

Assessing the Influence of Optimism on Users' Continuance Use Intention of ChatGPT: An Expectation-Confirmation Model Perspective

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Abstract: With the development of generative AI, ChatGPT has been the one generally used by users. Newer version of ChatGPT is in charge now. Understanding users' continuance use intention of ChatGPT is then of importance. However, the impact of optimism in technology readiness index on users' user satisfaction and continuance use intention of ChatGPT is not known. Furthermore, the importance of service quality in the expectation-confirmation model of ChatGPT also needs verification. This study is therefore motivated to clarify the issues based on the expectation-confirmation model. Data of one hundred and eight valid respondents were gathered and analyzed with SmartPLS 4.0. The results show that service quality significantly increases perceived usefulness and user satisfaction of ChatGPT. Optimism in technology readiness index also significantly enhances users' user satisfaction and continuance use intention of ChatGPT. The results indicate that users enjoy the driving of ChatGPT in life or work; this differs ChatGPT from other general software. The results facilitate further development of diverse tools of generative AI.

Keywords: ChatGPT, the expectation-confirmation model, service quality, optimism, technology readiness index.

1. Introduction

With the development of information technology, generative AI becomes popular. And among the diverse applications, ChatGPT (Chat Generative Pre-Trained Transformer) is the one generally used by users. Newer version of ChatGPT is in charge now in spite that it is still controversial.

ChatGPT gains its attention among users. However, users' continuance use intention of ChatGPT is not clear. Technology readiness index is shown its impact on users' attitude and intention (Rojas-Mendez et al., 2017). Among the constructs in technology readiness index, optimism reflects users' willingness to believe that using new technology brings advantages of convenience, saving time and enhancing efficiency (e.g. Parasuraman, 2000; Parasuraman and Colby, 2001). ChatGPT provides solutions to problems quickly in the conversation. However, the impact of optimism in technology readiness on users' attitude and intention is not known. This study is therefore motivated to clarify the impact of optimism on users' user satisfaction and continuance use intention of ChatGPT.

In addition, Benlian et al. (2011) adopt SaaS-Qual in measuring the service quality of software as a service of cloud computing to replace confirmation and find that service quality has higher interpretation in perceived usefulness and user satisfaction. The importance of service quality in the expectation-confirmation model also needs verification. This study is therefore motivated to clarify the issues.

The clarifications of the study facilitate the understanding of continuance use intention of ChatGPT users. They help in the development of diverse tools of generative AI in the future.

2. Literature Background

The introduction of ChatGPT

ChatGPT is a generative AI application. It was developed by OpenAI and open for use. Newer version of ChatGPT is now also open for use but the use is in charge.

About the use of generation conversational AI, Dwivedi et al. (2023) give multidisciplinary perspectives on opportunities, challenges and implications. The study provides various expert opinions about generative conversational AI. With the powerful functions of ChatGPT, it attracts users' use and also fear of being replaced by it. However, now, since the newer version of ChatGPT is in charge, users' continuance use intention of ChatGPT then becomes an important issue. The impact of optimism in technology readiness index needs to be verified in the study. Finally, the importance of service quality in the expectation-confirmation model is also to be validated.

The expectation-confirmation model and service quality

The expectation confirmation theory has originally proposed by Oliver (1977; 1980). Bhattacharjee (2001) integrates the expectation confirmation theory and the technology acceptance model, and proposes the expectation-confirmation model. He indicates that the expectation-confirmation model is a post-acceptance model of information systems continuance, and proposes three differences in the expectation confirmation theory and the expectation-confirmation model: (1) the expectation-confirmation model only focuses on variables after acceptance because confirmation and user satisfaction have reflected variables before acceptance; (2) the expectation-confirmation model only measures variables after acceptance because expectations change with time; (3) perceived usefulness is consistent with beliefs in the expectation confirmation theory because perceived usefulness is a cognitive belief (Davis et al. 1989).

However, according to the expectation-confirmation model, confirmation reflects the difference between expectation and perceived performance (Bhattacharjee, 2001). Yeh and Lin (2016) argue that users' perception of service quality also reflects the difference between expectation and perceived performance. Hence, they propose the impact of service quality on perceived usefulness and user satisfaction. In the use of ChatGPT, service quality perceived by users is also of importance because users may not feel satisfied if they do not perceive it. Furthermore, according to the innovation diffusion theory, during the confirmation stage, adopters make evaluations on the adoption decision and try to avoid the state of dissonance (Rogers, 1995; Hossain and Quaddus, 2011). Innovation diffusion theory argues that confirmation is not a measurement step but is a stage of adoption diffusion (Hossain and Quaddus, 2011; Rogers, 1995) because the evaluation of confirmation is often based on user experience along with the influence on the change (Hossain and Quaddus, 2011). Finally, Benlian et al. (2011) adopt SaaS-Qual in measuring the service quality of software as a service of cloud computing to replace confirmation also find that service quality has higher interpretation in perceived usefulness and user satisfaction. Therefore, this study also adopts service quality to verify its impact on perceived usefulness and user satisfaction (Hossain and Quaddus, 2011).

Although a consensus exists that performance is primarily a function of confirmation (Tse and Wilton, 1988; Yi, 1990; Susarla et al., 2003; Premkumar and Bhattacharjee 2008) and thus has an indirect effect on satisfaction, some researchers have empirically validated that performance also has a direct effect on satisfaction (Churchill and Surprenant 1982; Oliver and DeSarbo 1988; Tse and Wilton 1988; Oliver and Burke 1999). With the importance of service quality, the hypotheses are, therefore, proposed.

H1: Service quality of ChatGPT is positively associated with perceived usefulness of ChatGPT.

H2: Service quality of ChatGPT is positively associated with user satisfaction of ChatGPT.

H3: Perceived usefulness of ChatGPT is positively associated with user satisfaction of ChatGPT.

H4: User satisfaction of ChatGPT is positively associated with users' continuance use intention of ChatGPT.

H5: Perceived usefulness of ChatGPT is positively associated with users' continuance use intention of ChatGPT

Optimism in technology readiness index

Technology readiness index affects users' adoption of new technology (Parasuraman, 2000). It reflects users' readiness to accept and use new technology to accomplish tasks in life or work (Parasuraman, 2000).

According to Parasuraman (2000), models regarding technology acceptance only consider the impact of external variables on use attitude and intention, it ignores the impact of individual characteristics on use attitude and intention. About products and service of new technology, some users may hold positive attitudes, such as convenience, real-time interaction and joy. However, others may hold negative perception, such as unsafety, out of control, even fear. Therefore, it is important to understand the impact of technology readiness index on users' user satisfaction and behavioral intention (Lin & Hsieh, 2007). ChatGPT is a tool provides real-time interaction with users in text. It helps to solve problems in life or work. Consequence, users may hold positive perception of the attitude and intent to continuously use ChatGPT.

And among the dimensions of technology readiness index, optimism reflects that users usually hold positive attitudes toward technologies. Users are willing to believe that using new technology brings advantages, such as more convenient, saving more time and enhancing job efficiency (Parasuraman, 2000; Parasuraman and Colby, 2001). ChatGPT provides solutions to problems quickly in the conversation way. It is convenient in use, saves time and enhances job efficiency to users. As a result, the influence of technology readiness on satisfaction and behavioral intention is to be verified (Lin & Hsieh, 2007). Therefore, this study verifies the impact of optimism on both user satisfaction and continuance use intention of ChatGPT users. The hypotheses are proposed.

H6: Optimism in technology readiness index is positively associated with users' user satisfaction of ChatGPT

H7: Optimism in technology readiness index is positively associated with users' continuance use intention of ChatGPT

The conceptual model of the study is shown in Figure 1.

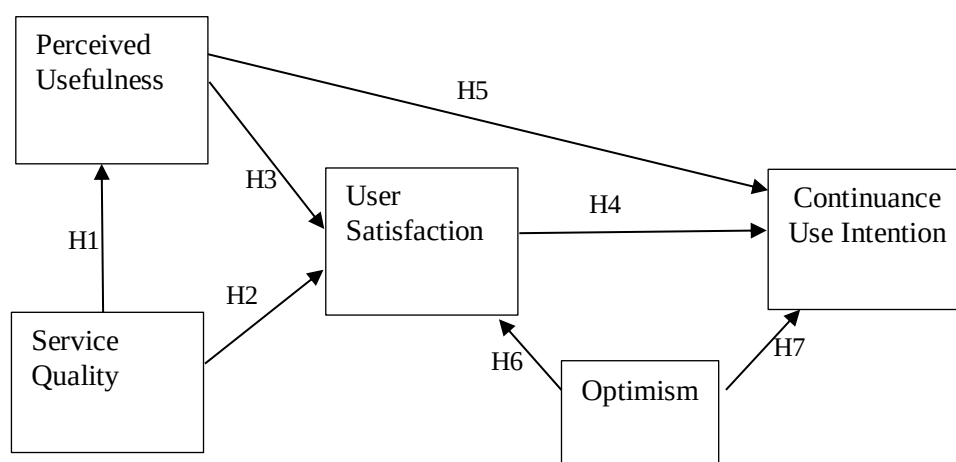


Figure 1. The conceptual model of the study

3. Research method

The study adopted survey method to verify hypotheses. Data of one hundred and eight valid respondents were gathered. All the respondents had experience in using ChatGPT. The description of the study is shown in Table 1.

Table 1 the description of the study

ITEMS	NUMBER	PERCENT	ITEMS	NUMBER	PERCENT
Gender			Education		
Male	27	25.0%	Junior high school	5	4.6%
Female	81	75%	Senior high school	25	23.2%
Occupation			College	5	4.6%
Office	10	9.3%	University	61	56.5%

workers					
Students	94	87.0%	Master	11	10.2%
Others	4	3.7%	Doctor	1	0.9%

Due to the limit in data number, the study adopted PLS (partial least square) for data analysis. SmartPLS 4.0 was adopted (Ringle et al., 2022). Before PLS analysis, Harmon's one factor analysis was done to test common method variance (CMV) (Avolio et al., 1991; Podsakoff & Organ, 1986). The factor analysis of PASW 18.0 showed that the first factor extracted a total of 46.87% variance, which was below 50%. The results showed that the common method variance was not a big issue in the study. PLS was then further done.

The average variance extracted (AVE), composite reliability (CR), and Cronbach's α are shown in Table 2. The loadings are also listed in Table 2. The results showed acceptable construct validity and reliability. About discriminant validity, the cross-loading, construct correlations, and square roots of construct AVEs are provided in Table 2 and Table 3. Only perceived usefulness showed a little lower than the square root of construct AVE of user satisfaction. Generally, the results showed acceptable discriminant validity.

Generally speaking, the results showed commonly acceptable construct validity and reliability

Table 2 construct validity and reliability

CONSTRUCTS	ITEMS	AVE	CR	CRONBACH'S α	SVQ	PU	SAT	CONTUI	OPT
Service Quality	SVQ1	0.63	0.81	0.80	0.78	0.56	0.70	0.44	0.57
	SVQ2				0.73	0.42	0.61	0.46	0.49
	SVQ3				0.79	0.46	0.45	0.36	0.42
	SVQ4				0.87	0.60	0.59	0.41	0.52
Perceived Usefulness	PU1	0.58	0.83	0.82	0.44	0.73	0.68	0.58	0.66
	PU2				0.46	0.78	0.50	0.33	0.39
	PU3				0.47	0.63	0.38	0.22	0.29
	PU4				0.54	0.83	0.65	0.54	0.57
	PU5				0.56	0.82	0.69	0.55	0.60
User Satisfaction	SAT1	0.68	0.89	0.88	0.53	0.44	0.70	0.41	0.59
	SAT2				0.57	0.71	0.86	0.57	0.70
	SAT3				0.64	0.72	0.85	0.65	0.65
	SAT4				0.68	0.66	0.85	0.48	0.59
	SAT5				0.67	0.65	0.85	0.61	0.71
Continuance Use Intention	ContUI1	0.78	0.91	0.91	0.41	0.53	0.64	0.89	0.70
	ContUI2				0.48	0.58	0.55	0.87	0.51
	ContUI3				0.51	0.52	0.59	0.86	0.58
	ContUI4				0.48	0.51	0.58	0.92	0.58
Optimism	OPT1	0.68	0.90	0.88	0.48	0.44	0.52	0.40	0.72
	OPT2				0.57	0.60	0.73	0.63	0.87
	OPT3				0.44	0.52	0.55	0.50	0.84
	OPT4				0.55	0.62	0.77	0.67	0.88
	OPT5				0.56	0.57	0.62	0.51	0.79

Table 3. correlations and square roots of AVEs

CONSTRUCTS	SVQ	PU	SAT	CONTUI	OPT
Service Quality	0.79 ^a				

Perceived Usefulness	0.65	0.76 ^a			
User Satisfaction	0.75	0.78	0.82 ^a		
Continuance Use Intention	0.53	0.60	0.67	0.88 ^a	
Optimism	0.64	0.68	0.79	0.68	0.82 ^a

a: square roots of AVEs.

The SmartPLS results showed the significant positive impact of service quality on perceived usefulness and user satisfaction. Therefore, the hypotheses of H1 and H2 were supported. Perceived usefulness was also shown to significantly positively increase user satisfaction. User satisfaction was also shown of significant impact on continuance use intention. Thus, the hypotheses of H3 and H4 were also supported. Optimism in technology readiness index was also shown of positive impact on user satisfaction and continuance use intention. The results indicated that optimism in technology readiness was of higher importance on users' continuance use intention of ChatGPT. The hypotheses of H6 and H7 were supported.

However, the results showed that perceived usefulness was not shown of significant impact on users' continuance use intention of ChatGPT. Therefore, the hypothesis of H5 was not supported but rejected. The results showed that perceived usefulness influenced continuance use intention via user satisfaction.

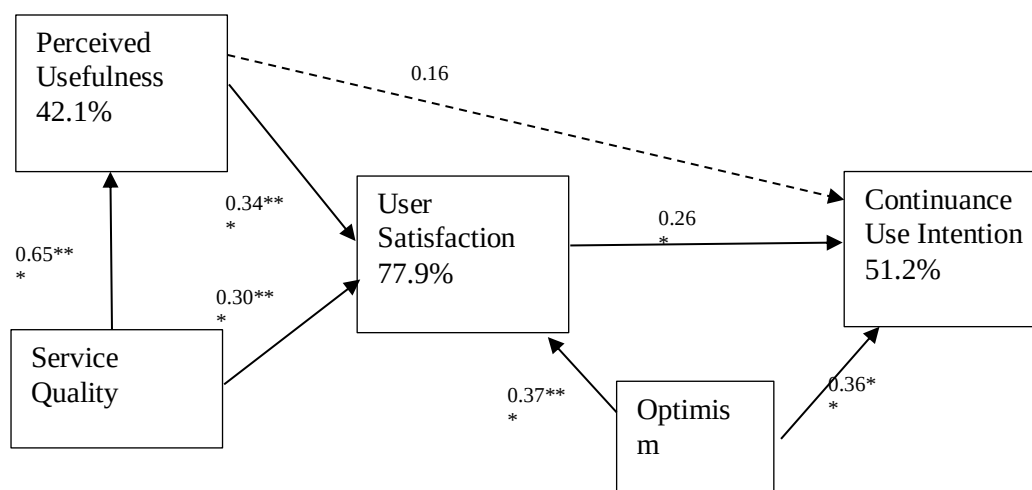


Figure 2. The results of the study

4. Discussion

ChatGPT is a generative AI tool of growing importance. Nevertheless, users' continuance use intention of ChatGPT is not clear. Furthermore, the importance of service quality in the expectation-confirmation model also needs validation in ChatGPT. Finally, the impact of the construct of optimism in the technology readiness index also needs clarification. This study, therefore, clarified the issues. Most hypotheses are supported.

First, the results show the significantly positive impact of service quality on perceived usefulness and user satisfaction. The results indicate that service quality also reflects the difference between expectation and perceived performance as confirmation does (Yeh and Lin, 2016). The results of the study also correspond to the study of Benlian et al. (2011) that service quality replaces confirmation and has high interpretation in perceived usefulness and user satisfaction. In the use of ChatGPT, service quality perceived by users is of importance because users feel satisfied if they perceive it.

Second, user satisfaction increases users' continuance use intention of ChatGPT. When users are satisfied with ChatGPT, they are willing to continue to use it. However, perceived usefulness is not shown its significant direct impact on users' continuance use intention. The results indicate that perceived usefulness is not the important factor that directly drives users' continuance use intention of generative AI, but it impacts users' continuance use intention of ChatGPT through user satisfaction.

Finally, the results show that optimism in the technology readiness index significantly increases both user satisfaction and continuance use intention of ChatGPT. The results reflect that users enjoy the driving of technology of generative AI in their work or life and correspond to the study of Lin and Hsieh (2007). Optimism indicates users' willingness to believe that using ChatGPT brings advantages of convenience, saving time and enhancing efficiency (Parasuraman, 2000; Parasuraman and Colby, 2001). This differs ChatGPT from general software.

5. Conclusion

ChatGPT is of growing importance. Nevertheless, its continuance use behavior of users is not clear. This study thus validates users' continuance use intention of ChatGPT based on the expectation-confirmation model.

The results indicate that service quality reflects the difference between expectation and perceived performance as confirmation does (Yeh and Lin, 2016), and have good interpretation in perceived usefulness and user satisfaction of ChatGPT (Benlian et al., 2011). The results also indicate the importance of user satisfaction on continuance use intention. Nevertheless, perceived usefulness is not shown its direct impact on continuance use intention, but optimism shows its significant direct positive impact on both user satisfaction and continuance use intention (Lin and Hsieh, 2007). The results indicate that user's hunger for the driving of generative AI tool in their life or work because of optimism. This makes ChatGPT differ from other general software and empowers ChatGPT in the future.

6. Limitations and Suggestions

The study was built based on a relatively small sample although the results corresponded former studies. Further studies that gather larger sample size under different cultural contexts are suggested. In addition, perceived usefulness was shown its indirect impact on continuance use intention of ChatGPT through user satisfaction. Future studies that validate different values of ChatGPT on continuance use intention is suggested.

Acknowledgements

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