

# **A Study on the Factors Influencing the Adoption of E-Payment Systems Amidst the COVID -19 Pandemic**

Mandeep Kaur, Research Scholar, Sardulgarh, Punjab  
Shefali, Assistant Professor, IITM Janakpuri, New Delhi  
Himanshu Barthwal, Student, IITM Janakpuri, New Delhi

## **ABSTRACT**

The present research is purposed to understand the adoption of e payment services and study whether consumer intention is affected by Perceived Security, Perceived Health Security, Perceived Benefits and Technology Acceptance Model in India especially in the region of Delhi NCR. Qualitative and quantitative research are the main methodology in this research. The main reason of the research is to check the adoption of e payment services amidst the COVID -19 pandemic specifically due to increased health security awareness. Data of survey was collected from total of 201 participants who include undergraduate and post graduate college students by sending mails online. Out of which only 173 responses found to be fully completed and satisfactory for analysis. Frequencies, Cronbach's alpha, Factor Analysis, Multiple linear regression and one-way ANOVA techniques has been employed by using SPSS. The result has shown that all the five variables used are significantly influencing the intentions to use the e payment services in India, particularly, in Delhi NCR. Even though, PEOU, PB are the main factors affecting the intention to use e payment system, perceived health security (PHS) is also found to be positively affecting people in adopting e payment systems. Study also found that people who are using and likely to use e- payment preferred debit card (35.8%), e wallet (29.5%) and UPI (23.1%) as first mode of payment than credit card (11.6%).

***Keywords: Electronic payment; Perceived security; Perceived health security, Perceived benefits; Technological acceptance model***

## **1. INTRODUCTION**

With the advent in digital technologies, Electronic commerce is having a progressively more profound impact on our daily lives. As a result of this, people commence their day with mobiles by checking emails, using social media such as WhatsApp, Facebook, Instagram and

doing lot of activities which vary from searching to purchasing (Vukomirovic & Cvetkovski, 2018).

In the modern era, E-commerce is growing by leaps and bounds. Myriad factors such as proliferation of Internet convenience, time constraints because of busy work schedules along with the convenient

payment methods as well as cost effectiveness play significant role in the development of e-commerce. Businesses are also incurring huge amount of revenues by meeting needs and demands of customers successfully. This is the platform where buyers and sellers meet and carry out electronic transactions with the help of electronic devices such as mobiles, computers, laptops, tablets, and other electronic gadgets. Therefore, e-Payment is defined here as “*the transfer of an electronic value of payment from a payer to a payee through an e-payment mechanism*” (Weir et al. 2006, Lim 2008).

India is one of the countries, where the number of digital payments has been mounting at a faster pace. As per the report by Razorpay in 2019, India recorded a massive 338% growth in the digital payments in year 2018-19. A data by RBI also concluded that total digital transaction has grown in terms of volume during 2018-19 (Kumar, 2019). Demonetization in 2016, Digital India mission led by our honorable Prime Minister Mr. Narendra Modi played a remarkable role in making India a cashless economy. These steps are taken to promote cashless economy which was proven to be a turning point in e-payment system in India.

Due to the dynamic nature of technology and VUCA (Volatile, Uncertain, Complex and Agile) business environment, e-payment systems are constantly developing. The very good example of this VUCA environment is the COVID-19 pandemic. This coronavirus outbreak has put global population under threat and makes social distancing as a norm. Social distancing is the term used to deliberately increase the physical space between

persons to reduce the risk of infection (Maragakis, 2020). Hence, people are avoiding cash transactions as paper currency is considered to be carrier of virus. World Health organisation also recommended to use contactless payments i.e. where no physical contact is present (Sarang, 2020). A study done by (Girma, 2015; Sharma, 2018) suggested to avoid paper currency as it carries the risk of transmission of pathogens and recommended the replacement of paper currencies with electronic payment methods. Hence, the companies underwent a digital transformation i.e. promoting and offering contactless e payment services to avoid human interactions. This led to a dramatic shifting of consumer predilections from traditional payment methods (such as in cash and cheque) to modern and contactless e payment methods (Rooney, 2020). It also resulted into a rapid adoption of e payment methods by the consumer. In this paper, we termed this factor as a perceived health security.

Perceived health security refers to consumer's perceptions about protection from diseases and unhealthy lifestyles. The paper has discussed the perceived health security in terms of e-payment over paper currency. Countries such as China, Australia, South Korea etc. have taken measures to disinfect paper currencies by disinfectant, UV rays, High heat and by other chemicals (Brown, 2020; Moeser, 2020). In lieu of this, washable plastic currency was introduced in Australia in 1988 and more than 30 countries are using this because of its eco-friendly nature (Mohamed, 2019). But India is still far behind and Indian notes /paper currency is usually contaminated by pathogens which poses risk to human

health (Sadawarte, Mahobe, & Saxena, 2014) (Rath, 2020). Therefore, Indian Government and Finance ministry in the coronavirus outbreak suggested digital route as a safety measure and has nudged Indian people to use more e-payment tools (Kumar, 2020).

According to the report by RBI, E payment is classified into different types of payment systems such RTGS, NEFT, NACH, IMPS, BHIM UPI, BHIM Aadhaar, NETC, AEPS, Credit Cards, Debit Cards, PPIs, Mobile Banking, Internet Banking, Closed System PPIs and Others (Reserve bank of India, 2019). In this research paper, e wallets, Credit card, Debit card and UPI (Unified personal interface) has been used as e-payment sources to carry out research. 1) Electronic wallets (e-wallets) is the copy of physical wallets in virtual environment which is used to physical wallet, used to store information such as credit card numbers, debit numbers, e-cash and other required information of customer etc. which is essential during the time of checkout on e-commerce sites (Junadi & Sfenrianto, 2015). Nowadays, various companies have developed and made e wallets available to consumers as they are more efficient than physical wallets. In India, the major players in e wallet industry are paytm, phone pay, ola money, Amazon pay, mobikwik, jio money etc. 2) Credit cards: It is a system where the server validates the consumer and then confirms with the bank whether sufficient funds are available before the purchase; then charges imposed against the customer's account; and the customer is billed afterwards for the charges and pays the balance of the account to the bank (Kim, Tao, Shin, & Kim, 2010). 3) Debit cards: In this system, money is maintained by the customer in

their bank account and, when a debit transaction is carried out, money is transacted from the account (Kim, Tao, Shin, & Kim, 2010). 4) UPI (Unified personal interface): This is application-based method launched in 2016 in India named as BHIM UPI. It is usable on smartphones and customers are required to make a registered virtual address and then use this address to make transactions (Reserve bank of India, 2019).

Electronic payment methods are accepted by consumers because of different factors derived from various theoretical models. The most commonly used methods to evaluate consumer adoption of technology are theory of reasoned action, theory of planned behaviour and Technology Acceptance Model (Kim & Malhotra, 2015). In this paper, the major focus is on Technology Acceptance model because this model has a better capability to explain consumer adoption towards technology especially e payment methods than theory of reasoned action, theory of planned behaviour. Many researchers have used TAM (Technology Acceptance Model) to explain about user acceptance on technologies.

### **1.1 TAM MODEL**

TAM model was first introduced by Davis in 1989 to determine the behaviour of computer usage. The model was used to the constructs, perceived usefulness (PU) and perceived ease of use (PEOU) to predict behavioural intention and attitudes of users for acceptance of information technology. A study by Venkatesh (1996) imparted that the effect of attitude element did not fully mediate the effect of perceived usefulness on intention to use. Thus, the refined model has been used in

the study which did not include attitudinal element of users towards technology adoption. Zhou et al. (2008) also stated that both perceived usefulness and perceived ease of use directly affect the consumer intention.

## **2. LITERATURE REVIEW**

Literature is collected based on the factors influencing the E-payment system.

1) Perceived Usefulness, Khan and Jain (2018) Because of large and widespread use of Smartphones, trend of online payments is increasing. Sometimes, this is due to availability of different and attractive discounts as well as the convenience. The upsides of using e-payments are frequently related to the benefits provided by the smartphones, which comprises of various kinds of advantages such as easy to access the services, independent payments, not time bound as well as place bound, doorstep delivery etc. All these provisions built the credence of users on the e-payments. Wulandari, et.al. (2018) The properties of electronic money should be simple and easy to understand. The simplicity of access of electronic system could be significance its usefulness and user's attitude. The factors affecting the use of electronic money namely assess usefulness affects significantly towards intention to use electronic money. The assess usefulness has the noticeable offering towards the intention to use electronic money.

2) Perceived Ease of use, Wulandari, et.al. (2018) Technology has played a splendid role in improving the lifestyle of

individuals and it is more useful for them when easier to use. Results have demonstrated that the ease of use and intention to use e-money shared a positive relation with each other. Roy and Sinha (2017) The focus of customers towards the adoption of electronic payment and clearing system will increase; when only customers believe that the services of electronic payment system are easy to use. Mobile Banking operation software, ATM interface software should be handy and user friendly so that it can easily capture the attention of customers.

3) Perceived Security, Mazumder, Jahan, and Das (2015) Security of information has become a very crucial and the most concerned parameter of modern communication system which is achieved by cryptography functions and techniques when customers and merchants carry out a transaction over internet. Thus, it helps to resolve a key issue of protection of information against the security threats. Roy and Sinha (2017) Indian customers are overly sensitive for the security concern that is why they can only adopt the electronic payment system and clearing services when they feel the channel of electronic payment system are safe and threat free.

In the current study, the above variables have been employed to check their influence on the intention to use e payment systems because the previous studies have noticeably illustrated their effects on human behaviour while considering the use of technology.

### **2.1 RESEARCH GAP**

Based on the literature review it is noted that much research has been conducted in

the area of E-Banking, E-Commerce, and Electronic Shopping. But little research is conducted on acceptance of Electronic payment system especially in Northern Region of India namely Delhi NCR. In addition, with the variables of Perceived security, perceived benefits and TAM, the Perceived health security element is also employed with respect to adoption of e payment services. Therefore, it is considered as a research gap and an attempt has been made to cover the above gaps and bring out a detailed study of the research topic.

### 3. OBJECTIVE OF THE STUDY

The Objective of the study is to determine the factors which are influencing customer intention to adopt E-payment system in

India. The Specific Objectives are listed below:

H<sub>1</sub>: To determine the relationship between perceived usefulness and customer intention to adopt E-Payment.

H<sub>2</sub>: To determine the relationship between perceived ease of use and customer intention to adopt E-Payment.

H<sub>3</sub>: To determine the relationship between perceived security and customer intention to adopt E-Payment.

H<sub>4</sub>: To determine the relationship between perceived health security and customer intention to adopt E-Payment.

H<sub>5</sub>: To examine the relationship between perceived benefits and customer intention to adopt E-Payment.

H<sub>6</sub>: To determine the relationship between customer intention to adopt E-Payment and actual system usage.

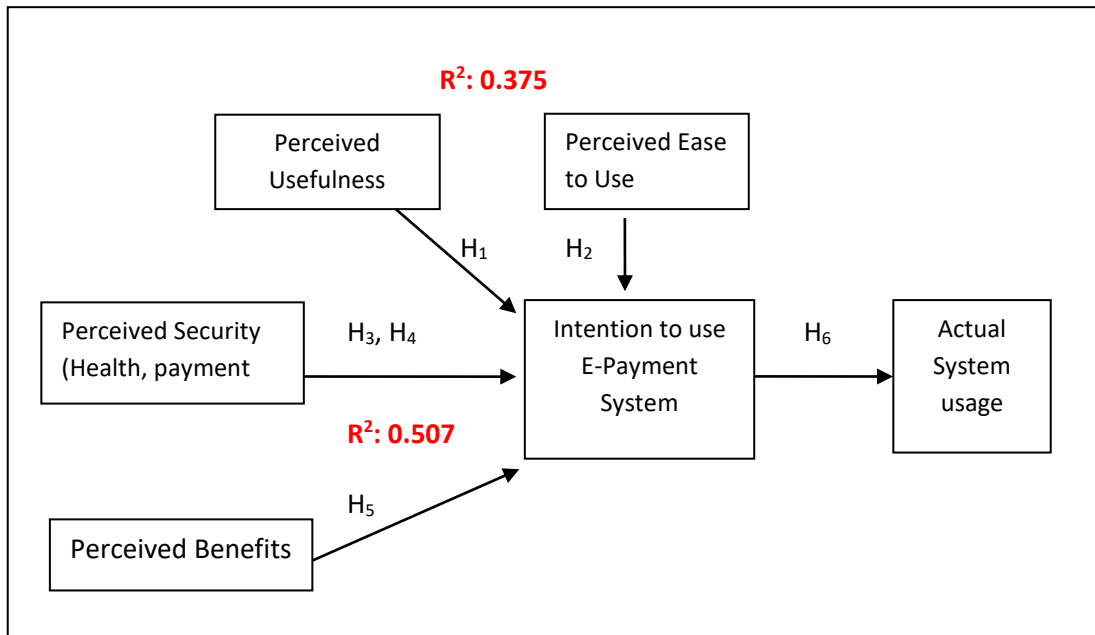


Figure 1: Proposed Research Model

### 4. RESEARCH METHODOLOGY

The present research paper is based on descriptive type of research i.e. adding something new to an already existing TAM model. Because of two reasons the

purposed research is different: one is that it has been carried out on college students living in Delhi NCR other than normal consumers and second to ascertain if health security could be considered as an independent factor and variable influencing the model amidst the Coronavirus outbreak globally. During this pandemic crisis, Consumers are much more conscious about their health security and to avoid getting infected in the public place's government is instructing the people to follow social distancing i.e. to avoid going out as much as possible. Also, National Payments Corporation of India has started a campaign known as: India pays safe, to aware and promote digital payment methods as dealing in cash could lead to Coronavirus infections, which is fatal for human health (Khosla, 2020). A well-structured questionnaire was used to gather the information. It was included demographics, perceived usefulness, perceived ease of use, customer intention to use, perceived security, perceived health security and perceived benefits. The intention to use measure was adopted from Davis et al. (1989). Standardised scale used to collect the data for all the six constructs which were measured on 5-point Likert scale where, 1= strongly agree and 5 strongly disagree. Besides this, the development of hypothesis to test the relationship among the variables has been done in the purposed research.

The reason for selecting College students as a target population in the present research is their tech savvy nature and awareness of them towards the new trends of e payment mechanisms. It is also supported by the research conducted by Farag, Schwanen, Dijst and Faber in (2007), that young people have more

positive attitude towards internet than older people. Also, the students use internet more on their mobile and other electronic gadgets for their daily activities (Burns & Bush, 2005).

Sample has been collected from the college students of Delhi NCR as Delhi NCR is in the top 10 list of digital transaction state-wise. Majority of our data collected from New Delhi city, Gurgaon and Noida out of which New Delhi has scored 6<sup>th</sup> position and Gurgaon has scored 8<sup>th</sup> position in the top 10 list of highest digital transactions city-wise as per to the report of Worldline in 2019.

Both Primary and Secondary sources have been used to carry out the research. The primary data has been collected by survey method with the help of Questionnaires. Due to lockdown in coronavirus outbreak, questionnaires were mailed online through different channels such as e mails, whatsapp, facebook etc. The total number of 201 questionnaires were mailed, out of which 28 responses were found incomplete therefore not used in the analysis. Finally, 173 questionnaires were completely collected. Purposive sampling was used to complete the research as sample were collected from undergraduate and postgraduate college students of Delhi NCR. This sampling is based on pre-defined purpose on adoption of e payment methods specifically by college students. This is supported by the fact that college students have good basic knowledge of Internet functioning and e-commerce activities (Dan, Xu & Liu, 2012).

Analytical techniques such as Frequencies, Cronbach's alpha to check the reliability of scale items used, factor analysis to reduce the factors, multiple linear regression

technique to achieve first five hypotheses and one way- ANOVA to achieve the last hypothesis are employed.

## 5. DATA ANALYSIS AND INTERPRETATION

Out of 201, total 173 responses were found complete for further analysis and 28

**Table 1: Summary of 173 sample respondents**

Variables	Information	Frequency	Per cent (%)
Gender	(1) Male	97	56.1
	(2) Female	76	43.9
Educational Level	(1) Graduate	160	92.5
	(2) Postgraduate	13	7.5
Have you ever heard of e payment before	(1) Yes	169	97.7
	(2) No	4	2.3
Have you ever used it before	(1) Yes	157	90.8
	(2) No	16	9.2
Which is the most preferable mode of E-Payment	(1) E Wallet	51	29.5
	(2) UPI	40	23.1
	(3) Credit Card	20	11.6
	(4) Debit Card	62	35.8
	Total	173	100

responses were rejected due to missing values. Table 1 below demonstrates count and percentage value of Gender, Educational level, awareness about E-payment system, actual usage of E-payment system, and most preferable mode of E-Payment.

### 5.1 Reliability Test

**Table 2: Reliability Statistics**

Cronbach's Alpha	N of Items
.91	26

From table 2, it is indicated that cronbach's alpha value is .91 for 26 statements which is highly satisfactory value for reliability analysis in social sciences (Cronbach, 1990). This fulfils the requirement that items used in the scale are highly reliable to find what is purposed to be.

## 5.2 FACTOR ANALYSIS

The K.M.O. value of the data set is 0.867 is greater than 0.5 which means that Factor Analysis can be suitable to conduct at 95% confidence level. 63.58% of variation in the data set can be illustrated by six factors. Eigen values of factors are larger than one which indicates that all the factors are important. The eigenvalues of factor 1 (PB) is 8.943 that involves 34.396% of variance. The eigenvalues of factor 2 (PEOU) is 1.942 which consists 7.470% of variance. The eigenvalues of factor 3 (PU) is 1.666 which consists 6.407% of variance. The eigenvalues of factor 4 (PS) is 1.477 which consists 5.681% of variance. The eigenvalues of

factor 5 (CI) is 1.417 which consists 5.451% of variance. The eigenvalues of factor 6 (PHS) is 1.085 which consists 4.175% of variance. Thus, Perceived Benefits is the most important factors.

## 5.3 TESTING OF HYPOTHESIS

A multiple linear regression test was performed to test hypotheses H<sub>1</sub>, H<sub>2</sub> only. R square value= .375, F= 50.99, Sig. = .000 indicates that PEOU, PU are good predictors of Customer intention towards use of e payment system and explains approximately 37% of the total variance in the dependent variable customer intention to use e payment. The table 3 below demonstrates the above explanation.

**Table 3: First Regression model**

		Coefficients a				
		Unstandardized Coefficients		Standardized Coefficients		
Model		B	Std. Error	Beta	t	Sig.
1	(Constant)	.674	.129		5.205	.000
	PEOU mean	.433	.079	.412	5.510	.000*
	PU mean	.238	.065	.272	3.632	.000*

a. Dependent Variable: CI mean

**Note: \* means p value is significant at .01 level**

However, along with perceived usefulness and perceived ease of use variables other three external variables like Perceived security, perceived health security, perceived benefits were also tested to check their influence on intention to use e payment system, thus, multiple linear regression test was performed to test hypotheses H<sub>1</sub>, H<sub>2</sub>, H<sub>3</sub>, H<sub>4</sub> and H<sub>5</sub> altogether. R square value= .507, F= 34.31, Sig. = .000 which means that five independent variables explains almost 50%

of the total variance in the dependent variable customer intention to use e payment. This shows improved results as the total explained variance in dependent variable has increased. So, it can be reiterated that along with TAM variables other variables such as perceived security, perceived health security, perceived benefits also have a significant effect on customer intention to use e payment systems (Table 4).



**Table 4: Second Regression model**

Model	Unstandardized Coefficients		Standardized Coefficients	T	Sig.
	B	Std. Error	Beta		
1 (Constant)	-.012	.172		-.071	.943
PEOU mean	.248	.079	.236	3.143	.002*
PU mean	.127	.063	.145	2.025	.044**
PS mean	.139	.061	.149	2.294	.023**
Health Security mean	.247	.068	.207	3.624	.000*
PB mean	.234	.068	.254	3.458	.001*

Note: significant at \*.01 and \*\*.05

**Table 5: The Pearson Correlation Relationship between Variables**

	This research is N= 173	
	correlation**	Strength of correlation
H <sub>1</sub> : PU & CI	.513	Moderate Positive
H <sub>2</sub> : PEOU & CI	.571	Moderate Positive
H <sub>3</sub> : PS & CI	.479	Moderate Positive
H <sub>4</sub> : PHS & CI	.365	Moderate Positive
H <sub>5</sub> : PB & CI	.595	Moderate Positive

Note: Correlation \*\* test at 0.01 significance level.

Table 5 depicts that in this study, all the hypotheses are correlated to each other variable since r are higher than 0.1, also most of hypotheses are positively correlated to another variable and have moderate correlation. This result is similar with Davis (1989) research, so this result is close to the reality.

## 6. CONCLUSION

The proposed model in present research is used to examine consumer's intention to use e-payment system in Northern region

of India. It is based on TAM to investigate customer's intention to use e-payment system specifically among Delhi NCR people. Two regression models are proposed: first involves only TAM variables and second model includes three external variables added to Technology Acceptance Model. These external variables are perceived security, perceived health security, perceived benefits. After Comparing the Results of Table 3 which involves only TAM variables and Table 4 which includes TAM

model along with three external variables, it can be concluded that the second regression model which considers the five independent variables such as perceived usefulness, perceived ease of use, perceived security, perceived health security and perceived benefits is better predicting the dependent variable intention to use e payment system in India particularly referring to the Covid-19 pandemic as the R square is increased from 0.375 to 0.507 which is a good indicator, and all the independent variables are determined to be significant at 95% and 99% confidence levels and positively affecting the intention to use e payment system by people in Delhi NCR.

In these five factors, PB and CI are strongly related (Table 5). Although, PB and PEOU are main factors in affecting the customer intention (CI) to use e payment system (Table 5), PHS i.e. perceived health security is also found to be positively affecting the intention to use e payment system among Delhi NCR people in the times of COVID-19 pandemic.

## **7. LIMITATIONS AND RECOMMENDATIONS**

The study, however, has done amid the coronavirus pandemic which has been prevailing not only in India, but in all over the world. So, it is more likely that the effects of a few factors, which have been used in the present study, would remain same in the intention to use e-payment systems in India, as these variables have shown positive correlation with the intention to use e-payment systems. Thus, the results can be considered reliable at the point. As, every research has certain limitations; this study is done in Delhi NCR region only, consequently, the findings may not be generalised all over in

Additionally, study illustrated that people who are using e payment are preferred Debit card (35.8%), e wallet (29.5%) and UPI (23.1%) as first mode of payment over credit card (11.6%). And the findings of last hypothesis ascertained that there is significant difference between the actual system usage (yes=157, no=16) and Customer intention to use e payment at 0.05 significant levels where the Posthoc test TukeyHSD showed that count and mean of people who agreed to use e payment services (113, 1.05) is quite different from who can't say (54, 1.17) and disagreed (6, 1.17) for e payment usage. This revealed that people who intend to can't say and disagreed upon its usage are practically adopting e payment systems in practice amidst pandemic crisis the results supported by report of KPMG., August, 2020, which highlighted that amid the pandemic crisis 81% people expressed to use cashless payments but 8% were already preferring digital payments.

the India due to the differences in education levels or e payment awareness levels. In fact, the research area can be broadened by involving other metro regions to check the effects of same variables. Furthermore, other parameters such as social pressure, culture and attitudinal variables could be used in the future study.

## **8. REFERENCES**

- Bhusry, M. (2011). *E-Commerce*. New-Delhi: Firewall Media.
- Davis, F. D. (1989) "Perceived usefulness, perceived ease of use, and user acceptance of information technology," *MIS Quarterly*, 13(3), 319–340.
- Dehbini, N., Birjand, M., & Birjandi, I. H. (2015). Factors Influencing The Adoption Of Electronic Payment Cards In Urban Micro Payment. *Research Journal Of Finance And Accounting* , 6 (1).
- Fika, D., & Maya, A. (May 2017). Factors Affecting The Adoption Of E-Payment On Transportation Services Application Using Modified Unified Technology Of Acceptance And Use Of Technology 2 Model. *Academics World 64th International Conference*., Putrajaya, Malaysia.
- Goh Sau Wei. (April 2017). Factors Affecting Adoption Of E-Payment Among Private University Students In Klang Valley. Research Project, Universiti Tunku Abdul Rahman.
- Igudia, D. P. (2017). A Qualitative Evaluation of the Factors Influencing the Adoption of Electronic Payment Systems (SMEs) by SMEs in Nigeria. *European Scientific Journal* , 13 (31).
- Khan, S., & Jain, S. (2018). A Study on Usage of ePayments for Sustainable Growth of Online Business. In G. I. Management (Ed.), *Innovative Business Practices and Sustainability in VUCA World*, 74-81. Mumbai.
- KPMG. (August, 2020). Impacting digital payments in India.
- Mazumder, F. K., Jahan, I., & Das, U. K. (2015). Security in Electronic Payment Transaction. *International Journal of Scientific & Engineering Research* , 6 (2).
- Mbwayo, E. M. (2017). Factors influencing adoption of Electronic payments by Commercial banks in Kenya. Research Report, University of Nairobi, MBA.
- Padiya, D. J., & Bantwa, P. A. (2018). Adoption of E-wallets: A Post Demonetisation Study in Ahmedabad City. *Pacific Business Review International* , 10 (10).
- RBI. (2020). *E-payment*. Dun Broadstreet & RBI Data.
- Roy, S., & Sinha, I. (2017). Factors affecting Customers' adoption of Electronic Payment : an Empirical Analysis. *IOSR Journal of Business and Management (IOSR-JBM)* , 19 (12).
- Samuel, E., & Agnes, N. (2018). Framework Towards Enhancing Adoption of Electronic Payment in a Developing Economy. *The African Journal of Information Systems* , 10 (3).
- Sokobe, O. E. (2015). Factors Influencing Adoption of Electronic Payment by Small and Medium Hotel Enterprises in Kisii Town, Kisii County. (M. E. SHRD, Ed.) *International Journal of Novel Research in Computer Science and Software Engineering* , 2 (2), 5-18.
- The Economic Times. (2020, Jan 7). Definition of E-wallets.
- Venkatesh, V., & Davis, F.D. (1996). A model of the Antecedents of perceived ease of use: Development and test, *Decision Sciences*, 27 (3), 451-481.
- Wulandari, D., Narmaditya, B. S., Parewangi, A. M., Sakarji, S. R., Purnamasari, V., & Qurrata, V. A. (2018). Factors affecting the adoption of electronic money. *International Journal of Civil Engineering and Technology* , 9 (7), 1927-1937.
- Zhou, Y., Meng, W., & Du, H. (2008). Study on the influence factors of customers' buying intention on the mobile data services market, *Science Research Management*, 29 (6), 131-136.