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User Acceptance of the Libyan Mobile Shopping App Baahy: A UTAUT Study

Shahed Al-Sanousi Muhammad [1], Mohammed Salhoub [1], Asiel Hilal Abdulrasul [1], Sadam A Almgron [1], and Monther M. Elaish [1,]*

[3] *Computer Science, University of Benghazi, Benghazi, Libya.*

Corresponding author E-mail: *monther.elaish@uob.edu.ly*[*]

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ABSTRACT

Libya's m-commerce is advancing rapidly; yet, there is limited knowledge regarding the public's perception of purchasing applications such as Baahy. This research employs the Unified Theory of Acceptance and Use of Technology (UTAUT) to evaluate user acceptance of Baahy, a mobile shopping application in Libya. Instead of random selection, researchers chose 67 active users who filled out a reliable survey translated into Arabic. The questionnaire assessed performance expectancy (PE), effort expectancy (EE), social influence (SI), facilitating conditions (FC), behavioural intention (BI), and usage behaviour (UB). Cronbach's α values varied from 0.737 to 0.827, and the average variance extracted (AVE) surpassed 0.50, thereby affirming reliability and construct validity. The Pearson correlations analysis showed that PE was the strongest predictor of BI ($r = 0.71$, $p < .001$) and also had a direct effect on UB ($r = 0.65$, $p < .001$). BI completely mediated the effects of all other UTAUT constructs on UB ($r = 0.79$, $p < .001$). To deal with problems with local infrastructure and security, practical suggestions include using AI-powered customer support (which targets SI) and trust-mark certifications (which target FC). In general, the study shows that UTAUT

can be used in developing economies and gives useful information to people who work in mobile commerce.

قبول المستخدمين لتطبيق التسوق الليبي عبر الهاتف المحمول "Baahy": دراسة باستخدام نموذج UTAUT

شهد السنوسي[1]، محمد صلهوب[1]، اصيل هلال، صدام المقرون[1]، منذر العيش[1]

[1] علم الحاسوب، جامعة بنغازي، بنغازي، ليبيا

الـمُخلص

يشهد قطاع التجارة الإلكترونية عبر الهاتف المحمول في ليبيا نموًا متسارعًا، إلا أن المعرفة المتاحة حول تصورات المستخدمين تجاه تطبيقات التسوق، مثل تطبيق "Baahy"، لا تزال محدودة. تهتدف هذه الدراسة إلى استخدام النظرية الموحدة لقبول واستخدام التكنولوجيا (UTAUT) لتقييم مدى تقبّل المستخدمين لتطبيق "Baahy"، وهو تطبيق ليبي للتسوق عبر الهاتف المحمول. بدلًا من العينة العشوائية، اعتمد الباحثون على عينة قصدية مكونة من 67 مستخدمًا نشطًا للتطبيق، قاموا بتعبئة استبيان موثوق ومترجم إلى اللغة العربية. شمل الاستبيان: توقعات الأداء (PE)، وتوقعات الجهد (EE)، والتأثير الاجتماعي (SI)، والظروف الميسرة (FC)، والنية السلوكية (BI)، وسلوك الاستخدام الفعلي (UB). تراوحت قيم معامل ألفا لكرونباخ بين 0.737 و0.827 كما تجاوز متوسط التباين المستخرج (AVE) قيمة 0.50، مما يؤكد تمتع أداة الدراسة بدرجة جيدة من الثبات والصدق البنائي. وأظهر تحليل ارتباط بيرسون أن توقعات الأداء كانت أقوى العوامل المرتبطة بالنية السلوكية ($r = 0.71$، $p < 0.001$)، كما ارتبطت بصورة مباشرة بسلوك الاستخدام ($r = 0.65$، $p < 0.001$). كذلك، أظهرت النتائج وجود ارتباط قوي بين النية السلوكية وسلوك الاستخدام ($r = 0>79$، $p < 0.001$). ولمواجهة التحديات المرتبطة بالبنية التحتية ومخاوف الأمن في البيئة الليبية، تقترح الدراسة مجموعة من النطبيقات العملية، مثل استخدام دعم العملاء المدعوم بالذكاء الاصطناعي لتعزيز التاثير الاجتماعي، وإظهار شارات الثقة والشهادات الأمنية لتحسين الظروف الميسرة وتعزيز ثقة المستخدمين. بشكل عام، تُظهر الدراسة إمكانية استخدام UTAUT في الاقتصادات النامية، كما تُقدم مؤشرات علمية يمكن أن تساعد مطوري التطبيقات وصناع القرار في تحسين تجربة المستخدم وزيادة معدلات الاستخدام..

الكلمات المفتاحية: النية السلوكية، ليبيا، التجارة عبر الهاتف المحمول، قبول التكنولوجيا، نموذج ***UTAUT***

1 Introduction

E-commerce is the act of buying and selling goods and services online through web-based platforms that let people do business all over the world (Grandon & Pearson, 2004). The COVID-19 pandemic sped up digital commerce around the world even more (Luo et al., 2023). This shows how important it is to study what makes people in different places adopt new technologies. Consequently, numerous companies have migrated to e-commerce, altering the economic and business landscapes across all industry sectors. Information technology and web-based platforms have made this change possible by making it easier for businesses to work together and do business around the world (Jain et al., 2021). Like other developing countries, Libya can benefit from e-commerce by increasing revenues and opening its companies to the global market (Central Bank of Libya, 2025). Atkinson et al. (2014) observe that "With m-commerce being a subset of e-commerce, it permits transactions to be performed from anywhere and at any time using mobile devices over a wireless telecommunication network".

In the field of information systems, many acceptance models have been developed and used to measure user acceptance in various contexts. The Unified Theory of Acceptance and Use of Technology (UTAUT) has demonstrated its effectiveness in assessing the impact of technology (Venkatesh et al., 2003), particularly in the acceptance of mobile applications (Samartha et al., 2022). Recently, many studies have been conducted on the use of m-commerce in Libya (Dagnoush & G. S. Khalifa, 2021b); no study has used UTAUT to assess acceptance of the Baahy application. This study aims to apply the UTAUT model to investigate user acceptance of the Baahy mobile application.

Mobile commerce (m-commerce), defined as the buying and selling of goods and services via mobile devices, such as smartphones and tablets, has become increasingly widespread (Wasiq et al., 2022). Commercial transactions conducted via mobile devices, propelled by widespread technology adoption and the expanding wireless Internet connectivity, have become ubiquitous in this Silicon Age (Alaskar & Alsadi, 2023). According to the 2022 m-commerce Report, global m-commerce sales are projected to reach $4.5 trillion by 2024, accounting for more than half (69.9%) of all e-commerce transactions (*Mcommerce*). There are a few things that have helped m-commerce grow, such as how easy it is to get to mobile devices, how easy it is to buy things on the go, and how many mobile payment options are available. Also, improvements in mobile technology have made it possible to make mobile apps and mobile-optimised websites, which make shopping easier for users (Yaqub et al., 2024).

M-commerce has quickly become a major way for people to buy and sell things online around the world. This is mostly because there are so many mobile users (*Mcommerce*). Along with the technological aspects of m-commerce adoption, social influence, perceived ease of use, perceived usefulness, and perceived trust also shape the guidelines for m-commerce acceptance, as emphasised by Yaqub et al. (2024) research. The rapid growth of mobile purchasing processes for goods and services (Baima et al., 2022) is due to the widespread use of smartphones for more than just social networking. M-commerce is growing quickly in developed countries, but it is limited in developing areas because people don't know about it and are worried about it (Ciupac-Ulici et al., 2022).

During the COVID-19 outbreak, people in developing countries changed how they shopped, including using m-commerce more often (Rakshit et al., 2021). As work has largely shifted from physical to virtual spaces, which has led to widespread online purchasing of goods and services, it is unlikely that this trend will become a fad (Sheth, 2020). As m-commerce keeps growing quickly, researchers and businesspeople need to know what social and psychological factors are driving it so they can come up with good ways to get people to use it and spread it (Yaqub et al., 2024).

The rise of m-commerce presents promising prospects for retailers globally, including in developing nations (Rakshit et al., 2021). It can be very hard to take advantage of these chances if the conditions are not right, both socially and psychologically. Despite extensive research employing diffusion of innovations (DOI), technology acceptance model (TAM), technology organisational environment (TOE), and unified theory of technology acceptance and use (UTAUT) to investigate the socio-psychological determinants of m-commerce adoption and diffusion, a cohesive and comprehensive explanation continues to be unattainable (Yaqub et al., 2024).

Though m-commerce reaches fewer people in developing nations compared to developed ones, that gap highlights unseen hurdles standing in the way (Ciupac-Ulici et al., 2022; Hu et al., 2008). Without readiness from buyers or sellers, progress often stalls unexpectedly across those areas (Ashraf et al., 2017). Even as m-commerce grows fast in Libya, how locals feel about apps like Baahy stays unclear. What shapes their choice to use the app gets explored here through an adaptation of the UTAUT model.

2 Related Work

A. Global m-commerce trends

Mobile phones are no longer used only for communication purposes; they have become a vital tool for purchasing products, managing financial transactions, and accessing services anytime and anywhere (Grewal et al., 2016). Previous research by (Omar et al., 2021) shows that m-commerce continues to grow rapidly, with increasing sales and user adoption each year. Through shopping applications, mobile advertising, and on-demand customer services, the way

people interact with markets has changed significantly. However, this rapid development also creates challenges, as businesses need to better understand changing user behaviour and adapt to new market dynamics. Despite this progress, identifying the key factors that influence user adoption remains a major challenge (Ameziane, 2024).

At the same time, concerns about security and privacy continue to affect users' willingness to adopt m-commerce. Stocchi et al. (2022) highlighted that many users hesitate to use m-commerce services due to fears related to personal and financial information. Therefore, there is a need for more studies, both conceptual and empirical, to better understand how these applications perform beyond routine transactions. In addition, the increasing use of digital platforms reveals gaps in how applications engage users, communicate value, and support meaningful interaction, which may limit their effectiveness and user acceptance.

B. Global m-commerce trends

In general, according to Ihnissi and Klaib (2021), E-commerce (which of m-commerce is a part) in Libya faces a wide range of challenges that must be addressed, and the country is falling behind in the global race to adopt emerging technologies. Moreover, the COVID-19 pandemic has highlighted the specific obstacles that developing nations such as Libya encounter when trying to grow their e-commerce sector. E-commerce in Libya cannot grow until several key challenges are addressed. These include the absence of effective policies and regulations; limited banking services for online transactions such as credit cards; weak infrastructure and technical shortcomings; cybersecurity vulnerabilities; and persistent trust issues. Furthermore, there is a shortage of foundational IT skills and limited awareness of the e-commerce potential advantages.

In the Arab region, there are several challenges for adopt m-commerce which is mobile broadband infrastructure. Additionally, Libya ranks sixteenth out of twenty-two Arab countries on the 2024 Infrastructure Index with a score of 12.8 (Ameziane, 2024). In the Libyan context, most people access the internet via mobile devices, which has led to increased m-commerce usage (Dagnoush & G. S. Khalifa, 2021a). However, research on m-commerce adoption and usage in Libya remains limited. In Libya itself, El-fitouri (2015) is the sole UTAUT-based study, examining technology impact and use in domestic companies. Board Arab context research includes (e.g. Alsharif, 2013; Tarhini et al., 2019).

C. UTAUT in m-commerce

The UTAUT model comprises four constructs: Performance Expectancy (PE), Effort Expectancy (EE), Social Influence (SI), and Facilitating Conditions (FCs). PE refers to the degree to which consumers believe that using a technology will help them achieve performance gains. EE denotes the perceived ease associated with using the technology. SI captures how much people care about the opinions of those around them (friends, supervisors, or family) when deciding to use a new technology. FCs describe whether someone feels they have the right support and resources such as access to hardware, training programs, and technical assistance to make using that technology smooth and reliable (Venkatesh et al., 2003).

Venkatesh et al. (2007) argued that understanding how individual accept and use information technology is one of the most research topics in the information system domain. Previous studies on m-commerce conducted between 2007 and 2018, in different contexts such as mobile banking, online ticketing, and mobile payment, demonstrated that constructs from the UTAUT model contribute significantly to users' Behavioural Intention (BI) to adopt and use m-commerce and its applications (Imtiaz, 2018).

Barry and Haque (2024) found that PE and Trust both significantly predict Malaysian m-commerce adoption, with PE emerging as a stronger driver. Lee et al. (2019) extended the UTAUT model by incorporating a Privacy Risk construct in South Korea and demonstrated that heightened privacy concerns negatively impact users' BI, particularly among female customers.

The study of Kamal and Subriadi (2021) found that more than 80 percent of mobile-shopping studies rely solely on the four original UTAUT factors. By contrast, UTAUT2 (Venkatesh et al., 2012) extensions and other outside variables appear only sporadically. That pattern suggests the original four constructs already capture the key drivers of mobile-shopping adoption, so there's no need to pile on extra factors by default.

3 Method

A. The UTAUT model

In 2003, Venkatesh and his colleagues introduced the Unified Theory of Acceptance and Use of Technology (UTAUT) by integrating eight established models of technology acceptance: the Theory of Reasoned Action, the Theory of Planned Behaviour, the Technology Acceptance Model, the Motivational Model, the Model of Personal Computer Utilization, the combined TPB–TAM framework, Social Cognitive Theory, and the Diffusion of Innovation Theory. To boost its ability to predict user behaviour, they also tested four moderating factors: age, gender, experience, and voluntariness of use. As shown in Fig. 1, UTAUT identifies four core constructs: performance expectancy, effort expectancy, social influence, and facilitating conditions that directly shape behavioural intentions, which in turn determine actual usage. The strength of these relationships varies depending on the user's age, gender, prior experience, and whether use is voluntary.

To ensure translation accuracy, we conducted a two-round expert panel review during the Arabic-English back translation process (Sousa & Rojjanasrirat, 2011).

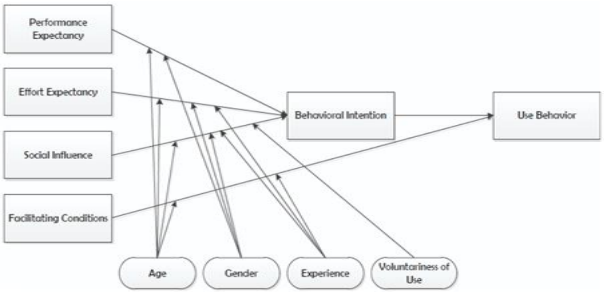

Fig. 1: UTAUT Model

B. Instruments

The questionnaire served as the measurement tool and comprised two section. The first section addressed the model's moderates (age, gender, experience, voluntariness of use) along with additional items related to online behaviour (internet usage, electronic payment experience). The second section contained items for the four UTAUT constructs (24 items), adopted from (Venkatesh et al., 2003).

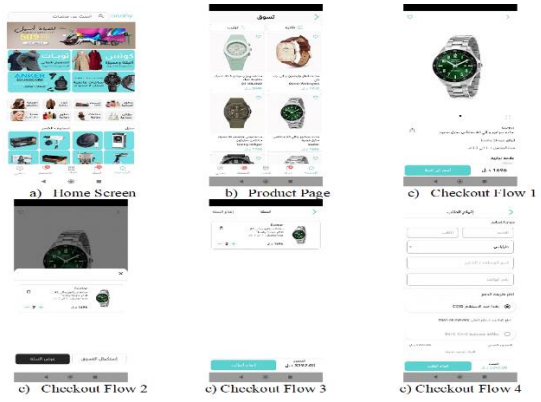

Fig. 2: Annotated Screenshots of the Baahy Mobile Application

Items per construct: PE (6), EE (7), SI (5), FC (3), BI (3). A 5-point Likert scale was employed, with specialists' responses ranging from 1 (strongly disagree) to 5 (strongly agree). Participants received a 10-minute guided tutorial on Baahy features, followed by 5 minutes of free exploration. After verifying familiarity, they completed the questionnaire. To illustrate the application interface and participant interaction, Fig. 2 presents annotated screenshots of the Baahy mobile app, highlighting the home screen, product page, and checkout flow.

C. Respondent demographics and online usage

More than 70% of participants hold at least a first degree. Only 23 of the 67 respondents have less than 3 years of experience; the remaining 44 have three or more years. Nearly all participants (65 of 67) expressed a desire to learn about the internet. Although 37 know about electronic payment cards, 13 are completely unaware of them, 50 out of 67 have never made an online payment, illustrating limited adoption of this technology in Libya.

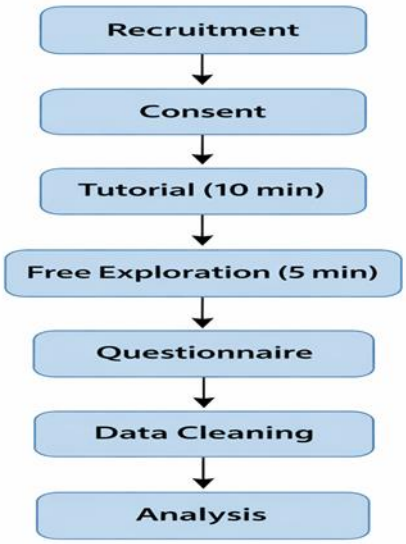

Fig. 3: Flowchart of the Data-Collection Procedure

Conversely, 32 participants have completed an online payment, sometimes with assistance. More than half (36 of 67) have used other online shopping applications. Even though participants use them a lot, most (60 of 67) think electronic payments are helpful, and 40 of 67 say they feel unsafe when they do business online. Table 1 shows the descriptive details of the participants who took this survey. To clarify the study workflow, Fig. 3 summarises the sequential data-collection procedure, from recruitment and consent through tutorial, exploration, questionnaire, data cleaning, and analysis.

D. Data analysis

Data were analysed in IBM SPSS v26. We report means, standard deviations (SD), standard errors (SE), and 95% confidence intervals (CI) for all items and constructs. Reliability was assessed with Cronbach's alpha and composite reliability (CR); convergent validity is reported as AVE. Construct structure was checked with EFA and, where sample size allowed, CFA with fit indices (χ^2/df, CFI, TLI, RMSEA [90% CI], SRMR). Correlations use Pearson r with 95% CIs; effect sizes (Cohen's d or partial η^2) are reported for comparisons. Normality was checked with the Shapiro–Wilk and Levene's test; nonparametric alternatives were used when assumptions failed. Missing data handling and any sensitivity checks are described in Results. This study

did not use algorithms or machine learning models, so metrics like confusion matrices, accuracy, precision, or recall are not applicable.

Table 1: Description of the Actions Implemented in Doubt API

Variable	Label	Frequency
Educational qualification	School	19
	Bachelor's degree	41
	Master's degree	7
	Total	67
Experience	Less than 3 years	23
	3 to 5 years	13
	More than 5 years	31
	Total	67
Desire to Learn the Internet	Yes	65
	No	2
	Total	67
Electronic Payment Cards Usage	I use them	17
	I know about them but haven't used them	37
	I am not aware of them at all	13
	Total	67
Other Online Shopping Usage	Yes	36
	No	31
	Total	67
Perceived Usefulness of Electronic Payment	Yes	60
	No	7
	Total	67
Feeling Insecurity Online	Yes	40
	No	27
	Total	67

4 Results

To assess the questionnaire reliability, we calculated Cronbach's alpha coefficient. Table 2 presents the instrument's reliability and validity coefficients.

Table 2: Cronbach's Alpha and Construct Validity (Ave)

No.	Construct	No. of Items	Cronbach's Alpha	Construct Validity (AVE)
1	PE	6	0.776	0.602
2	EE	7	0.737	0.543
3	SI	5	0.741	0.549
4	FC	3	0.827	0.683
5	BI	3	0.807	0.651
		24	0.738	0.544

All dimensions show strong internal consistency because Cronbach's alpha coefficients range from 0.737 to 0.827, which is higher than the usual 0.70 threshold. Table 3 shows that the survey tool is very reliable and valid, which shows that it is appropriate and useful for this research. All correlations are statistically significant at the 0.01 level (two-tailed).

Table 3: Pearson Correlation between Each Construct and the Total Questionnaire Score

No.	Construct	Sig. (p-value)	Construct Validity (AVE)
1	PE	< 0.001	0.77
2	EE	< 0.001	0.85
3	SI	< 0.001	0.70
4	FC	< 0.001	0.76
5	BI	< 0.001	0.65

In addition to the tables presented earlier, visual summaries were also used to support the analysis. Histograms were first included to show the distribution of each UTAUT construct, followed by boxplots to illustrate how the scores varied among participants. Scatterplots with trend lines were then used to explore the relationships between key variables, such as performance expectancy (PE) and behavioural intention (BI), as well as BI and usage behaviour (UB). Furthermore, Table 4 presents the mean values together with their variability in a clear format (mean ± standard deviation). Correlation results are reported with their corresponding significance levels and 95% confidence

intervals. Where relevant, effect sizes are also provided, using Cohen's d or Pearson's r, depending on the type of analysis.

Table 4 shows that PE got the highest score (M = 4.12, 82%), which is strong evidence that users believe Baahy is useful. This is in agreement with the study by Alalwan et al. (2014), in which the researchers investigated the adoption of mobile banking among Jordanian consumers. On the other hand, lower values in SI (M = 3.45, 69%) indicated the cultural inclination towards collectivism in Arab cultures (Akour et al., 2022). BI (M = 4.05, 81%) appeared to be a significant determinant of UB (M = 3.97, 79%), as per the conceptual framework by Venkatesh et al. in the UTAUT theory.

Table 4: Descriptive Statistics and Compliance Levels of UTAUT Constructs

Construct	Mean (M)	SD	Agreement (Agree + Strongly Agree)	Compliance Level
PE	4.12	0.58	84%	High
EE	3.89	0.62	78%	Moderate high
SI	3.45	0.71	69%	Moderate
FC	3.72	0.65	74%	Moderate high
BI	4.05	0.53	81%	High
UB	3.97	0.60	79%	High

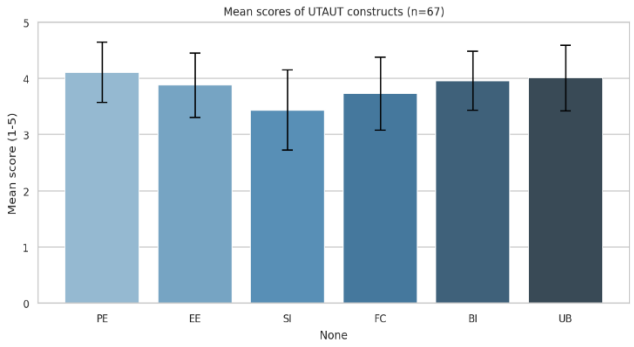

Fig. 3: Mean Scores (±SD) for UTAUT Constructs (PE, EE, SI, FC, BI, UB), n = 67

Fig.4 illustrates the average scores for each construct, with error bars showing variability. Fig. 5 displays the spread and outliers across constructs, clarifying variability beyond mean values.

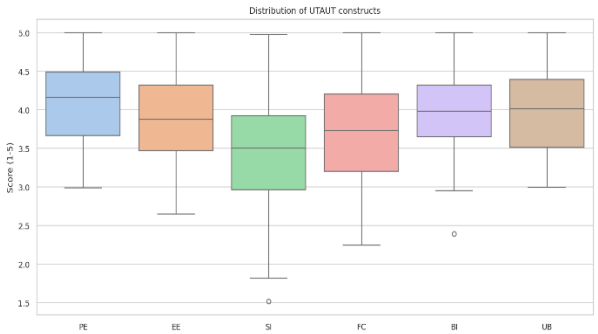

Fig. 5: Distribution Of UTAUT Construct Scores (Boxplots; Scores 1–5), N = 67

Table 4: Inter-Construct Correlation Matrix

	PE	EE	SI	FC	BI	UB
PE	1.00	0.48	0.35	0.42	0.71	0.65
EE	-	1.00	0.29	0.39	0.59	0.53
SI	-	-	1.00	0.31	0.47	0.44
FC	-	-	-	1.00	0.56	0.56
BI	-	-	-	-	1.00	0.79
UB	-	-	-	-	-	1.00

Fig. 6 shows the strong positive correlation between performance expectancy and behavioural intention. Fig. 7 highlights the sequential link between behavioural intention and actual use behaviour.

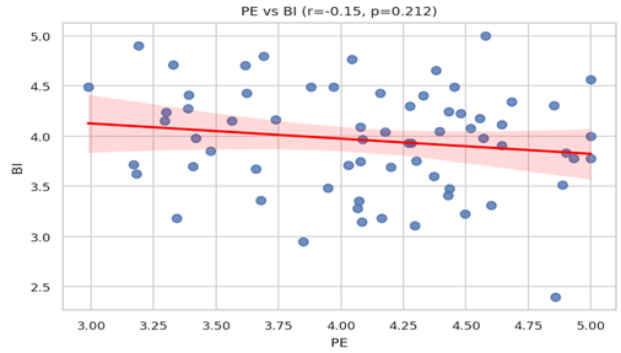

Fig. 6: Mean Scores (±SD) for UTAUT Constructs (PE, EE, SI, FC, BI, UB), n = 67

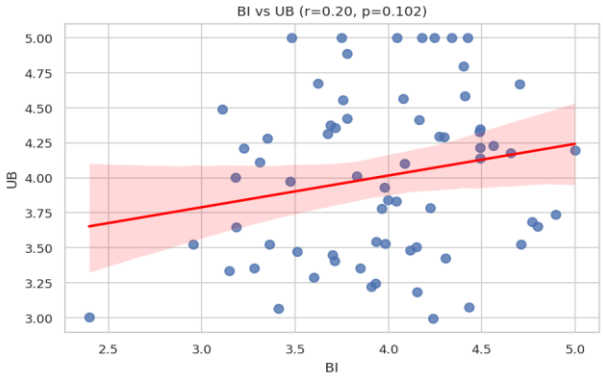

Fig. 7: BI Versus UB with Fitted Regression Line (Pearson r = 0.79, p < 0.01), n = 67

5 Discussion

The findings of Behavioural Intention (BI) and Use Behaviour (UB) supported and extended the UTAUT theory of m-commerce adoption in Libya. BI demonstrated high internal reliability with α=0.807 and a high score of 4.05 (SD=0.53). The findings also showed high agreement of 81%. The findings of Use Behaviour were similar to BI with a high score of 3.97 (SD=0.60) and high agreement of 79%. This indicates that participants who reported a strong intention to use the system also reported actual usage. Performance Expectancy (PE) was identified as a key factor associated with intention and use.

The correlations found are consistent with the UTAUT model: BI shows a strong correlation with self-reported UB, and PE shows a strong correlation with BI. These patterns are consistent with a sequential association (PE → BI → UB); however, conclusive claims about mediation or causality cannot be made due to the correlational design and analytical methodology used here. As a result, we offer these data as proof of strong correlations that require careful structural testing in future studies.

This finding is in line with previous meta-analyses in higher education contexts (Noureddine et al., 2025), which took a broad approach to illustrating UTAUT constructs. This finding is also similar to what Barry and Haque discovered in Malaysia with regard to m-commerce adoption, whereby both perceived usefulness and trust were standouts as determinants of m-commerce adoption.

In addition, the Ease Expectancy model revealed a moderate relationship to UB at r = 0.53, along with an average rating of 3.89, confirming the significance of ease of use in particular for inexperienced users. This further stresses the interface complexity as an important barrier that warrants discussion. Moreover, it confirms the supporting theory that interface help would be beneficial to improve understanding (Hartson & Pyla, 2012). In contrast, Social Influence recorded the lowest mean score at M = 3.45 along with a weak correlation to UB at r = 0.44, further supporting the idea that peer pressure plays a smaller part in the present scenario possibly because of the immature state of m-commerce in Libya (Kemp, 2025).

Previous studies in business-to-consumer (B2C) contexts suggest that trust increase when users observe others sharing experiences (Gefen & Straub, 2004). However, in this study, the effect of peer influence was weak compared to previous findings. This may reflect the early stage of m-commerce adoption in Libya.

A large number of participants (nearly 60%) expressed concerns about online transactions, indicating that trust remains a critical issue. FC sat around 3.72, fairly solid, linking closely with UB at 0.56. Safety indicators and live support services may help increase user trust and encourage continued use. Much like Lee et al. (2019) found, when privacy feels shaky, actions shift; support structures must build in safeguards from the start.

EE showed a reliability score of 0.737, while SI reached 0.741 - both barely clearing the 0.70 mark, which might point to subtle differences across languages or cultures. Instead of viewing these numbers as solid, some researchers suggest going back and forth between exploratory and confirmatory analysis, especially when tools move across regions. Strengthening how translations are done could help make results more stable (Sousa & Rojjanasrirat, 2011). On its own, the connection between thinking something is useful and actually using it matches earlier findings by Syamsuar et al. (2023) in ERP settings. This pattern hints that real-world use may follow belief in utility, regardless of whether someone says they intend to use it.

The analysis is based on Pearson correlation, which describes relationships between variables. Because the number of participants was too small, methods like multilevel regression or SEM were not used. Bootstrapped tests for mediation also did not happen under these conditions. Future work, given more data points, could apply such tools to examine how UTAUT factors link - both directly and through pathways. Future studies with larger samples would help improve the analysis.

This study builds on previous research, such as Lee and Han (2024), by examining real-world usage behaviour. Instead of asking people how they might act, we watched real activity - Baahy purchases made through mobile devices across multiple weeks. Perceived usefulness showed a strong influence on actual usage - even stronger once we adjusted for behavioural intention. Nearly 60% of participants reported discomfort when conducting mobile transactions. Safety worries were folded into our FC measure, backing up key claims from UTAUT while spotlighting trust elements that pull hesitant users toward consistent engagement.

From a practical perspective, elements like usage analytics, tailored suggestions, community ambassadors, and conspicuous security indicators appear to be associated with improved intention and usage. Although these components are theoretically

substantiated, their efficacy necessitates practical assessment via focused pilot studies within the Libyan setting.

A. Design implications: Proposed support module

The following design suggestions are proposed as plausible interventions, rather than validated solutions:

- Performance Expectancy (PE): Emphasize time savings and productivity benefits through demonstrations and guided examples, drawing on practices shown to be effective in higher-education technology adoption campaigns (Teo & Huang, 2019).
- Effort Expectancy (EE): Reduce perceived effort by streamlining essential processes through usability testing with inexperienced users and incorporating context-sensitive assistance.
- Social Influence (SI): Utilise new social norms to share real-life experiences and demonstrations with local vendors, faculty, student leaders, and community ambassadors (Akour et al., 2021).
- Facilitating Conditions (FC): Incorporate visual trust indicators (e.g., certification badges), clear security explanations, and live support channels to reduce perceived risk.
- Behavioural Intention / Use Behaviour (BI/UB): Use early interaction data to personalize suggestions and notifications, similar to adaptive recommendation systems used in e-learning platforms.

6 Limitations and Future Research

The results of this study cannot be applied to other regions or industries because it uses cross-sectional survey data collected from a single academic setting in Libya. The fact that EE and SI had lower values indicates that the measuring instruments need to be enhanced and culturally adjusted, even though the reliability coefficients for all constructs were above acceptable levels**.**

Longitudinal or mixed methods designs should be used in future research to more thoroughly examine the intention behaviour gap and to better record temporal changes. Qualitative interviews with individuals who have a high intention but little usage could provide important information about contextual barriers. Because we struggled to reach the app's truly active users, the sample is small. Larger samples would make it easier to use multivariate techniques, such as mediation or moderation analyses and structural equation modelling (SEM), to look into perceived risk, expertise level, or AI-based support as possible moderators within the UTAUT model.

7 Conclusion

This study proves the importance of the main factors of the UTAUT model in the adoption of m-commerce in Libya among its users. Performance Expectancy is the strongest relationship between Behavioural Intention and self-Reported Use Behaviour. While the findings are consistent with international studies of corporate systems and mobile payment systems, the findings regarding the impact of social influence are an exception**.**

Given the importance of security and privacy in online transactions, it is necessary to extend the UTAUT model by incorporating risk-related factors, particularly in m-commerce contexts. Features such as AI-based customer support and visible trust certifications may help increase user confidence. However, these approaches require further validation in real-world settings. It is also important to consider local factors such as infrastructure and available payment methods. In this context, the UTAUT model remains a useful framework for understanding user behaviour and technology adoption.

For future research, it would be useful to include participants from different regions in Libya, and to use longer-term studies as well as mixed research methods. In addition, future work can examine extended models that include factors such as privacy concerns and adaptive support features. This may help improve our understanding of technology adoption and support the development of more secure and user-friendly m-commerce systems in developing countries.

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References

Akour, I., Alnazzawi, N., Alshurideh, M., Almaiah, M. A., Al Kurdi, B., Alfaisal, R. M., & Salloum, S. (2022). A conceptual model for investigating the effect of privacy concerns on E-commerce adoption: a study on United Arab Emirates consumers. *Electronics*, *11*(22), 3648.

Akour, I., Alshurideh, M., Al Kurdi, B., Al Ali, A., & Salloum, S. (2021). Using machine learning algorithms to predict people's intention to use mobile learning platforms during the COVID-19 pandemic: Machine learning approach. *JMIR Medical Education*, *7*(1), e24032.

Alalwan, A., Dwivedi, Y., & Williams, M. (2014). Examining factors affecting customer intention and adoption of internet banking in Jordan.

Alaskar, T. H., & Alsadi, A. K. (2023). Drivers of mobile commerce adoption intention by Saudi SMEs during the COVID-19 pandemic. *Future Business Journal, 9*(1), 12.

Alsharif, F. F. (2013). *Investigating the factors affecting online shopping adoption in Saudi Arabia* De Montfort University].

Ameziane, A. (2024). The Reality of E-Commerce Development as One of the Most Important Activities of the Digital Economy: A Case Study of Arab Countries. *Le Manager, 11*(2), 291-311.

Ashraf, A. R., Thongpapanl, N., Menguc, B., & Northey, G. (2017). The role of m-commerce readiness in emerging and developed markets. *Journal of International Marketing, 25*(2), 25-51.

Atkinson, S., O'Hara, S., Sturgeon, A., & Graham, J. (2014). *The Business Book: Big Ideas Simply Explained*. Dorling Kindersley Ltd.

Baima, G., Santoro, G., Pellicelli, A. C., & Mitręga, M. (2022). Testing the antecedents of customer knowledge sharing on social media: a quantitative analysis on Italian consumers. *International Marketing Review, 39*(3), 682-705.

Barry, M., & Haque, A. (2024). Examining the Determinantsof Mobile CommerceAdoptionthrough UTAUT: A Structural Equation Modelling. *Scope, 14*(2), 1603-1619

Central Bank of Libya. (2025). *Research and Statistics Department*. Retrieved 31-03-2026 from https://cbl.gov.ly/

Ciupac-Ulici, M., Beju, D.-G., Bresfelean, V. P., & Zanellato, G. (2022). Which factors contribute to the global expansion of m-commerce? *Electronics, 12*(1), 197.

Dagnoush, S., & Khalifa, G. S. (2021a). The relationship between users' performance expectancy and users' behavioral intentions to use mobile commerce transactions in the Libya context. *Asia-Pacific Journal of Management and Technology (AJMT), 2*(2), 22-29.

Dagnoush, S., & Khalifa, G. S. (2021b). The Effect of Users'effort Expectancy on Users'behavioral Intention to Use M-Commerce Applications: Case Study In Libya. *International Journal on Recent Trends in Business and Tourism (IJRTBT), 5*(4), 1-7.

El-fitouri, M. O. (2015). E-commerce in developing countries: A case study on the factors affecting e-commerce adoption in Libyan companies. *International Journal of Engineering Research and Applications, 5*(1), 102-115.

Gefen, D., & Straub, D. W. (2004). Consumer trust in B2C e-Commerce and the importance of social presence: experiments in e-Products and e-Services. *Omega, 32*(6), 407-424.

Grandon, E. E., & Pearson, J. M. (2004). Electronic commerce adoption: an empirical study of small and medium US businesses. *Information & management, 42*(1), 197-216.

Grewal, D., Bart, Y., Spann, M., & Zubcsek, P. P. (2016). Mobile advertising: A framework and research agenda. *Journal of interactive marketing, 34*(1), 3-14.

Hartson, R., & Pyla, P. S. (2012). *The UX Book: Process and guidelines for ensuring a quality user experience*. Elsevier.

Hu, X., Li, W., & Hu, Q. (2008). Are mobile payment and banking the killer apps for mobile commerce? Proceedings of the 41st Annual Hawaii International Conference on System Sciences (HICSS 2008),

Ihnissi, R., & Klaib, A. (2021). Barriers preventing to reap the benefits of E-commerce in Libya prior and during COVID-19 pandemic. *Journal of Pure & Applied Sciences, 20*(2), 22-28.

Imtiaz, S. (2018). The studies of unified theory of acceptance and use of technology (UTAUT) in M-commerce context. *International Journal of Information Communication Technology and Digital Convergence, 3*(1), 42-56.

Jain, V., Malviya, B., & Arya, S. (2021). An overview of electronic commerce (e-Commerce). *Journal of Contemporary Issues in Business and Government, 27*(3), 666.

Kamal, M., & Subriadi, A. P. (2021). UTAUT model of mobile application: literature review. 2021 International Conference on Electrical and Information Technology (IEIT),

Kemp, S. (2025). *Digital 2026: Libya*. https://datareportal.com/reports/digital-2026-libya?utm_source=copilot.com

Lee, J.-M., Lee, B., & Rha, J.-Y. (2019). Determinants of mobile payment usage and the moderating effect of gender: Extending the UTAUT model with privacy risk. *International Journal of Electronic Commerce Studies, 10*(1), 43-64.

Lee, S., & Han, S. (2024). An analysis of factors influencing college students' acceptance of telemedicine. *KSII Transactions on Internet & Information Systems, 18*(10).

Luo, Q., Forscher, T., Shaheen, S., Deakin, E., & Walker, J. L. (2023). Impact of the COVID-19 pandemic and generational heterogeneity on ecommerce shopping styles–A case study of Sacramento, California. *Communications in Transportation Research, 3*, 100091.

Mcommerce. Retrieved 21-08-2025 from https://www.emarketer.com/topics/industry/mcommerce

Noureddine, R., Boote, D., & Campbell, L. O. (2025). Assessing the validity of utaut among higher education instructors: a meta-analysis. *Education and Information Technologies*, 1-33.

Omar, S., Mohsen, K., Tsimonis, G., Oozeerally, A., & Hsu, J.-H. (2021). M-commerce: The nexus between mobile shopping service quality and loyalty. *Journal of retailing and consumer services, 60*, 102468.

Rakshit, S., Islam, N., Mondal, S., & Paul, T. (2021). Mobile apps for SME business sustainability during COVID-19 and onwards. *Journal of Business Research, 135*, 28-39.

Samartha, V., Shenoy Basthikar, S., Hawaldar, I. T., Spulbar, C., Birau, R., & Filip, R. D. (2022). A study on the acceptance of mobile-banking applications in India—unified theory of acceptance and sustainable use of technology model (UTAUT). *Sustainability, 14*(21), 14506.

Sheth, J. (2020). Impact of Covid-19 on consumer behavior: Will the old habits return or die? *Journal of Business Research*, *117*, 280-283.

Sousa, V. D., & Rojjanasrirat, W. (2011). Translation, adaptation and validation of instruments or scales for use in cross-cultural health care research: a clear and user-friendly guideline. *Journal of evaluation in clinical practice*, *17*(2), 268-274.

Stocchi, L., Pourazad, N., Michaelidou, N., Tanusondjaja, A., & Harrigan, P. (2022). Marketing research on Mobile apps: past, present and future. *Journal of the Academy of Marketing Science*, *50*(2), 195-225.

Syamsuar, D., Oktaharisetia, M. A., Witarsyah, D., Luthfi, A., Dell, P., Permana, Y. S., & Antoni, D. (2023). Exploring ERP User Behaviour in Developing Countries: Integrating Self-efficacy and UTAUT Perspectives. 2023 International Conference on Advancement in Data Science, E-learning and Information System (ICADEIS),

Tarhini, A., Alalwan, A. A., Shammout, A. B., & Al-Badi, A. (2019). An analysis of the factors affecting mobile commerce adoption in developing countries: Towards an integrated model. *Review of International Business and Strategy*, *29*(3), 157-179.

Teo, T., & Huang, F. (2019). Investigating the influence of individually espoused cultural values on teachers' intentions to use educational technologies in Chinese universities. *Interactive Learning Environments*, *27*(5-6), 813-829.

Venkatesh, V., Davis, F., & Morris, M. G. (2007). Dead or alive? The development, trajectory and future of technology adoption research. *Journal of the association for information systems*, *8*(4), 1.

Venkatesh, V., Morris, M. G., Davis, G. B., & Davis, F. D. (2003). User acceptance of information technology: Toward a unified view. *MIS quarterly*, 425-478.

Venkatesh, V., Thong, J. Y., & Xu, X. (2012). Consumer acceptance and use of information technology: extending the unified theory of acceptance and use of technology. *MIS quarterly*, 157-178.

Wasiq, M., Johri, A., & Singh, P. (2022). Factors affecting adoption and use of M-commerce services among the customers in Saudi Arabia. *Heliyon*, *8*(12).

Yaqub, M. Z., Badghish, S., Yaqub, R. M. S., Ali, I., & Ali, N. S. (2024). Integrating and extending the SOR model, TAM and the UTAUT to assess M-commerce adoption during COVID times. *Journal of Economic and Administrative Sciences*.