Integrating Technology and Belief: Factors Influencing Halal App Usage Among Students

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Abstract **– Halal tourism represents an emerging sector in global tourism that adheres to Islamic principles in serving Muslim travelers. This aims to investigate the factors that influence students' interest in halal applications, by employing the Technology Acceptance Model (TAM) framework alongside additional constructs, including convenience, functionality, trust, and religiosity. The study adopts a survey methodology involving 582 student participants. The Generalized Structured Component Analysis (GSCA) technique within the framework of Structural Equation Modeling (SEM) is used for data analysis in this study. The research results show that Perceived Ease of Use (PEOU), Perceived Convenience (PCON), and Functionality (FUNC) significantly positively influence Perceived Usefulness (PU). Perceived Usefulness (PU), Trust (TRST), and Functionality (FUNC) also play an essential role in influencing students' interest in using halal applications. Religiosity (RELG) and Perceived Convenience (PCON) do not significantly influence Intention to use halal application (INTE), but Perceived Usefulness (PU) was able to moderate the connection between Functionality (FUNC) and students' interest. This indicates that practical and functional factors are more dominant than religious factors in user decisions. This study contributes by extending the TAM model to the context of halal applications in the education sector, a topic that is still underexplored. This study provides practical insights for stakeholders and developers seeking to promote wider use of halal applications among students and society at large.**

Keywords **– Halal application, convenience, functionality, trust, religiosity.**

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1. Introduction

Halal tourism is an increasingly prominent sector in the global tourism market, designed to accommodate the needs and expectations of Muslim travelers. This form of tourism ensures that all services and facilities comply with Islamic principles, providing a comfortable and faith-friendly environment for Muslim tourists [1]. Muslims strive to align their thoughts, behavior, and way of life with religious principles [2]. Key features of halal tourism include access to halal food, prayer facilities, and gender-segregated amenities [3], [4]. The rise of halal tourism can be attributed to the increasing global Muslim population and the growing middle class within Muslim-majority countries. The Global Muslim Travel Index reports that the Muslim travel market reached a value of $194 billion in 2018 and is expected to maintain its growth momentum. This underscores the substantial economic opportunities for destinations that prioritize halal toursm.

Indonesia has become a key player in halal tourism by delivering comprehensive facilities and services that align with the needs of Muslim travelers. In 2023, Indonesia's halal lifestyle development significantly contributed to the national economy. Indonesia, with 240.62 million Muslims comprising 86.7% of its total population of 277.53 million, emerges as the world's most substantial halal consumer market. The growing halal sector covers a wide array of Sharia-based offerings, ranging from food, clothing, healthcare products, media, travel services, and Islamic financial institutions. Additionally, Indonesia ranked third in the Global Islamic Economy Indicator (GIEI) report, followed by Malaysia and Saudi Arabia [5]. In 2022/2023, Indonesia attracted the highest Islamic economy-related investments. The trade of halal products between Indonesia and Organization of Islamic Cooperation (OIC) countries reached $43.67 billion, comprising $30.29 billion in imports and $13.38 billion in exports [6]. It underscore Indonesia's crucial role in the halal product trade within the OIC region.

The global increase in the Muslim population has transformed the global economy and business landscape. Muslim consumers seek products that are not only safe and beneficial but also halal according to Islamic law. As a result, manufacturers must meet these requirements [7]. The halal industry involves processing goods and services raw materials, equipment, and production processes that comply with Islamic principles. The goal is to produce halal products, including the entire value chain related to this industry, promoting a healthy, ethical, and sustainable halal lifestyle for consumers [8]. The rapid advancement of global technology, mainly through the expansion of the internet and the Fourth Industrial Revolution, is significantly boosting the Islamic economy [6]. This growth is driven by promoting of digital entrepreneurship and innovation across various sectors. The impact of digital technology advancements is profoundly reshaping consumers' daily lives in numerous ways [9]. Halal apps play a crucial role in this ecosystem giving travelers easy access to information about halal-certified products, restaurants, and accommodations [10]. Apps like Verify Halal, eHalal.id, and Halal MUI enable users to check the halal compliance of different goods and services, ensuring a worry-free travel experience. These apps also offer features such as prayer time notifications, Qibla direction, and nearby mosque locations, making it convenient for Muslim travelers to maintain their religious practices while exploring new destinations [11]. Integrating of digital solutions in halal tourism not only enhances the convenience and comfort for Muslim travelers but also promotes Indonesia as a modern and inclusive destination [12].

By leveraging technology, Indonesia continues to attract a growing number of Muslim tourists, contributing to the country's economic growth and cultural exchange [13].

This research investigates the determinants affecting Muslim tourists' inclination to utilize digital halal tourism applications. Previous research has primarily focused on online technology for finding halal products, but there is a lack of studies specifically addressing halal apps in the tourism sector. For instance, this study emphasizes technological aspects by reviewing innovative digital technologies like blockchain, RFID, and IoT in the halal supply chain, this study emphasizes technological aspects [14]. However, it may not fully address consumer perspectives or the challenges small and medium enterprises (SMEs) encounter during technology adoption. In study [15], The emerging practices in halal supply chain management are explored, stressing the importance of digital technologies in verifying halal integrity. The research is constrained by its focus on supply chain management and may not address the end-user experience or the effectiveness of these technologies in different cultural contexts. Other research, [16] examined consumer behavior and the obstacles encountered when buying halal food online, the study's geographical scope restricts its generalizability to regions with distinct cultural and regulatory contexts. This research gap underscores the need for further exploration digital halal tourism applications [17].

In halal tourism, this study expands the Technology Acceptance Model (TAM) by integrating additional variables such as trust, halal knowledge, functionality, perceived usefulness, convenience, and religiosity [18]. These elements form a comprehensive framework to better understand user adoption of technology. Specifically, this study will expand the TAM for analyzing students' interest in using halal applications. Perceived convenience, functionality, perceived usefulness, ease of use, trust, and religiosity are among the key factors examined in this study. The proposed model formulates ten hypotheses (H1–H10) to evaluate the relationships among these variables and their impact on students' intention to adopt halal applications. This structured approach helps in understanding the key determinants of technology acceptance among students, particularly in the context of applications that align with Islamic principles.

1.1. Literature Review and Hypotheses Development

The Technology Acceptance Model (TAM) identifies perceived convenience and usefulness as critical elements that drive individuals' intention to use technology and determine its overall effectiveness [19].

TAM is tailored for use in organizational environments and aims to predict how information technology is accepted and utilized at work [20].

Other external variables influence perceptions of convenience in usage and perceived utility [19], and many studies show that TAM is more effective in explaining sustained intention to use technology if it includes a broader range of exogenous variables [21], [22]. The Technology Acceptance Model highlights that user attitudes toward adopting new technologies are influenced by how easy the technology is to use and how beneficial it is perceived to be [23]. The decision to adopt new technological solutions is largely dependent on individual perceptions, which are shaped by various factors, allowing TAM to help system developers evaluate user responses and behavior [24].

Comfort is a condition in which a person feels at ease when using technology in various activities [19]. Convenience refers to the comfort experienced in performing an activity or obtaining a service, often related to reduced time and effort [25]. Comfort is interpreted as a basic concept that includes the dimensions of time, place, and implementation, integrating important aspects for effective use [26]. Statistical results show that higher levels of comfort lead to a greater perception of perceived usefulness, making it easier for users to use technology whenever and wherever needed [27], [28]. The comfort users feel positively impacts their perception of benefits, as feeling quality in usage makes them comfortable operating the system smoothly, making the system more useful [29]. A strong correlation exists between consumers' perceived online comfort (PCO) and their perceived utility (PU) among consumers in online environments [30]. Technological adoption tends to rise as individual motivation strengthens, when they feel comfortable using it, so perceived convenience significantly impacts perceived usefulness [31]. Perceived convenience has been identified in various studies as a key predictor with a significant positive impact on usage intention [32], [33], [34]. Findings indicate that the level of comfort experienced by users may influence how much benefit they gain from a product or service [35].

One important factor influencing the intention to use is convenience; when individuals feel comfortable, they are more likely to participate [36]. Other studies suggest that the intention to use is strongly associated with comfort, highlighting the need to enhance service customization to make access easy and comfortable [37]. Technological service systems offer high levels of comfort, as this comfort can motivate the adoption of new technology [38]. Convenience significantly influences individual behavior, meaning that when a task feels easy, people are more likely to engage [39].

E-book users, for example, feel that if a technology is convenient, compatible, and has media-rich features, it becomes easier to use and more beneficial, which in turn strengthens the intention to utilize new technological solutions [40].

User acceptance is influenced by perceived convenience, usefulness, and effectiveness [41]. Thus, the first and second hypotheses are:

H1: Perceived convenience (PCO) has an effect significant positive on perceived usefulness (PU).

H2: Perceived convenience (PCO) has an effect significant positive on intention to use (IU).

Religion is a system of symbols, beliefs, and organized practices that enable individuals to feel a connection with God and provide guidance in their relationships with others [42]. Religiosity is the level of devotion, faith, and respect a person has toward God [43]. It is associated with a lifestyle, manifested through the values and beliefs held by individuals or communities [44]. As a personal commitment to God's rules, religiosity influences one's way of life, interactions with others, and choices in consuming products and services [45]. Therefore, creating individual interest in using technology that aligns with religious teachings is essential [46]. Religiosity plays a very important role when a Muslim faces actions related to religion [47]. Additional research indicates that religiosity positively and significantly impacts individuals' intention to adopt technology [48], [49]. A society that adheres to religious values tends to have a stronger intention to adopt mobile service platforms [45]. The level of religiosity can determine consumer satisfaction and interest in a product or service [50], [51], [52], [53].

Thus, the third hypothesis can be stated as follows:

H3: Religiosity (RE) has an effect significant positive against intention to use (ITU).

Functionality can be interpreted as information from services provided [54]. Functionality features of service will influence the satisfaction consumer [55]. A technology is considered more valuable by individuals if it can be used effortlessly, without encountering challenges or disruptions [56]. The effectiveness of an application's technical aspects is a key driver of both perceived usefulness and future usage intention among users [57]. Functionality systems show that every element or instrument functioning functions with good for support performance overall [58]. The functionality of halal applications positively affects both perceived usefulness and usage intention, elements like responsiveness, ease of use, organized interface, and technical reliability motivate users to interact with the application more regularly [59].

Findings from other research demonstrate that the usability features of tablets, such as responsive touchscreens and simple interfaces, support users in performing tasks like browsing information, reading, and accessing media content [57].

Previous studies on wireless technology adoption show that compatibility between task characteristics and technology and perceived usefulness are interrelated [60].

An individual's perception of mobile multimedia services is influenced by the functionality of the device's hardware and software, such as battery life, display quality, speed, and features [61]. Functionality significantly enhances perceived usefulness, which subsequently exerts a positive influence on the intention to use. The fourth, fifth, and sixth hypotheses are as follows:

H4: Functionality (FU) has an effect significant positive against intention to use (ITU).

H5: Functionality (FU) has an effect significant positive on perceived usefulness (PU).

H6: Functionality (FU) has an effect positive towards intention to use (ITU) through perceived usefulness (PU) in halal application users.

Perceived utility relates to how users view applications overall and the functional support and efficiency they experience during use [62]. Perceived usefulness refers to an individual's belief that utilizing e-Government services provides advantages and outperforms conventional public service system [63]. Perceived usefulness is the perception that technology can enhance the performance of business users who adopt it [64]. Innovative technologies offer support, adaptability, improved efficiency, and enhanced productivity, which are regarded by users as valuable benefits [65]. A number of studies have shown that perceived usefulness plays a crucial role in positively shaping the intention to use a system or application. [63], [66], [67]. The benefits experienced by user's stem from the innovative technology's ability to provide assistance, efficiency, and productivity, helping to alleviate dissatisfaction [19]. If consumers perceive benefits from implementing technology, they become more willing to use it [68]. A positive technological perception among students strongly contributes to their willingness to utilize online platforms, highlighting the critical role of perceived usefulness in influencing usage intention [69], this contributes to a marked positive effect of perceived usefulness on users' behavioral intentions [70].

Thus, the seventh hypothesis is:

H7: Perceived usefulness (PU) has an effect significant positive against intention to use (ITU).

Convenience of use is defined as an individual's perception that a system can be operated with minimal physical or cognitive effort [19].

Users' perceptions of a technology's convenience directly contribute to their assessment of its usability and practical value [71]. When technology is easy to use without requiring additional effort, confidence in its benefits also increases [72]. When halal applications are offered, they increase user trust by providing positive benefits and convenience [73]. Perceived usefulness is often influenced by how easy a system is perceived to be used; if an application is to use, users are less likely to be interested [28].

The simpler the use of mobile banking, the greater the benefits perceived by its users [74]. The perception of ease in using a system has been consistently associated with an increase in its perceived usefulness [31], [66], [75], [76]. This research also shows that the more accessible and more comfortable the service is to use, the higher the perceived benefits for consumers. [27], [34], [77], [78]. Convenience of use is essential in influencing user intentions through perceived benefits [79].

The intention of customers to use a technology is largely determined by its perceived ease of use, given that effective engagement with mobile banking requires specialized skills and understanding [80]. The perception of ease in using a system positively and significantly influences users' intention to adopt it [66], the perceived ease of use of an application enhances users' willingness to accept and maintain continued usage of the technology [68]. Young consumers in India, for example, tend to intend to use M-banking services because they consider it easy to use [81]. The adoption of mobile banking services in Brazil has been positively linked to users' perception of the system's convenience [82]. Consumers' intention to adopt mobile banking is greatly influenced by how useful and easy to use they perceive the service to be [74].

The eighth and ninth hypotheses are:

H8: Perceived Ease of Use (PEOU) has an effect positive and significant on Perceived Usefulness (PU).

H9: Perceived Ease of Use (PEOU) has an effect positive and significant against Intention to Use (ITU).

To encourage greater participation in online transactions, service providers need to build trust to reduce consumer uncertainty and concerns about risks and security issues [83]. Individual trust in the characteristics of others or systems can be defined as confidence [84]. Trust plays a crucial role in positively influencing the purchase intentions of online consumers [85]. Trust depends on the reliability of food, system applications, and business practices that align with Islamic teachings [86].

Consumers will continue using online platforms if they trust the technology and its outcomes, as this demonstrates the benefits of the technology [87].

If users are confident that the institution managing the technology is reliable in safeguarding their personal information and privacy, they are more inclined to employ the system in practice. This indicates that trust in the institution managing the technology is a key factor in determining users' interest in adopting the technology [68]. Research in the field of business shows that a positive intention to adopt mobile services can be directly built through trust [88].

Empirical studies have identified trust as a critical factor that significantly enhances users' intention to utilize a given service or platform [46], [66], [89].

Thus, the tenth hypothesis is:

H10: Trust (TR) has an effect positive and significant against Intention to Use (ITU).

2. Research Methodology

This research adopts a quantitative method within an explanatory research framework, which aims to identify connection causal between variables that influence students' interest in halal application. Participants are student active at Surabaya State University. This study used Krejcie and Morgan's sample size determination, with a total of 582 samples collected [90].

The characteristics of the respondents are presented in Table 1:

Table 1. Description of respondents

Gender	Male (28.5%)	166
	Female (72.5%)	416
Age	18 years or below (13.4%)	78
	19 years (36.6%)	213
	20 years (36.4%)	212
	21 years (12%)	70
	22 years or above (1.6%)	9
Duration of use application	Less than 6 months (98.8%)	576
	1 year (0.6%)	3
	More from 1 year (0.6%)	3

Source(s): Authors' work

Based on the data obtained from the 582 students at Surabaya State University, there is a significant difference in the gender composition of the respondents. A total of 72.5% of respondents are women, while only 28.5% are men. This shows that women dominate the student population at the university. The majority of participants are aged between 19 and 20 years, with 36.6% aged 19 and 36.4% aged 20. Only 13.4% of respondents were 18 years or younger, 12% were 21, and just 1.6% were 22 years or older.

This indicates that the student population tends to be young, ranging from first-year to second-year students. Furthermore, regarding the duration of application use, almost all respondents (98.8%) reported using the application for less than six months. Only 0.6% have used the application for one year, and another 0.6% have used it for more than one year. These findings indicate that most respondents are first-time users, likely still in the process of exploring the features and functions of the application. With this information, it can be concluded that this survey reflects the perspective the application's relatively young, new users, providing insight into the experiences and challenges they encounter during initial use.

The instrument of the study uses a questionnaire with 5- 5-point Likert scale (from "Strongly Disagree " to " Strongly Agree ") for measure perception and intention use halal application [91]. This questionnaire adapts relevant variables from study previously, such as perceived convenience [32], religiosity [92], functionality [93], perceived usefulness and perceived ease of use[18], and trust [47]. Each variable consists of some question items to catch aspects specific to the behavior user. Research instrument is in the attachment.

Data collection was conducted through the Google Form platform to enhance accessibility and expedite the response process. All questionnaires were distributed to students online between February and November 2024. A preliminary pilot study was carried out on the research instrument before collecting the primary data, utilizing Pearson Product Moment and Cronbach's alpha methods via SPSS to assess validity and reliability [94]. The questionnaire that satisfied the established validity and reliability standards was subsequently employed in the full-scale survey.

The study utilized the Generalized Structured Component Analysis (GSCA) method within the framework of Structural Equation Modeling (SEM) to analyze the data, employing the GSCA-Pro application. The GSCA method was selected because it can analyse connections between latent variables simultaneously, provide stable estimates even if the data is not normally distributed, and can handle relatively small sample sizes. The analytical procedure involves two phases: Analysis of both the measurement and structural components. The evaluation of the measurement model involves assessing construct validity and reliability, whereas the structural model is analyzed to examine model fit and the hypothesized relationships among variables. Model fit indicators, such as GFI and SRMR, are used to ensure that the resulting model aligns with empirical data. Figure 1 illustrates the structural model of this study, which depicts the relationships among perceived convenience, religiosity, functionality, perceived usefulness, perceived ease of use, trust, and intention to use a halal application:

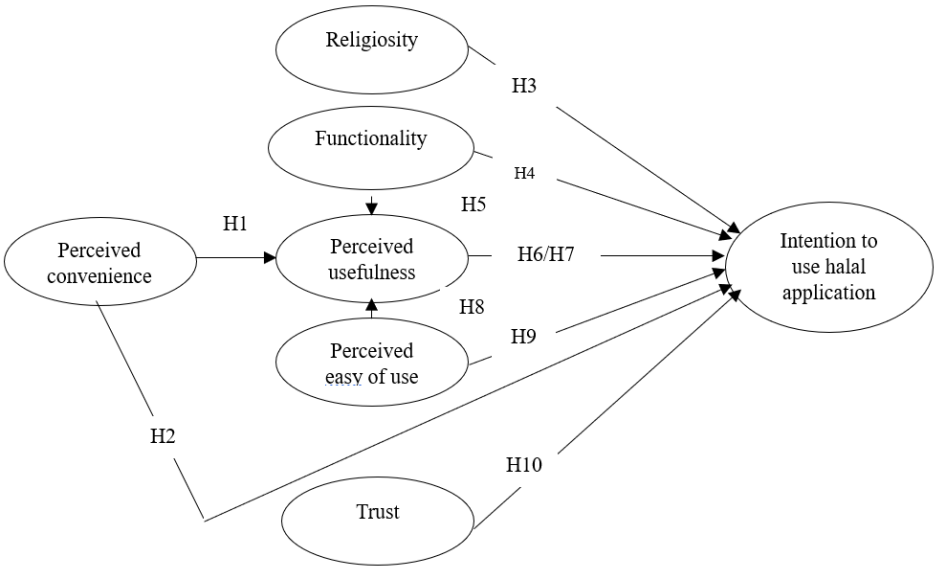

Figure 1. Structural model

3. Results

This section presents the results of the study, which include the assessment of the measurement model and the structural model. The measurement model assessment evaluates the reliability and validity of the constructs, while the structural model assessment examines the relationships among the variables to address the research objectives regarding factors influencing Halal app usage among students.

3.1. Measurement Model Assessment

Based on Table 2, it can be known that the indicators of loading on components that have been conducted in the research. Indicators of loading on components can be condition when value ⩾0.7 [95]. If the observed mark indicators of loading on components are ⩾0.7 then, it can be concluded that the model in this research has fulfilled condition from indicators of loading on component. For the RELG construct, the indicator RELG3 demonstrates the highest factor loading at (0.884), whereas RELG5 exhibits the lowest loading value, recorded at (0.768).

Table 2. Indicator of loading assessment

Loadings				
	Estimate	SE	95%CI(L)	95%CI(U)
RELG				
RELG1	0.823	0.031	0.743	0.869
RELG2	0.881	0.023	0.832	0.922
RELG3	0.884	0.021	0.846	0.923
RELG4	0.835	0.038	0.749	0.895
RELG5	0.768	0.039	0.685	0.833
PU				
PU1	0.878	0.017	0.844	0.908
PU2	0.906	0.011	0.882	0.931
PU3	0.931	0.009	0.912	0.947
PU4	0.858	0.016	0.828	0.887
PEOU				
PEOU1	0.891	0.012	0.862	0.916
PEOU2	0.918	0.009	0.900	0.935
PEOU3	0.902	0.012	0.874	0.924
PEOU4	0.910	0.011	0.886	0.930
PEOU5	0.834	0.021	0.795	0.879
TRST				
TRST1	0.755	0.033	0.686	0.815
TRST2	0.852	0.016	0.810	0.881
TRST3	0.884	0.011	0.855	0.902
TRST4	0.882	0.009	0.868	0.899
TRST5	0.837	0.017	0.800	0.867
PCON				
PCON1	0.929	0.009	0.914	0.946
PCON2	0.944	0.006	0.930	0.957
PCON3	0.915	0.010	0.891	0.933
INTE				
INTE1	0.905	0.011	0.882	0.928
INTE2	0.936	0.007	0.919	0.951
INTE3	0.940	0.006	0.925	0.952
FUNC				
FUNC1	0.914	0.008	0.895	0.929
FUNC2	0.923	0.010	0.899	0.941
FUNC3	0.896	0.010	0.876	0.917

Source(s): Authors' work

The highest loading on the PU variable is observed in PU3 (0.931), while PU4 demonstrates the lowest loading value of (0.858). Among the indicators of the PEOU variable, PEOU2 exhibits the highest loading value (0.918), whereas PEOU5 shows the lowest loading value (0.834). For the Trust construct, the TRST3 indicator has the highest loading value (0.884), while TRST1 has the lowest (0.755).

The highest loading for the PCON construct is observed on the PCON2 indicator (0.944), with the lowest on PCON3 (0.915). INTE3 demonstrates the greatest loading value (0.940) for the INTE variable, while INTE1 presents the smallest (0.905). The FUNC2 indicator exhibits the strongest factor loading (0.923) for the FUNC variable, in contrast to FUNC3, which has the weakest loading (0.896).

Table 3. Construct quality measures

Construct quality measures							
	RELG	PU	PEOU	TRST	PCON	INTE	FUNC
PVE	0.705	0.799	0.795	0.712	0.864	0.860	0.831
Alpha	0.894	0.916	0.935	0.898	0.921	0.918	0.898
rho	0.922	0.940	0.951	0.925	0.950	0.948	0.936
Dimensionality	1	1	1	1	1	1	1

Source(s): Authors' work

The assessment of construct quality (indicator reliability) involves examining convergence validity, consistency across items, and overall reliability of the construct, where PVE values are deemed acceptable if they are 0.50 or higher [1]. A Cronbach's alpha value is considered good when it is >0.70 and if the Composite Reliability (rho) is >0.70, the items in the variable can be considered reliable [96], [97]. The dimensionality value should be 1.0 [98].

Table 3 shows that the PVE values for the variables RELG, PU, PEOU, TRST, PCON, INTE, and FUNC are all above 0.50.

The results indicate that the Alpha and Rho coefficients for all constructs exceed the threshold of 0.70, demonstrating strong reliability in terms of measurement convergence, internal coherence, and overall construct reliability within the proposed model.

Forner Lacker criterion values have proven that overall diagonal values that represent root the square of AVE is found more from correlation between factor [2]. Table 4 shows the discriminant validity, indicating that the measurement model has acceptable psychometric characteristics.

Table 4. Component validity assessment

Fornell-Larcker criterion values							
	RELG	PU	PEOU	TRST	PCON	INTE	FUNC
RELG	0.839						
PU	0.414	0.894					
PEOU	0.375	0.774	0.892				
TRST	0.430	0.753	0.753	0.843			
PCON	0.357	0.667	0.680	0.611	0.929		
INTE	0.333	0.680	0.714	0.656	0.537	0.927	
FUNC	0.360	0.783	0.768	0.732	0.682	0.703	0.911

Source(s): Authors' work

Table 5. HTMT

HTMT	
RELG <-> PU	0.458
RELG <-> PEOU	0.410
RELG <-> TRST	0.481
RELG <-> PCON	0.393
RELG <-> INTE	0.365
RELG <-> FUNC	0.401
PU <-> PEOU	0.834
PU <-> TRST	0.830
PU <-> PCON	0.725
PU <-> INTE	0.736
PU <-> FUNC	0.862
PEOU <-> TRST	0.819
PEOU <-> PCON	0.732
PEOU <-> INTE	0.769
PEOU <-> FUNC	0.838
TRST <-> PCON	0.671
TRST <-> INTE	0.717
TRST <-> FUNC	0.812
PCON <-> INTE	0.583
PCON <-> FUNC	0.749
INTE <-> FUNC	0.773

Source(s): Authors' work

While mark maximum HTMT is 0.90 capable, the results indicate an acceptable level of discriminant validity [1]. As it is seen in the Table 5 about HTMT, overall variable shows that mark 0.90 is not enough evaluation for discriminant validity with HTMT to be met and cannot be accepted.

Opinions expressed by [99] that VIF value <5, the purpose of the Variance Inflation Factor (VIF) is to assess whether there is a linear correlation among the independent variables in a regression analysis. In line with research by [100], it is revealed that redundancy in an indicator, due to height level multicollinearity, in indicators are not significant.

To find out if there is or whether or not multicollinearity can be known from mark variance inflation factor (VIF), Table 6 shows VIF value of each <5, then can be concluded that VIF value in research has fulfilled VIF standard and free from problem multicollinearity.

Table 6. Assessment of component correlation

VIFs						
	RELG	PU	PEOU	TRST	PCON	INTE	FUNC
RELG						1.265	
PU						3.604	
PEOU		2.750				3.491	
TRST						3.003	
PCON		2.106				2.190	
INTE							
FUNC		2.759				3.443	

Source(s): Authors' work

Table 7 shows the results from R square calculation, R square itself aiming to measure strength prediction from the structural model.

The PU variable demonstrates a value of 0.695, indicating that 69.5% of the variance in perceived usefulness is explained by the exogenous variables included in this study, while the remaining 30.5% is attributed to factors not accounted for in the model.

The INTE construct produced a value of 0.585, suggesting that 58.5% of the variance in intention is accounted for by the exogenous variables examined in this study, while the remaining 41.5% is attributed to other factors not captured within the proposed research model.

Table 7. R square

R squared values of components in structural model						
RELG	**PU**	**PEOU**	**TRST**	**PCON**	**INTE**	**FUNC**

Source(s): Authors' work

3.2. Structural Model Assessment

FIT values range from 0 to 1, and FIT itself functions as an explanation of the total variance across all variables.

A higher FIT value indicates that more variance is explained by the research model [3].

Table 8. Structural model fit measures

FIT	AFIT	FITs	FITm	GFI	SRMR	OPE	OPEs	OPEm
0,663	0,661	0,183	0,783	0,997	0,027	0,337	0,821	0,216

Source(s): Authors' work

Based on Table 8, the FIT value is 0.663, meaning that 66.3% of the variance in the model is explained. The AFIT score, reflecting the model's complexity, is measured on a scale from 0 to 1. In the context of this research, the AFIT score of 0.661 signifies that the model accounts for 66.1% of the total variance. FITs represent the total variance explained by all model components, also ranging from 0 to 1.

In this study, the FITs score of 0.183 indicates that the structural model accounts for 18.3% of the observed variance. FITs, which ranges from 0 to 1, has a value of 0.783 in this research, indicating that 78.3% of the variance is explained in the measurement model. When the sample size is 100, the model fit is considered acceptable if the GFI value is >0.89 and SRMR is ⩽0.09 [3]. A GFI score of 0.997 and an SRMR value of 0.027 demonstrate that the model satisfies the requirements for an acceptable fit.

Table 9. Path coefficient

Path coefficients					
	Estimate	SE	95%CI(L)	95%CI(U)	Information
PEOU->PU	0.365	0.051	0.248	0.459	Hypothesis accepted
PCON->PU	0.141	0.039	0.063	0.225	Hypothesis accepted
FUNC->PU	0.406	0.046	0.327	0.503	Hypothesis accepted
RELG->INTE	0.016	0.038	-0.055	0.083	Hypothesis rejected
PU->INTE	0.145	0.079	0.021	0.288	Hypothesis accepted
PEOU->INTE	0.319	0.059	0.220	0.442	Hypothesis accepted
TRST->INTE	0.123	0.055	0.003	0.205	Hypothesis accepted
PCON->INTE	-0.051	0.048	-0.142	0.045	Hypothesis rejected
FUNC->INTE	0.283	0.063	0.151	0.415	Hypothesis accepted
FUNC -> PU -> INTE	0.059	0.032	0.008	0.119	Hypothesis accepted

Source(s): Authors' work

Significance of the path coefficient is confirmed when it falls inside the 95% confidence level range and indicates a positive, non-negative estimate. Statistical significance at the 0.05 level is established when the confidence interval excludes 0 [3]. Table 9 shows the results of the path coefficients of PEOU to PU is 0.365 (CI L = 0.248, CI U = 0.459), these findings support the acceptance of the first hypothesis, meaning PEOU significantly influences PU. The path coefficient value of PCON to PU is 0.141 (CI L = 0.063, CI U = 0.225), these results confirm the second hypothesis, showing that PCON significantly and positively impacts PU. The path coefficient value of FUNC to PU is 0.406 (CI L = 0.327, CI U = 0.503), confirming the third hypothesis, which suggests that FUNC significantly influences PU.

The path coefficient value of RELG to INTE is 0.016 (CI L = -0.055, CI U = 0.083), leading to the rejection of the fourth hypothesis, meaning RELG does not significantly influence INTE.

The path coefficient value of PU to INTE is 0.145 (CI L = 0.021, CI U = 0.288), these findings support the fifth hypothesis and demonstrate that PU has a significant influence on INTE. The path coefficient value of PEOU to INTE is 0.039 (CI L = 0.220, CI U = 0.442), supporting the sixth hypothesis, which shows that PEOU significantly influences INTE. The path coefficient value of TRST to INTE is 0.123 (CI L = 0.003, CI U = 0.203), the results validate the seventh hypothesis, indicating that TRST significantly and positively affects INTE.

The path coefficient value of PCON to INTE is -0.051 (CI L = -0.142, CI U = 0.045), leading to the rejection of the eighth hypothesis, indicating that PCON does not significantly influence INTE. The path coefficient value of FUNC to INTE is 0.283 (CI L = 0.151, CI U = 0.415), supporting the ninth hypothesis, indicating that FUNC significantly influences INTE. Finally, the path coefficient value of FUNC to INTE via PU is 0.059 (CI L = 0.008, CI U = 0.119), supporting the tenth hypothesis, indicating that FUNC significantly influences INTE through PU.

4. Discussion

The focus of this study is to investigate what factors contribute to students' engagement with halal applications at Surabaya State University. This investigation is based on the TAM framework, which prioritizes two key perceptions: The usefulness and the ease of use of technology. In addition, this research also considers additional variables such as perceived convenience (PCON), functionality (FUNC), trust (TRST), and religiosity (RELG). This discussion will describe the research results and analysis for each variable, as well as their interactions in the context of using halal applications.

Perceived convenience (PCON) positively affects perceived usefulness (PU) in user's halal application. The results show that convenience in access and use halal application is significant to perception benefit application PCON, which refers to perceived comfort. moment use applications, contributing to the perception user about how much beneficial is said that application is. In the digital era where students often have busy schedules, the application offering comfort in its use will be more interesting. For example, the feature search fast and efficient halal products can increase PCON, so that users feel more satisfied and inclined to use the application in a repeated way. This result follows the TAM (Technology Acceptance Model) theory, which states that convenience access increases perception benefits [19]. Easy application used makes it easier to operate its activities, increasing perception benefits. Research results in accordance with supporting research that PCON has an effect positive against PU [32], [33], [34], [35].

However, there are different facts with study previously stated that there is no influence between PCON and INTE. Some possibilities may come from the features in the application, but comfort by itself is not enough to keep users interested or using it continuously. This is in no accordance with results of the research that states that comfort will give influence to interest individual to use technology [37], [40]. However, the research results are in line with research that states that although variable comfort can influence attitude users, the variable has no impact on intention consumers to buy traditional food [101]. Another study that states similar results that comfort use digital wallets of smartphone owners in the USA do not influence the intention in adopting technology on digital wallets [102]. Afterwards, other research reveals that comfort in using mobile phone is not influential to intention to use it on cycle repeat rubbish electronics in India [103].

This research reveals that religiosity is not a significant determinant of users' intention to adopt the application.

The result deviates from previous empirical evidence, which states that one's level of religiosity can determine consumer satisfaction and interest in a product or service [50], [51], [52], [53].

In this context, users are more influenced by the application's practical aspects than religious factors. These findings may be surprising, considering that halal applications are designed to meet users' religious needs. However, this shows that other factors, such as convenience, are more dominant in influencing users' decisions to adopt the application. One explanation for these findings is that younger generations, including students, are more influenced by practical and functional factors than by religious considerations. As an example, prior research on halal tourism applications has demonstrated that religiosity does not play a significant role in influencing users' interest, as the application is more related to travel preferences and culinary choices than to religious obligations [66]. Similarly, other studies have indicated that religiosity does not significantly affect the intention to buy sports equipment and accessories in the Indian market [104]. Religiosity also does not affect users of the ShopeeFood application when ordering halal food in Indonesia [105]. Furthermore, the purchase of luxury products in Pakistan is also not influenced by religiosity [106]. This indicates that, in the context of halal applications, users may be more focused on practical benefits offered by the application than on religious aspects.

Functionality (FUNC) is affected positive on intention to use (INTE) and perceived usefulness (PU) in halal applications. Complete and relevant functions in application proven increase interest user. This outcome affirms that functionality plays a crucial role in positively affecting perceived usefulness and user intention toward halal application usage [59]. However, FUNC shows that Features offered by the application must be relevant and fulfil need users. Halal applications that have clear and useful functions will more Possible received by the user. For example, complete information about halal products and ability to share information with the community can improve FUNC. This research shows that user not only looks for an easy application for using, but also who offers features that can help them in fulfilling needed daily related halal. Analysis results show that functionality applications influence perception user to its benefits. This is in accordance with TAM theory, where the more complete function applications, increasingly big benefits felt users [18]. In addition, functionality (FUNC) contributes to intention to use (INTE) through its positive effect on perceived usefulness (PU). Functionality No only impact direct but also in a No direct through perception benefits. These results follow the theory that benefits application become an important mediator in building interest user [107].

These research findings are further supported by previous studies indicating that functionality significantly enhances perceived usefulness, which in turn positively influences the intention to use [108].

Intention to use (INTE) is significantly affected by both perceived usefulness (PU) and perceived ease of use (PEOU) in a positive manner. Users who feel application the beneficial tend own intention stronger for using it. This result is consistent with TAM theory, which states that perception benefit plays an important role in motivating users [19]. The result corresponds with various studies that confirm perceived usefulness significantly enhances users' intention to adopt the system [63], [66], [67]. This research reveals that for halal application users, perceived ease of use (PEOU) significantly enhances their perceived usefulness (PU) and strengthens their intention to use (INTE). This suggests that increased ease of use enhances users' perception of the application's usefulness. In the context of halal applications, ease of use becomes a key factor that can increase students' interest in adopting this technology. Previous research also supports these findings, where ease of use often becomes a determining factor in adopting new technology [19].

Important For noted that PEOU does not only covers aspect of technical from application, but also experience user in a way overall. Designed application with intuitive interface and simple navigation will be more interesting for user. In the context of halal applications, users who feel comfortable and not experience difficulty when using the application tend to have more perception positive to the benefits offered. This shows that developer applications must focus on user-friendly design for increase PEOU and PU. Perceived ease of use has been shown in some studies to play a crucial role in enhancing perceived usefulness [31], [66], [75], [76]. Convenience in use application increases perception benefit and directly influences the intention user. This is consistent with theory, where the ease use push adoption technology [107]. This outcome aligns with earlier studies, reinforcing the notion that perceived ease of use (PEOU) positively and significantly affects the intention to use (INTE) [66].

Trust (TRST) is an important variable in this study. Users' trust in an application can influence their intention to use it. In the context of halal applications, trust can be built through transparency, data security, and the reputation of the application provider. Research shows that users who trust an application are more likely to use it regularly. Trust is crucial in applications related to religious and ethical aspects, in order to ensure that the data they are presented with is both valid and trustworthy. Factors that can increase TRST include positive reviews from other users, certification from competent institutions, and clear privacy policies.

Application developers should focus on building trust through clear communication and effective risk management. Transparency in user data management and personal information security becomes very important in this context. Users who feel that the application is safe and trustworthy are more likely to adopt and use the halal application sustainably. Some relevant research provides evidence that trust intention to use [46], [66], [89].

5. Conclusion

Although this research yields significant contributions, several critical constraints should be considered. First, this research was conducted at only one university, consequently, the applicability of the findings to other populations may be restricted. Future research should consider involving more universities or even users outside the academic environment. Second, a non-probability sampling approach was adopted in this study, which may affect the sample's representativeness. Therefore, future research is recommended to use more representative sampling methods. Another limitation is that this study did not consider external factors that may influence the use of halal applications, such as cultural influences, government policies, and technological developments. Future research could explore how these factors interact with the variables investigated in the context of halal applications. Considering these limitations, future research directions could include longitudinal studies to understand user intention and behaviour changes over time. Additionally, demographic variables such as age, gender, and education could be examined in future research to identify potential differences in halal application usage. Future studies could also consider exploring factors that influence user trust in the context of halal applications and how application developers can build and maintain this trust. Identifying the determinants that affect the adoption of halal applications is expected to make a significant contribution to developing more user-centered applications, enhancing our understanding of this phenomenon in the context of information technology and user behaviour.

The study's overall outcome indicates that PEOU, PCON, and FUNC are key determinants that positively affect the perceived usefulness of the system, which subsequently impacts users' intention to adopt halal applications. Although religiosity and PCON do not show a significant influence, trust remains an important element in technology adoption. An understanding of these factors allows developers to design applications that are better aligned with user expectations and preferences, thereby increasing the adoption of halal applications among students and the wider society.

This study is anticipated to provide a valuable reference for future research in the fields of information technology and user behavior. The results of this research carry important practical implications for developers of halal applications. First, application developers must prioritize user-friendliness in their design. An intuitive interface design and simple navigation can increase PEOU and, consequently, PU. Second, developers should consider adding relevant and useful features for users to enhance functionality (FUNC). Third, building trust through security and transparent information will be very important in attracting users.

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