Research Paper



Factors Affecting Users' Continuance Intention towards Mobile Banking In Vietnam

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ABSTRACT: This paper is aimed at analyzing the factors influencing the continuance intention of users towards mobile banking in Vietnam. The data is collected from 393 mobile banking customers across Vietnam. The model and hypotheses are developed basing on the combination of the Technology Adoption Model (TAM), Task Technology Fit (TTF), and perceived risk into the Expectation-Confirmation Model (ECM). Five key factors affecting continuance intentions of users include: satisfaction, perceived usefulness, perceived ease of use, task-technology fit, and perceived risk in the ECM. The additional moderating factor of gender is included for checking the gender difference in customers' intention. The key findings are: (i) Satisfaction is the strongest influencer of users' continuance intention, followed by perceived task-technology fit, perceived usefulness, and perceived risk while perceived ease of use is found to have no impact on continuance intention; (ii) Satisfaction is significantly affected by perceived task-technology fit, along with perceived usefulness and confirmation, but not perceived risk; (iii) Perceived usefulness, in turn, is determined by confirmation, perceived ease of use and perceived task-technology fit; (iv) Users in Vietnam have no difficulty in using mobile banking services, which is consistent with the widely use of mobile phones and internet of the whole population; (v) There are no gender differences in satisfaction, perceived usefulness, ease of use, task-technology fit in continuing to use mobile banking services, resulted from high gender development of Vietnam; (vii) However, women are more concerned with perceived risk compared to men. From the findings, key recommendations to Vietnamese commercial banks to increase the continuance usage of mobile banking users are to: (1) Pay more attention to increasing clients' satisfaction via good customer care policies, (2) Build the friendly and easily accessible mobile app; (3) Educate customers well to protect themselves and ensure the safety of mobile banking services, particularly the cybercrime attacks; (4) Adopt different tailored-made strategies for male and female customers to enhance their confidences that using mobile banking is secure and protected.

Keywords: - continuance intention, expectancy-confirmation model, mobile banking, gender difference, task-technology fit, technology acceptance model.

I. INTRODUCTION

Over the past few decades, the advent of Information and Communications Technology (ICT) has revolutionized business operation systems in every economy, especially in the field of financial services. These technological advancements have spread the proliferation of electronic-based products, proffered clientele tailor-made financial solutions at their doorstep, and helped change the structure of traditional banking from Bricks to Clicks (Priya et al., 2018).

Mobile banking is an innovation in the banking sector, which enables customers to gain access to banks virtually anywhere and anytime (Kiesnoski, 2000), through their smartphones and tablets.

According to reports from Juniper Research, worldwide mobile banking is set to exceed 1 billion users in 2017 and to double to 2 billion users by 2020 (Morris, 2013; Danny, 2017). In Vietnam, banks have started to manage their own mobile banking services since 2010. The number of mobile banking users in Vietnam has been increasing sharply ever since, with the case of Vietinbank whose mobile banking users almost tripled in the period of 2016-2017 (Trang, 2018).

The rapid growth of mobile banking not only brings about opportunities but also challenges to the service providers. In fact, many mobile banking users have switched back to PC-based banking services (Yang et al., 2015). Moreover, new forms of financial transactions such as Fintech have emerged to compete with traditional banks (Lee, 2015). All these issues come up to confront the growth of mobile banking. Therefore, banks have to devise appropriate methods to retain and increase the numbers of users.

Although abundant papers have investigated factors affecting the adoption of mobile banking, seldom have drivers moderating post-consumption intentions in this realm been examined. Only 10 papers in this field have been found worldwide. Among factors affecting users' continuance intention, satisfaction, perceived usefulness, perceived ease of use, perceived risk, and confirmation of expectation are the most powerful determinants in previous studies (Kumar and Ravindran, 2012; Susanto et al., 2015; Yuan et al., 2016; Thaker et al., 2018; Poromatikul et al., 2019). However, some other papers indicated different determinants such as technology readiness (Chen, 2012); word-of-mouth (Shaikh and Chinje, 2015); self-congruence (Shaikh and Chinje, 2016); channel preference (Foroughi et al., 2019).

TAM and ECM are the most frequently used model in evaluating factors affecting users' postconsumption intention to mobile banking. This research inherits and develops ECM and TAM from previous researches, also incorporates TTF into the model to analyze both performance-based and social-technical predictors of continuance intention, while others mainly focus only on either of it. This research model has also been used by Yuan and his colleague (2016) in the context of China, however, different national contexts with discrepancies in economic growth, user behavior, culture have shown variations in final findings. This research will be the first to investigate users' continuance intention towards mobile banking in Vietnam, with a view to shedding light on unexplored findings and assisting Vietnamese mobile banking service providers with insights to enhance their user retention.

II. RESEARCH MODEL AND HYPOTHESIS

Our research model and hypotheses are conducted based on the combination of the Technology Adoption Model (TAM), Task Technology Fit (TTF), and the perceived risk into the Expectation-Confirmation Model (ECM). Five main defined factors are: satisfaction, perceived usefulness, perceived ease of use, task-technology fit, and perceived risk in the ECM.

H1: Users' satisfaction with mobile banking positively relates their continuance intention.

H2: Users' perceived usefulness with mobile banking positively relates their continuance intention.

H3: Users' perceived usefulness with mobile banking positively relates their satisfaction.

H4: Users' confirmation of expectations with mobile banking positively relates their satisfaction.

H5: Users' confirmation of expectations with mobile banking positively relates their perceived usefulness.

H6: Users' perceived ease of use with mobile banking positively relates their continuance intention.

H7: Users' perceived ease of use with mobile banking positively relates their perceived usefulness.

H8: Users' perceived task-technology fit with mobile banking positively relates their continuance intention.

H9: Users' perceived task-technology fit with mobile banking positively relates their satisfaction.

H10: Users' perceived task-technology fit with mobile banking positively relates their perceived usefulness.

H11: Users' perceived risk with mobile banking negatively relates their continuance intention.

H12: Users' perceived risk with mobile banking negatively relates their satisfaction.

The influential effects of gender in mobile service have been mentioned in several previous studies. Garbarino and Strahilevitz (2004) indicated that women perceive more risk than men when purchasing online. Both Riquelme and Rios (2010) and Yu (2012) found that gender plays an important role in the adoption of mobile banking. Besides, scant research has been done to examine the importance of gender in the mobile banking continuance intention context, apart from Yuan et al. (2016). Therefore, we incorporate these hypotheses that the impacts of antecedents on continuous usage are influenced by gender.

H13a: The impact of satisfaction on continuance intention is influenced by gender.

H13b: The impact of perceived usefulness on continuance intention is influenced by gender.

H13c: The impact of perceived ease of use on continuance intention is influenced by gender.

H13d: The impact of perceived task-technology fit on continuance intention is influenced by gender.

H13e: The impact of perceived risk on continuance intention is influenced by gender.

Fig. 1 summarizes our research model of users' continuance intention towards mobile banking for the Vietnam empirical case.



Figure 1: Summary of research hypotheses on factors affecting mobile banking continuance users in Vietnam

III. RESEARCH METHODOLOGY

1. Questionnaire development

To test the developed hypotheses from the literature review, we develop the questionnaire survey with two parts: the first part was used to gather demographic information of the sample and the second part involved a range of questions measuring the variables presented in the research model. To achieve discriminant validity, the measurement items were adapted from intensive literature (Straub et al., 2004). Inspired by Yuan et al. (2016), the questionnaire was adapted and re-checked by in-depth interviews with five experts in the banking industry to check the content, wording, accuracy, and clarity. All items corresponding to the constructs were measured by using a 5-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree). The scale items for perceived usefulness, satisfaction, confirmation, and continuance intention were derived from Bhattacherjee (2001a, 2001b), while the scale items for perceived ease of use were drawn from Davis (1989). Moreover, the items measuring perceived task-technology fit were adapted from Goodhue and Thompson (1995), and the perceived risk items were taken from Kang et al. (2012).

Before conducting the survey, the questionnaire was first sent to experts and users of mobile banking to identify problems in the content, wording, quantities of items and clarity, and was then revised according to their remarks and suggestions.

2. Pilot test

Convenience sampling was used to check the revised questionnaire. A total of 157 responses were received, of which 132 valid responses were received, reflecting a valid response rate of 84% using Cronbach's reliability test and Exploratory Factor Analysis (EFA). The reliability coefficients for the products of each construct were initially determined, and then the construct as a whole. The standard lower bound for Cronbach's alpha was set at 0.7 (Anderson and Gerbing, 1988), with items that did not sufficiently contribute to the reliability test being eliminated. We then performed an EFA to determine whether the items generated the required number of factors and whether the individual items were loaded onto their related factors (Lee, 2010). Each element in our sample has high loading (recommended value > 0.5) on its related factors and low crossloading (< 0.4) on other factors, suggesting that the questionnaire has strong discriminant and convergent validities.

3. Data collection and sample

The population of this study was all mobile banking users in Vietnam, though conducting the survey in such a population is impractical. Therefore, in this study, we set the minimum sample size at 300, which is deemed adequate according to Comrey & Lee (1992), and this sample size also meets many other recommendations such as: the formula of a minimum ratio at 15 of the sample size to the number of variables

(Stevens, 2002) (6*15 = 90 < 300); and the required sample size of at least 200 to use Structural Equation Modeling (SEM) suggested by Hoetler (1983).

Data were collected by online surveys via Google Form, which was distributed via Facebook as this is the leading active social media platform among internet users in Vietnam (Ella, 2020) so that we could easily reach our target respondents across Vietnam and obtain a large sample size conveniently.

After a four-month period survey (from December 2019 to March 2020), we obtained 393 valid responses for analysis, excluding 43 respondents who indicated that they had no experience in using mobile banking services, which fulfilled the requirements of sample size mentioned above. The survey was widespread along Vietnam, including the North (35.1 percent), the South (49.1 percent) and the Central region (15.8 percent). The majority (63 percent) were in their 20s and 30s which represents the young users of mobile banking services and also the golden age population of Vietnam (Kempt, 2020). In total, 67 percent of the respondents were employed, and 28 percent were students. Most of the respondents were comfortable with mobile banking (73.8%), which is also consistent with the widely use of Vietnam population on mobile phone connections (145.8 million mobile phone users with a population of 96.9 million, which means 150%) and internet (68.17 million internet users, equal to 70% of internet penetration rate) (Kempt, 2020). Therefore, the survey sample showed good representatives of mobile banking users in Vietnam.

IV. RESULTS AND DISCUSSION

The study model was evaluated with Anderson and Gerbing (1988) suggested the two-step approach. We performed the Confirmatory Factor Analysis (CFA) to validate the measurement model and analyze the structural model with Structural Equation Modelling (SEM). The maximum likelihood approach was chosen as the method of estimation.

1. Measurement model

By evaluating convergent validity and discriminant validity, the validity of the measurement model was assessed. Convergent validity refers to the degree to which two tests of structures, which should be related logically, are actually related. Average Variance Extracted (AVE) and Composite Reliability (CR) are the two most common metrics for convergent measure validity (Lee et al., 2007), and a CR of 0.70 or higher is deemed appropriate (Fornell and Larcker, 1987). AVE is a measure of the amount of variance that a construct captures in comparison to the amount of variance due to a measurement error, and an AVE of 0.50 or above is considered appropriate (Fornell and Larcker, 1987). As shown in Table 1, the load factor of each item is greater than 0.600 ($0.600 \sim 0.973$) and is statistically significant (p < 0.001), the CR values of the constructs range from 0.830 to 0.945 and the AVE values range from 0.626 to 0.851, indicating a good convergent validity.

Table 1. Descriptive statistics and convergent validity							
Constructs	Items	Mean	Standard deviation	Factor loading	Cronbach's alpha	CR	AVE
Perceived task- technology fit	TTF1	3.53	0.929	0.712	0.859	0.861	0.674
	TTF2	3.83	0.860	0.704			
	TTF3	3.82	0.872	0.841			
Perceived usefulness	PU1	4.09	0.725	0.610	0.892	0.899	0.691
	PU2	4.22	0.747	0.888			
	PU3	3.99	0.886	0.607			
	PU4	4.19	0.725	0.914			
Perceived ease of use	PEOU1	4.16	0.752	0.860	0.943	0.945	0.851
	PEOU2	4.15	0.738	0.973			
	PEOU3	4.13	0.761	0.833			
Perceived risk	PR1	3.92	0.715	0.600	0.852	0.857	0.671
	PR2	3.78	0.839	0.990			
	PR3	3.80	0.825	0.896			
Confirmation	ECT1	4.07	0.715	0.626	0.943	0.943	0.847
	ECT2	4.09	0.717	0.726			
	ECT3	4.06	0.691	0.685			
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Satisfaction	SAT1	3.75	0.746	0.778	0.893	0.893	0.677
	SAT2	3.89	0.723	0.819			
	SAT3	3.79	0.750	0.782			
	SAT4	3.85	0.751	0.871			
Continuance intention	CI1	4.07	0.907	0.749	0.854	0.830	0.626
	CI2	3.52	0.886	0.622			
	CI3	3.93	0.958	0.655			

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Source: Authors' compilation from primary data

Reliability item analysis refers to the factors' internal consistency (Chu and Murramann 2006), which is evaluated using Cronbach's alpha (Fornell and Larcker 1981; Churchill 1979). Coefficient α was estimated for all variables, and all values range from 0.830 to 0.943. The values of α exceed the minimum 0.7 score (Nunnally, 1978) and 0.6 reported in Garg et al. (2014). The findings show reliability in constructs designating internal consistency. Therefore, it is not required to improve the value of α for any cluster of items. The findings demonstrate the measures' unidimensionality, as each object is related to only one fundamental construct (Garg et al., 2014; Gerbing and Anderson, 1988).

Discriminant validity tests whether non-related terms or measures are in fact unrelated and to what degree the measure is not a representation of other variables (Lee et al., 2007). To assess the discriminant validity in this analysis, we compared the shared variances between factors with the AVE of the individual factors. In Table 2, the AVE values 'square roots are higher than their shared variances, which reflects the strong discriminant validity of the variables.

				v				
	TTF	PU	PEOU	PR	ECT	SAT	CI	
TTF	0.821							
PU	0.359	0.831						
PEOU	0.273	0.684	0.922					
PR	- 0.192	- 0.599	- 0.583	0.819				
ECT	0.198	0.711	0.709	- 0.748	0.920			
SAT	0.623	0.257	0.201	- 0.197	0.232	0.823		
CI	0.657	0.272	0.188	- 0.158	0.675	0.781	0.791	

 Table 2. Discriminant validity of variables

Note: All correlations are statistically significant (p < 0.001). Diagonal elements are the square roots of AVE. Source: Authors' compilation from primary data

In order to determine whether or not the measurement model can explain the actual observed data, our research evaluated the measurement model in terms of eight different indices: the ratio of Chi-square to the degrees of freedom ($\chi 2/df$); root mean square approximation error (RMSEA); standard root mean square residual (SRMR); Tucker-Lewis index (TLI); comparative fit index (CFI); normed fit index (NFI); All actual fit indices follow the recommended level, as shown in Table 3. The measurement model is appropriate and fit.

Two tests were also conducted to examine the Common Method Variance (CMV). First, a Harman's single-factor test was conducted (Podsakoff et al., 2003). The results show that 36.732 percent (< 50 percent) is the largest variance explained by an individual factor. And thus, the majority of the variance in question cannot be explained by any one factor. Secondly, we modelled all items as the indicators of a latent factor representing the method effect and re-estimated the model using the marker method. The results indicate a poor fitness, for example, the RMSEA is 0.112 (> 0.08): SRMR is 0.0973 (> 0.05): and NFI is 0.518 (< 0.9). Both test results indicate that CMV is not a concern in our research.

2. Structural model

As Table 3 shows, the goodness-of-fit of the structural model is comparable to the previous CFA measurement model: $\chi^2/df = 1.548$; SRMR = 0.022; RMSEA = 0.038; GFI = 0.928; AGFI = 0.904; NFI = 0.952; CFI = 0.982; TLI = 0.978. These fit indices provide evidence of adequate fit between the hypothesized model and the observed data.

Table 3. Fit indices for measurement and structural models							
Fit indices	Recommended value	Measurement model	Structural model				
χ ²		307.597	346.830				
df		205	224				
χ ² Idf	< 3	1.500	1.548				
SRMR	< 0.05	0.022	0.022				
RMSEA	< 0.08	0.036	0.038				
GFI	> 0.9	0.933	0.928				
AGFI	> 0.9	0.910	0.904				
NFI	> 0.9	0.957	0.952				
CFI	> 0.9	0.985	0.982				
TLI	> 0.9	0.982	0.978				

Table 4. Summary of hypotheses testing.						
Hypotheses	Standardized path Coefficients	P-value	Hypotheses testing			
H1: Satisfaction \rightarrow Continuance intention	0.606	< 0.001	Accepted			
H2: Perceived usefulness \rightarrow Continuance intention	0.247	0.009	Accepted			
H3: Perceived usefulness \rightarrow Satisfaction	0.189	< 0.001	Accepted			
H4: Confirmation \rightarrow Satisfaction	0.177	0.004	Accepted			
H5: Confirmation \rightarrow Perceived usefulness	0.488	< 0.001	Accepted			
H6: Perceived ease of use \rightarrow Continuance intention	- 0.013	0.822	Insignificant not supported	→		
H7: Perceived ease of use \rightarrow Perceived usefulness	0.270	< 0.001	Accepted			
H8: Perceived task-technology fit \rightarrow Continuance intention	0.271	< 0.001	Accepted			
H9: Perceived task-technology fit \rightarrow Satisfaction	0.620	< 0.001	Accepted			
H10: Perceived task-technology fit \rightarrow Perceived usefulness	0.183	< 0.001	Accepted			
H11: Perceived risk \rightarrow Continuance intention	- 0.208	0.012	Accepted			
H12: Perceived risk \rightarrow Satisfaction	- 0.089	0.946	Insignificant	→		
H13a: Satisfaction \rightarrow Continuance intention moderated by ge	0.204	not supported Insignificant not supported	→			
H13b: Perceived usefulness \rightarrow Continuance intention moderated by gender			Insignificant	→		
H13c: Perceived ease of use \rightarrow Continuance intention moderated by gender			not supported Insignificant	→		
		not supported				
H13d: Perceived task-technology fit \rightarrow Continuance intention gender	0.207	Insignificant not supported	→			
H13e: Perceived risk \rightarrow Continuance intention moderated by	0.045	Accepted				

As shown in Table 4 and Fig. 2, the explained variances of satisfaction, continuance intention, and perceived usefulness are 40 percent, 66.2 percent, and 59.4 percent, respectively. The continuance intention to use mobile banking is jointly predicted by satisfaction ($\beta = 0.606$, p < 0.001), perceived usefulness ($\beta = 0.247$, p < 0.01), perceived risk (β = - 0.208, p < 0.05) and perceived task technology fit (β = 0.271, p < 0.001) directly, supporting H1, H2, H8 and H11, respectively. The results highlight that satisfaction is the most significant driver of users' continuance intention, which is in line with previous studies (Kumar and Ravindran, 2012; Yuan et al., 2016; Poromatikul et al., 2019). Hence, commercial banks should pay the highest intention to and improve users' satisfaction with mobile banking services for retaining users; educate customers well in protecting themselves and ensure the safety of mobile banking services, particularly cybercrime attacks.

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Satisfaction is strongly affected by perceived task-technology fit ($\beta = 0.620$, p < 0.001), confirmation ($\beta = 0.177$, p < 0.01) and perceived usefulness ($\beta = 0.189$, p < 0.001). The results provide support for H3, H4, and H9. Therefore, in order to better meet users' demand, banks need to understand users' expectations of mobile banking by sharing the best information on the benefits and costs of using mobile banking services, establishing and maintaining close relationships with their customers, upgrading mobile banking services based on their requirements; building the friendly and easily accessible mobile app.

In addition, confirmation ($\beta = 0.488$, p < 0.001), perceived ease of use ($\beta = 0.270$, p < 0.001), and perceived task-technology fit ($\beta = 0.183$, p < 0.001) have significant effects on perceived usefulness, supporting H5, H7, and H10, respectively. Consequently, it is essential for service providers to upgrade mobile banking systems in terms of interface designs and functions as well as categorize customers and develop different services catering to different customer groups' needs and wants to enhance their clients' perceived usefulness.



Figure 2: Hypothesis testing results of the model

Note: * p < 0.05; ** p < 0.01; *** p < 0.001; ns. not significant.

However, the two hypotheses (H6 and H12) were not supported: perceived ease of use has no impact on continuance intention of mobile banking clients ($\beta = -0.013$, p = 0.822), and satisfaction is not associated with perceived risk ($\beta = -0.089$, p = 0.946). These reflect the specific characteristics of Vietnam, thanks to experience and familiarity with the features in the post-adoption stage, ease of use might no longer be a matter to mobile banking users. It is also consistent with the fact that Vietnamese have high population proportions using mobile phones (150%) – highest in the world (compare with Southeast Asia of 135%, Western Europe of 117%, Northern America of 106%), internet penetration (70%), and e-commerce activities (with 84% searched online for a product or service to buy; 75% purchased a product online, 59% purchased a product online via mobile device) (Kemp, 2020). Vietnam's golden age population also generally known as an IT-savvy group, they would not usually encounter any difficulties in using technologies such as mobile banking services (Worldometer, 2020). Additionally, the insignificant relationship between perceived risk and satisfaction was also consistent with the finding of Poromatikul et al. (2019). As suggested by Susanto et al. (2016), it implies that all users assume security is a must-have in banking services in general, in high-tech application services like mobile banking in particular.

On gender effect of continuance intention, the results indicate that gender does not significantly moderate the effects of satisfaction (p = 0.204), perceived usefulness (p = 0.158), perceived task-technology fit (p = 0.207), perceived ease of use (p = 0.180) to continuance intention. Meanwhile, the effect of perceived risk to continuance intention is significantly moderated by gender (p < 0.05). It means that there are no gender differences in these perceptions. These results are backed up by the sound record regarding gender equality and the empowerment of women. Vietnam has the highest women labor force participation (73.2%) compared to neighboring countries (Indonesia: 50.7%, China: 61.5%, Thailand: 60.5%) (World Bank, 2020). Vietnamese women have a high literacy rate (93.6%) (Trading Economics, 2020). The only gender difference is the influence of perceived risk on continuance intention, of which women are more risk-averse than men (β = -0.489 and β = -0.153, respectively). Therefore, commercial banks should adopt different tailored-made

strategies for male and female customers to enhance their confidence that using mobile banking is secure and protected.

V. CONCLUSION

With the empirical case of Vietnamese customers' retention on mobile banking services usage, the key findings are: (i) Satisfaction is the strongest influencer of users' continuance intention, followed by perceived task-technology fit, perceived usefulness, and perceived risk while perceived ease of use is found to have no impact on continuance intention; (ii) Satisfaction is significantly affected by perceived task-technology fit, along with perceived usefulness and confirmation, but not perceived risk, which showed that all users assume security is a must-have for high-tech application services like mobile banking in particular; (iii) Perceived usefulness, in turn, is determined by confirmation, perceived ease of use and perceived task-technology fit; (iv) Users in Vietnam have no difficulty in using mobile banking services, which is consistent with the widely use of mobile phones and internet of the whole population; (v) There are no gender differences in satisfaction, perceived usefulness, ease of use, task-technology fit in continuing to use mobile banking services, resulted from high gender development of Vietnam; (vi) However, women are more concerned with perceived risk compared to men.

Therefore, to improve the users' continuance intention for mobile banking services, commercial banks in Vietnam should: (1) Pay more attention to increasing clients' satisfaction via good customer care policies; (2) Build the friendly and easily accessible mobile app; (3) Educate customers well to protect themselves and ensure the safety of mobile banking services, particularly the cybercrime attacks; (4) Adopt different tailored-made strategies for male and female customers to enhance their confidences that using mobile banking is secure and protected.

In addition, by integrating the TAM and TTF into the ECM, we found out that perceived tasktechnology fits not only affect the intention of continuance but also the perceived usefulness, which showed the appropriateness and value of using TTF to explain the intention of continuance. Thirdly, our research has broadened the limits of the ECM, TAM, and TTF by integrating them in the context of mobile banking and has enriched the IS continued usage literature. The entire model provides strong explanatory power for the purpose of the continuance of the users. Based on our research model, future research may consider investigating the continued use by users of other mobile services (e.g. mobile crowdfunding; mobile SNS).

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