

DOI: https://doi.org/10.48009/2_iis_2026_124

Trust antecedents and their impact on behavioral intention in a mobile health application: Evidence from a quantitative study of a newly introduced app

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Abstract

This study examines the factors influencing consumers' intention to use a mobile e-commerce application designed to help users make healthier food choices in Kuwait. It focuses on perceived usefulness, perceived risk, and perceived privacy as key antecedents of perceived trust and behavioral intention. The study is motivated by the need to better understand the drivers and barriers of mobile commerce adoption, particularly concerns related to privacy, security, and uncertainty in online transactions and developed a modified TAM. Data were collected from 272 respondents, primarily young, educated, and experienced online shoppers. The data were analyzed using SPSS through reliability testing, factor analysis, and multiple regression analysis. The measurement model demonstrated strong reliability and validity. The results show that perceived privacy is the strongest predictor of perceived trust, followed by perceived usefulness, while perceived risk has a significant negative effect on trust. Regarding behavioral intention, perceived usefulness emerges as the most influential positive factor, followed by perceived privacy and trust, whereas perceived risk negatively affects intention to use. The model explains 53.9% of the variance in trust and 41.2% of the variance in intention. Overall, the findings confirm that trust plays a central role in mobile app adoption, with perceived usefulness and privacy enhancing acceptance, while perceived risk remains a key barrier.

Keywords: Customer trust, perceived risk, perceived privacy protection, perceived usefulness, intention to adopt, Kuwait factors of adoption, B2C

Introduction

In online environments, uncertainty is generally higher than in traditional commercial settings. Consumers engaging in e-commerce face greater levels of risk because they cannot physically inspect products, interact directly with service providers, or verify the quality and reliability of offerings before making a purchase (Hassna et al., 2023; Rouibah et al., 2016). In addition, payments are often completed before products or services are delivered, increasing concerns about the security of personal and financial information. Consumers may also receive products that are damaged, defective, or different from those advertised. Furthermore, the growing prevalence of cybercrime and data breaches continues to discourage many individuals from engaging in online transactions.

These concerns create substantial uncertainty and perceived risk, making trust a critical mechanism for facilitating online transactions. Trust helps reduce uncertainty and enables consumers to make decisions in environments characterized by risk and incomplete information. Establishing trust in online environments is particularly challenging because interactions occur through technology rather than direct interpersonal contact. As e-commerce continues to expand globally, trust has become a key factor shaping consumers' beliefs, attitudes, and behavioral intentions. Despite the rapid growth of digital commerce in Kuwait, research examining trust in online environments remains relatively limited. This gap highlights the need for further investigation into the factors that influence trust within the Kuwaiti context.

Trust is widely recognized as a major determinant of e-commerce adoption and continued usage (Rouibah et al., 2016). Because trust develops through positive experiences and perceptions, understanding its antecedents is essential for encouraging consumers to engage with digital commerce platforms and for promoting online purchasing behavior (Hassna et al., 2023).

This study focuses on trust for several reasons. First, the sustained growth of e-commerce depends on consumers' willingness to trust digital platforms. Second, identifying the factors that shape trust can help organizations design more secure, reliable, and user-centered applications. The findings may therefore assist developers and service providers in creating digital environments that better meet consumers' expectations. From an academic perspective, this study contributes to the growing literature on e-commerce trust, particularly in Kuwait and the broader Arab region, where empirical evidence remains relatively scarce. The study also provides practical recommendations for enhancing trust in digital commerce applications and identifies directions for future research.

The primary objective of this research is to examine the influence of trust antecedents on perceived trust and their subsequent impact on users' intention to use a recently launched mobile application in Kuwait that helps consumers make healthier food choices. Specifically, the study addresses the following research questions: Q1: To what extent do perceived risk, privacy, and perceived usefulness influence users' trust in the mobile application? And Q2: To what extent do perceived trust, perceived risk, privacy, and perceived usefulness influence users' intention to use the mobile application?

Background and Literature Review

Technology Acceptance and E-Commerce

The rapid growth of e-commerce, including platforms that promote healthier and sustainable consumption, has stimulated extensive research on the factors influencing consumers' adoption of digital technologies. Several theoretical models have been applied in this context, including the Technology Acceptance Model (TAM), Theory of Reasoned Action (TRA), Theory of Planned Behavior (TPB), Diffusion of Innovation (DOI), and the DeLone and McLean Information Systems Success Model (D&M) (Hassna et al., 2023; Rouibah et al., 2016). Among these, TAM remains one of the most widely used frameworks for explaining technology adoption behavior.

TAM posits that perceived usefulness (PU) and perceived ease of use (PEOU) influence users' behavioral intentions toward technology adoption. Although TAM has demonstrated strong explanatory power, researchers have argued that adoption decisions in online environments are also shaped by concerns regarding uncertainty, privacy, security, and risk. Consequently, many studies have extended TAM by incorporating trust-related constructs to improve its explanatory capability in e-commerce settings (Neama et al., 2016; Rouibah et al., 2016).

Consistent with this perspective, the present study adopts TAM as its theoretical foundation and extends it by examining the influence of perceived usefulness, privacy, and perceived risk on perceived trust and users' intention to use a newly introduced mobile application

Trust in E-Commerce

Trust is widely regarded as a key determinant of e-commerce adoption and continued usage because online transactions are characterized by uncertainty, information asymmetry, and perceived risk (Rouibah et al., 2016). Consumers often have concerns regarding payment security, privacy protection, product quality, and the reliability of service providers. Under such conditions, trust serves as a mechanism that reduces uncertainty and facilitates transaction decisions.

Table 1. A Subset of Trust Definitions

Source	Definition of trust
McKnight et al. (1998)	One believes the other person is benevolent, competent, honest, or predictable in a situation).
Gefen (2000)	The confidence a person has in his or her favorable expectations of what other people will do, based, in many cases, on previous interactions.
Coulter and Coulter (2002)	A set of beliefs held by a consumer as to certain characteristics of the supplier, as well as the possible behavior of the supplier in the future.
McKnight et al. (2002)	Integrity to "how consistent, reliable, and honest the company is
Xiao and Benbasat (2003)	The extent of consumers' confidence in an e- merchant's competence, benevolence and integrity to perform online transactions successfully.
Johnson and Grayson (2005)	Customers' confidence or willingness to rely on a trustee's competence and reliability.
Flavián and Guinalíu (2006)	One party's belief that its needs will be fulfilled in the future by actions undertaken by the other party.
Gefen (2003)	Belief that an e-vendor is trustworthy

Researchers have conceptualized trust from various perspectives, see table 1 in (Rouibah et al., 2016). In e-commerce research, trust is commonly defined as consumers' belief that a service provider possesses the competence, benevolence, and integrity necessary to fulfill its obligations successfully (Xiao & Benbasat, 2003).

This study adopts the definition proposed by Rouibah et al. (2016), defining perceived trust as the extent to which consumers believe that a service provider is competent, benevolent, and honest in conducting online transactions. Competence refers to the provider's ability to deliver reliable services, benevolence reflects concern for consumers' interests, and integrity represents adherence to ethical standards and promises. Recent research continues to confirm that trust plays a central role in shaping consumers' intentions to engage in online transactions (Hassna et al., 2023; Mayayise, 2024).

A subset of Previous Studies on Trust in E-Commerce

Previous studies have examined trust using a variety of theoretical perspectives, including TAM, TPB, and integrated trust-based models. Research has investigated numerous trust antecedents, including perceived usefulness, privacy, security, website quality, and perceived risk, as well as trust outcomes such as purchase intention, loyalty, and actual usage behavior (Hassna et al., 2023)..

Empirical evidence consistently indicates that trust positively influences consumers' behavioral intentions. For example, Chen and Dibb (2010) found that website quality and security enhance trust and purchase intention. Qingyun et al. (2009) reported that perceived risk negatively affects trust and adoption behavior, whereas Rouibah et al. (2016) found no significant relationship between perceived risk and trust. Such inconsistent findings suggest that the relationships among trust antecedents and outcomes may vary across contexts.

More recent studies continue to confirm the importance of trust in digital commerce. Trust and perceived security have been shown to influence consumers' willingness to engage in online transactions, while privacy concerns and cybersecurity threats remain important factors in trust formation (Bhattacharya et al., 2023; Dwivedi et al., 2022)

Despite the growing international literature, empirical research on e-commerce trust in Arab countries, particularly Kuwait, remains limited (Abbas et al., 2025; AlMarzouq et al., 2025; Hassna et al., 2023; Rouibah et al., 2016). Existing studies have focused primarily on general technology adoption and traditional TAM variables, with relatively less attention devoted to trust and its antecedents.

Critical Review of Previous Studies and Research Gap

The literature reveals several important gaps. First, studies differ considerably in their selection of trust antecedents and theoretical foundations, resulting in fragmented findings and limited theoretical integration (Bhattacharjee, 2002). Second, prior research has reported inconsistent relationships between trust and its antecedents, particularly perceived risk, suggesting the need for further contextual validation. Third, trust measurements vary across studies, making comparisons difficult and highlighting the importance of using theoretically grounded constructs.

A further limitation concerns research settings. Many studies investigate online shopping in general without focusing on a specific platform, although trust perceptions are often shaped by the characteristics of a particular digital service. Scholars have therefore recommended examining trust within a specific application or platform context (Chen & Dibb, 2010; Kim et al., 2008)..

Finally, despite the acknowledged importance of trust in influencing online behavior, relatively few studies in the Arab region have examined trust as a mediating mechanism linking trust antecedents to behavioral intention. This limitation is particularly evident in Kuwait, where empirical evidence remains scarce despite the rapid growth of digital commerce.

To address these gaps, this study develops a theory-driven model based on TAM and extends it with trust-related antecedents. Specifically, it examines the effects of perceived usefulness, privacy, and perceived risk on perceived trust and investigates how trust subsequently influences users' intention to adopt a newly introduced mobile application designed to support healthier purchasing decisions. Because the application is in its early stage of diffusion, the study focuses on potential users and their adoption intentions rather than actual usage behavior.

Research Model and Hypotheses

Development of the Initial Research Model

This study adopts the Technology Acceptance Model (TAM) as its theoretical foundation. TAM has been widely applied in e-commerce and mobile commerce research because of its ability to explain users' behavioral intentions toward technology adoption (Rouibah et al., 2016). However, researchers have argued

that TAM alone does not fully capture the uncertainty and risk associated with digital environments. Consequently, trust-related constructs have frequently been incorporated into TAM to improve its explanatory power in online contexts (Hassna et al., 2023; Rouibah et al., 2022).

The initial proposed model was developed through a systematic review of prior literature on e-commerce adoption and online trust which includes several phases. Based on the synthesis of the reviewed studies, perceived usefulness, perceived risk, and perceived privacy were identified as the most frequently examined antecedents of trust. Trust was conceptualized as a key mechanism through which these factors influence consumers' behavioral intention to use digital platform.

Phase 1: Identification of Trust-Related Factors: The first phase involved reviewing 106 previous studies, derived from SLR (Hassna et al., 2023; see see appendix) related to e-commerce adoption and online trust. A total of 305 variables were initially identified from these studies. Variables with similar meanings or overlapping concepts were merged and categorized according to their frequency of occurrence in prior research. This process reduced the total number of variables to 132 distinct constructs.

Phase 2: Merging Similar Constructs: In the second phase, conceptually related variables were further consolidated into broader dimensions. This process reduced the number of constructs to 17 major factors. Since TAM served as the underlying theory of the study, its primary constructs were retained directly in the model. The resulting variables were categorized into two categories : Trust antecedents (including: Perceived Risk, Perceived Security, Perceived Privacy, Reputation, Website Quality, Perceived Usefulness, Perceived Ease of Use), and trust consequences (including: Intention to Use and Attitude, Actual Use, Loyalty, Satisfaction, Word of Mouth).

Phase 3: Pilot Testing and Expert Evaluation: To determine the most relevant antecedents of trust, a pilot study was conducted involving seven academics specializing in e-commerce and consumer behavior from Kuwait University, three e-commerce website owners in Kuwait, and five experienced ecommerce users. Participants were asked to evaluate and rank the identified trust antecedents according to their perceived importance using a five-point scale. They were also invited to provide qualitative feedback and suggest additional factors. The pilot study results supported the inclusion of the most frequently cited and highly ranked variables in the final research model.

Phase 4: The separation between intention behavior and actual behavior: Previous studies have examined trust outcomes using either intention behavior, actual behavior, or both (Kim et al., 2010; Palvia, 2009). Although the sample comprised 385 respondents, including both potential users and actual users of the mobile app, this study focuses exclusively on behavioral intention for two reasons. *First*, the majority of respondents were potential rather than active users. Specifically, the intention group consisted of 272 respondents, representing 70.6% of the sample, whereas actual users accounted for only 113 respondents (29.4%). *Second*, most prior e-commerce trust studies have identified purchase intention as a key consequence of trust, highlighting its importance as a predictor of future online behavior, particularly in the context of newly introduced mobile platforms (Chen & Dibb, 2010; Hassna et al., 2023). Accordingly, the study adopts the intention behavior model as the primary framework for analysis

The new Research Model

After data collection, exploratory factor analysis (EFA) was conducted using Varimax rotation to assess convergent validity and refine the research model. Five factors with eigenvalues greater than 1 were retained, explaining 68.2% of the total variance, which exceeds the acceptable threshold recommended by (Hair et al., 2021). Only items with factor loadings greater than 0.50 were retained. The analysis resulted in the elimination of the following four constructs: Perceived Security, Website Quality, Perceived Ease of

Use and Attitude. In addition, the perceived trust and reputation constructs loaded together and were therefore merged into a single construct representing trustworthiness and reputation. The final model retained includes three independent factors (Perceived Risk, Perceived Privacy and Perceived Usefulness), a mediator factor (perceived trust) and a dependent factor (intention to use).

Based on TAM and the literature reviewed this study proposes a model that examines the effects of perceived usefulness, perceived risk, and perceived privacy on online purchase intention via the mediation of perceived trust.

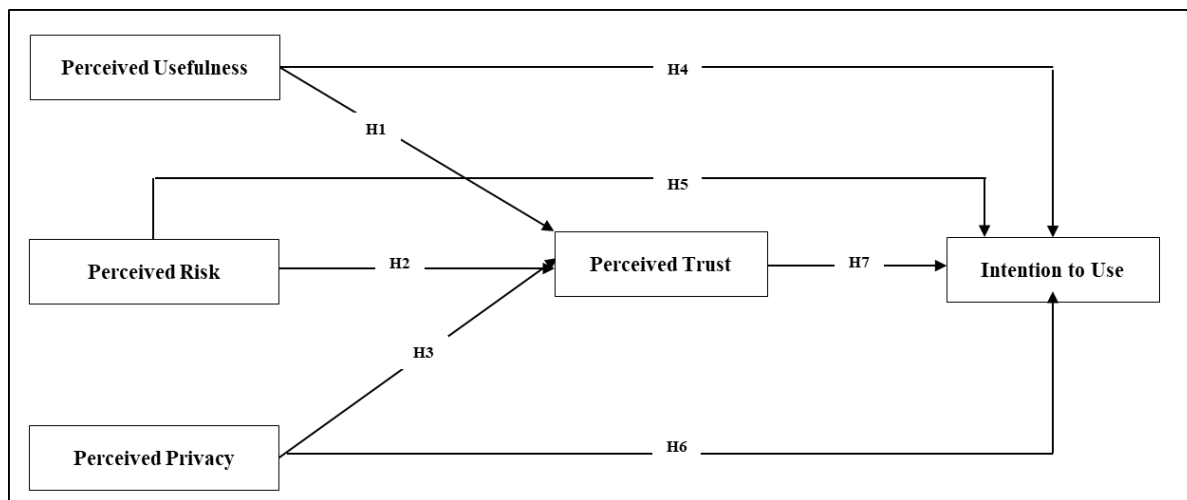


Figure 1. The research model

Antecedent of Perceived Trust

Perceived usefulness refers to the degree to which an individual believes that using a particular mobile application enhances the effectiveness and quality of their decision-making process (Rouibah et al., 2015). In the context of mobile health applications, perceived usefulness reflects users' beliefs that the system helps them make healthier food choices, improves their understanding of nutritional content, and supports better dietary decisions during shopping in physical retail environments. When users perceive that the application provides valuable, relevant, and practical health information, they are more likely to develop trust in the reliability and credibility of the system. Prior research confirms that perceived usefulness plays an important role in trust formation in digital environments (Gefen et al., 2003; Liao et al., 2006). Therefore, the following hypothesis is proposed:

H1: Perceived usefulness positively affects consumers' perceived trust toward the mobile health application.

Perceived risk refers to users' subjective expectations of potential negative outcomes associated with using a digital health application, including concerns related to information accuracy, privacy of usage data, and uncertainty in relying on system-generated recommendations (Pavlou, 2003). In the context of the FoodSwitch mobile application, there are no financial transactions or online purchases involved. Instead, the application is used to obtain nutritional information and healthier product alternatives through barcode scanning in physical retail environments. Accordingly, perceived risk in this study is conceptualized as information-related, privacy-related, and decision-related risk, reflecting users' concerns about the reliability of nutritional information and the potential misuse or misinterpretation of scanned data. Prior studies have shown that higher levels of perceived risk reduce user confidence and hinder trust formation in digital systems (Kim et al., 2008; McKnight et al., 2002; Pavlou, 2003; Rouibah et al., 2016). Therefore, perceived risk is expected to negatively influence trust.

H2: Perceived risk negatively affects consumers' perceived trust toward the mobile health application.

Perceived privacy refers to users' beliefs regarding the extent to which their personal data and application usage information are securely protected and responsibly managed within the mobile application (Flavián & Guinalíu, 2006). In mobile health contexts, privacy protection is a key factor influencing users' confidence, as individuals may be concerned about how their scanning behavior and usage data are stored or utilized. When users believe that their personal information is adequately protected, they are more likely to trust the application and rely on it for health-related decision support. Prior research highlights the critical role of perceived privacy in trust formation in digital environments (Alalwan et al., 2019; Flavián & Guinalíu, 2006; Kim et al., 2008). This leads to the following hypothesis:

H3: Perceived privacy positively affects consumers' perceived trust toward the mobile health application.

Antecedent of Intention to Use

TAM posits that individuals are more likely to adopt technologies they perceive as useful and beneficial (Rouibah et al., 2015). Within this framework, behavioral intention refers to the extent to which a user is willing or plans to use a specific technology or system in the future. In the original literature, intention has sometimes been operationalized in e-commerce contexts as intention to purchase; however, this study is not concerned with purchasing behavior. Given that the FoodSwitch mobile application is a free health-oriented tool that provides users with nutritional information and healthier food alternatives prior to purchase decisions in physical stores, the dependent variable in this study is explicitly defined as behavioral intention to use the application for information and decision support, rather than purchase intention. Behavioral intention is widely recognized as a strong predictor of actual technology usage behavior. Accordingly, when users perceive the application as useful in improving their food choices and supporting healthier decisions, they are more likely to develop a stronger intention to use it (Alalwan et al., 2019; Gefen et al., 2003). This leads to the following hypothesis:

H4: Perceived usefulness positively influences consumers' behavioral intention to use the mobile health application.

Perceived risk in the context of mobile health applications reflects users' concerns about uncertainty, data misuse, and the reliability of app-generated information. Higher levels of perceived risk may discourage users from relying on the application for health-related decision support due to fear of inaccurate information or privacy-related concerns (Hassna et al., 2023; Kim et al., 2008; Pavlou, 2003). Accordingly, this leads to the following hypothesis:

H5: Perceived risk negatively affects consumers' behavioral intention to use the mobile health application.

Perceived privacy refers to users' beliefs that their personal data and usage information are adequately protected when using the application. When users feel that their privacy is safeguarded, they are more likely to trust and engage with the application for informational purposes and decision support in food selection contexts (Alalwan et al., 2019; Chellappa & Sin, 2005; Flavián & Guinalíu, 2006; Rouibah & Abbas, 2006). This leads to the following hypothesis:

H6: Perceived privacy positively affects consumers' behavioral intention to use the mobile health application.

Trust represents users' confidence in the reliability, accuracy, and integrity of the information provided by the mobile health application. In this context, higher levels of trust reduce uncertainty and increase users'

willingness to rely on the application when making healthier food choices (Chen & Dibb, 2010; Gefen et al., 2003; Rouibah et al., 2016). This leads to the following hypothesis:

H7: Perceived trust positively affects consumers' behavioral intention to use the mobile health application.

Research Methodology

This study adopts a mixed-methods research design that integrates qualitative and quantitative approaches to investigate the determinants of consumers' perceived trust and behavioral intention to use the FoodSwitch mobile application in Kuwait. The theoretical rationale, research model development, construct selection based on the qualitative approach, and hypothesis development have already been presented in the Research Model and Hypotheses section. Therefore, this section focuses exclusively on the empirical procedures used to validate the measurement instrument and test the proposed research model.

Pilot Study

Before the main data collection, a pilot study was conducted to refine and validate the survey instrument. The pilot involved seven academics specializing in e-commerce and consumer behavior, three mobile application owners, and five experienced users of digital applications in Kuwait. Participants evaluated the questionnaire for clarity, relevance, and comprehensibility. Their feedback was used to improve item wording, eliminate ambiguities, and ensure cultural appropriateness. The questionnaire was translated into Arabic and subsequently back-translated into English to ensure linguistic equivalence and consistency. The validated questionnaire was then used for the main data collection.

Data Collection

Data were collected using an online survey administered through QuestionPro. The survey targeted users and potential users of FoodSwitch, a newly introduced mobile application in Kuwait that assists consumers in identifying healthier food alternatives by scanning product barcodes while shopping in physical stores.

The questionnaire included two respondent pathways (actual users and potential users). However, because the application was still in the early stage of adoption, the analysis focused on potential users and their behavioral intention to use the application. All measurement items were assessed using a five-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree). A total of 385 valid responses were obtained, comprising 272 potential users and 113 actual users. Consistent with the objectives of the study, only the 272 potential users were included in the hypothesis testing.

Sampling

A non-probability sampling technique was employed to recruit respondents familiar with the FoodSwitch application or interested in using it. The final analytical sample of 272 respondents is adequate for multivariate statistical analysis and satisfies the recommended sample-size-to-item ratio for factor analysis and regression analysis (Hinkin, 1995).

Construct Measurement

The measurement scales were adapted from previously validated instruments in the literature, with minor modifications to fit the context of mobile health and e-commerce adoption in Kuwait.

The final questionnaire consisted of 22 measurement items distributed across five constructs. Perceived Risk was measured using four items adapted from Kim et al. (2008). Perceived Privacy was measured using four items adapted from Flavián and Guinalíu (2006). Perceived Usefulness was measured using four items adapted from Pavlou (2003). Perceived Trust was measured using seven items adapted from Gefen et al. (2003), while Intention to Use was measured using three items adapted from (Gefen, 2000; Rouibah et al., 2016).

Analysis and Results

Data Analysis Procedures

The collected data were coded and analyzed using SPSS. Several statistical techniques were employed to evaluate the proposed research model, including descriptive statistics, reliability analysis, factor analysis, and regression analysis. Reliability was assessed using Cronbach's alpha coefficients, while factor analysis was conducted to evaluate construct validity and reduce overlapping variables. Regression analyses were then used to test the hypotheses and examine the relationships among perceived usefulness, perceived risk, perceived privacy, perceived trust, and intention to use e-commerce websites.

Demographic Profile of Respondents

The demographic analysis indicated that the majority of respondents were young Internet users, with approximately two-thirds under the age of 27. Male respondents represented 61.8% of the sample, while females accounted for 38.2%. Most respondents held at least a bachelor's degree, reflecting a relatively educated sample. In addition, the majority reported previous online shopping experience, with nearly half purchasing online between one and four times during the previous year. These findings suggest that the respondents were sufficiently familiar with the mobile App and capable of evaluating trust-related issues in online transactions.

Reliability, Validity, and Common Method Bias Assessment

The reliability of the measurement scales was evaluated using Cronbach's alpha. All constructs exceeded the recommended threshold of 0.70, indicating satisfactory internal consistency and reliability (Hair et al., 2021).

Table 2: Scale items, Cronbach's alpha, mean, and standard deviation

Construct	N. of Items	Mean	Standard Deviation	Factor Loading	Cronbach's Alpha
Perceived Risk (PR)	4				0.811
PR1		2.71	0.816	-0.709	0.782
PR2		2.89	0.962	-0.782	0.748
PR3		2.93	0.946	-0.788	0.754
PR4		2.81	0.917	-0.759	0.762
Perceived Privacy (PP)	4				0.752
PP1		3.31	0.745	0.606	0.687
PP2		3.26	0.739	0.768	0.667
PP3		3.44	0.695	0.751	0.637
PP4		3.43	0.881	0.506	0.788
Perceived Usefulness (PU)	4				0.900

PU1		3.80	0.776	0.819	0.874
PU2		3.76	0.823	0.789	0.853
PU3		3.78	0.851	0.803	0.874
PU4		3.70	0.766	0.680	0.881
Perceived Trust (PT)	7				0.889
PT1		3.28	0.700	0.518	0.866
PT2		3.22	0.587	0.586	0.877
PT3		3.35	0.676	0.526	0.876
PT4		3.22	0.767	0.513	0.866
RP1		3.19	0.693	0.791	0.876
RP2		3.06	0.742	0.781	0.866
RP3		3.17	0.624	0.718	0.880
Intention (I)	3				0.876
I1		3.39	0.992	0.696	0.895
I2		3.62	0.945	0.868	0.745
I3		3.58	0.961	0.824	0.830

The Cronbach's alpha values for the five factors were all above the required threshold: Perceived Risk (0.811), Perceived Privacy (0.752), Perceived Usefulness (0.900), Perceived Trust (0.889) and Intention to Use (0.876). In addition, factor analysis using Varimax rotation confirmed the validity of the retained constructs. Five factors with eigenvalues greater than 1 explained 68.2% of the total variance, which is considered acceptable according to Hair et al. (2021). Constructs with weak or overlapping loadings, including perceived security, website quality, perceived ease of use, and attitude, were removed from the final model.

To assess the potential impact of common method bias, Harman's single-factor test was conducted in SPSS. The results revealed that five factors emerged, and the first factor accounted for 45% of the total variance, which is below the recommended threshold of 50%. In addition, procedural remedies were employed, including anonymity of responses and the use of established measurement scales. Therefore, common method bias is unlikely to pose a significant threat to the validity of the findings.

Regression Analysis and Hypothesis Testing

Two multiple regression analyses were conducted to test the proposed relationships in the research model. A significance level of 0.05 and a 95% confidence interval were adopted for all statistical tests (see Table 3).

The first regression analysis examined the effects of perceived usefulness, perceived risk, and perceived privacy on perceived trust. The results indicated that the model explained 53.9% of the variance in perceived trust ($R^2 = 0.539$). Among the predictors, perceived privacy exerted the strongest positive influence on perceived trust ($\beta = 0.360$, $p < .001$), followed by perceived usefulness ($\beta = 0.313$, $p < .001$). In contrast, perceived risk had a significant negative effect on perceived trust ($\beta = -0.256$, $p < .001$). These findings provide support for hypotheses H1, H2, and H3.

The second regression analysis investigated the effects of perceived usefulness, perceived risk, perceived privacy, and perceived trust on intention to use the mobile app. The model accounted for 41.2% of the variance in intention to use ($R^2 = 0.412$). The findings revealed that perceived usefulness had the strongest positive effect on intention to use ($\beta = 0.345$, $p < .001$). Perceived risk negatively influenced

intention to use ($\beta = -0.228$, $p < .001$), whereas perceived privacy had a significant positive effect ($\beta = 0.201$, $p < .01$). Additionally, perceived trust positively affected intention to use ($\beta = 0.189$, $p < .001$). Accordingly, hypotheses H4, H5, H6, and H7 were supported.

Table 3: Statistical relationship - Regression 1 of antecedents of perceived trust

Relationship	Beta (β)	t-test	Significance
Regression of perceived trust			
Perceived Trust Risk $\rightarrow$ Perceived Trust	-0.256	-5.734	0.000
Perceived Trust Privacy $\rightarrow$ Perceived Trust	0.360	6.899	0.000
Perceived Trust Usefulness $\rightarrow$ Perceived Trust	0.313	5.922	0.000
Model diagnostics $R^2 = 0.539$ (53.9% variance explained). VIF range = 1.4–2.11; Durbin–Watson ≈ 4.03 . $F=7$			
Regression of intention to use			
Perceived Trust Risk $\rightarrow$ Intention to use	-0.228	-4.515	0.000
Perceived Trust Privacy $\rightarrow$ Intention to use	0.201	3.412	0.001
Perceived Trust Usefulness $\rightarrow$ Intention to use	0.345	5.763	0.000
Perceived Trust $\rightarrow$ Intention to use	0.189	4.030	0.000
Model diagnostics $R^2 = 0.412$ (41.2% variance explained). VIF range = 1.6–1.82; Durbin–Watson ≈ 5.20 . $F=10$			

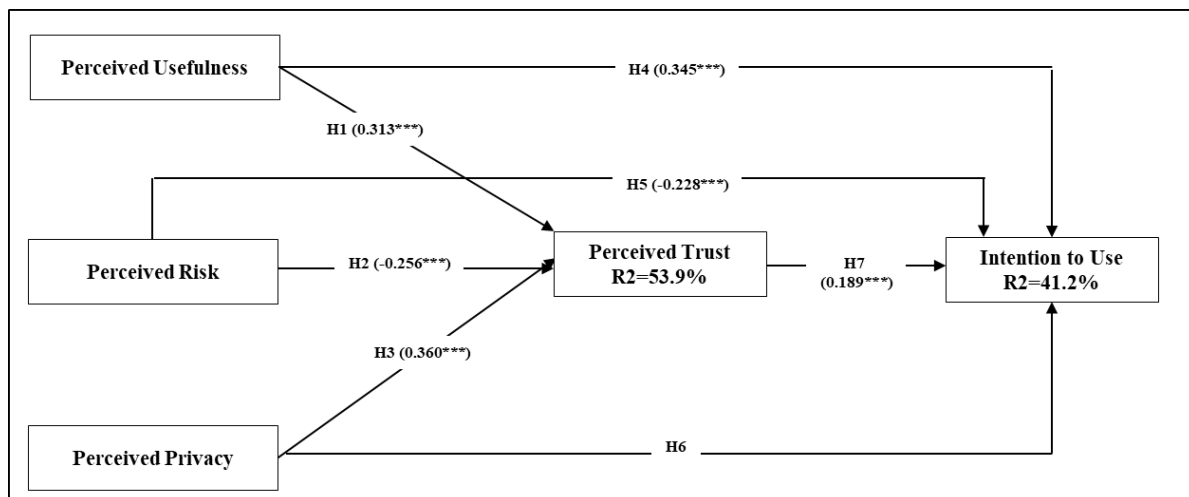


Figure 2 provides the validated and modified TAM model

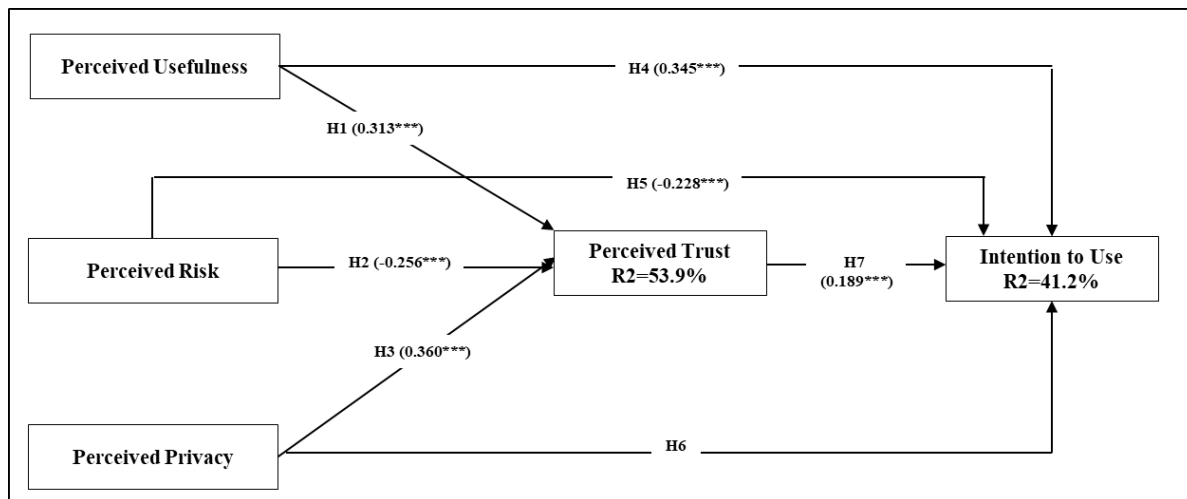


Figure 2. Validated Research Model

Discussion of Findings

The findings support the proposed research model and are generally consistent with prior studies on e-commerce trust (Gefen et al., 2003; Hassna et al., 2023; Kim et al., 2008; Pavlou, 2003). The results confirm that perceived usefulness, perceived privacy, and perceived risk are significant antecedents of perceived trust and consumers' intention to use the mobile app for online shopping. Previous studies have conceptualized trust (Gefen, 2000, 2003) and reputation (Pavlou & Gefen, 2004) as distinct constructs. However, the exploratory factor analysis conducted in this study revealed that the items measuring trust and reputation loaded onto a single factor and therefore were combined into a unified construct representing trustworthiness and reputation. This finding differs from much of the existing literature, which generally treats trust and reputation as separate dimensions. One possible explanation lies in the cultural and contextual characteristics of the study setting. In the Kuwaiti and broader Arab context, consumers may perceive a vendor's reputation as an integral component of trustworthiness rather than as a separate evaluative judgment. As a result, respondents may not clearly distinguish between trusting a vendor and perceiving the vendor as reputable. This finding has important implications for interpreting the results. The construct referred to as "perceived trust" in this study should be viewed as a broader assessment of trustworthiness and reputation. Therefore, the observed relationships may reflect the combined influence of both trust and reputation on consumers' behavioral intentions. Future research should employ confirmatory factor analysis and cross-cultural validation to further examine whether trust and reputation represent distinct constructs in Arab e-commerce environments. Among the examined variables, perceived privacy emerged as the strongest predictor of perceived trust. This finding highlights the importance of protecting users' personal information in online environments, particularly within mobile applications. Consumers are more likely to trust e-vendors that provide clear privacy policies, secure payment systems, and transparent data protection practices.

Perceived usefulness was identified as the strongest predictor of intention to use. This suggests that consumers are more willing to adopt the mobile app when it is perceived as useful, efficient, and capable of enhancing the online shopping experience. Features such as ease of navigation, detailed product information, and convenient transaction processes contribute significantly to perceived usefulness.

Perceived risk negatively influenced both perceived trust and intention to use, indicating that concerns related to security, financial loss, and uncertainty continue to represent major barriers to e-commerce

adoption. Reducing perceived risk through secure payment methods, effective customer support, and reliable transaction systems may therefore strengthen users' trust and increase their intention to shop online.

Conclusion

This study focused on identifying the factors influencing the acceptance of a recently introduced mobile app designed to help consumers in Kuwait purchase healthier food products. The study offers several unique contributions by providing management with practical guidelines to enhance the adoption of the mobile app. At the same time, it presents certain limitations that may serve as directions for future research.

Research Contributions

This study contributes to the literature in three important ways.

First, the study develops a context-adapted, partial TAM-based framework by extending the Technology Acceptance Model with trust-related constructs, applied to a health-related mobile application (FoodSwitch). Unlike traditional e-commerce settings, health-related mobile shopping involves higher perceived risk, greater uncertainty, and stronger concerns about privacy and personal data protection. In this context, the original TAM structure is intentionally adapted, as perceived ease of use (PEOU) was excluded following exploratory factor analysis due to insufficient measurement validity. As a result, the study focuses on perceived usefulness as the core TAM construct, integrated with perceived trust, perceived risk, and perceived privacy to better explain user acceptance in this specific domain. The findings confirm that trust plays a central mediating role in technology adoption under conditions of perceived uncertainty, supporting prior research that emphasizes the importance of trust-related factors in digital environments (Gefen et al., 2003; Hassna et al., 2023; Kim et al., 2008; Pavlou, 2003; Rouibah et al., 2016).

Second, the study highlights the distinctive importance of privacy in health-related mobile commerce. Among the examined antecedents, perceived privacy emerged as the strongest predictor of trust, suggesting that consumers place substantial emphasis on the protection of sensitive personal information when using health-related applications. This finding indicates that privacy concerns may play a more central role in trust formation in health-related digital environments than in many conventional e-commerce contexts.

Third, the study provides empirical evidence supporting the applicability of an extended TAM incorporating trust, privacy, and risk constructs in the Kuwaiti context. The findings contribute to the growing body of research on digital commerce adoption in developing Arab countries and offer insights for researchers and practitioners seeking to understand consumer behavior in emerging digital health and e-commerce ecosystems.

Managerial Implications

The findings offer several practical implications for mobile application developers, health organizations, and policymakers seeking to encourage the adoption of digital tools that promote healthier consumer choices.

First, privacy protection should be treated as a strategic priority. Since perceived privacy emerged as the strongest determinant of trust, application developers should provide clear privacy policies, transparent

data management practices, and explicit explanations regarding how user data are collected, stored, and utilized.

Second, developers should focus on enhancing the application's usefulness by ensuring that nutritional information is accurate, up-to-date, easy to understand, and relevant to consumers' needs. Features that simplify the identification of healthier alternatives and support informed food choices are likely to increase users' willingness to adopt the application.

Third, efforts should be made to reduce users' perceived risk regarding the reliability of nutritional recommendations. Providing information from credible health authorities, nutrition experts, and trusted institutions may strengthen users' confidence in the application and improve trust.

Finally, because trust was found to be a significant predictor of behavioral intention, organizations promoting health-related applications should invest in communication strategies that emphasize credibility, transparency, and reliability. Building trust is essential for encouraging consumers to integrate such applications into their everyday shopping decisions.

Study Limitations

Despite its contributions, this study has several limitations that should be considered when interpreting the findings.

First, the study focused on individuals familiar with mobile technologies and digital applications. Therefore, the findings may not fully represent consumers with limited digital literacy or those who rarely use mobile applications.

Second, the study examined a single mobile application (FoodSwitch). Consequently, the findings may not be generalizable to other types of health-related applications, mobile services, or digital platforms that differ in functionality and user experience.

Third, the study was conducted within the Kuwaiti context. Cultural, social, and economic factors specific to Kuwait may influence users' perceptions of trust, privacy, and technology adoption. Therefore, caution should be exercised when generalizing the findings to other countries.

Finally, the cross-sectional design limits the ability to examine how trust and behavioral intentions evolve over time as users gain experience with the application.

Future Research Directions

The findings of this study suggest several opportunities for future research.

First, this study examined the direct relationships among perceived usefulness, perceived privacy, perceived risk, perceived trust, and intention to use using multiple regression analysis. Although perceived trust was theoretically positioned as a key mechanism linking these antecedents to intention, its mediating role was not formally tested using indirect-effect methods such as bootstrapping. Future research should therefore apply mediation analysis techniques, such as PROCESS macro or structural equation modeling, to examine whether perceived trust partially or fully mediates the effects of perceived usefulness, perceived privacy, and perceived risk on users' intention to use health-related mobile applications.

Second, future research should explore additional factors that may influence both perceived trust and behavioral intention. Variables such as social influence, health consciousness, perceived information quality, electronic word-of-mouth, and prior experience with health-related applications may further enhance the explanatory power of the model.

Third, future studies could examine alternative mediating or moderating relationships among the constructs. For example, trust may interact with variables such as perceived security, satisfaction, or loyalty in shaping users' intention to use mobile health applications.

Fourth, future research may extend the proposed model to other mobile health and digital service contexts, such as fitness, nutrition tracking, and chronic disease management applications. Comparative studies across different types of mobile applications could also provide valuable insights, particularly regarding how demographic and behavioral factors (e.g., age, gender, education, and digital experience) influence trust formation and usage intention.

Finally, longitudinal studies are recommended to examine how trust and users' behavioral intentions evolve over time as individuals gain experience with mobile health applications and as digital health technologies continue to develop.

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