destinations have had to transform their marketing and redesign the best marketing and operational practices available to benefit from

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the technological paradigm shifts experienced (Buhalis, 2020). A digital presence neither brings nor guarantees visibility and accessibility to tourism destinations. Tourism marketers can fulfil tourists' preferences and meet expectations by adopting a well-articulated and systematic approach to using technology and providing personalised services to tourists. Practitioners often encounter challenges when launching marketing campaigns using digital channels to maximise effectiveness. Therefore, it is essential for tourism marketers to comprehend the influential factors and effects of age when utilising digital marketing tools and platforms to achieve success in tourism marketing (Balouchi et al., 2017).

The potential benefits of using digital technologies have engendered significant debates within the tourism marketing-focused discourse. Most research consisted of fervent discussions concerning how stakeholders can use digital platforms to market tourism destinations (Dwivedi et al., 2022; Lamberton and Stephen, 2016; Talwar et al., 2022; Tsourgiannis and Valsamidis, 2019). Furthermore, some research has concluded that as much as tourists utilise digital platforms, tourists are different (González-Reverté and Liviano-Solís, 2020). To highlight this phenomenon, some studies focused on the younger generation (Acheampong and Siiba, 2020; Matikiti-Manyevere and Hattingh, 2020) while others concentrated on the older generation (Zhang et al., 2023; Zhou et al., 2014). Previous studies have not paid attention to the moderating effect of age on factors that influence the use of tourism digital marketing tools and platforms. The factors that enable the actual use of digital platforms need to be explored, amplified, and tackled to maximise adoption (Mametja et al., 2023). Thus, the need for empirical research on the factors that influence the use of digital marketing tools and platforms should not be overlooked. Furthermore, with technology accessible and used by different ages, it is crucial to understand the moderating effect of age in digital marketing tools and platforms. As such, the study proposes the following research question: What is the moderating effect of age on the relationship between perceived usefulness (PU), perceived ease of use (PEOU), motivation (M), and tourists' actual use of digital marketing tools and platforms for tourism?

LITERATURE REVIEW

Theoretical background

Several information systems (IS) models related to the adoption of new technology have been put forward by different scholars (Davis, 1989; DeLone and McLean, 2003; Mason, 1978; Taylor and Todd, 1995; Venkatesh et al., 2003, 2012; Wixom and Todd, 2005). However, several studies on technology adoption have focused on understanding the variables affecting technology acceptability (Isaac et al., 2019). One widely accepted and used model which has gained popularity because of its simplicity and adaptability is the Technology Acceptance Model (TAM) (Al-Qaysi et al., 2020), which Davis (1989) developed. TAM allows easy transfer and application to different contexts (Chocarro et al., 2023). The TAM has gained popularity as a grounding theory since one can explain and predict the acceptance of technology among potential users based on causal relationships (Chocarro et al., 2023). The TAM uses a user-centric approach as it emphasises the perception of users. The TAM reflects that the actual use of new technology is determined by a user's perceived benefits obtained from using the new technology, as well as its perceived ease of use (Chamboko-Mpotaringa and Tichaawa, 2023).

Various scholars have successfully adopted the TAM to study technology acceptance and usage in different contexts, such as in education (Chocarro et al., 2023), banking (Purohit and Arora, 2023), metaverse (Almarzouqi et al., 2022) and tourism (Alma Çallı et al., 2023; Liu and Zheng, 2023). However, the model faced criticism because of its limitations, such as the factors in TAM alone being insufficient to predict user acceptance (Wong et al., 2022). The factors in the TAM do not characterise much detail about technology use and acceptance (Lin and Yu, 2023). Since the TAM accounts for slightly more than 40% of the variance, the contribution of other variables requires examination (Legris et al., 2003). To overcome that, additional variables such as perceived enjoyment, perceived risk, and perceived social capital (Singh and Srivastava, 2019), trust (Liu and Zheng, 2023), experience (Huang et al., 2019), engagement, immersion, and perceived utility (Sepasgozar, 2022) have been added in extant studies. This study proposes adding M to the TAM constructs as an important variable in the adoption of digital marketing for tourism use. Motives are general tendencies that affect people's behaviours taken to satisfy a need or desire (Miranda et al., 2023). Motivations for using digital marketing tools and platforms for travel purposes are varied and can include a source of information, social interaction, convenience, feedback, and ease to use (Dyk et al., 2020; Lou and Xie, 2021). The comprehension of tourists' intentions and expectations concerning system utilisation is paramount, and motivation plays a crucial role for marketers in acquiring this comprehension (Hew et al., 2023; Lowry et al., 2015).

Hypothesis and research model

In this study, tourists are considered as users of digital marketing tools and platforms in their travel decisions. When tourists are exposed to new technology, many factors influence their acceptance decision (Chamboko-Mpotaringa and Tichaawa, 2023). This paper adopts the TAM to measure tourists' use of digital marketing tools and platforms in travel decisions. The TAM rests on the notion that tourists' behavioural intention to use digital marketing tools and platforms is determined by two central beliefs: PU and PEOU. PU refers to the degree to which a person believes using a particular technology would enhance performance. PEOU refers to the degree to which a person believes using a particular system would be free from effort (Davis, 1989). In the case of digital marketing tools and platforms, PU entails the benefits derived from using digital marketing tools and platforms, and PEOU refers to the ease with which tourists can use digital marketing tools and platforms. Marketers can promote digital marketing tools and platforms if the tourists believe they can benefit from using the digital platforms and they are easy to use. Two hypotheses would be tested based on the traditional TAM constructs: PU and PEOU according to similar research (Singh and Srivastava, 2019) using TAM constructs in the context of tourism. Many previous studies have identified a positive relationship between PU, PEOU, and actual use of technology (Renny et al., 2013; Tavitiyaman et al., 2022). However, a considerable body of research found contradicting

results regarding the predictive role of PU and PEOU. For example, Deng and Yu (2023) could not confirm the influence of PU. Similarly, Musina and Gao (2016) could not establish a relationship between ease of use and the use of new technology. Confronted with such inconsistencies in the existing literature, the study tests the following hypotheses:

H1: PU positively influences the use of digital marketing tools and platforms for tourism.

H2: PEOU positively influences the actual use of digital marketing tools and platforms.

Motivations for using digital marketing tools and platforms for travel purposes are varied and can include a source of information, social interaction, convenience, feedback, and ease to use (Dyk et al., 2020; Lou and Xie, 2021). Several authors have reported a positive relationship between motivation and user intention (Ali et al., 2022; Hew et al., 2023). Venkatesh et al. (2012) maintain that motivation is a powerful predictor of technology adoption and usage behaviour. However, literature is scant in tourism studies that exclusively examined the influence of motivation in assessing the actual usage behaviour of technology in digital marketing tools and platforms, which led to testing the following hypothesis:

H3: M positively influences the use of digital marketing tools and platforms for tourism.

The moderating effect of age

Age is a crucial marketing phenomenon in tourism as it affects tourists' consumption patterns of tourism products (Wong et al., 2022). In marketing, it is common practice to categorise target markets into consumer segments. This is often done using the term "generation," which refers to age, birth year, location, or significant life events (Dida et al., 2021; Jonck et al., 2017). People born in the same generation often exhibit similar behavioral patterns due to shared experiences that shape their childhood. Their preferences change as they progress through different life stages, such as childhood, adolescence, or becoming senior citizens (George, 2019). The use of new technology differs from one age group to another (Zhuang et al., 2021). People's technological preferences in their teens may differ from those in their seventies (Zhang et al., 2023). Therefore, marketers often use age as a means of segmenting markets (Funk, 2008).

In technology adoption and acceptance age is an important demographic variable that has moderating and direct effects on technology adoption and acceptance (Anwar et al., 2021; Hua et al., 2021). Earlier studies have been undertaken to understand the impact of age on technology use in tourism (Chen et al., 2023; Hua et al., 2021; Setiawan et al., 2018). The studies show an age gap between young people, who embrace existing mobile applications, and those who follow new mobile phone features. Chen et al. (2023) found significant effects of age on Chinese handwriting performance on touch screens through fingers and stylus. Older adults use limited phone functions, with the camera being popular for viewing photos. According to Setiawan et al. (2018), millennials value family and leisure and use smartphones for communication and problem-solving. They spend their free time on social media and are interested in its audio and visual aspects. Thus, the current study attempts to understand the moderating effect of age on the study's variables, and the following hypothesis were developed:

H4a: Age moderates the relationship between PU and tourists' use of digital marketing tools and platforms.

H4b: Age moderates the relationship between PEOU and tourists' use of digital marketing tools and platforms.

H4c: Age moderates the relationship between M and tourists' use of digital marketing tools and platforms.

Based on the literature, the authors propose a model (Figure 1) which shows the relationship between the constructs, the type of relationships, and the moderating effect of age.

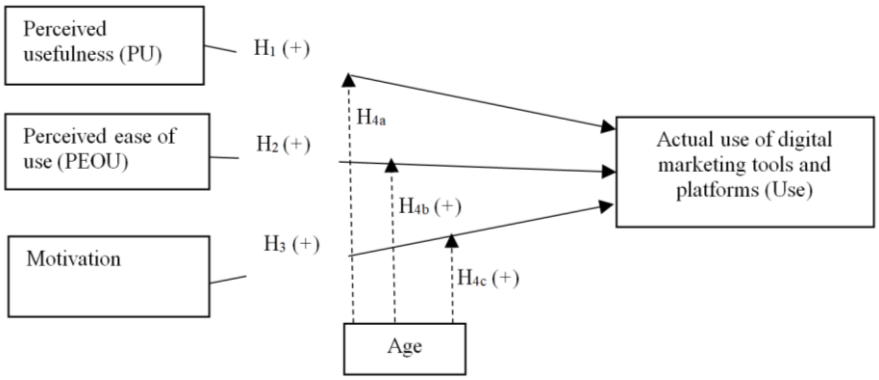

Figure 1. Proposed model

METHODOLOGY

In the positivist paradigm, this study examines the antecedents of digital marketing tools and platforms' actual usage for tourism purposes through quantitative research design. The sample population for the study was domestic tourists travelling to the Free State province in South Africa, either as day visitors or overnight visitors. The selection criteria to be included in the study is that tourists must be familiar with and should have used digital marketing tools and platforms in their travel decisions. Non-probability, convenience sampling techniques were used to select the sample from the sampling frame. The respondents were approached face-to-face and asked to complete a self-administered questionnaire survey focused on digital marketing tools and platforms. The survey consisted of 24 items and was divided into four themes: digital marketing tools and platforms usage, M, PU and PEOU.

The questionnaire was based on previous studies (Breda et al., 2019; Davis, 1989; Dyk et al., 2020; González-Reverté and Liviano-Solís, 2020; Jeng et al., 2017; Singh and Srivastava, 2019; Venkatesh et al., 2012) but was

modified to better suit the objectives of this study and improve the generalisation of the findings. The variables of the research and indicators are shown in Table 1. The study utilised a five-point Likert scale to evaluate the questionnaire items. The scale ranged from strongly disagree (1) to strongly agree (5). SPSS software version 27 was utilised to capture and analyse the data, conducting descriptive and inferential statistics. Descriptive analysis summarised the variables, and regression analyses were performed to test the study's hypotheses.

Table 1. Study variables

Variables	Indicators
Perceived usefulness (PU)	useful on trips, enhances the quality of trips, enables convenient trips, allows for instant feedback, gives ideas about possible next trips
Perceived ease of use (PEOU)	part of lifestyle, user-friendly, familiarity, content is readily and easily available, flexibility
Motivation (M)	benefits derived, easy-to-use, high-quality information, the quality of the digital marketing platforms concerned, and high-quality service received when using digital marketing tools.
Use of/Intent	blogs, consumer review sites, online sharing economy platforms, social network sites, travel applications

RESULTS

Sample description

The respondents' demographic statistics are presented in Table 2. As presented in Table 2, 55.3% of the respondents were females, while 44.7% were male. Respondents aged 18 to 30 years constituted 35.9%, those aged 31 to 40 constituted 32.7%, and those above 40 years of age constituted 31.4% of the sample. The income bracket of respondents revealed that 23.3% of the respondents earned R1000 or below, 15.3% earned between R1001-R5000, 10.7% earned between R5001-R10000, and 13.7% earned between R10001-R15000. Most of the participants (24.1%) earned more than R20000.

Table 2. Demographic statistics for 401 respondents

Criterion	Factor	Frequency	Percentage
Sex	Female	222	55.3%
	Male	179	44.7%
Age	18-30	144	35.9%
	31-40	131	32.7%
	41-50	67	16.7%
	51-60	31	7.7%
	≥61	28	7%
Income	≤R1000	85	23.3%
	R1001-R5000	56	15.3%
	R5001-10000	39	10.7%
	R10001-R15000	50	13.7
	R15001-R20000	47	12.9
	≥R20001	88	24.1%

Table 3. Cronbach's Alpha reliability results

Construct	No of items	Cronbach's Alpha
Use/Intent	9	0.846
Motivation (M)	5	0.929
Perceived usefulness (PU)	5	0.932
Perceived ease of use (PEOU)	5	0.949

Table 4. Kaiser-Meyer-Olkin test of sampling adequacy and Bartlett's test of sphericity

Kaiser-Meyer-Olkin measure of sampling adequacy		0.948
Bartlett's test of sphericity	Approx. Chi-Square	7560.696
	df	276
	Sig	0.000

Reliability of constructs

The Cronbach's Alpha test was used to evaluate the reliability of the study constructs. Findings showed that all the construct variables were reliable, with an Alpha coefficient above 0.8 (Table 3). A cut-off value of 0.7 or higher implies increased reliability when evaluating composite reliability coefficients for internal consistency reliability (Hair et al., 2019).

Kaiser-Meyer-Olkin (KMO) test of sampling adequacy and Bartlett's test of sphericity were performed to validate the sample size. The KMO value for the scale items was 0.948, surpassing the recommended value of 0.6, meaning an acceptable value as seen in Table 4. Kaiser (1974) suggested that values between 0.8 and 0.9 are meritorious, while Hair et al. (2006) suggested accepting values between 0.7 and 0.8 as good. Bartlett's test of sphericity results (Table 4) was significant (Chi-Square = 7560.696; $p < 0.000$), substantiating that the sample size was adequate.

Regression analyses were performed to test the statistical significance of the variables. Collinearity statistics (tolerance and Variance Inflation Factor (VIF)) were used to test multicollinearity. As shown in Table 5, the study findings revealed that tolerance values ranged from 0.261 to 0.322, and VIF values ranged from 3.107 to 3.831. These findings suggested that multicollinearity issues were not of concern. Tolerance values of less than 0.7 and VIF values of less than 10 are acceptable (Balachandran and Tan, 2015; Şengel et al., 2022). Table 5 shows that all four constructs are positively correlated with each other. The correlation coefficients (0.585, 0.499, and 0.590) indicate positive linear relationships.

Table 5. Multicollinearity test and correlation analysis

Independent variable	Direction of path	Dependant variable	Correlations	Collinearity statistics	
				Tolerance	VIF
Perceived usefulness (PU)	→	Digital marketing tools and platforms used	0.585	0.261	3.831
Perceived ease of use (PEOU)	→	Digital marketing tools and platforms used	0.499	0.291	3.432
Motivation (M)	→	Digital marketing tools and platforms used	0.590	0.322	3.107

The study proposed a positive significant relationship between the independent variables, PU, PEOU, M, and the dependent variable, tourists' use of digital marketing tools and platforms. Study findings are shown in Table 6.

Table 6. Results of hypothesis testing(M: motivation; PE-perceived usefulness; PEOU-perceived ease of use)

Dependent variable: Digital marketing tools and platforms used						
Goodness of fit: R=0.618, R^2=0.382, Adjusted R^2=0.377, Standard error of estimate= 0.719						
Analysis of variance		**Df**	**Sum of squares**		**Mean square**	
Regression		3	125.922		41.974	
Residual		395	203.916		0.516	
F-static=81.306						
Significant F=<0.001						
Hypothesis and relationship	**Path**	**Standardised coefficient Beta (β)**	**Standard error (SE)**	**t-Value**	**p-value**	**Hypothesis supported**
$H_{1\,(+)}$	PU ⟶ Use	0.344	0.066	4.445	0.000	Yes
$H_{2\,(+)}$	PEOU ⟶ Use	0.065	0.059	0.886	0.376	No
$H_{3\,(+)}$	M ⟶ Use	0.364	0.061	5.217	0.000	Yes

Table 6 shows that 38% (R^2=0.38) of the variance in tourists' use of digital marketing tools and platforms for tourism purposes can be explained by tourists' perceptions of the usefulness, ease of use, and motivation to use digital marketing tools and platforms. Table 6 also shows that the model is statistically significant (p<0.001). H_1 proposed that PU positively influences the use of digital marketing tools and platforms for tourism.

The results in Table 6 support the hypothesis (β=0.344, SE=0.066, t=4.445, p=0.000). H_2 proposed that PEOU positively influences the actual use of digital marketing tools and platforms for tourism purposes. As the findings show Table 7 (β=0.065, SE=0.059, t=0.886, p=0.376), PEOU is not significantly related to the actual use of digital marketing tools and platforms for tourism purposes. Therefore, H_2 is not supported. H_3 proposed that motivation positively influences the use of digital marketing tools and platforms for tourism. Findings (β=0.364, SE=0.061, t=5.217, p=0.000) indicate a statistically significant relationship. Therefore, H_3 is supported. Motivation surfaces as the most significant influence (β=0.368) on the actual use of digital marketing tools and platforms.

The study examined how age affects the relationship between PU, PEOU, M, and tourists' use of digital marketing tools and platforms. A moderator variable alters the connection between two other variables (Albaom et al., 2022). For instance, in this study, age is a moderator. If the relationship between PU, PEOU, M, and tourists' use of digital marketing tools and platforms were moderated by age, they would have an impact on the strength or direction of the relationship. The outcomes of the hypothesised relationship for testing the moderating effect of age are summarised in Table 7.

Table 7. Results for hypothesis testing (moderation effect)
(INT-Interactive item; M- motivation; PE-perceived usefulness; PEOU-perceived ease of use)

Dependent variable: Digital marketing tools and platforms used						
Goodness of fit: R=0.624, R^2=0.389, Adjusted R^2=0.383, Standard error of estimate= 0.715						
Analysis of variance		**Df**	**Sum of squares**		**Mean square**	
Regression		4	128.323		32.081	
Residual		394	329.837		0.511	
F-static=62.724						
Significant F=<0.001						
Hypothesis and relationship	**Path**	**Standardised coefficient Beta (β)**	**Standard error (SE)**	**t-value**	**p-value**	**Hypothesis supported**
	INT ⟶ Use	0.085	0.035	2.167	0.031	Yes
$H_{4a\,(+)}$	Moderating effect PU ⟶ Use	0.350	0.071	4.540	0.000	Yes
$H_{4b\,(+)}$	Moderating effect PEOU ⟶ Use	0.072	0.066	0.992	0.322	No
$H_{4c\,(+)}$	Moderating effect M ⟶ Use	0.368	0.063	5.302	0.000	Yes

The model uses the predictor variables PU, PEOU, and M, the hypothesised moderator (age), and their interaction to predict the result. Table 7 reveals that considering the moderation effect, the model explains that 39% (R^2=0.39) of the variance in tourists' use of digital marketing tools and platforms for tourism purposes can be explained by tourists' motivation, perceptions of the usefulness and ease of use of digital marketing tools and platforms. The model is statistically significant (p<0.001). The path coefficient of the interactive item of PU, PEOU and M is (β=0.085, SE=0.035, t=2.167, p=0.031), implying that the moderating role of age is statistically significant.

H_{4a} proposed that age moderates the relationship between PU and tourists' use of digital marketing tools and platforms. The results in Table 7 show that age moderates the relationship between PU and tourists' use of digital marketing tools and platforms (β=0.350, SE=0.071, t=4.540, p=0.000). Therefore, H_{4a} is supported. H_{4b} proposed that age moderates the relationship between PEOU and tourists' use of digital marketing tools and platforms.

The results in Table 7 show that age does not mediate the relationship between PEOU and tourists' use of digital marketing tools and platforms (β=0.072, SE=0.066, t=0.992, p=0.322). Like H_2 in the original model (Table 6), the p-value is greater than 0.05, indicating that this moderated relationship is not statistically significant at the conventional

level. Therefore, H_{4b} is not supported. H_{4c} proposed that age moderates the relationship between motivation and tourists' use of digital marketing tools and platforms. The results in Table 7 show that age moderates the relationship between motivation and tourists' use of digital marketing tools and platforms (β=0.368, SE=0.063, t=5.302, p=0.000). Therefore, H_{4c} is supported. The results of the model testing are illustrated in Figure 2.

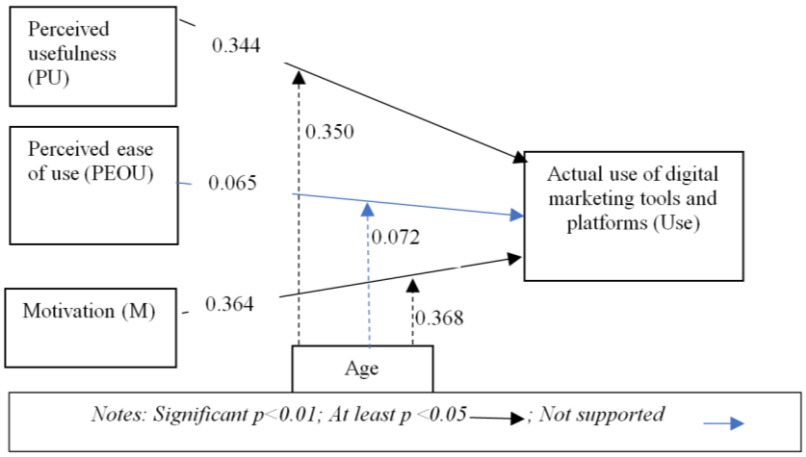

Figure 2. Results of model testing

The standardised coefficients for PU, PEOU, and M in the original model are 0.344, 0.065 and 0.364 respectively. In the moderation effect model, the standardised coefficients for PU, PEOU, and M are 0.350, 0.072, and 0.368, respectively. In both models, the findings indicate that these variables have positive effects on actual usage behaviour. In comparison, the standardised coefficients for PU, PEOU, and M are slightly higher in the moderation effect model than in the original model.

DISCUSSION AND CONCLUSIONS

Theoretical implications

This study extends the theoretical research on the TAM model by adding M as a factor influencing tourists' use of digital marketing tools and platforms. It assesses the moderating effect of age on the use of digital marketing tools and platforms for tourism purposes. The study made three contributions to existing literature related to tourism digital marketing.

Firstly, the study contributes to the existing literature and extension of the scope of the application of TAM in adopting technology in tourism research. In Table 6 and as shown in Figure 2, it was found that PU and M (H1 and H3) significantly positively affect tourists' use of digital marketing tools and platforms for tourism purposes. These findings are consistent with previous scholars (Ali et al., 2022; Tavitiyaman et al., 2022). PU has been found to contribute significantly to the acceptance and use of technology for tourism purposes (Alma Çallı et al., 2023). Considering motivation, the study findings are consistent with Camilleri and Falzon (2021), who concluded that motivation has a significant effect on the intention to use technology. Studies have shown that when adopting new technology, people are more likely to do so if they find it easy to use (Davis, 1989; Renny et al., 2013). This study showed that PEOU (H2) positively correlates with using digital marketing tools and platforms. However, it was not statistically significant (as shown in Table 6 and Figure 2). This means that while there may be a positive trend, the relationship is not strong enough to confidently conclude that it exists in the current study's population. Thus, the study contradicts Venkatesh et al. (2012) but is consistent with Ali et al. (2022), who also found the insignificant influence of ease of use on the actual use of technology. Secondly, this study uses PU, PEOU and use of/intention from the TAM model and added M as an independent variable. In line with the other studies which have added variables to the original TAM model (Albaom et al., 2021; Estriegana et al., 2019; Matikiti et al., 2018), the study has confirmed TAM's versatility and broader applicability based on the findings of the current research.

Thirdly, age was also used as a moderating variable in this study. This study extends our understanding of the moderating effect of age on factors affecting acceptance of new technology. Several studies have used age as a moderator in adopting new technology (Hua et al., 2021) and found significant effects (Chen et al., 2023; Hua et al., 2021; Zhuang et al., 2021). The moderation effect model introduces the role of age as a moderator in the relationships between the predictor variables (PU, PEOU, and M) and the use of digital marketing tools and platforms for tourism. The study findings suggest that age has a positive effect on the actual usage of digital marketing tools and platforms, which is consistent with (Chen et al., 2023; Zhang et al., 2023). In the cases of PU and M (H4a, H4c), age was found to have a significant moderating effect on the relationship with tourists' actual use of digital marketing tools and platforms. However, regarding PEOU (H4b), age was not found to have a significant moderating effect on the relationship. This means that age does not significantly alter the relationship between PEOU and tourists' use of digital marketing tools and platforms.

Practical implications

The study has a few practical implications. Firstly, the study uncovers core factors (PU and M) influencing the usage of digital marketing tools and platforms for tourism. As a result, tourism marketers need to be aware of these factors since they provide them with insights into the aspects of their digital marketing tools and platforms that need to be considered to leverage and influence behavioural intentions.

Secondly, this study provides an understanding of the effect of age on factors that influence the adoption of technology in tourism. The study suggests that the influence of PU and M on tourists' use of digital marketing tools and platforms varies depending on the age of the tourists. This information is valuable in understanding the role of age as a factor in shaping tourists' behaviors toward technology adoption. This understanding is relevant in tourism marketing for designing targeted interventions, marketing strategies, or policies that address different age groups' diverse needs and preferences when accepting and adopting new digital marketing tools and platforms.

Drawing on the research findings, managers and policymakers can address potential concerns related to the digital divide, ensuring that inclusivity and accessibility considerations align with SDG 10 (reduced inequalities). Researchers and scholars can also gain novel insights from the current study findings, which aids in developing future tourism research studies where technology is a crucial component.

Limitations and suggestions for future studies

The study examined the moderating effect of age on given variables without delving into the specifics of different age groups, thus limiting its contribution to our understanding of generational heterogeneity concerning their acceptance of new technology in tourism. Future studies could focus on comprehensive generational analysis, specifically on generational differences regarding technology adoption.

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REFERENCES

Acheampong, R.A., & Siiba, A. (2020). Modelling the determinants of car-sharing adoption intentions among young adults: The role of attitude, perceived benefits, travel expectations and socio-demographic factors. *Transportation*, 47(5), 2557–2580. https://doi.org/10.1007/S11116-019-10029-3/TABLES/3

Albaom, M.A., Sidi, F., Jabar, M.A., Abdullah, R., Ishak, I., Yunikawati, N.A., Priambodo, M.P., Husen, J.H., Issac, O., & Al-Harasi, A.H. (2021). The impact of tourist's intention to use Web 3.0: A conceptual integrated model on TAM & DMISM. *Journal of Theoretical and Applied Information Technology*, *99*(24), 6222–6238.

Albaom, M.A., Sidi, F., Jabar, M.A., Abdullah, R., Ishak, I., Yunikawati, N.A., Priambodo, M.P., Nusari, M.S., & Ali, D.A. (2022). The moderating role of personal innovativeness in tourists' intention to use Web 3.0 based on updated information systems success model. *Sustainability (Switzerland)*, *14*(21), 13935. https://doi.org/10.3390/su142113935

Ali, M.B., Tuhin, R., Alim, M.A., Rokonuzzaman, M., Rahman, S.M., & Nuruzzaman, M. (2022). Acceptance and use of ICT in tourism: The modified UTAUT model. *Journal of Tourism Futures*. https://doi.org/10.1108/JTF-06-2021-0137

Alma Çallı, B., Çallı, L., Sarı Çallı, D., & Çallı, F. (2023). The impact of different types of service robots usage in hotels on guests' intention to stay. *Journal of Hospitality and Tourism Technology*, *14*(4). https://doi.org/10.1108/JHTT-09-2021-0266

Almarzouqi, A., Aburayya, A., & Salloum, S.A. (2022). Prediction of user's intention to use metaverse system in medical education: A hybrid SEM-ML learning approach. *IEEE Access*, *10*, 1–1. https://doi.org/10.1109/ACCESS.2022.3169285

Al-Qaysi, N., Mohamad-Nordin, N., & Al-Emran, M. (2020). Employing the technology acceptance model in social media: A systematic review. *Education and Information Technologies*, *25*(6), 4961–5002 (2020). https://doi.org/10.1007/s10639-020-10197-1 https://doi.org/10.1007/S10639-020-10197-1

Anwar, A.P., Yuvaraj, G., Nurul, S.Z., & Ahmad, K. (2021). Determinants of customers' intention to use online food delivery application through smartphone in Malaysia. *British Food Journal*, *124*(3), 732–753. https://doi.org/10.1108/BFJ-01-2021-0075

Balachandran, D., & Tan, G.W.H. (2015). Regression modelling of predicting NFC mobile payment adoption in Malaysia. *International Journal of Modelling in Operations Management*, *5*(2), 100. https://doi.org/10.1504/ijmom.2015.072671

Balouchi, M., Aziz, Y.A., Hasangholipour, T., Khanlari, A., Abd Rahman, A., & Raja-Yusof, R.N. (2017). Explaining and predicting online tourists' behavioural intention in accepting consumer generated contents. *Journal of Hospitality and Tourism Technology*, *8*(2), 168–189. https://doi.org/10.1108/JHTT-09-2016-0059

Breda, Z., Pacheco, C., & Dinis, G. (2019). Future trends in the hospitality industry: An analysis from the consumers'point of view. *Tourism in Southern and Eastern Europe*, *5*, 139–162. https://doi.org/10.20867/tosee.05.9

Buhalis, D. (2020). Technology in tourism-from information communication technologies to eTourism and smart tourism towards ambient intelligence tourism: A perspective article. *Tourism Review*, *75*(1), 267–272. https://doi.org/10.1108/TR-06-2019-0258

Buhalis, D., & Karatay, N. (2022). Mixed Reality (MR) for Generation Z in cultural heritage tourism towards metaverse. In J. L. Stienmetz, B. Ferrer-Rosell, & D. Massimo (Eds.), *Information and Communication Technologies in Tourism 2022* (pp. 16–27). Springer. https://doi.org/10.1007/978-3-030-94751-4_2

Buhalis, D., Leung, D., & Lin, M. (2023). Metaverse as a disruptive technology revolutionising tourism management and marketing. *Tourism Management*, *97*, 104724. https://doi.org/10.1016/J.TOURMAN.2023.104724

Camilleri, M.A., & Falzon, L. (2021). Understanding motivations to use online streaming services: integrating the technology acceptance model (TAM) and the uses and gratifications theory (UGT). *Spanish Journal of Marketing - ESIC*, *25*(2), 217–238. https://doi.org/10.1108/SJME-04-2020-0074

Chamboko-Mpotaringa, M., & Tichaawa, T.M. (2021). Digital trends and tools driving change in marketing Free State tourism destinations: A stakeholder's perspective. *African Journal of Hospitality, Tourism and Leisure.*, *10*(6), 1973–1984. https://doi.org/10.46222/ajhtl.19770720.204

Chamboko-Mpotaringa, M., & Tichaawa, T.M. (2023). Domestic tourists' perceptions of the intention to use digital marketing tools and platforms. *Geojournal of Tourism and Geosites*, *46*(1), 9–18. https://doi.org/10.30892/gtg.46101-995

Chen, Z., Yun, D., & Zhou, J. (2023). Handwriting on touch screens through fingers and stylus: Investigating the optimal size of the input box for younger and older adults. *International Journal of Human–Computer Interaction*, 1–10. https://doi.org/10.1080/10447318.2023.2192107

Chocarro, R., Cortiñas, M., & Marcos-Matás, G. (2023). Teachers' attitudes towards chatbots in education: a technology acceptance model approach considering the effect of social language, bot proactiveness, and users' characteristics. *Educational Studies*, *49*(2), 295–313. https://doi.org/10.1080/03055698.2020.1850426

Davis, F.D. (1989). Perceived usefulness, perceived ease of use, and user acceptance of information technology. *MIS Quarterly: Management Information Systems*, *13*(3), 319–339. https://doi.org/10.2307/249008

DeLone, W.H., & McLean, E.R. (2003). The DeLone and McLean model of information systems success: A ten-year update. *Journal of Management Information Systems*, *19*(4), 9–30. https://doi.org/10.1080/07421222.2003.11045748

Deng, X., & Yu, Z. (2023). An extended hedonic motivation adoption model of TikTok in higher education. *Education and Information Technologies*. https://doi.org/10.1007/s10639-023-11749-x

Dida, S., Hafiar, H., Kadiyono, A.L., & Lukman, S. (2021). Gender, education, and digital generations as determinants of attitudes toward health information for health workers in West Java, Indonesia. *Heliyon*, *7*(1), 1–8. https://doi.org/10.1016/J.HELIYON.2021.E05916

Dinhopl, A., & Gretzel, U. (2016). Selfie-taking as touristic looking. *Annals of Tourism Research*, *57*, 126–139. https://doi.org/10.1016/j.annals.2015.12.015

Dwivedi, Y.K., Hughes, L., Wang, Y., Alalwan, A.A., Ahn, S.J., Balakrishnan, J., Barta, S., Belk, R., Buhalis, D., Dutot, V., Felix, R., Filieri, R., Flavián, C., Gustafsson, A., Hinsch, C., Hollensen, S., Jain, V., Kim, J., Krishen, A.S., & Wirtz, J. (2022). Metaverse marketing: How the metaverse will shape the future of consumer research and practice. *Psychology and Marketing*, *40*, 750–776. https://doi.org/10.1002/MAR.21767

Dyk, A.V., Slabbert, E., & Tkaczynski, A. (2020). Segmenting tourists based on traditional versus social media usage and destination image perception. *Tourism, Culture and Communication*, *20*(4), 189–206. https://doi.org/10.3727/194341420X15905692660247

Estriegana, R., Medina-Merodio, J.A., & Barchino, R. (2019). Student acceptance of virtual laboratory and practical work: An extension of the technology acceptance model. *Computers and Education*, *135*, 1–14. https://doi.org/10.1016/j.compedu.2019.02.010

Etale, L.M., & Uranta, K.G. (2022). Digital marketing and consumer behavioral pattern of fast food business enterprises in Yenagoa, Bayelsa State. *European Journal of Hospitality and Tourism Research*, *10*(1), 1–13. https://doi.org/10.37745/ejhtr.2013/vol10no1pp.1-13

Funk, D.C. (2008). *Consumer behaviour in sport and events: Marketing action*. Butterworth-Heinemann.

Gajdošík, T. (2022). Smart tourists. In *Encyclopedia of Tourism Management and Marketing* (pp. 130–132). Edward Elgar Publishing. https://www.elgaronline.com/view/book/9781800377486/b-9781800377486.smart.tourists.xml

George, R. (2019). *Marketing Tourism in South Africa* (6th ed.). OUP Southern Africa.

González-Reverté, F., & Liviano-Solís, D. (2020). We are all digital tourists, but are all digital tourists the same? In I. de Luna, A. Fitó-Bertran, J. Lladós-Masllorens, & F. Liébana-Cabanillas (Eds.), *Sharing economy and the impact of collaborative consumption* (pp. 263–277). IGI. https://doi.org/10.4018/978-1-5225-9928-9.ch014

Hair, J.F., Black, W.C., Babin, B.J., Anderson, R.E., & Tatham, R.L. (2006). *Multivariate data analysis*. Pearson University Press.

Hair, J.F., Risher, J.J., Sarstedt, M., & Ringle, C.M. (2019). When to use and how to report the results of PLS-SEM. *European Business Review*, *31*, 2–24. https://doi.org/10.1108/EBR-11-2018-0203

Hew, J.J., Lee, V.H., T'ng, S.T., Tan, G.W.H., Ooi, K.B., & Dwivedi, Y.K. (2023). Are online mobile gamers really happy? On the suppressor role of online game addiction. *Information Systems Frontiers*, 2023. https://doi.org/10.1007/s10796-023-10377-7

Hua, C., Cole, S., & Xu, N. (2021). Rethinking trust in tourism apps: The moderating effect of age. *Journal of Hospitality and Tourism Technology*, *12*(3), 548–562. https://doi.org/10.1108/JHTT-01-2020-0013

Huang, Y., Chang, L., Yu, C., & Chen, J. (2019). Examining an extended technology acceptance model with experience construct on hotel consumers' adoption of mobile applications. *Journal of Hospitality Marketing & Management*. https://doi.org/10.1080/19368623.2019.1580172

Isaac, O., Aldholay, A., Abdullah, Z., & Ramayah, T. (2019). Online learning usage within Yemeni higher education: The role of compatibility and task-technology fit as mediating variables in the IS success model. *Computers and Education*, *136*, 113–129. https://doi.org/10.1016/j.compedu.2019.02.012

Jeng, M.Y., Pai, F.Y., & Yeh, T.M. (2017). The virtual reality leisure activities experience on elderly people. *Applied Research in Quality of Life*, *12*(1), 49–65. https://doi.org/10.1007/s11482-016-9452-0

Jonck, P., van der Walt, F., & Sobayeni, N.C. (2017). A generational perspective on work values in a South African sample. *SA Journal of Industrial Psychology*, *43*(1), a1393. https://doi.org/10.4102/sajip.v43.1393

Kaiser, H.F. (1974). An index of factorial simplicity. *Psychometrika*, *39*(1), 31–36. https://doi.org/10.1007/BF02291575

Lamberton, C., & Stephen, A.T. (2016). A thematic exploration of digital, social media, and mobile marketing: Research evolution from 2000 to 2015 and an agenda for future inquiry. *Journal of Marketing*, *80*(Special issue), 146–172. https://doi.org/10.1509/jm.15.0415

Legris, P., Ingham, J., & Collerette, P. (2003). Why do people use information technology? A critical review of the technology acceptance model. *Information and Management* , *40*(3), 191–204. http://dx.doi.org/10.1016/S0378-7206(01)00143-4

Lin, Y., & Yu, Z. (2023). Extending Technology Acceptance Model to higher-education students' use of digital academic reading tools on computers. *International Journal of Educational Technology in Higher Education*, *20*(1), 34. https://doi.org/10.1186/s41239-023-00403-8

Liu, S., & Zheng, D. (2023). Impacts of tourists' trust, perception and acceptance of health quick response technology on responsible pandemic travel behaviours. *Journal of Hospitality and Tourism Technology*, *14*(2), 278–294. https://doi.org/10.1108/JHTT-11-2021-0330

Lou, C., & Xie, Q. (2021). Something social, something entertaining? How digital content marketing augments consumer experience and brand loyalty. *International Journal of Advertising*, *40*(3), 376–402. https://doi.org/10.1080/02650487.2020.1788311

Lowry, P.B., Gaskin, J., & Moody, G.D. (2015). Proposing the multi-motive information systems continuance model (MISC) to better explain end-user system evaluations and continuance intentions. *Journal of the Association for Information Systems*, *16*(7), 515–579. http://dx.doi.org/10.17705/1jais.00403

Mametja, T.R., Lebambo, M.M., & Tichaawa, T.M. (2023). The adoption of digital technologies by women-owned tourism micro-enterprises. *African Journal of Hospitality, Tourism and Leisure*, *12*(2), 717–734. https://doi.org/10.46222/ajhtl.19770720.395

Mason, R.O. (1978). Measuring information output: A communication system. *Information and Management*, *1*(4), 219–234. https://doi.org/10.1016/0378-7206(78)90028-9

Matikiti, R., Mpinganjira, M., & Roberts-Lombard, M. (2018). Application of the Technology Acceptance Model and the Technology–Organisation–Environment Model to examine social media marketing use in the South African tourism industry. *SA Journal of Information Management*, *20*(1), 1–12. https://doi.org/10.4102/sajim.v20i1.790

Matikiti-Manyevere, R., & Hattingh, J. (2020). Factors influencing intention to use social media sites for holiday destination selection by the young generation. *African Journal of Hospitality, Tourism and Leisure*, *9*(3), 302–318. https://doi.org/10.46222/ajhtl.19770720-20

Miranda, S., Trigo, I., Rodrigues, R., & Duarte, M. (2023). Addiction to social networking sites: Motivations, flow, and sense of belonging at the root of addiction. *Technological Forecasting and Social Change*, *188*, 122280. https://doi.org/10.1016/j.techfore.2022.122280

Monaco, S. (2018). Tourism and the new generations: Emerging trends and social implications in Italy. *Journal of Tourism Futures*, *4*(1), 7–15. https://doi.org/10.1108/JTF-12-2017-0053

Musina, Ž., & Gao, X. (2016). DMO tourism website's success evaluation model and framework. *European Journal of Economics and Management Sciences*, *16*(4), 61–76. https://doi.org/10.20534/ejems-16-4-61-76

Purohit, S., & Arora, R. (2023). Adoption of mobile banking at the bottom of the pyramid: an emerging market perspective. *International Journal of Emerging Markets*, *18*(1), 200–222. https://doi.org/10.1108/IJOEM-07-2020-0821

Rauschnabel, P.A., Babin, B.J., tom Dieck, M.C., Krey, N., & Jung, T. (2022). What is augmented reality marketing? Its definition, complexity, and future. *Journal of Business Research*, *142*, 1140–1150. https://doi.org/10.1016/j.jbusres.2021.12.084

Renny, Guritno, S., & Siringoringo, H. (2013). Perceived usefulness, ease of use, and attitude towards online shopping usefulness towards online airlines ticket purchase. *Procedia - Social and Behavioral Sciences*, *81*, 112–216. https://doi.org/10.1016/j.sbspro.2013.06.415

Şengel, Ü., Genç, G., Işkın, M., Çevrimkaya, M., Assiouras, I., Zengin, B., Sarıışık, M., & Buhalis, D. (2022). The impacts of negative problem orientation on perceived risk and travel intention in the context of Covid-19: A PLS-SEM approach. *Journal of Tourism Futures*, (ahead-of-print). http://dx.doi.org/10.1108/JTF-05-2021-0130

Sepasgozar, S.M.E. (2022). Immersive on-the-job training module development and modeling users' behavior using parametric multi-group analysis: A modified educational technology acceptance model. *Technology in Society*, *68*, 101921. https://doi.org/10.1016/j.techsoc.2022.101921

Setiawan, B., Trisdyani, N.L.P., Adnyana, P.P., Adnyana, I.N., Wiweka, K., & Wulandani, H.R. (2018). The profile and behaviour of 'digital tourists' when making decisions concerning travelling, case study: Generation Z in South Jakarta. *Advances in Research*, *17*(2), 1–13. https://doi.org/10.9734/AIR/2018/43872

Singh, S., & Srivastava, P. (2019). Social media for outbound leisure travel: a framework based on Technology Acceptance Model (TAM). *Journal of Tourism Futures*, *5*(1), 43–61. https://doi.org/10.1108/JTF-10-2018-0058

Talwar, S., Kaur, P., Nunkoo, R., & Dhir, A. (2022). Digitalization and sustainability: Virtual reality tourism in a post pandemic world. *Journal of Sustainable Tourism*. https://doi.org/10.1080/09669582.2022.2029870

Tavitiyaman, P., Zhang, X., & Tsang, W.Y. (2022). How tourists perceive the usefulness of technology adoption in hotels: Interaction effect of past experience and education level. *Journal of China Tourism Research*, *18*(1), 64–87. https://doi.org/10.1080/19388160.2020.1801546

Taylor, S., & Todd, P.A. (1995). Understanding information technology usage: A test of competing models. *Information Systems Research*, *6*(2), 144–176. https://doi.org/https://doi.org/10.1287/isre.6.2.144

Tsourgiannis, L., & Valsamidis, S. (2019). Digital marketing in tourism: Why Greek tourists use digital marketing applications like Airbnb. *International Journal of Culture, Tourism, and Hospitality Research*, *13*(4), 473–486. https://doi.org/10.1108/IJCTHR-03-2019-0043

Venkatesh, V., Morris, M.G., Davis, G.B., & Davis, F.D. (2003). User acceptance of information technology: Toward a unified view. *MIS Quarterly: Management Information Systems*, *27*(3), 425–478. https://doi.org/10.2307/30036540

Venkatesh, V., Thong, J.Y.L., & Xu, X. (2012). Consumer acceptance and use of information technology: Extending the unified theory of acceptance and use of technology. *MIS Quarterly: Management Information Systems*, *36*(1), 157–178. https://doi.org/10.2307/41410412

Wixom, B.H., & Todd, P.A. (2005). A theoretical integration of user satisfaction and technology acceptance. *Information Systems Research*, *16*(1), 85–102. http://dx.doi.org/10.1287/isre.1050.0042

Wong, L.W., Tan, G.W.H., Hew, J.J., Ooi, K.B., & Leong, L.Y. (2022). Mobile social media marketing: a new marketing channel among digital natives in higher education? *Journal of Marketing for Higher Education*, *32*(1), 113–137. https://doi.org/10.1080/08841241.2020.1834486

Yousaf, S., & Xiucheng, F. (2018). Halal culinary and tourism marketing strategies on government websites: A preliminary analysis. *Tourism Management*, *68*, 423–443. http://dx.doi.org/10.1016/j.tourman.2018.04.006

Zeng, S., Lin, X., & Zhou, L. (2023). Factors affecting consumer attitudes towards using digital media platforms on health knowledge communication: Findings of cognition–affect–conation pattern. *Frontiers in Psychology*, *14*, 1008427. https://doi.org/10.3389/fpsyg.2023.1008427

Zhang, B., Ying, L., Khan, M.A., Ali, M., Barykin, S., & Jahanzeb, A. (2023). Sustainable digital marketing: Factors of adoption of M-technologies by older adults in the Chinese market. *Sustainability*, *15*(3), 1972. https://doi.org/10.3390/su15031972

Zhou, J., Rau, P.L.P., & Salvendy, G. (2014). Older adults use of smart phones: An investigation of the factors influencing the acceptance of new functions. *Behaviour and Information Technology*, *33*(6), 552–560. https://doi.org/10.1080/0144929X.2013.780637

Zhuang, X., Hou, X., Feng, Z., Lin, Z., & Li, J. (2021). Subjective norms, attitudes, and intentions of AR technology use in tourism experience: the moderating effect of millennials. *Leisure Studies*, *40*(3), 392–406. https://doi.org/10.1080/02614367.2020.1843692

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