


**CONSUMER PERCEPTIONS AND BEHAVIORS ON DIGITAL PAYMENT ADOPTION  
AMONG OLDER GENERATION Z AND YOUNGER MILLENNIALS IN PHNOM PENH,  
CAMBODIA**

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ARTICLE INFO	ABSTRACT
<p><b>Article history:</b></p> <p><b>Received</b> 29 May 2023</p> <p><b>Accepted</b> 23 August 2023</p>	<p><b>Purpose:</b> The study's goal is to better understand how older and younger generations in Phnom Penh, Cambodia, behave when it comes to using digital payments. Investigating the choice of mobile payment application in the Phnom Penh region is another objective of this study. Here, it is also investigated how usage, economic situation, and adoption of mobile payments are related.</p>
<p><b>Keywords:</b></p> <p>Consumer Perceptions; Consumer Behavior; Clustering; Digital Payments; UTAUT; K-Mean Clustering; Cambodia.</p>	<p><b>Theoretical framework:</b> One of the most well-known research models on consumer behavior among younger and older generations and the adoption of new technical systems emphasizes the influence of geography, socioeconomic status, and specific traits on consumer acceptance. The concept considers factors including social effects, credibility requirements, effort expectations, and performance requirements when determining the best digital payment application.</p> <p><b>Design/Methodology/Approach:</b> The Unified Theory of Acceptance and Use of Technology (UTAUT) model and K-mean clustering for distance and economic status studies were used in this research paper to select 150 locals in Phnom Penh from the target population in order to study consumer behavioral intention to accept digital payment method and application.</p>
	<p><b>Findings:</b> The result we aimed to show and analyses the Digital payment methods, payments sharing, receiving, storing evidences, that older generation started understanding the digital payment by Khmer language and accepting the digital transactions from known customers. The current generation using Sathapana application and English Language in wide ranges through the Phom Penh region. The study also trying to exhibit the purpose of the digital payment systems in and across the e-commerce activities, through the older and younger generation.</p> <p><b>Research, practical &amp; social implications:</b> The elder generation Z handled digital payments for regional transactions like banking, home tasks, loan repayment, peer lending, travel, and local marketplaces in Khmer. The subsequent generations of millennials also incorporated cross-border payments in English and Khmer.</p> <p><b>Originality/Value:</b> Bringing up a Digital Platform shall make a positive change in economy and circulation of economy to the people and country. Unless the people trust the digital payments, they cant share their money for the business or basic operations to run the government. Thy the Digital Payment applications shall understand the behavior of the customers and share the services through the digital payment systems.</p> <p>Doi: <a href="https://doi.org/10.26668/businessreview/2023.v8i8.3647">https://doi.org/10.26668/businessreview/2023.v8i8.3647</a></p>

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**PERCEPÇÕES E COMPORTAMENTOS DOS CONSUMIDORES SOBRE A ADOÇÃO DE PAGAMENTOS DIGITAIS ENTRE A GERAÇÃO Z MAIS ANTIGA E OS MILÊNIOS MAIS JOVENS EM PHNOM PENH, CAMBOJA**

**RESUMO**

**Objetivo:** O objetivo do estudo é compreender melhor como as gerações mais velhas e mais jovens de Phnom Penh, no Camboja, se comportam quando se trata de usar pagamentos digitais. Investigar a escolha da aplicação de pagamento móvel na região de Phnom Penh é outro objetivo deste estudo. Aqui, também é investigado como o uso, a situação econômica e a adoção de pagamentos móveis estão relacionados.

**Estrutura teórica:** Um dos modelos de pesquisa mais conhecidos sobre o comportamento do consumidor entre as gerações mais jovens e mais velhas e a adoção de novos sistemas técnicos enfatiza a influência da geografia, status socioeconômico e características específicas na aceitação do consumidor. O conceito considera fatores que incluem efeitos sociais, requisitos de credibilidade, expectativas de esforço e requisitos de desempenho ao determinar a melhor aplicação de pagamento digital.

**Design/Methodologia/Abordagem:** O modelo UTAUT (Unified Theory of Acceptance and Use of Technology, teoria unificada de aceitação e uso de tecnologia) e o agrupamento K-mean para estudos de distância e status econômico foram usados neste trabalho de pesquisa para selecionar 150 moradores de Phnom Penh da população-alvo, a fim de estudar a intenção comportamental do consumidor de aceitar o método e a aplicação de pagamento digital.

**Constatações:** O resultado que pretendemos mostrar e analisar os métodos de pagamento Digital, compartilhamento de pagamentos, recebimento, armazenamento de evidências, que a geração mais antiga começou a entender o pagamento digital pela língua Khmer e aceitar as transações digitais de clientes conhecidos. A geração atual usando o aplicativo Sathapana e a língua inglesa em amplas faixas através da região de Phnom Penh. O estudo também tenta expor o objetivo dos sistemas de pagamento digital nas atividades de comércio eletrônico e entre elas, através da geração mais velha e mais jovem.

**Pesquisa, implicações práticas e sociais:** A geração mais velha Z lidou com pagamentos digitais para transações regionais, como transações bancárias, tarefas domésticas, reembolso de empréstimos, empréstimo de pares, viagens e mercados locais em Khmer. As gerações seguintes de millennials também incorporaram pagamentos transfronteiriços em inglês e khmer.

**Originalidade/Valor:** A criação de uma plataforma digital deve fazer uma mudança positiva na economia e na circulação da economia para as pessoas e os países. A menos que as pessoas confiem nos pagamentos digitais, elas não podem compartilhar seu dinheiro para o negócio ou operações básicas para administrar o governo. As aplicações de pagamento digital devem compreender o comportamento dos clientes e partilhar os serviços através dos sistemas de pagamento digital.

**Palavras-chave:** Percepções do Consumidor, Comportamento do Consumidor, Agrupamento, Pagamentos Digitais, UTAUT, Agrupamento K-Mean, Camboja.

**PERCEPCIONES Y COMPORTAMIENTOS DEL CONSUMIDOR SOBRE LA ADOPCIÓN DE PAGOS DIGITALES ENTRE LA GENERACIÓN Z MÁS ANTIGUA Y LOS MILENIOS MÁS JÓVENES EN PHNOM PENH, CAMBOYA**

**RESUMEN**

**Propósito:** El propósito del estudio es comprender mejor cómo se comportan las generaciones mayores y más jóvenes en Phnom Penh, Camboya, cuando se trata de utilizar pagos digitales. Otro objetivo de este estudio es investigar la elección de la aplicación de pago móvil en la región de Phnom Penh. Aquí también se investiga cómo se relacionan el uso, la situación económica y la adopción de los pagos móviles.

**Marco teórico:** Uno de los modelos de investigación más conocidos sobre el comportamiento del consumidor entre las generaciones más jóvenes y mayores y la adopción de nuevos sistemas técnicos enfatiza la influencia de la geografía, el estatus socioeconómico y las características específicas en la aceptación del consumidor. El concepto considera factores que incluyen efectos sociales, requisitos de credibilidad, expectativas de esfuerzo y requisitos de desempeño al determinar la mejor aplicación de pago digital.

**Diseño/Methodología/Enfoque:** En este trabajo de investigación se utilizaron el modelo UTAUT (Teoría Unificada de Aceptación y Uso de Tecnología) y la agrupación de media K para estudios de distancia y estatus económico para seleccionar a 150 residentes de Phnom Penh de la población objetivo con el fin de Estudiar la intención del comportamiento del consumidor al aceptar el método y la aplicación de pago digital.

**Hallazgos:** Nuestro objetivo es mostrar y analizar los métodos de pago digitales, el intercambio de pagos, la recepción y el almacenamiento de evidencia, de que la generación anterior ha comenzado a comprender los pagos digitales en idioma jemer y a aceptar transacciones digitales de clientes conocidos. La generación actual utiliza la

aplicación Sathapana y el idioma inglés en amplias zonas de la región de Phnom Penh. El estudio también intenta exponer el propósito de los sistemas de pago digitales en y entre las actividades de comercio electrónico, entre las generaciones mayores y más jóvenes.

**Investigación, implicaciones prácticas y sociales:** La Generación Z anterior se ocupó de pagos digitales para transacciones regionales como banca, tareas domésticas, pago de préstamos, préstamos entre pares, viajes y mercados locales en jemer. Las generaciones posteriores de millennials también han incorporado pagos transfronterizos en inglés y jemer.

**Originalidad/Valor:** La creación de una plataforma digital debería generar un cambio positivo en la economía y la circulación de la economía para las personas y los países. A menos que las personas confíen en los pagos digitales, no pueden compartir su dinero para negocios u operaciones básicas para administrar el gobierno. Las aplicaciones de pago digital deben comprender el comportamiento del cliente y compartir servicios entre los sistemas de pago digital.

**Palabras clave:** Percepciones del consumidor, Comportamiento del consumidor, Agrupación, Pagos digitales, UTAUT, Agrupación K-Mean, Camboya.

## INTRODUCTION

The world is moving to digital payments. They are faster, more secure, more transparent and more efficient than cash. The COVID-19 pandemic has accelerated the shift toward paying digitally and demonstrated clear benefits beyond cost and efficiency: by minimizing human interactions during money exchanges, reducing travel and keeping commercial establishments less crowded, and managing health risks.

The case for digital payment of wages in the workplace is strong. For example, Bangladesh's ready-made garment sector increased its adoption of wage digitization over the last decade and the business benefits of digital payments were clearly demonstrated, including lowering the costs and security risks of disbursing cash on payday. Adopting digital wage payments also expanded access to formal financial services for workers, especially women, and increased the use of accounts for savings and sending remittances, especially when partnered with financial capability training and ongoing support (**World Bank Organization, 2021**).

The economy of Cambodia had been predicted to expand by 4.5 percent in 2022, but the future is still uncertain. The government will need to continue funding programs to assist the poor, which will cause the fiscal deficit to increase to 6.3 percent of GDP (**World Bank Organization, 2022**). After covid pandemic the south Asian economic platforms are based on digital payments and also based on the support of the people towards the new digital payment systems. Digital payment is a modern method of payment which can help promote financial inclusion in the country. However, it only has positive impacts when everything is done right. If the digital payment systems are centralized through the government, then people can use it with confidence, because the transparency will increase. **Erol Kazan, et al (2014), Kamal et al (2023)** figured out and compared the characteristics of centralized and decentralized digital

payment systems. The research studies revealed that centralized digital platforms tend to create unique configurational to get monopolistic power by tightly coupling platform layers, which are difficult to replicate. Conversely, decentralized digital platforms purposely decouple platform layers, to foster open innovation and accelerate market disruption. The same author **Erol Kazan, et al (2014)** published another work which is related to digital payment design framework by picking up four types of payment players including a bank, a mobile network operator, a merchant, and a startup, with four design components including direct interaction(multi-sided platform), platform design(closed or open platform), technology design(evolutionary and revolutionary) and business design(platform development and Schumpeterian innovation) as the case studies. The comparative study and results showed how payment incumbents and disrupters design their digital payment platforms, and the design choices they have. These results indicate that payment instruments have evolved from a two-sided payment platform (involving only the cardholder and the merchant) to a multi-sided digital payment platform, i.e., third-party services are incorporated into the digital payment platform. For technology design, evolutionary payment instrument is the prevailing technology design strategy as it is compatible with an existing user base and to its payment infrastructure. Revolutionary payment instruments (such as Near Field Communication or NFC mobile phones), on the other hand, though have been found to offer great services, they often have adoption and compatibility issues on user and merchant side, respectively. **Musa Abdullahi Bayero, et al (2015)** discussed on the effects of cashless economy policy on financial inclusion in Nigeria showed that awareness, consumer value proposition, and infrastructure have significant relationship with financial inclusion whereas business model of financial service providers did not show any significant relationship with financial inclusion. This implies that without proper studies, the actions to promote financial inclusion can go in vain as what they are trying to improve or change is not the root cause of the problem. Like in this case in Nigeria, some digital payment service providers tend to improve the business model while it is not the right thing to do. However, this study has too few hypotheses which might have looked over some other potential factors. This suggests that further studies on the topic should be conducted, and my study will be one that fills this gap using a different methodology and covers different country. Once the financial inclusion is boosted, the economy will also be positively impacted. Consumer awareness and social influence are very powerful to drive digital payment adoption. The adoption of one cashless method will push another type of cashless payment. In the long run, there is a significant effect of adopting cashless or digital payment on the economy of the

five European Union countries including Austria, Belgium, France, Germany, and Portugal (Hock-Han Tee, et al, 2016) , Radhika (2023). The authors would like to bring out the real world parameters into the study and operational issues, Consumer behavior, perceptions related to generations in Phnom Penh region, Cambodia.

- Digital payment: “Digital payments are transactions that take place via digital or online modes, with no physical exchange of money involved. This means that both parties, the payer and the payee, use electronic mediums to exchange money [6]”
- Older Generation Z: Generation Z (also known as Gen Z) refers to people who were born in or between 1997-2012 or whose age is between 10-25 . By older Generation Z, the author refers to those who were born in the year closer to 1997 or 25 years in age.
- Younger Millennials: millennials refer to people who were born in or between 1981-1996 or whose age is between 26-41 . By younger millennials, the author refers to those who were born in the year closer to 1996 or 26 years in age.

## LITERATURE REVIEW

### Consumers’ Perception

After having a well-designed, robust digital payment framework and platform along with an understanding of how it is important to financial inclusion as well as the economy, how it is perceived by the consumers is also crucial to know as it has a lot to do with driving the adoption of the established platforms and considering necessary enhancement to the platforms to meet the consumers’ overall expectations. Consumer perceptions of digital payment have a significant and positive impact on the adoption of digital payment, and they may vary in accordance with the differences in demographic facts. However, in Delhi, India, among demographic factors such as gender, age, profession, education, and annual income, only education has been found to have significant influence on digital payment adoption (Shamsher Singh, 2017). This implies that adoption of digital payment can be driven by improving the education or training about how the digital transaction could be made so that they start to feel confident in using those platforms. Moreover, it also has a link with the design of the platform in terms of its user experience and ease of use. The easier it is, the more people will adopt it.

### Social Influence and Behavioral Intentions

Social influence also has significant impact on digital payment adoption. During the demonetization period in which the policy was issued by the government, India has seen



remarkable rise in digital payment transactions. However, after the period ended, many ignored the digital payment method again. The behavioral intention to use and innovation resistance affect the usage of digital payment systems. The relation between behavioral intention to use digital payment systems and the actual usage of digital payment system is moderated by the stickiness to cash payments (**Brijesh Sivathanu, et al, 2017**). In the same year, another research also focusing on the Indian Demonetization period in 2016 revealed that people started to adopt digital payment; however, they did not want to pay extra for digital transaction fee (**Chaubey Dhani, et al, 2017**). Therefore, it can be concluded that when driving the adoption of digital payment platform, one should also consider the cost of transaction as well—it should be either totally free or at least at a point that is affordable for typical consumers. If it costs consumer too much, no matter how smart and convenient the systems are, people will not use it. In addition, although payment digitalization is a growing sector, some of the main reasons for not adopting digital methods for payment include low rate of mobile internet penetration, comfort of using cash, lack of training for digital payment etc. (**Malusare Lalita Babulal, et al, 2019**). The implication from this research can give the direction for the policy makers or government to realize the current barriers so that they can take remedial actions accordingly. My future research also aims to figure out the factors for not adopting the digital payment services as the mobile penetration rate is already high in the selected region. From this point, I doubt if lack of awareness and training is the concern in my region, so this will be hypothesized and tested. A study has been done in Kuala Lumpur, to learn the behavioral intention of the consumers. This method used Mobile payments and applications in Kuala Lumpur. In this study they used 100 students and analyzed their needs, mobile payments and also how many downloads have been recorded on different mobile payment applications, etc. (**Ama Henry Ebubedike et al 2022**).

### **Bank Account Opening Challenge: Process and KYC Issues**

The adoption behaviors of digital payment can associate with the fact that whether the consumers have a bank account or not. Having an account with a financial institution and using mobile money services usually have a positive effect on the participation of non-cash transactions (**Nguyen & Nguyen Vinh, 2019**). Driving people to register a bank account can be challenging, especially during this pandemic. People have hectic schedule, and if they are required to go to bank to register the account, they feel reluctant as it takes them both time and risk of transmission of the virus. The suggested solutions as a response to the study result is to simplify the process for opening a bank account. For instance, minimizing the required

document and allowing a self-serviced e-KYC through mobile phone for consumers to register can encourage the starting point for registering bank account, which finally contributes to the adoption of cashless transaction. Thinking more deeply into the method and data used, this research also has some limitation. The researcher did not collect primary data, but instead retrieved them from secondary data source and with the last update of one year prior to the study. This can create a bias as well since now things might already have been slightly changed as it is in the end of the pandemic. However, there is another study saying about the same regarding KYC matters, yet it has also revealed other inhibitors. Some important inhibitors of digital payment service adoption include poor network and connectivity, ineffective security and support, not-entirely digital KYC process, and additional fees for making wallet-to-bank transactions (**Rahul Gupta, et. al, 2020**).

### **Generations Influencing Digital Payment Adoption**

Evolving technologies such as internet of things, big data, mobile technology, and computing power, have become the drivers of innovations in financial services. Other potential factors influencing the digital payment adoption include social influence, facilitating conditions, trust, performance expectancy, and attitude. These hypotheses have been proved by several prior studies. The research was done by **Norulhuda Abdullah, (2020)** revealed that there are four factors significantly influencing e-wallet acceptance including performance expectancy, social influence, facilitating conditions, and trust. Another one was done by **Pushp Patil, et al, (2020)** which revealed that performance expectancy, intention to use, and grievance redressal are significant positive factors of consumer use behavior towards mobile payment. The intention to use was remarkably influenced by attitude, social influence, and facilitating conditions. A Study was held by Sirait **H et al (2023)** , to find the impact of technology infrastructure, digital lending, and digital payments on income, health, and education was examined using quantitative research between 2015 and 2020. The results showed that technical infrastructure has a negative and small impact on education level but a considerable beneficial impact on real per capita income and public health. Digital lending had negligible detrimental effects on public health and education levels and insignificantly beneficial effects on real per capita income. The degree of education was also negatively and insignificantly impacted by the study. Digital payments also had a favorable effect on health and education levels, although they had a minor negative influence on real per capita income.

### Weight of Impact by Different Factors

Although there seems to be many factors influencing the intention to adopt digital payment method, the impact weight varies. Both performance expectancy and facilitating condition have the most significant influence on the adoption of cashless payments. The perceived technology security, of course, also has a strong relationship with the adoption of cashless payment. Hedonic motivation, social influence, and innovativeness are positively related to the adoption of cashless payments (**Mahfuzur Rahman, 2020**). Nevertheless, these influential factors can be different from one region to another as well. Only perceived ease of use and usefulness have a positive effect on the intention to adopt digital payment through mobile wallet in Indonesia; others have very little impact on the adoption (**Triyani Budyastuti, 2020**). Therefore, the results of the studies from different countries are significantly different as the population, culture and their behaviors are different. With this regard, one should not generalize the findings from one research study without thoroughly considering the differences in region, nature of the platform, consumer behaviors, and supporting infrastructure. The foundation for the research design is reviewed in one more interesting study that builds on the many studies conducted around the many assessments of the idea of digital financial inclusion before highlighting some important difficulties. The study found that as digital technology has advanced, it has become a powerful tool for promoting financial inclusion. According to the study, there is plenty of room for incorporating and modifying some distinctive traits and beneficial behaviors into the local culture. Initiatives like domestic remittances, government-to-person transfers, etc. are particularly important for disadvantaged communities' financial inclusion. According to the report, digital platforms improve access to education, reduce poverty, and increase gender equality (**Kasiisii A.S et al, 2023**).

### CONCEPTUAL FRAMEWORK

The theoretical model of UTAUT suggests that the actual use of technology is determined by behavioural intention. The perceived likelihood of adopting the technology is dependent on the direct effect of four key constructs, namely performance expectancy, effort expectancy, social influence, and facilitating conditions. The effect of predictors is moderated by age, gender, experience and voluntariness of use (**Venkatesh et al., 2003**).

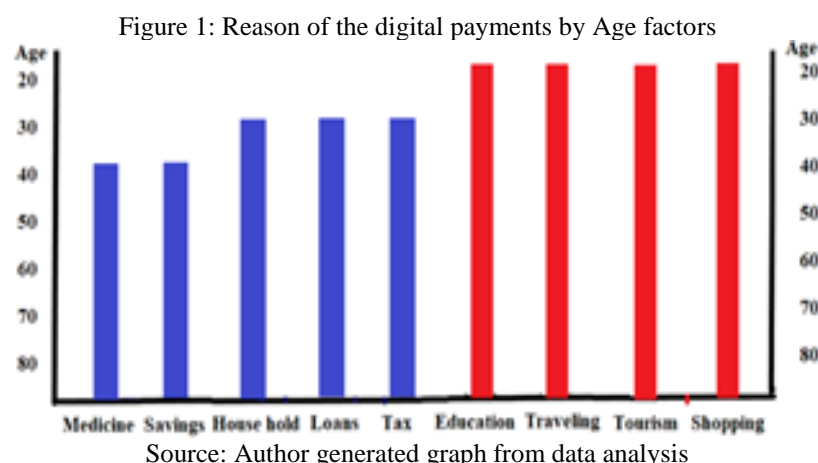
Performance expectancy is defined as the degree to which an individual believes that using the system will help him or her to attain gains in job performance (**Venkatesh et al., 2003**). Performance expectancy is based on the constructs from Technology Acceptance Model



(TAM), TAM2, Combined TAM and the Theory of Planned Behaviour (CTAMTPB), Motivational Model (MM), the model of PC Utilisation (MPCU), Innovation Diffusion Theory (IDT) and Social Cognitive Theory (SCT) (i.e. perceived usefulness, extrinsic motivation, job-fit, relative advantage and outcome expectations). It is the strongest predictor of use intention and is significant in both voluntary and mandatory settings (Marikyan, D. & Papagiannidis, S., 2021).

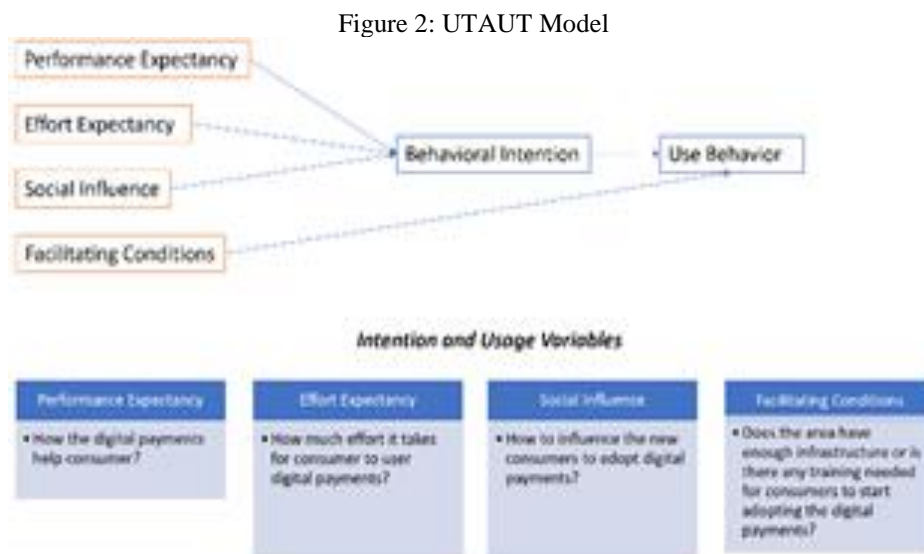
Effort expectancy is defined as the degree of ease associated with the use of the system (Venkatesh et al., 2003). Effort Expectancy is constructed from perceived ease of use and complexity driven from TAM, MPCU, IDT, which share a similarity in definitions and scales. The effect of the construct becomes nonsignificant after extended usage of technology (Marikyan, D. & Papagiannidis, S., 2021).

Social Influence is defined as “the degree to which an individual perceives that important others believe he or she should use the new system” (Venkatesh et al., 2003). Social influence is similar to the subjective norms, social factors and image constructs used in TRA, TAM2, TPB, CTAMTPB, MPCU, IDT in the way that they denote that the behaviour of people is adjusted to the perception of others about them. The effect of social influence is significant when the use of technology is mandated (Venkatesh et al., 2003). In the mandatory context, individuals might use technology due to compliance requirement, but not personal preferences (Venkatesh & Davis, 2000). This might explain the inconsistent effect that the construct demonstrated across further studies validating the model (Marikyan, D. & Papagiannidis, S., 2021).



Facilitating conditions is defined as “the degree to which an individual believes that an organisations and technical infrastructure exists to support the use of the system” (Venkatesh

et al., 2003). The facilitating conditions construct is formed from compatibility, perceived behavioural control, and facilitating conditions constructs drawn from TPB, CTAMTPB, MPCU and IDT. Facilitating conditions have a direct positive effect on intention to use, but after initial use, the effect becomes no significant. Therefore, the model proposes that facilitating conditions have a direct significant effect on use behaviour (Venkatesh et al., 2003).



Source: Author simulation on UTAUT for the study

From the collected data, the Unified Theory of Acceptance and Use of Technology (UTAUT) model will be used to understand the consumer behaviors and perceptions on the adoption and use of digital payment services in Phnom Penh, Cambodia.

Adopting new technologies requires a cultural shift. These shifts do not happen overnight; they take time, for users to experience a learning curve and gain confidence in the new system. Technology use may be inevitable, but it should be managed, nonetheless. Research relating to the theory of technology acceptance is ongoing and inconclusive. It refers to concepts in consumer behavior, the diffusion of innovations, psychology and many more (Deborah, 2017).

When it comes to acceptance of technology, there are two relevant research models namely UTAUT and Technology Acceptance Model (TAM). However, the author has chosen UTAUT as it has been more recommended than TAM since TAM is just one of the eight models that form UTAUT model. It is a subset of UTAUT. Most importantly, UTAUT considers demographic factors while other similar models do not.

Figure 2 shows the reasons for the payment transactions which can bring into accountability for the governance. The figure also shows the classification of number of transactions and number of transactions held by age factor.

By comparing the generation or age groups, the number of transactions is associated with the age and expenses are given in the figure. Basic streams such as Medicine, savings, household related payments, loan repayment, payment of employment tax, road tax, education fee, traveling, tourism related payments, online Shopping and supermarket-based shopping.

## **RESEARCH SCOPE**

The proposed method is using self-administered Microsoft Forms questionnaire survey using both Khmer and English which will be distributed online to the target participants acquired by purposive sampling technique. The method connects the UTUAT model, Digital Payment platform characteristics with Older Generation Z and Younger Millennials in Cambodia. In Unified Acceptance pattern, both generations expected the parameters such as lifestyle that the author considers include Spending, Saving, Bank Balance, Houses, Apartments, Insurance, Commerce around the province, Cross Border Commerce, Digital devices using, Digital payments using, transport, travel frequency, Age, Gender, Education level, Languages known. These parameters are the expected characteristics of the people in Cambodia in Digital Payment relations platforms. In addition, using the purposive sampling technique allows the author to maintain the authentic objective of the study by having totally expected responses from the eligible respondents only.

## **THE PROPOSED METHOD AND RESULTS**

The qualitative research will be conducted as the researchers wants to understand consumers' perceptions, behaviors and the degree of satisfaction related to their experience using the digital payment platforms. It will be based solely on a primary data collected from the participants.

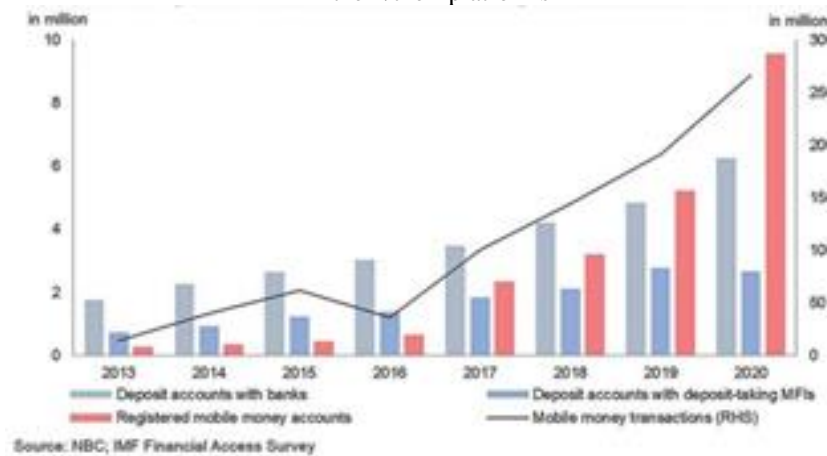
The number and value of mobile money transactions have also expanded rapidly, reaching 266.5 million transactions in 2020 from just around 60 million transactions in 2015. Looking at historical data, it appears that 2019 was the tipping point for mobile money usage, where the number of registered mobile money accounts surpassed that of deposit accounts with banks. This means that consumers have been embracing mobile money and digital financial services at a much faster pace than traditional banking services and implies that fintech

providers have been successful in reaching populations that had so far remained out of the traditional banking system.

Online lending is another area that has recorded strong growth, especially since the beginning of the COVID-19 pandemic. Cambodia’s central bank has encouraged and supported the use of technology in the provision of digital financial services with hopes that innovation will help improve financial inclusion (**Digital Financial Services Picks up Steam in Cambodia. 2022**).

There are roughly more than 30 payment service institutions in Cambodia according to the National Bank of Cambodia.

Figure 3: Number of deposit accounts and mobile money accounts and transactions. Below are just some of them/their platforms



Source: IMF NBC Survey

Table 1: Some Local Digital Payment Service Providers Available in Cambodia

Platform	Description / Available Features
Bakong & KHQR Payment by National Bank of Cambodia	KHQR is a Unified QR code system created for retail payments in the Kingdom and cross-border payments as well. This has been very important player in enabling access to the unbanked as well as promoting financial inclusion through interbank transfer and payment using its unified QR code called KHQR.
ABA Mobile/Pay Way	Leading digital payment service provider and widely accepted across the city and provinces in Cambodia. There’s a rapid growth in the acceptance of this payment as it is also a member of KHQR as well. It provides payment service to diverse institutions and firm both government and private, including tax payment, public services, utilities, internet and TV, real estate, insurance, education, entertainment, charity and donation, travel and tours, membership and subscription and more.
ACLEDA Mobile	One of the most mature payment service providers in the country for retail payments and is also a member of KHQR. On this app, consumer can share bill, make bill payment (Water Supply, Electricity, Solid Waste, Financial, Mobile Operator, Internet & TV, School, Insurance, Agriculture, Real Estate, Bill24, Public Services, Trading & Distribution, etc.), charity & donation, payment from partners' app/web.
Wing Money	Transformed from a simple money transfer firm to mobile payment provider with various services like account-to-account transfer, payroll service, charity and other utility bill payments.
True Money	Bill payment, retail payment, money transfer, payroll, started implemented by the government like paying the fine for traffic rule violations.

Pi Pay	Mobile wallet that provides retail payment and money transfer services with mobile phone top-up, pay utility and internet bills or settle insurance premiums bills.
Sathapana Mobile	Locally owned, with various features including money transfers, cross-border payment and also a member of KHQR.
Maybank QR	Retail payment and transfer within and inter-bank with a support of KHQR
Vatanak Mobile, Woori Bank Mobile, JTrust Royal,	All of these 3 also provide mobile banking service with working towards integration with utility services providers and be a member of KHQR.

Source: Self-developed

### K-Mean (KM) Algorithm

KM Algorithm is a hard segmentation procedure that generates a sharp classification. It assigns each payment platform to clusters or not, definitely. This algorithm comes under unsupervised classification technique. KM Algorithm is used to classify a given pixel through a certain number of clusters. The steps involved in KM algorithm are given below.

1. Set the cluster size as K.
2. Initialize the centroid of each cluster  $C_i=0, i=1, \dots, k$ .
3. Process the observations and assign to a cluster.
4. Find the centroids of each cluster.

The centroid of a cluster is found by minimizing the objective function:

$$J = \sum_{j=1}^k \sum_{i=1}^n \| P_i^{(j)} - C_j \|^2$$

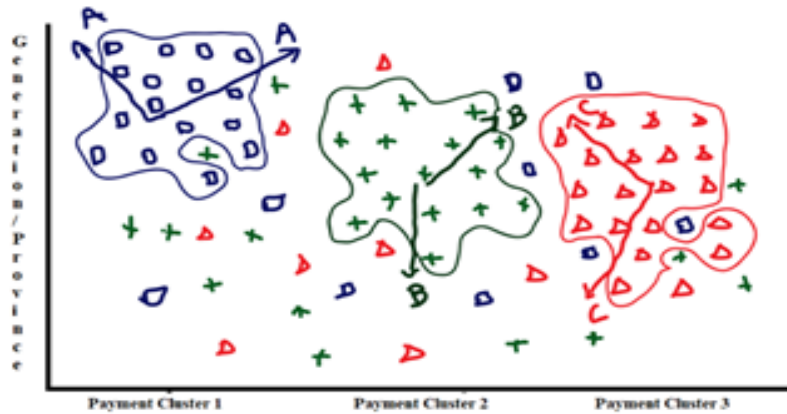
Where,

$\| P_i^{(j)} - C_j \|^2$  is the distance between the centroid,  $P_i$  is the  $j$ th pixel of the  $i$ th cluster,  $C_j$  is the  $j$ th pixel of the centroid.

In the proposed method, clusters represent the payments done using the digital platforms or cash payments. The clusters are observed in every province or generations as well. When the cluster size is high, it indicates the concern that generation is choosing that payment system. By the survey or considering the age factor, Cambodia is not ready to fore the older generation to change, but it can guide the younger millennials to choose the correct applications based on the cluster provided in the provinces.



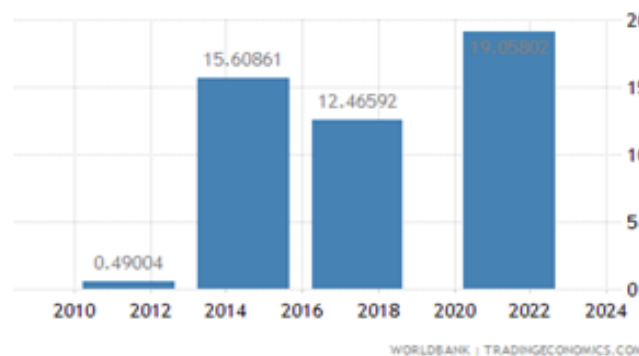
Figure 4: Payment clusters by the generations and provinces



Source: Author simulated cluster

Figure.4 illustrated the cluster can be classified by generation and province-based clusters as well. Figure.5 shows the relevant data is given from World Bank sources by March 2023. Digital methods and gadgets were used to make payments (% age 15+) in Cambodia was reported at 19.06 % in 2021, according to the World Bank collection of development indicators, compiled from officially recognized sources. Cambodia – Electronic payments used to make payments (% age 15+) – actual values, historical data, forecasts and projections were sourced from the World Bank on March of 2023.

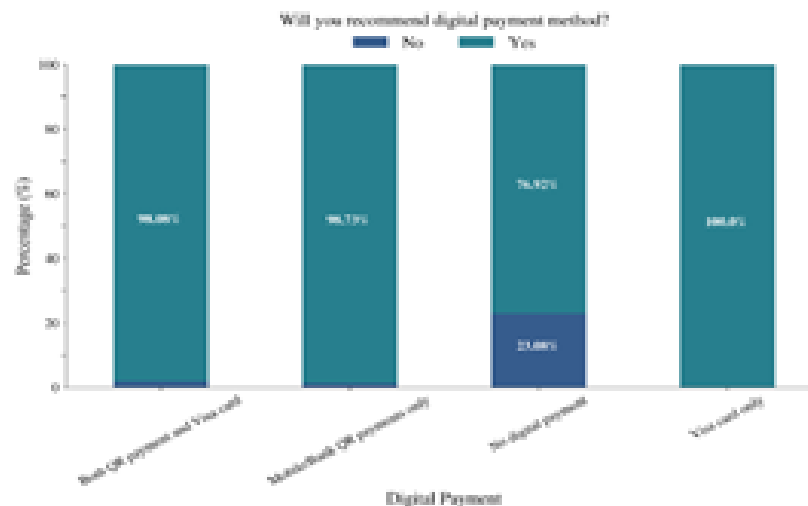
Figure 5: Electronic payment transaction by Age-Source World Bank



Source: Tradingeconomics.com

The percentage of respondents who used electronic payments (payments that one makes or that are made automatically including wire transfers or payments made online) in the past 12 months to make payments on bills or to buy things using money from their accounts (% age 15+) (Trading Economics ,2023).

Figure 6: Likelihood of digital payment recommendation by payment methods

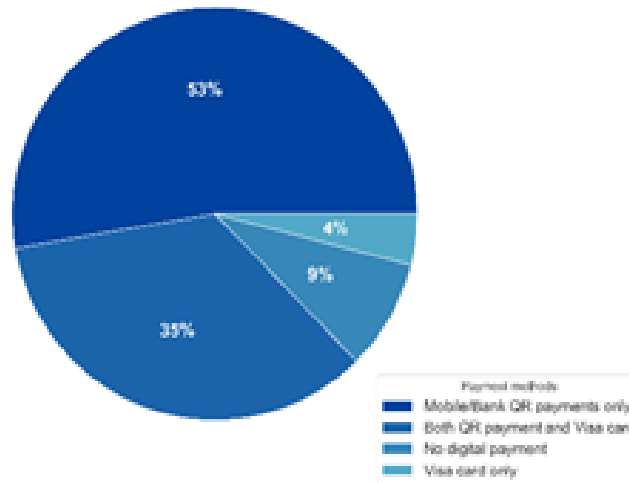


Source: Author generated graph from data analysis

In figure 6, according to the collected data, great proportion of respondent expresses an optimistic view towards the digital payment, so the majority would recommend this payment method to other people like friends, family and colleagues. However, this proportion is associated with the type of digital payments the respondents have experienced. Those who are experienced in using “Visa card only” seems to strongly recommend and advocate about the digital payments, accounting for 100% as illustrated in the figure. The rate and tendency to recommend the digital payment method is also very high from these groups of respondents, those using “Both QR payment and Visa card” and those using “Mobile/Bank QR payments only” as they both account for over 98%. Interestingly, it is found that among those who are using digital payments, there are some respondents, accounting for approximately 23%, would not recommend using digital payments while the rest are still willing to recommend although they have not experienced themselves yet. From this last part, respondents do get negatively influenced by the consumers around them about the digital payments because they seem to have enough evidence to prove it is good to adopt the digital method of payment. People must be communicating or articulate the benefits of this transformation, and this is a good sign that indicates the increase the future adoption. On the flip side, some other people are not influenced and are not amazed by this new way of payment, either they have realized bad experiences when people use this or digital payments are not widely accepted in that area or possibly both. As they have not been the consumers of those payment platforms, they are not willing to recommend. This implies that there is still a room to increase the adoption—basically by ensuring people are educated and aware of those platforms, supportive infrastructure and

working with merchants and all business owners to encourage them to start accepting digital payments as some small or family businesses do not accept digital payment yet.

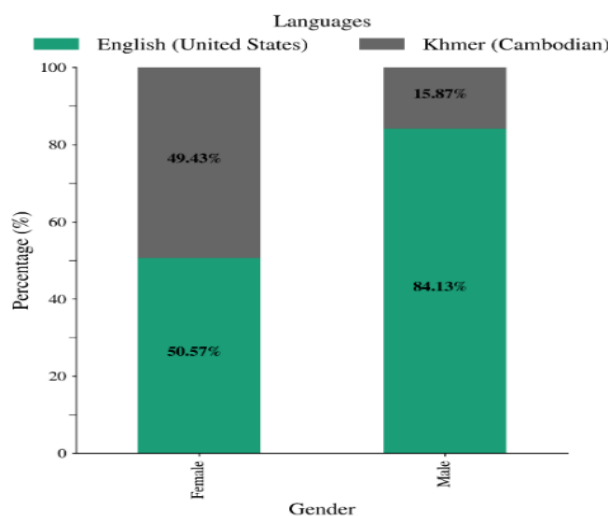
Figure 7: Proportion of payment methods



Source: Author generated graph from data analysis

In figure 7, mobile and QR payments are the most popular payment methods in Cambodia. They account for 88% with 53% only use mobile or QR payments and another 35% use both QR or mobile and visa card. Little proportion, roughly 4%, of the respondent is only using visa card and not using mobile or QR payments. The result also shows that there are still people (9%) among those generation z and millennials that have not used any digital payments yet; thus, further analysis shall be carried out to understand why those consumers do not adopt the digital payments.

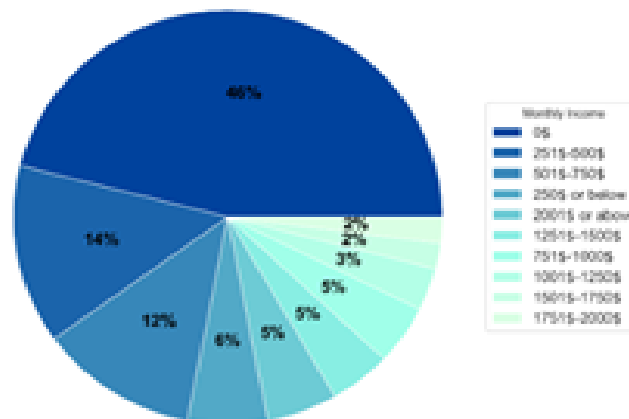
Figure 8: Proportion of survey response’s language by gender



Source: author generated graph from data analysis

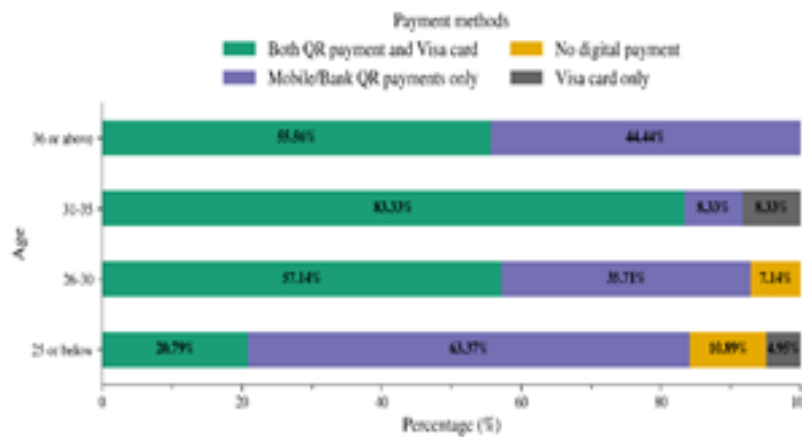
In figure 8, among the respondents’ responses, females are likely to choose either one among Khmer and English equally. However, male respondents are more into choosing English language as their response. This shows that there seems to be no issues for the language of the digital payment platforms for those generation Z and millennials. Nonetheless, it is always wise to make the platforms bilanguage so that consumers can switch based on their preferences that make them feel convenient and confident in using them.

Figure 9: Proportion of monthly income (employment income)



Source :Author generated graph from data analysis

Figure 10: Proportion of payment methods by age group



Source: Author generated graph from data analysis

In figure 9, the result shows that 46% of respondents are still students and currently not being employed by any company or in the government. For those who are employed, the employed respondents have different salary ranges. This demonstrates the variety in the collected data contributed by various respondents. However, those with higher income are typically older in age though they are still in their generation Z or millennials.

In figure 10, older people (36-above) use digital payments 100%. Many of them use both QR payments and visa card while almost half of them use mobile or bank QR only. Therefore, all of the consumers within this age group are using mobile or QR payments. For consumers aged between 31-35, roughly 83% use both mobile or QR payments and visa card as their payment methods according to their situation and type of expenses. A little proportion (8.33%) of consumers from this age group use either mobile QR payment or visa card equally. The pattern of the proportion for payment method for the 26-30 age group is similar to that of 31-35, but consumers from this group have bigger proportion as they use mobile or bank QR payments only. However, most of the consumers from this group keep using both mobile QR payments and visa card, the same way as older age groups mentioned above. Interestingly, there are still a few consumers (accounting for roughly 7%) with this group not using any of the digital payment methods above—simply meaning they insist using cash. For the last group (25 or below), also known as the teenagers and younger adult groups, are also dominantly using mobile QR. The number of consumers using both mobile QR and visa card payments is lower compared to the older groups, meaning younger consumers are more obsessed with mobile payments, probably because they are very active with phones. Like the 26-30 group, yet unlike the first 2 groups, there is a small number not using any of these digital payment methods. One thing can be observed from here is that those who are still students and have no job have some chance of not owning a bank account; thus, missing the chance for the digital payments as they might receive cash from their parents or guardian physically as they have no income in terms of employment.

Finally, the proposed method uses the UTUAT as the primary initiative to conclude the clusters of the digital payments for basic banking transfer, savings, peer transfer, insurance payments, tax payments, household related payments, cross-border ecommerce, Fintech, cryptocurrency exchanges, transport, shopping for the younger millennials. The younger millennials do not have the habit of using payment slips, but approximately 15% are using them to share.

The older generation Z can combine both cash transactions and digital payments in Khmer language, which lead them to savings, property issues, Insurance and medical payments, travel, loan repayments, supply chain payments. The older generation are keen on saving the payment slips. They didn't use Fintech at all.

Sathapana Mobile payment packed award for Innovative and Digital solutions for 2022 in Cambodia (**Khmer Times, 2022**), because of balancing the younger and older generation



satisfying the UTUAT and clusters. In the given Table.1 Sathapana Mobile covers the older generation for basic transactions and used by young millennials for cross border payments.

## CONCLUSION

Cambodia is adopting cashless transactions, especially in the last few years, and this will ensure the growth of Cambodian currency and GDP. Cashless payment adoption supports the commitment of Cambodian government and local authorities towards cutting off the transmission of COVID-19 in the country, building digital economy, and promoting financial inclusion. Another goal of this study is to look into how people in the Phnom Penh area choose to use mobile payment applications. The impact of geography, social level, and particular qualities on consumer acceptance is highlighted in one of the most well-known study models on consumer behavior among younger and older generations and the adoption of new technical systems. When determining the ideal digital payment application, the concept takes into account elements including social consequences, credibility needs, effort expectations, and performance requirements. 150 locals in Phnom Penh were chosen from the target population using the Unified Theory of Acceptance and Use of Technology (UTAUT) model and K-mean clustering for distance and economic status studies in order to study consumer behavioral intention to accept digital payment method and application. The work used Unified Theory of Acceptance and Use of Technology (UTAUT) model and gives the result of English as common accepted language in Digital payment system and Sathapana Mobile payments are accepted in Younger generation. K-Mean Clustering is used to classify the generation and provinces in Cambodia. The region of Phnom Penh and the group of generations with the largest number of digital payment transactions were determined through clustering. The clustering and UTAUT gave Sathapana mobile utilization in Phnom Penh region in and around local markets between 2020 to 2022. The result illustrates and assesses the digital payment methods, proof-sharing, -receiving, and -storage that the older generation has started to understand and accept. The elder generation Z handled digital payments for regional transactions like banking, home tasks, loan repayment, peer lending, travel, and local marketplaces in Khmer. The subsequent generations of millennials also incorporated cross-border payments in English and Khmer. Bringing up a Digital Platform shall make a positive change in economy and circulation of economy to the people and country. Unless the people trust the digital payments, they can't share their money for the business or basic operations to run the government. Thy the Digital Payment applications shall understand the behavior of the customers and share the services through the digital

payment systems. The future work may be implications to combine the data towards the key players in the industry such as consumers, central bank, and digital payment service providers so that further enhancement on the platforms could be made, and further studies could be carried out to fill the gaps.

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