

A Multiple Linear Regression in Determining the Influential Factors of Cashless Payment Adoption Among University Students

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Abstract: The procedure of receiving and making payments has altered as a result of the development of mobile wallets and online payment options. Different sorts of payment methods have emerged as a result of ongoing technological and governmental developments. However, the adoption of cashless transactions in Malaysia was relatively slow due to a lack of awareness and confidence about security concerns. Hence, this study aims to determine the level of Adoption of Cashless Payment among university students. A total of 232 UiTM Cawangan Kelantan, Kampus Kota Bharu (UiTMKB) students were involved in the study using stratified sampling. Five factors had been examined which were Performance Expectancy, Social Influence, Perceived Technology Security, Perceived Ease of Use and Hedonic Motivation. The study revealed that all factors had a significant effect on the Adoption of Cashless Payment, with Social Influence as the most significant influence.

Keywords: Adoption, Cashless payment, Online payment, Mobile wallets, University students

1 Introduction

Cashless societies and advanced technology are gaining popularity around the world [13]. Transactions are made either via a digital wallet, online banking, or debit or credit cards [15]. In other words, cashless payment is defined as an economic environment in which goods and services are exchanged without using cash [1], mostly using cards and electronic devices. An electronic device that is often used for cashless payment is a smartphone which is a mobile phone with a built-in computer and other functionality such as an operating system, web surfing, and software application support that were not previously found in phones [30]. Furthermore, in today's society, it is obvious that having a smartphone has become increasingly essential in daily life. With the increasing availability of low-cost smartphones, the number of smartphone users has grown substantially [34]. It is estimated that 6.92 billion people will be using smartphones worldwide in 2023, making up to 86.41% of the world's population. This number is significantly more than it was in 2016, when there were just 3.668 billion users, or 49.40% of the world's population [40]. According to [37], it stated that people would enjoy the flexibility of not having to carry money around in their pockets, and with the simplicity of hi-tech gadgets, transactions may be completed simply by using wireless technologies via mobile devices (smartphones).

Since the beginning of human civilization, bartering has been utilized instead of tangible money to exchange products by utilizing various items such as plants and animals [5]. The evolution of money that everyone currently uses took a long time, beginning with metal coins and ending with physical paper money, and it includes commodity money, metal, ancient coins, gold, and paper money [26]. Paper money has been recognised as a critical step in the evolution of money throughout its history.

However, the development did not end with paper money and had been converted into a new payment system based on plastic money. The modernisation of the age introduced plastic money, also known as credit cards and debit cards, which may replace physical money in daily transactions such as bill payment online, fund transfer, and even mobile banking by just calling [33]. Besides that, [28] explains that in terms of transaction volumes, e-wallet is used on average 58.4 (56.2%) times per person in Malaysia, followed by online banking on average 18.7 (18%) times per person. An e-wallet (electronic wallet) sometimes referred to as a digital wallet is a software program, internet service, or electronic gadget that enables one party to do electronic business with another party to purchase products and services [29]. The popularity of e-wallets has increased in Malaysia along with the use of smartphones. Because of this, youngsters prefer digital wallets over other contactless payment options, and their use of them is on the rise. In 2021, 65% of young millennials, up from 59% in 2020, utilized a digital wallet [23].

In the 1990s, with the widespread use of online banking, the trend towards non-cash transactions and settlements started. Digital wallet systems like Apple Pay, PayPal, and NFC payments via electronic cards or smartphones, as well as electronic bills and banking were all common in the 2010s [32]. In addition, cash remains a significant means of settlement across the world despite the growing use of non-cash payment methods in industrialised nations [14]. However, some transactions are no longer possible with cash due to the hassle. Can you picture paying your rent or purchasing an airline ticket entirely in cash? The convenience of using a credit card or bank transfer makes them popular choices for many individuals for some purchases and transactions, particularly online purchases that cannot be completed with cash [44]. Moreover, payment with a large sum of cash has been intentionally forbidden by some suppliers and merchants, to the extent of coining the concept of a "war on cash" [45]. When individuals used coins or paper money to trade money, where it was used to be done physically. However, as eCommerce has expanded and the Internet has grown in popularity, online payments have become more and more practical. [35] explained that e-commerce, commonly referred to as electronic commerce or internet commerce, is the term used to describe the exchange of money and data for the purpose of transacting business through the internet. While cashless transactions continue to grow globally, Malaysian government continues to promote a cashless society to boost Malaysia's economy [2]. The term "e-commerce" is frequently used to refer to the online sale of real goods, but it may also apply to any form of business deals made possible by the internet. This is because, one of the most often used methods of payment for products and services nowadays is online [31].

Cashless payment methods can be broadly categorized into three groups: paper-based, card-based, and electronic-based [4]. A cheque is a type of paper-based payment method. It is a type of written instruction telling a bank to give the recipient money. Next, credit cards allow holders to purchase goods and services with a credit line, with the amount settled at a later date. Meanwhile, debit card is a type of payment card in which the transaction value is debited straight from the cardholder's bank account upon authorization. Subsequently, [6] said electronic money is the preferred term for electronic-based non-cash payment tools (e-money). Customers can fill in their e-money balance in accordance with their demands because it is prepaid. E-money is not only convenient and constantly available, but it can also be used to conduct transactions with small denominations of the appropriate amount [21]. Therefore, when you make the purchase at mini markets or grocery stores that accept e-money payments, you do not have to worry about getting change. Increasingly more people from all over the world have attempted to take on e-wallet as one kind of electronic payments, or also known as e-payment strategy, for everyday exchange. An e-payment framework is an approach to making exchange or paying for labor and products through an electronic medium, without the utilization of checks or money [46]. The E-payment framework is progressively turning into a trying method for payment in the present business world.

In the past decade, China has embraced a payment system based on smartphones and QR codes (two-dimensional bar codes), while the rest of the world has continued to transact with magnetic cards issued by banks. China's payment system is built on digital wallets, QR codes and operations through major tech firms such as Alipay and WeChat Pay [7]. It is likely that young people's financial situation will be determined in the near future by their spending habits and money management techniques.

Families and friends have a big impact on how much money a person spends. Family members are quite important when it comes to using and consuming specific products and things [3]. Additionally, a person's lifestyle has a direct impact on the manufactured goods that he or she purchases. Lifestyle is the term used to describe a person's manner of life in society as demonstrated by the goods they purchase or consume. Furthermore, a person's mindset determines their propensity to spend money [36]. It is well known that the trend towards digital payment systems is most prevalent among higher education students. They are drawn to these payment methods because they are simple, offer discounts, and are cheaper and faster. It is safe to assume that educational institutions play a significant role in preparing the next generation to adopt the mindsets required for the full adoption of a truly cashless and digitally empowered society. Additionally, COVID-19 pandemic has altered the payment ecosystem, with digital payments emerging as the preferred method among youths. All of banking's age restrictions have already been eliminated by digital applications [4]. According to [43], youths are the second-fastest-growing group in the digital payment industry behind millennials. Due to the simplicity of making payments as well as the rewards and additional incentives provided by various portals, they favor digital payments over traditional methods.

Youths are in charge of explaining and managing the technicalities despite being sponsored by parents. They are embracing contactless payment, even in smaller places where cash is still widely used [25]. One in three internet users worldwide are under the age of 18, and globally, 71% of young people are online, compared to 48% of the general population. Financial institutions are looking for new opportunities to provide goods and services for the young demographics as youths, or "digital natives", decide the direction for digital payments [19]. To embrace the digital economy, Bank Negara has found a serious way to upgrade the e-payment stage, to move the country towards a cashless payment society [12]. At this point, there are 42.8 million telephone and 45.4 million debit cards subscriptions in Malaysia [39]. In fact, several numbers of studies have been done to determine young consumers' intentions towards the adoption of e-wallets in many developing nations, including China, Indonesia, India and Vietnam [9][39][41][42]. However, research on the variables influencing university students in Malaysia to utilize e-wallets is still in its infancy. [11] reported that 32.6 million people is calling Malaysia home, with 28.8% of them being young adults between the ages of 18 and 24. Therefore, university students will be a useful target market for marketers because the younger generation has more disposable income [16][18]. Malaysians are beginning to take on e-payment methods, however, at that point the commitment is exceptionally low on account of insufficient information and uncertainty about security issues [27]. Hence this paper highlights in-depth the factors influencing the adoption of cashless payment among university students by totally focusing on UiTMKB students.

2 Methodology

A cross-sectional study design was applied for the study. A total of 232 students were selected from a population of 1612 students of UiTMKB. The students were sampled using Stratified sampling. The research instrument was a questionnaire. The questionnaire was adapted from various sources as summarized in Table 1.

Table 1 : Sources of the Questionnaire

Section	Description	Number of Questions	Sources
B	Adoption of Cashless Payment	5	Mohamed et al. (2020)
C	Performance Expectancy	5	Boonsiritomachai et al. (2018)
D	Social Influence	5	Koenig-Lewis et al (2015)
E	Perceived Technology Security	5	Davis et al. (2017)
F	Perceived Ease of Use	5	Goh (2017)

Section	Description	Number of Questions	Sources
G	Hedonic Motivation	5	Lin et al. (2020)

3 Results and Analysis

A Reliability Test Analysis

Table 2 : Reliability Test for Pilot Study and Actual Study

Variables	Pilot Study		Actual Study	
	Number of Items	Cronbach's Alpha	Number of Items	Cronbach's Alpha
Adoption of Cashless Payment	5	0.884	5	0.918
Performance Expectancy	5	0.818	5	0.907
Social Influence	5	0.844	5	0.894
Perceived Technology Security	5	0.944	5	0.935
Perceived Ease of Use	5	0.929	5	0.945
Hedonic Motivation	5	0.710	5	0.917

Table 2 depicts the Cronbach's Alpha values for pilot study and the real study. Since all the Cronbach's Alpha values were greater than 0.7, hence the variables were reliable and can be used to access the influential factors on cashless adoption among students in UiTMKB.

B Descriptive Statistics

Table 3 : Descriptive Statistics of Demographic Profile (Continued)

Variable	Groups	Frequency	Percentage (%)
Gender	Male	51	22.0
	Female	181	78.0
Semester	Semester 2	18	7.8
	Semester 3	47	20.3
	Semester 4	35	15.1
	Semester 5	70	30.2
	Semester 6	46	19.8
	Semester 7	16	6.9
Age	18-20 years old	12	5.2
	21-23 years old	211	90.9
	24-25 years old	9	3.9
Programme	BA240	32	13.8
	BA242	78	33.6
	BA250	34	14.7
	CS241	82	35.3
	CS291	6	2.6

Variable	Groups	Frequency	Percentage (%)
Area of living	Urban	112	48.3
	Suburban	75	32.3
	Rural	45	19.4
Have you heard about cashless payment?	Yes	231	99.6
	No	1	0.4
How do you pay for your regular household expenses?	Credit Card	3	1.3
	Debit Card	37	15.9
	Internet Banking	126	54.3
	E-Wallet	12	5.2
	Cash	54	23.3
Is cashless payment convenient in Malaysia?	Yes	218	94.0
	No	14	6.0
How often do you withdraw cash from ATM machines?	Daily	2	0.9
	Weekly	78	33.6
	Monthly	91	39.2
	Emergency Case	61	26.3
Will you reduce the frequency of cash withdrawal?	Yes	214	92.2
	No	18	7.8

Table 3 shows that there were more female respondents than male respondents. In this research, 78.0% of all respondents were female respondents and another 22.0% were male respondents. Besides, the age of 21–23 years old is the highest percentage among the age group which was 90.9%. The 18–20 years old were at 5.2% while the age of 24–25 years old consisted of 3.9%. The 18–20 years old was the second lowest among the age group. The age 24–25 years old having the lowest percentage among the age group. Next, the respondents from programme CS241 tend to get the highest percentage which was 35.3% among others. While respondents from programme BA242 were 33.6% as the second highest and the lowest percentage for programmes was CS291 where only 2.6% participated in this study. In addition, the highest response based on the data area of living was 48.3% from urban areas, followed by suburban areas 32.3% and the least was 19.4% from rural areas.

Furthermore, 99.6% of respondents have heard about cashless payment while another 0.4% have not heard about cashless payment. 54.3% are the highest respondents that use the internet banking to pay their regular household expenses followed by 23.3% preferred using cash rather than the cashless payment. Hence, 15.9% of respondents use a debit card, 5.2% use an e-wallet and the lowest is using the credit card which was 1.3%. 94.0% of respondents stated that cashless payment in Malaysia is convenient and another 6.0% of respondents stated that cashless payment in Malaysia is not convenient. Most respondents withdraw cash from ATM machines every month (39.2%) followed by weekly (33.6%), emergency cases (26.3%) and daily (0.9%). Lastly, 92.2% of respondents wanted to reduce the frequency of cash withdrawal and another 7.8% did not want to reduce the frequency of cash withdrawal.

C Pearson Correlation Analysis

The analysis was proceeded with assumption checking on the linearity between Adoption of Cashless Payment and the factors before Pearson correlation coefficients were conducted. The summary of linearity test is as shown in Table 4.

Table 4: Summary of Linearity Test

Variable	F-value	P-value
Performance Expectancy	0.982	0.497
Social Influence	1.086	0.360
Perceived Technology Security	1.445	0.075
Perceived Ease of Use	0.551	0.971
Hedonic Motivation	1.411	0.084

Table 4 showed that the independent variables (Performance Expectancy, Social Influence, Perceived Technology Security, Perceived Ease of Use, Hedonic Motivation) were linearly dependent since all the p-value were greater than the significance level 0.05. In other words, it can be concluded that all variables were linearly correlated with Adoption of Cashless Payment.

Table 5: Pearson's Correlation Table

Variable	Adoption of Cashless Payment
Performance Expectancy	0.827 (< 0.001)
Social Influence	0.848 (< 0.001)
Perceived Technology Security	0.813 (< 0.001)
Perceived Ease of Use	0.775 (< 0.001)
Hedonic Motivation	0.719 (< 0.001)

Note: The value in the bracket represents the p-value of the test.

Based on Table 5, all the independent variables have a significant relationship with the Adoption of Cashless Payment since all the p-values were less than 0.05. All these independent variables have a strong positive linear relationship with Adoption of Cashless Payment since all the coefficient values were greater than 0.7. Social influence has the strongest correlation followed by Performance Expectancy, Perceived Technology Security, Perceived Ease of Use and the weakest was Hedonic Motivation.

D Multiple Linear Regression Analysis

The multiple linear regression analysis started with the initial model with all independent variables (Performance Expectancy, Social Influence, Perceived Technology Security, Perceived Ease of Use and Hedonic Motivation) were included in the model since Backward Elimination methods were applied. Model adequacy checking for the initial model are shown in Table 6, Figure 1, and Figure 2.

Table 6: ANOVA Table for Multiple Linear Regression Analysis

Source of Variation	Sum of squares	Degree of Freedom	Mean Square	F	Sig.
Regression	576.124	5	115.225	183.864	<0.001
Error	141.631	226	0.627		
Total	717.756	231			

Table 6 confirmed that the model was significant since the p-value was less than 0.05.

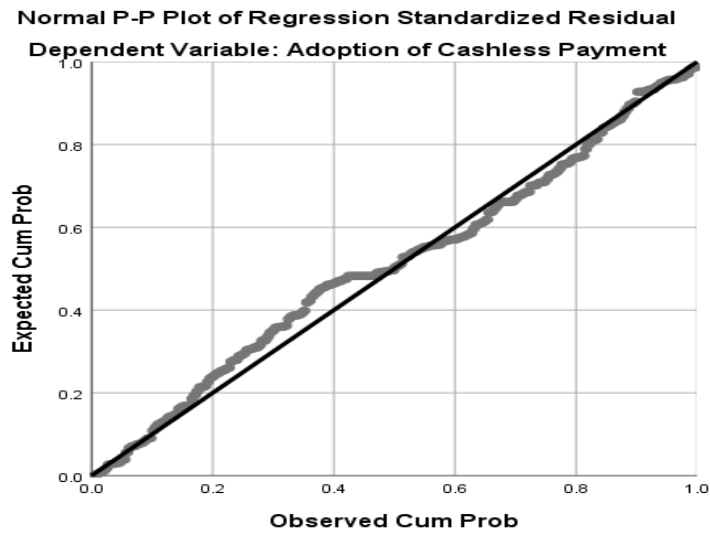


Figure 1: Residual Plot

Next, Figure 1 shows that the points fall close to the normal distribution line, therefore the error were approximately normally distributed.

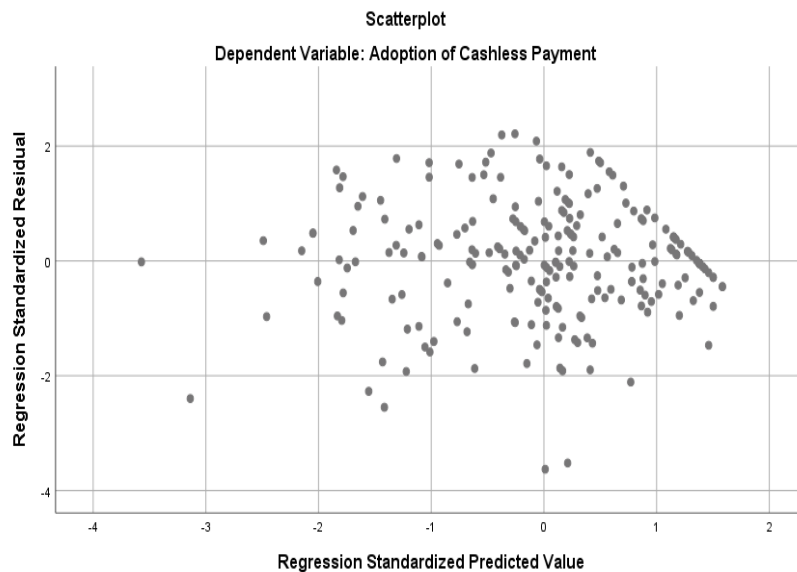


Figure 2: Scatter Plot

Figure 2 showed there was no obvious pattern which indicated that the error variance is constant. Therefore, it can be confirmed that the error was normally distributed with constant variance. Hence,

the assumption of error was satisfied. Since all the assumptions on the regression were fulfilled, then the initial model on Table 7 was valid.

Table 7: Result for Multiple Linear Regression Analysis (Initial Model)

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
	β	Std. Error	β			Tolerance	VIF
(Constant)	-1.121	0.304		-3.689	<0.001		
Performance Expectancy	0.261	0.075	0.226	3.468	0.001	0.206	4.857
Social Influence	0.364	0.081	0.307	4.492	<0.001	0.187	5.359
Perceived Technology Security	0.214	0.066	0.189	3.263	0.001	0.259	3.862
Perceived Ease of Use	0.321	0.071	0.271	4.507	<0.001	0.242	4.135
Hedonic Motivation	-0.013	0.061	-0.012	-0.206	0.837	0.254	3.935

Based on Table 7, all the p-values for independent variables were significant except for Hedonic Motivation since the p-value for Hedonic Motivation (0.837) was greater than 0.05. Thus, Hedonic Motivation was omitted from this analysis. After omitting Hedonic Motivation, the result for Multiple Linear Regression Analysis (Last Model) was shown in Table 8. In the table, it shows that all the independent variables were significant since all the p-values were less than 0.05. Therefore, these four independent variables can be used to predict the level of Adoption of Cashless Payment.

Table 8: Result of Multiple Regression Model (Last Model)

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
	β	Std. Error	β			Tolerance	VIF
(Constant)	-1.119	0.303		3.692	<0.001		
Performance Expectancy	0.257	0.073	0.222	4.539	<0.001	0.220	40.545
Social Influence	0.364	0.081	0.308	4.506	<0.001	0.187	5.357
Perceived Technology Security	0.214	0.065	0.190	0.275	0.001	0.259	3.861
Perceived Ease of Use	0.311	0.053	0.263	0.840	<0.001	0.430	2.326

Besides, the R , R^2 , and $R^2 adjusted$ in Table 9 proved the percentages of total variation using independent variables (Performance Expectancy, Social Influence, Perceived Technology Security and Perceived Ease of Use) were almost the same as that of Hedonic Motivation.

Table 9: Comparison of R , R^2 and $R^2 adjusted$

	Initial Model	Last Model
R	0.896	0.896
R^2	0.803	0.803
$R^2 adjusted$	0.798	0.799

Based on Table 8, Hedonic Motivation has been removed out of the multiple linear regression model. The VIF values for all predictors were less than 10, therefore, there were no collinearity problems in this model. Other than that, the correlation coefficient (R) was 0.896, showing a strong relationship between dependent variable and independent variables. In addition, coefficient of determination value (R^2) was stated as 0.803 which indicates that 80.3% of total variation in Adoption of Cashless Payment is explained by the variation in these four independent variables. While another 19.7% is explained by another factor such as compatibility, cost efficiency, time saving and perceived benefits.

The final model based on Table 8 was as Eq (1):

$$Y = -1.119 + 0.257 * Performance Expectancy + 0.364 * Social Influence + 0.214 * Perceived Technology Security + 0.311 * Perceived Ease of Use \quad (1)$$

Based on Eq (1), β_1 (0.257) explains that every increasing 1 unit of Performance Expectancy, on average, the Adoption of Cashless Payment was increased by 0.257 units. β_2 (0.364) explains for every increasing 1 unit of Social Influence, on average, The Adoption of Cashless Payment was increased by 0.364 units. As for $\beta_3 = 0.214$, it means that for every increasing 1 unit of Perceived Technology Security, on average, the Adoption of Cashless Payment was increased by 0.214 units. The last variable, β_4 (0.311), explains that every increasing 1 unit of Perceived Ease of Use, on average, the Adoption of Cashless Payment was increased by 0.311 units. Regarding this parameter, we also can conclude that Social Influence is the most influential factor that contributed to Adoption of Cashless Payment since β_2 is the highest compared to other β_i .

4 Conclusion and Recommendations

The study found that all the influential factors had a significant influence on the Adoption of Cashless Payment except for Hedonic Motivation. This finding contrasted with the finding from Lin et al. (2020) where their insignificant variables were Performance Expectancy, effort expectancy and complexity. Historically, many believed that cashless transactions are difficult and have limited effectiveness. They never thought that cashless payment would be more convenient than using cash payment as of today. There are a few recommendations that can be used for future research. Researchers can consider different scope of target population for their study. Since the target population for this study only focuses on students in UiTMKB. Researchers can also consider other public universities or private universities. Besides, future researchers can add more on other factors such as compatibility, cost efficiency, time saving and perceived benefits to improve the understanding on the Adoption of Cashless Payment in the target population of study.

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