УДК 004.4

Abdulla Najwan Sabeh AL-Muwassefi,
Student,
Department of Big Data Analytics and Video Analysis Methods,
Engineering School of Information Technologies,
Telecommunications and Control Systems,
Ural Federal University
Yekaterinburg, Russian Federation

DESIGN A MOBILE E-COMMERCE APPLICATION AND INVESTIGATING USERS' BEHAVIORAL INTENTION TO USE IT IN IRAQ

Abstract:
Technological utilization and applications have become inevitable, particularly with the worldwide movement restrictions (following the COVID-19 pandemic) that compelled digitized platform usage compared to physical settings for minimal health risks. This study intends to recommend the newly-designed Best Deal application (mobile shopping application) that enabled easy consumer access to information on discounted items and a complete shopping process. The aforementioned application would prove advantageous to many consumers, specifically with the COVID-19 restrictions that compelled most users to utilize technology for making purchases. In this vein, this study highlighted the necessity to develop the Best Deal mobile shopping application and investigate behavioral intention indicators among Iraqi consumers backed by the Unified Theory of Acceptance and Use of Technology (UTAUT 2). With 194 respondents data assessed with partial least squares structural equation modelling (PLS-SEM), results of the study are presented. The study makes contributions to both theory and practice.

Keywords:
UTAUT 2, PLS-SEM, Mobile E-Commerce, Software Engineering, Iraq.

Introduction

The utilization of advanced technologies is no longer a novel phenomenon for daily activities [1]. Specifically, mobile devices have extensively influenced daily routines over the last 20 years. Notably, the number of Iraqi smartphone users was predicted to reach 36.1 million by 2025 [2], and mobile internet users (approximately 24.8 million in 2020) were forecasted to reach 38.1 million users by 2025 [2]. In this regard, Iraqi technopreneurs and the retail sector have come to acknowledge mobile technology potentials and develop mobile application for close consumer interactions. Mobile shopping application demonstrated multiple user benefits that enabled product browsing and purchasing through mobile devices at any given time or location [3]. Mobile applications implied external software installable on mobile devices [4]. Consumers could install various mobile application types offered by external providers [5]. Mobile device roles were broadened to facilitate high user demands through mobile applications [6].

The present study aimed to develop a novel mobile shopping application ("Best Deal") to provide Iraqi users with easy, beneficial, and accessible means of obtaining various discounted product knowledge and facilitating online shopping completion.

It is crucial to investigate which factors foster the users' intention to use the newly designed application. This study adopted the UTAUT 2 model and extended it with the personal innovativeness factor to investigate the Iraqi users' behavioral intention to use the Best Deal mobile shopping application [7]. Researchers have not previously addressed the factors that affect the behavioral intention to use the mobile shopping applications, especially in Iraq. This study addressed this literature gap by investigating the relationship between seven independent variables (PE, EE, SI, FC,

HM, PV, and PI) and the dependent variable (BI) of this study model. The result will be valuable in filling the literature gap, and in future studies of similar applications, especially in Iraq and Middle East countries.

Best Deal Mobile Shopping Application

The Best Deal mobile shopping application was designed by utilizing various programs such as the Dart programming languages, Flutter, and Visual Studio. Examples of Best Deal mobile shopping application pages are seen in Figures 1 and 2.

Theoretical Background

UTAUT 2 Model

Venkatesh et al. expanded the unified theory of acceptance and use of technology (UTAUT) model to UTAUT 2 [7]. They reported that the UTAUT 2 model had outperformed other technology acceptance models/theories such as technology acceptance model (TAM), theory of planned behavior (TPB), and UTAUT [7].

Therefore, the UTAUT 2 model may be used to assess the factors that impact the behavioral intention to use the Best Deal mobile shopping application in Iraq and the UTAUT 2 model is employed as the foundation of the current study proposed research framework.

Research Model and Hypothesis

A research framework signifies the nature and direction of the relationships between the variables in the study which is justified by an underlying theory [8]. The extension of the UTAUT 2 model is used as the underlying theory to support the current study. Based on the review of literatures concerning the study variables on performance expectancy (PE), effort expectancy (EE), social influence (SI), facilitating conditions (FC), hedonic motivation (HM), price value (PV), personal innovativeness (PI) and behavioral intention (BI), the current study research framework is developed (Fig. 3). Table 1 presents the definitions of the current study research variables.
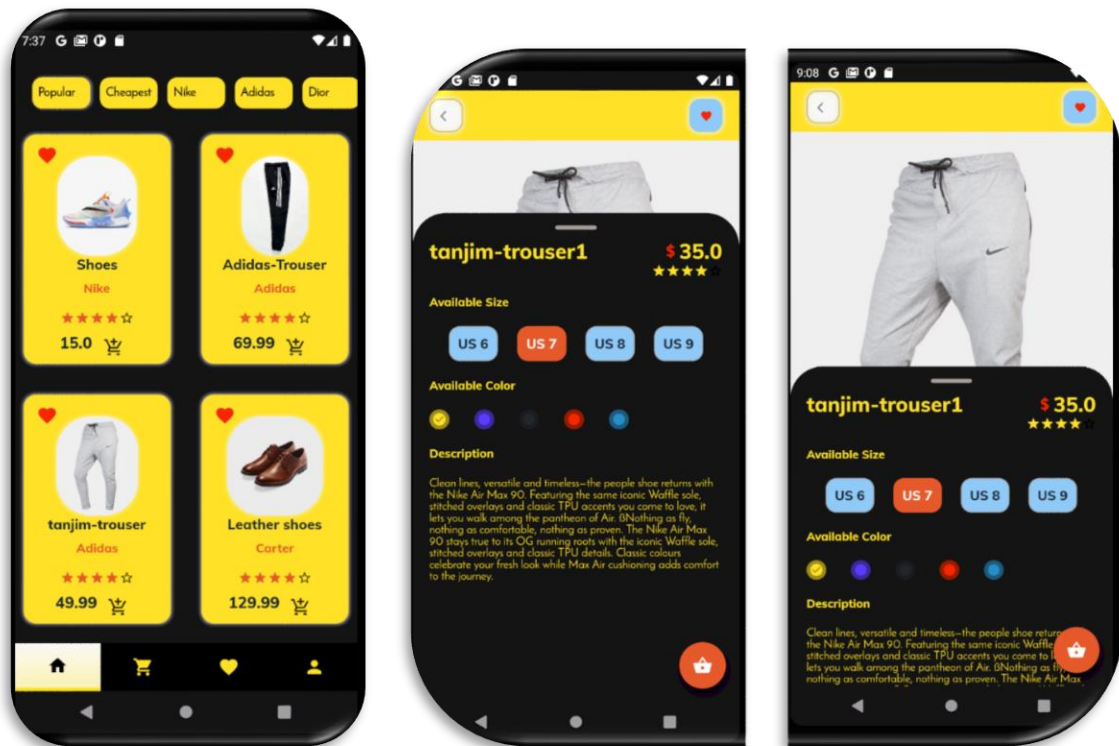

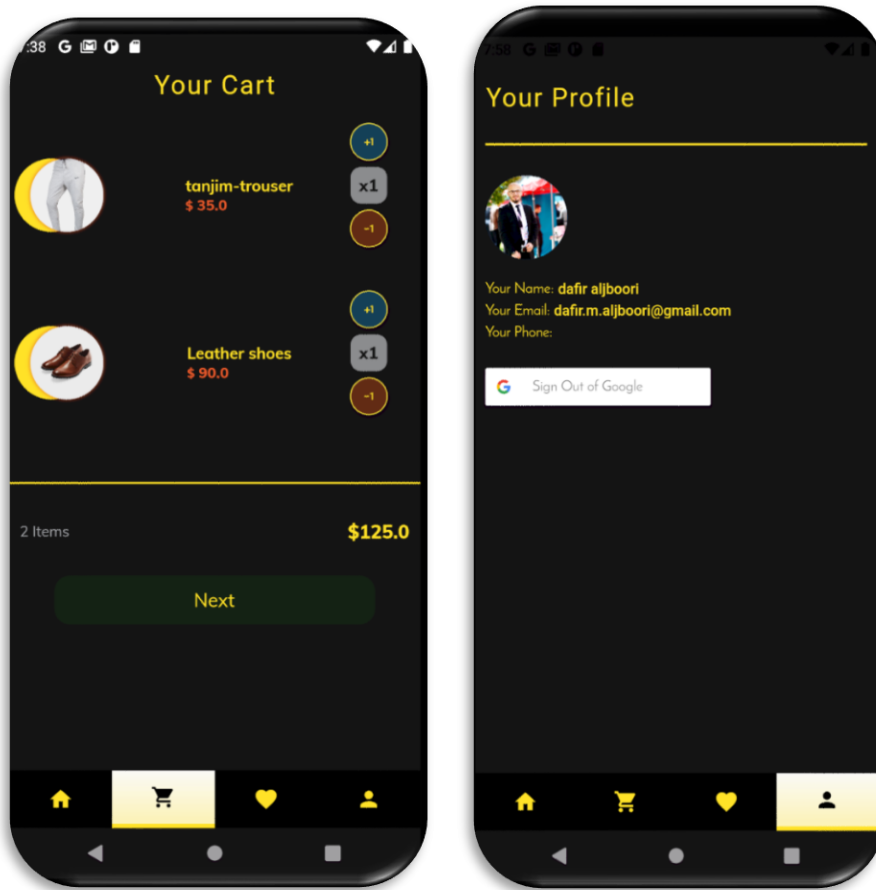Figure 1 - Home and product details pages
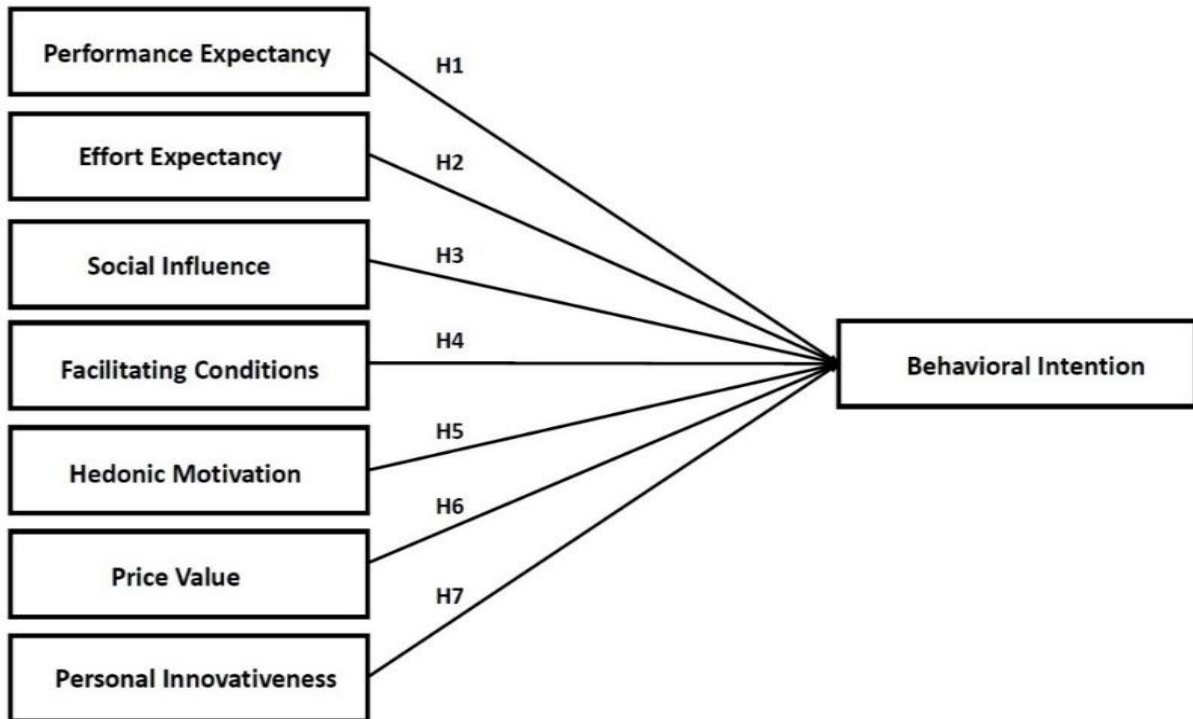
Figure 2 - Cart and profile pages

Figure 3 – Research framework

Table 1 – Definitions of the Research Variables

Variable	Definition
PE	The degree to which using the Best Deal mobile shopping application will provide benefits to consumers in performing certain activities [7].
EE	The degree of ease associated with consumers' use of the Best Deal mobile shopping application [7].
SI	The extent to which consumers perceive that important others (e.g., family and friends) believe they should use the best deal mobile shopping application [7].
FC	Refer to consumers' perceptions of the resources and support available to perform a behavior [7].
HM	The fun or pleasure derived from using the Best Deal mobile shopping application [7].
PV	Consumers' cognitive tradeoff between the perceived benefits of the Best Deal mobile shopping application and the monetary cost for using it [7].
PI	The willingness of the user to try out the newly designed application " Best Deal mobile shopping application" [9].
BI	The users' perceived intention to use the Best Deal mobile shopping application [7].

Research Method

This research encompassed a correlational study with a survey method for hypothesis-testing. Specifically, correlational research sought to assess the hypothetical links developed from the study model [8]. This study is employed a quantitative research method. Online surveys were employed in the data-gathering procedure for all research variable responses and 194 validated responses were collected.

The online survey is divided into two sections. Section A measures performance expectancy, effort expectancy, social influence, facilitating conditions, hedonic motivation, price value, personal innovativeness, and behavioural intention, while Section B seeks the personal particulars of the respondents for the purpose of demographic information and general questions analysis. Previously validated scales were used to measure the variables of the current study. The measurement for research variables was measured with a 7-point Likert scale, ranging from 1 (strongly disagree) to 7 (strongly agree).

Results and Discussion

A descriptive analysis was performed on 194 responses with Statistical Package for Social Sciences Software (SPSS) version 22. The results revealed that most respondents were females (61.3%) with the highest respondent age ranging from 21 to 29 years old (47.9%). Concerning marital status, most respondents were single (41.8%) and Bachelor's Degree holders (39.7%). Most respondents (37.1%) spent between 3 and 4 hours daily in internet. Lastly, 38.7% indicated using internet over seven years.

As part of the PLS-SEM analysis, the measurement model was assessed first followed by the structural model.

Validity and reliability measurements could be evaluated through the SmartPLS software using the PLS algorithm for factor loadings, path coefficients, coefficient of determination, model validity, and reliability measures. Validity denoted the degree to which an instrument truly assessed the notion, whereas reliability implied the instrument stability and consistency in concept measurement [8]. Table 2 highlights the measurement model outcomes.

The significance of the structural paths was evaluated by examining the path coefficients and the t values. To test the hypothesis, the PLS algorithm and bootstrapping were carried out. The path coefficients and R^2 were gained from the PLS algorithm while the t values were gained from the bootstrapping. Figure 4 shows the t values for each individual path.

The bootstrapping was run based on 5,000 resamples as recommended by researchers [11]. A total of 7 hypotheses were tested. Table 3 illustrates the path coefficients, standard errors, R^2 values, and the results of the hypotheses testing between the PE, EE, SI, FC, HM, PV, PI and BI. The R^2 was measured from the structural model. According to Cohen's rule of thumb, R^2 of 2% is considered

small, R^2 of 13% is considered medium and R^2 of 26% is considered large [12]. The R^2 for BI is 0.663 meaning that 66.3% of the variance in BI was explained by PE, EE, SI, FC, HM, PV, and PI.

Table 2 - Measurement Model Results

Constructs	Items	Loadings	AVE	Composite Reliability
Behavioral Intention	BI1	0.885	0.791	0.919
	BI2	0.899		
	BI3	0.884		
Effort Expectancy	EE1	0.811	0.747	0.922
	EE2	0.897		
	EE3	0.849		
	EE4	0.896		
Facilitating Conditions	FC1	0.898	0.866	0.951
	FC2	0.945		
	FC3	0.949		
Hedonic Motivation	HM1	0.875	0.786	0.917
	HM2	0.884		
	HM3	0.900		
Performance Expectancy	PE1	0.876	0.726	0.888
	PE2	0.800		

By observing each individual structural path, PE ($\beta = 0.252$, $p < 0.001$), EE ($\beta = 0.241$, $p < 0.001$), FC ($\beta = 0.144$, $p < 0.05$), PV ($\beta = 0.211$, $p < 0.01$), and PI ($\beta = 0.193$, $p < 0.01$) were found to have a significant positive relationship with BI. Therefore, H1, H2, H4, H6, and H7 were supported. Meanwhile, SI ($\beta = -0.088$, $p > 0.05$) and HM ($\beta = 0.022$, $p > 0.05$) were not found to be significantly related to BI. Therefore, H3, and H5 were not supported.
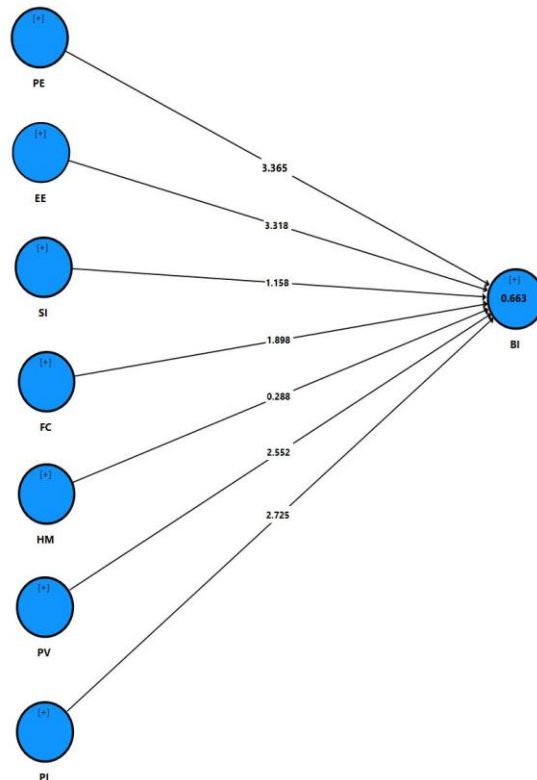

Figure 4 - Structural model of the research framework with *t* values

Table 03 –Path coefficients

H	Relationships	Beta	Std Error	t value	R^2	Decision
H1	PE → BI	0.252	0.075	3.365***		Supported
H2	EE →BI	0.241	0.072	3.318***	0.663	Supported
H3	SI → BI	-0.088	0.076	1.158		Not Supported
H4	FC → BI	0.144	0.076	1.898*		Supported
H5	HM → BI	0.022	0.078	0.288		Not Supported
H6	PV → BI	0.211	0.083	2.552**		Supported
H7	PI → BI	0.193	0.071	2.725**		Supported

Note.
$p < 0.05$*, $p < 0.01$**, $p < 0.001$***
BI= Behavioral Intention; SI= Social Influence; PV= Price Value;
PE= Performance Expectancy; FC= Facilitating Conditions; PI= Personal Innovativeness;
EE= Effort Expectancy; HM= Hedonic Motivation.

The results demonstrate that PE, EE, FC, PV, and PI have a significant positive relationship with BI. Conversely, this study revealed that SI and HM do not have a significant relationship with BI. Therefore, the results prove that the proposed research framework is effective in explaining contributing factors affecting the behavioral intention to use the Best Deal mobile shopping application.

Conclusion
From a theoretical contribution perspective, this research has enhanced the literature on the behavioral intention by integrating several determinants of behavioral intention into one holistic research model. Hence, this study has contributed empirical support in applying the UTAUT 2 model, addressing the need to extend it. Studies have highlighted that it is vital to examine personal innovativeness as an impacting factor under the new technology system [13]. Based on previous studies, the present study has extended the UTAUT 2 model by incorporating personal innovativeness to create a comprehensive research framework to analyze the behavioral intention to use the Best Deal mobile shopping application among Iraqi users [7],[13].

References:
1. M. Z. Islam, P. K. C. Low, and I. Hasan. Intention to use advanced mobile phone services (AMPS). Management Decision, vol. 51, no. 4, pp. 824–838, 2013.
2. Statista, Number of smartphone users in Iraq from 2010 to 2025, 2020.
3. C. Kim, W. Li, and D. J. Kim. An Empirical Analysis of Factors Influencing M-Shopping Use. International Journal of Human-Computer Interaction, vol. 31, no. 12, pp. 974–994, 2015.
4. E. Grøtnes. Standardization as open innovation: Two cases from the mobile industry. Information Technology and People, vol. 22, no. 4, pp. 367–381, 2009.
5. M. R. Islam, M. R. Islam, and T. A. Mazumder. Mobile application and its global impact. International Journal of Engineering & Technology, vol. 10, no. 6, 2010.
6. S. C. Kim, D. Yoon, and E. K. Han. Antecedents of mobile app usage among smartphone users. Journal of Marketing Communications, vol. 22, no. 6, pp. 653–670, 2014.
7. V. Venkatesh, J. Y. L. Thong, and X. Xu. Consumer acceptance and use of information technology: Extending the unified theory of acceptance and use of technology. MIS Quarter, vol. 36, no. 1, pp. 157–178, 2012.
8. U. Sekaran and R. Bougie. Research methods for business: A skill-building approach. John Wiley & Sons Ltd., 2016.
9. R. Agarwal and J. Prasad. A conceptual and operational definition of personal innovativeness in the domain of information technology. Information Systems Research, vol. 9, no. 2, pp. 204–215, 1998.

10. M. Soni, K. Jain, and B. Kumar. Factors affecting the adoption of fashion mobile shopping applications. Journal of Global Fashion Marketing, vol. 10, no. 4, pp. 358–376, 2019.

11. J. F. Hair, G. T. M. Hult, C. M. Ringle, and M. Sarstedt. A primer on partial least squares structural equation modeling (PLS-SEM). SAGE, 2014.

12. J. Cohen. Statistical power analysis for the behavioral sciences, Second. Routledge, 1988.

13. T. Natarajan, S. A. Balasubramanian, and D. L. Kasilingam. The moderating role of device type and age of users on the intention to use mobile shopping applications. Technology in Society, vol. 53, pp. 79–90, 2018.