

# Factors Shaping E-Payment Adoption Intentions among Senior Citizens: A Cross-National Comparative Study of Malaysia and China

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## Abstract

The increase in the speed of financial technology has changed the way people transact their business but the aged citizens are mostly reluctant to use e-payment systems. The paper investigates the factors that affect the e-payment intention in older adults in Malaysia and China, including four major factors: Social and Family Influence, Perceived Security and Trust, Digital Ease of Use, and Perceived Benefits (Performance Expectancy), the perceived usefulness that is used as a moderating variable. To achieve this, the study is conducted based on the Technology Acceptance Model (TAM) and the Unified Theory of Acceptance and Use of Technology (UTAUT) and structured questionnaires are administered to the elderly respondents aged 55 and above in Kuala Lumpur and Shanghai. Statistical tests (regression and moderation tests) will be used to evaluate the relationships among constructs, as well as comparing the cross-country differences. The research will focus on the way in which the willingness of the elderly people to use digital payment systems is influenced by psychological, social, and technological perceptions. In learning about these factors, the study aims to suggest effective measures that can be taken by fintech firms, policymakers, and service-providers to improve digital inclusivity and access to financial services among older adults. The anticipated outcomes are that the perceived usefulness will play a significant role in mediating between the independent variables and intention to use e-payment. It is expected that Digital Ease of Use and Perceived Benefits (Performance Expectancy) will have the most positive effects. Perceived Security and Trust and Social and Family Influence are also likely to have significant but secondary effects. In comparison, Chinese older users will show greater adoption intentions than Malaysian ones because of a stronger governmental support, a greater level of digital literacy, and a stronger integration with fintech.

**Keywords:** e-payment Adoption, Elderly Users, Perceived Usefulness, Digital Financial Inclusion, Malaysia and China

**Introduction**

The internet has become a crucial part of business and corporate life which is now technologically advanced (Li, 2024). With the help of this process, it is possible to perform electronic cashless transactions with distinctive payment features. E-payment is a model that may be applied anywhere without the physical cash transactions. Nowadays, the e-payment process has extended to various age-groups of various geographical regions of the world particularly in Malaysia (Trianto et al., 2025). It is possible because the new generations are going through technological advancement, and the usage of the internet is prevalent to them (McHaney, 2023).

Many experts believe that e-payment is one of the most promising applications in the business sector as the future 'Grab' or 'Touch n Go' in Malaysia (Lim, 2024) and 'Alipay' in China (Raub & Kuppusamy, 2023) applications in mobile communications. E-payment can be defined as any type of individual or business activity involving an electronic device with a connection to a mobile network enabling the successful completion of an economic transaction (Kimonye & Muchelule, 2024). This form of payment has got a number of benefits to both companies and users as compared to other payment systems in e-commerce. The major benefits are greater versatility, quicker transactions, enhanced convenience, time-saving, and reduced costs (Islam et al., 2023).

Financial technology has greatly changed the world of payment through an increase in the speed, convenience, and efficiency of transactions (Harsono & Suprpti, 2024). The popularity of smartphones has increased the process of implementing e-payment: mobile banking, digital wallets, and contactless payments (Haider et al., 2024). But this change has not been equally felt by all the members of the demography. Specifically, the adoption rates of the elderly population are much lower than those of younger users, which suggests that the digital financial inclusion gap is critical (Atan, 2024).

The gist of the issue that this paper aims to solve is the poor uptake of e-payment system among the elderly in Malaysia and China, a continued problem in both countries. Even though older adults are rapidly becoming digitalized, they may be challenged by low digital literacy, security fears, distrust, and perception of technology complexity (Vercruyssen et al., 2023; Pleno, 2024). This is a particularly relevant problem since aging populations, such as China and Malaysia, have an aging population, and old consumers are a major and economically important market segment with high purchasing power (Wronka, 2023).

There is a specific need to carry out a comparative analysis of Malaysia and China because these countries are characterized by a different degree of maturity of digital payments. China is one of the pioneers of e-payment adoption in the global market, and the use of e-payment systems, including WeChat Pay and Alipay, has penetrated the everyday life of people. Conversely, Malaysia is yet to achieve a cashless society though it has high-level government efforts. Such a comparison makes it possible to identify both context-specific and universal determinants that can be of great value to policymakers and businesses willing to increase the level of digital payment use by older generations.

The Technology Acceptance Model (TAM) and the Unified Theory of Acceptance and Use of Technology (UTAUT) are the models that underlie this research. The study has four

independent variables such as Social and Family Influence, Perceived Security and Trust, Digital Ease of Use and Perceived Benefits (Performance Expectancy) in which the perceived usefulness is the moderating variable and intention to use e-payment is the dependent variable. The research will focus on elderly respondents in Kuala Lumpur, Malaysia, and Shanghai, China aged 55 years and above.

### **Literature Review**

With the introduction of electronic payment systems, the world economy has been revolutionized. Over the past several decades, the digital technology has created the possibility of moving away from physical cash-based solutions to more complicated electronic ones. The e-payment segment has seen the use of new technologies such as internet banking and mobile apps integrated with them quickly (Emmanuella Tracy Eyram, 2023). It is estimated that in most developed economies, digital payments now make up more than 60 percent of all retail transactions, with an average estimated growth rate of 12 to 15 percent a year.

In the recent years, the e-payment sector in Malaysia has been flourishing as digital technology revolutionizes the financial transactions. The combination of government policies and the innovations of the private sector established an ecosystem in which mobile wallets, online banking, and contactless payment systems are becoming more popular (Putrevu & Mertzanis, 2024). The Malaysian government has made a step forward in strategic programs such as MyDIGITAL, which aims to make the society cashless. Touch 'n Go eWallet, Boost, GrabPay, and BigPay are the market leaders. The development of the DuitNow QR, which is a unified system of QR codes, has also contributed to the simplicity of transactions between various e-wallets providers and banking apps (GEORGE, 2024).

The e-payment sector in China is a pioneer in the world of digital finance solutions, with fast innovation and ubiquitous use of mobile payment systems. Both clients and businesses are changing the way they transact with innovative platforms such as Alipay and WeChat Pay (Ye et al., 2023). The market research shows that approximately 80 percent of urban Chinese customers tend to make daily purchases with the help of digital methods of payment and that the total market of digital payment has grown at a very impressive annual rate of approximately 20 percent. The size and the economic importance of the sector can be evidenced by the fact that the volume of mobile payment transactions in China already exceeds USD 77 trillion in 2023.

The desire to adopt e-payment systems among the elderly in Malaysia is of high research interest. The population in Malaysia is ageing slowly; in 2022, 7.3 per cent of the population in Malaysia is of 65 years and older and the figure is projected to increase to 14.5 per cent by 2040 (Khalid, 2023). The lack of digital literacy is one of the most critical barriers influencing the intention to use e-payment among elderly Malaysians. In a research conducted by the Malaysian Communications and Multimedia Commission (MCMC) in 2021, just 39 percent of elderly citizens aged 60 years have claimed to be comfortable with the use of mobile applications (Husin and Khamis, 2024). The tendency of the older generation to use e-payment systems is also threatened by the issues of trust and security.

As of the end of 2022, more than 280 million individuals aged over 60 years constituted over 19.8% of the Chinese population (Dai et al., 2024). According to a 2022 survey conducted by the China Internet Network Information Center (CNNIC), only a third of older users of the internet used online payment services regularly (Cui et al., 2024). Security issues also become an important influencing factor of older Chinese people's willingness to use e-payment systems. Statistics prepared by the Ministry of Public Security of China show that in 2022, the cases of online fraud against the elderly increased by 20% (Yilmaz et al., 2023).

Among the most salient factors of user behavior and intention to adopt e-payment systems, there is Social and Family Influence (Al-Sabaawi et al., 2023). Social and Family Influence is directly associated with behavioral intention as stated in the UTAUT. To achieve digital payment adoption, Social and Family Influence is likely to manifest in peer recommendations, family encouragement, and trends in society towards digitalization. In Malaysia, behavioral intention to use mobile wallets was attributed to Social and Family Influence, which described the majority of variation in older users and first-time adopters (Soo et al., 2023). Fifty-six percent of older adults in China began to pay using e-payment systems owing to the provisions or advices of younger relatives.

Perceived Security and Trust is one of the critical determinants impacting users' intention for adoption and usage of e-payment systems (Haider et al., 2024). A majority of individuals have been concerned about the risks associated with security due to the increased use of e-payment systems. According to CyberSecurity Malaysia, there was an astounding 25 percent growth in cyber fraud between 2019 and 2022 (Afzal et al., 2024). In China, the Ministry of Public Security discovered that the volume of online financial fraud rose by 15 percent in 2022 (Huang & Pontell, 2023). In 2022, a survey conducted by Bank Negara Malaysia found that security was the most important consideration of consumers when it comes to mobile payments (68%).

A key construct derived in UTAUT is Digital Ease of Use which is the degree of ease that is related to the use of a particular system or technology. Ease of learning, ease of understanding, and usage to certain demographic users can greatly enhance the adoption rate per user demographic on an e-payment system. It has been found that more than 60 percent of senior users in Malaysia are not willing to use e-payment systems as they feel complex (Atan, 2024). In China, CNNIC (2022) discovered that perceived ease of use significantly predicted the adoption of mobile payments among rural residents and elderly adults.

Another important construct in the UTAUT model is Perceived Benefits (Performance Expectancy), which can be defined as the degree to which an individual believes that with the application of a particular technology, he/she can achieve better performance or efficiency. Perceived Benefits (Performance Expectancy) has always been rated as one of the most powerful predictors of behavioral intention to use e-payment systems both in Malaysia and in China. Perceived benefits are convenience, speed, cost savings, accessibility, tracking transactions, and improved financial management. According to Statista (2022), 71% of mobile payment users in Malaysia cited convenience as their primary motivation to use mobile payments (Lim, 2024).

One of the key aspects influencing the adoption of technology in e-payment systems is the perceived usefulness. According to TAM (Davis, 1989), perceived usefulness is the extent to which a person holds the belief that the utilization of a certain technology will enhance his or her performance or efficiency. In Malaysia, the primary factor that resulted in the implementation of e-payment systems was seen as the perceived greater convenience and efficiency, with 68 percent of the respondents (Zhang et al., 2024). Another significant benefit of mobile payment systems among the 85 percent of users in China was the ability to conduct multiple transactions in one application (Chen and Shen, 2023). Perceived usefulness has dominant influence on user acceptance and continued usage of e-payment technologies in both Malaysia and China (Trianto et al., 2025).

In this research, the relationships are tested between four independent variables (Social and Family Influence, Perceived Security and Trust, Digital Ease of Use, and Perceived Benefits/Performance Expectancy) and one moderating variable (Perceived Usefulness) and one dependent variable (Intention to Use E-Payment). The framework is based on TAM and UTAUT, both of which are highly utilized theoretical frameworks in the study of technology adoption. TAM is concerned more with the constructs of perceived usefulness and perceived ease of use whereas UTAUT extends the discussion to the constructs of social influence and performance expectancy.

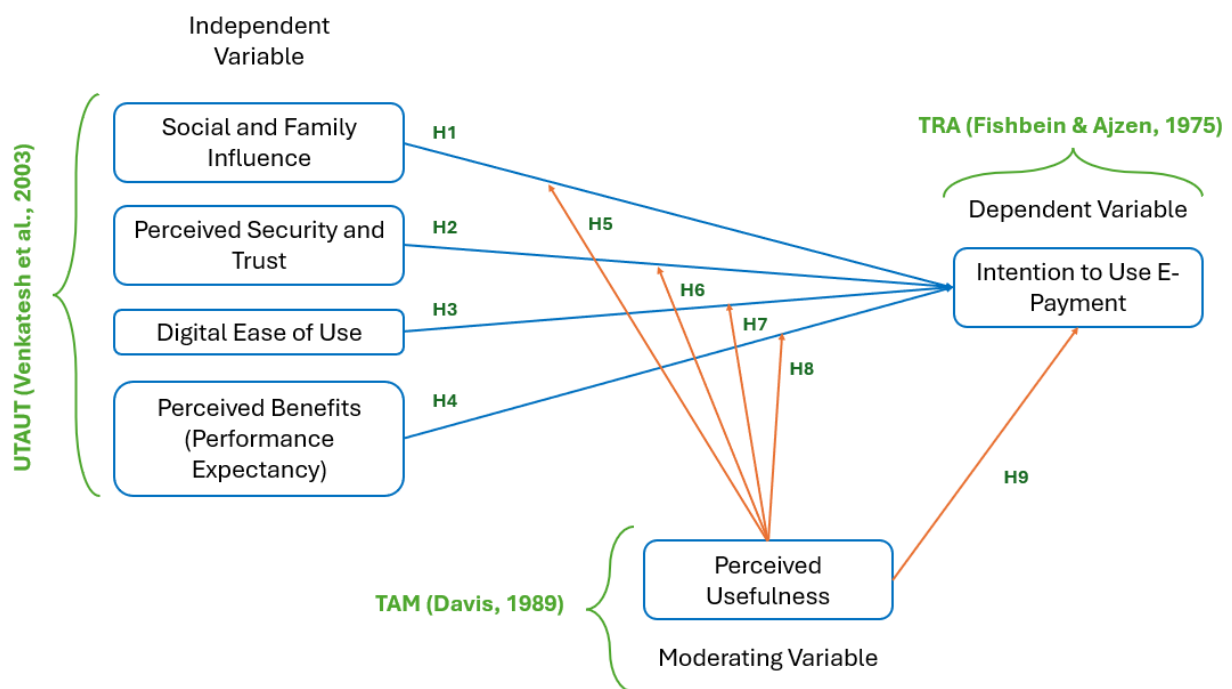


Figure 1: Research Framework

**Methodology**

The present research follows a quantitative research paradigm with a positivist paradigm. Positivist paradigm was chosen because it supports objective and quantifiable data that can be linked to investigating the associations between Social and Family Influence, Perceived Security and Trust, Digital Ease of Use, Perceived Benefits (Performance Expectancy), perceived usefulness and intention to use e-payment of the elderly population in Malaysia

and China (Guba, 1990). This paradigm highlights the use of formal approaches, including surveys, to gather numerical data that can be statistically analysed.

The study is a quantitative, deductive and cross-sectional research design. The cross-sectional design was selected to reflect the adoption behavior of elderly users at one instance in time and thus it was practical and in line with the current trends of the fast-changing digital payment environment (Sekaran and Bougie, 2019). The hypotheses based on existing theoretical frameworks, TAM and UTAUT, were tested with the help of deductive approach and empirical data which was collected through structured surveys.

The survey on the structured questionnaire was used to gather primary data based on the respondents who were old in both Kuala Lumpur, Malaysia, and Shanghai, China. The questionnaire has been created by relying on known scales according to Technology Acceptance Model (TAM) and UTAUT models. Constructs such as Social and Family Influence, Perceived Security and Trust, Digital Ease of Use, Perceived Benefits (Performance Expectancy), perceived usefulness and intention to use e-payment were measured and operationalized using a five-point Likert scale with strong disagreement (1) to strongly agree (5). The questionnaire was bilingual, in Malay and Mandarin and a rigorous back translation process was followed to ensure semantic equivalence.

The target population is elderly people aged 60 years and above residing in urban areas of Kuala Lumpur and Shanghai. The reason behind selecting this age group is that it is determined by the international standards set by the World Health Organisation (WHO, 2015) and United Nations (United Nations, 2019). The respondents were divided into age groups (60-69, 70-79 and 80+) in order to ensure that variation in adoption behavior is captured. The sampling method is non-probability convenience sampling that embraces purposive screening, which is suitable when dealing with the elderly populations, which are hard to access by random sampling. According to the table as a general guideline presented by Krejcie and Morgan (1970), the number of questionnaires that were distributed was about 615 so that the final valid responses can be obtained with the necessary minimum number to conduct the statistical analysis.

The survey was administered online and face to face. Google Form was used to collect online data of Malaysian respondents and Wenjuanxing (Sojump) was used to collect online data of Chinese respondents. Paper-based surveys were done at community centres and the elderly senior citizens associations in case of less technologically literate participants. Respondents were led through by trained enumerators so that they can be sure they fill the form correctly. The ethical principles of research were observed: the process of data collection was voluntary, informed consent was provided, and anonymity was guaranteed.

Validity was tested in content and construct validity in factor analysis. The measure of reliability used Cronbachs Alpha with the values ranging between 0.70 and 0.95 deemed to be satisfactory measures of internal consistency (Nunnally and Bernstein, 1994). A pre-test with subject-matter experts and a pilot test with a small sample from the defined population were planned prior to full-scale data collection.

Data analysis was done using descriptive and inferential statistical methods. The descriptive analysis was done with the help of IBM SPSS Statistics version 29.0 and the inferential analysis was done with the help of Partial Least Squares Structural Equation Modelling (PLS-SEM) through the SmartPLS software. PLS-SEM was chosen because it is best suited to complex models, it works well with small sample sizes, it does not rely heavily on normality and it enables the researcher to test measurement as well as structural models at the same time (Hair et al., 2019). The Malaysian and Chinese data were analyzed independently and Multi-Group Analysis (MGA) was done to determine whether differences in structural relationships existed between the two nations. The extrapolation technique using wave analysis was used to overcome non-response bias. Common Method Variance (CMV) was managed by means of non-statistical techniques (anonymous questionnaires, expert review, moderator variables) as well as the statistical Harman's Single-Factor Test.

### **Discussion**

This paper explores the important factors that affect the intention of elderly users to use the e-payment systems in Malaysia and China. It is hoped that the results will indicate valuable trends concerning the role of Social and Family Influence, Perceived Security and Trust, Digital Ease of Use, and Perceived Benefits (Performance Expectancy) in adoption behavior moderating by perceived usefulness. The following discussion considers each of the determinants with regard to the elderly populations of the two countries.

It is anticipated that the Social and Family Influence will have a significant positive impact on the intention to use e-payment among the elderly in both Malaysia and China (H1). In group-based cultures such as Malaysia and China, people believe in group harmony, social acceptance and community belonging. Approximately 70 percent of Malaysian seniors depend on their children or grandchildren to get them used to mobile banking apps, QR codes transactions, and e-wallets (Atan, 2024). In China, 56% of elderly respondents in a 2022 study were introduced to mobile payment applications by their children or grandchildren (Hou & Chen, 2024). This intergenerational dynamic is an important facilitator of e-payment adoption among the elderly and is consistent with the conceptualization of UTAUT of social influence as a key predictor of behavioral intention.

It is expected that Perceived Security and Trust will play a crucial positive role in the intention to use e-payment (H2). Users of digital platforms are especially risk-averse to older users who fear fraud, scams, and loss of money. More than three-quarters of Malaysian respondents consider security as the major factor in the choice of an e-payment service (Trianto et al., 2025). In China, mobile payment security breach and cyber fraud are also very important issues even though most of the 90 percent of the population in China uses mobile payment. Technical details such as encryption, biometric authentication, and two-factor authentication improve the perceptions of security (Aburbeian and Fernandez-Veiga, 2024). Also, the perceived security of the users helps to generate positive attitudes and trust towards e-payment systems, which enhances intention to adopt.

Digital Ease of Use is likely to have a strong impact on the intention to use e-payment (H3). Ease of Use Digital Ease of Use is of particular concern among older groups that may have less digital skills or be afraid of making errors. Survey studies indicate that more than 60 percent of older customers in Malaysia are hesitant to use e-payment systems because they think

that it is too complicated (Atan, 2024). To counter this, e-payment vendors have created options to minimize cognitive load by creating extra features like bigger icons, simple language, voice commands, and multilingual features. Digital Ease of Use is also a determinant of educational interventions. MDEC (2022) also says that users who were either formally or informally trained on mobile payments were 40% more confident and were found to have a sense of ease of use compared to those who were not provided with any support in the matter (Sidek et al., 2024).

One of the most influential factors in the intention to use e-payment is expected to be Perceived Benefits (Performance Expectancy) (H4). The primary perceived advantage among the users is that they can make payments where they want and at any time without having to carry cash with them. In Malaysia, more than three out of five users of e-payment embrace the use of digital payments due to the time saved (Trianto et al., 2025). Over 85 percent of urban consumers in China pay their daily bills via mobile payments in their cities, as they think that it is more convenient and quicker than cash. Cashback rewards, discounts, and loyalty programs are other financial incentives that strengthen the perceived benefits, and both new and existing users are likely to remain active users of e-payment systems.

All the four relationships (H5-H8) are expected to be highly mediated by perceived usefulness. It mediates the effect of Social and Family Influence by transforming the pressure of the outside to the desire of the inside. As an example, family members promoting the use of e-payment will eventually only make the adoption when they feel that it has a real-life application in their own situations (Kos et al., 2023). In the same way, Perceived Security and Trust are mediated through Perceived usefulness: as individuals feel that a system is secure they increase their belief that the platform is useful. It is statistically indicated that perceived usefulness is able to explain more than 50% of the variance in user intention to use e-payment (Pittri et al., 2024), so it is important to consider it as a moderating variable in all constructs. In terms of cross-country comparison (H9), one would expect that elderly users in China would have stronger adoption intentions compared with Malaysian users. The Chinese e-payment ecosystem is more developed, integrated in everyday life, and with greater governmental support and digital literacy. A majority of urban Chinese (85 percent) make e-payment every day, versus a relatively low proportion of older adults (55 years and older) in Malaysia (39.2 percent) who have reported frequent use (Chee, 2024a). Nevertheless, elderly adoption is still low in both countries in comparison to younger age groups, indicating both common and context-specific obstacles that have to be overcome with the help of specific interventions.

In both countries, the COVID-19 pandemic also contributed to the rapidness of the intention of senior citizens to switch to the use of e-payment. With the encouragement of social distancing, online shopping, food delivery applications, and contactless payment were new to many older people. Between 2020 and 2021, the number of people aged 60 and above who used mobile banking in Malaysia increased by 21% (Lee et al., 2023). The group of older users of mobile payment systems in China increased by a quarter between 2020 and 2021 (Huang et al., 2024). These changes depict how the obstacles to behavior could be overcome when there is an overlap between necessity and convenience.

**Conclusion**

This paper has explored the factors that affect the intention to use e-payment in terms of the populations of the older generation in Malaysia and China, using TAM and UTAUT models. Primary determinants identified included Social and Family Influence, Perceived Security and Trust, Digital Ease of Use and Perceived Benefits (Performance Expectancy), with the moderating variable being perceived usefulness.

It is believed that the results will substantiate the fact that the Digital Ease of Use and Perceived Benefits (Performance Expectancy) have the largest positive impacts on the adoption intention of elderly users in both countries, indicating that ease of interaction and tangible benefits are the key factors that drive the use of digital payments among older adults. The effects of Social and Family Influence and Perceived Security and Trust also have a strong impact highlighting the importance of intergenerational support and cybersecurity assurance in influencing the use of technology among the elderly.

Perceived usefulness will largely mediate the four associations, and it will highlight its central role in the adoption decision-making process. Other positive factors like social pressure or sense of security might not be enough to encourage adoption unless the elderly people feel that e-payment is actually helpful to their lives, in terms of saving time, effort, and increasing convenience. The implications of this finding on service providers are significant: platforms should be clear and useful in real life to the elderly users.

Relatively, the adoption intentions of the elderly users in China are likely to be high in comparison to that of the Malaysian users, which is further an indication of the more developed digital payment infrastructure in China, stronger government regulations, and more developed digital literacy. However, both countries report very low levels of elderly adoption as compared to younger demographics, which is indicative of structural and attitudinal obstacles that need concerted efforts on the part of fintech companies, governments, and communities.

Hypothetically, this research will add to the growth of TAM and UTAUT models by testing their relevance in the case of the elderly users within the cross-national settings. The moderating variable of perceived usefulness makes the existing models more effective, as it does not only aim to predict the behavioral intention directly, but also clarifies how other determinants convert into it.

In practice, the results can be applied in practice to offer practical advice to e-payment service providers to create more elderly-friendly interfaces characterized by simplified interfaces, larger text, voice-assisted features, multilingual capabilities, and responsive customer support. The Malaysian and Chinese policymakers are advised to focus on digital literacy initiatives among the elderly, enhance cybersecurity, and establish regulatory frameworks that enhance consumer confidence. The financial institutions need to develop elderly friendly products that would employ the use of family circles and community associations to fill the digital divide. In the end, realizing higher uptakes of e-payment by the aging population is one of the elements that lead to more comprehensive objectives of financial inclusion, building a cashless economy, and sustainable digital expansion in both countries.

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