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The Mediating Impact of Innovation Types in the Relationship between Innovation Use Theory and Market Performance

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Abstract: The ultimate goal of innovation is to improve performance. But if people's needs and uses are ignored, innovation will only be a formality. In the past, research on innovation mostly focused on technology, processes, business models, services, and organizations. The measurement of innovation focuses on capabilities, processes, results, and methods, but there has always been a lack of pre-innovation measurements and tools. This study is the first to use the innovation use theory proposed by Christensen et al. combined with innovation types, and it uses the measurement focus on the early stage of innovation as a post-innovation performance prediction. This study collected 590 valid samples and used SPSS and the four-step BK method to conduct regression analysis and mediation tests. The empirical results obtained the following: (1) a confirmed model and scale of the innovation use theory; (2) that three constructs of innovation use theory have an impact on market performance; and (3) that innovation types acting as mediators will improve market performance. This study establishes an academic model of the innovation use theory to provide a clear scale tool for subsequent research. In practice, it can first measure the direction of innovation and performance prediction, providing managers with a reference when developing new products and applying market strategies.

Keywords: innovation use theory; innovation use scale; innovation type; disruptive innovation; continuous innovation; market performance

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1. Introduction

The landscape of innovation remains an enduring focal point for corporate entities globally, mirroring the ever-evolving dynamics of the business environment. Navigating swift shifts in market trends and meeting the dynamic needs of customers present ongoing challenges that underscore the strategic imperative of prioritizing innovation in business operations. Simultaneously, corporate innovation is inherently driven by the overarching objective of enhancing performance [1,2]. The undeniable interconnection between innovation and performance reverberates across diverse business sectors [3]. In essence, innovation is a strategic endeavor meticulously designed to address consumer needs and usage patterns, yielding tangible performance outcomes for the company. However, a prevalent challenge faced by many companies lies in the propensity of innovation initiatives, particularly within research and development (R&D) departments, to invest substantial resources and time in the pursuit of an ostensibly flawless product. Unfortunately, such perfection-seeking endeavors may not align with the dynamic demands of the market [4], posing a critical predicament in corporate innovation.

In 2016, Christensen et al. introduced the innovation use theory, heralding a paradigm shift in the approach to corporate innovation. Their proposal advocates for initiating innovation with a focus on multifaceted uses, recognizing the integral roles played by functional, social, and emotional factors in shaping successful innovations. According to Christensen, adopting a user-oriented methodology in product development, one that meticulously aligns with customer needs, is key to achieving success in the realm of

innovation. This perspective marks a departure from the notion that innovation is a stroke of luck, emphasizing a strategic and purposeful approach to product development that considers diverse usage scenarios. The innovation use theory posits that success in innovation results from thoughtful consideration of user experiences and needs, ushering in an era where innovation is an intentional and systematic endeavor rather than a gamble.

While it is intuitively evident that these innovations are likely to positively impact firm performance, existing evidence in the literature is predominantly anecdotal or derived from case studies, lacking comprehensive empirical support. Our study's primary purpose is to empirically investigate the impact of innovation on market performance from the perspective of the innovation use theory. Additionally, building on Christensen et al.'s insights, our secondary objective is to explore the mediating role of two distinct types of innovation—highlighted by Augusto et al.'s findings [5]—in enhancing a company's economic performance and customer satisfaction. This study aims to delve into the crucial role of innovation types in satisfying three dimensions of consumer needs: functional, social, and emotional uses. Furthermore, our research seeks to examine the intricate interplay between innovation types and their connection to overall market performance. To structure these hypotheses, we propose a conceptual model (Figure 1) based on extant literature, elucidating the anticipated relationships among innovative use, innovation types, and market performance. This multifaceted exploration aims to deepen our understanding of how diverse categories of innovation contribute not only to consumer satisfaction but also to the broader landscape of corporate success in the marketplace.

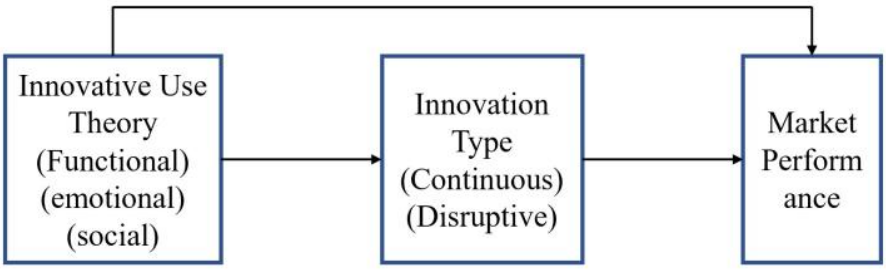

Figure 1. Concept model.

According to the conceptual diagram, we will first establish the scale for the innovative use theory and transform it into effective measurement tools. Additionally, for the first time, we will combine the innovative use theory and innovation types to validate market performance. Based on this, we pose the following questions:

RQ 1: Do the three dimensions of the innovative use theory directly influence market performance? Is there a difference in the impact of these three dimensions?

RQ 2: Do the three dimensions of the innovative use theory affect innovation types? Which dimension has a more significant impact?

RQ 3: In terms of the impact on market performance, is the direct influence of the three dimensions of the innovative use theory or the mediated impact through innovation types more effective?

Our purpose is to understand the impact of the three aspects proposed by the innovative use theory on market performance through measurement. In addition, we also want to understand the differences in market performance through the mediating role of different innovation types. This study gathered 590 valid responses through surveys, utilized SPSS regression analysis to validate the reliability and validity of each scale, and subsequently applied the four-step BK method proposed by Baron and Kenny [6] to examine the mediating effect. Through empirical research, we have achieved several significant contributions. Firstly, we validated the model and scale of the innovative use theory, addressing the academic gap in the innovative use theory scale. Secondly, we demonstrated that the three dimensions of the innovative use theory have an impact on market performance, serving as a predictive tool for early-stage innovation. Lastly, we confirmed that incorporating the

innovative use theory with different innovation types as intermediaries yields superior performance, facilitating adjustments in industry market strategies. To the best of our knowledge, this marks the first instance of combining a theory acknowledged by the academic community with a market-proven innovation model for measurement, introducing both novelty and practical value.

In the remaining sections of this paper, the arrangement is as follows: Section 2 elucidates the three dimensions of the innovative use theory and innovation types. Section 3 outlines the methodology employed, while Section 4 presents the results and subsequently conducts the analysis and discussion. Section 5 provides conclusions, implications, and directions for future research.

2. Theoretical Development

2.1. Innovative Use Theory

When Christensen et al. [7] introduced disruptive innovation, it successfully established a new competitive model. However, this model does not provide specific guidance on the direction of corporate innovation or how to innovate to disrupt market leaders or pioneers. Managers must autonomously choose their innovation strategies based on market conditions and the resources available to their enterprises. Hence, Christensen et al. [8] subsequently proposed the innovative use theory, adopting a usage perspective to explore the reasons behind consumer purchases. According to this theory, companies should understand the specific "jobs" consumers hire their products for. In essence, consumers utilize various methods, tools, or products to accomplish a task, meeting their needs [8]. In simpler terms, consumers buy and use a particular product to fulfill their requirements and enhance their lives. The key insight here is that customers are not seeking a product or service; rather, they are seeking a solution to their problem [8].

Delving deeper, Christensen et al. explored the innovative use theory across three key dimensions. Regarding the functional aspect, they probed into the new functionalities emerging from product innovation and development, seeking to understand the specific consumer needs these innovations aim to address. On the emotional side, the focus shifted to consumers' unique feelings when using the product and any emotional shifts they may experience. Regarding the social aspect, the examination extended to the impact of innovations on diverse ethnic groups, backgrounds, and social classes. This approach allows the innovative use theory to employ a uniform line of thinking and language, facilitating comprehension and enabling managers to contemplate and predict potential future innovation strategies effortlessly. Furthermore, at its core, the innovative use theory encompasses three fundamental questions: (1) What change do you want to achieve? Including functional, emotional, and social aspects. (2) In what situation does the perplexing occur? Including who, when, where, and when and what was done. (3) What are the obstacles to progress? The moment of its innovation lies in finding the best method that can help consumers remove obstacles and achieve the job perfectly.

From a corporate perspective, the innovative use theory primarily focuses on the progress of consumers' desires. It uses this purpose as a guide for innovative development. The emphasis of innovation lies not in tools or methods but in observation, synthesis, and induction. The goal is to identify clues to innovative content, ensuring that the results of innovation align with the progress consumers aspire to achieve.

From the consumer's point of view, the change that consumers want in a specific situation is defined as progress [8]. The meaning is not the product, but the change after using the product, which is progress. That is to say, consumers hire or use products and services under specific circumstances because they need to complete a certain job to achieve the consumer's purpose, or what they want to progress in.

Based on the above explanation, the core of the innovative use theory is to predict and provide solutions to solve needs and give consumers what they want; that is, companies predict the demand for innovation and provide solutions that meet consumers' needs and uses. Therefore, this study agrees with the definition of innovative use theory as

innovatively developing products or services based on consumers' situations and desired changes to provide consumers with use and needs to satisfy their tasks and emotions [9].

2.1.1. Functional Use

According to the Oxford English Dictionary [10], the function is defined as the purpose of something, which generally refers to purpose, goal, and intention. Miles [11] explains function as, the basic purpose of every product development expenditure. Functionality reflects consumers' perceptions of a product's ability to fulfill its purpose [12,13]. Therefore, product functionality refers to the specific functions, functions, or uses of this product. In addition, from the perspective of product design, product functions and the goals to be achieved by the product are related to technology and are usually expressed in terms of technical operations [14].

Basic functionality is the main reason why users purchase products. For example, a light bulb has the basic function of providing a light source. However, users are not necessarily interested in secondary functions, because they will only pay attention to basic functions, and users do not care about these secondary functions until they are needed. For example, a light bulb has three light sources that can be switched to bright white light, white light, and yellow light. Only when special needs arise, the user will press the switch to switch the color of the light. That is to say, only when product functions are guided by affordances can users use them appropriately and can users and product functions be correctly connected.

According to the above literature description, we can define the functional aspect as the specific technology and use of the basic functions of the product, which can meet the user's goals, objectives, and intentions in the process of realizing the needs. This is in line with the functional aspect questions asked by Christensen et al.: What is new product development and innovation? What needs of consumers should be solved?

2.1.2. Emotional Use

The functions and attributes of a product can provide users with experiences that help them achieve their goals. If the goal is achieved and basic psychological needs are fulfilled, the inner emotions will cause a sense of happiness. Therefore, by providing experiences, products can provide pleasant interactions for users [15]. Therefore, Hassenzahl [16] stated that using a product with characteristics in a specific situation will lead to consequences, such as emotional ups and downs (satisfaction and pleasure, dissatisfaction, and anger), clear evaluations (judgments of good and bad or beautiful and ugly), or overt behavior (approach or avoidance). When a person is satisfied and happy with the outcome of an event, no need for any expectations will be funny [17]. However, as a result of the emotional side, satisfaction is related to success in using the product to achieve a specific goal, and fun is related to using the product in a specific situation and an unimaginable situation.

Consumers' emotional responses to products vary depending on their mood. Researchers have found that emotions have a strong influence on consumer behavior [18]. Cheerful people are more likely to be attracted to products; when they are in a bad mood, their emotions will also affect their choice of products. Frijda [19] also proposed that all emotions are involved in a specific tendency to act in preparation for the impact caused by the emotion. In addition, there are also other different emotional reactions, such as surprise, sadness, jealousy, fascination, boredom, and surface reactions.

According to the above literature description, we can define the emotional side of products as the emotions, evaluations, and behaviors displayed in the process of achieving specific goals through perception and experience when using products with specific functions. The emotional aspect is related to the mood when using the product, which is in line with the emotional aspect of Christesen et al.'s question on the special feelings of consumers and product use, or questions about emotional changes.

2.1.3. Social Use

The concept of the social impact of products is interpreted as the impact of products on the quality of people's daily lives [20]. The focus is on the consequences of product use and the social issues associated with it. In addition, consumers will also like a certain product because of social recognition; in other words, the use of the product has a positive impact on society. The most obvious example that occurs in the surrounding area is that every year new mobile phones are released, which attracts many Apple fans, Samsung fans, and Huawei fans to replace their new mobile phones. The main reason is also social recognition.

Scholars [21,22] also noted that the relevance of specific social impacts often depends on the local environment, community, health, and economy. To predict social impacts, it is necessary to understand the society and stakeholders that may be affected [23], determine the areas of potential social impacts [24], which stakeholders should be concerned [22], and related measures for stakeholders [25]. Vanclay [26] added that the social impact of a product will affect the experience of individuals or communities. Employment, health and safety, network and communication, and cultural identity are used as the framework for the impact of products on society.

According to the above literature description, we can define the social aspect of products as the impact of product use and related information delivered on people's quality of life, social interaction, and work, the environment, and the safety, health, relationship networks, and ethnic groups in the community positive impact. This is in line with Christensen et al.'s social aspect impact on different ethnic groups, backgrounds, and classes.

2.2. Continuous Innovation

Continuous innovation focuses on innovation processes and activities that occur continuously, regularly, routinely, in a structured manner, and over a longer period [27]. The main characteristics are persistence, sustainable economic growth, and sustainable development of enterprises [28]. The core elements of its conceptualization are continuous improvement and continuous innovation. Based on this, Pasche and Magnusson [29] stated that continuous and effective interaction can promote continuous improvement, learning, and innovation of enterprises and ensure their continued effectiveness. Lianto et al. [27] proposed that continuous innovation is defined as innovation processes and activities that are sustained, regular, repeated, and carried out over a long period, thus having a beneficial impact on the company. Watts [30] defines it as a moderate, incremental, and continuous upgrade or enhancement of existing products, services, or technologies. Some scholars also believe that continuous innovation requires enterprises to have the ability to implement continuous and incremental innovation while taking into account operational efficiency [31]. It involves a continuous interaction between operations, incremental improvements, learning, and radical innovation, aiming to effectively combine operational efficiency with strategic flexibility, resource development, and exploration [32].

Comprehensive literature shows that continuous innovation must combine efficiency, speed, flexibility, and continuity. Therefore, this study defines continuous innovation as the continuous improvement of ideas, technologies, and products based on resources and capabilities, maintaining their consistent continuity, and effectively combining innovation, development, efficiency, and flexibility, which can create performance and market competitiveness for enterprises. From the above literature, we propose the following hypotheses:

H1a. *There will be a positive association between functional use and continuous innovation.*

H1b. *There will be a positive association between emotional use and continuous innovation.*

H1c. *There will be a positive association between social use and continuous innovation.*

2.3. Disruptive Innovation

Disruptive innovation focuses on enterprises that have limited resources and difficulty in allocating them and must meet the needs of these external entities, such as customers in the consumer market and investors in the capital market [7,33]. Therefore, it must be disruptive. The approach is to obtain the low-end market or target market and continue to upgrade and innovate to meet the needs of high-end market customers; this means establishing advantages in the low-end market and also advancing to occupy the mainstream market [7]. Many scholars emphasize that the theory can be used to predict the operation of disruptive innovation and play an important role in management [34,35].

So far, disruptive innovation not only refers to technological disruption and innovation but also involves disruptive practices in other aspects such as products and business models [36–38]. Its research content is extensive and diverse, covering technology, business models, products, strategies, internal conditions external conditions, etc. But overall, its projects still follow the original connotation of disruptive technology [39]. Suseno [40] defines disruptive innovation as disruptive innovation usually using new technologies or business models to replace outdated business methods and create new business methods and new needs, and new competitors will also appear. Si and Chen [41] define it as an innovation process in which technologies, products, or services are inferior to existing enterprises in terms of attributes but are cheap, simple, or convenient, and can attract and meet the needs of low-end consumers. Over time, through incremental improvements in technology or processes, the needs of mainstream consumers are gradually met, thereby gaining a certain market share in the mainstream market and even replacing established products and companies in the mainstream market. Thomond and Lettice [42] also believe that disruptive innovation is a market strategy that successfully utilizes products, services, or business models, which significantly changes the needs of non-mainstream markets and subverts previous major players.

Comprehensive literature shows that the core of disruptive innovation is divided into two stages. The first stage is to develop niche markets with good quality and low prices; the second stage is technological upgrading to provide product needs for mainstream market customers and seize market shares. Therefore, this study agrees with Chen and Chen's [9] definition of disruptive innovation as changing the basis of products, services, and competition in the early stage, providing sufficiently attractive product functions and prices, developing niche markets, and then upgrading products and services to provide mainstream customer demand and seize mainstream market shares, while still maintaining the base market and advantages that lead. From the above literature, we propose the following hypotheses:

H2a. *There will be a positive association between functional use and disruptive innovation.*

H2b. *There will be a positive association between emotional use and disruptive innovation.*

H2c. *There will be a positive association between social use and disruptive innovation.*

2.4. Market Performance

Market performance is the final result of enterprise operations and policies [43], and it is also the goal of enterprise establishment and operation. The level of market performance can be revealed through the size of the market share [44]. Saeko et al. [45] pointed out that business performance is the result of customers, markets, and market strategies, which are mainly related to sales, market shares, and market development. According to the research, good business performance is mainly seen in the sales value, sales growth, and market share that increase corporate profits [46]. Enterprise profitability is an important market performance result [47]. If the company's profits are too low, market performance is poor and it cannot make up for the shortcomings, the company will face the problem of business contraction or exit from the market.

Regarding market performance, Gunday et al. [48] believe that quality and consistency, total sales, market share, and customer satisfaction are used as measurement indicators of market performance. Cheng et al. [49] measure business performance in terms of return on investment (ROI), market share, profitability, and sales. Based on the market-side perspective, this study uses the assessment of market performance proposed by Gunday et al. [48] as a measure of market performance.

Based on the above literature, continuous innovation and disruptive innovation are two different types of innovation. They are directly related to product development and production and are also related to the market strategy adopted. Kogabayev and Maziliauskas [50] illustrate that the results (performance) of innovation depend on the type of innovation used. Based on this, we propose hypotheses about the impact of continuous innovation and disruptive innovation on market performance.

H3. *There will be a positive association between continuous innovation and market performance.*

H4. *There will be a positive association between disruptive innovation and market performance.*

In addition, scholars such as Gunday et al. [48] also explained that innovation is one of the basic ways to enter new markets, increase existing market shares, and provide companies with competitive advantages. Since the innovative use theory can examine the direction of innovation types and help select which type of technological innovation to meet consumer needs and uses, it is "inevitable" to achieve performance goals. Therefore, we believe that the three constructs of the innovation use theory are also related to performance, so we propose the following hypotheses:

H5a. *There will be a positive association between functional use and market performance.*

H5b. *There will be a positive association between emotional use and market performance.*

H5c. *There will be a positive association between social use and market performance.*

3. Research Methodology

Based on the above research hypotheses, the structure of this study is shown in Figure 2.

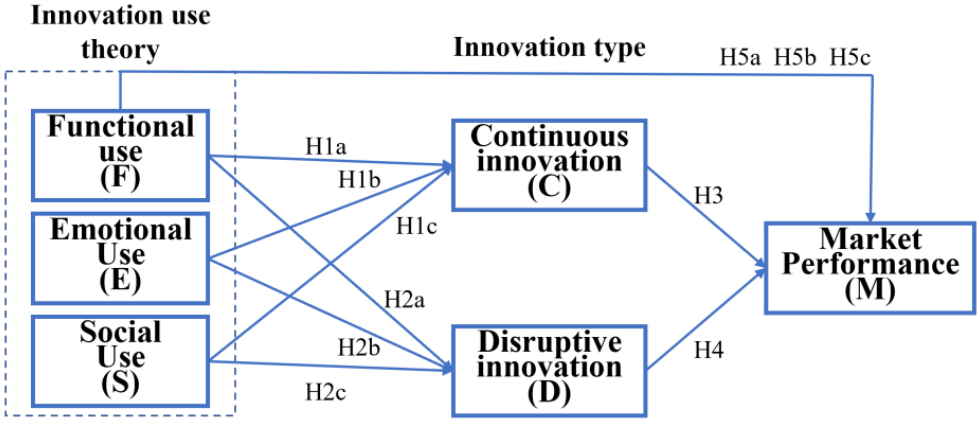

Figure 2. Research model.

3.1. Variables and Analysis Methods

3.1.1. Variables

Independent Variables

Independent variables are variables that we can control and choose to change [51]. According to Figure 2, F, E, and S in this study are identified as independent variables.

Changes in the conditions of independent variables will affect market changes. Therefore, proper management of independent variables can achieve ideal expected values.

Dependent Variables and Mediating Variables

The dependent variable is a variable that we cannot directly control, and when we change the independent variable, the dependent variable also changes [51]. According to Figure 2, C, D, and M are identified as dependent variables. Furthermore, the two innovation types C and D also play the role of mediators. Therefore, choosing appropriate mediating variables will also affect the expected value.

3.1.2. Analysis Methods

We planned six analysis models based on the route in Figure 2, namely, F-C-M, E-C-M, S-C-M, F-D-M, E-D-M, and S-D-M, and performed regression analysis on the routes within the model using SPSS-25. Secondly, regression analysis was performed on C-M and D-M. Finally, the four-step BK method was used to conduct mediation analysis and tabulate explanations.

3.2. Item Measurement

3.2.1. Questionnaire Items Development

Yam et al. [52] illustrate that enterprises invest a large amount of technological innovation resources in innovation activities, which has the most direct effect on improving enterprise performance. However, if the innovative product cannot achieve good market performance, this innovation is equivalent to ineffective innovation. Ineffective innovation will also cause the company to be unable to survive, and innovation will be interrupted [53]. Therefore, this study is based on the conceptual definition of six aspects for the first time, referring to the questionnaire design process [54,55] and adapting past research on technological innovation and items from product design concept literature to develop the questions of this study, as shown in Appendix A. This study used an interval scale and measured it using a five-point Likert scale [56]. Strongly disagreeing is given for point 1, disagreeing is given for point 2, normal is given for point 3, agreeing is given for point 4, and strongly agreeing is given for point 5. In addition, the basic information of the respondents is shown in Table 1.

Table 1. Basic information of respondents.

A.Gender: 1. ☐Male, 2. ☐Female
B.Marriage: 1. ☐Single, 2. ☐Married, 3. ☐Single,
C.Age: 1. ☐Under 20 years old, 2. ☐21–30 years old, 3. ☐31–40 years old, 4. ☐41–50 years old, 5. ☐51–60 years old, 6. ☐61 years old and above,
D.Educational: 1. ☐High school, 2. ☐University (Private), 3. ☐University (National), 4. ☐Master (Private), 5. ☐Master (National), 6. ☐Ph.D.(Private), 7. ☐Ph.D.(National),

3.2.2. Expert Validity Assessment

After sorting the references, a total of 41 questions were generated. To ensure that the scale items have content validity, two scholars and two experts with practical experience in product development and production were invited to evaluate the content validity of the scale. First, it provides scholars and experts with conceptual definitions of each aspect. Secondly, four scholars and experts were invited to discuss whether each aspect item could fully reflect the conceptual connotation it measured. Based on the revised opinions given

by the scholars and experts, the content and terminology of several items were revised. Finally, signature confirmation was obtained.

3.2.3. Pre-Test

The pre-test of the scale is mainly used to ensure that the questionnaire respondents have readability and understandability of the text of the items and can clearly understand the meaning of each item. Therefore, this study first invited 13 actual users of the products illustrated in this study to conduct a preliminary test on each item from the perspective of consumer needs and usage.

The pre-test interview process is as follows: First, the respondents are asked to read the noun definitions at the top of the questionnaire to confirm that they understand the meaning of the questions in this questionnaire. If the respondents do not understand the content and meaning of each item, each item will be explained individually. The conceptual category is reflected by the facet. Secondly, the relevant information is filled in. Finally, the interviewees were asked to give trial answers and an overall evaluation of the questionnaire. Based on the suggestions of the respondents, this study made small corrections to the text content of some items without affecting the meaning of the questions to make them easier to understand. Please refer to Table 2 for the pre-test scores. According to the table, attention should be paid to E3, S1, S2, S3, S4, S5, D7, and other issues.

Table 2. Pre-test scores.

Question	Number	Judgment	Question	Number	Judgment
F1	4.538		C1	4.231	
F2	4.538		C2	4.308	
F3	4.462		C3	4.308	
F4	4.077		C4	4.308	
F5	4.538		C5	4.231	
F6	4.231		C6	4.077	
F7	4.385		C7	4.154	
E1	4.462		D1	4.077	
E2	4.231		D2	4.000	
E3	3.923	×	D3	4.308	
E4	4.385		D4	4.308	
E5	4.538		D5	4.231	
E6	4.000		D6	4.077	
E7	4.154		D7	3.923	×
S1	3.154	×	M1	4.000	
S2	2.923	×	M2	4.154	
S3	3.923	×	M3	4.538	
S4	3.846	×	M4	4.692	
S5	3.692	×	M5	4.385	
S6	4.308				
S7	4.308				
S8	4.385				

3.2.4. Data Collection

This study focuses on those who use the LINE App. The questionnaire survey subjects are mainly employees of all ranks in the technology industry, covering multiple age groups

and subjects with different educational backgrounds. A total of 700 copies were sent in the form of an online questionnaire (survey cake). Regarding the questionnaire, only 470 questionnaires were collected in the first week. After prompting, 190 questionnaires were collected successively, totaling 660 questionnaires, with a recovery rate of 94.28%. After excluding 70 invalid questionnaires, 590 questionnaires were analyzed, with an adoption rate of 89.39%.

3.3. Data Detection

The statistical software used in this study is the SPSS_25 version. First, we detected the non-response bias [57]. We conducted a chi-square test on the four variables of gender, marriage, age, and education level of the subjects. According to the data in Table 3, there is no significant difference between the variables ($p > 0.05$), so the null hypothesis is accepted, that is, there is no significant difference in the responses of the respondents between the early and late recycling periods.

Table 3. Non-response bias–chi-square test.

Item	Pearson Chi-Square	Fd	*p* Value
Gender	0.644	1	0.422
Marriage	4.446	2	0.108
Age	9.622	5	0.087
Educational	4.433	6	0.618

Secondly, SPSS_25 was used to conduct an Exploratory Factor Analysis (EFA) with the Varimax rotation method, and items S1, S2, S5, D6, D7, and M3 with smaller factor loading coefficients were deleted. In addition, to ensure that the fit index GFI and the comparative fit index CFI can meet the requirements of > 0.9 or above, AMOS_24 was used to conduct a Confirmatory Factor Analysis (CFA). The results showed that GFI = 0.915, CFI = 0.935, AGFI = 0.902, RMSEA = 0.037, the overall Cronbach's Alpha = 0.932, and the Cronbach's Alpha values of other aspects are all above 0.6, which are all acceptable standards [58,59]. KMO = 0.941, which is consistent with what Hu and Bentler [60] proposed. The Composition Reliability (CR) is always greater than 0.6, which is in line with what Fornell and Larcker [61] proposed. Furthermore, 0.3 < AVE < 0.5 is also consistent with the description of Shrestha [62], which is summarized in Table 4, indicating that this research model has a good fit, reliability, and validity.

Finally, linear regression analysis was performed on F-C-M, E-C-M, S-C-M, F-D-M, E-D-M, and S-D-M, and mediation validation was conducted using the four-step BK method [6].

Table 4. Fit of the measurement model.

Structure	Question	Standardized Estimate	Cronbach's α	CR	AVE
Functional aspects	F1	0.658	0.824	0.825	0.403
	F2	0.652			
	F3	0.581			
	F4	0.597			
	F5	0.668			
	F6	0.647			
	F7	0.638			

Table 4. *Cont.*

Structure	Question	Standardized Estimate	Cronbach's α	CR	AVE
Emotional aspects	E1	0.643	0.789	0.792	0.354
	E2	0.620			
	E3	0.570			
	E4	0.483			
	E5	0.546			
	E6	0.624			
	E7	0.660			
Social aspects	S3	0.631	0.765	0.768	0.399
	S4	0.565			
	S6	0.646			
	S7	0.668			
	S8	0.643			
Continuous innovation	C1	0.688	0.837	0.838	0.425
	C2	0.685			
	C3	0.651			
	C4	0.631			
	C5	0.680			
	C6	0.587			
	C7	0.634			
Disruptive innovation	D1	0.580	0.760	0.761	0.390
	D2	0.619			
	D3	0.631			
	D4	0.588			
	D5	0.699			
Market performance	M1	0.640	0.634	0.641	0.314
	M2	0.623			
	M4	0.409			
	M5	0.541			
GFI = 0.915, AGFI = 0.902, CFI = 0.935, RMSEA = 0.037, chi-square = 979.672, chi-square/Fd =545, Cronbach's α = 0.932, KMO = 0.941					

4. Analysis and Discussion

4.1. Descriptive Statistical Analysis

4.1.1. Basic Information

The basic personal information of this questionnaire is shown in Table 5. Among the respondents, 251 were male, accounting for 42.54%, and 339 were female, accounting for 57.48%. Those who regularly use this product range from 21 to 50 years old, with a total of 551 people, accounting for 93.39%. This is in line with the normal age distribution of technology product users, and the information they gave back in the questionnaire is credible. In addition, as Cui et al. [63] remind us, consumer demographics (such as age, income, and education) have been widely used to describe different consumer groups. Secondly, general product development requirements should be usable by men, women, old, and young as far as possible. According to research by Gilly et al. [64], consumer groups will face difficulties in adopting and enjoying new technologies. Consumers who

may face barriers to adopting technology products include older adults and those from different income and educational backgrounds. Therefore, this study will conduct an in-depth analysis of gender, education level, and age, as shown in Tables 6 and 7.

Table 5. Basic information of respondents (N = 590).

Item	Content	Number	%	Item	Content	Number	%
Gender	Male	251	42.54	Education	High school	64	10.85
	Female	339	57.46		University (Private)	254	43.05
Age	Under 20 years old	9	1.53		University (National)	182	30.85
	21–30 years old	144	24.41		Master (Private)	38	6.44
	31–40 years old	250	42.37		Master (National)	48	8.14
	41–50 years old	157	26.61		Ph.D.(Private)	1	0.17
	51–60 years old	25	4.24		Ph.D.(National)	3	0.51
	61 years old and above	5	0.85				

Table 6. Cross-comparison of age and education level.

Ag/Ed	High School	University (Private)	University (National)	Master (Private)	Master (National)	Ph.D. (Private)	Ph.D. (National)	Total
Under 20 years old	1	3	5	0	0	0	0	9
	1.56%	1.18%	2.75%	0.00%	0.00%	0.00%	0.00%	1.53%
21–30 years old	10	60	52	6	16	0	0	144
	15.63%	23.62%	28.57%	15.79%	33.33%	0.00%	0.00%	24.41%
31–40 years old	15	108	89	14	21	1	2	250
	23.44%	42.52%	48.90%	36.84%	43.75%	100.00%	66.67%	42.37%
41–50 years old	25	76	29	17	9	0	1	157
	39.06%	29.92%	15.93%	44.74%	18.75%	0.00%	33.33%	26.61%
51–60 years old	9	7	6	1	2	0	0	25
	14.06%	2.76%	3.30%	2.63%	4.17%	0.00%	0.00%	4.24%
61 years old and above	4	0	1	0	0	0	0	5
	6.25%	0.00%	0.55%	0.00%	0.00%	0.00%	0.00%	0.85%
Subtotal	64	254	182	38	48	1	3	590
	10.85%	43.05%	30.85%	6.44%	8.14%	0.17%	0.50%	

Table 7. Cross-comparison of gender and education level.

Ge/Ed	High School	University (Private)	University (National)	Master (Private)	Master (National)	Ph.D. (Private)	Ph.D. (National)	Total
Male	27	99	77	19	26	0	3	251
	42.19%	38.98%	42.31%	50.00%	54.17%	0.00%	100.00%	42.54%
Female	37	155	105	19	22	1	0	339
	57.81%	61.02%	57.69%	50.00%	45.83%	100.00%	0.00%	57.46%
Subtotal	64	254	182	38	48	1	3	590

4.1.2. Cross-Analysis by Age and Education Level

As shown in Table 6, the chi-square test of age and education level has a p-value = 79.697 ***, df = 30, so there is a significant relationship. The majority of respondents have a college degree, with a total of 436 people, accounting for 73.89%, followed by a master's degree, with a total of 86 people, accounting for 14.57%, and the third is a high school degree, with a total of 64 people, accounting for 10.84%. Comparing the age of normal users, there are 414 people aged 21 to 50 with a college degree, accounting for 70.16%, 83 people with a master's degree, accounting for 14.06%, and a total of 497 people with a university and master's degree, accounting for 84.23%. A comprehensive review of the product usage set in this study, as shown in Table 7, shows that more than 70% of product users are mainly between the ages of 21 and 50 and have a college degree. The main reason is that the LINE App is a product with some technological components. Users with higher education can make full use of the functions provided by the LINE App in daily life and work.

4.1.3. Cross-Analysis by Gender and Education Level

As shown in Table 7, the chi-square test of gender and education level has a p-value = 9.639, df = 6, significance = 0.141, and the correlation is not significant. The ratio of male to female students who answered the questionnaire was approximately 4:6. Among them, the number of men and women with college degrees is 176 and 260, about 3:4.3. The number of people with a master's degree or above is 48:42, about 6:5.25. Generally speaking, men are more comfortable using technological products. Past research has shown that a higher proportion of women exhibit moderate to high levels of technophobia [65]. Recent research concludes that the past gender gap has now narrowed to the point where women are no longer more fearful than men when it comes to computer-related technology [66]. According to the results of this study, the proportion of girls using technology products is no less than that of boys. The main factor is that the educational level of men and women has generally improved, and there is no gender difference in the use of technology products for daily life.

4.2. Regression Analysis

First, six analysis models were planned according to the path, namely, F-C-M, E-C-M, S-C-M, F-D-M, E-D-M, and S-D-M. Regression analysis was performed on the routes within the model. The results are shown in Table 8.

Table 8 indicates the following results:

1. Model 1 (F-C), the function aspect has a positive and significant impact on continuous innovation, and its β value is 0.620 ($p < 0.001$), reaching a significant level. Therefore, H1a is established.
2. Model 2 (E-C), the emotion aspect has a positive and significant impact on continuous innovation. Its β value is 0.646 ($p < 0.001$), reaching a significant level. Therefore, H1b is established.
3. Model 3 (S-C), the social aspect has a positive and significant impact on continuous innovation, and its β value is 0.570 ($p < 0.001$), reaching a significant level. Therefore, H1c is established.
4. Model 4 (F-D), the functional aspect has a positive and significant impact on disruptive innovation, and its β value is 0.608 ($p < 0.001$), reaching a significant level. Therefore, H2a is established.
5. Model 5 (E-D), the emotional aspect has a positive and significant impact on disruptive innovation, and its β value is 0.619 ($p < 0.001$), reaching a significant level. Therefore, H2b is established.
6. Model 6 (S-D), the social aspect has a positive and significant impact on disruptive innovation, and its β value is 0.486 ($p < 0.001$), reaching a significant level. Therefore, H2c is established.

7. The β value of H3 (C-M) is 0.407 ($p < 0.001$), and the β value of H4 (D-M) is 0.385 ($p < 0.001$), both reaching the significant level. Therefore, both H3 and H4 are established.
8. The β value of H5a (F-M) is 0.369 ($p < 0.001$), the β value of H5b (E-M) is 0.379 ($p < 0.001$), and the β value of H5c (S-M) is 0.288 ($p < 0.001$), all of which are of a significant level. Therefore, the hypotheses H5a, H5b, and H5c are all established.

Table 8. The impact of innovative uses and innovation categories on market performance.

Construct	PathCoefficient	*t*-Value	Significance	Indirect Impact	Total Impact
Model 1	F-C-M				
F-M	0.369	11.169	0.000	0.253 ***	0.501
F-C	0.620 ***	16.046	0.000		0.620
C-M	0.407 ***	14.690	0.000		0.407
Model 2	E-C-M				
E-M	0.379 ***	12.115	0.000	0.263 ***	0.504
E-C	0.646 ***	18.149	0.000		0.646
C-M	0.407 ***	14.690	0.000		0.407
Model 3	S-C-M				
S-M	0.288 ***	9.402	0.000	0.232 ***	0.148
S-C	0.570 ***	16.527	0.000		0.362
C-M	0.407 ***	14.690	0.000		0.407
Model 4	F-D-M				
F-M	0.369 ***	11.169	0.000	0.234 ***	0.603
F-D	0.608 ***	15.232	0.000		0.608
D-M	0.385 ***	13.921	0.000		0.385
Model 5	E-D-M				
E-M	0.379 ***	12.115	0.000	0.238 ***	0.617
E-D	0.619 ***	16.574	0.000		0.619
D-M	0.385 ***	13.921	0.000		0.385
Model 6	S-D-M				
S-M	0.288 ***	9.402	0.000	0.187 ***	0.475
S-D	0.486 ***	12.972	0.000		0.486
D-M	0.385	13.921	0.000		0.385

*** $p < 0.01$.

Secondly, regarding the impact of innovative use theory on innovation types, it can be seen from Table 9 that F-C, E-C, and S-C are all greater than F-D, E-D, and SD. In addition, the C values of F-C-M, E-C-M, and S-C-M are also greater than those of F-D-M, E-D-M, and S-D-M. From the D value, it can be seen that the three constructs of the innovative use theory have a greater impact on continuous innovation than destructive innovation. in addition, E > F > S, that is, the impact of the emotional side will be greater than the functional side and the social side (Tables 8 and 9). The path coefficients of this research architecture model are shown in Figure 3.

Table 9. The impact of innovation use theory on innovation type.

				F-C-M		E-C-M		S-C-M		F-D-M		E-D-M		S-D-M	
	C	D	M	F	C	E	C	S	C	F	D	E	D	S	D
F	0.620	0.608	0.369	0.168 ***	0.325 ***					0.189 ***	0.297 ***				
E	0.646	0.619	0.379			0.180 ***	0.307 ***					0.206 ***	0.278 ***		
S	0.570	0.486	0.288					0.081 **	0.362 ***					0.130 ***	0.325 ***
C			0.407												
D			0.385												

** $p < 0.05$, *** $p < 0.01$.

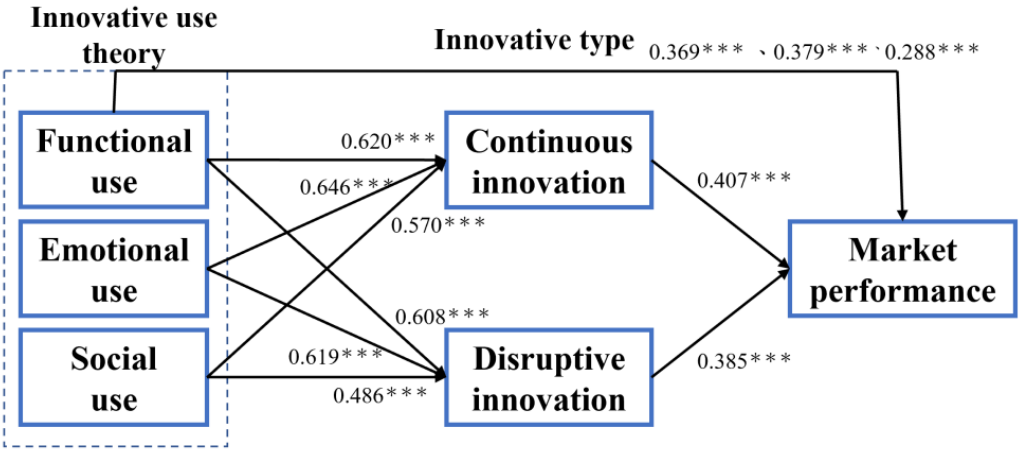

Figure 3. Path Diagrams (*** $p < 0.01$).

4.3. Mediation Effect Test (BK Method)

According to the mediation operation (the four steps of the BK method) proposed by Baron and Kenny [6], it is pointed out that if steps 1–4 (C, a, b, c′) can be satisfied at the same time (C > a, b, c′), it is a fullpartial mediation. If one item cannot be satisfied, it is partial mediation, as shown in Figure 4. Accordingly, the results obtained are shown in Tables 10 and 11. The results show that C > c′ has a mediating effect, and according to the data, it is a partial mediation.

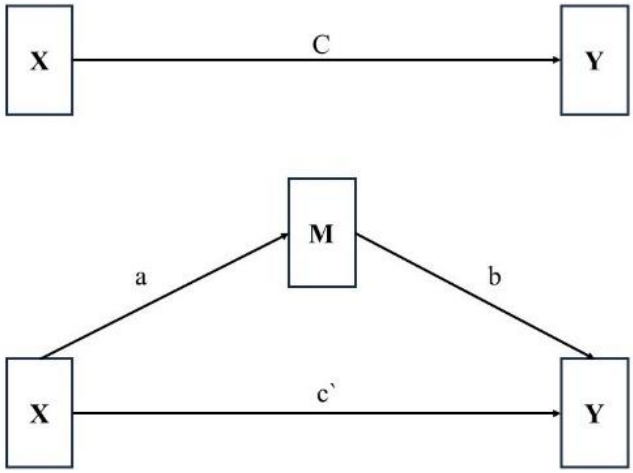

Figure 4. Four steps of the BK method [6]. (X = independent variable; Y = dependent variable; M = mediating variable; a = path from X to M; b = path from M to Y; c′ = path from X to Y; C = path from X to Y).

Table 10. Mediation effect of continuous innovation.

Continuous Innovation	Regression				C > c′
	C	a	b	c′	Significance
F	0.369 ***	0.620	0.407	0.168 ***	0.000
E	0.379 ***	0.646	0.407	0.180 ***	0.000
S	0.288 ***	0.570	0.407	0.081 ***	0.017

*** $p < 0.01$.

Table 11. Mediation effect of disruptive innovation.

Disruptive Innovation	Regression				C > c′
	C	a	b	c′	Significance
F	0.369 ***	0.608	0.385	0.189 ***	0.000
E	0.379 ***	0.619	0.385	0.206 ***	0.000
S	0.288 ***	0.486	0.385	0.130 ***	0.000

*** $p < 0.01$.

4.4. Research Results

This study, through empirical findings, provides answers to three questions:

Ans 1: The three facets of the innovative use theory do indeed impact market performance (H5a, H5b, and H5c) (Table 8). The emotional aspect has a more pronounced effect, with the b series being consistently greater than the a and c series (Table 9).

Ans 2: The three facets of the innovative use theory do have an impact on innovation types, and continuous innovation has a greater influence on subsequent market performance (Table 9).

Ans 3: In this study, as an example, the effect of the innovation type as a mediator is more noticeable than directly using the three facets of the innovative use theory on market performance (H3 and H4 > H5a, H5b, and H5c). Among these, continuous innovation has a better impact on market performance (H3 > H4). Thus, it can be inferred that evaluating the three facets of the innovative use theory in conjunction with innovation types is the correct approach (Figure 4).

Based on the research results, first of all, the three aspects of the innovative use theory will indeed have an impact on market performance. Therefore, before launching new products, companies should carefully consider using the three aspects of the innovative use theory to conduct pre-tests of innovative development to stabilize market performance. In addition, the types of innovation represented by continuous innovation and disruptive innovation will also have an impact on market performance, which is consistent with the results of innovation research. Finally, if the two types of innovation are used as mediation and combined with the measurement of innovation use theory, there will be a better impact on market performance. Therefore, choosing the appropriate type of innovation becomes an important factor affecting market performance.

5. Conclusions and Suggestions

The primary objective of this study is to base itself on the innovation use theory, integrate explanations from existing literature, define each variable, adapt questions from past relevant scholars for this study, and proceed with the collection and analysis of questionnaire data. Finally, through regression analysis using SPSS and mediation analysis using the BK method, the research inferences are validated, and empirical results are obtained. This study demonstrates that market performance is positively influenced by the independent variables within the theory of innovative use. Moreover, innovation types, acting as mediating variables, also positively affect market performance. According to the findings of this research, the impact of continuous innovation on market performance is more pronounced than that of disruptive innovation. Therefore, the mediating role of innovation types is crucial for a firm's competitiveness.

5.1. Theoretical Implications

First of all, this study continues in the spirit of the author of this theory and confirms the functional aspect, emotional aspect, and social aspect models of the innovative use theory; based on this model, for the first time, a measurement scale is proposed before product innovation development, and the feasibility of this model is empirically demonstrated. In this way, subsequent academic research on innovative use theory will have a reference scale for use.

Secondly, the three aspects of innovative use theory will have a positive impact on market performance. Empirical analysis proves that this model framework does have an impact on market performance, and the emotional framework has a greater impact on market performance. For example, between the mobile phone duo Huawei and Apple, many Huawei and Apple fans are queuing up every time a new product is launched. Among them, the functions of the two mobile phones are each superior. The reason why Huawei fans and Apple fans rush to buy is not always because of the functions of the mobile phones, but because of the emotional support for their favorite mobile phones. Therefore, the emotions of future product development and production and the surface evaluation will be greater than the functional surface of a practical nature.

Finally, according to empirical data, innovation type, as the intermediary variable of the innovative use theory, has a greater impact on market performance than the innovative use theory aspect alone. In addition, choosing different innovation types will have different impacts on market performance. The impact of continuous innovation selected in this study is greater than that of destructive innovation.

5.2. Management Implications

Although the essence of innovation type is to define the type of innovation, the industry can already regard innovation type as a part of the market strategy. The literature shows that the degree of innovation and of maintaining continuous innovation will be similar to that of radical innovation. Scholars Chen and Chen [53] have also clearly pointed out that radical innovation is the development of new products using innovative technology, which has its benefits whether it is launched in new markets or original markets. Therefore, the practical implications of this study are as follows:

First, before product plan development, consumers' needs and uses are evaluated using the three-facet model of the innovative use theory to develop products that consumers need. Product developers who think they have developed a perfect product but are not favored by market consumers should be avoided, as this is a waste of resources and weakens the competitiveness of the company.

Secondly, empirical data shows that consistent and continuous innovation has a greater impact on market performance than destructive innovation. Therefore, it is a more prudent operation for managers to select appropriate innovation types for products developed according to market strategies. If various forms of innovation types are cross-used (dual or multiple), they will also make market operations more elastic and flexible and have an absolute effect on the growth of market performance.

Finally, according to the data, we can also infer that among the types of innovation evaluated based on market and technology, disruptive innovation can achieve performance in the existing market by investing fewer resources to lower the technical threshold. Architectural innovation should be able to combine existing technologies in developing new markets and investing smaller resources to achieve greater market performance. Although radical innovation can achieve greater performance, it requires a relatively large investment of capital and technology, so it needs to be carefully evaluated. However, the selection of various innovation types can be carried out after careful evaluation based on the theory of innovative uses.

The results of this study can be used as a reference for managers on how to improve the accuracy of production and the application of market strategies through the use of appropriate innovation use theory scales and innovation types, thereby ensuring the sustainable operation of the enterprise.

5.3. Future Research and Suggestions

5.3.1. Suggestions

This study takes pre-product development as the main consideration, supplemented by the three aspects of innovative use theory, and combines it with innovation type as an intermediary to evaluate market performance. Based on this, the following suggestions

are made: (1) The scale measurement unit should be composed of personnel from the production side and the sales side in a task grouping manner to avoid errors in data interpretation caused by departmentalism. (2) The measurement targets of the scale are mainly the original consumers of the company, and the future consumers are ancillary. The measurement after the target group that is segmented will also be more accurate for the subsequent development of innovative products. For example, the product in this study is tentatively designated as a digital product, so employees in the technology industry are the main test subjects. (3) It is necessary to fine-tune the text of the scale according to the attributes of product development (it would be better if the product characteristics could be listed) so that the respondents can understand the meaning of the questions and answer them correctly.

5.3.2. Future Research Directions

The main focus of this study is to avoid problems on the production side to facilitate market-side performance. Therefore, the three-facet scale of the innovative use theory is used to evaluate the needs of consumers in the real market and decide what kind of innovation to use for product development, which can not only avoid the wrong investment of resources but also ensure the acquisition of market performance. One of the important decisions is the mediating variable in this research framework, that is, the choice of innovation type. There are many types of innovation known at present. Which one is the most suitable innovation strategy? This needs to be evaluated through innovative use theory. Therefore, future research can have the following directions: (1) Use products with different characteristics to conduct scale testing. (2) Use multiple innovation types as intermediaries for verification. In addition, national conditions and cultures are different, and the views on product attributes are also different. Therefore, the scope of testing can also be increased as follows: (3) consumers from different countries or living areas can be used as testing targets. Based on this, as a future research direction, the accuracy of this scale can be improved, and it can be used as a standard scale for pre-testing on the production side. It will also be closer to practical management applications and be more helpful to the market.

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Data Availability Statement: Data are available on request.

Conflicts of Interest: The authors declare no conflicts of interest.

Appendix A

Table A1. Questionnaire on the impact of innovation use theory and innovation type on performance.

Structure	Question Item
Functional Aspect [67–70]	F1: The functions of this product are suitable for my use (such as messaging, stickers, or voice calls) F2: The functions of this product are easy to understand (such as messages, stickers, or voice calls) F3: The functions of this product are easy to learn and use (such as messages, stickers, or voice calls) F4: This product has life-oriented functions (such as platform shopping, payment, or music entertainment) F5: This product has social link functions (such as groups, or communities) F6: This product can effectively solve my problems (such as communication, social networking, or daily life applications) F7: This product has value for me

Table A1. *Cont.*

Structure	Question Item
Emotional Aspect [71]	E1: The messages, stickers, or voice calls of this product are my favorite functions and make me want to use them. E2: This product is easy to use and makes me feel good, so I am willing to use it E3: This product can keep me connected and makes me feel at ease, so I continue to use it E4: Using this product's free calls saves me money, so I like to use it E5: The functions of this product (such as text messages, stickers, or voice calls) are easy to use, so I am happy to use them E6: Compared with other products of the same type, I have a better impression of this product's functions. E7: I would recommend this product to my relatives and friends to learn about and use it.
Social Aspect [24,68–70,72]	S1: This product is safe for the body when used normally S2: Normal use of this product will not affect personal health S3: The correct use of this product can assist in work efficiency S4: The payment function of this product (such as LINE Pay) will increase the convenience of life S5: Normal use of this product will not affect the environment S6: The use of this product is recognized by the general public S7: This product is loved and used by the majority of users S8: Users of this product cover different jobs, ethnic groups, religions, classes, and nationalities
Continuous Innovation [48,73]	C1: This product will continue to develop and add new features that are different from existing products. C2: This product will continue to develop new features to improve ease of use for customers C3: This product will continue to develop new features to improve customer satisfaction C4: This product will continue to be developed and the quality of the service will be increased C5: This product will continue to be developed and the number of new services will be increased C6: The new features of this product are higher than those of competitors' products C7: This product will continue to launch new features based on market demand.
Disruptive Innovation [35,74]	D1: This product can be integrated with existing functions (such as mobile phone and PC versions) D2: This product has sufficient maturity and reliability to meet the needs of consumers. D3: This product improves consumer satisfaction by simplifying technology (such as stickers replacing text) D4: This product will reduce the profits of certain services (such as free messages, free stickers, or free voice calls) to increase consumer usage D5: This product will gain new niche markets through innovative methods (such as free messages, stickers, or voice calls) D6: Compared with other products of the same type, this product is more cost-effective D7: This product develops the market with a new business model
Market Performance [48,73]	M1: The quality of this product has stable consistency M2: This product has good consumer satisfaction M3: This product has good market performance M4: This product has a good market share M5: This product has good market potential

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