

# The Key Factors Influencing the Differentiation Strategy of Digital Payment Systems From the Perspective of Consumers

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## ABSTRACT

Digital payment can be classified as browser-based e-commerce and ‘in-app’ purchases. The growing popularity of e-commerce in general digital checkout solutions is contributing to the overall trend of payments toward digitisation. Therefore, understanding customer satisfaction is a critical factor in adopting digital payment systems. It is an area that has grown rapidly in recent years. In this paper, five interviews were conducted with managers of different companies or with suppliers of digital payment systems and a questionnaire survey was carried out to collect data from 787 respondents from the Business School at the University of Birmingham. Multiple regression analysis was used to test the relationship between digital strategies and customer performance. The study identified five factors related to digital strategies. Timing strategy was found to be the most significant factor for consumer switching cost. Fast payment, which belongs to block-chain key success factors in product strategy, was found to be the most significant factor of consumer satisfaction and retention. Qualitative content analysis was used to interpret the content of the interviews. The outcome of this analysis confirms the results of the questionnaire survey and re-emphasises the importance of security and customer orientation. The results also confirm the advantages of block-chain technology and suggest that technology strategy is indispensable. This paper can be used by suppliers to better understand the needs of customers and to improve the quality of digital payment systems, thereby satisfying customers. To improve product differentiation, suppliers should concentrate on improving the quality and function of their digital payment system in terms of its security and convenience.

**Keywords:** *Digital Payment, e-Business, e-Commerce, block-chain, digital strategy*

## 1. INTRODUCTION

Digital payment is an area that has grown rapidly in recent years[1]. According to the McKinsey’s Global Payments Map, global digital commerce volume exceeded \$3 trillion in 2017, which accounts for 13 percent of global total commerce. Experts predict that the volume will more than double by 2022. In this paper we hope to explore the relationship between strategy variables and performance variables. And also the kinds of strategy variables, which have a significant direct impact both on customer satisfaction and retention and on consumer switching costs. Therefore, understanding customer satisfaction is a critical factor in adopting digital payment systems.

Key factors of customer satisfaction are customers’ perceptions, expectations and preferences [2]. Thus, to increase customer satisfaction, companies need to reduce the difference between customer expectations and their perceptions of reality. Furthermore, consumer preference for a digital payment system should also consider consumer switching cost which is an essential factor for measuring consumers’ loyalty[3]. Following this, applying

a suitable development strategy to improve customer performance is vital. Rather than focusing on economies of scale and the resultant cost advantage, adopting a digital payment system gives more advantages. Compared to traditional businesses, consumers in the e-business environment can easily switch to firms that offer additional value through differentiated features[4]. Similarly, digital payment systems will gain advantages if they can provide unique products but, in the meantime, additional methods to differentiate them must be found. Lynch and Ariely[5] found that, even in a competitive e-business environment, customers are less price-sensitive when they know that a particular product or service will meet their needs. Therefore, the differentiation strategy should be considered as the main business strategy for digital payment systems: to this end, we need to identify the key factors that can influence the differentiation strategy of digital payment systems from the perspective of consumers.

This paper identified key factors that influence the differentiation strategy of digital payment systems in terms of consumer satisfaction and retention. The findings of this study will benefit both suppliers and users of digital

payment systems. First, this study will provide suppliers with a better understanding of what customers require from a digital payment system and attempt to find ways to meet these requirements so that customers can obtain products and services with higher quality. Second, suppliers may be able to apply the recommendations derived from this study and to combine them with their company's current operating model to provide a clear direction for development in the future. Guidance will be given about what factors of strategies should be emphasised to improve customer satisfaction and create competitive advantage. For researchers, this groundwork may help them study new areas of the differentiation strategy of digital payment systems and other kinds of payment systems.

In this paper, we study the relationship between customer performance and various digital strategies which are used to make the digital payment system different, also to find out which factors have a significant direct impact both on customer satisfaction and retention and consumer switching costs and how strong and significant the relationship is. We came to the conclusion these factors can be considered as key differentiation strategy factors that influence consumer performance. The structure is organized as follows: Section 1 introduces the study, while Section 2 presents the related work which explored the background of differentiation strategy, characteristics of digital payment systems, customer preferences and drivers of uniqueness. Section 3 presents the conceptual framework and explains the development of the hypotheses. Section 4 presents describes in detail the research methodology used, including data and sampling, data analysis methods and limitations. Finally, Section 5 concludes the paper and points out further work.

## **2. OVERVIEW OF RELATED WORK**

### ***2.1. The Concept of Differentiation Strategy***

Competitive advantage is the leverage that helps a business provide a higher value of products or service than its industry competitors[6]. Porter[7] defines differentiation strategy as one of the generic strategies used to create a firm's competitive advantage. Differentiation means selecting specific attributes that are essential to buyers in a particular industry, and then uniquely positioning the company to meet buyers' needs. It requires strong research, development and design thinking to create innovative ideas. The business objective is to build consumer brand loyalty and reduce price elasticity[8].

Companies should adjust or reset their competitive strategies according to the market environment; differentiation strategy is used to build long-term competitive advantages in the digital industry. The Five Forces Model is a commonly used analytic tool that helps firms to shape suitable strategies by which they can gain a

competitive advantage over their rivals by evaluating their competitive pressures. It suggests that the rivalry will be more intense when the number of competitors increases and when they are more equal in size and capability [9]. For example, Kodak used to dominate the global market for portable film and camera technology but, as other competitors entered the market, it faced a tough fight on price. Strategic leaders at Kodak refused to switch from their low-cost leadership strategy with photographic film to a more innovative digital imaging-based product-differentiation strategy. This caused the loss of competitive advantage and led to Kodak's declaration of bankruptcy in 2012[10]. Although digital technology can be a shock, in contrast to Kodak, Fuji-Photo actively developed new products and became one of the best in the industry[11].

Similarly, the digital payment industry has realised a tremendous growth over the last decade, with new providers, new platforms and new payment tools being launched almost every year. To achieve a sustainable competitive advantage over a growing number of competitors, companies need to keep innovating their products and providing product differentiation.

According to the Five Forces Model and learning from Kodak's case, a low-cost competitive strategy can effectively improve firms' competitive advantages in the short term but, to achieve sustainable competitive advantages, firms need to increase the entry barriers of the competition which will, in turn, reduce the substitutes and new entrants. Hence, differentiation strategy has mainly been used for the digital payment system in recent years.

### ***2.2. The Characteristics of Digital Payment Systems***

Digital payment refers to the payer processing a cash transaction via electronic devices and channels. A digital payment system is when both the payer and the payee use electronic means to initiate and receive payments[12]. For example, customers can use Microsoft Wallet after setting up a Microsoft Passport, which is used to record personal information. The shopper can shop online with a wallet service[13]. Adopting a digitalised system is both feasible and inexpensive. In terms of the relationship between applications and users, merchants who adopt digital payment systems can be considered as the supply-side of the relationship while customers who adopt the system can be seen as the demand-side. Except for the necessary infrastructure, merchants on the supply-side only need to be able to obtain infrastructure to enable them to conduct digital transactions, such as bank accounts and smartphones; afford fees on adopting digital platforms; and have sufficient literacy to use digitalised systems[14]. Kongaut and Lis[15] suggest that, for most developed countries, supply-side factors involve a well-developed financial sector as well as high coverage of mobile broadband. For developing countries, the important factor appears to be the ability to use a mobile phone for

transferring money, or substitutability to more traditional financial transaction methods which are often marked by low accessibility. Hence, in most cases, the supply-side barriers of adopting digitalised systems are low which can lead to intense competition. To increase the entry barriers and gain a long-term competitive advantage, understanding the key factors influencing the differentiation strategy of digital payment systems is essential.

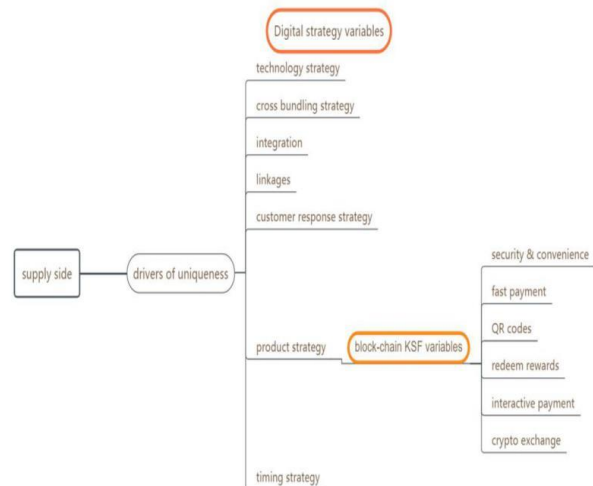
One of the key elements of successfully adopting a digital payment system is to achieve consumer retention, which can be built through customer relationship management (CRM) and product quality. CRM is an effective way to maintain customer databases which enable companies to understand customers' needs, especially their relationship needs, better than their competitors [16]. Market competition causes dynamic erosion of enterprise added value. Therefore, to protect their added value, firms need to build and strengthen long-term customer relationships. They must update or improve their CRM strategies by producing high quality core products and supporting services in a more systematic manner. In this case, higher quality improves profitability by helping to create customer loyalty and competitive advantage, thus increasing market share which in turn leads to scale economies[17].

**2.3. Consumer Preference**

The main objective of customer satisfaction programs is to increase customer retention rates. Day[18] suggests that success should firstly reduce customer dissatisfaction and ensure consumer satisfaction and secondly use unique competitive advantages to build consumer retention. During this process, switching cost plays a critical role in explaining the link between customer satisfaction and retention[19]. For example, the presence of switching costs can mean that some seemingly loyal customers are actually dissatisfied but do not defect because of high switching costs. Thus, the level of switching costs moderates the link between satisfaction and loyalty. Switching cost means the cost that a consumer incurs as a result of changing brands or products. This cost can be divided into monetary, psychological, effort and time-based switching costs[20]. The higher the switching cost, the more difficult substitution will be. In other words, high switching cost can improve customers' loyalty. Hauser[21] also discovered that, as the cost increases, customers become less sensitive to the satisfaction level. Gremler and Brown[22] found that the switching cost of a service product is usually higher than that of a tangible product because the latter can be evaluated by a typical standard while the former is usually evaluated by personal experience. A digital payment system is closer to a service product and so evaluation relies on customers' experience. Hence, switching cost can be a powerful factor in differentiating a mobile payment system.

**2.4. Drivers of Uniqueness**

Porter lists eight drivers of product uniqueness: policy choices, linkages, locations, interrelationships, learning and spillovers, integration, scale and institutional factors. Product strategy is closely linked to the quality of digital products and services. Security is the so-called 'pain point' of customers when adopting a digitalised system. Suppliers should continue to innovate to meet the latest demands and to mitigate against factors which have a negative impact on system security. Product quality was also emphasised as a basic judgment standard. The three challenges of traditional centralised trust mechanism that most mobile payment systems face are the self-interest of supply chain members, information asymmetry in production processes, and costs and limitations of quality inspections. Block-chain technology provides a shared platform for product data management, especially for product data that is updated and distributed between the parties of a supply chain[23]. Owing to the chain-like structure, it is much more difficult to tamper with data which guarantees the authenticity of information and highly increases security and convenience[24]. Block-chain is based on cryptography and helps to generate the efficient cryptographic protocol. The smart contract is the key component of the block-chain, which has made block-chain a technology beyond the scope of the cryptocurrencies and applicable for digital identity. 'OYENTE', one of the smart contracts security analysis tools, can realise interactive payment rather than traditional mobile payment systems which rely on escrow transaction[25]. In addition, the smart contract supports automatic trading once terms meeting. It improves the efficiency of system operation and realises fast payment[26]. Linkage means connecting interdependent activities of a company's value chain. Additionally, linkages are not only limited to inside the firm.



**Figure 1** Conceptual framework (1)

They also create interdependencies between a firm’s suppliers and the firm itself. Good coordination can improve the linkage outside the firm and reduce the transaction cost. Both inside and outside firm linkages improve the firm’s control purposes and save the developing time. Advanced linkage management is helpful to coordinate with suppliers, which costs less than asking for just-in-time deliveries by the supplier. Timing strategy, technology strategy and product strategy can influence each other[27]. First-mover strategy is applied to the firm that has a higher estimate of market size or a superior development process. Timing strategy should cooperate with the product type, product development process and the level of product performance, especially for products dominated by technology. For a digitalised system, the time to launch new services, technology sustainability and market selection are all important to suppliers. Although the key principle of the new economy is that first movers will dominate, pioneers usually take greater risks than those who make a later commitment[28]. Hence, the advanced firm with high capability of technology forecasting will have a higher success rate. A breadth of value activities can help a firm with differentiation. Integration helps a firm to better control its activities and allows activities to coordinate with each other. For a digitalised system, technology is at the core of competitiveness and decides the speed and entry barriers of diversification. Vertical integration in the supply chain contributes to an enhanced relationship with customers, but it must be based on rapid technological innovation. Rothaermel[29] and others point out that, in the pursuit of progressive integration, the combination of innovation and balance of integration and strategic outsourcing can enrich the company’s product portfolio and product success. Integration is both the fastest route to building a vast commercial empire and the best method by which enterprises can realise their upgrade and transformation.

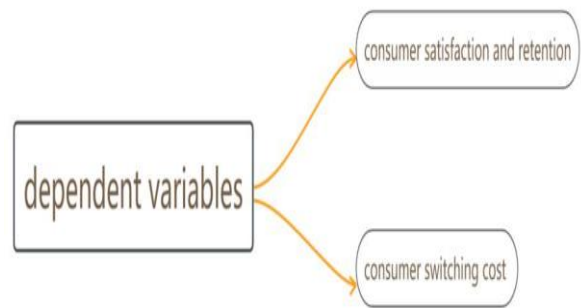
**3. THE MODEL AND METHODOLOGY**

**3.1. Conceptual Framework**

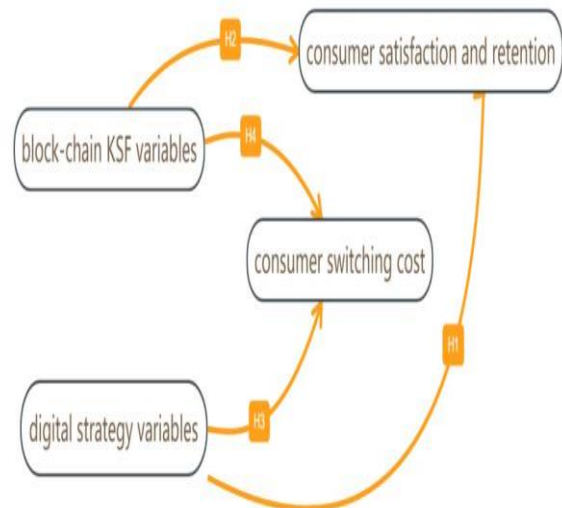
This paper aims to research a cause-effect relationship between seven digital variables (technology strategy, cross-bundling strategy, integration, linkages, customer response strategy, product strategy and timing strategy) and two consumer performance variables (consumer satisfaction and retention, and consumer switching cost). The key success factor variables for block-chain are included in the product strategy because they represent the quality of digital products or services. Age and gender are regarded as two control variables in this cause-effect relationship. The conceptual framework is shown in Figures 1 and 2.

As already discussed, the key element of success is to achieve consumer retention while a high switching cost helps to change satisfaction into retention. Firms in the

digital payment industry are required to keep innovating and differentiating product in order to gain a sustainable competitive edge over their rivals and to succeed[30]. All the digital strategy variables have been considered as drivers of uniqueness in the previous literature. Therefore, to keep innovating and providing product differentiation, digital strategy variables are essential. If there was an improvement in the firm’s digital strategy, then a higher consumer performance is expected. The hypotheses are shown in Figure 3. H1: There is a positive relationship between digital strategy variables and consumer satisfaction and retention. H2: There is a positive relationship between block-chain key success factors variables and consumer satisfaction and retention. H3: There is a positive relationship between digital strategy and consumer switching cost. H4: There is a positive relationship between block-chain key success factors and consumer switching cost.



**Figure 2** Conceptual framework (2)



**Figure 3** Hypotheses

**3.2. Methodology**

There are key factors that influence the differentiation strategy of digital payment systems from the perspective of consumers, but that these also depend on experiences and practices in different contexts. In terms of epistemology, we can observe and measure customers' opinions by questionnaires given to a large randomly selected sample. We need to develop and build a set of hypotheses about the relationship between digital strategy variables and consumer performance variables.

This paper drawing on previous literature concerning the key factors influencing the differentiation strategy of digital payment systems from the perspective of consumers, this research develops the hypothesis that there is a positive relationship between digital strategy variables and consumer performance. Since the results of previous literature were all found under particular contexts, this research aims to test whether these results are appropriate in a more general context through the collection of data by theory verification. Regression analysis is used to test the causal relationship between digital strategy variables and consumer performance variables. Qualitative content analysis is used to interpret the content of the interviews.

This study mainly uses primary data. First, data was collected through the survey questionnaire. Second, data was collected from semi-structured interviews. Primary data can provide focused information on specific research and can increase its accuracy [30]. In addition, the up-to-date information can be collected which also helps improve accuracy. There are a number of methods to collect primary data. This study followed a mixed-method research design to strengthen the research. It aims to use qualitative data to augment a quantitative outcome study. The questionnaire was used as an initial quantitative data collection phase instrument and the interview was used as a qualitative data collection phase to collect data from different sample groups. The qualitative data is used to supplement and support the outcomes of the quantitative study. There are two obvious advantages of using a mixed-method in this research. First, it allows a comparison of the results of quantitative and qualitative research as it is helpful to understand any contradictions between the quantitative and qualitative findings. Secondly, integrating quantitative and qualitative data enables the collection of more comprehensive data.

The questionnaire method is easy for statistical analyses and fits well with deductive approaches [31]. First, we used self-completion to collect data because it is cheaper and more convenient for a large sample. It ensures the sampling is representative and increases the probability that the result of the study can be generalised beyond this specific research context. Secondly, it avoids interview or reactive effects, which refers to the distortion of responses to an interview resulting from differential reactions to specific characteristics of interviewers [32]. The result of questionnaires will not be influenced by interviewers asking questions in different ways, thus creating more objective results. Thirdly, the questionnaire is suitable to link with other methods to counteract any defects in each

method. Hence, the questionnaire can be combined with the interview and, as well as analysing the statistics, the study can also evaluate the in-depth findings from the qualitative research. Having considered the different types of customers for digital payments, we divided them into individual users and companies as the two groups are likely to have different requirements which are closely connected to consumer performance. The questionnaire is focused on individual users while the interview aims to survey companies of different scales or types (as shown in Table 1) There are three main reasons for using the interview approach. First, interviews contribute to discovering how respondents think and feel

**Table 1** The interview of two interviewees

Interviewee 1	Company name	Company information
Co-founder & CEO	First Plus Education Technology Company Ltd. (FP), Birmingham	Headquarters: Hull, East Riding of Yorkshire Year founded: 2017 Company type: privately held Size: 11-50 employees Summary: a new starter with small size, a UK registered and operated company, has two branch companies in Birmingham and Sheffield, the education industry
Employment period: from the establishment of the company to now		
Interviewee 2	Company name	Company information
General Manager for PU Zhenjiang (Tube Mill)	Sandvik Materials Technology (China) Co. Ltd, Zhenjiang	Headquarters: Stockholm, Sweden Year founded: 1862 (157 years ago) Company type: public company in Sweden Size: 41,670 employees Summary: a sophisticated multinational with large scale, has branch companies in more than 130 countries, the traditional manufacturing industry
Employment period: 12 years in Sandvik		

about key factors that influence digital payment systems and reasons for holding their opinions. Second, a semi-structured interview allows the interviewer to ask further questions in response to what are seen as significant replies. This helps to collect in-depth information. Thirdly, this research includes some sensitive topics to which people may give vague answers without a face-to-face situation. For instance, the manager will be more likely to tell you the internal transfer methods of the company when face-to-face. Therefore, the interview allows more detailed questions to be asked and some interviewees may be less self-conscious in a one-to-one situation, which enhances the validity of the research. Information gained in this way also helps to improve the effectiveness of recommendations since motivations and contextual influences can be taken into account. Cross-sectional studies are used to examine variations across cases in terms of a range of variables. All the data are collected over a short period of time. It is suitable to analyse how factors are related to customers in different contexts and to

judge what factors are more relevant to the dependent variables. Random sampling and high response rate can make up the shortfall caused by cross-sectional studies to a certain degree, and achieve highly representative results[33].

**4. EXPERIMENT AND ANALYSIS**

**4.1. Data and Sampling**

To ensure representativeness, a large sample size is needed to test hypotheses across different contexts. The target population was 787 students in 2018 in the Business School at the University of Birmingham. First, it is easy for researchers to achieve a large sample size with low cost in their own university. Second, Birmingham (university) is a university with many international students from all over the world which can reduce the geography limitation of the study and increase the representativeness of the sample. Third, all the students have a business background which ensures a basic understanding of digital payment and other digital strategy variables. Since the average age of these university students is already more than 20 years old, they are all able to use digital payment systems themselves which ensures the validity of the research. Based on the conditions above, the sampling method used was the probability sampling method. The sample was selected by random selection and all the students had an equal chance to be selected. Dillman and colleagues[34] state that a questionnaire can collect three types of data variable: the factual or demographic variable, the attitude and opinion variable, and the behaviour and event variable which reflects people’s experience or behaviour at any time in different contexts. This questionnaire focused on collecting the first two variables. It mainly used nation, gender and age as factual or demographic variables to check that the data collected are representative of the total population. It analyses consumer performance according to the respondents’ attitudes and evaluations of digital payment systems.

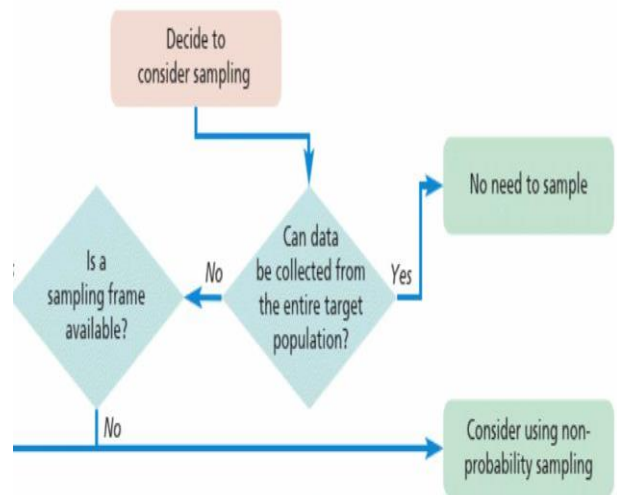
Four aspects have been considered to ensure the quality of the questionnaire:

1. The questionnaire is mainly composed of closed questions which can help enhance the comparability of responses. The open questions about the consumers’ personal information contribute to a careful classification.
2. Questions were coded according to the characteristics of the variables. The coding system is well-structured and contributed to later data classification. The Likert-scale allows the use of quantitative methods to measure qualitative questions[35]. In this questionnaire, it is mainly used to measure consumers’ degree of importance, satisfaction and agreement. It helps to code the questions and evaluate the answers using regression analysis later.
3. The questionnaire also uses ‘alternative form’ questions to test the same question for reliability [36]. For example,

it uses both ‘I am likely to use’ and ‘I feel satisfied with using’ to test consumers’ satisfaction.

4. Sufficient time was given for respondents to complete questionnaires and all questionnaires are in paper form. Students can return questionnaires over several days and it improves the validity of answers because students have enough time to think about answers to the questionnaire. With the cooperation of the Business School management, the questionnaire achieved a complete response and had a high response rate. As demonstrated by Figure 4, data from companies’ response to a digital payment system cannot be collected from the entire target population and the sampling frame is unavailable. So we considered using non-probability sampling, deciding on convenience sampling owing to the limited number of companies which were convenient to participate in the research. Additionally, respondents need to be the managers of companies with different characteristics which means that the target population is defined in terms of a very broad category. This meets the requirement of convenience sampling, which aims to provide preliminary research efforts to get a gross estimate of the results.

Questions were identified relating to the company’s current methods of internal and external transaction, difficulties during the transaction process, and their reasons for choosing a specific digital payment system. The ‘non-standardised’ interview form enabled the interviewer to ask further questions in-depth, with flexibility. Before starting each interview, the interviewee was told the purpose of the research and could see the research design if desired as this helps to understand the research process and improve reliability. All the interviews were recorded and can be listened to again to allow direct quotes to be used. Recording also helps to keep answers being unbiased and accurate. The audio-recording of the interview was transcribed and sent to the interviewee. In order to increase the translation validity, it used back-translation of the content of the cross-language interview to ensure data accuracy and avoid individual subjectivity.



**Figure 4** Sampling Method



## 4.2. Analysis and Limitations

Multiple regression analysis was used to investigate how consumer satisfaction and retention and consumer switching cost are influenced by drivers of uniqueness. The independent variables were divided into two groups: 1. Digital strategy variables: technology strategy, cross-bundling strategy, integration, linkages, customer response strategy, product strategy and timing strategy. 2. Block-chain key success factor variables: security and convenience, fast payment, QR codes, redeem rewards, interactive payment and crypto exchange. The two groups of independent variables were subjected to two sets of regression according to each dependent variable respectively. The four estimating equations were as follows:

In the equations, the dependent variable CSR refers to consumer satisfaction and retention and the dependent variable CSC refers to consumer switching cost. All the equations are estimated using ordinary least square (OLS), which can directly calculate parameters in the model and conveniently interpret the results. There are two reasons to use OLS when conducting linear regression analysis of the data measured: the optimal solution is unique in OLS, as long as the independent variables are not multi-collinearity; OLS regression is one of the major techniques forming the basis of ANOVA. It is convenient to test the data validity at the same time when analysing the regression results.

In terms of time horizon, cross-sectional study makes it difficult to make causal inferences about the relationship. It is only a snapshot and the situation may provide differing results if another time-frame had been chosen[37]. Thus, a longitudinal time horizon can be applied to test the change of results. The data collected this time can be reanalysed together with the latest data to create longitudinal research.

In terms of the design of interviews, audio-recording and interviewee bias can be limitations. Audio-recording may put pressure on interviewees and lead them to avoid important information or provide false information. As the semi-structured interview aims to explore topics in-depth, it might involve sensitive questions, for example about the internal transfer method of the company. The interviewee may only provide a general answer and avoid some pivotal information. To solve this problem, the interview can start from some simple and easy questions and graduate to in-depth questions. It can also bridge any psychological distance with the interviewee to ensure that the interview achieves the desired result.

In terms of the design of the questionnaire, the use of 'alternative form' may lead to a longer questionnaire and prompt respondents to simply refer back to their previous answers, thus causing inaccurate results. Therefore, the number of questions with alternative forms should be limited.

In terms of sampling selection for interviewees, it was difficult to access some companies which led to a self-selection component in sample selection. It should be noted too that data from a small non-probability sample

cannot be used to make statistical generalisations about the entire population. Nevertheless, the data from the interviews can offer a different perspective and play an auxiliary role to support and supplement the result of the questionnaires.

In terms of sampling selection for the questionnaires, this research could not access the full population of users of digital payment systems. All the respondents were from the same university which may result in biased or inaccurate conclusions. Furthermore, since most respondents were aged between 20 to 23 with no salary, this could result in low representativeness, especially in the analysis of a payment system. Thus, further study with broader sampling is needed.

## 5. RESULTS AND FINDINGS

### 5.1. Data Analysis

Except for the two control variables of age and gender, the component is divided into two parts. The first part is called 'digital strategy variables', which contains component 1 and cross-bundling strategy (a compositional variable consists of multiple questions). The second part is called 'block-chain KSF variables', which contains components 2 and 3. Therefore, the formula can be simplified as follows: The regression output in Model 1, Table 2 shows that the digital strategy variable is statistically significant because its p-value (0.000) is less than the significance level of 0.05. The coefficient of the digital strategy variable is positive ( $\beta = 0.417$ ). This result supports Hypothesis 1, indicating that there is a positive relationship between the digital strategy variable and consumer satisfaction and retention. For the block-chain KSF variable, the significance level is also 0.000 ( $p = 0.000$ ), which is below the significance level of 0.05. Therefore, there is a statistically significant relationship between block-chain KSF variables and consumer satisfaction and retention. The coefficient of the block-chain KSF variables is positive ( $\beta = 0.169$ ) and it supports Hypothesis 2, indicating that there is a positive relationship between block-chain KSF variable and consumer satisfaction and retention. The coefficient of determination indicates that Model 1 can explain 31.2% of the variation of the dependent variable ( $R\text{-squared} = 0.312$ ).

As shown in Model 2, Table 2, the p-value (0.002) of digital strategy variable is less than the significance level of 0.05. Thus, it is statistically significant. The coefficient of the digital strategy variable is positive ( $\beta = 0.159$ ). This result supports Hypothesis 3, indicating that there is a positive relationship between digital strategy variable and consumer switching cost. Given that the significance level of block-chain KSF variable is 0.000, which is below 0.05, this demonstrates that there is a statistically significant relationship between block-chain KSF variable and consumer switching cost. The coefficient of the block-chain KSF variable is positive ( $\beta = 0.332$ ) and it supports

Hypothesis 4, indicating that there is a positive relationship between block-chain KSF variable and consumer switching cost. The coefficient of determination indicates that Model 2 is able to explain 15.8% of the variation of the dependent variable (R-squared = 0.158).

The regression output in Model 3, Table 3 shows that linkages, customer response strategy and product strategy are statistically significant because their p-values are all less than the significance level of 0.05. The coefficient of linkages variable is positive ( $\beta = 0.102$ ), indicating that there is a positive relationship between linkages and

consumer satisfaction and retention. A one-unit increase in linkages will increase consumer satisfaction and retention by 10.2%. The coefficient of customer response strategy is positive ( $\beta = 0.127$ ), indicating that a one-unit increase in customer response strategy will increase consumer satisfaction and retention by 12.7%. The coefficient of product strategy is positive ( $\beta = 0.115$ ), indicating that a one-unit increase in product strategy will increase consumer satisfaction and retention by 11.5%. The coefficient of determination indicates that Model 3 can explain 29.1% of the variation of the dependent variable (R-squared = 0.291). In this model, the fluctuation of consumer satisfaction and retention made by customer response strategy is the largest. Furthermore, the age of customers also plays an important role in consumer satisfaction and retention. The results show that consumer satisfaction and retention increase with age.

The regression output in Model 4, Table 3 indicates that integration and timing strategy are statistically significant because their p-values are both less than the significance level of 0.05. The coefficient of integration is positive ( $\beta = 0.106$ ). This indicates that there is a positive relationship between integration and consumer switching cost. A one-unit increase in integration will increase the consumer switching cost by 10.6%. The coefficient of timing strategy is also positive ( $\beta = 0.270$ ), indicating that a one-unit increase in timing strategy will increase the consumer switching cost by 27%. The coefficient of determination indicates that Model 4 can explain 11.5% of the variation of the dependent variable (R-squared = 0.115). In this model, timing strategy is the most significant item in terms of improving consumer switching cost. Age and gender are not statistically significant because their p-values are greater than the usual significance level of 0.05. The regression output in Model 5, Table 4 indicates that security and convenience, fast payment, QR codes, redeem rewards and interactive payment are all statistically significant because their p-values are all less than the significance level of 0.05. The coefficient of security and convenience is positive ( $\beta = 0.058$ ). This indicates that there is a positive relationship between security and convenience and consumer satisfaction and retention. A one-unit increase in security and convenience will increase

The regression output in Model 6, Table 4 shows that security and convenience, QR codes and crypto exchange are statistically significant because their p-values are all less than the significance level of 0.05. The coefficient of security and convenience is positive ( $\beta = 0.080$ ), indicating that there is a positive relationship between security and

consumer satisfaction and retention by 5.8%. Similarly, the coefficient of fast payment is positive ( $\beta = 0.279$ ). This indicates that a one-unit increase in fast payment will increase the consumer satisfaction and retention by 27.9%.

**Table 2** Model 1 and Model 2

Table 2	Model 1		Model 2	
	Dependent variable: Consumer switching cost	1: p-value	Dependent variable: Consumer satisfaction & 2: retention	2: p-value
Digital strategy variable	0.159** (0.05)	0.002	0.417*** (0.033)	0.000
Block-chain KSF variable	0.332*** (0.037)	0.000	0.169*** (0.024)	0.000
Gender	0.089 (0.056)	0.113	-0.043 (0.037)	0.248
Age	-0.026 (0.053)	0.624	0.078* (0.035)	0.026
Constant	1.410*** (0.122)	0.000	0.828*** (0.08)	0.000
Observations	787		787	
R-squared	0.158		0.312	

Robust standard errors in parentheses  
\*\*\* p<0.01, \*\* p<0.05, \* p<0.1

The coefficient of QR codes is positive as well ( $\beta = 0.055$ ), indicating that a one-unit increase in QR codes will increase consumer satisfaction and retention by 5.5%. The coefficient of interactive payment is positive ( $\beta = 0.086$ ). This indicates that a one-unit increase in interactive payment will increase consumer satisfaction and retention by 8.6%. However, the coefficient of redeem rewards is negative ( $\beta = -0.095$ ), indicating that a one-unit increase in redeem rewards will decline consumer satisfaction and retention by 9.5%. The coefficient of determination indicates that Model 5 can explain 33.1% of the variation of dependent variable (R<sup>2</sup>=0.331). In this model, fast payment is the most significant item in terms of improving consumer satisfaction and retention. Age and gender are not statistically significant because their p-values are greater than the usual significance level of 0.05.

convenience and consumer switching cost. A one-unit increase in security and convenience will increase the consumer switching cost by 8%. The coefficient of QR codes is also positive ( $\beta = 0.076$ ), indicating that a one-unit increase in QR codes will increase the consumer switching cost by 7.6%. The coefficient of crypto



exchange is positive ( $\beta = 0.119$ ), indicating that a one-unit increase in crypto exchange will increase the consumer switching cost by 11.9%. The coefficient of determination indicates that Model 6 can explain 15.6% of the variation of the dependent variable (R-squared = 0.156). In this model, crypto exchange is the most significant item in terms of improving consumer switching cost. Age and gender are not statistically significant because their p-values are greater than the usual significance level of 0.05.

**Table 3** Model 3 and Model 4

Table 3	Model 3 Dependent variable: Consumer satisfaction & retention	Model 4 Dependent variable: Consumer switching cost
Technology Strategy	0.052 (0.029)	-0.042 (0.044)
Cross-Bundling Strategy	-0.045 (0.087)	0.149 (0.134)
Integration	-0.012 (0.025)	0.106** (0.039)
Linkages	0.102*** (0.028)	0.029 (0.042)
Customer Response Strategy	0.127*** (0.033)	-0.030 (0.051)
Product Strategy	0.115*** (0.035)	-0.036 (0.054)
Timing Strategy	0.054 (0.027)	0.270*** (0.042)
Gender	-0.046 (0.038)	0.100 (0.058)
Age	0.077* (0.036)	-0.018 (0.055)
Constant	1.149*** (0.091)	1.721*** (0.140)
Observations	787	787
R-squared	0.291	0.115

Robust standard errors in parentheses  
\*\*\* p<0.01, \*\* p<0.05, \* p<0.1

### 5.2. Results and Discussion

Security and convenience are significantly related to consumer performance. Most companies in different industries still use bank transaction as the internal transfer method. Firstly, the bank business account can manage budget payment, record all the transactions and is easy to apply for international transfer (transcript 1 and 2), which means it is convenient and practical. In the choice of banks, companies prefer to choose a bank with a reliable reputation and will take into consideration the bank's system integrity and efficiency (transcript 3). All

respondents agreed that, for a company, the basic requirement of a digital payment system is financial security. A clear employee permission setting is needed in the system: for example, the CEO should have access to all the records but the sales manager should only be able to look at part of them. This indicates a requirement for security and convenience. The conclusion is consistent with regression results. Other reasons also include government policy support, the number of branches of the bank and other companies' choices in the supply chain (transcript 2 and 4).

**Table 4** Model 5 and Model 6

	Model 5 Dependent variable: Consumer satisfaction & retention	Model 6 Dependent variable: Consumer switching cost
Security & Convenience	0.058** (0.021)	0.080* (0.032)
Fast Payment	0.279*** (0.023)	0.068 (0.035)
QR Codes	0.055** (0.020)	0.076* (0.030)
Redeem Rewards	-0.095*** (0.022)	0.024 (0.034)
Interactive Payment	0.086*** (0.024)	0.017 (0.037)
Crypto Exchange	0.008 (0.017)	0.119*** (0.026)
Gender	-0.040 (0.038)	0.099 (0.056)
Age	0.046 (0.035)	-0.028 (0.054)
Constant	1.256*** (0.073)	1.547*** (0.113)
Observations	787	787
R-squared	0.331	0.156

Robust standard errors in parentheses  
\*\*\* p<0.01, \*\* p<0.05, \* p<0.1

Fast payment can increase customer's satisfaction and retention. The payment method provided for companies' customers can be diversified. The companies in the upstream supply chain usually deal with large-amount transactions and B2B transactions use bank transfer. The main methods are electronic funds, electronic bank acceptance bill, check and bank draft (transcript 2 and 4). TSL, a company in the retail industry, accepts all the payment methods as long as they are safe and can realise instant transfer (transcript 3), while First Plus prefers to use Worldpay rather than bank cards because Worldpay relates to UK bookkeeping and it is convenient to search transaction information and to forecast transactions (transcript 1). A bank card lacks these features and, in the process of transfer, the bank will delay payment (transcript 1). However, customers prefer to use mobile payment methods such as Alipay and Paypal because the Worldpay process of payment is too complex and it does not accept large-amount transactions (transcript 1). First Plus only supports the sterling transaction because the Chinese

Foreign Exchange Control involves tedious procedures and will charge a commission (transcript 1). Therefore, a secure, fast and convenient digital payment system which can pay across banks globally would be welcomed. This conclusion not only confirms the results of the regression analysis that fast payment can increase customer's satisfaction and retention, but also supplements company users' different emphasis in different country contexts.

Customer can enjoy the benefit of block-chain while it is still a developing technology. The block-chain key success factors should be based on customers' need and digital technology. First, the original purposes of block-chain technology are to improve security and convenience and to decrease the time cost of transactions as these are all the customers' 'pain points'. The use of block-chain technology can reduce the risk of letters of credit and other frauds, improve bank efficiency and reduce trade financing errors. Second, the use of QR codes can be seen as a key success factor because it is one of the methods that deals with security and fast payment. Thirdly, the most innovative key success factors of block-chain are interactive payment and crypto exchange (transcript 5). Four respondents all agree that block-chain technology is immature and that the cooperation of bank and block-chain is imperative. Whether a company will choose digital payments depends on bank recommendations, consumers' choices and the maturity of this payment method (transcript 3). For SMEs, the choice of other companies in the supply chain affects them as they are followers rather than pathfinders (transcript 4). Sandvik's manufacturing factory considers that digital payment is closer to individual customers (B2C transaction) and that the retail industry will adopt the digital payment more quickly (transcript 2). These results can explain why all block-chain KSFs are statistically significant in the regression analysis but they are still not widely used.

The increasing emphasis on customer response strategy can increase customer retention. However, it still has different weights according to companies' vary developing strategies. From the company users' perspective, three points make a digital payment system significantly superior to other systems. First, a customer orientation system can commercial operational procedures and should be reliable. For example, the system should help enterprises design personalised training because payment methods vary in different companies. In First Plus, customers need to pay from different sites and this is different from the method of in-store retailing (transcript 1). In contrast, the pursuit of standardisation may add limitations and may be incompatible with individual needs (transcript 1). Second, a lower service charge is attractive and the system should be easy to use so that users do not need to spend too much time on professional training; this will save labour cost (transcript 2). Thirdly, the system should be a diversified application with continued innovation (transcript 4). Supporting large-amount transactions and instant transfer were mentioned as well. Once the digital payment system is more applicable for customers, their satisfaction and retention will increase. However, the importance of the customer response

strategy is different in different companies. For a company which has already achieved a quality brand, high reputation and large market share, the customer response strategy may be less important. But the sensibility of customers or issues with products should be a high priority for a new starter. Other companies may think the customer response strategy is the most important as they want to quickly respond or quickly introduce products (transcript 5).

Product strategy has a positive relationship with consumer satisfaction but it depends on the depreciation of the timing strategy. From the perspective of the supply-side, in order to be unique and to stand out from the tough competition, the company should consider its product strategy first to satisfied customers (transcript 5). For example, the company wants to be a new player and designs the digital payment system to manipulate not only users' contacts but it can be connected with the design of products and product strategy. It also depends on the depreciation of the timing strategy once the company wants to be a first-mover and provide unique products (transcript 5). If the company only wants to catch for the competition and offer everyone else offering, there is no depreciation of the timing strategy.

Technology strategy is statistically significant related to consumer performance. Technology strategy matters, especially in adopting a digital payment system because it helps to create a high-tech environment. The cross-bundling strategy and integration depend on the features of the product and they have the potential not to work. However, it is still important to integrate technologies to deliver final features (transcript 5). It proves the significance of technology strategy in the perspective of customers, even technology strategy is not statistically significant in the result of regression analysis.

## 6. CONCLUSION

This paper focuses on the relationship between differentiated customer-based strategies and consumer satisfaction and retention. It combines questionnaires and interviews to collect primary data from different standpoints. The result confirms the significance of the security and efficiency of digital payment systems and emphasises the importance of customer response. Compared to market strategies, customers care more about the product quality. Overall, it also demonstrates people's positive expectations of the new block-chain technology. This paper makes two primary contributions to strategy research. First, it gives validity to the overall theory in the current context. According to the theory, differentiated customer-based strategies which are mentioned in the research have a positive effect on consumer performance. This study tests the theory and proves it based on the digital payment industry. Second, this study provides preliminary research on people's attitude towards the new block-chain technology. All five factors belonging to block-chain are statistically significant to consumer performance. With the exception of inappropriate redeem

rewards, customers consider all the factors have a positive effect on improving customer satisfaction.

### **6.1. Results Analysis**

According to the results of the quantitative research, age, as a control variable, is statistically significantly related to consumer satisfaction and retention. This suggests that consumer satisfaction and retention will increase with age, while gender is not statistically significant. This finding confirms Jabulani's[38] evaluation of the effects of demographic characteristics on the quality of the perception of hotel clients. In the Jabulani study, age and education affect the 'age and education affect the customers' perceived quality of the hotel. Gender has no significant relationship with the five dimensions of service quality or with customers' perceptions of service quality. We believe that it is meaningful for companies which adopt digital payment systems to consider age as a segmentation criterion in order to meet customers' preferences and expectations. Product strategy and all block-chain KSF variables have significant relationships with consumer performance variables. Among them, security and convenience and QR codes are related to both consumer switching cost and consumer satisfaction and retention. Furthermore, fast payment has the highest degree of importance to consumer satisfaction and retention. This result also matches the results of the interviews where security and fast payment are mentioned by all the interviewees. This indicates that block-chain KSF has an essential effect on consumer performance and customers pay great attention to the quality of digital payment systems. This proves the rationality and practical value of Parasuraman's multiple-item scale for measuring the service quality delivered by websites.

The research results confirm that most drivers of product uniqueness on Porter's 1985 list are relevant and have a positive relationship with consumer performance. The results imply that good internal and external linkages contribute to higher consumer satisfaction and retention. The data infers that high quality integration can increase the consumer switching cost. It confirms Rothaermel's opinion[28].

Although large scale, good brand image and high capability of technology forecasting can make up the disadvantage of timing strategy[39], the data suggests that timing strategy still plays the most essential role on consumer switching cost. As mentioned in transcript 5, to be unique in a new market area as a new player, the company must consider the depreciation of the timing strategy. Therefore, it may be beneficial to catch a first-mover advantage, especially in the digital payment industry. Customer response strategy is the second most important factor in consumer satisfaction and retention. In transcript 1, the interviewee emphasises a preference for a customer orientation system. For users, customer response strategy can present whether the system is feasible. For example, customers' feedback can point out the system's

main functions and its strengths and weaknesses. This confirms that responsiveness is one of the most significant predictors of the e-service quality of internet banking. We believe that, in the short term, customer relationship management helps to best understand customers' needs, produce high quality core products and achieve competitive advantage. In the long term, the lifetime value of a satisfied customer can strengthen long-term customer relationships and contribute to the company's brand image[40].

Although cross-bundling strategy is not statistically significantly related to consumer performance variables in this research, its coefficient is positive when the dependent variable is consumer switching cost and its coefficient is negative when the dependent variable is consumer satisfaction and retention. These results suggest that the cross-bundling strategy can play a positive role on improving customers' loyalty but inappropriate bundling can make customer feel disgusted. It helps suppliers to view the relationship between cross-bundling strategy and consumer performance dialectically. As mentioned in the literature review, an improper bundling may allow customers to become overly sensitive to changes in the price and ignore the quality of core products[41]. For suppliers, the bundling should be consciously related to the core products and customers should be free to choose whether they need a bundling set.

It should be noted that there are two unexpected results in this research. Firstly, the data suggests that technology strategy is not statistically significantly related to consumer performance variables. Even its coefficient of integration is negative when the dependent variable is consumer switching cost. However, we could not conclude that the result opposes traditional theories which believe that the technology gap helps to create competitive advantage[42] and that technology is the key to achieve sustained productivity growth[43]. Technology strategy is not statistically significant in this research is probably a consequence of learning and spillover. Assuming there is not a large technology gap, with the rise of technology spillover effect, the technology gap will narrow. Second, the data indicates a negative relationship between redeem rewards and consumer satisfaction. In traditional reward-based programs, redeem rewards can increase consumer participation and improve consumer loyalty. However, in recent years, payment systems often require higher points for customers to earn reward fulfillment and so redeem rewards become less valuable to the consumer. Many financial institutions currently believe that traditional reward-based programs no longer provide the required return on marketing investments. It seems that traditional reward-based programs need some adjustment to function effectively.

### **6.2. Future work**

Researchers could choose more control variables to test the relationships. The factors behind age could be education level, experience, salary level and nationality.

Therefore, the sample should be broader. For example, researchers could test in different geographical areas. This would help a company to target market segmentation more clearly.

This research is time-sensitive and it is a brand new framework. A longitudinal time horizon could be used to test the significance of the relationships of the variables.

Different suppliers will have different strategy focuses to create their own competitive advantages. The degree of importance of the customer response strategy is a typical example that was mentioned in the findings of this study. The case study method is recommended to analyse factors that influence the differentiation strategy of a specific digital payment system. The definition of independent variables in this research is somewhat simplified. Researchers could define and test more dimensions. For example, some of strategies should be combined to maximise their values. When choosing samples of company users, researchers could focus on similar companies with different characteristics. For example, they could choose companies with similar scales but operating in different industries. For this, in-depth research could be appropriate and conducive to locating mediating variables.

The results could be used to analyse how companies can adopt a digital payment system and what demand factors are responsible for consumer performance variables. Researchers could choose more personnel from companies to interview and choose more samples from different locations to test whether the result is valid in different contexts.

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