# Application of Unified Theory of Acceptance, Use of Technology Model and Delone & Mclean Success Model to Analyze Use Behavior in Mobile Commerce Applications

Dendy K. Pramudito[1✉], Arief Nuryana[2], Syeh Assery[3], Hery Purnomo[4], Asri Ady Bakri[5]

[1]Universitas Pelita Bangsa
[2]Universitas Mercubuana Yogyakarta
[3]STIE Widya Wiwaha
[4]Universitas Nusantara PGRI Kediri
[5]Universitas Muslim Indonesia

doktor.haji.dendy@pelitabangsa.ac.id

## Abstract

In order to assist businesses, create more efficient solutions and get the greatest benefits from these applications, this research was undertaken with the primary goal of identifying the elements that influence the behavior of utilizing food service applications and enhancing their use. Three variables from the Delone & Mclean IS Success Model and the measurement model, UTAUT, are used in this study's quantitative methodology. Users of food service applications on the island of Java make up the study's population. A total of 150 people responded to the samples. Purposive sampling was used to collect samples. Data analysis using SmartPLS version 4 and the PLS-SEM methodology. Five of the seven factors examined in the study of interest and usage behavior were found to be valid. This means that the use of food service applications can improve performance, assisted by supporting facilities and systems of good quality, so that it can affect the level of user acceptance of the food service application. This research can provide startups with an understanding of the factors that influence their application usage behavior, with the aim of increasing the acceptance and use of food service applications.

**Keywords:** Food Service, Application, UTAUT, Delone & Mclean, Performance.
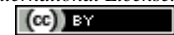
## 1. Introduction

Electronic commerce, or e-commerce, is a term used to indicate buying and selling activities using the internet that bridge transactions between organizations and customers and are facilitated by various kinds of digital technology that enable electronic communication activities to occur. Mobile commerce (m-commerce) refers to e-commerce procedures and business models that utilize mobile devices. The ability to shop online whenever and wherever one wants is one of the benefits of adopting mobile commerce [1]. Despite the proliferation of e-commerce and the benefits it offers, Indonesian business people still ignore and are hesitant to adopt e-commerce, which they perceive as a new phenomenon to be adopted, due to problems with poor infrastructure and inadequate online policies. Previous research said that in order to benefit from the implementation of a technology, the first challenge that must be faced is how to succeed in implementing it. Technology must be accepted and used by members of the organization as users so that it can increase productivity [2].

The Unified Theory of Acceptance and Use of Technology (UTAUT) is one of various models that can be used to assess the degree of user acceptance. Since 2003, UTAUT has been regularly utilized in literature both domestically and internationally to analyze the acceptance of an information system. This model is the culmination of eight successful models that were previously created. In comparison to the other eight theoretical models, the UTAUT model is thought to be more successful at describing up to 70% of user variations. Use behavior is defined as the overall feeling and reaction of an individual to using something. A system will be used when users of the information system are interested in using technology [3]. The UTAUT theory demonstrates how performance expectancy, effort expectancy, social influence, and facilitating factors affect users' intentions to use (behavioral intention) and actual conduct (use behavior) when interacting with a system. With the intention of identifying interest in utilizing the system and sustainable use behavior, the UTAUT model is a theory that describes the aspects that drive user behavior and technological adoption. This model was developed by Vankatesh and other researchers. Through the development of the UTAUT model, Venkatesh hopes to provide better guidance for companies and developers in designing, marketing, and implementing technologies that are more accepted and used by users. The UTAUT model has the advantage of describing the relationship between user convenience,

perceived benefits, and their interest in using technology. This theory is a combination of eight theories about the adoption of other technologies, with the aim of obtaining the same view about their application [4].

Along with the six factors from the UTAUT model, three more DeLone & McLean model variables System Quality, Information Quality, and Service Quality were introduced in this study [5]. By merging the theories of the UTAUT model and the D&M model, an integrated evaluation model was created. Information system success is measured using the Delone and Mclean models. The Delone & Mclean Information System Success Model was initially presented based on their study in 1992. Six factors that are used to gauge the effectiveness of information systems are interdependent, as shown by this model [6]. According to this concept, the six success factors for information systems are system quality, information quality, usability, user happiness, personal impact, and organizational impact [7]. The model can be used to assess the success of online shopping as well as its primary impacts on a range of individuals, social groups, companies, and industries [8] [9]. Additionally, determining six factors in the information system success model, particularly in the model that can be used for e-commerce study, by reading papers about e-commerce [10] [11]. The six factors are net benefits, intention to use, system quality, information quality, service quality, and intention to use [12].

The object of this study is a digital start-up in the field of agrotechnology founded in 2017. They provide distribution services for fresh food such as vegetables, fruit, fish, dry goods, chicken, eggs, and meat to B2B and B2C consumers in Greater Jakarta, Semarang, Bandung, and Surabaya. Since 2020, startups have been using mobile applications to sell their products. This application makes it easy for consumers to buy food with features such as catalogs, digital payments, discount vouchers, and more. The food service application in its use is still relatively new because, in selling it, startups are transitioning towards using the application as a whole because there is still a transaction process carried out through sales. In 2021, it had 48,000 users and hoped to reach 100,000 in 2022. Data obtained from internal parties says that up to 2022, the increase will not be significant, only reaching 57,000 users [13]. Researchers conducted interviews with a Business Analyst named Dimas. Dimas revealed that based on the data mentioned, it turned out that the number of application users did not reach the specified target, so startups did not yet know whether consumers could adopt the application they made, and it was important to understand the behavior of using the new application so that they could evaluate it to increase the number of users [14] [15]. Therefore, researchers are interested in conducting research on this issue by providing companies with knowledge about what influences the behavior of using food service applications to increase application acceptance and users.

## 2. Research Methods

To ascertain the characteristics that affect usage behavior and application adoption in this research strategy, quantitative methodologies are employed. Both data gathering and data analysis approaches are employed in this study. The process of gathering data involved observation, reading of relevant literature, and the distribution of surveys to application users online using the Google Forms tool. The second approach is then statistical data analysis using the used model. After all the surveys have been collected, the data will be categorized and aggregated using Microsoft Office 365 to make the next analysis easier. Then, using SmartPLS version 4, the PLS-SEM technique was used to analyze both internal and external models. Based on the research questions that have been discussed and the defined research boundaries, the analysis's findings will be analyzed, and conclusions will be reached. All application users are included in the study's population. According to information on the application's active user base in Indonesia, there are more than 80,000 people who have signed up for it. Purposive sampling was the method of sampling that was employed in this investigation. Each subject chosen from the population is specifically chosen based on particular goals and standards. Users who enrolled and used the application as well as users who owned or worked for a business were chosen as respondents for this study. The Delone & McLean IS Success Model and the Unified Theory of Acceptance and Use of Technology (UTAUT) model, which are used to assess user behavior and acceptance of a system, are both adopted in this study. Nine factors, including use behavior, behavioral intention, performance expectation, effort expectation, social impact, facilitating condition, system quality, information quality, and service quality, are used.

A two-part questionnaire was employed as a study tool by the researchers. 12 general and respondent profile questions are included in the first section. 31 questions based on the research model are included in the second section. Five Likert scales, each with five answer alternatives, are used in this study as the assessment technique. The two types of data analysis are statistical analysis and demographic analysis. First, the authors used the Microsoft Excel 365 program to perform a demographic analysis. Data from respondents were categorized by gender, age, business type, place of residence, amount of internet use, and frequency of application use. Second, the authors used SmartPLS version 4 software to conduct statistical analysis utilizing the PLS-SEM approach. The two stages of the PLS-SEM approach are the evaluation of the measurement model (also known as the outer model) and the evaluation of the structural model (also known as the inner model). Testing the validity (convergent and discriminant) and reliability of the measurement model is done in order to evaluate it. The path efficiency, coefficient of determination ($R^2$), T-Statistic using the bootstrapping approach, effect magnitude ($f^2$), predictive

relevance (Q2), and relative impact (Q2) are used to assess the structural model. This method is known as the blindfold test method. Third, the findings of the statistical analysis are explained using the facts of the real circumstances and a review of the relevant literature.

## 3. Results and Discussion

Results of the coefficient of determination test, with use behavior having an R2 of 0.644 and behavioral intention having a value of 0.627. It is therefore reasonable to conclude that the independent variables that are connected to the behavioral intention and use behavior variables have a moderate impact. The significance of a model is assessed using the t-statistic test. The bootstrapping approach is used to compute the p-values and t-statistic values that represent the outcomes of this test. This information can be used to decide whether the proposed hypothesis is accepted or rejected. In this t-statistic test, it is done by calculating bootstrapping with a significant level of 5%. One can say that a significant variable has an impact when the t-test value is higher than 1.96 or the p-value is lower than the significance level ($< 0.05$). These findings show that six relationships between other variables have a relationship that is significant because the t-statistic value is above 1.96, except for two relationships between variables that have insignificant results: the relationship between EE→BI and the relationship between SEQ→BI, both of which have t-statistic values of 1.423 and 0.883, respectively. It can be claimed that this hypothesis has a significant impact on the model's structure because the path association between BI→UB has a substantial effect size value. Then FC→ UB, and SI→BI, have a moderate effect value. While the EE→BI, IQ→BI, PE→BI, SEQ→BI, and SQ→BI paths have little effect.

Based on previous structural model results, it can be seen that the relationship between the performance expectancy (PE) variable and the behavioral intention (BI) variable has a t-statistic value at a significant level of 5% of 3.385; the value is above the threshold value of 1.96, indicating that the two variables have a significant relationship. The effect size test (f2) with a value of 0.120 and the relative impact test (q2) with a value of 0.094 have a little effect, however the coefficient of determination (R2) PE on BI has a moderate effect with a value of 0.627. The analysis's findings demonstrate that the hypothesis (H1) is true. These findings are consistent with other research that demonstrates the strength of the PE variable and its beneficial impact on behavioral intention variables. Acceptance of this theory argues that people's opinions about their propensity to use applications effectively can affect such propensity. This finding may have significant ramifications for mobile commerce-based businesses because it suggests that user engagement with food service applications aims to raise expectations for the users' own performance while using the applications, which may increase users' motivation to use the applications.

According to the findings of the previous structural model, the relationship between the variables behavioral intention (BI) and effort expectancy (EE) has a t-statistic value at a significant level of 5% of 1.423, which is below the threshold value of 1.96, indicating that the two variables do not significantly influence one another. The effect size test (f2) with a value of 0.013 and the relative impact test (q2) with a value of -0.009 have a minor effect. The value of the coefficient of determination (R2) EE on BI, however, has a substantial effect with a value of 0.627. According to the analysis's findings, hypothesis 2 (H2) is not true. This runs counter to his earlier research, which indicated that the EE variable had a major impact on UB. This also happens in other studies, albeit they claim that there is no correlation between the EE variable and BI. According to the findings of this hypothesis, users may find the program challenging to use or requiring more effort than anticipated. Users' complaints that the application is less effective and difficult to register with are more proof of this. As a result, the user's intention to use the application may decline or weaken, which will result in a lack of interest in using it consistently.

Based on the findings of the previous structural model, it can be seen that there is a significant relationship between the behavioral intention (BI) variable and the social influence (SI) variable, with a t-statistic value of 5.404 at a significant level of 5%. Since this value is higher than the threshold value of 1.96, this relationship is considered to be significant. The SI coefficient of determination (R2) on BI then has a moderate effect with a value of 0.627, although the effect size test (f2) and the relative impact test (q2) both have a moderate effect with values of 0.250 and 0.222, respectively. As a consequence of the analysis, hypothesis 3 (H3) is confirmed. These findings are consistent with earlier study, which discovered that the SI variable is a powerful variable that significantly influences behavioral intention variables that indicate desire in utilizing information technology. Acceptance of this hypothesis shows that social influence refers to the impact of other people's actions, beliefs, or attitudes on individual behavior. If people perceive that other people around them are using the app, they may be more likely to use it. This can occur when people adjust to the behavior of others to suit or be accepted by a group.

The relationship between the facilitating condition (FC) variable and the use behavior (UB) variable has a t-statistic value at a significant level of 5% of 4.955, which is above the threshold value of 1.96 and indicates the two variables have a significant relationship. This finding is based on the results of the structural model that has been conducted in the past. Then, the effect size test (f2), the relative impact test (q2), and the FC coefficient of determination (R2) for UB all had moderate effects with values of 0.644, 0.315, and 0.255, respectively. According to the analysis's findings, hypothesis 4 (H4) is true. These findings are consistent with earlier study, which discovered that the FC variable is a powerful variable that significantly influences whether or not individuals

express interest in adopting information technology in the use behavior variable. Acceptance of this hypothesis suggests that facilitating conditions refer to external factors, such as the availability and dependability of internet connectivity, the usability of applications, and the accessibility of technical support, that make it simpler for a person to engage in particular behaviors. These are all elements that can help create circumstances that affect how an application is used.

According to previous structural model results, the relationship between system quality (SQ) and behavioral intention (BI) variables has a t-statistic value at a significant level of 5% of 2.193; the value is higher than the threshold value of 1.96, indicating that the two variables have a significant relationship. The coefficient of determination ($R^2$) SQ on BI then has a moderate effect with a value of 0.627, while the effect size test ($f^2$) with a value of 0.035 and the relative impact test ($q^2$) with a value of 0.002 have a minor effect. As a consequence of the analysis, hypothesis number five (H5) is confirmed. These findings are consistent with earlier study, which found that the variable system quality (SQ) is a powerful variable and significantly influences behavioral intention variables that indicate desire in adopting information technology. Acceptance of this hypothesis suggests that the program's system quality gives users the impression that it has a good system quality, leading to users' propensity to utilize the application going forward. To sustain and boost user interest in using the application, businesses must continuously assess and improve the quality of their application systems.

Based on previous structural model results, it can be seen that there is a significant relationship between the behavioral intention (BI) and information quality (IQ) variables, with a t-statistic value at a significant level of 5% of 2.313. This value is higher than the threshold value of 1.96, indicating that the two variables are related. Then, with a value of 0.627, the coefficient of determination ($R^2$) IQ on BI has a moderate effect; however, the effect size test ($f^2$) and the relative impact test ($q^2$) both have a minor influence. As a consequence of the analysis, hypothesis 6 (H6) is confirmed. These findings are consistent with earlier study, which discovered that the variable information quality (IQ) is a powerful variable that significantly affects behavioral intention variables that measure displaying interest in utilizing information technology. Acceptance of this hypothesis means that users are more likely to be interested in utilizing the program frequently since they perceive the application to be providing high-quality information.

Based on the findings from previous structural models, it can be shown that the association between service quality (SEQ) and behavioral intention (BI) variables has a t-statistic value at a significant level of 5% of 0.883, which is less than the threshold value of 1.96. This indicates there is no meaningful association between the two variables. The effect size test ($f^2$) has a value of 0.003, the relative impact test ($q^2$) has a value of -0.028, and the coefficient of determination ($R^2$) SEQ on BI has a value of 0.627, all of which have a moderate effect. The analysis's findings demonstrate that hypothesis number seven (H7) is unsupported. This finding conflicts with other research, which found that behavioral intention variables' expressions of interest in utilizing information technology are influenced by the variable service quality (SEQ). This has happened in previous trials, demonstrating even again that SEQ has no discernible impact on BI. According to the findings of the hypothesis analysis, the service quality variable cannot deliver services in line with user expectations, which would have an effect on user interest and application use. This is corroborated by complaints concerning the caliber of services rendered, such as inadequate methods of contact and subpar customer support responses. sluggish and unclear information is presented.

Based on the findings of the previous structural model, it can be seen that there is a significant relationship between the behavioral intention (BI) and use behavior (UB) variables, with a t-statistic value at a significant level of 5% of 6.701; this value is higher than the threshold value of 1.96, indicating that the two variables are related. The effect size test ($f^2$) with a value of 1.809 and the relative impact test ($q^2$) with a value of 1.551, which has a significant influence, both show that the value of the BI's coefficient of determination ($R^2$) on UB has a moderate effect with a value of 0.644. The analysis's findings demonstrate that the hypothesis (H1) is true. These findings are consistent with other studies that discovered the behavioral intention (BI) variable to be a powerful variable with a large impact on the use behavior (UB) variable. If this hypothesis is correct, it means that how a person uses an application is influenced by how interested they are in using it. Knowing these data, startups might concentrate on initiatives to spark interest in user behavior. By understanding the factors that influence user interest, companies can adopt the right strategy and direct their resources and efforts more effectively to increase user interest and increase usage. Startups can increase interest in user behavior by providing a better user experience, offering attractive promotions, improving service quality, or providing additional useful features for users.

Enhancing the application's performance in terms of speed, effectiveness, usability, and the advantages that users receive from using it. In application development, it is important to pay attention to things that can increase user convenience. Efforts made could include simplifying the interface, providing user guidance, improving navigation, and ensuring smooth app performance. Startups can pay attention to things like user reviews and the influence of social media on users' decisions to adopt and use applications. Improve device accessibility, quality of internet connection, integration with payment systems, and availability of technical support. This research can help identify barriers that affect the ease of use of applications. This research can evaluate the quality of application systems by increasing their reliability, performance, and speed of response. It is important for startups to focus on improving

service quality by paying attention to aspects such as reliability, speed, interaction with customers, and the availability of relevant information. Startups can raise the caliber of the data the application provides. This encompasses the precision, consistency, and applicability of the data delivered to users.

## 4. Conclusion

In order to assist businesses, expand the number of users, certain criteria need to be taken into account, according to the analysis's findings. These elements include behavioral intention variables, social impact, system quality, information quality, and performance expectations. These results explain that usage can be influenced by perceptions of helping user performance, social influence to use the application, good system quality, whether the information provided is accurate, and interest in using the application. Effort expectancy and service quality variables are factors that make it possible not to achieve the target user because users feel the application is not easy to use and the quality of service provided is not good, which can reduce user interest in using the application on an ongoing basis. Startups need to pay attention to things that can increase user convenience so that they match user expectations. Efforts made can be in the form of simplifying the interface, providing user guidance, improving navigation, and ensuring smooth application performance in order to increase user intention to use and interact with the application on an ongoing basis and then improve service quality by paying attention to aspects such as reliability, speed, interaction with customers, and availability of relevant information in application development. For future researchers, it is hoped that they can test other similar research objects to find out the behavior of mobile commerce applications such as Segari, HappyFresh, SayurBox, etc. The researcher suggests conducting research after conducting research on acceptance levels such as success, satisfaction, and sustainability in using the application. Startup parties are expected to take into account suggestions from a variety of aspects when developing applications, particularly those that are connected to system quality, information quality, performance expectations, social influence, and facilitating conditions. These factors have been shown to have a significant impact on the intention to use and use of the application continuously in order to increase use of the application, and startups need to pay attention to factors that have negligible effects, such as service quality and effort expectancy, by improving the services offered and developing applications that are simple to use in order to give startups an understanding of the factors that influence their application. In future research, it is advised to review the variables that are not significant in this study by redeveloping the model or adding variables that have been shown to have a significant effect.

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