# Will Hong Kong consumers embrace mobile payments?

## -Exploring the early adopter's intention to use mobile payment platforms

-Research in progress-

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# Agenda

- Background Introduction
- Literature review and theoretical background
- Research model and hypotheses
- Research methods
- Summary

# Background introduction

- Mobile payment:
  - payments for goods, services and bills with a mobile device by taking advantage of wireless and other communication technologies (Dahlberg, et al., 2008).
- Traditional payment methods in Hong Kong



HK's payment system is very mature, reliable, and even saturated, why an alternative payment method is needed?

# Background introduction

- Three categories of mobile payment (eMarketer, 2017):
  - In-personal mobile payments (e.g., NFC and QR code);
  - Remote mobile payments;
  - Peer-to-peer mobile payments (e.g., PayMe, O'ePay, Jetco Pay, Tap&Go).
- Mobile payment history in Hong Kong
  - 2015 Tap & Go
  - 2016 Apple Pay, Android Pay, Samsung Pay
  - 2017 Alipay, WeChat pay
  - *High competition among major market occupiers and over 248% mobile devices penetration rate, the mobile payments adoption rate is still low in HK.*

# Background introduction

- Nearly 80% of the respondents "seldom" or "never" paid through mobile devices, and only 8% used it regularly; mobile payments were used more frequently by the younger than by other age groups(CUHK, 2018).

Hongkongers are still at a very early stage of mobile payments adoption, and the youngsters become the early adopters of the new payment methods.

- This study focuses on the current stage of mobile payments adoption in HK, especially the early adopters (youngsters)' intention to accept mobile payments.

# Background introduction

- From theoretical perspective, many previous studies have used the well-developed IS adoption theories or the combination of theories to explain the factors influencing user's intention to adopt mobile payment.
  - TAM (Davis, 1989), TPB (Ajzen, 1985)-in appropriate, end-user acceptance within organization, instead of general consumers (Jung, 2014)
  - Innovation Diffusion Theory (Rogers, 1983); Unified Theory of Adoption and Use of Technology (UTAUT, Venkatesh, et al., 2003); UTAUT2 (Venkatesh, et al., 2012).
  - Oliveira et al. (2016) is the only work that has used the combination of these two theories in explaining consumers' adoption intention of mobile payments. Their work however didn't include critical contextual factors such as trust, privacy and more dimensions of innovation characters.
- Our goal is to build a holistic model to extend Oliveira et al. (2016)'s work, and explain the unique and specific consumers' mobile payment adoption intention in HK.

# Background introduction

- **Research questions:**
  - What are the innovation characteristics that influence the early adopters' intention to adopt mobile payments?
  - Will social influence, facilitating conditions, and hedonic motivation from UTAUT2 influence early adopters' intention to adopt mobile payments?
  - Will trust, perceived security, and perceived privacy risk significantly influence early adopters' intention to adopt mobile payments?
  - What will be the role of alternative payment habit?

# Literature review and theoretical background

1. **Technology adoption models for mobile payments**
2. **Innovation characteristics and early adopter (from IDT)**
3. **Hedonic motivation, facilitating conditions, social influence and alternative payment habit (from UTAUT2)**
4. **Trust, perceived security and perceived privacy risk (contextual factors)**

# Literature review and theoretical background

1. **Technology adoption models for mobile payments**
   - TAM: has been employed by numerous empirical studies to predict actual IS adoption (e.g., Moores, 2012; Venkatesh and Bala, 2008) and mobile payments adoption in particular (e.g., Shankar and Datta, 2018; Matemba and Li, 2018).
   - TAM2 and TPB: seldom used independently in mobile payment context.
   - Criticism of TAM, TAM2, TPB and UTAUT:
     1) Originally built for ease managing IS activities in the workplace (Venkatesh and David, 2000) and the focus remained confined to understanding adoption process within organizational settings (Yang, et al., 2012).
     2) TAM related model is not able to comprehensively explain the specifics and contextual factors in consumers' technology adoption market (Benbasat and Barki, 2007; Dahlberg et al., 2015).

# Literature review and theoretical background

- **UTAUT2**: includes more contextual factors, and applied specifically in the consumer adoption market(Venkatesh et al., 2012).
  - It allows for augmenting or removing constructs to capture aspects of adoption that are task-environment specific (Morosan and DeFranco, 2016).
  - It has been used in the NFC based mobile payment context such as in hotels (Morosan and DeFranco, 2016) and restaurants (Khalilzadeh, et al., 2017).
- **IDT**: has been validated by a large number of studies in both organizational settings and individual settings (Choudhury and Karahanna, 2008; Kim et al., 2010).
  - It was also chosen as the only theoretical framework when it comes to mobile payment adoption (Mallat, 2007; Johnson, et al., 2018).
  - We adopted IDT as the second theoretical lens as IDT focuses on consumers and provides flexibility in the repacking of empirical studies to obtain higher levels of generalization (Rogers, 2003).

# Literature review and theoretical background

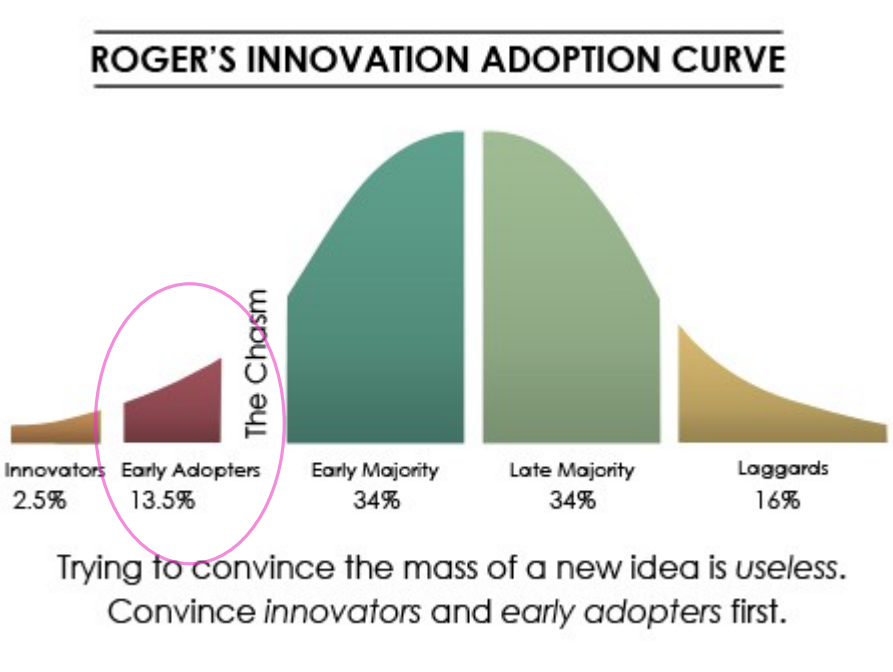
**2. Innovation characteristics and early adopter**

- IDT defines innovation characteristics as well as different types of adopters.
- Innovation characteristics(Rogers,1983):
  - Relative advantage (convenience, efficiency, and ubiquity, Yang, et al., 2012)
  - Compatibility (consistent with the existing values, past experiences, and needs of potential adopters)
  - Complexity (relatively difficult to understand and use; = perceived ease of use in TAM model, Moore and Benbasat, 1991)
  - Trialability (the ability to try an innovation prior to making a commitment; more important for early adopters)
  - Observability (the mobile payment methods are visible to others)

# Literature review and theoretical background

**2. Innovation characteristics and early adopter (Cont'd )**

- Different adopters may have different approaches and timing toward an innovation.




- Early adopters: well educated, risk seeking, and sometimes opinion leaders in a certain social society; trigger the critical mass (Rogers, 2003)
  - Understanding early adopter's intention to adopt new technologies in mobile payments is critical.
  - Less than 20% of the HongKongners have tried mobile payments before. We map these youngsters as early adopters of mobile payments in IDT.

# Literature review and theoretical background

### 3. Hedonic motivation, facilitating conditions, social influence and alternative payment habit

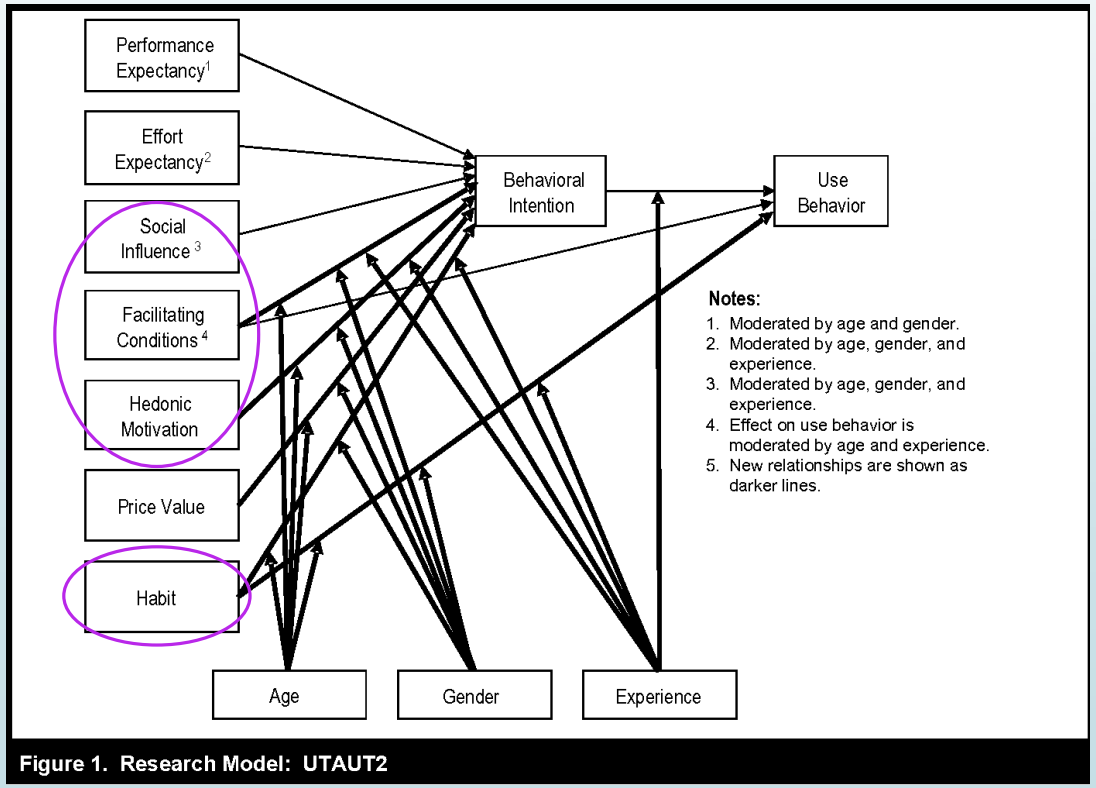


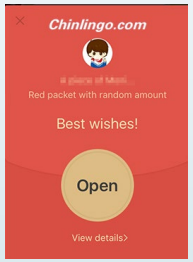

**Figure 1. Research Model: UTAUT2**

- **Performance expectancy**: benefits to consumers = relative advantage in IDT
- **Effort expectancy** = complexity in IDT
- **Price value**: not relevant, since it refers to monetary cost, while Mobile Apps and technology are free.
- **We focus more on psychological and social factors**

# Literature review and theoretical background

**3. Hedonic motivation, facilitating conditions, social influence and alternative payment habit (Cont'd)**

Hedonic motivation: the fun and pleasure from using a technology (Venkatesh, et al., 2012) (e.g., NFC based mobile payments display the credit cards on the screen; WeChat Pay enables the red-packet function.


Facilitating conditions: Consumers' perceptions of the resources and support (Brown and Venkatesh, 2005). From government, app operators, other customers and cashiers.

Social influence: Consumers perceive that important others believe they should use a particular technology (Venkatesh, et al., 2012). It is more important in the early adoption stage for info. searching and confidence building (Dahlberg, et al., 2008).

Alternative payment habit: Habit-individual's tendency to repeat automatic behaviors that were developed in the past (Limayem and Hirt, 2003). Since our focus is not on continuance adoption intention, alternative payment habit will be examined. Automatic payment behavior other than using mobile devices. Cash, credit cards, debit cards, and contactless cards.

# Literature review and theoretical background

**4. Trust, perceived security and perceived privacy risk**

UTAUT2 was proved to be deficient in fully capturing specific task environment (Baptista and Oliveira, 2015), we augment UTAUT2 with additional constructs.

- Trust: willingness that users perform payment transaction over the mobile internet and expect the payment platform fulfilling its obligations, irrespective of users' ability to monitor or control mobile payment platform's actions (Cao, et al., 2018)
  1. Trust in mobile service providers (e.g., Tencent, Alibaba)
  2. Trust in the telecommunication operator (e.g., China mobile)
  3. Trust in the merchants or retailors (e.g., the QR code reader in supermarket)
  4. Trust in financial institutions (e.g., HSBC)

# Literature review and theoretical background

**4. Trust, perceived security and perceived privacy risk (Cont'd)**

Authentication and confidentiality issues as well as secondary use and unauthorized access to payments and user data. (Dewan and Chen, 2005)

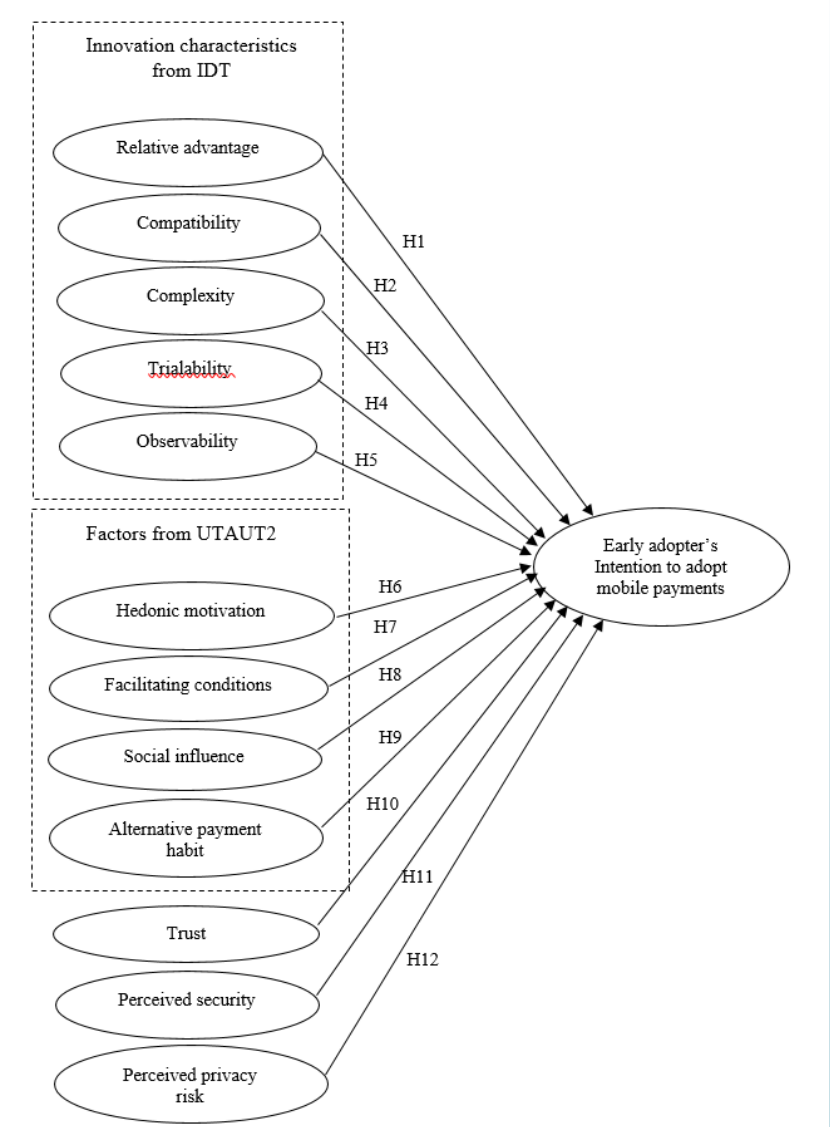
- Perceived security: the degree to which a customer believes that using a particular mobile payment procedure will be secure (Shin, 2009). Focus on the subjective perceptions of security rather than on the objective metrics.

- Perceived privacy risk: the concern an individual would have regarding the potential compromise of their personal information (Johnson et al., 2018).
  - The risks may come from not only the invaders but also the service providers (Yang, et al., 2012), and the private information involve not only consumers' personal data and financial data, but also locational information (Gao, et al., 2015).

# Research Gap and contribution

- Summary: Adopt the UTAUT2 and extends it by incorporating the five innovation characteristics from IDT as well as the security related constructs to investigate early adopter's intention toward mobile payments.
- Contribution:
  - Among the early work that combine multiple theories applicable in consumer adoption market and use the integrated model to investigate consumers' intention to accept mobile payments.
  - Among the few studies that examine a specific category of adopters (early adopter) in IDT.
  - Echo to the call from Dahlberg et al. (2015) to include more specific and contextual factors (Trust, alternative payment habit) that could capture the exact scenario of mobile payments in HK.
  - Few efforts were made to integrate the appropriate theories and provide a holistic view to understand the key factors leading to the mobile payments adoption in a specific market of HK.

# Research model and hypotheses




H1. Relative advantage positively influences early adopter's intention to use mobile payments.

H2. Compatibility positively influences early adopter's intention to use mobile payments.

H3. Complexity negatively influences early adopter's intention to use mobile payments.

H4. Trialability positively influences early adopter's intention to use mobile payments.

H5. Observability positively influences early adopter's intention to use mobile payments.

H6. Hedonic motivation positively influences early adopter's intention to use mobile payments.

H7. Facilitating conditions positively influences early adopter's intention to use mobile payments.

H8. Social influence positively influences early adopter's intention to use mobile payments.

H9. Alternative payment habit negatively influences early adopter's intention to use mobile payments

H10. Trust positively influences early adopter's intention to use mobile payments.

H11. Perceived security positively influences early adopter's intention to use mobile payments.

H12. Perceived privacy risk negatively influences early adopter's intention to use mobile payments.

# Research methods

- Current stage: focus group + interviews
  - Focus group: 11 Hong Kong youngsters aged 18-30, mobile payment users
  - Interviews: Starbucks and Uniqlo, among the first to offer in-store proximity payment methods in HK (2017).
- Future study: survey
  - Target respondents: youngsters in HK who have never used mobile payments before.

# Research methods

| Focus group questions (early adopters) | |
|---|---|
| **Warm up** | How would you define mobile payments? |
| | Share you experience with mobile payments. |
| **Relative advantage** | What do you think are the advantages of using mobile payments? |
| **Compatibility** | What are your traditional payment methods? Do they conflict with your new mobile payments behaviors? |
| **Complexity** | Do you think mobile payments in HK are difficult to understand and use? |
| **Trialability** | Did you have an opportunity to try the mobile payments before adopting them? |
| **Observability** | Did you observe other people's use of mobile payments before your own use? |
| **Hedonic motivation** | Do you feel mobile payments are fun and interesting? |
| **Facilitating conditions** | Do you feel the resources and support are sufficient for you to begin using mobile payments? |
| **Social influence** | Do you think your family or friends' use of mobile payments influence your own decision to go with mobile payments? |
| **Alternative payment habit** | Did your traditional payment habits (cash, credit card, octopus card) influence your intention to adopt mobile payments? |
| **Trust** | In general, do you trust the mobile payment platforms in HK? Can you elaborate specific type of trust? |
| **Perceived security and privacy** | What are your concerns regarding to mobile payments security and privacy? Did they influence your intention to adopt mobile payments? |

# Research methods

| **Interview protocols (from the retailer's side) with Starbucks and Uniqlo** | | |
|---|---|---|
| Warm up | Can you briefly talk about the types of payments that are accepted in Starbucks/Uniqlo? | |
| | When was the mobile payments introduced in the store? | |
| | Based on your observation, what is the most popular payment method(s) in your store? Who are the mobile payments users? | |
| | What are the benefits of adopting mobile payments? | |
| | What are the obstacles or concerns with mobile payments? | |
| Key constructs From the retailers' perspective | **Relative advantage** | **Facilitating conditions** |
| | **Compatibility** | **Social influence** |
| | **Complexity** | **Alternative payment habit** |
| | **Trialability** | **Trust** |
| | **Observability** | **Perceived security** |
| | **Hedonic motivation** | **Privacy** |

# Summary

- Mobile payments offer many advantages; however, the adoption rate remains low in Hong Kong, where the penetration rate of mobile devices is ironically high.
- Researchers and practitioners are rather unclear whether the innovative payment methods in Hong Kong will trigger a long anticipated large-scale adoption (as that in China).
- In this study, we present a theoretical model based on the Innovation Diffusion Theory and an extension of UTAUT2 to investigate the factors influencing early adopters' intention to use mobile payments in Hong Kong.

**-The end, thanks!-**

# References


- Dahlberg, T., Mallat, N., Ondrus, J., and Zmijewska, A. (2008). Past, present and future of mobile payments research: A literature review, *Electronic Commerce Research and Applications*, 7(2), pp. 165-181.
- EMarketer (2017). *Personal Mobile Payments on the Rise in Europe*, available at: https://www.emarketer.com/Article/Personal-Mobile-Payments-on-Rise-Europe/1015592
- Chinese University of Hong Kong (2018). *Survey Findings on Use of and Views about Payment through Mobile Phones in Hong Kong*, available at: https://www.cpr.cuhk.edu.hk/en/press_detail.php?id=2712&t=survey-findings-on-use-of-and-views-about-payment-through-mobile-phones-in-hong-kong-released-by-hong-kong-institute-of-asia-pacific-studies-at-cuhk&id=2712&t=survey-findings-on-use-of-and-views-about-payment-through-mobile-phones-in-hong-kong-released-by-hong-kong-institute-of-asia-pacific-studies-at-cuhk
- Davis, F. D. (1989). Perceived usefulness, perceived ease of use, and user acceptance of information technology, *MIS Quarterly*, 13(3), pp. 319-340.
- Ajzen, I. (1985). From intentions to actions: A theory of planned behavior, In J. Kuhl, and J. Beckman (Eds.), *Action-control: From cognition to behavior*, Springer, Heidelberg, pp. 11-39.
- Jung, Y. (2014). What a smartphone is to me: Understanding user values in using smartphones, *Information Systems Journal*, 24(4), 299-321.
- Rogers, E. M. (1983). *Diffusion of Innovations*. Third edition. New York. Free Press.
- Venkatesh, V., Morris, M., Davis, G., and Davis, F. (2003).User Acceptance of Information Technology: Toward a Unified View, *MIS Quarterly*, 27 (3), pp. 425-478.
- Venkatesh, V., Thong, J. Y. L. and Xu, X. (2012). Consumer acceptance and use of information technology: Extending the Unified Theory of Acceptance and Use of Technology. *MIS Quarterly,* 36 (1), pp. 157-178.
- Oliveira, T., Thomas, M. A., Baptista, G., and Campos, F. (2016). Mobile payment: Understanding the determinants of customer adoption and intention to recommend the technology, *Computers in Human Behavior*, 61, pp. 404-414.

# References


- Moores, T. T. (2012). Towards an integrated model of IT acceptance in healthcare. *Decision Support Systems, 53*, pp. 507-516.
- Venkatesh, V. and Bala, H. (2008). Technology acceptance model 3 and a research agenda on interventions. *Decision Sciences,* 39 (2), pp. 273-315.
- Shankar, A., and Datta, B. (2018). Factors affecting mobile payment adoption intention: An Indian perspective, *Global Business Review*, 19(3), pp. 72-89.
- Matemba, E. D., and Li, G. X. (2018). Consumers' willingness to adopt and use WeChat wallet: An empirical study in South Africa, *Technology in Society*, 53, pp. 55-68.
- Yang, S.Q., Lu, Y. B., Gupta, S., Cao, Y. Z. and Zhang, R. (2012). Mobile payment services adoption across time: An empirical study of the effects of behavioral beliefs, social influences, and personal traits. *Computers in Human Behavior*, 28, pp. 129-142.
- Benbasat, I. and Barki, H. (2007). Quo vadis TAM? *Journal of the Association for Information Systems.* 8(4), pp. 211-218.
- Dahlberg, T., Guo, J., and Ondrus, J. (2015). A critical review of mobile payment research, *Electronic Commerce Research and Applications*, 14, pp. 265-284.
- Morosan, C., and DeFranco, A. (2016). It's about time: revisiting UTAUT2 to examine consumers' intentions to use NFC mobile payments in hotels, *International Journal of Hospitality Management*, 53, pp. 17-29.
- Khalilzadeh, J., Ozturk, A. B., and Bilgihan, A. (2017). Security-related factors in extended UTAUT model for NFC based mobile payment in the restaurant industry, *Computers in Human Behavior*, 70, pp. 460-474.
- Choudhury, V. and Karahanna, E. (2008). The relative advantage of electronic channels: A multidimensional view, *MIS Quarterly*, 32(1), pp. 179-200.

# References


- Kim, C., Mirusmonov, M., and Lee, I. (2010). An empirical examination of factors influencing the intention to use mobile payment, *Computers in Human Behavior*, 26(3), pp. 310-322.
- Mallat, N. (2007). Exploring consumer adoption of mobile payments – a qualitative study, *Journal of Strategic Information Systems*, 16, pp. 413-432.
- Johnson, V. L., Kiser, A., Washington, R. and Torres, R. (2018). Limitations to the rapid adoption of M-payment services: Understanding the impact of privacy risk on M-Payment services, *Computers in Human Behavior*, 79, pp. 111-122.
- Moore, G. C., Benbasat, I., (1991). Development of an instrument to measure the perceptions of adopting an information technology innovation, *Information Systems Research*, 2(3), pp. 192-223.
- Brown, S. A., and Venkatesh, V. (2005). A model of adoption of technology in the household: A baseline model test and extension incorporating household life cycle, *MIS Quarterly*, 29 (3), pp. 399-426.
- Limayem, M., Hirt, S. G., and Cheung, C. M. K. (2007). How habit limits the predictive power of intentions: the case of IS continuance, *MIS Quarterly*, 31(4), pp. 705-737.
- Baptista, G., and Oliveira, T., (2015). Understanding mobile banking: the unified theory of acceptance and use of technology combined with cultural moderators. *Computers in Human Behavior*, 50, 418–430.
- Cao, X. F., Yu, L. L., Liu, Z. Y., Gong, M. C., and Adeel, L. (2018). Understanding mobile payment users' continuance intention: a trust transfer perspective. *Internet Research*, 28(2), pp. 456-476.
- Dewan, S and Chen, L (2005). Mobile payment adoption in the US: A cross-industry, cross-platform solution, *Journal of Information Privacy and Security*, 1(2), pp. 4-28.
- Shin, D. H. (2009). Towards an understanding of the consumer acceptance of mobile wallet, *Computers in Human Behavior*, 25(6), pp. 1343-1354.