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ADVERTISING MIX AND MOBILE APP ADOPTION IN EGYPT: THE MODERATING ROLE OF PERCEIVED UTILITY

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Abstract. This study investigates the moderating role of perceived utility on the relationship between the advertising mix and mobile app adoption in Egypt, an emerging market. Drawing on the Unified Theory of Acceptance and Use of Technology (UTAUT), the research explores how perceived utility, defined as the extent to which consumers believe a mobile app enhances their performance or provides value, influences the effectiveness of various advertising mixes in mobile app adoption. Using a quantitative research design, data were collected from 418 Egyptian consumers exposed to mobile app advertisements. The findings reveal that the advertising mix and perceived utility significantly impact mobile app adoption, with perceived utility as a positive moderator. Specifically, the study demonstrates that when consumers perceive higher utility in a mobile app, the effectiveness of the advertising mix in mobile adoption increases. This research contributes to the marketing literature by extending UTAUT to include the advertising mix as a determinant of technology adoption in emerging markets. It also provides actionable insights for marketers and policymakers, emphasising the importance of tailoring advertising strategies to enhance perceived utility and improve adoption rates in culturally and economically diverse contexts.

Keywords: perceived utility; advertising mix; mobile app adoption; UTAUT; Egypt

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1. Introduction

Particularly in developed markets where digital adoption is growing, the fast spread of mobile applications (apps) has changed how customers connect with technology (Keith et al., 2015; Mabungela et al., 2025). From financial services to entertainment, mobile applications have become integral to daily life; their adoption is increasingly driven by evolving marketing methods, particularly the advertising mix (Alghazi et al., 2021; Liu et al., 2022). Consumer impressions and behaviours toward mobile applications are shaped by the *advertising mix*, defined as the strategic combination of promotional tools (e.g., digital/social media, TV, print, influencer endorsements) used to communicate app value (Kotler & Keller, 2016; Belch & Belch, 2018; Quyet, 2024). Nevertheless, the success of various promotional techniques in increasing mobile app adoption varies depending on the market, particularly in developing countries where customer behaviour is much influenced by cultural, financial, and infrastructure aspects (Burgess & Steenkamp, 2006; Mugunzva & Manchidi, 2024).

One crucial aspect that moderates the link between the advertising mix and mobile app uptake is perceived utility (Lin et al., 2016). A central concept in the Technology Acceptance Model (TAM) is perceived utility, which refers to an individual's subjective belief that using a specific technology will improve their performance (Davis, 1989). Although many studies have examined perceived utility in industrialised economies, its function in emerging regions such as Egypt—where digital uptake is still maturing—remains under-explored (Bendary & Al-Sahouly, 2018). Emerging markets provide special difficulties, including lower internet penetration, different degrees of digital literacy, and cultural preferences that might change the efficacy of conventional and digital advertising strategies (El-Gohary, 2012).

The body of current research has concentrated chiefly on the direct impact of advertising on consumer behaviour, paying little attention to the moderating function of perceived value, particularly regarding the acceptance of mobile apps in developing countries. For example, although studies in developed markets have shown that digital advertising and sales promotions greatly affect app adoption (Taylor & Levin, 2014), the same approaches may not produce similar results in emerging markets due to variations in perceived utility and contextual factors. This research gap emphasises the need for a more complex knowledge of how perceived utility interacts with the advertising mix to impact mobile app uptake in developing economies.

This study aims to address this gap by examining the moderating role of perceived utility on the relationship between the advertising mix and mobile app adoption in Egypt, a representative emerging market. The rationale for this research lies in its potential to provide actionable insights for marketers and policymakers in emerging markets. By understanding how perceived utility influences the effectiveness of different advertising strategies, businesses can tailor their marketing efforts to better align with consumer expectations, thereby enhancing app adoption rates. Additionally, this study contributes to the broader academic discourse by extending the Unified Theory of Acceptance and Use of Technology (UTAUT) to include the advertising mix as a key determinant of technology adoption in emerging markets (Venkatesh et al., 2012; Liu et al., 2022).

The study employs a quantitative research design, utilising survey data collected from Egyptian consumers exposed to advertisements promoting mobile apps. The findings will provide a deeper understanding of the interplay between advertising strategies and perceived utility in driving mobile app adoption in emerging markets. The remainder of this study is structured as follows: Section 2 provides a comprehensive review of the literature on advertising mix, perceived utility, and mobile app adoption, focusing on emerging markets. Section 3 outlines the research methodology, including data collection and analysis procedures. Section 4 presents the Conclusion and recommendations.

2. Literature review

Recent studies examine how the advertising mix influences mobile app adoption, especially in developed and digitally transforming markets (Ben Arfi et al., 2021; Andrews et al., 2021). Emerging economies like Egypt, however, have specific characteristics that call for more research on this link, particularly given the moderating influence of perceived utility (Bendary & Al-Sahouly, 2018). Contemporary conceptualisations frame the advertising mix as an integrated bundle of promotional tools—digital, social, traditional and influencer channels—deployed to communicate value propositions (Kotler & Keller, 2022). Rather than a static “4-P” inventory, it is now viewed as a dynamic system that adapts to platform algorithms and consumer journeys in emerging markets (Belch & Belch, 2022; Liu et al., 2022).

Developed by Davis (1989), the Technology Acceptance Model (TAM) offers a theoretical basis for comprehending how perceived utility and simplicity of use affect technology acceptance in the context of mobile app uptake. Key factors of technology adoption, according to TAM, are perceived utility- the degree to which a person feels using a technology would improve their performance - and perceived ease of use - the degree to which a person believes utilising a technology will be free of effort (Ridings & Geffen, 2000). Particularly in developed economies, this model has been extensively used in research on mobile app uptake (Venkatesh et al., 2012; Haurovi & Chilunjika, 2024).

The Unified Theory of Acceptance and Use of Technology (UTAUT) (Venkatesh et al., 2003) extends TAM by integrating social influence and facilitating conditions, offering a broader lens for emerging markets (Liu et al., 2022). UTAUT has proved very helpful in elucidating technology adoption in developing countries, where social and infrastructure elements significantly influence (Venkatesh et al., 2012; Liu et al., 2022)

Recent evidence affirms that advertising-mix strategies significantly influence consumer decisions to adopt mobile applications, especially in digitally expanding economies (Alalwan et al., 2017; Bu et al., 2021). Particularly via social media and search engines, digital advertising - especially in developed markets - has been quite successful in increasing app downloads and usage (Taylor & Levin, 2014). For instance, the study by Kim & Han (2014) indicated that focused digital advertising considerably raised the United States' usage of mobile banking apps. Likewise, sales campaigns like free trials and discounts have improved app acceptance by lowering perceived risk and increasing perceived value (Huang & Kuo, 2011).

Empirical comparisons indicate that UTAUT outperforms individual predecessor models in explaining technology-usage behaviour (see meta-analyses by Williams et al., 2015; Venkatesh et al., 2011, 2012) and AbuShanab & Pearson, 2007; Im et al., 2011; Lin et al., 2019; Alghazi et al., 2021; Andrews et al., 2021; Ben Arfi et al., 2021; Bu et al., 2021; Liu et al., 2012). Behavioural intention and use behaviour are investigated using variables including use performance expectations, ease-of-use expectations, social effects, and enabling environments (Wu & Du, 2012). Four additional moderating factors—gender, age, experience, and voluntary use—are also suggested for investigating usage behaviour (Park & Gweon, 2015). This study applied the UTAUT framework to examine the impact of middle-aged PX Mart consumers' behavioural intentions to use PX Pay and related variables since UTAUT has a significant degree of explanatory power for people's intentions and actions in utilising technology (Liu et al., 2012). This study's independent variables include performance expectations, ease-of-use expectations, social effect and enabling circumstances. PX Pay can cause consumers to have distinct behavioural goals and use patterns.

As for the perceived utility of adopting mobile phone applications, the literature has indicated many types, including: performance expectation, effort expectation, social influence, and facilitating conditions. Performance expectancy, a key construct in the UTAUT model, captures an individual's belief that using a system will lead to tangible benefits in their performance (Venkatesh et al., 2003). Previous research has shown that acceptance of technology is much influenced by performance expectations (Davis, 1989; Venkatesh & Davis, 2000; Oechslein et al., 2014). Consumers are more ready to employ information systems when they can use technology to achieve their objectives when their pragmatic and convenient expectations are satisfied (Szajna & Scamell, 1993). Furthermore, performance expectations change based on age and gender (Cabrera et al., 2009; Lian & Yen, 2014; Liu et al., 2012)

Effort expectation (EE) is the degree of simplicity with which the user may use recently developed technology, systems, and applications (Venkatesh et al., 2003). Ease of use expectations change with age and gender (Venkatesh & Davis, 2000). For instance, although women and seniors often pay greater heed to the ease-of-use expectations of information systems, the accumulation of experience still affects their experience. Simultaneously, Maduku et al. (2016) pointed out that consumers do not need extra time and effort if they believe that mobile marketing tools are simple and easy to use; moreover, the tools can help them locate the necessary information, thus enhancing their acceptance .

Social influence is the personal understanding of the user that key others think the user should apply this new technology or system (Venkatesh et al., 2003). Social impact also depends on gender, age, experience, and willingness (Ye et al., 2020). For instance, their colleagues and top managers influence early adopters and young women

As defined by Venkatesh et al. (2003), facilitating conditions refer to an individual's perception of the organisational and technical resources available to support the use of a system. These conditions encompass the provision of necessary hardware and software tools and the broader organisational support for new technologies

(Venkatesh et al. 2003). Recent research consistently highlights the critical role of facilitating conditions in influencing technology adoption across various contexts. For instance, studies on educational technology adoption emphasise the importance of adequate infrastructure and support systems (Jarvie-Eggart et al., 2022; Feng et al., 2025). Similarly, in the context of mobile applications, reliable internet access, compatible devices, and technical assistance significantly impact user adoption and continued engagement (Marikyan & Papagiannidis, 2025). Empirical evidence suggests that facilitating conditions directly influence behavioural intention and usage behaviour, potentially moderated by factors such as age and experience (Mensah et al., 2022; Mensah & Khan, 2024).

Behavioural intention, defined as the subjective probability that an individual will perform a specific behaviour (Ajzen & Fishbein, 1975), remains a robust predictor of technology adoption and system utilisation. In the context of mobile app adoption, recent studies consistently demonstrate the significant role of behavioural intention in driving user engagement and continued use (Roy, 2017; Sadiq et al., 2025). For example, research on mobile health services and mobile shopping applications highlights how factors influencing behavioural intention, such as perceived usefulness and social influence, directly translate into adoption behaviours (Popescu et al., 2021; Cao et al., 2024). Venkatesh et al. (2003) established that customers' technology adoption behaviour is contingent upon their behavioural intents, a finding that continues to be validated in contemporary research across various digital platforms and emerging markets (Mahmud et al., 2022; Indiani et al., 2025).

However, the effectiveness of the advertising mix in developing countries remains underexplored (see Figure 1), particularly in contexts like Egypt (Elsafty & Yehia, 2023; Statista, 2023). Furthermore, national culture dimensions shape users' receptivity to new technologies (Hofstede, 1980, as cited in Sheth, 2011, p. 174). Research on collectivist cultures suggests that social influence and interpersonal recommendations can outweigh traditional advertising when consumers decide whether to adopt an app (Burgess & Steenkamp, 2006).

Perceived usefulness is a significant determinant of technology adoption, especially for mobile applications. Davis (1989) claimed that technology acceptance depends mostly on perceived utility, and much research in industrialised and developing economies has confirmed this. For instance, (Venkatesh et al., 2012) research discovered that the acceptance of mobile banking apps in India, a growing market with traits comparable to Egypt, was much impacted by perceived value.

In mature markets, time savings and convenience define perceived usefulness. For example, the study by Kim & Han (2014) revealed that Americans were more inclined to utilise mobile banking applications if they thought they were handy and straightforward. In developing markets, perceived value also includes access to otherwise absent services and cost reductions. For instance, Malaquias and Hwang (2016) discovered that, in Brazil, where access to conventional banking services is restricted, adoption of mobile banking was primarily driven by perceived usefulness.

Empirical research has produced conflicting findings regarding the interaction between advertising mix, perceived usefulness, and mobile app uptake in established and developing economies. With digital advertising and sales promotions especially successful, the advertising mix has been demonstrated in developed countries to directly influence app uptake (Taylor & Levin, 2014). In developing countries, however, the link is sometimes moderated by perceived utility and other contextual elements, including infrastructure and cultural standards (Burgess & Steenkamp, 2006).

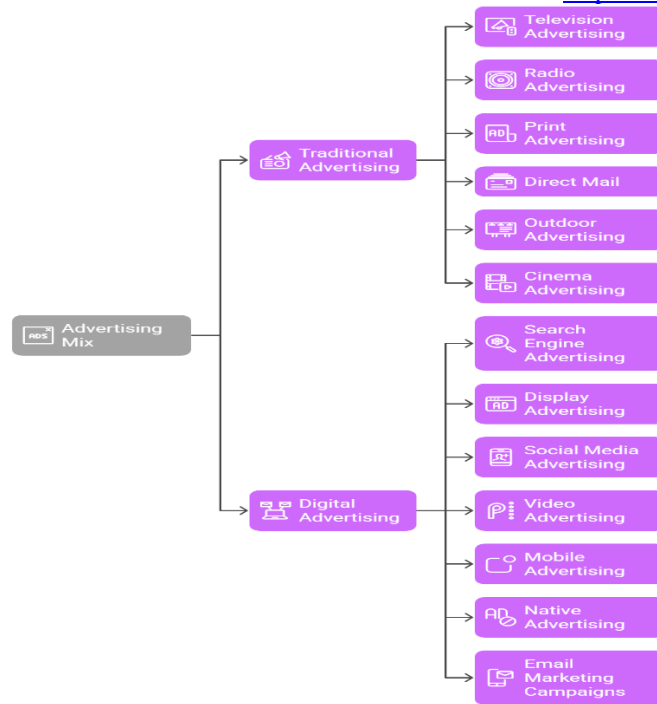


Figure 1. Advertising mix

For instance, El-Gohary's (2012) study indicated that, in Egypt, where internet penetration is somewhat low, conventional advertising media, including TV and radio, were more effective than digital promotion in boosting app use. Likewise, Malaquias and Hwang's (2016) study revealed that, in Brazil rather than in the United States, where infrastructure and access to traditional banking services are more established, perceived usefulness significantly influenced mobile banking uptake. These results imply that although the advertising mix is a major driver of app uptake in developed and developing nations, its efficacy may depend on contextual elements like infrastructure, cultural standards, and perceived usefulness. This emphasises the requirement for a more sophisticated knowledge of the interactions among these elements in diverse marketplaces. Though the literature on the link between advertising mix, perceived usefulness, and mobile app adoption is increasing, an empirical study looking at this link in developing nations such as Egypt is lacking.

3. Study methodology and design

3.1. Hypotheses' development

The advertising mix (comprising traditional advertising and digital methods) is a cornerstone of marketing theory. It has influenced consumer behaviour across various contexts (Belch & Belch, 2018). Mobile app adoption, on the other hand, is a critical area of study in technology acceptance and digital marketing, particularly in emerging markets like Egypt, where digital transformation is accelerating. Still, adoption barriers remain due to economic, cultural, and infrastructural factors (Bendary & Al-Sahouly, 2018). The relationship between the advertising mix and mobile app adoption can be explored through the Technology Acceptance Model (TAM) lens, which posits that perceived usefulness and ease of use are key determinants of technology adoption (Davis, 1989). Advertising plays a pivotal role in shaping these perceptions by communicating the value proposition of mobile apps to potential users. In the Egyptian context, where trust in digital tools and familiarity with mobile apps may vary, understanding how the advertising mix influences adoption behaviours becomes particularly relevant. Then came the emergence of the Unified Theory of Acceptance and Use of Technology (UTAUT), representing the second generation of theories dealing with new technology (Venkatesh et al., 2012). Based on this theoretical foundation, the following hypothesis is proposed:

Hypothesis no.1: The advertising mix has a positive and significant impact on mobile app adoption in Egypt

On the other hand, mobile app adoption has been studied extensively in technology acceptance models, where perceived utility plays a critical role as a predictor of adoption intention (Davis, 1989; Venkatesh et al., 2003). Perceived utility refers to the extent to which a consumer believes using a particular mobile app will enhance their performance or provide value (Davis, 1989). In the Egyptian context, where digital transformation is accelerating but adoption barriers remain due to cultural and economic factors (Elsafty & Yehia, 2023), understanding how perceived utility moderates the relationship between the advertising mix and mobile app adoption becomes particularly relevant. Based on this theoretical foundation, the following hypothesis is proposed:

Hypothesis no.2: Perceived utility positively moderates the relationship between the advertising mix and mobile app adoption in Egypt.

The advertising mix serves as a strategic framework to communicate the benefits of products or services to consumers. Research shows that a compelling advertising mix can significantly influence consumer attitudes and behaviours of adoption (Kotler & Keller, 2016). For instance, promotional strategies highlighting a mobile app's functional benefits can lead to higher adoption rates (Kim et al., 2015). Similarly, pricing strategies, such as free trials or discounts, have been shown to lower perceived risk and encourage trial behaviours (Alalwan et al., 2017).

In emerging markets like Egypt, mobile app adoption is influenced by unique contextual factors, including economic constraints, cultural preferences, and technological infrastructure (Badran, 2017). Studies suggest that advertising tailored to local contexts, such as emphasising affordability, accessibility, and culturally relevant features, can enhance adoption rates (Venkatesh et al., 2003). For example, apps that address specific needs of Egyptian users, such as financial management tools or localised content, are more likely to succeed when supported by targeted advertising.

Perceived utility - "the degree to which a person believes that using a particular system would enhance his or her job performance" (Davis, 1989, p. 320) - is central to TAM. In the context of mobile apps, studies have demonstrated that perceived utility directly affects adoption intentions and amplifies the impact of external stimuli, such as advertising efforts (Venkatesh et al., 2003; Alalwan et al., 2017).

In Egypt, where digital literacy and trust in technology may vary across demographics, perceived utility could act as a critical moderator. Chiagouris and Mohr (2004) argue that enhancing the perceived value of digital tools through targeted advertising can overcome scepticism and drive adoption. Therefore, the interaction between the advertising mix and perceived utility is expected to be pivotal in shaping mobile app adoption behaviours in this market.

These hypotheses contribute to the marketing literature by exploring the moderating role of perceived utility in Egypt's unique cultural and economic context. It extends the Unified Theory of Acceptance and Use of Technology (UTAUT) by integrating the concept of the advertising mix. It provides actionable insights for marketers aiming to promote mobile apps in emerging markets. Furthermore, the findings could inform tailored advertising strategies that emphasise utility to enhance adoption rates.

3.2 Measurement of variables

it is divided into three dimensions: Perceived Utility, Advertising Mix, and Mobile App Adoption. Each dimension includes relevant constructs and items measured on a 5-point Likert scale (1 = Strongly Disagree, 5 = Strongly Agree). The study can demonstrate the statements utilised in measuring the study variables, along with the sources of these statements, as illustrated in Table 1.

Table 1. Sources of Questionnaire

Dimension	Statements	Sources of Questions
Perceived Utility	1-10	Davis, 1989; Venkatesh et al., 2003
Advertising Mix	11-20	Kotler & Keller, 2016; Belch & Belch, 2018
Mobile App Adoption	21-31	Rogers, 2003; Venkatesh et al., 2012; Hayes, 2018; Baron & Kenny, 1986

In addition to the above, the study created a moderating variable based on the interaction between perceived utility and advertising mix. The moderating role is multiplying the value of the perceived benefit dimension by the value of the advertising mix dimension based on the participants' attitudes.

3.3. Collection of data

The proposed hypotheses are designed to be empirically tested using quantitative research methods. A survey-based approach could collect data from Egyptian consumers exposed to advertisements promoting mobile apps. The study population comprises a broad segment of consumers from various parts of Egypt. 418 surveys were distributed via Google Forms using paid advertisements through X (formerly Twitter) and Facebook. Table 2 illustrates the distribution of the study sample based on demographic characteristics.

Table 2. Demographic Characteristics

Demographic Characteristics	Gender		Education				Age		
	Male	Female	diploma	Bachelor's	MBA	PhD	Age 24 years or below	Between 24 and 45 years	Age 45 years or above
Size	248	170	57	254	75	32	61	283	74
Weight (%)	59.33	40.67	13.64	60.76	17.94	7.65	14.59	67.70	17.70

The study was approved by Helwan University, Egypt, Faculty of Commerce and Business Administration's ethics committee and registered on March 7, 2024 (Ref. No. 61001). Informed consent was collected in written form for the study. The study was approved by the human subjects' research committee of Helwan University, Faculty of Commerce and Business Administration and registered at March 12, 2024

All study participants in the questionnaire-based survey were provided with detailed information about the study's objectives, procedures, and confidentiality protocols. Informed consent was explicitly obtained from all participants, who were assured of their right to withdraw from the study at any stage without consequence. Data collected from participants was anonymised and aggregated to ensure privacy and compliance with data protection regulations.

The study design and implementation aligned with ethical standards to minimise risks to participants, including avoiding harm, coercion, or undue influence. Special care was taken to ensure the questionnaire content did not infringe on personal privacy.

3.4. Reliability statistics

Based on the study variables, which include three variables, the results of the Reliability statistics appear according to three dimensions in Table 3.

Table 3. Reliability Statistics

Cronbach's Alpha	N of Items
0.763	3

Source: Statistical Package for the Social Sciences output.

The surveys received had a Cronbach's alpha coefficient of 0.76377. Thus, this study identified markers of the consistency of the outcomes of the statistical tests.

3.5. Description analysis

Table 4 presents the descriptive statistics of perceived utility. This table displays values of the mean, standard deviation, and coefficient of variation.

Table 4. Descriptive statistics of perceived utility

No.	Statement	Mean	Std. deviation	Coefficient of variation
S1	Using mobile apps makes it easier to accomplish tasks.	3.6770	0.99084	0.269469
S2	Mobile apps provide useful features that meet my needs.	3.7153	1.00015	0.269196
S3	Mobile apps are beneficial in my daily life.	3.8158	1.02348	0.268223
S4	Mobile apps save me time and effort.	3.7488	0.98017	0.261462
S5	Mobile apps enhance my productivity.	3.7632	1.00544	0.267181
S6	Mobile apps are user-friendly and easy to navigate.	3.7847	1.01384	0.267879
S7	Mobile apps provide accurate and reliable information.	3.7392	0.96532	0.258159
S8	Mobile apps help me achieve my goals more efficiently.	3.7847	0.98505	0.260271
S9	Mobile apps are a valuable tool for managing my daily activities.	3.7632	0.97148	0.258155
S10	Mobile apps improve the quality of my life.	3.7464	0.98322	0.262442
D1	Perceived Utility	3.7578	0.65613	0.1746

Source: Statistical Package for the Social Sciences output.

According to Table 4, the participants agreed on the Perceived Utility at a rate of 82.54%. The agreement was highest for ‘Mobile apps provide accurate and reliable information’ but lowest for ‘Using mobile apps makes it easier to accomplish tasks.’

Table 5 presents the descriptive statistics of perceived utility. This table displays values of the mean, standard deviation, and coefficient of variation.

Table 5. Descriptive statistics of the advertising mix

No.	Statement	Mean	Std. deviation	Coefficient of variation
S11	I am exposed to advertisements for mobile apps through social media platforms.	3.4450	1.32784	0.385442
S12	I notice advertisements for mobile apps on television or the radio.	3.5120	1.32350	0.376855
S13	I encounter advertisements for mobile apps in print media (e.g., newspapers, magazines).	3.5742	1.28093	0.358385
S14	I receive recommendations for mobile apps through word-of-mouth or influencer endorsements.	3.6172	1.25306	0.346415
S15	I find advertisements for mobile apps on search engines (e.g., Google).	3.6962	1.23538	0.334233
S16	I see advertisements for mobile apps in public spaces (e.g., billboards, posters).	3.6148	1.23400	0.341371
S17	I receive promotional emails or notifications about mobile apps.	3.6794	1.21644	0.330605
S18	I am influenced by advertisements that highlight the benefits of mobile apps.	3.6459	1.23070	0.337554
S19	I trust advertisements that feature testimonials from real users.	3.6770	1.25750	0.341986
S20	I am more likely to adopt a mobile app if it is advertised through multiple channels.	3.5526	1.27825	0.359803
D2	Advertising Mix	3.5891	0.92080	0.256553

Source: Statistical Package for the Social Sciences output.

According to Table 5, the participants agreed on the advertising mix at a rate of 74.34%. The agreement was highest for 'I receive promotional emails or notifications about mobile apps' but lowest for 'I am exposed to advertisements for mobile apps through social media platforms.'

Table 6 presents the descriptive statistics of perceived utility. This table displays values of the mean, standard deviation, and coefficient of variation.

Table 6. Descriptive statistics of mobile app adoption

No.	Statement	Mean	Std. deviation	Coefficient of variation
S21	I will likely download and use a mobile app if it is recommended.	3.8732	0.90863	0.234594
S22	I frequently try out new mobile apps that are advertised to me.	3.8852	0.86010	0.221382
S23	Adopting new mobile apps improves my productivity or lifestyle.	3.8421	0.83333	0.216893
S24	I will pay for a mobile app if it provides significant value.	3.8971	0.89036	0.228467
S25	I prefer mobile apps that are free to download, even if they include ads.	3.8852	0.88213	0.22705
S26	I am more likely to adopt a mobile app with high ratings and positive reviews.	3.8589	0.86868	0.225114
S27	I adopt mobile apps that align with my interests and needs.	3.8708	0.89097	0.230176
S28	I was influenced by the popularity of a mobile app when I decided to adopt it.	3.9330	0.85400	0.217136
S29	I adopt mobile apps that offer unique features not available in other apps.	3.8995	0.85352	0.218877
S30	I will likely adopt a mobile app if it is compatible with my device and operating system.	3.8301	0.85234	0.222533
S31	The usefulness of a mobile app influences my decision to adopt it, even if I see many advertisements for it.	3.8995	0.92108	0.236204
D3	Mobile App Adoption	3.8795	0.41671	0.107413

Source: Statistical Package for the Social Sciences output.

According to Table 6, the participants agreed on the mobile app adoption at a rate of 89.25%. The agreement was highest for 'I believe adopting new mobile apps improves my productivity or lifestyle' but lowest for 'The usefulness of a mobile app influences my decision to adopt it, even if I see many advertisements for it.'

3.6. Testing hypotheses

The following formulation shows the hypothesis in the form of an alternative hypothesis.

The advertising mix positively and significantly impacts mobile app adoption in Egypt.

Through data analysis, the ANOVA table tests the overall significance of the regression model (see Table 7). The F-statistic (48.943) is significant at $p < 0.001$, indicating that the model as a whole is statistically significant in predicting App adoption. Combining Advertising mix and perceived utility significantly explains the variance in the dependent variable (App Adoption).

Table 7. ANOVA tests without the moderating role

ANOVA ^a						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	13.820	2	6.910	48.943	.000 ^b
	Residual	58.591	415	0.141		
	Total	72.411	417			
a. Dependent Variable: App Adoption						
b. Predictors: (Constant), Advertising Mix, perceived utility						

Source: Statistical Package for the Social Sciences output.

On the other hand, the coefficients in Table 8 provide insights into the individual contribution of each variable

Table 8. ANOVA tests without the moderating role

Coefficients						
Model		Unstandardised Coefficients		Standardised Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	3.432	0.078		44.212	0.000
	perceived utility	0.059	0.010	0.632	5.696	0.000
	Advertising mix	0.101	0.050	0.222	2.004	0.046
a. Dependent Variable: App adoption						

Source: Statistical Package for the Social Sciences output.

The coefficients table provides insights into each variable's contribution in the app adoption regression model. The perceived utility unstandardised coefficient ($B = 0.059$) is positive and statistically significant ($p < 0.001$). This means that for every one-unit increase in perceived utility, there is a 0.059-unit increase in app adoption. Advertising Mix has an unstandardised coefficient of 0.101 that is positive and statistically significant ($p = 0.046$). This means that for every one unit increase in Advertising Mix, there is a 0.101 increase in App Adoption.

According to Table 9, the regression model explains 19.1% of the variance in App adoption, as indicated by the R Square value of 0.191. The Adjusted R Square value of 0.187 adjusts for the number of predictors in the model, suggesting that the model's explanatory power is relatively modest but statistically significant.

Table 9. Model summary without the moderating variable

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.437 ^a	0.191	0.187	0.37574

a. Predictors: (Constant), Advertising mix, perceived utility

Source: Statistical Package for the Social Sciences output.

The Standard Error of the Estimate (0.37574) reflects the average deviation of the observed values from the regression line, indicating moderate precision in the model's predictions. Thus, the null hypothesis can be rejected and the alternative hypothesis can be accepted.

Hypothesis within the moderating role:

Perceived utility positively moderates the relationship between the advertising mix and mobile app adoption in Egypt.

Through data analysis, the ANOVA tests the overall significance of the regression model (see Table 10). The F-statistic (52.768) is significant at $p < 0.001$, indicating that the model as a whole is statistically significant in predicting App adoption. This means that the combination of Advertising mix, moderating role, and perceived utility significantly explains the variance in the dependent variable (App adoption).

Table 10. ANOVA tests within the moderating role

ANOVA ^a						
Model	Sum of Squares	df	Mean Square	F	Sig.	
1	Regression	20.029	3	6.676	52.768	.000 ^b
	Residual	52.382	414	0.127		
	Total	72.411	417			

a. Dependent Variable: App adoption

b. Predictors: (Constant), Advertising Mix, moderating role, perceived utility

Source: Statistical Package for the Social Sciences output.

In Table 11, the coefficients table provides insights into the individual contribution of each variable.

Table 11. Within the moderating role

Coefficients					
Model	Unstandardised Coefficients		Standardised Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	1.672	0.262		6.386	0.000
Perceived utility	0.105	0.025	1.127	4.143	0.000
Moderating role	0.550	0.079	0.866	7.006	0.000
Advertising mix	0.441	0.091	0.975	4.861	0.000

a. Dependent Variable: App Adoption

Source: Statistical Package for the Social Sciences output.

The coefficients table provides insights into the individual contribution of each variable in the regression model, including the moderating role. The unstandardised coefficient of perceived utility ($B = 0.105$) is positive and statistically significant ($p < 0.001$), meaning that an increase of one unit in perceived utility is linked to an increase of 0.105 units in app adoption. The Advertising Mix unstandardised coefficient ($B = 0.441$) is positive and statistically significant ($p < 0.001$). This means that for every one-unit increase in advertising mix, there is a 0.441-unit increase in app adoption. The unstandardised moderating role coefficient ($B = 0.550$) is positive and statistically significant ($p < 0.001$). This means that for every one-unit increase in the moderating role, there is a 0.550-unit increase in App Adoption. According to Coefficient Analysis, all variables have a significance level of 1%. However, Table 12 shows the model and explains the variance in app adoption.

Table 12. Model summary within the moderating variable

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.526 ^a	0.277	0.271	0.35570

a. Predictors: (Constant), Advertising Mix, moderating role, perceived utility

Source: Statistical Package for the Social Sciences output

The model explains 27.7% of the variance in App adoption, as indicated by the R Square value of 0.277 (see Table 12). The Adjusted R Square value of 0.271 accounts for the number of predictors in the model, suggesting that the model's explanatory power is modest but statistically significant. The Standard Error of the Estimate (0.35570) indicates the average distance that the observed values fall from the regression line, reflecting a moderate level of precision in the model's predictions. Thus, the null hypothesis can be rejected and the alternative hypothesis can be accepted.

4. Discussion

The advertising mix, which encompasses various promotional tools such as social media, television, print media, and word-of-mouth, is crucial in influencing consumer behaviour. Prior research has demonstrated that a well-executed advertising mix can significantly enhance brand awareness and consumer engagement, driving product adoption (Kotler & Keller, 2016). In the context of mobile apps, the advertising mix has been shown to positively impact adoption rates by increasing visibility and perceived value (Kim et al., 2015). However, the effectiveness of advertising tools may vary across different cultural and economic contexts, particularly in emerging markets where consumer preferences and media consumption patterns differ from those in developed economies (Sheth, 2011). On the other hand, perceived utility, defined as the extent to which consumers believe a product or service will meet their needs and provide value, is a critical factor in adoption decisions. Studies have consistently shown that perceived utility positively influences technology adoption, as consumers are more likely to adopt innovations that offer clear benefits (Davis, 1989; Venkatesh et al., 2003). In the context of mobile apps, perceived utility has been found to mediate the relationship between advertising efforts and adoption, as consumers are more likely to adopt apps that they perceive as useful and relevant to their daily lives (Lu et al., 2011). However, the moderating role of perceived utility in shaping the impact of advertising mix on adoption remains underexplored, particularly in emerging markets.

As an emerging market, Egypt presents a unique context for studying mobile app adoption. With a rapidly growing digital economy and increasing smartphone penetration, Egypt offers a fertile ground for examining the interplay between advertising strategies and consumer behaviour. However, the effectiveness of traditional advertising channels may be influenced by cultural and socioeconomic factors, such as the prevalence of informal communication networks and the importance of word-of-mouth recommendations (El Said & Galal-Edeen, 2017). This study aims to contribute to the literature by exploring how perceived utility moderates the relationship between advertising mix and mobile app adoption in Egypt.

The statistical results of this study reveal several key insights. First, the regression model without the moderating role of perceived utility explains 19.1% of the variance in mobile app adoption, with both advertising mix ($B = 0.101$, $p = 0.046$) and perceived utility ($B = 0.059$, $p < 0.001$) exhibiting significant positive effects. These

findings align with previous research, consistently highlighting the importance of advertising efforts and perceived utility in driving adoption (Lu et al., 2011; Kim et al., 2015). However, including perceived utility as a moderating variable significantly enhances the model's explanatory power, with the R Square value increasing to 27.7%. This suggests that perceived utility directly influences adoption and amplifies the impact of the advertising mix on adoption decisions.

The moderating role of perceived utility is further supported by the positive and statistically significant coefficients for both perceived utility ($B = 0.105$, $p < 0.001$) and the moderating role variable ($B = 0.550$, $p < 0.001$). These findings are consistent with the Technology Acceptance Model (TAM), which posits that perceived usefulness is a key determinant of technology adoption (Davis, 1989). Moreover, the strong positive effect of the advertising mix ($B = 0.441$, $p < 0.001$) in the moderated model underscores the importance of integrated marketing communications in driving adoption, particularly in emerging markets where consumers may rely on multiple channels for information.

This study contributes to the marketing literature by providing empirical evidence of the moderating role of perceived utility in the relationship between advertising mix and mobile app adoption. The findings highlight the importance of tailoring advertising strategies to enhance perceived utility, particularly in emerging markets where unique cultural and socioeconomic factors may influence consumer behaviour. Furthermore, the study underscores the need for marketers to adopt a holistic approach to advertising, leveraging multiple channels to maximise visibility and perceived value.

5. Conclusion and Recommendations

5.1. Conclusion

This study investigated the moderating effect of perceived utility on the relationship between the advertising mix and mobile app adoption in Egypt, an emerging market. The findings consistently demonstrate that the advertising mix significantly influences mobile app adoption, with perceived usefulness as a crucial moderator. Specifically, the study reveals that the effectiveness of advertising strategies in promoting adoption is enhanced when users perceive the mobile application as highly useful. This aligns with contemporary applications of the Unified Theory of Acceptance and Use of Technology (UTAUT) and the Technology Acceptance Model (TAM), which continue to underscore the paramount importance of perceived usefulness in technology acceptance across diverse contexts (Jiang and Lau, 2023; Dinh et al., 2025).

The research further highlights the unique opportunities and challenges in developing countries, where cultural preferences, economic constraints, and varying levels of digital literacy shapes consumer behaviour. Recent studies in emerging markets, including those in the Middle East and North Africa, corroborate that while digital advertising approaches must be meticulously tailored to local contexts to optimise perceived usefulness and drive adoption, traditional advertising channels such as television and radio often retain considerable influence (Barquin et al., 2022; Rodríguez-Espíndola et al., 2022). Consequently, the results suggest that marketers should prioritise communicating the pragmatic benefits of mobile applications, such as time-saving and cost-effectiveness, to elevate perceived utility and accelerate adoption rates in these dynamic environments (Lim et al., 2022).

Moreover, the report offers companies and legislators practical advice. To increase customer confidence and improve perceived value, regulatory authorities should demand openness in advertising techniques, support regional content, and tighten data privacy rules (Kotler & Keller, 2016; Venkatesh et al., 2012). Conversely, companies could use influencer marketing to improve user experience and provide incentives such as free trials to drive app acceptance (Rogers, 2003; Nielsen, 2012a).

By extending the UTAUT paradigm to incorporate the advertising mix as a predictor of technology adoption in developing countries, this study finally adds to the scholarly debate. It also offers valuable advice for legislators and marketers trying to increase the acceptance of mobile apps in such surroundings. Future studies may look at cross-cultural comparisons, the function of new technology, and how social media advertising affects uptake and perceived usefulness (Hofstede, 1980; Sheth, 2011)

5.2. Recommendations

The results of this study underline the vital part that perceived utility plays in controlling the link between mobile app uptake in developing countries like Egypt and the advertising mix. The digital ecosystem is powerfully shaped by regulatory agencies, which also help to guarantee that mobile applications provide real value to consumers and support fair and open advertising policies. Supported by pertinent scholarly material and pragmatic advice, the following are specific suggestions for regulatory authorities:

- a. **Enforce Transparency in Advertising Practices:** Clear, honest, and non-misleading information on the functioning, advantages, and possible constraints of mobile applications should be mandated by regulating authorities for app creators and marketers. Establishing rules requiring marketers to reveal essential characteristics, pricing strategies, and data usage policies will help them to comply. Such steps will improve users' perceived app usefulness, thus raising adoption rates (Davis, 1989; Venkatesh et al., 2012). In developing countries, where consumers may be more dubious of digital platforms owing to prior experiences with false promises, openness in advertising is especially important (Kotler & Keller, 2016).
- b. **Promote Localised Content and Solutions:** Emerging markets like Egypt often present special cultural, financial, and infrastructure issues. Regulatory authorities should encourage the creation of localised applications catering to the particular requirements of different markets. Applications tailored to local languages, payment systems and culturally specific needs tend to be perceived as more useful (Rogers, 2003). Policies supporting local developers and entrepreneurs help to boost creativity in this field even more. For instance, the success of mobile payment systems, as evidenced by Kenya's M-Pesa, illustrates the importance of aligning technology offerings with local context (El-Gohary, 2012).
- c. **Strengthen Data Privacy and Security Regulations:** Users' confidence in mobile applications is intimately related to perceived utility. Strong data privacy and security rules should be set by regulatory bodies to guard consumers' data. These cover giving apps explicit permission for data collecting, guaranteeing safe data storage, and giving consumers easily understandable privacy regulations (Zikmund et al., 2013). Such actions will improve apparent value and foster long-term confidence in digital environments. Emerging markets look to the European Union's General Data Protection Regulation (GDPR) as a model for adopting such systems (Venkatesh et al., 2012).
- d. **Encourage Digital Literacy Programs:** Many consumers in developing countries lack the digital literacy required to completely appreciate the value of mobile apps. Working with corporate sector players and academic institutions, regulatory agencies should start programs to raise digital literacy. These courses may teach consumers how to assess the value of applications, decipher advertising claims, and guard their online privacy (Ajzen, 1991). Through including technology in public services and education, the Indian government's Digital India initiative has been credited with improving nationwide digital literacy (World Bank, 2023a).
- e. **Monitor and Regulate In-App Purchases and Subscriptions:** Regulatory authorities should set rules for in-app purchases and subscription models to stop user discontent and supposed exploitation. This covers mandating applications to show clear information on expenses, cancellation rules, and the value proposition of premium tools (Kotler & Keller, 2016). Such rules guarantee that users view apps as fair and helpful, promoting greater adoption rates. Similar actions taken by the Federal Trade Commission (FTC) in the United States help to guard customers against misleading in-app purchase policies (Zikmund et al., 2013).
- f. **Foster Collaboration Between Stakeholders:** To produce a fair and user-centric digital environment, regulatory authorities should help cooperation between app developers, marketers, and consumer advocacy organisations. Frequent discussions and feedback systems help spot problems and guarantee that regulatory systems stay relevant and efficient (Rogers, 2003). For example, the cooperation between the Egyptian government and commercial technology firms has produced creative ideas like the "Digital Egypt" platform, which seeks to improve digital inclusion and adoption (World Bank, 2023a).

Following these suggestions would help regulatory authorities maximise the apparent value of mobile applications, increasing adoption rates and supporting the digital revolution of developing countries like Egypt.

The results of this study underline the vital part that perceived value plays in controlling the link between the advertising mix and mobile app acceptance in developing countries like Egypt. These observations lead to the following suggestions for companies hoping to increase the acceptance of mobile apps using efficient advertising campaigns:

- a. **Emphasise Perceived Utility in Advertising Campaigns:** Companies should create campaigns that effectively convey their mobile apps' usefulness and clear benefits. Emphasising time-saving, cost-effective, and navigational simplicity of use, for instance, can significantly increase apparent value (Davis, 1989; Venkatesh et al., 2012). Showcase in ads how the software addresses specific issues or enhances users' everyday life with case studies, quotes, or demos. This strategy could increase the apparent worth of the app among possible consumers (Kotler and Keller, 2016).
- b. **Tailor Advertising Mix to Local Preferences:** In developing countries like Egypt, consumer behaviour is shaped by cultural, socioeconomic, and economic elements. Companies should match their advertising mix (e.g., social media, TV, influencer marketing) to local tastes and consumption trends (Hofstede, 2011; Statista, 2023). Using well-known social media sites like Facebook and Instagram, which Egypt uses extensively, for example, can help advertising efforts to be more successful and reachable (Smith & Anderson, 2016).
- c. **Leverage Influencer Marketing and Word-of-Mouth:** Working with local opinion leaders and influencers helps make advertising messages more credible and relevant. Target consumers will find the app more enticing if influencers show its value in practical settings (Turban et al., 2018). Encourage happy consumers to spread their good experiences via internet evaluations or word-of-mouth, as, in developing countries, peer recommendations have great power (Rogers, 2003).
- d. **Optimise User Experience (UX) Design:** The software's usability and functionality determine perceived utility. Investing in user-friendly interfaces, simple navigation, and flawless performance can help companies guarantee a favourable user experience (Nielsen, 2012a). Perform frequent user testing and receive comments to find and solve problems so the app satisfies the needs and expectations of its target market (Zikmund et al., 2013).
- e. **Offer Incentives for Adoption:** Companies could provide discounts, free trials, or loyalty prizes to stimulate first adoption. These rewards help users to test the app by lowering their apparent risk (Kotler & Keller, 2016). Offering complimentary premium trials or price reductions can entice users and demonstrate the app's value proposition (Venkatesh et al., 2012).
- f. **Monitor and Adapt to Market Trends:** Emerging markets are dynamic and reflect fast-changing consumer tastes and technology developments. Companies should closely monitor consumer trends and modify advertising plans (World Bank, 2023b). Tracking the success of advertising campaigns and basing judgments on data analytics can help you to maximise the following initiatives (Zikmund et al., 2013).

Following these suggestions will help companies improve the apparent value of their mobile applications and increase the effect of their advertising mix on adoption rates in developing countries like Egypt.

The results of this study underline the critical role that perceived utility plays in controlling the link between mobile app uptake in developing countries like Egypt and the advertising mix. For customers, these realisations provide practical advice to guide their decisions on using mobile apps:

- a. **Evaluate Functional Relevance:** Users should consider whether the app tools fit their requirements. Consider whether a financial-management app simplifies budgeting, expense tracking and personal financial planning. When the app's capabilities immediately solve the user's problems, perceived value is much higher (Davis, 1989; Venkatesh et al., 2012).
- b. **Prioritise Ease of Use:** The study underlines the relevance of usability in boosting perceived utility. Customers are urged to pick programs with low learning curves, easy navigation, and simple UI.

Regardless of the degree of promotional activities, apps that demand too much time or effort to grasp are less likely to be accepted (Nielsen, 2012b; Rogers, 2003).

- c. **Seek Tangible Benefits:** Although advertising primarily stresses applications' emotional or aspirational attractiveness, customers should pay more attention to real advantages. A shopping app should provide benefits such as discounts, quick delivery, or an extensive product line. These valuable features significantly increase apparent value and stimulate acceptance (Sheth, 2011; Kotler & Keller, 2016).
- d. **Leverage Social Proof:** In developing markets, perceived utility is much shaped by word-of-mouth and peer recommendations. Before starting an app, consumers should give evaluations, ratings, and quotes from reliable sources some thought. Social proof helps to confirm the app's value and lower the apparent adoption risks (Ajzen, 1991; Statista, 2023).
- e. **Be Cautious of Over-Advertising:** Although advertising can raise awareness, too aggressive or invasive advertising could inspire mistrust. Consumers should cross-check the assertions stated in ads with independent evaluations or app trial runs to be sure they hold. This strategy guarantees that judgments on adoption are grounded in actual value instead of merely compelling advertising itself (Sheth, 2011; Kotler & Keller, 2016).
- f. **Consider Cultural Fit:** Cultural significance strongly influences apparent value in markets like Egypt. Consumers should choose apps honouring regional cultures, linguistic preferences, and social mores. In this environment, national culture dimensions shape users' receptivity to new technologies (Hofstede, 1980, as cited in Sheth, 2011, p. 174).
- g. **Test Before Committing:** Several programs provide limited-feature versions or free trials. Consumers should seize these chances to evaluate the app's value before committing themselves in the long run. This practical knowledge helps one grasp the app's value proposition (Davis, 1989; Venkatesh et al., 2012).

Following these suggestions helps customers in developing countries make better judgments and guarantees that their adoption of mobile apps is motivated by actual value instead of outside pressures like advertising.

6. Directions of further research

Particularly in developing countries, the results of this study open many directions for future studies on the acceptance of mobile apps. Supported by in-text references to pertinent material, these are the leading suggestions for the subsequent research:

- a. **Cross-Cultural Comparisons:** Future studies could investigate the moderating function of perceived utility in other emerging economies, including India, Brazil, or South Africa, to ascertain if cultural variations influence the link between advertising mix and app uptake (Hofstede, 1980; Sheth, 2011). Comparative research might offer a more thorough understanding of how cultural aspects such as individualism versus collectivism shape consumer impressions of utility.
- b. **Longitudinal Studies:** Although this study offers a snapshot of mobile app adoption in Egypt, longitudinal research might examine how perceived usefulness changes over time as users get more experienced with applications (Venkatesh et al., 2012). Research may also investigate how long-term adoption rates are affected by variations in advertising approaches.
- c. **Role of Emerging Technologies:** Future research could examine how perceived usefulness and uptake are influenced by newly developing technologies such as augmented reality (AR) and artificial intelligence (AI). How, for instance, might tailored recommendations driven by artificial intelligence improve the apparent value of shopping apps? (Zhou, 2011; Zhang et al., 2012).
- d. **Impact of Social Media Advertising:** Although this study concentrates on the conventional advertising mix, other studies should investigate how social media advertising influences perceived utility and adoption. Emerging economies are seeing more and more influence from platforms like Instagram and TikTok, which affect customer behaviour, therefore, demand further research (Wang & Sun, 2010).
- e. **Behavioural Segmentation:** Future research might divide customers based on behavioural and psychographic elements, like tech-savviness or risk aversion, to see how these characteristics interact with perceived utility and advertising efficacy (Rogers, 2003; Yousafzai et al., 2003).

- f. Quantitative and Qualitative Approaches: Combining quantitative polls with qualitative techniques like focus groups or interviews would help to offer a more complex knowledge of the elements influencing perceived value. Qualitative insights, for example, could highlight why some advertising messages appeal more strongly to particular consumer groups (Davis, 1989; Nielsen, 2012b).
- g. Regulatory and Ethical Considerations: Future studies should investigate how ethical issues, including data privacy and legal frameworks, affect apparent value and acceptance. For instance, how would customers in developing countries see the trade-off between usefulness and privacy by utilising mobile apps? (Kotler & Keller, 2016).

By filling these gaps, the following research projects can expand on this work's results and help provide a more complete knowledge of mobile app acceptance in developing nations.

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