

# Digital Payments: India vs. China – An Empirical Study with the Help of TAM

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**Abstract:** With the growth in the demand for e-payment services in India especially post demonetization, the aim here is to ascertain the selected important factors that play into the acceptance of these services using Technology Acceptance Model. The TAM model is empirically evaluated by using data obtained from 106 respondents through a survey. This study compares these factors with the Chinese market to understand the differences in the perception of users in the two countries and to deduce the reason India needed demonetization to initiate user acceptance unlike China.

**Keywords:** Demonetization, Electronic payment services, Digital wallets, TAM.

## 1. Introduction

India and China have been classified as developing countries for quite some time now, they are both standing at the most populated countries in the world today. In 2016, the Government of India declared a demonetization of denominations of Rs.500 and Rs. 1,000 notes which claimed to curtail the illicit and counterfeit cash to fund terrorism and other illegal activities. This decision had a dual effect of improving the Digital India campaign of the government. This led to a significant increase in growth of organizations like Paytm, Freecharge, CitrusPay, and so on. However, there were claims that increase in digitalization showed its flying colors in the formal sector and not in the informal sector.

China on the other hand has risen to becoming a cashless economy without the need for demonetization. The scenario in China is such that carrying cash is redundant, everything can be paid using e-wallets and other payment interfaces. Smartphone users in China are estimated at around 690 million in 2019.

In Mobile cellular subscriptions the statistics are India-87.28 and China-104.58 (per 100 people). (World Bank)

What are Digital or Mobile payments?

They may be defined as payments initiated and transmitted by access devices that are connected to mobile communication networks (CPSS, 2012). They facilitate transactions between these communications.

What is a Technology Acceptance Model?

This research uses TAM which stands for Technology Acceptance Model to explore the adoption of digital interfaces in both India and China by the General public. The TAM model

devised by is simply a theory or concept that tries to explain how different factors affect the actual or resulting usage of a system. TAM is based on theory of reasoned action (TRA). It is about comparing quantitative usage data collected when different factors that influence usage changes. This model aims to understand the factors affecting consumers adoption of E-payment services.

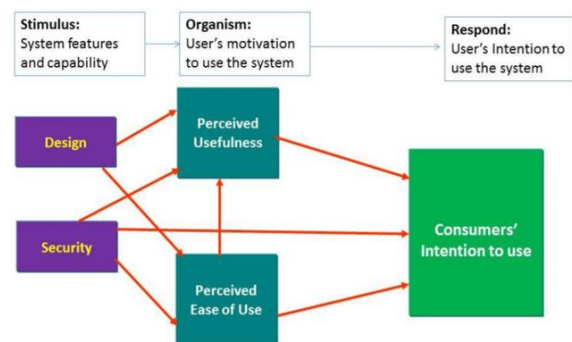


Fig. 1. Stimulus theoretical framework

There are six common mobile payment methods given below. Each method relies on mobile communication protocols that transmits financial messages for transactions to occur.

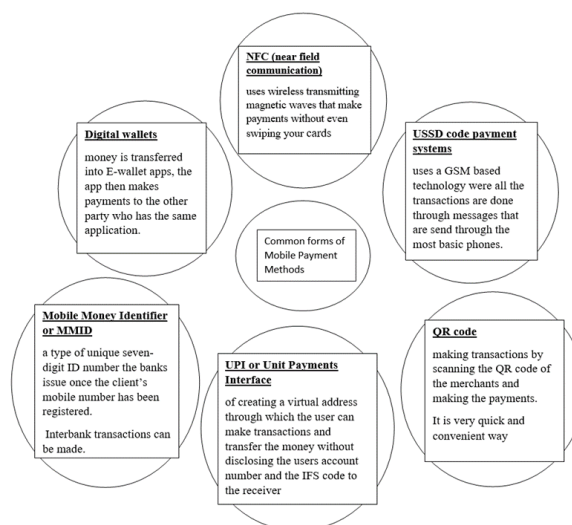


Fig. 2. Common mobile payment methods

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## 2. Literature Review

Dr. Ramesh Sardar, speaks about the development of the mobile payment option as an alternative to the cash payment system. He also specifies that promotions used while using mobile payments provide incentive for people to adopt digital and e-wallets. Mobile payment solutions provide advantages to the economy such as financial inclusion reduction in risk and fraud and reduction of management cost. (Sardar D. R., 2016)

Dorothy Sagayarani provides knowledge about the continuous acceptance of digital payments by people in India and the lacking of digital payment systems in India is the factor of security and increase of cybercrime. (Sagayarani).

K. Suma Vally, Dr. K. Hema Divya studies the effect of adoption of digital payments to felicitate the impact on consumers in the banking sector in India. There is an important policy direction towards the factors that determine cashless payments in India. (Suma Vally)

Dr. S. Manikandan, J. Mary Jayakodi state that the usage of mobile wallets in India have increased owing to the government's policy of demonetization. Security issues and other risk factors subsequently reduced will lead to an increase in the level of adoption of mobile wallets.

T. Praiseye, Dr. Florence John gives us the exact scenario that is demonetization when digital payments became extremely popular. Internet problems and payment for two-digit amounts are areas where issues are faced and redressal of these problems must take place. (T. Praiseye)

Chauhan and Shingari speak about the different types and application of wallets along with the different types of E wallet companies that existed in the world today. E wallets can be used for recharging prepaid mobile phones, booking hotel rooms and paying insurance premium. it is further understood that youngsters are becoming more engaged in the topic of digital payments and are contributing towards it which has led to the success of going digital in India. (Madhu Chauhan).

India set sail to the third phase of Indian e-commerce from the year 2010 when it involved implementation in many avenues and activities such as B2B, the development and initiation of E wallets, Digital India and Mobile-Commerce. India received a funding spree from 2014 as multiple foreign direct investment avenues were initiated through foreign Giants who entered into the Indian market. The third phase is also known to be the innovation and advancement phase. (Kalia, 2016)

Important derivations by using TAM according to this paper is that consumers will shy away from wireless services without the security and privacy protection also the way the consumer applies the technology is important for its success (Lu & Lu, 2003)

Lonare (et. al) talks about the factors affecting the rise in the number of users of E-wallets, and also the difference between their user proportion in metro and tier-2 studies. It also brings to our notice the various types of E- wallets and online payments methods available to the public. Post demonetization the number of users increased explosively including their use by small vendors. Also, the number of users in metropolitan cities was higher than those in tier-2 cities. One of the

significant factors affecting the use of E- wallets in the 'Simplicity' factor i.e., the ease of usage. The study shows that the adoption of E-wallets has been proportionately greater in users that in vendors in urban cities. (Alanknanda Lonare).

It is important to understand India's emerging economy and the need for an ever increasing infrastructural requirement ,which also leads it to an increase in the expenditure to be met by the country for its development .India, already has a large amount of loans and interests to payback and cannot depend on any more debts in order to finance these developments ,to ensure respite from existing levels of interests, making it even more important for India to improve its GDP to tax ratio from the current level of 18%, which happens to be one of the lowest in the world. (Singh).

In this extract, the importance of E-wallets as well as the related problems are clearly defined. Advancements in technology, which contributes to faster commercial transactions conducted through communication networks that interface with wireless devices. This improves the time taken to conduct such transactions and also makes them independent of the location. This paper also categorizes the issues faced by managers, users and researchers and developers. These categories include technological (both infrastructure and client) issues, application issues and areas of future research. (Peter Tarasewich, 2002).

A study undertaken with S. Ananth for World Gold Council stated that out of fifty people interviewed, it was found that a both the 'urban poor' and the 'salaried class' didn't see an increase in usage in bank use. A table depicts the responses (in %) of the public towards demonetization in terms of implementation of 'Perceived objectives' 'Exchange of old Demonetized notes' 'Consumption pattern' and 'Digital transactions'.

## 3. Statement of the Problem

What are the factors influencing Technology acceptance in India? Why did India need demonetization to gain acceptance of technology from the population in the domain of e-payment services? And why did China not require this step from the government?

## 4. Research Objectives

- To find the factors affecting usage of Digital payment services in India using Technology Acceptance Model.
- To compare the information received with the usage patterns of Digital payments in China which is comparable with India in terms of technology.

## 5. Research Model

The goal of Davis' (1989) TAM is to understand the general determinants of users acceptance of technology across the various technologies and user populations. This model is a culmination of selective items from various Technology Acceptance Models devised. The items used for this study are:

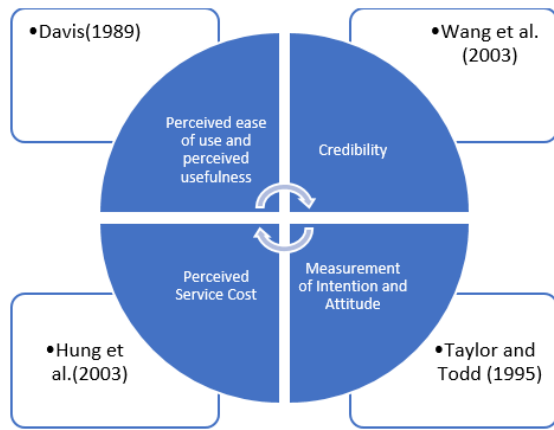


Fig. 3. Research model

H1- Respondent’s attitude has a consequential effect on behavioural intention to use.

1) Perceived Usefulness- Is ‘defined as the potential user’s subjective possibility of usage of a technology’. Triandis (1980) spoke about the important factors that influence behavior and the expected consequences of the behavior. He also shed light upon the fact that human beings tend to choose behaviors that they perceive to be useful and base their choice of behaviors on the desirability of the view of usefulness.

H2- The useful quality perceived by the user has a consequential effect on attitude to utilize technology.

1) Perception of easy use- Refers to ‘the extent to which a person believes that using a particular appliance would be free of any effort’

H3- 1) Perception of easy use has a consequential effect on perceived usefulness.

H3a - Perception of easy use has a consequential effect on attitude to use.

H3b- Perception of easy use has a consequential effect on perceived service cost.

2) Perception of service costs associated- Cost factors in terms of time and money needed regarding usage that may cause refusal to utilize the technology. The argument is that when all other things are equal, behavioral intention and technology usage would be expected to be less likely as less time and money are available and as technical compatibility decreases (Taylor and Todd, 1995).

H4 Perception of service costs associated has a consequential effect on attitude to use

3) Perceived Credibility- For e-payment services, the criteria basically involve privacy and safety of information, this item was chosen because the other items chosen may not fully explain behavior and attitude of consumer’s acceptance to e-payment services. Moreover, financial authorities have been faced with oversight challenges in protecting consumers and the payment system. In China, central banks temporarily suspended the use of mobile payments due to financial and information security concerns

H5 Perception of safety associated has a consequential effect on attitude to use.

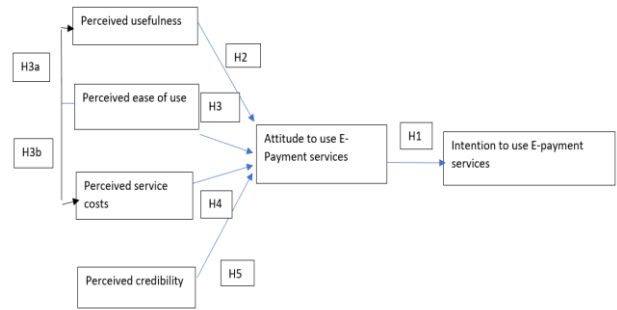


Fig. 4. The Technology Acceptance model this research utilizes

Construct	Item	Source
Perceived usefulness	Using Digital payment services has enhanced my ability to transact online.	Davis et al. (1989)
	Using Digital payment services has made it more easier to carry out transactions.	
	Digital payment services increase the speed in conducting transactions.	
Perceived Ease of Use	Learning to use Digital payment services is easy for me.	
Perceived Credibility	I feel like using Digital payment services will not divulge my personal information.	Wang et al. (2003)
Perceived service costs	Digital payment services are worth the cost due to their effectiveness.	Wu and Wang (2005)
Attitude to Use	I feel like Digital payment services are the future.	
	I have a positive attitude towards e-payment services	
Intention to Use	I fully intend to use Digital payment services in the near future	Taylor and Todd (1995)
	Mostly I will use Digital payment services in the near future.	
	I am using Digital payment services and will continue to use it.	

**6. Research Methodology and Data Collection**

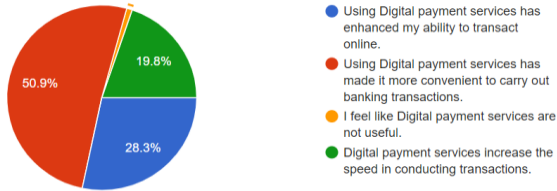
The study is a descriptive research, both primary and secondary sources of data were used. A questionnaire survey was issued to a sample based on the non-probability method of ‘convenience sampling’. The survey was administered to 200 respondents out of which we obtained 106 completed surveys, thus response rate reaches 53%, containing data sufficient to showcase the usage of Digital payment services in India on the basis of the various items mentioned in the TAM. The questionnaire was administered to students of Christ (Deemed to be University), Bengaluru, India and family members of the researchers. The questionnaire highlights certain facts about the demographic profile of the respondents. The results of the questionnaire will be compared with an existing TAM model developed in China based on mobile banking.

**7. Results**

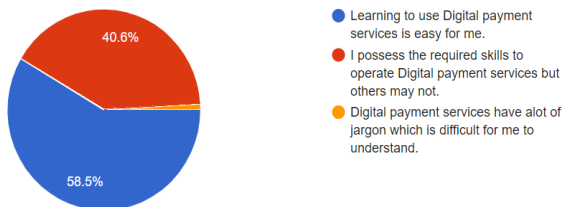
*A. TAM in India*

According to the results of the questionnaire for India, the information received indicates that the most of the respondents are college students. 84% of respondents are between the ages of 18 to 35 which is the clear majority. About 48.1% use e-payment services to pay for food, drink and other consumables

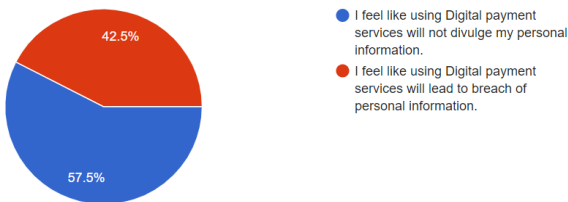
and 26.4% for recharge and repayment of bills and utilities.



1. All the three items that form the construct ‘Perceived Usefulness’ are chosen by the respondents indicating that they do find usefulness in the e-payment technology. Hence H2 is satisfied and is an important item to consider for Technology acceptance.



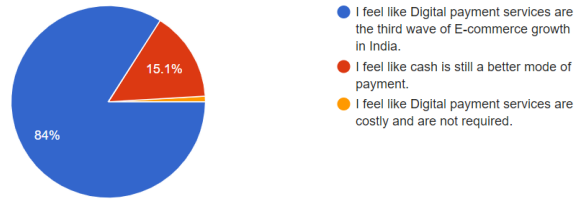
2. The two items favoring the construct ‘Perceived Ease of Use’ are picked by the respondents. Hence the H3 and H3a are not important hypothesis to consider in acceptance of technology.



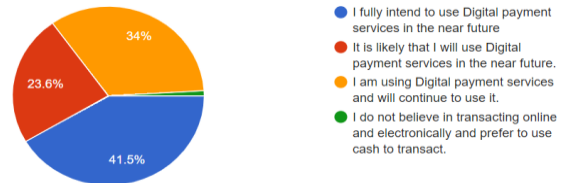
3. However, there seems to be a close call between the desired construct in the case of ‘Perceived Credibility’ with 57.5% respondents confident that e-payment services will not divulge personal information and the latter 42.5% believe that e-payment services could potentially cause privacy issues. H5 is therefore only marginally satisfied. And it is a big indicator for Technology acceptance.



4. Respondents do not mind spending money because digital payments are worth the cost according to them. This means that H4 is not an important factor for technology acceptance, the respondents feel that e-payment services are ‘worth’ a cost. There is however no effect of perceived ease of use on perceived service costs. Hence H3b is not satisfied.

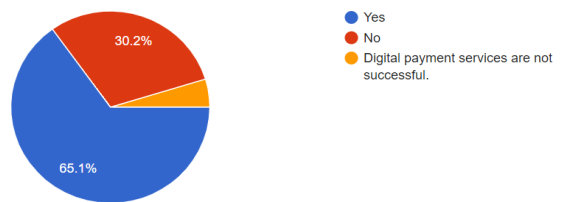


5.84% of the respondents believed that ‘digital payments are the third wave of e-commerce growth’. Therefore, indicating a positive outlook or attitude towards e-payment services in general amongst the respondents. H1 is satisfied.

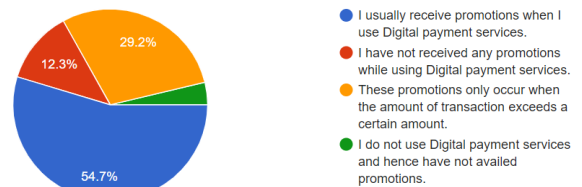


The responses show that the people want to use e-payment services, they either intend to use or are already using the various interfaces. This is an indicator of high technology acceptance rates in India.

When asked about the effects on demonetization on the usage of e-payment services, 65.1% of the respondents feel that demonetization was instrumental in jumpstarting the e-payment service industry for the country.



Indian e-payment interfaces are aiming to enhance user acceptance by providing various promotional features. 54.7% of the respondents felt they did receive cashbacks, bonuses, etc. from these services, 29.2% feel that these offers are only available if the transaction exceeds a certain amount and 12.3% feel that they have not received any of these promotional schemes.



### B. TAM in China

The study conducted by Zhaohua Deng (et.al) the results indicated that in China perceived ease of use has no consequential effect on user’s acceptance of technology. Possibly because the population are familiar with the services offered on their mobile phones so they find mobile services is easy to use. This means, H3 and H3a are not determinants for

positive attitude towards technology acceptance.

Secondly, the higher service costs definitely do not decrease attitudes to use mobile banking in China. The reason is that the trend in mobile banking began with SMS' and now people have grown accustomed to the use of the service regardless of the service cost. Moreover, most of the sample selected owned smartphones for years and they frequently used SMS'. Therefore, perception of higher service cost does not lead to negative perception towards mobile banking.

In this study conducted, the hypothesis' are 'Perceived usefulness' and 'Perceived credibility' are supported.

## 8. Conclusion

Based on the results of the questionnaire it is safe to say that India and China are closely on par with each other in terms of the population's acceptance of technology. However, in case of India many respondents felt that even though these e-payment services were available before demonetization, the actual acceptance of these services began only after. China has a mammoth number of smartphone users in the world currently and for a while now, this means there are huge mobile business market opportunities and smart technology available for expansion of this arena. Now with India's rising numbers of mobile users there is going to be a similar need for technology and opportunity. The results obtained comply with previous research done on mobile banking adoption in China vs Taiwan. The advent of information technology and use of smartphones began at different paces, which is why there is a stark difference in development between the two regions. Similarly, in India, the advent and implementation of such technology occurred much after China. Also, the acceptance of this technology before demonetization was quite low, only after the constriction of cash in India due to PM Modi's initiative of 'Digital India'. Policymakers and developers of technology in China recognized the potential of digitalization before India did, hence they are ahead in the race for public acceptance of technology.

### A. Limitations and Recommendations

The study largely consisted of college going students and not a very wide view of the public which is a considerable limitation in the collection of data. Also, the data derived from Chinese counterparts are limited to research papers published.

Digital transactions can be made attractive to lure the public but successful transactions have to be guaranteed at all times to sustain them. There must be better connectivity for seamless transfer of money for every transaction. A sense of security of transaction must be felt and received by the user by way of strong mechanisms to prevent the misuse of private information. However, as observed 'Perceived credibility' in

India is not exactly successful as the rates for respondents who felt that there is no breach of private information falls short only by a few respondents. Therefore, better technology with no breach of privacy and accompanying laws must be implemented by the government.

According to the survey conducted the respondents feel that through use of digital payments they do receive a lot of promotions by way of cashback, bonuses, and so on, however many respondents also felt that a certain of money has to be transacted in order to avail these promotions. To enhance consumers' acceptance of technology these promotions will have to use aggressive and innovative techniques and strategies. In e-payment services having a smart phone is necessary. A committee may be formed to understand the geographical areas and the issues undermining implementation of these services. It is obvious that digitalization is not an easy process and must be handled with diligence and most importantly with complete understanding of all the issues that need to be dealt with.

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