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Electronic Payment Behaviors of Consumers under Digital Transformation in Finance—A Case Study of Third-Party Payments

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Abstract: In the digital era, new financial technologies and big data are accelerating the development of financial transactions. With the rise of e-commerce transactions, the financial industry has come to recognize that banking as a service can be seamlessly integrated into any scenario, thanks to disruptive innovation driven by electronic and third-party payments. This study aims to examine the consumer acceptance of third-party payment systems offered by electronic payment platforms for e-commerce, as well as their continued usage in the context of digital transformation in finance. This study employed the questionnaire survey method, and it distributed questionnaires to consumers who have used third-party payment systems. A total of 332 valid questionnaires were collected. The results indicate that user acceptance of innovative technologies and various external variables (e.g., the user's external environment, internal characteristics, and information system quality) were significantly positively correlated with perceived usefulness, perceived ease of use, and behavioral intention regarding the electronic payment behaviors of consumers. Based on the empirical results, this study proposes important managerial implications for the financial industry and e-commerce platforms in promoting electronic payment innovation.

Keywords: digital transformation in finance; third-party payment; modified technology acceptance model; diffusion of innovation theory

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1. Introduction

The world experienced the COVID-19 pandemic in 2020, which altered lifestyles and shopping habits. As physical stores became inaccessible, most consumption behaviors shifted online, increasing the prevalence of online payments. A novel transaction model for online buyers and sellers facilitated by non-bank intermediaries, known as third-party payment, has emerged. Third-party payments involve electronic payment institutions serving as intermediaries to assist online buyers and sellers in fund transfer transactions. Due to their operational model, third-party payment systems offer a safe, convenient platform for online transactions. Moreover, the cost of many transaction fees can be saved, as funds bypass banking intermediaries.

Due to its densely populated, narrow geographical structure, ATM services are widespread in Taiwan. As such, people habitually use cash or credit cards. Unlike the United States, which established PayPal in 1998, and China, which launched Alipay and other third-party payment systems in 2004, third-party payments in Taiwan are not as

developed. Hence, most people use credit cards or pay on delivery, even when shopping online. This necessitates examining why Taiwanese consumers are reluctant to use third-party payments, making it a critical research question amidst financial digital transformation.

Studies on consumers' intentions to use innovative financial services like third-party payments often explore their behavioral intention and technology acceptance levels. The Technology Acceptance Model (TAM) proposed by Davis (1986) is the most widely used, essential model in the field (Lee et al. 2003). Based on the Theory of Reasoned Action (TRA) and the Theory of Planned Behavior (TPB) by Fishbein and Ajzen (1975), Davis et al. (1989) developed an effective behavioral intention model to explain and predict the determinants of users' acceptance of emerging technologies and information systems. By exploring the influence of external factors on users' beliefs, attitudes toward using (ATU), and intentions, we can understand how external factors affect users' internal factors and explain or predict the factors influencing information technology use (Fisher and Howell 2004). Hence, most subsequent scholars have adopted the modified TAM by Davis et al. (1989) as the primary research theory. For instance, Lim and Zhang (2022) used the TAM to discuss user behavior of AI-driven personalization in digital news platforms. Song et al. (2021) examined the decision-making process of consumers adopting food-delivery apps. Lunney et al. (2016) explored consumers' acceptance of wearable fitness technology. Huang and Liao (2015) discussed the moderating role of augmented-reality interactive technology on cognitive innovativeness.

The TAM, although insightful in understanding consumer acceptance of technology, primarily discusses the impact of perceived usefulness (PU) and perceived ease of use (PEOU) on behavioral intention (BI). However, the launch time of innovative products and services also affects consumer acceptance. Rogers' (1983) Innovation Diffusion Theory (IDT) examines the process where more consumers accept and understand new products or technologies post-launch over time. Wu et al. (2022) employed the Innovation Diffusion Theory in studying the intent of e-retailers to adopt cryptocurrency.

Thus, the present study combines the TAM and IDT to explore consumer payment behavior toward third-party payments. Past research suggests that perceived usefulness and ease of use directly impact behavioral intent (Adams et al. 1992; Szajna 1996; Venkatesh 2000). However, the factors affecting consumer acceptance of electronic payments have multiple dimensions and cannot be explored from one dimension. As such, the present study proposes an extended integrated framework. The framework employs the two dimensions of the TAM—"perceived usefulness" and "perceived ease of use"—to measure consumers' behavioral intention toward third-party electronic payments. Previous research suggests that the TAM should be expanded by adding extra variables to increase its explanatory power (Hu et al. 1999; Mathieson et al. 2001). Since the transaction risk of third-party electronic payments is higher than that of traditional counter transactions, it is crucial to consider user intrinsic characteristics, the external environment, and the quality and safety of information systems. Previous literature discussing the factors influencing third-party electronic payments is plentiful. However, there is little elaboration in studies examining internal and external factors simultaneously, and there is a lack of empirical support. Therefore, in the extended TAM, this study added several new variables such as "user external environment, user intrinsic characteristics, information system quality" to develop a more specific research framework. This study applied the TAM and IDT to explore consumers' acceptance of the third-party payment systems offered by e-commerce platforms under financial digital transformation and the likelihood of continued use. It aims to identify the critical factors influencing consumers' willingness to use third-party payments and provide insight into how to promote electronic payment innovation for the financial industry and e-commerce platforms. This study's findings serve as a reference for financial providers and e-commerce platforms. Helping to drive electronic payment innovation is this study's contribution to the field of knowledge systems.

2. Literature Review and Hypotheses Development

2.1. Electronic Payment Behavior in the Context of Digital Transformation in Finance

The COVID-19 outbreak has accelerated the global digital transformation. As traditional financial service providers innovate and seek transformation opportunities, the financial industry has developed from Bank 3.0 to 4.0. Digital transformation refers to the introduction of digital technologies and artificial intelligence to systems to explore new business areas or the application of digital technologies to refine existing business models. Heavin and Power (2018) suggested that digital transformation can be classified into three categories: operation optimization, customer experience customization, and business remodeling. Consumer behaviors refer to behaviors directly related to the acquisition, purchase, use, and treatment of products and services, including the decision-making process that influences and determines such behaviors. The definition of electronic payment platforms in Taiwan did not become a proper noun until the Act Governing Electronic Payment Institutions was implemented. However, electronic payments differ from mobile payments, and the difference is misunderstood by most people. Service providers must obtain an electronic payment license to promote diversified services. E-commerce divides the receipt and payment process into two steps, which were integrated in the past. In contrast, payments might not be made on time after commodities have been delivered, or commodities might not be received after payment. The rise of e-commerce has driven the emergence of third-party payments. However, banks have taken no measures to protect the transaction process. Third-party payments are a mechanism designed to address these issues. Consumer electronic payment behavior refers to the commercial behavior of a consumer in browsing a commodity catalog and placing an order in an electronic store established by a seller in a browser. After obtaining a license, a third-party payment service provider can provide collection and payment services. Furthermore, it can offer fund transfers and the receipt and acceptance of stored values into customers' accounts, where transactions occur between electronic payment accounts.

2.2. Innovation Diffusion Theory

Rogers (1983) developed the IDT to explore the process where consumers increasingly accept and understand a new product or technology. The diffusion of innovation refers to the process by which an innovation is communicated over time among participants in a social system. All people need, share, and participate in innovations to reach a consensus, and the sharing process involves bidirectional communication. According to the IDT, adopting an innovation does not happen simultaneously in a social system but is a series of results over time. As such, the present study classified the mass market of innovative technology users into (1) the mass market early stage, (2) the mainstream mass market, and (3) the underdeveloped mass market. We used these categories to distinguish three types of consumers with differing levels of innovative technology acceptance.

According to the IDT, innovation perception characteristics significantly impact the innovation diffusion process. Several related studies on e-commerce have recently emerged. Citrin et al. (2000) indicated that consumers with higher innovation characteristics directly increase their online shopping acceptance. At the same time, users with higher innovation characteristics attach greater importance to the practicability of online shopping, which further enhances the positive correlation between behavioral intention and online transaction acceptance. Given the above, this study proposed the following hypotheses:

Hypothesis 1 (H1). *The user's role in using innovative technologies positively impacts perceived usefulness.*

Hypothesis 2 (H2). *The user's role in using innovative technologies positively impacts perceived ease of use.*

2.3. Modified Technology Acceptance Model

The TAM was designed given the financial consumer behavior of accepting new information systems and was developed by Davis (1986). The TAM was based on the Theory of Reasoned Action (TRA) and is widely applied in various fields. However, past research indicates that the TAM is overly simple. Since it only discusses perceived usefulness and perceived ease of use, the model appears to be insufficient to examine consumer behaviors. Perceived usefulness and perceived ease of use are influenced by external variables (including the user's external environment), such as organizational support, computer interfaces, convenience, and the user's internal characteristics (such as self-efficacy and learning style). Therefore, an extended TAM modified by such factors can be applied in research on the acceptance of various financial information technologies. Lin and Lu (2000) added the information system quality proposed by DeLone and McLean (1992) as an external variable based on the TAM to examine users' behavioral intention to use websites. Lin and Lu (2000) also divided factors into five dimensions: service quality, information quality, mobile device quality, user satisfaction, and use effectiveness. Lin and Lu (2000) also analyzed the correlation between it and the TAM's perceived usefulness and perceived ease of consumer satisfaction, and the correlation between user satisfaction and use effectiveness. Additionally, to simplify the extended TAM, Venkatesh and Davis (1996) removed user attitude to develop a modified TAM framework, including external variables, perceived usefulness, perceived ease of use, behavioral intention, and actual use behavior.

Given the above, the present study adopted the modified TAM as the research framework. The influence path of this dimension was the external variables (user external environment, user internal characteristics, and information system quality), perceived usefulness, perceived ease of use, behavioral intention, and actual use behaviors. This study used the proposed framework to examine consumer behavioral intention and acceptance of third-party payments. Figure 1 shows this study's research model.

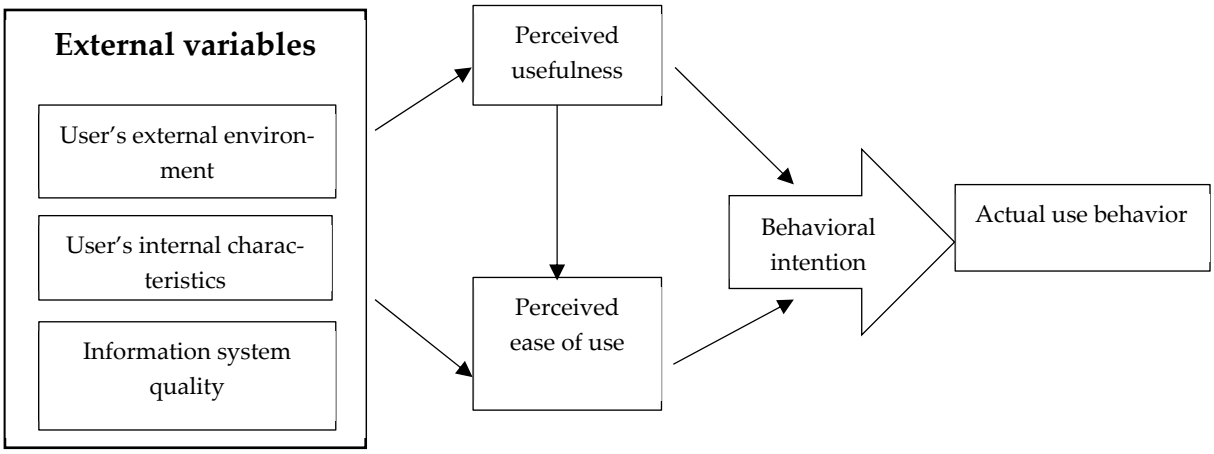

Figure 1. Relational graph of the modified TAM (DeLone and McLean 1992).

2.4. Relational Inference and Hypothesis Derivation of the Modified Technology Acceptance Model

Figure 1 shows how we inferred the influence path of all dimensions to examine consumer behavioral intention and acceptance of third-party payments. Therefore, this study proposed the relational inferences and hypotheses detailed below.

Research has suggested that consumers often meet setbacks when facing user external information technology products and operating such products. It is insufficient to explain current usage situations while only examining innovation perception characteristics. Tsikriktsis (2004) conducted a classified study on consumers based on technology readiness (TR) and found significant differences in consumers' current and future use intentions regarding information technology services. Research has indicated that new technological products and services can effectively increase human welfare; bring breakthroughs to old

technology; and provide unparalleled practical usefulness, ease of use, and a competitive advantage. Therefore, new technological products and services should be preferentially adopted. Consumers will be willing to adopt new technology if they perceive it as useful and easy to use. Given the above, this study proposed the following hypotheses:

Hypothesis 3 (H3). *The user's external environment positively impacts perceived usefulness.*

Hypothesis 4 (H4). *The user's external environment positively impacts perceived ease of use.*

A low consumer behavioral intention to use online transactions is often due to an internal characteristic of consumers and cognitive belief. Consumers consider potential risks (Jarvenpaa et al. 2000) and uncertainties when using an insecure network environment as the transaction medium (Featherman and Pavlou 2003). Vijayasarathy (2004) indicates that a user's perception is highly correlated with their personal assessment of online shopping, which directly influences consumer behavioral intention to buy a commodity. However, studies on the acceptance of electronic services have found that higher mental intangibility leads to a lower perceived system security of consumers and a lower consumer behavioral intention to accept information services (Featherman and Wells 2004). Pavlou (2003) suggested that consumers with strong self-learning abilities expect to take action to reduce environmental uncertainties. Once new knowledge is completely accepted, the perceived system security will directly impact users' behavioral intention to make a transaction. Reducing uncertainty is a critical factor in consumer acceptance of e-commerce services. Given the above, this study proposed the following hypotheses:

Hypothesis 5 (H5). *The user's internal characteristics positively impact perceived usefulness.*

Hypothesis 6 (H6). *The user's internal characteristics positively impact perceived ease of use.*

Bellman et al. (1999) examined online consumption behaviors and found that consumers are most concerned with security and privacy when using networks. Therefore, when network system services make users feel at ease while learning and using a system, users will no longer worry about security and privacy problems and feel free to make network transactions. Featherman and Pavlou (2003) indicated that users' perceived ease of use reduces their perceived risk when using electronic payment services. Therefore, when users feel that an information service is easy to use, they consider the system secure and reliable. Liao and Cheung (2002) also found that the perceived convenience of users regarding network services significantly influences their perception of network system security. Given the above, this study proposed the following hypotheses:

Hypothesis 7 (H7). *The information system's quality positively impacts perceived usefulness.*

Hypothesis 8 (H8). *The information system's quality positively impacts perceived ease of use.*

Oh et al. (2003) applied the TAM to analyze broadband network adoption behavior in South Korea. Their study found that perceived ease of use positively impacts perceived usefulness and attitude. Wu and Chen (2005) combined the Theory of Planned Behavior (TPB), the TAM, and trust to examine the intention to use online taxation. Their study showed that, when users feel that it is easy to learn a system's operation and that it is easy to use, they consider online taxation to be a helpful service. By applying the preceding argument to third-party electronic payments, the present study posits that consumers' perceived ease of use regarding third-party electronic payments will positively impact the perceived usefulness of electronic payments. Given the above, this study proposed the following hypothesis:

Hypothesis 9 (H9). *Perceived ease of use positively impacts the perceived usefulness of third-party electronic payments.*

When using electronic payments, consumers make commercial transactions through a website interface. The perceived usefulness of consumers regarding such websites is the most critical factor influencing such online transactions. Chen and Tan (2004) found that the perceived usefulness of consumers is a crucial factor affecting the acceptance of online virtual stores. Studies on network shopping indicate that perceived usefulness influences shopping attitudes and that it indirectly and directly influences behavioral intention (Shih 2004; Vijayasarathy 2004). Network banking is beneficial to customers because it can save time and costs, allow for prompt responses to customer complaints, allow financial transactions to be conducted anytime and anywhere, and provide customers with more services (Turban et al. 2000). Therefore, consumers expect these benefits when deciding to use electronic payments. When the perceived usefulness of consumers regarding electronic payments increases, the behavioral intention to use such payment systems also increases. Given the above, this study proposed the following hypotheses:

Hypothesis 10 (H10). *Perceived usefulness positively impacts consumer behavioral intention to use electronic payments.*

Hypothesis 11 (H11). *Perceived ease of use positively impacts consumer behavioral intention to use electronic payments.*

3. Research Method

3.1. Research Framework

This study adopted consumer acceptance of innovative technologies as the classification basis according to the IDT. It employed the modified TAM to measure user behavioral intention to use electronic payments and how the intention affects consumer acceptance of third-party payments. This study discussed consumer electronic payment behavior in the context of digital transformation in finance by presenting a case study of third-party payments. To verify the propositions in discussions and inferences from prior studies, the present study established a research framework, as shown in Figure 2.

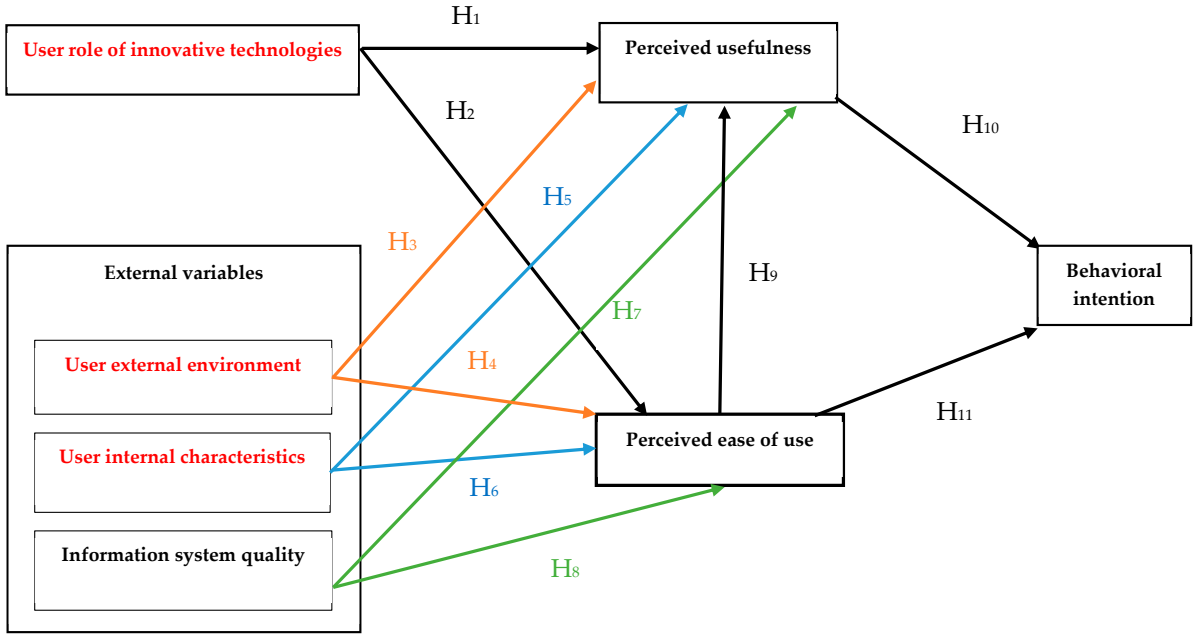

Figure 2. Research framework.

3.2. Questionnaire Design

3.2.1. Research Subjects and Data Sources

This study adopted a survey questionnaire for data collection. Before implementing the survey, questions were devised according to the practices and literature discussion results of third-party payment systems provided by electronic payment platforms in e-commerce. This study also employed descriptive statistics and a path analysis (a multiple regression analysis) to verify the hypotheses. This study adopted purposive sampling and distributed questionnaires to consumers who had smartphones or tablets and had used third-party payments in an electronic payment system. As the questionnaire respondents had used electronic payments, i.e., third-party payments, they could better understand and meet the study purposes. We used statistical software to verify the validity and reliability of the data distribution of 332 valid samples.

3.2.2. Definition and Measurement of Variables

Part 1 of the questionnaire comprised multiple-choice questions regarding the respondents' basic data. The other seven parts of the questionnaire focused on user acceptance of innovative technologies, external variables (user external environment, user internal characteristics, and information system quality), perceived usefulness, perceived ease of use, and behavioral intention. A seven-point Likert scale was used to measure the variables (with answers ranging from strongly disagree to strongly agree).

1. User's role in using innovative technologies

This study simplified the analysis according to the IDT. We divided users of innovative technologies into the early stage of the mass market, the mainstream mass market, and the underdeveloped mass market. We used the scale developed by Moore and Benbasat (1991) regarding innovation characteristics that include three factors: acceptability, challenge, and simplicity; these three factors were employed to determine the mass market classification of respondents. In theory, consumers with a great acceptance for or who perceive challenges toward new technological products are within the mass market early stage. In contrast, consumers who attach greater importance to the simplicity of new technological products are part of the underdeveloped mass market. The opinions of the mainstream mass market regarding new technological products are between the two. To measure user acceptance of innovative technologies, the present study revised the scales of McKnight et al. (2002), Parasuraman (2000), and Moore and Benbasat (1991) and selected a total of eight questions to distinguish the respondents' level of acceptance of innovative technologies.

2. External variables

According to Venkatesh (2000), we examined the external factors that could influence users, including the user's external environment, their internal characteristics, and information system quality.

(1) User external environment

A user's external environment is the complete and adequate provision of operating interfaces, organizational support, convenience, and support for decision-makers to improve usability. This study defined a user's external environment as the level of support one feels regarding the support and convenience of computer interfaces and system organization when operating electronic third-party payments. Furthermore, to measure this external variable, we revised the scales of Wang et al. (2003), Venkatesh (2000), Szajna (1996), and Adams et al. (1992). We devised three questions to understand the factors that could influence a user's external environment.

(2) User internal characteristics

Self-competence, learning style, and learning attitude influence a user's perceptions, i.e., the user's internal characteristics. This study defined a user's internal characteristics as the belief that their internal characteristics affect their willingness to use information technologies. Survey questions 4 and 5 were two reverse questions; their scores were

calculated reversely to seek effective statistics. Furthermore, when measuring user internal characteristics, this study revised the scales of Wang et al. (2003), Venkatesh (2000), Szajna (1996), and Adams et al. (1992) and developed five questions to understand the potential influencing factors regarding user internal characteristics.

(3) Information system quality

A reliable computer system should provide users with a high level of convenience, security, and privacy. It should promptly respond to user demands and protect data from being stolen or destroyed (data integrity). Considering the features of third-party payments, this study defined the operability of an information system as the level of trust that users feel toward data integrity and privacy after conducting third-party electronic payments. Furthermore, to measure information system quality, this study revised the scales of Gefen (2003), McKnight et al. (2002), and Parasuraman (2000) and developed eight questions to understand the potential influencing factors regarding information system quality.

3. Perceived usefulness

Venkatesh (2000) suggested that users often believe that a particular application of information technology can improve their work efficiency. The present study defined perceived usefulness as a user's perceived level of helpfulness or convenience in life and work that using electronic payments brings. Furthermore, to measure perceived usefulness, this study revised the scales of Chau and Lai (2003), Legris et al. (2003), Gefen (2003), and McKnight et al. (2002) and developed five questions to distinguish the respondents' degree of perceived usefulness.

4. Perceived ease of use

According to Venkatesh (2000), perceived ease of use refers to the degree of effortless learning when using an information system as perceived by potential users. When users believe that it is easy to use a device, they will accept it more easily. This will directly influence use intention and indirectly influence use attitude through its perceived usefulness. This study defined perceived ease of use as the degree of the ease of use of third-party electronic payments and the degree of helpfulness or convenience that they bring to life and work. Furthermore, to measure perceived ease of use, this study revised the scales of Chau and Lai (2003), Legris et al. (2003), Gefen (2003), and McKnight et al. (2002) and devised five questions to distinguish the respondents' degree of perceived ease of use.

5. Behavioral intention

This study defined behavioral intention as the degree of intentionality of an individual to perform an action under the influence of various factors. This study operationally defined behavioral intention as the degree of intentionality of users to use third-party electronic payments in current or future transactions regarding the selection and judgment of payment methods. Furthermore, to measure behavioral intention, this study revised the scales of Gefen (2003), Moon and Kim (2001), and Taylor and Todd (1995) and devised six questions to distinguish the respondents' degree of behavioral intention.

3.3. Data Analysis Method

First, this study used the statistical frequency distribution and percentage to describe the data structure of the valid samples. Then, we explained the degree of perception of the respondents regarding the questionnaire response, with the mean and standard deviations calculated based on the user's role in using innovative technologies, external variables (user external environment, user internal characteristics, and information system quality), perceived usefulness, perceived ease of use, and behavioral intention. A greater mean inferred that a question was more trusted by the respondents, and a smaller standard deviation indicated that the respondents more unanimously agreed with the question. Furthermore, this study applied suitable verification methods for analysis, such as a reliability analysis, validity analysis, correlation analysis, and path analysis.

4. Research Results Analysis

4.1. Sample Description

Table 1 lists the analysis results of the respondents' basic information among the valid samples. Regarding the overall sample analysis, the number of female respondents was greater than the number of male respondents. However, the ratio of male respondents to female respondents was about 1:1.22, representing an even distribution according to gender. Most respondents, 273 persons, were between 21 and 60 years old, accounting for 82.3% of the total sample; hence, most respondents were between young and mature age groups. Most respondents (88.6%) had a bachelor's degree or a master's degree or above, indicating that the group had a high educational level. Most respondents (64, 19.3%) were employed in the business, finance, or insurance industries, followed by the manufacturing, service, student, or other industries. Most (187 respondents, 56.4%) had an average monthly income of more than NTD 65,001 or NTD 45,001–55,000. Regarding the digital transformation of finance, a third-party payment system business model provided by electronic payment platforms is innovative and complex. Therefore, this study distributed questionnaires to consumers who had previously used third-party electronic payments to measure consumer behavior intentions to use electronic payments, which would further influence consumer acceptance of third-party payments. The findings indicate that this criterion has made this research more objective. Given the above, this research topic is essential. It can provide users with a better understanding of the efforts made by financial service providers and e-commerce platforms to promote innovation in electronic payments.

Table 1. Formal analysis of the basic information of the valid samples (n = 332).

Background Variable	Category	Number of Respondents	Percentage (%)
Gender	Male	149	44.9
	Female	183	55.1
Age	20 years old and below	5	1.5
	21 to 30 years old	48	14.5
	31 to 40 years old	28	8.4
	41 to 50 years old	69	20.8
	51 to 60 years old	156	47.0
	61 years old and above	26	7.8
Educational level	Junior high school diploma and below	1	0.3
	Senior (vocational) high school diploma	37	11.1
	Bachelor's degree	148	44.6
	Master's degree	128	38.6
	Doctoral degree	18	5.4
Industry	Student	35	10.5
	Steward	8	2.4
	Military, police, civil servant, and teacher	28	8.4
	Catering	4	1.2
	Service	49	14.8
	Manufacturing	60	18.1
	Transportation and storage	4	1.2
	Construction	14	4.2
	Business/finance/insurance	64	19.3
	Information/communication	9	2.7
	Wholesale and retail	19	5.7
	Other	38	11.4
Average monthly income	NTD 25,000 and below	40	12.0
	NTD 25,001–35,000	39	11.7
	NTD 35,001–45,000	39	11.7
	NTD 45,001–55,000	43	13.0
	NTD 55,001–65,000	27	8.1
	NTD 65,001 and above	144	43.4

4.2. Reliability and Validity Analysis of the Research Variables

4.2.1. Reliability Analysis

Reliability primarily tests the stability and consistency of a measurement tool. The present study tested the reliability of each dimension using Cronbach's α, as proposed by Nunnally (1978).

The reliability is acceptable if Cronbach's α is greater than 0.5. If Cronbach's α is greater than 0.7, the data have adequate internal reliability. DeVellis (1991) proposed that 0.7 > Cronbach's α > 0.6 represents moderate reliability, 0.8 > Cronbach's α > 0.7 represents high reliability, and Cronbach's α > 0.8 represents the best reliability.

4.2.2. Validity Analysis

Good validity indicates that the measurement tool can measure the degree that the researchers intend to measure.

The present study employed a factor analysis to test the questionnaire's construct validity. First, we conducted a KMO test (Kaiser–Meyer–Olkin measure of sampling adequacy) and Bartlett's spherical test to understand the classified dimensions of consumers' behavior intention to use electronic payments and consumers' acceptance of third-party payments under the digital transformation in finance to determine whether it was appropriate to employ a factor analysis. Hair et al. (1998) proposed that a KMO value greater than 0.8 represents good, greater than 0.7 represents better, and a significant Bartlett's spherical test ($p < 0.001$) represents good data convergent validity. Therefore, this study employed a principal component analysis (PCA), selected factor loading and communality factors for analysis, and used the Varimax Method for rotation. The absolute value of the factor loading must be greater than 0.5. If the factor loading is smaller than 0.5, but the communality is larger than 0.5, it represents a significant interaction between the question and other questions, and the question should be reserved (Larose 2006).

4.2.3. Question Groups Reliability Analysis/Validity Analysis

Cronbach's α value of the questionnaire in this study was 0.952, greater than 0.8, representing good reliability, high stability, and good reliability quality for a subsequent data analysis. The KMO value of the questionnaire was 0.948, and Bartlett's spherical test was significant ($p < 0.001$), indicating the data's good convergent validity and that they are appropriate for a factor analysis.

Three deletions were performed in this study based on the factor analysis results. The first deletion was question 7, "I am cautious about using a new technical product/service before it is proven trustworthy," because the factor loading (0.292) and commonality (0.153) were both less than 0.5. The second deletion was question 21, "When sending messages in the network, I am not sure whether messages are sent correctly," because the factor loading (0.470) and commonality (0.419) were both less than 0.5. The third deletion was question 13, "I often question old ideas and traditional norms," because the factor loading (0.469) and commonality (0.338) were both less than 0.5. The remaining 37 questions could be classified into nine domains. Table 2 summarizes the questions, question content, and factor loadings for each domain.

Moreover, this study first constructed a validity analysis by re-running the questionnaire's reliability after deleting the items. Cronbach's α values were 0.539 for "user acceptance of innovative technology–simplicity" and 0.614 for "external variables–user's intrinsic characteristics," which are still in accordance with Nunnally's (1978) recommendation that Cronbach's α value should be greater than 0.5 as an acceptable range. The other seven dimensions were between 0.801 and 0.953, as shown in Table 2. The overall Cronbach's α value was 0.956, which is in accordance with the recommendations of both Nunnally (1978) and DeVellis (1991), indicating that the data in this study have a level of reliability above medium and high. This indicates that the reliability of the questionnaire is stable and acceptable. Therefore, the remaining 37 questions were retained for the subsequent analysis, except for questions 7, 21, and 13; thus, each question was conducted at its original number.

Table 2. Reliability and validity analysis.

Dimensions	Question Item No.	Question Content	Factor Loading	Communality	Cronbach's α
User acceptance of innovative technologies		(1) Acceptance			
	1	Generally, I can clearly know how to use new technical products/services without others' help.	0.794	0.701	0.842
	2	Generally, I am the first one among my friends to search for new technical products/services.	0.778	0.800	
	3	I already know how to use a new technical product/service even when others do not know about it.	0.806	0.803	
		(2) Challenge			
	4	I will still try to use a new technical product/service even if I do not know it.	0.781	0.746	0.833
	5	I enjoy the challenge brought by using a new technical product/service.	0.767	0.806	
		(3) Simplicity			
	6	I do not think that a new technical product/service is designed for the general public.	0.707	0.610	0.539
	8	I would rather buy a basic type of new technical product/service than buy a multi-functional and intelligent one.	0.875	0.841	
External variables		(1) User external environment			
	9	I think that personal data will not be leaked when I use a third-party electronic payment system.	0.826	0.725	0.915
	10	I think that a third-party payment electronic system is stable and trustworthy.	0.842	0.821	
	11	I think that I can feel free to use a third-party electronic payment system.	0.793	0.775	
		(2) User internal characteristic			
	12	I am willing to try new things.	0.627	0.591	0.614
	14	I like to think about whether there are new ways of doing things.	0.537	0.498	
	15	It is convenient to use a third-party electronic payment system. However, I am still not fond of it.	0.814	0.757	
	16	I am used to shopping in physical stores and I am unwilling to try a third-party electronic payment system.	0.730	0.712	

Table 2. *Cont.*

Dimensions	Question Item No.	Question Content	Factor Loading	Communality	Cronbach's α
		(3) Information system quality			
	17	I believe that a third-party electronic payment system has a robust protection mechanism so that users can feel free to make transactions.	0.761	0.752	0.924
	18	I believe that laws and the rules of network security systems will protect the transactions in a third-party electronic payment system.	0.841	0.809	
	19	I believe that encryption and other technologies will allow users to make transactions safely using a third-party electronic payment system.	0.706	0.710	
	21	I think that the accounts in a third-party electronic payment system are not secure.	0.775	0.747	
	22	I can query useful transaction records in a third-party electronic payment system.	0.515	0.416	
	23	I believe that a third-party electronic payment system can resist external attacks (such as hacker attacks).	0.795	0.690	
	24	Overall, I think that a third-party electronic payment system is a robust and secure transaction environment.	0.767	0.753	
Perceived usefulness	25	I think that it is quite useful for me to use electronic payments.	0.711	0.719	0.926
	26	I think using electronic payments can improve the efficiency of financial transactions or related transactions.	0.775	0.672	
	27	I think that by using electronic payments, I can better control my time and get rid of the restriction of fixed business hours.	0.824	0.713	
	28	I think electronic payments allow me to make financial transactions more conveniently.	0.847	0.763	
	29	I think that electronic payments can improve the service quality of online shopping.	0.726	0.632	

Table 2. *Cont.*

Dimensions	Question Item No.	Question Content	Factor Loading	Communality	Cronbach's α
Perceived ease of use	30	I think it is easy to use third-party electronic payment to make a payment for a transaction.	0.772	0.727	0.801
	31	I think that it is effortless to use third-party electronic payment.	0.793	0.737	
	32	I think that others can also clearly and easily use third-party electronic payment after I tell them how to use it.	0.686	0.586	
	33	Third-party electronic payment cannot be used as easily as cash transactions. I will spend a lot of time to learn to use it correctly.	0.944	0.928	
	34	Overall, I think that it is easy to use third-party electronic payment.	0.703	0.676	
Behavior intention	35	I think that it is worthy to use third-party electronic payment.	0.756	0.759	0.953
	36	I am willing to spend more time to learn to effectively use third-party electronic payment.	0.755	0.743	
	37	I will consider using third-party electronic payment when making financial transactions.	0.755	0.792	
	38	When third-party electronic payment service providers provide favorable incentives (redeeming bonus points), I am willing to make some transactions with them.	0.679	0.613	
	39	I will recommend others to use third-party electronic payment services.	0.713	0.736	
	40	In the future, I will be willing to continue to use third-party electronic payment services.	0.737	0.766	

Source: compiled by this study.

4.3. Correlation Matrix of Variables

This study conducted a Pearson Product-Moment Correlation analysis to understand the correlation between user acceptance of innovative technologies and external variables (user external environment, user internal characteristics, and information system quality) toward the perceived usefulness, perceived ease of use, and behavioral intention of consumer electronic payment behavior. Cohen (1992) proposed a reference index for the degree of association represented by the correlation coefficient value. If there is a positive relationship between two variables, a correlation coefficient between 0.1 and 0.3 is considered low, that between 0.3 and 0.5 is moderate, and that between 0.5 and 1.0 is high. The results of the present study showed a significant positive relationship among the seven dimensions, indicating that they co-vary positively. Furthermore, the correlation coefficients in this study were primarily between 0.3 and 0.7. Hence, the two variables have a moderate correlation, as shown in Table 3.

Table 3. Pearson correlation coefficient matrix.

	a. User Acceptance of Innovative Technologies	b. External Variable (User External Environment)	c. External Variable (User Internal Characteristic)	d. External Variable (Information System Quality)	e. Perceived Usefulness	f. Perceived Ease of Use	g. Behavior Intention
a. User acceptance of innovative technologies	1						
b. External variable (user external environment)	0.391 **	1					
c. External variable (user internal characteristic)	0.207 **	0.206 **	1				
d. External variable (information system quality)	0.451 **	0.793 **	0.300 **	1			
e. Perceived usefulness	0.370 **	0.452 **	0.424 **	0.584 **	1		
f. Perceived ease of use	0.407 **	0.463 **	0.393 **	0.600 **	0.738 **	1	
g. Behavior intention	0.380 **	0.564 **	0.462 **	0.649 **	0.796 **	0.726 **	1

** The correlation is significant when the significance level is 0.01 (two-tailed).

4.4. Path Analysis and Results

After the empirical analysis and test, this study conducted a path analysis and a regression analysis on the dimensions, including user acceptance of innovative technologies, external variables (user external environment, user internal characteristics, and information system quality), perceived ease of use, perceived usefulness, and behavior intention based on empirical analyses and the verification results. Table 4 lists the estimated analysis results.

Table 4. Path analysis results.

Independent Variable	Dependent Variable	Estimated Path Coefficient β	F Value	T Value	Adjusted R^2	*p* Value
User acceptance of innovative technologies	H1: perceived usefulness	0.370 ***	52.333	7.234	0.134	<0.001
	H2: perceived ease of use	0.407 ***	65.661	8.103	0.163	<0.001
External variable (user external environment)	H3: perceived usefulness	0.452 ***	84.625	9.199	0.202	<0.001
	H4: perceived ease of use	0.463 ***	90.166	9.496	0.212	<0.001
External variable (user internal characteristic)	H5: perceived usefulness	0.424 ***	72.508	8.515	0.178	<0.001
	H6: perceived ease of use	0.393 ***	60.330	7.767	0.152	<0.001
External variable (information system quality)	H7: perceived usefulness	0.584 ***	171.097	13.080	0.339	<0.001
	H8: perceived ease of use	0.600 ***	185.337	13.614	0.358	<0.001
Perceived ease of use	H9: perceived usefulness	0.738 ***	393.738	19.843	0.543	<0.001
Perceived usefulness	H10: behavior intention	0.796 ***	570.818	23.892	0.633	<0.001
Perceived ease of use	H11: behavior intention	0.726 ***	468.493	19.196	0.526	<0.001

*** Indicates that the level of significance is <0.001.

Table 4 shows that, in the first path, the path value of the user's role in using innovative technologies to perceived usefulness in using third-party electronic payment was $\beta = 0.370$, $p < 0.001$. The regression coefficient was positive, and the t value was 7.234, reaching a level of significance. This finding indicates that a user's innovative technology use significantly impacted perceived usefulness. Furthermore, the respondents had a high degree of acceptance of perceived usefulness in using third-party electronic payments. In the regression model, the overall F value reached a level of significance ($F = 52.333$, $p < 0.001$). This finding indicates that the regression model had an explanatory power (adjusted $R^2 = 0.134$). This result suggests that the user's role in using innovative technologies significantly impacts perceived usefulness. The respondents would have a higher degree of perceived usefulness if they had a higher degree of the perceived user's role in using innovative technologies. Therefore, H1 is supported. In the second path, the user's role in using innovative technologies significantly impacted perceived usefulness. Additionally, the path value of the user's role in using innovative technologies to the perceived ease of use in using third-party electronic payments was $\beta = 0.407$, $p < 0.001$. The regression coefficient was positive, and the t value was 8.103, reaching a level of significance. This finding indicates that the user's role in using innovative technologies significantly positively impacted perceived ease of use. This suggests that the respondents had a high degree of acceptance of perceived ease of use in using third-party electronic payments. In the regression model, the overall F value reached a level of significance ($F = 65.661$, $p < 0.001$), indicating that the regression model had an explanatory power (adjusted $R^2 = 0.163$). This finding shows that the user's role in using innovative technologies significantly impacted perceived ease of use. The respondents would have a higher degree of perceived ease of use if they had a higher degree of perceived user's role in using innovative technologies. Therefore, H2 is supported, and the user's role in using innovative technologies significantly impacted perceived ease of use.

In the third path, the user's external environment's path value to perceived usefulness in using third-party electronic payments was $\beta = 0.452$, $p < 0.001$. The regression coefficient was positive, and the t value was 9.199, reaching the significant level. This finding indicates that the user's external environment had a significant positive impact on perceived usefulness. This suggests that the user's external environment had a high degree of acceptance with perceived usefulness in using third-party electronic payments. In the regression model, the overall F value reached a level of significance ($F = 84.625$, $p < 0.001$), indicating that the regression model had an explanatory power (adjusted $R^2 = 0.202$). This finding shows that the user's external environment significantly impacted perceived usefulness. The respondents would have a higher degree of perceived usefulness if they had a higher degree of perceived user external environment. Therefore, H3 is supported, and the user's external environment significantly impacted perceived usefulness. In the fourth path, the path value of the user external environment to perceived ease of use in using third-party electronic payments was $\beta = 0.463$, $p < 0.001$. The regression coefficient was positive, and the t value was 9.496, reaching a level of significance. This finding indicates that the user's external environment had a significant positive impact on perceived ease of use. This suggests that the user's external environment had a high degree of acceptance of perceived ease of use in using third-party electronic payments. In the regression model, the overall F value reached a level of significance ($F = 90.166$, $p < 0.001$), indicating that the regression model had an explanatory power (adjusted $R^2 = 0.212$). This result demonstrates that a user's external environment significantly impacted perceived usefulness. The respondents would have a higher degree of perceived usefulness if they had a higher degree of perceived user external environment. Therefore, H4 is supported, and the user's external environment significantly impacted perceived usefulness.

In the fifth path, the path value of user internal characteristics to perceived usefulness in using third-party electronic payments was $\beta = 0.424$, $p < 0.001$. The regression coefficient was positive, and the t value was 8.515, reaching a level of significance. This finding indicated that user internal characteristics significantly positively impacted perceived use-

fulness. This suggests that user internal characteristics had a high degree of acceptance of perceived usefulness in using third-party electronic payments. In the regression model, the overall F value reached a level of significance (F = 72.508, $p < 0.001$), indicating that the regression model had an explanatory power (adjusted $R^2 = 0.178$). This result indicates that user internal characteristics significantly impacted perceived usefulness. The respondents would have a higher degree of perceived usefulness if they had a higher degree of user internal characteristics. Therefore, H5 is supported, and user internal characteristics significantly impacted perceived usefulness. In the sixth path, the path value of user internal characteristics to perceived ease of use in using third-party electronic payments was $\beta = 0.393$, $p < 0.001$. The regression coefficient was positive, and the t value was 7.767, reaching a level of significance. This finding indicates that user internal characteristics significantly positively impacted perceived ease of use. This result demonstrates that user internal characteristics had a high degree of acceptance of perceived ease of use in using third-party electronic payments. In the regression model, the overall F value reached a level of significance (F = 60.330, $p < 0.001$), indicating that the regression model had an explanatory power (adjusted $R^2 = 0.152$). This result shows that user internal characteristics significantly impacted perceived ease of use. The respondents would have a higher degree of perceived ease of use if they had a higher degree of user internal characteristics. Therefore, H6 is supported, and user internal characteristics significantly impacted perceived ease of use.

In the seventh path, the path value of information system quality to perceived usefulness in using third-party electronic payments was $\beta = 0.584$, $p < 0.001$. The regression coefficient was positive, and the t value was 13.080, reaching a level of significance. This finding indicates that information system quality had a significant positive impact on perceived usefulness. This suggests that information system quality had a high degree of acceptance of perceived usefulness in using third-party electronic payments. In the regression model, the overall F value reached a level of significance (F = 171.097, $p < 0.001$), indicating that the regression model had an explanatory power (adjusted $R^2 = 0.339$). This finding indicates that information system quality significantly impacted perceived usefulness. The respondents would have a higher degree of perceived usefulness if they had a higher degree of perceived information system quality. Therefore, H7 is supported, and information system quality significantly impacted perceived usefulness. In the eighth path, the path value of information system quality to perceived ease of use in using third-party electronic payments was $\beta = 0.600$, $p < 0.001$. The regression coefficient was positive, and the t value was 13.614, reaching a level of significance. This finding indicates that information system quality significantly positively impacted perceived ease of use. This suggests that information system quality had a high degree of acceptance of perceived ease of use in using third-party electronic payments. In the regression model, the overall F value reached a level of significance (F = 185.337, $p < 0.001$), indicating that the regression model had an explanatory power (adjusted $R^2 = 0.358$). This result demonstrates that information system quality significantly impacted perceived ease of use. The respondents would have a higher degree of perceived ease of use if they had a higher degree of perceived information system quality. Therefore, H8 is supported, and information system quality significantly impacted perceived ease of use.

In the ninth path, the path value of perceived ease of use to perceived usefulness in using third-party electronic payments was $\beta = 0.738$, $p < 0.001$. The regression coefficient was positive, and the t value was 19.843, reaching a level of significance. This finding indicates that perceived ease of use had a significant positive impact on perceived usefulness. This result demonstrates that perceived ease of use had a high degree of acceptance on perceived usefulness in using third-party electronic payments. In the regression model, the overall F value reached a level of significance (F = 393.738, $p < 0.001$), indicating that the regression model had an explanatory power (adjusted $R^2 = 0.543$). This result demonstrates that perceived ease of use significantly impacted perceived usefulness. The respondents would have a higher degree of perceived usefulness if they had a higher degree of per-

ceived ease of use. Therefore, H9 is supported, and perceived ease of use significantly impacted perceived usefulness. In the tenth path, the path value of perceived usefulness to consumer behavior intention to use third-party electronic payments was $\beta = 0.796$, $p < 0.001$. The regression coefficient was positive, and the t value was 23.892, reaching a level of significance. This finding indicates that perceived usefulness had a significant positive impact on behavior intention. This suggests that perceived usefulness had a high degree of acceptance of consumer behavior intention to use third-party electronic payments. In the regression model, the overall F value reached a level of significance ($F = 570.818$, $p < 0.001$), indicating that the regression model had an explanatory power (adjusted $R^2 = 0.633$). This result shows that perceived usefulness had a significant impact on behavior intention. The respondents would have a higher degree of behavior intention if they had a higher degree of perceived usefulness. Therefore, H10 is supported, and perceived usefulness significantly impacted behavior intention.

In the last path, the path value of perceived ease of use to consumer behavior intention to use third-party electronic payments was $\beta = 0.726$, $p < 0.001$. The regression coefficient was positive, and the t value was 19.196, reaching the level of significance. This finding indicates that perceived ease of use had a significant positive impact on behavior intention. This suggests that perceived ease of use had a high degree of acceptance of consumer behavior intention to use third-party electronic payments. In the regression model, the overall F value reached a level of significance ($F = 368.493$, $p < 0.001$), indicating that the regression model had an explanatory power (adjusted $R^2 = 0.526$). This result demonstrates that perceived ease of use significantly impacted behavior intention. The respondents would have a higher degree of behavior intention if they had a higher degree of perceived ease of use. Therefore, H11 is supported, and perceived ease of use significantly impacted behavior intention. According to the path analysis results, all 11 hypotheses showed statistically significant positive correlations and were supported: H1 (the user's role in using innovative technologies significantly impacts perceived usefulness); H2 (the user's role in using innovative technologies significantly impacts perceived ease of use); H3 (the user's external environment significantly impacts perceived usefulness); H4 (the user's external environment significantly impacts perceived ease of use); H5 (the user's internal characteristics significantly impact perceived usefulness); H6 (the user's internal characteristics significantly impact perceived ease of use); H7 (the information system's quality significantly impacts perceived usefulness); H8 (the information system's quality significantly impacts perceived ease of use); H9 (perceived ease of use significantly impacts perceived usefulness); H10 (perceived usefulness significantly impacts behavior intention); and H11 (perceived ease of use significantly impacts behavior intention).

5. Conclusions and Suggestions

5.1. Conclusions

This study simplified the analysis according to the IDT and divided users of innovative technologies into the early stage of mass market, the mainstream mass market, and the underdeveloped mass market. The classification of the mass market was based on the scale developed by Moore and Benbasat (1991) for innovation characteristics. The three factors of acceptability, challenge, and simplicity were included in the scale. In theory, consumers with a great acceptance for or who perceive challenges toward new technological products are the early stage of mass market, and consumers who attach greater importance to the simplicity of new technology products are the underdeveloped mass market. The opinions of the mainstream mass market toward new technology products fall between the early stage of mass market and the underdeveloped mass market. According to the research results, the users' role in using innovative technologies is significantly positively correlated with both perceived usefulness and perceived ease of use. In other words, the mainstream mass market that perceives challenges has the highest level of user acceptance of innovative technologies. Therefore, consumers who perceive challenges tend to believe that it is useful and easy to use third-party electronic payments, and they have a higher level of acceptance.

This study used the modified TAM as the framework. The influence path of this dimension was in the following order: external variables (user external environment, user internal characteristic, and information system quality), perceived usefulness, perceived ease of use, behavioral intention, and actual use behaviors. This study used the proposed framework to discuss consumer behavioral intention and acceptance concerning third-party payments. The research results are as follows:

1. Users' external environment was significantly and positively related to both perceived usefulness and perceived ease of use. When a third-party electronic payment system provides better organizational support and more convenient operating interfaces, consumers perceive usefulness and ease of use when using electronic payment and have a higher level of acceptance.
2. Users' internal characteristics were significantly and positively correlated with perceived usefulness. In other words, when users have higher self-efficacy, they become more confident in using third-party electronic payment. Furthermore, users are influenced by their learning styles, learning preferences, and tendencies. Consumers who often think about replacing an approach with a new method and are willing to try new approaches have a higher level of perceived usefulness and acceptance in using third-party electronic payment.
3. User internal characteristics were significantly and positively correlated with perceived ease of use; i.e., when users are more concerned about the learning process, including how to absorb, think, and ultimately assess the result, they will have a weaker sense of distrust with third-party electronic payment and will make more transactions. Therefore, these consumers have a higher level of perceived ease of use and acceptance in using third-party electronic payment.
4. Information system quality was significantly and positively correlated with perceived usefulness. In other words, when conducting financial transactions, users would have a higher level of perceived usefulness and acceptance in using third-party electronic payment if the information security is guaranteed, the quality of the financial services is good, and the transaction time is not limited by the fixed business hours of the bank.
5. Information system quality was significantly and positively correlated with perceived ease of use. When conducting financial transactions, users would have a higher level of perceived ease of use, convenience, and risk-free operation in using third-party electronic payment if the information security can be controlled easily and the financial service transactions can be made quickly. In this way, users would feel more confident about transactions and further have a higher level of trust in and acceptance of the system security.
6. Perceived ease of use was significantly and positively correlated with perceived usefulness of third-party electronic payment. When consumers perceive that a third-party electronic payment system is easy to learn and use, they perceive that they can complete financial transactions more quickly and conveniently in the third-party electronic payment system.
7. Perceived usefulness was significantly and positively correlated with consumer behavioral intention to use electronic payments. Consumers believe that, if the industry can actively make attempts to establish more and well-functioned financial transaction mechanisms and make users perceive the usefulness of an electronic payment system, they would have a higher level of behavioral intention to accept third-party electronic payment.
8. Perceived ease of use was significantly and positively correlated with consumer behavioral intention to use electronic payments. Consumers believe that, if the industry can make a continuous effort to put forth new ideas in innovation and R&D and make users perceive that an electronic payment system is easy to learn and use, they would have a higher level of behavioral intention to accept third-party electronic payment.

The empirical results of this study can provide references for academia, e-commerce companies, the financial industry, owners of third-party payment platforms, and the government in Taiwan for future research and business development. Furthermore, through the empirical results of this study, related stakeholders can gain an insight into the matters concerning consumers about third-party electronic payment systems. The findings of this study can provide a basis for the establishment and improvement of third-party electronic payment systems in the context of digital transformation in finance.

5.2. Management Implications

This study discussed the factors influencing consumer behavioral intention to use third-party electronic payment. The results reveal the factors influencing consumer acceptance of third-party payments. The findings can provide references to banks and e-commerce platforms in promoting online banking and electronic payments, assist them with designing action plans and systems and formulating marketing strategies, and further improve the level of consumer behavioral intention to use third-party electronic payment. Among these factors, the more important ones include the external environment, internal characteristics, and information system quality. For customers, perceived ease of use is only a basic requirement for accepting third-party electronic payment. Perceived usefulness must be increased to improve consumer behavioral intention to accept third-party electronic payment. On this basis, financial service providers need to understand that system ease of use should be a priority in the design of payment functions so that consumers can perceive the benefit of third-party electronic payment in providing fast financial transaction services, which could assist financial transaction flows. In addition, third-party electronic payment can ensure secure data transfers, protect transactions, and enable fast transactions. These factors are worthy of financial service providers' attention in designing their blueprint and planning policies.

Various financial service providers adopt their own operating interfaces. As a result, consumers must learn to use different interfaces when using different electronic payment services. Users may also need to readapt to the electronic payment and transaction process and network operation procedure after a system is upgraded. System interfaces must be highly consistent so that users can learn to use a system effortlessly and smoothly conduct financial transactions in the network or when using smartphones. This will certainly help in promoting financial services.

In view of the above, it is critical to design general and easy-to-use mobile apps or computer software. When interfaces are easier to use, consumers tend be more interested in using the payment tool and have a higher level of behavioral intention to use electronic payments. To this end, at the level of improving electronic payment systems, designers should create user-friendly and simple systems. Furthermore, open third-party payment systems are prone to computer viruses and hacker attacks. In such a context, financial service providers should focus on how to eliminate user concerns about transaction data security and properly take information security protection measures. When financial service providers design and plan mobile banking systems in view of their perceived usefulness and perceived ease of use, consumers can access real-time, convenient, and effective financial services through third-party electronic payments and use such payment methods more frequently. In this way, financial service providers can expand their business scope to improve their competitiveness.

5.3. Limitations and Recommendations for Future Research

First, the present study overlooks the fact that consumers do not have a choice when it comes to using the TAM. The TAM has been criticized for disregarding the essential social factors that users face, coercing users to adopt technology through cost and structural obligations. The framework of perceived usefulness and ease of use overlooks the problem of costs and structural obligations that force users to adopt technology (Bagozzi 2007).

In this study, users had no other choice but to accept third-party payments if the company required it. This potential flaw in the researchers' initial intent could be a study limitation.

Second, this study adopted a survey questionnaire distributed over the Internet for a limited period. As such, the sampling scope was limited. Moreover, the questionnaire responses could have been influenced by existing consumption behaviors or strong subjectivity and consumer preference. Therefore, we recommend that subsequent studies adopt qualitative analyses to identify other factors influencing consumer behaviors regarding third-party payments.

Research regarding third-party electronic payment behaviors is still in the early stages. Therefore, the present study used a scale for measuring behavioral intention to measure consumer behavior regarding the use of third-party electronic payments. This may have influenced the measurement validity. However, there is currently no scale for measuring third-party electronic payment behavior in academia. Therefore, we suggest that scholars establish a scale for measuring third-party electronic payment behavior to support subsequent related studies.

Moreover, the current model is unsuitable for using only a multiple regression analysis to determine the model's structural discriminant and mediating effects.

Therefore, we suggest that future studies establish the application of a structural equation modeling approach. Figure 1 on page 4 of this study indicates that perceived usefulness is a moderating variable. However, this study has not tested the direct and indirect relationships between the dependent variable (DV) and independent variable (IV) from this perspective. Therefore, this study suggests that future researchers explore using perceived usefulness as a moderating variable to investigate whether it strengthens the relationship between perceived ease of use and behavioral intention.

Finally, we suggest that future scholars perform consumer market segmentation and a differentiation analysis according to the financial industry, e-commerce platforms, and fields where consumption occurs. Research should summarize strategies to attract customers to different groups. Such studies can further assist financial service providers in understanding the similarities and differences between various types of consumers in target markets. Studies on market segmentation types, such as population, geography, behavior, and psychological segmentation, can be conducted to identify consumer groups in target markets and further provide financial service providers with appropriate strategies. Researchers can examine the factors of consumer behavior in the non-acceptance of third-party electronic payment options and the keys to the success of the digital transformation of financial service providers. Research should investigate the decisive factors related to executing policies, technological strategies, inter-sector operation, and collaboration. We consider it a financial digital transformation ecosystem for seamlessly integrating different technologies and solutions to achieve a perfect transformation.

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