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Gamification of mobile wallet as an unconventional innovation for promoting Fintech: An fsQCA approach

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ABSTRACT

Although digitalisation brings important possibilities to banking & finance service, implementing digital technologies in practices can be challenging. Indeed, the adoption of new innovative technology in the banking & finance sector lags behind other business sectors. Many of the valuable banking & finance-related technologies have not been adopted in relation to the strategic implications of decisions in domains such as the development of service innovation and personalization, value co-creation, and marketing strategies. In particular, there is a paucity of research in using gamification to explore ways of customising banking & finance fintech offerings, improving customers' experience, and developing efficient banking & finance marketing tactics. Drawing on the UTAUT2 and Otcalysis gamification framework, this study develops a research model investigating what configurations of motivations, expectations and conditions can shape consumers' behavioral intention to adopt a gamified mobile wallet system. Findings suggest that combining effort expectancy, facilitating conditions and perceived value leads to higher intention to use gamified mobile wallet. Accordingly, firms need to consider the three core conditions when design relevant gamifications.

1. Introduction

Financial technology (Fintech) companies, led by the rapid expansion of innovation in the financial market, provide new and exceptional financial services to customers. According to a PwC report (Vishwanath, Bhat, & Chhonkar, 2016), more than 50 % world's population currently lives in urban areas and millennials will form 50 % global workforce by 2020, followed by 180 % increase in middle class scale over the next 20 years. These features have triggered constant growth in Fintech services as well as led to intensified competition among its providers and companies. The outbreak of the Covid-19 pandemic since early 2020 has made the Fintech services more important with the measurements such as on social distancing, lockdowns and contactless payments. According to a report by McKinsey in 2021, in the next decade key technologies such as artificial intelligence (AI) and blockchain will lead the development of Fintech, and reshape the landscape of competition in the finance and banking sector (Fong, Han, Liu, Qu, & Shek, 2021).

Mobile wallet, a new application that replaces physical payment and processes private information such as credit card information and personal accounts, has experienced an explosive growth in the last few years (Sharma, Mangla, Luthra, & Al-Salti, 2018). The wide usage of mobile wallet has led to intensified competition among online payment platforms, especially with the fact that once users engage with a particular platform, they are not likely to change or switch to others. Therefore, mechanisms to attract and engage customers become significantly important for all payment platforms and mobile wallet providers. Constantly increasing application of game mechanisms and game design techniques, conceptualised as gamification, has formulated a new approach of attracting and retaining customers. Gamification extracts and uses the essence of games – fun, playful, objective, and challenging – and applies this to pursue real-life benefits rather than pure entertainment (Hwang & Choi, 2020). Enhanced by the AI technologies, analytics of user behaviours, tailored products and personalised experience, the gamification have significant potentials to be widely deployed to facilitate online processes and transactions (Fong et al., 2021). In the business context, providing customers rewards with game components has

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become as a critical strategy in service and customer relationship management (Hwang & Choi, 2020).

There has been an increasing number of studies focusing on the role of gamification in various business contexts. Previous work of gamification in mobile wallet has mainly focused on (i) examining technical, organisational and social influences on user acceptance of the financial innovation (e.g. Hu, Ding, Li, Chen, & Yang, 2019), and (ii) exploring and proposing solutions to improve customer's responses towards this financial innovation (e.g. Zhao, Tsai, & Wang, 2019). However, no prior research can clarify the full application of gamification in mobile wallet or explains what configurations of motivation can attract more users and customers in such context. This leads to our research question.

RQ1: what configurations of motivations, expectations and conditions lead to user's intention to adopt a gamified mobile wallet system.

To answer the above question, this study firstly proposes a conceptual model with a set of potential elements leading to gamified mobile wallet adoption. Then, we analyse different configurations of these elements based on a set-theoretic configurational method, fuzzy-set qualitative comparative analysis (fsQCA) as the data analysis method. This study advances the understanding of gamification in financial services by proposing configurational lens of user intention and adoption of gamification. There is limited previous research that has considered the complex combination or interaction between acceptance and behavioural factors in the gamified mobile wallet context. Furthermore, this study contributes to the management literature by providing evidence regarding the configurations identified. Interactions between the causal elements and ways through which relational elements interacting with each other can create high intention and adoption are explained by our results. This extends the understanding of how gamification can be better implemented and provides practitioners guidelines through outlining various paths that they can follow.

2. Theoretical background and research model

2.1. Financial technology and mobile wallet trends

Digitalisation is influencing in all aspects of banking & finance service nowadays. Digitalisation refers to the socio-technical process of utilising digital technologies to catalyse the connectivity of individuals, organisations, industries, and society as a whole. Technologies typically associated with digitalisation in the banking & finance sectors include big data analytics, artificial intelligence (AI), smart devices, service robots, and augmented and virtual reality. The applications of these digital technologies have the potential to reshape customer journeys, the way that banking & finance stakeholders collaborate, and revamp business models in the banking & finance sectors. Ryu (2018) defined Fintech as disruptive and innovative financial services by non-financial companies where IT plays a key role. Dhar and Stein (2017) described Fintech as "Financial sector innovations involving technology-enabled business models that can facilitate disintermediation; revolutionise how existing firms create and deliver products and services; address privacy, regulatory and law-enforcement challenges; provide new gateways for entrepreneurship; and seed opportunities for inclusive growth" (pp.33). Digital innovations such as blockchain, artificial intelligence, machine learning, cryptocurrencies and technology-enabled business innovations are fundamental in Fintech industry.

Robo-advisor is one of the most popular robot-based services in Fintech programmed to serve the customer needs. According to Sironi (2016), robo-advisory is "*automated investment solution which engages individuals with digital tools featuring advanced customer experience, to guide them through a self-assessment process and shape their investment behaviour towards rudimentary goal-based decision-making, conveniently supported by portfolio rebalancing technique using trading algorithms based on passive investments and diversification strategies*" (pp. 23). Such a service replaces the traditional face-to-face wealth management advisory to a greater extent (Jung, Dorner, Glaser, & Morana, 2018). Compared to human advisors, some strengths of robo-advisors include low costs and fees, convenience of access, and lower risks. Initial studies show how robo-advisors increase the effectiveness of financial workers or have even rendered some of their activities obsolete—such as online credit application, risk management, claims management, all of which can be automated (Lee & Shin, 2018; Puschmann, 2017). However, robot-advisory has some limitations such as lower quality of advice and conflicts of interest (Fisch, Labouré, & Turner, 2018). For example, robo-advisors are only capable of dealing with a financial decision that is not too complex (Cocca, 2016).

Mobile payments are a method of initiating, approving, and confirming business transactions using a mobile device (Dahlberg, Guo, & Ondrus, 2015; Kim, Mirusmonov, & Lee, 2010), which creates a disruptive revolution in society and has a significant impact on the change of payment ecosystem both on economic and social aspects. Not only proving a convenience to customers, but mobile payment also benefits individual companies and raise national financial services standards. It has a high penetration rate in many countries, especially in China (Amoroso & Magnier-Watanabe, 2012; Phonthanukitithaworn, Sellitto, & Fong, 2016; Zhou, 2013). The profit-making of each mobile payment transaction is very low.

2.2. Gamification in mobile wallet

Gamification refers to the use of game-design mechanics and elements to increase user's awareness and behaviour in experiencing, engaging and being loyal towards non-game contexts such as marketing, education, and fitness (Huang, Chen, & Liu, 2019). In business context, gamification activity usually involves a reward mechanism that encourages customers to constantly engage with relevant mobile application, through which higher engagement and sales can be achieved (Huang et al., 2019). Introducing game mechanisms into mobile payment can enhance customer interaction whilst serving the business's original goal (Zichermann & Cunningham, 2011).

The literature has proposed several examinations and frameworks to explain the usage of gamification in different organisation context. Overall, the first batch of gamification research was structured by 1. to propose definitions, frameworks, and classifications of gamification and game design elements (e.g. Maican, Lixandroiu, & Constantin, 2016; Hwang & Choi, 2020); 2. to describe systems, design, and architecture (e.g. Friedrich, Becker, Kramer, Wirth, & Schneider, 2020); 3. to examine gamification's influence on users (Hamari, Koivisto, & Pakkanen, 2014; Mullins & Sabherwal, 2020; Seaborn & Fels, 2015).

Current gamification in mobile wallet and bank & finance research focuses on technological understanding of gamification design and implementation. Several issues such as privacy concerns, perceived value and ownership have been studied when developing gamification initiatives for banking and finance organisations. Yet, demonstrable successes in embedding gamification functions require a better understanding of user preferences and experience. To address this gap, this study explores different factors, and more importantly how do the configurations of these factors, impact gamification in mobile wallet.

2.3. Research model

We draw on the extended Unified Theory of Acceptance and Use of Technology (UTAUT2) model to explain consumer behavioural intention in their acceptance of fintech technologies (Alalwan, Dwivedi, & Rana, 2017; Venkatesh, Thong, & Xu, 2012). The UTAUT2 model has been widely used to study consumer motivations to adopt mobile health (Duarte & Pinho, 2019), information and communication technology (Macedo, 2017; Tamilmani, Rana, & Dwivedi, 2021), and social networking sites (Herrero & San Martín, 2017). We draw on the main constructs in UTAUT2 model, including performance expectancy, effort expectancy, social influence, facilitating condition, hedonic motivation, perceived value, habit as the causal factors for consumers' behavioural

intention. Furthermore, we integrate the Chou (2019)'s Octalysis gamification framework and consider the factors of avoidance and ownership in impacting mobile wallet user's behavioural intention. The Octalysis gamification framework provides psychological motivations for user retention when designing games, especially the avoidance and ownership factors (Chou, 2019). Therefore, we integrate the avoidance and ownership from Octalysis gamification framework with the UTAUT2 framework to investigate user behavioural intentions. The research model is presented in Fig. 1, with conficuratinoal elements detailed in Table 1.

3. Research method

3.1. Research site and data collection

This study aims to examine the configurational effects of technology-acceptance features and gamification design features on users' behavioural intention of constantly engaging with gamification in the financial services. We collected data from individual mobile wallet users with different education level, income and working background, with the age group of 18 to 36 years-old in China via online questionnaires. The questionnaire was designed into three main sections, including technology acceptance centred questions (i.e. performance expectancy, effort expectancy, social influence, facilitating conditions, hedonic motivation, perceived value, and habit), gamification design related questions (i.e. avoidance and ownership), and questions regarding user intention to continuous engagement. Responses for each question were captured through a five-point Likert scale varying from 1 = strongly disagree to 5 = strongly agree. A total number of 251 responses were collected. After excluding the incomplete and invalid responses, 231 questionnaires were finally obtained and used for the fsQCA analysis.

The Chinese site was chosen for two reasons. Firstly, China ranks the first in penetration rate, the coverage rate, and the population of use of mobile payment worldwidely, and their transactions in daily life and economy depend to a large extent on mobile payment. The mobile payment in China is dominated by two leading companies – Alipay and WeChat – with fierce competition between them ranging from the download rate to frequency of usage and engagement of activities within the platform, which leads to the significance of exploring user intentions in constantly using mobile wallet. Secondly, China's millennials tend to have a strong preference for gaming services, making the background particularly relevant to the study of gamification. The development and new trend of mobile app with game feature have prompted mobile payment companies to introduce game elements, such as red envelopes, coupons, virtual pets to its traditional applications. It also brings a trend to increase the user experience through gamification and to engage users more actively in the application.

3.2. Reliability and validity of measurements

In order to increase reliability and validity of measurements, this research adopted measurements from existing studies that were previously validated in the literature and then modified them to fit the research context. Specifically, measurements of expected performance, expected effort, social influence, facilitating conditions, hedonic motivation and perceived value are adopted from the UTAUT2 (Venkatesh et al., 2003) model, and constructs of habit, avoidance and ownership are developed based on the Otaylysis gamification framework. The UTAUT2 model provides an explanation for potential factors that impact new technology acceptance, whilst Otaylysis framework is developed with a specific focus on gamification design. Therefore, a combination between these two models is useful to explore causal conditions for user behavioural intention in engaging with the gamification design in mobile wallet as a new technology. Such combination also reflects on the calls from Tamilmani et al. (2021) that when operationalising constructions from existing models such as UTAUT2, necessary adaptations are needed depending on research context. A pilot study was conducted with five gamified mobile wallet users; we controlled participants'

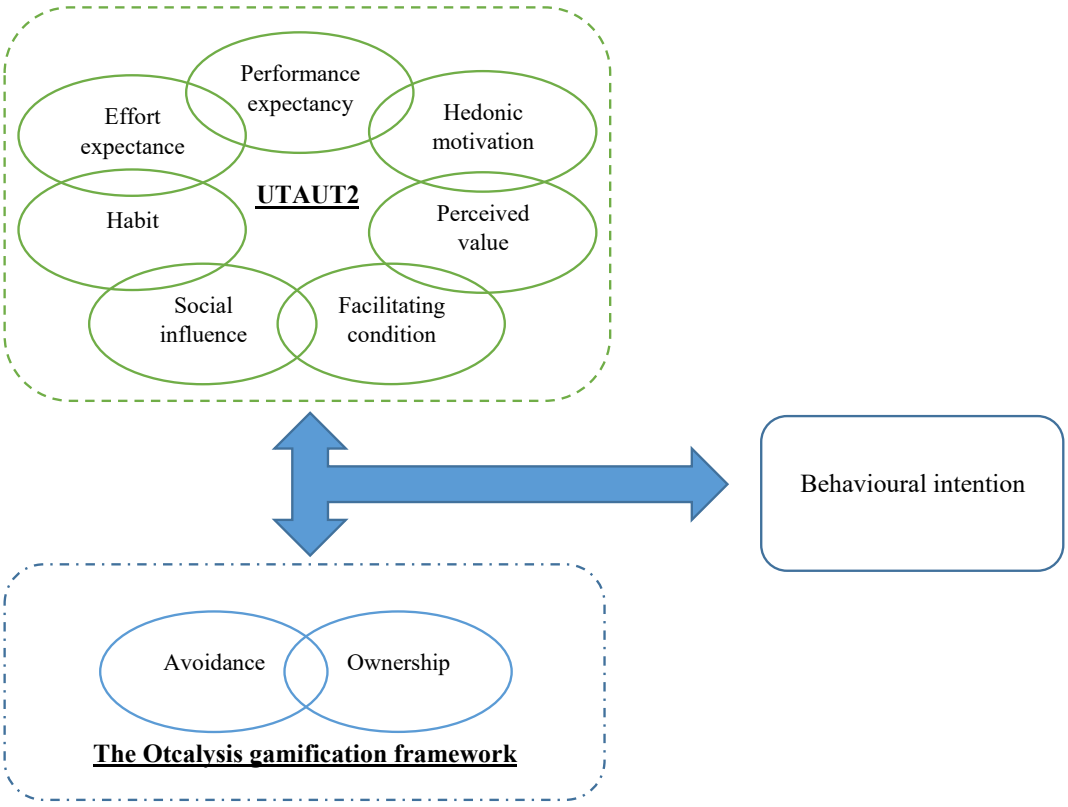

Fig. 1. Research model based on a configuration view of UTAUT2 and Otcalysis gamification.

Table 1
Definition of configurational element in the research model.

Configurational element	Definition	Sources
Performance expectancy	"The degree to which using a technology will provide benefits to consumers in performing certain activities" (Venkatesh et al., 2012, p. 159)	Alalwan et al. (2017); Venkatesh et al. (2012)
Effort expectancy	"The degree of ease associated with consumers' use of technology" (Venkatesh et al., 2012, p. 159)	
Social influence	"The extent to which consumers perceive that important others believe they should use a particular technology" (Venkatesh et al., 2012, p. 159)	
Facilitating condition	"Consumers' perceptions of the resources and support available to perform a behavior" (Venkatesh et al., 2012, p. 159)	
Hedonic motivation	"The fun or pleasure derived from using a technology" (Venkatesh et al., 2012, p. 161)	
Perceived value	"consumers' cognitive tradeoff between the perceived benefits of the applications and the monetary cost for using them" (Venkatesh et al., 2012, p. 161)	
Habit	"the extent to which people tend to perform behaviors automatically because of learn" (Venkatesh et al., 2012, p. 161)	
Avoidance	"The motivation to avoid something negative from happening (Chou, 2019, p.28)."	Chou (2019)
Ownership	"A driver where users are motivated because they feel like they own something. When a player feels ownership, she innately wants to make what she owns better and own even more (Chou, 2019, p.26)."	Chou (2019)

gender and age in order to obtain objective results.

Reliability and validity were evaluated from the sample data set (n = 231). Table 2 presents the descriptive statistics and correlations for measurement items used. As show in the table, reliability coefficients (Cronbach's alphas) are all above 0.70 which indicates sufficient reliability for all measurements. Validity was tested through factor loading, composite reliability and average variance extracted (AVE). Six loadings were within acceptable scope (i.e. below 0.5), and therefore were deleted in the questionnaire. The remaining 33 loadings are higher than 0.5 which represents sufficient internal consistency (Nunnally, 1978).

Table 2
Reliability and validity of measurements.

Construct	Items	Mean	Loading	Composite Reliability	AVE
Performance expectancy	4	3.00	0.633–0.777	0.90	0.75
Effort expectancy	4	3.83	0.795–0.816	0.94	0.83
Social Influence	2	3.18	0.730–0.793	0.94	0.89
Facilitating Conditions	3	3.99	0.593–0.778	0.92	0.79
Hedonic Motivation	3	4.42	0.633–0.680	0.94	0.78
Perceived Value	4	3.58	0.675–0.769	0.85	0.65
Habit	3	3.23	0.624–0.732	0.91	0.78
Avoidance	2	3.06	0.667–0.744	0.85	0.55
Ownership	3	3.36	0.603–0.713	0.92	0.74
Average behaviour intention score	–	3.43	–	–	–
Total performance score		31.65			

The composite reliability of one construct, Gamification, was less than 0.6, and thus the construct was entirely removed from the survey. AVE for each variable is greater than 0.5. These three tests confirm that all measurements have sufficient discriminant and convergent validities (Gefen & Straub, 2000).

3.3. Data analysis: An fsQCA approach

This study used fsQCA as the technique to obtain and explain the capability of gamification in affecting user's intention and behaviour in mobile wallet usage i.e. how different combinations of performance expectancy, effort expectancy, social influence, facilitating conditions, avoidance, ownership, hedonic motivation, perceived value and habit can create high degree of intention and behaviour in using mobile wallet.

FsQCA offers many unique benefits to this study. It is a set-theoretic method to explore how key constructs systemically combine into configurations and to demonstrate their complex causality or causal conditions (Ragin, 2008). Therefore, using fsQCA can explain combinations of theoretically related attributes leading to the outcome of interests through the subset relations (Wang, Kung, Gupta, & Ozdemir, 2019). It is arguably the best way to explain how variables can be configured more appropriately to achieve better results. Traditional cluster analysis examines only homogenous patterns and is unable to control the resulting outcome and regression-based analysis is limited to two-way or three-way interactions (Fiss, 2007), which is not suitable for this study. FsQCA can identify the clusters of high behaviour intention and more importantly, examine the relationship between elements and the role of each element of the configuration in achieving behaviour intention, from which systemic theory is established. Additionally, fsQCA focuses on finding the middle ground between variable-oriented quantitative methods and case-oriented qualitative methods (Ragin, 2000). Thus, it can evaluate case studies that have few standard statistical analysis cases.

Calibration. An essential step in fsQCA technique is to convert the attributes and outcomes into set-membership scores – defined as calibration process. Calibration defines the extent to which a particular case has membership within the given set and demonstrates a set of cases with similar membership (Fiss, 2011). This study followed Ragin (2008) direct method of calibration to transform the data of measurements into sets of memberships. As discussed in the above section, the intention and behaviour were considered as outcomes of this study. The configuration conditions selected included performance expectancy, effort expectancy, social influence, facilitating conditions, avoidance, ownership, hedonic motivation, perceived value, and habit. The calibration transforms the interval scale values into scores based on three qualitative anchors: non-membership, full-membership, and a crossover point that maximise ambiguity of membership within the target set (Ragin, 2008; Wang et al., 2019). These three anchors could be defined by the researcher him/her-self based on empirical and theoretical knowledge regarding the topic and cases (Ragin, 2008). By following the calibration guideline for survey data, we adopted the three high-level membership sets in the five-pint Likert scale and specifically defined 1 as full non-membership, 5 as full membership and 0.5 as the crossover point. Same calibration was applied to all variables.

Truth table. After calibration, the next step in using fsQCA is to apply truth-table algorithm i.e. examining the relationships between configurations of elements and the outcome (Wang et al., 2019). The analysis result, the truth table, contains all logically possible combinations of elements, each row indicating a combination (Park, Sawy, & Fiss, 2017). Before truth table analysis, we firstly tested the necessary condition in terms of whether any of the casual elements can be considered as necessary to the outcome of interest. After the necessary condition analysis, we then run the truth table algorithm in the fsQCA software by selecting standard analysis procedure. The truth table analysis captures relationships between potential configuration causal elements and the

outcome of interest. It provides insight into causality aspects (Ragin, 2000; Rihoux & Ragin, 2008). Required scores for frequency and consistency are clarified in this step. This study set the frequency of case for solutions at 1 for minimum acceptance.

FsQCA measures two types of consistency: raw consistency that its calculation is similar to the crisp set consistency but also calculates near misses and gives inconsistencies penalties, and PRI (proportional reduction in inconsistency) consistency as an alternative consistency measure that can further eliminate the effects of cases with both the outcome and its complement as simultaneous membership. We set raw consistency cut-off value at 0.9 and PRI consistency at 0.75 which meets the recommended minimum threshold (Ragin, 2008). The next section presents the necessary elements and multiple equifinal configurations for behavioural intention, which we will extract patterns to achieve behavioural intention.

4. Results

This section presents the results of the fsQCA analysis. We firstly run a necessary condition analysis to identify the antecedents for mobile wallet user's behavioural intention. The consistency value above the typically used threshold of 0.75 (Ragin, 2008) is considered as necessary conditions. Next, we identified the causal recipes sufficient for behavioural intention by using the truth table analysis. Table 3 presents the results following the notation system from Ragin and Fiss (2008). In the table, each column indicates a combination of conditions that serve as a solution leading to the outcome of interest i.e. high intention of continuously using gamification in mobile wallet. Core elements are represented by the large circles, whilst peripheral elements are represented by small circles. A full circle indicates the element present in the combination, and a crossed-out circle indicates the element is absent in the causal condition. The consistency scores for solutions are above the suggested cut-off value of 0.75 (Legewie, 2013) and therefore the models based on these three configurations are fully specified. The overall solution coverage presents the percentage of memberships in the outcome that can be explained by the complete solution; the extent to which these configurations are consistently leading to high quality can be reflected by the overall solution consistency (Ragin, 2008). In Table 3, the overall solution coverage shows the complete solution can capture 69.9 % of high behavioural intention, while overall solution consistency shows that the three solutions consistently explain 97.9 % of high behavioural intention.

Among the three solutions considered in Table 3, S2 has the highest unique coverage score (0.041). This solution demonstrates that effort expectancy, facilitating conditions and perceived value are considered as core elements to achieve high intention of using gamified mobile wallet, and this is better to be with the support of performance expectancy, hedonic motivation, habit, avoidance, and ownership. The necessary condition analysis revealed that these motivations i.e. effort expectancy, facilitating conditions and perceived value are necessary conditions for this outcome as well. This indicates that for gamified mobile wallet users, those with higher intention and behaviour are almost always satisfied by effort expectancy, facilitating conditions, perceived value.

Compared to S3, S1 and S2 have relatively more elements to be included in the configurations, meaning that these two solutions could be relatively difficult to achieve because they must meet more conditions criteria with more motivations required. S3 appears comparatively easier to achieve, as it requires fewer causal elements and has the second highest unique score of 0.029. S3 consists of six motivations in the configuration including expect expectancy, social influence, facilitating conditions, ownership, hedonic motivation, and perceived value. Performance expectancy, habit and avoidance appear as absence in S3, indicating that to engage users via gamified mobile wallet, Fintech companies could limit efforts in improving customer expectations, and reducing attentions towards customer habit and avoidance emotions; instead, spare more efforts on the effort expectancy, facilitating conditions and the perceived value of using gamified mobile wallet.

All the three solutions suggest the causal elements of effort expectancy, facilitating condition and perceived value as core conditions. Therefore, to gain and retain mobile wallet users, efforts expected to spend in usage, conditions that facilitate the usage and potential value perceived by user are the most important factors. In situations where a user does not have such habit or high expectance towards the performance, the noted three factors can still lead to a high intention in using gamified mobile wallet.

Table 3
Configurations for higher intention to adopt gamified mobile wallet.

	Solutions		
	S1	S2	S3
Configurational element			
Performance expectancy	●	●	⊗
Effort expectancy	●	●	●
Social influence	●		●
Facilitating Conditions	●	●	●
Hedonic Motivation	●	●	●
Perceived value	●	●	●
Habit		●	⊗
Avoidance	●	●	⊗
Ownership	●	●	●
Consistency	0.988	0.988	0.979
Raw Coverage	0.628	0.644	0.345
Unique Coverage	0.013	0.041	0.029
Overall Solution Consistency	0.979		
Overall Solution Coverage	0.699		

Note: *Black circles indicate the presence of a condition, and circles with "X" indicate its absence. Large circles indicate core conditions; small ones indicate peripheral conditions. Blank spaces indicate "don't care".

5. Discussion

This study empirically investigates how technology features and gamification design features interact to impact user behavioural intentions. Our findings reveal the critical influence of effort expectancy, facilitating condition and perceived value in achieving high user intention to use gamified mobile wallet. This reaffirms Baptista and Oliveira (2017) and Fan et al. (2017)'s study which indicated that effort expectancy, facilitating condition and perceived value play vital roles in improving the meaningful use of emerging technology and mobile application and this in turn increases user experience.

It is worth noting that performance expectancy, avoidance, and habit are considered to be avoided in one solution (S3) and yet this solution leads to expected outcomes. Differing from findings reported by previous studies (Baptista & Oliveira, 2017; Wu, Liu, & Huang, 2017), our result shows that performance expectancy, avoidance, and habit does not have to be presented in all solutions to generate high user intention and behaviour. A possible explanation is that in gamified mobile wallet environment, when using the application, user's focus is no longer on improving efficiency even if the gamified function is related to the use of their mobile wallet. Instead, their focus is likely to be extended towards entertainment function. As for habit, a causal element not present in one solution (S3) and serves as a non-essential factor (i.e. 'don't care' factor in fsQCA analysis) in another solution (S1), this is contrary to the earlier research (Zhou, 2013) which suggested the importance of formulating habit in using new technology applications. Our findings reveal that customers with high behaviour intention to use gamified mobile wallet function do not consider this has become a habit of theirs, potentially due to customer's purposeful usage of mobile wallet such as using the payment and the red envelope function, and unconscious habits do not cause these. Another possible explanation is that mobile payment's gamified function is not attractive enough for customers to use these features as a habit and will not make customers addicted to it.

It is also worth noting the role of social influence, hedonic motivation, and ownership in gamified mobile wallet environment. Our results reveal that consumers tend to have higher intention towards using gamified mobile wallet when social influence such as feelings or opinion of friends are higher. This reaffirms the results from Hamari and Koivisto (2015)'s study that providing gamified features such of sharing functions, badges and red envelop contribute to visualise user behaviour and encourage them to communicate in their social network.

5.1. Theoretical implications

This study has two theoretical implications to the UTAUT2 model and the gamified mobile wallet literature. First, despite a growing body of literature on the motivations and factors leading to user behavioural intention in adopting a new technology (e.g. Hamari et al., 2014; Seaborn & Fels, 2015), less attention has been paid to investigate the configurational effects of these motivations. While the existing literature on user motivation suggests that each motivation element solely leads to user behavioural intention (e.g. Belanche, Casaló, & Flavián, 2019), this study provides explanation for different configurations of these elements and extends the understanding of how behavioural intention can be achieved by different combinations of acceptance factors. When promoting a new gamified product in mobile wallet, companies are often confronted with the challenge to allocate resources effectively and make strategic decisions in engaging users. Thus, the results from this study contribute to the understanding of how to formulate solutions to achieve users' continuous engagement.

Second, we contribute to the UTAUT2 model and Octalysis framework by providing further explanation for the path relations among the model constructs in the gamification context. Although regarded as one of the most comprehensive theory in demonstrating individual technology adoption, UTAUT2 model still faces challenges of application in different research context (Tamilmani et al., 2021). This study applies the UTAUT2 model together with the Otcalysis framework to study the intention of young Chinese customers for mobile payment. The combination emphasises the characteristics of mobile payment as technology and the characteristics of gamification. It developed a new model for researching gamified applications, in line with the trend of a large number of mobile applications that emphasise the user experience. In terms of Octalysis framework, this research extends the understanding of avoidance and ownership in the Fintech context. Our findings indicate that ownership of Octalysis positively contributes to all the three solutions with a unique score of 0.859. This is consistent with the research results of Chou (2019)'s that customers with high behavioural intention are often motivated by owning or possessing "virtual goods" or "virtual currencies". This represents that when young Chinese customer using functions such as receiving red envelopes, vouchers, and bonuses, their behavioural intention towards using the mobile payment would be generated as well.

5.2. Practical implications

From a practical perspective, this study provides guidance to finance and technology firms that are involved in mobile wallet development and promotion. As gamification has become increasing popular as a mean to promote mobile wallet among consumers, a critical action is to identify motivational factors that drive the intentions of adoption and continuous usage of such gamification functions. Our findings suggest that the combination of effort expectancy, facilitating conditions and expected value is the most prioritised issue that needs to be considered and addressed by firms when develop relevant gamifications.

Second, this research focuses on the motivational theory in mobile payment and examines the complex interactions among motivations of increasing behavioural intention. We explore which combination of motivational factors can stimulate the highest behavioural intention to use mobile payment. If mobile payment companies and designers pay attention to satisfying a few specific combinations of impact factors when designing a gamified mobile payment, they can directly improve the user intention of using it.

6. Limitation and future research

First, before using fsQCA, we need to rely on prior knowledge and extensive literature on the subject to choose the appropriate condition, elements and outcome. The selection of the conditions in our fsQCA analysis was built on the motivated elements of UTUAT2 model and Octalysis (Baptista & Oliveira, 2017) and was informed by a comprehensive literature review on both gamification and mobile payment application. As a result, one or more motivation drivers could have been overlooked. To improve this deficiency, a study with a combination of a previous mix-method research design such as a qualitative approach involving more participants with the use of coding could provide a stronger condition selection.

Second, our empirical fsQCA solutions might show only part of the potential role of motivational factors. For example, we still don't know what kind of interface can increase hedonic motivation. Future research can focus on what kind of gamified interface or specified function can also impact on user intentions, beyond the nine motivational factors in this study.

Furthermore, this study is conducted in the context of China, and with a focus of the young generation within the age group of 18–36 years. We followed the guidance from Aguinis and Solarino (2019) to ensure the transparency in introducing research setting, setting questions for participants and in the analysis. However, to generalise the results to a wider context such as the western society or an older age group, the particular features within the new context should also be considered.

CRediT authorship contribution statement

Xiaoping Yang: Writing – original draft, Data curation, Conceptualization. **Jingshan Yang:** Writing – original draft, Methodology, Conceptualization. **Yilin Hou:** Writing – original draft, Validation, Investigation. **Shuyang Li:** Writing – review & editing, Software, Investigation. **Shiwei Sun:** Validation, Supervision.

Declaration of Competing Interest

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