EVALUATING USER ADOPTION ON SALESPERSON MOBILE APPS BY USING TTF AND UTAUT

[1]RYO SEGARA, [2]AHMAD NURUL FAJAR

1Information Systems Management Department, BINUS Graduate Program – Master of Information Systems Management, Bina Nusantara University, Jakarta, Indonesia 11480

2Information Systems Management Department, BINUS Graduate Program – Master of Information Systems Management, Bina Nusantara University, Jakarta, Indonesia 11480

E-mail: [1]ryo.segara@binus.ac.id, [2]afajar@binus.edu

ABSTRACT

The banking industry is one of the industries affected by the Covid-19 pandemic. The reason is that as a provider of financial services, the Bank will be very dependent on customer growth. This growth is achieved by establishing an intensive direct relationship with its customers, which is a challenge during the pandemic. One of the largest national private banks in Indonesia was developed mobile application for supporting their sales' daily work, named OS. With OS application sales can manage their pipeline digitally, get promotion info easily, do opening account independently, and get customer's information on their hand. However, the level of user adoption is still very low, this is a concern of management. This study is intended to see what factors influence the level of user adoption of using OS applications. By using two frameworks, UTAUT and TTF, we want to see the level of user adoption, which is more comprehensive regarding the use of OS applications by sales at Bank XYZ. The results show that there is a correlation between TTF and UTAUT structures. Technology characteristics have a large impact on effort expectations, and task technology suitability has a clear impact on performance expectations.

Keywords: *UTAUT, TTF, Mobile Apps, User Adoption, Sales*

1.   INTRODUCTION

In order to face the Industry 4.0 era which was strengthened by the Covid-19 pandemic, one of the national private banks in Indonesia created a mobile application called OS to assist sales work, which was developed by Bank internally using android and IOS-based technology. To use this application, sales are equipped with a smartphone device that can be carried while visiting customers. Beside the main job role for offering and selling, sales are also required to carry out administrative work, as part of compliance. In addition, sales are required to be able to play a role in attracting as many customers as possible and also to retain existing customers [1], as part of compliance with regulators.

The OS application helps sales in carrying out their work related to administration. Because this application offers five main services: Leads Management, Product Campaign & Promotion, Team Management, SME Module, and On Boarding. So that by utilizing this mobile application it is easier for them to access information about bank product details, team performance, customer loan proposal journeys, and also account creation, which is available in their hands.

The company has invested in mobile application development technology, this has challenges related to its use which has different penetrations in the sales segment of the business. Sales at bank have several business segments, namely: Sales Preferred (serve all customer needs for funding services from the retail segment, consisting of individual and non-individual customers), Sales Mortgage (serve all customer needs for loan product services for ownership credit houses and apartments for retail customers), Sales Emerging Business Banking (serve all customer needs for funding and lending product services for customers related to small and medium businesses, Sales Corporate Banking (serve all customer needs for funding and lending product services for customers related to large companies and non-individual), and Sales Commercial Banking (serve all customer needs for funding and lending products for customers related to multinational companies and non-individual). This OS application is only used by sales from the funding, mortgage, and emerging business banking (EBB) business segments.

Segment Bisnis	Total Leads	Total Contacted Leads	% Contacted
PREFERRED	77,225	32,413	42.0%
MORTGAGE	5,816	2,571	44.2%
EBB	1,609	704	43.8%
TOTAL	**84,650**	**35,688**	**42.2%**

Table 1:
OS Application Usage Penetration on Leads Management

Since it was first launched in November 2019, the effectiveness of using this application is still very low as shown in table 1. From a total of 84,650 leads that have been pumped into the new OS, only 42.2% have been contacted by sales. It will be useless if you see that the lead management process has been processed using data analytics so as to produce a list of customers who have the potential to be offered cross selling products.

The use of technology is currently a trend in the banking industry in Indonesia. Every bank is competing in their digital service innovation, and the automation of every existing business process is no exception. This is a big leap towards changes in banking business process services, which are accompanied by human behavior problems in using the technology that has been invested. This study focuses on looking at the factors that influence the desire of users (salespeople) to use a technology application that is made to simplify and support their work.

Interviews have been held with several salespeople at major branches, initial information was obtained that the penetration rate of OS application usage is closely related to encouragement from superiors, age, gender, stable network and also the availability of internet quota. However, technical factors in this study, such as network availability and internet quota, are not taken into account, because these two are external factors from outside of the company.

Based on the problems above, a study was conducted to evaluate the user adoption of OS applications in sales at Bank by using a combination of Task Technology Fit (TTF) and The Unified Theory of Acceptance and Use of Technology (UTAUT) approaches. The combined model between UTAUT and TTF has a significant influence on technology acceptance with mutually reinforcing results [2], where the TTF model evaluates users to predict the level of technology utilization specifically according to the task, and UTAUT focuses more on user views regarding

technology to be used [3]. Thus, it can be concluded that the research question is what factors have the most influence on the level of user adoption of the use of OS applications in sales at this Bank.

2. LITERATURE REVIEW

2.1 Mobile Applications

At the beginning of its development, mobile applications were present as tools for mobile devices, such as alarm clocks, calculators, currency converters, etc. At that time people only used mobile apps to receive call messages, perform simple calculations, etc. Although mobile applications at that time only focused on simplicity, mobile application developers know that in the future mobile applications will develop with wider feature capabilities that everyone will use.

In 2000 mobile application developers were talking about internet based mobile applications. With that mobile app people can connect them to the internet for their daily needs. The main advantage of the mobile application is that it makes it easy for users to get information portable without using a PC or netbook and its use in obtaining up-to-date information is fulfilled without being hindered by the time and place of where mobile device users are and whose area can be reached by internet communication networks[4]

The OS application is a mobile application consisting of a software/set of programs that runs on a mobile device and performs certain tasks for its users [5]. The OS application helps sales in carrying out their work related to administration. This application offers 5 main services: Leads Management, Product Campaign & Promotion, Team Management, SME Module, and On Boarding.

2.2 Task Technology Fit (TTF)

The TTF model explains that the acceptance of new technology is highly dependent on the characteristics of the fulfillment of its duties. Likewise, technology must fail if it does not meet desired needs or cannot improve routine life [6]. The TTF model consists of four dimensions including task characteristics, technology characteristics, suitability, and technology use. The model is widely used for research purposes such as [7]), concluding research with the integration of TTF and TAM models.

The TTF model has been applied to demonstrate how task-technology fit influences user acceptance of information systems, such as internet services [8]

and mobile technologies [9]. We defined this OS application as both internet services and mobile technology for supporting sales to do their daily job. Sales can access OS application anywhere and anytime to support their work both from the office and while visiting to customers.

2.3 The Unified Theory of Acceptance and Use of Technology (UTAUT)

UTAUT is a theoretical model that has been widely used in the study of acceptance and application of information technology [3]. This concept helps define what is known and provides a basis for guiding research in an area. UTAUT is the right theory to study the application of e-participation for three main reasons:

a. UTAUT is suitable for studying complex organizational technologies. E-participation can be considered a complex technological context due to the number of different tools and the amount of data generated by citizens, stakeholders with diverse interests and the two-way government-citizen interaction, where citizens typically expect to receive feedback on their actions. These factors create a complex research scenario in which UTAUT could be appropriate to test behavioral intentions to use e-participation, which has been suggested as a major predictor of human behavior.

b. UTAUT has the potential to provide important insights into e-participation investigations as it takes into account information technology and social factors.

c. UTAUT has been used in various fields of research to understand the factors that drive technology adoption, obtaining mixed results regarding significant constructs.

2.4 Integration TTF & UTAUT

Several researchers have used the integration of the UTAUT and TTF methods in explaining the acceptance of the technology. They integrated UTAUT and TTF to see the level of user adoption in terms of acceptance of mobile banking technology [2] [10] [11] acceptance of consumer healthcare devices [12], and also on Massive Open Online Courses (MOOCs) [8].

UTAUT is the most popular method used in many studies related to technology acceptance, while the TTF model explains the acceptance of new technology is thoroughly dependent on its task fulfillment characteristics. So this research try to explain the level of user adoption of a mobile application in a bank. This mobile application is used by the sales team to support their job descriptions. So that using both methods (UTAUT and TTF)

which are integrated will look at the overall acceptance of technology, where the technology is a supporter of a job.

3. HYPOTHESIS

The proposed model of this research is included 10 constructs explained from UTAUT and TTF. We will used user adoption to measure user adoption representing user acceptance. A TTF will promote user adoption of mobile banking. In contrast, a poor task technology fit will decrease users' adoption intention [2]. Although the previous research using TTF and UTAUT integration did not see the moderating variables of gender and age. In this study, we use two variables, which exist in the UTAUT to see how much influence gender and age have in determining technology acceptance as shown in figure 1.
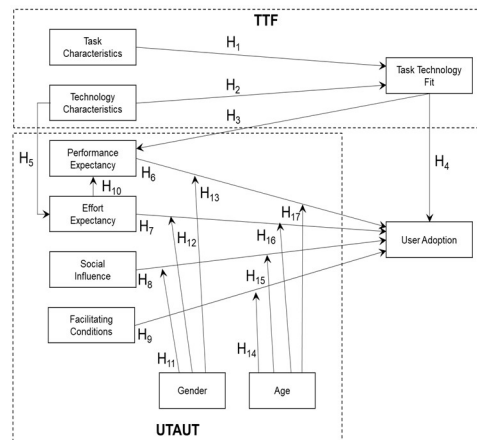

Figure 1 Research Model

3.1 Constructs from TTF

Based on TTF, task-technology fit reflects how technology capabilities match the tasks that individuals perform [8].

H1. Task characteristics significantly affect the task technology fit.

H2. Technology characteristics of mobile banking significantly affect the task technology fit.

H3. Task technology fit significantly affects a user's performance expectancy.

3.2 Constructs from UTAUT

UTAUT is an extension of TAM model. The model not only explores the intention towards technological advancement but also examine subsequent behavior. It includes three antecedents, effort expectancy, performance expectancy and

social influence [10]. UTAUT is used to measure the influence of an information technology on user adoption behavior [3][13][14].

H4. Task technology fit significantly affects user adoption.

H5. Technology characteristics significantly affect a user's effort expectancy.

H6. Performance expectancy significantly affects user adoption.

H7. Effort expectancy significantly affects user adoption.

H8. Social influence significantly affects user adoption.

H9. Facilitating conditions significantly affect user adoption.

H10. Effort expectancy significantly affects performance expectancy.

H11. Gender has a moderating effect of Social influence and user adoption.

H12. Gender has a moderating effect of effort expectancy and user adoption.

H13. Gender has a moderating effect of performance expectancy and user adoption.

H14. Age has a moderating effect of facilitating conditions and user adoption

H15. Age has a moderating effect of Social influence and user adoption.

H16. Age has a moderating effect of effort expectancy and user adoption.

H17. Age has a moderating effect of performance expectancy and user adoption.

4. RESEARCH METHOD

4.1 Participants

This research evaluates the use of OS applications at this Bank on their sales team by using a combination of the Task Technology Fit (TTF) and The Unified Theory of Acceptance and Use of Technology (UTAUT) approaches at this Bank. The population of this research was conducted on employees of this Bank who are directly or indirectly users of applications that have been implemented in sales at the S&D directorate of this Bank. Based on data from the Human Resource (HR) unit, the total

population of sales at the S&D directorate is 925 peoples, as shown in the table 2

Region	Sales
Jakarta 1	103
Jakarta 2	187
Jakarta 3	128
Jawa Barat	82
Jawa Tengah	97
Jawa Timur	154
Sumatera	116
Indonesia Timur	58
Total	**925**

Table 2: Sales Population in Bank

Based on a population of 925 people in 8 regions included in the study population, the minimum number of samples needed to conduct this study was determined is 309 respondents based on the results of the calculation of the number of respondents that can be used for the total population.

This research used the convenience sampling method and questionnaire is sent by email to all salesperson at this bank, a valid data collection tool [15], was applied in this study. We sent an e-questionnaire email to all salespersons at XYZ bank using google forms. We got 502 respondents (response rate: 54.3%) who successfully submitted complete answers for data analysis (Table 3).

Items	Type	Number of participants	Percent
Gender	Male	117	23.3%
	Female	385	76.7%
Age	< 30	105	20.9%
	30 - 39	270	53.8%
	40 - 49	104	20.7%
	> 49	23	4.6%
Location by Region	Jakarta	234	46.6%
	Jabar Jateng	100	19.9%
	Jatim & Bali Nusra	88	17.5%
	Sumatera	54	10.8%
	Kalimantan & Indonesia Timur	26	5.2%
Year of Service	< 1 year	19	3.8%
	1 - 2 year(s)	25	5.0%
	2 - 3 years	141	28.1%
	> 3 years	317	63.1%

Table 3:
Demographic characteristics for the participants
(n = 502)

Respondents by gender is dominated of female (76.7%), meanwhile male only 23.3%. More than 50% respondents is represented by age range 30-39 30-39 years old. Distribution by location base on Region is 46.6% from the Jakarta greater area. 19.6% from Jabar Jateng, 17.5% from Jatim & Bali

Nusra, 10.8% from Sumatera, and 5.2% from Kalimantan & Indonesia Timur Area. Most of sales has been joined for more than 3 years at this bank.

The questionnaire included two sections. The first section started with items for demographic information (e.g., age, gender, and year of services)

and items measuring constructs in the proposed model (Table 4). All the constructs were measured with a 5-point Likert-type scale, with anchors ranging from 1 (strongly disagree) to 5 (strongly agree).

Table 4:
Measurement items and sources of the constructs examined in the model

No.	VARIABLES	CONSTRUCT	QUESTIONAIRES	CODE
1	*Task Characteristics* (Zhou, et al., 2010)	*Task Requirements*	Wherever and whenever I can manage my work as a salesperson, using the OS mobile app	TAC1
			I can log all my work related to sales by using the OS mobile app	TAC2
			I can monitor all my work related to sales by using the OS mobile app	TAC3
2	*Technology Characteristics* (Zhou et al., 2010)	*Ubiquitous*	OS mobile app can be accessed wherever I am	TEC1
		Real-time	The OS mobile app provides services in real-time	TEC2
		Reliable	Customer information provided in the OS mobile app can be trusted	TEC3
3	*Task Technology Fit* (Moore & Benbasat, 1991)	*Perception of adopting IT innovation*	Using the OS mobile app fits perfectly with the way I work	TTF1
			The OS mobile app is compatible with all aspects of my work.	TTF2
			Using the OS mobile app fully supports my current job	TTF3
4	*User Adoption* (Zhou et al., 2010)	*Behavioral Intention*	I will often use the OS mobile app for pipeline management	USE1
			I will often use the OS mobile app to get information regarding product promotions	USE2
5	*Performance Expectancy* (Venkatesh, et al., 2003)	*Perceived Usefulness*	Using the OS mobile app is very useful in doing sales work	PFE1
			Using the OS mobile app makes sales work faster	PFE2
		Relative Advantage	Using the OS mobile app makes my productivity, as sales increase	PFE3
			Using the OS mobile app allows me to do work activities without having to always be in the office	PFE4
6	*Effort Expectancy* (Venkatesh, et al., 2003)	*Perceived Ease of Use*	Learning to use the OS mobile app is easy	EFE1
			I can use the OS mobile app clearly and understandably	EFE2
			OS mobile app can be used easily	EFE3
			Every time there are additional features in the OS mobile app I will quickly understand	EFE4
7	*Social Influence* (Venkatesh, et al., 2003)	*Subjective Norm*	The people closest to me suggest using the OS mobile app	SOC1
			People around my neighborhood suggest using the app	SOC2
		Image	Using the OS mobile app makes my status as a sales higher	SOC3
		Social Factors	I use the OS mobile app because the people around me already use it	SOC4
			My boss forced me to use the OS mobile app	SOC5
8	*Facilitating Conditions* (Venkatesh, et al., 2003)	*Perceived Behavioral Control*	I have quota to stay connected to the internet connection to use the app	FAC1
			I have been trained to gain knowledge of using the OS mobile app	FAC2
		Facilitating Conditions	The technical support team helps if I have difficulty using the OS mobile app	FAC3
			My friends, fellow application users are willing to help if I have difficulty using the OS mobile app	FAC4
			Using the OS mobile app is very suitable in supporting my work	FAC5

5. RESULT & DISCUSSION

A path analysis was performed using LISREL to test the model hypotheses. He had 502 respondents. The results are shown in Figure 2. Actual and recommended values for the model fit index are shown in Table 5. Except for GFI, the actual values of other fit metrics were better than the recommended values. The squared multiple correlations (SMC), which account for the variances of expected effort, expected performance, adaptation to task technique, and user acceptance, were 0.129, 0.432, 0.405, and 0.575, respectively. We also performed two ad-hoc analyses to compare the explained variances of the individual UTAUT and TTF models with those of the combined model. The results showed that the explained variances in user acceptance for the individual UTAUT and TTF models were 45.7% and 43.3%, respectively, both lower than the combined model (57.5%). This demonstrates the explanatory advantage of the combined model compared to the two separate models.
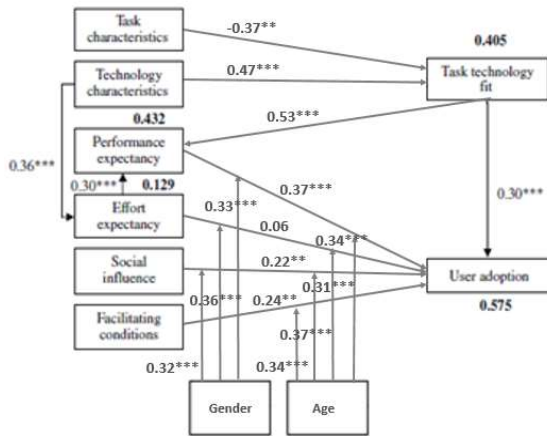

Figure 2 Model estimation results by LISREL
(Note. ***p < .001; **p < .01; bold figures

We also performed a partial least squares (PLS) path analysis to test whether the results are consistent with different statistical methods. Compared to LISREL, PLS is less restrictive regarding sample size and data distribution. It requires ten times more elements than the most complex structures. Our model had the highest number of both performance expectations and effort expectations, with four items. The PLS results are shown in Table 5. As shown in the table, the results produced by LISREL and PLS are very similar, indicating that the results are in agreement. Table 5 shows all the path coefficients estimated by LISREL

and PLS and their significance. All other hypotheses were supported, as shown in the table, except for H7. These path coefficients were significant at 0.01 or 0.001.

Based on data processing, it was found that performance expectancy, effort expectancy, social influence, and facilitating conditions, and facilitating conditions significantly affect user adoption, consistent with well-established evidence in previous UTAUT studies [2][16][17] [18]. In particular, performance expectancy was found to be the most important determinant of user adoption. Effort expectancy has a relatively smaller impact in determining user adoption of mobile OS applications, compared to other factors. The reason may be because currently sales have a lot of experience in using high-tech devices. They may believe that they can handle the application without spending too much effort. Also, if a technology offers the required functionality, sales will receive more effort in using it [11].

We also found a mediating effect of age as it significantly affects effort expectancy and subsequently influences user adoption. Given that users need some resources (for example, smartphones and Wi-Fi) to operate mobile OS applications for connection and data sharing, when these resources are sufficient, users are more likely to believe that using the application is easy and thus want to accept the application OS Mobile. In addition, we found that effort expectancy has a significant effect on user adoption, similar to previous research [13]. As such, sales should make it easier to use OS mobile apps with strategies such as adopting usability and user-centric design principles. Our findings suggest that technology and task characteristics directly predict TTF with technology characteristics contributing more, supporting previous studies [11][2][16].

Unexpectedly, we found a positive effect of task characteristics on task technology fit, contrary to our expectations and previous studies [19]. Possibly the OS has been proactively designed with advanced functions like lead management tracking anytime and anywhere, meeting common requirements for sales jobs. When the user requires the device to do so, a high match between technology and task is obtained. We also find that technology characteristics can positively predict business expectations. When the mobile application functions of the OS can allow users to manage their work in a fast and convenient approach, it is believed that the business costs will be reduced.

Table 5 The recommended and actual values of fit indices.

Fit index	χ^2/df	GFI	AGFI	CFI	NFI	NNFI	RMSEA
Recommended value	<3	>0.90	>0.80	>0.90	>0.90	>0.90	<0.08
Actual value	2.19	0.846	0.807	0.963	0.935	0.957	0.069

Note. χ^2/df is the ratio between Chi-square and degrees of freedom, GFI is the Goodness of Fit Index, AGFI is the Adjusted Goodness of Fit Index, CFI is the Comparative Fit Index, NFI is the Normed Fit Index, NNFI is the Non-Normed Fit Index, RMSEA is the Root Mean Square Error of Approximation.

As a theoretical implications, our study provides support for the positive impact of TTF on user adoption of mobile OS applications for salespersons. When users find a good match on an OS-task app, they tend to accept the OS's mobile app. Also, TTF indirectly influences user adoption through the mediating role of performance expectancy. This finding is supported by previous research [11], [13]. This means, if the OS has the right functionality to match the required sales activity of the sales team, users will expect this app to perform better and, in turn, will want to accept the OS mobile app.

While as a practical perspective, our research shows that performance expectations and TTF have a significant influence on the adoption of mobile applications by users. In addition, this study indicates that TTF has a clear effect on performance expectations. Thus, product owners of mobile OS applications need to improve TTF. Currently, this mobile application has different feature for each sales segmentation as its users. For example, users from the sales mortgage segment may focus to the end to end process of submitting a mortgage loan application, the credit scoring process, thus product owners can provide different services to meet the demands of different group assignments. So as to increase the adoption of mobile application users. In addition to TTF, product owners of mobile applications also need to improve the technology perception of mobile users such as performance expectations. They can achieve this by providing an easy-to-use interface, thereby reducing effort expectations and increasing performance expectations.

The results also show that there is a correlation between TTF and UTAUT structures [10], [18], [20], [21]. Technology characteristics have a large impact on effort expectations, and task technology suitability has a clear impact on performance expectations. Mobile application needs to keep improving technical aspects such as security. Compared to manual proses by using papers or desktop computer, which relies on wired networks, mobile apps, which relies on wireless networks, is vulnerable to security attacks and eavesdropping. This can cause users to worry about the security of their mobile apps, which can greatly affect the expected effort. Mobile apps can use wireless encryption technology to enhance security and provide users with a reliable and secure real-time service. So company need to maintain user trust by ensuring the security and convenience of using the system [18]. This can improve expectations of user effort. Additionally, properly tuning task technology is an important way to improve performance expectations. When users receive services that don't meet their needs, they perceive those services to be of little use and have low performance expectations.

5. RECOMMENDATION AND FUTURE RESEARCH

This study has the following limitations. First, we mainly describe the user adoption of mobile OS applications using UTAUT and TTF. Future research could use other theories such as perceived value theory and explore the effects of other factors such as cost and trust. Second, user adoption is dynamic and constantly changing. We only collected cross-sectional data. Longitudinal research can provide more insight into how user adoption behaviour changes over time. Third, we conducted this research at this Bank only. Our results may not generalize to other companies with relatively mature mobile applications. Fourth, compared to the rich services and functions offered by other mobile applications, the OS offers fewer simplified services and functions. This can also affect user adoption.

Future research could investigate their differences in more detail. Due to the limitations in our study, there are several future research directions. First, we focus on mobile apps and part of our sample is sales. Future research could examine other mobile apps for sales or replicate our results with a sample of working professionals. Second, we can also examine whether our results can be generalized to banking with relatively mature mobile commerce. This can provide richer insights into worldwide user adoption. Third, longitudinal research is needed to examine the dynamics of mobile application user adoption.

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