

FACTORS INFLUENCING E-CRM USE IN TUNISIAN FINANCIAL SERVICES: AN EXTENDED UTAUT MODEL WITH PERCEIVED RISK

FATORES QUE INFLUENCIAM O USO DO E-CRM NOS SERVIÇOS FINANCEIROS DA TUNÍSIA: UM MODELO UTAUT AMPLIADO COM RISCO PERCEBIDO

Article received on: 8/25/2025

Article accepted on: 10/24/2025

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The authors declare that there is no conflict of interest

Abstract

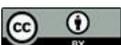
The aim of this research is to identify the main factors influencing the use of e-CRM systems in the financial services sector in Tunisia by applying the UTAUT model and integrating perceived risk as an additional construct, given the importance of data security and privacy concerns. The proposed research model is based on the Unified Theory of Acceptance and Use of Technology (UTAUT). A quantitative study was conducted with 240 respondents from Tunisian financial institutions with customer databases, using a judgmental (a priori) sampling method. The results show that effort expectancy and social influence do not have a significant positive effect on behavioral intention. However, facilitating conditions and behavioral intention both have significant positive effects on e-CRM adoption, while perceived risk has a significant negative effect. Structural equation modeling (SEM) was used to design the theoretical model and test the research hypotheses. Finally, the managerial and theoretical implications of these findings are discussed, and directions for future research are proposed.

Keywords: Unified Theory of Acceptance and Use of Technology (UTAUT). Perceived Risk and Structural Equation Modeling (SEM).

Resumo

O objetivo desta pesquisa é identificar os principais fatores que influenciam o uso de sistemas de e-CRM no setor de serviços financeiros na Tunísia, aplicando o modelo UTAUT e integrando o risco percebido como um constructo adicional, dada a importância da segurança dos dados e das questões de privacidade. O modelo de pesquisa proposto baseia-se na Teoria Unificada da Aceitação e Uso da Tecnologia (UTAUT). Foi realizado um estudo quantitativo com 240 entrevistados de instituições financeiras tunisianas com bancos de dados de clientes, utilizando um método de amostragem julgamental (a priori). Os resultados mostram que a expectativa de esforço e a influência social não têm um efeito positivo significativo sobre a intenção comportamental. No entanto, as condições facilitadoras e a intenção comportamental têm efeitos positivos significativos sobre a adoção do e-CRM, enquanto o risco percebido tem um efeito negativo significativo. A modelagem de equações estruturais (SEM) foi usada para projetar o modelo teórico e testar as hipóteses da pesquisa. Por fim, as implicações gerenciais e teóricas dessas descobertas são discutidas e são propostas direções para pesquisas futuras.

Palavras-chave: Teoria Unificada de Aceitação e Uso da Tecnologia (UTAUT). Risco Percebido e Modelagem de Equações Estruturais (SEM).



1 INTRODUCTION

Big data pose new challenges to traditional data processing methods, because they are not designed for the scale of the web (Chéour, 2019). Given the astronomical amount of potentially exploitable data, it is first necessary to put in place approaches to manage this wealth of information, to store and prioritize this data in an adhesive manner, with a view to their subsequent exploitation (Ghazaleh, 2020).

In this context, e-CRM systems become essential tools, as they enable organizations to efficiently manage, analyze, and leverage large volumes of customer data to enhance relationships, personalize interactions, and support strategic decision-making.

Despite the advantages of information technology (IT) and its ability to perform relationship marketing tasks, there is still a lack of empirical data in the field of customer relationship management. (CRM) and its e-CRM application.

In the literature, studies indicate several failures in the use and adoption of the e-CRM system / The failures are mainly due to employee resistance to change, insufficient training on the e-CRM system, lack of management support, and lack of appropriate IT infrastructure.

Indeed, most of the previous research had not focused on studying user acceptance behaviors or their attitude towards e-CRM adoption. The e-CRM projects have focused more on the application of technology and not on human issues. However, and according to Volle (2003), the gains to be made from the information system no longer come from massive investments in IT infrastructure but from the strengthening of links between people, technology, and the organization. Consequently, the rapid digitalization of financial services in Tunisia necessitates a comprehensive understanding of the factors influencing the adoption of electronic customer relationship management (e-CRM) systems.

This research seeks to identify the primary drivers of e-CRM usage within this sector by extending the Unified Theory of Acceptance and Use of Technology model to incorporate perceived risk, a crucial construct given prevalent concerns regarding data security and privacy in financial transactions (Alalwan *et al.*, 2017).

This research aims to determine the main factors that drive the use of e-CRM systems in financial service in Tunisia by Applying UTAUT model (Venkatesh, 2003) and

we add perceived risk as an additional construct where concerns about data security and privacy are particularly salient.

2 LITERATURE REVIEW AND HYPOTHESIS

The UTAUT model, originally synthesizing eight prominent theories of technology acceptance, provides a robust foundation for examining user behavior (Chatterjee *et al.*, 2020). Its four core constructs performance expectancy, effort expectancy, social influence, and facilitating conditions explain a significant portion of the variance in behavioral intention and actual technology use (Lee & Song, 2013). The original UTAUT model remains widely applicable, particularly when augmented with context-specific variables such as perceived risk, which has shown significant influence in Internet banking adoption studies (Martins *et al.*, 2013).

2.1 Effort expectancy and behavioral intention to use e-CRM in financial service

Effort Expectancy represents “*the degree of ease associated with the use of the system*” (Venkatesh, 2003). In previous research effort expectancy was defined as the degree to which an individual perceives a particular technology as being easy to use and requiring minimal cognitive or physical effort (Raman & Don, 2013). When companies consider adopting an e-CRM system, they often compare it with their existing systems. If they perceive the new system as easy to understand and use, their intention to adopt it increases (Pai & Tu, 2011). This observation is further supported by the studies of Park *et al.* (2007), and Yu (2012), who applied the UTAUT model and confirmed this relationship. Therefore, we propose

H1: Effort expectancy has a positive effect on behavior intention to use e-CRM systems in financial service.

2.2 Performance expectancy and behavioral intention to use e-CRM in financial service

Performance expectancy is defined as “*the degree to which the user expects that using the system will help him or her attain gains in job performance*” (Venkatesh *et al.*

2003). Several studies have identified this factor as a key determinant in explaining the intention to adopt new technologies (Ouedraogo, 2011; Venkatesh *et al.*, 2003). Generally, when companies consider investing in technological innovations, a primary concern during system implementation is whether the technology can enhance overall performance or effectively accomplish designated tasks (Pai & Tu, 2011). Indeed, technological innovations in information systems are likely to be adopted by financial service companies only when employees perceive tangible benefits in terms of efficiency, speed, and task performance. Moreover, these tools must be viewed not only as means to improve professional practice but also as strategic opportunities to support and advance business activities.

H2: Performance expectancy has positive effect on behavior intention to use e-CRM systems in service companies.

2.3 Social influence and behavioral intention to use e-CRM in financial service

This construct is defined as “*the degree to which an individual perceives that important others believe that he or she should use the new system*” (Venkatesh,2003). According to Joshi (2021), stronger social influence is positively associated with a higher likelihood of technology acceptance, as individuals tend to conform to social norms and expectations when deciding whether to engage with new digital solutions.

H3: Social influence has a positive effect on behavior intention to use e-CRM systems in service companies.

2.4 The facilitating condition and behavioral use of e-CRM system in financial service

Facilitating conditions are defined as “*the degree to which an individual believes that an organizational and technical infrastructure exists to support the use of the system*” Venkatesh *et al.* (2003). They are often theorized to have a direct effect on the intention and use of the information system (Venkatesh *et al.* 2003). The study by Venkatesh *et al.* (2003), and Chiu and Wang (2008) found that when users find that they have a fairly high capacity to use and support resources, this results in a more positive acceptance of information technology.

Facilitation conditions in both TAM and UTAUT are a direct determinant of adoption intention.

H4: The facilitating condition has positive effect on behavioral use e-CRM systems in financial service.

2.5 The perceived risk and behavioral intention to use e-CRM system in financial service

Perceived risk is defined in the literature as "*the perceived uncertainty in a purchasing situation that affects people's confidence in their decisions*" (Im *et al.* 2008).

Toufaily, Daghfous and, Toffoli, 2009 confirmed that perceived risk is a determining factor adopting of a new system. The more the manager perceives a high risk in the face of innovation, the lower the adoption rate will be and vice versa.

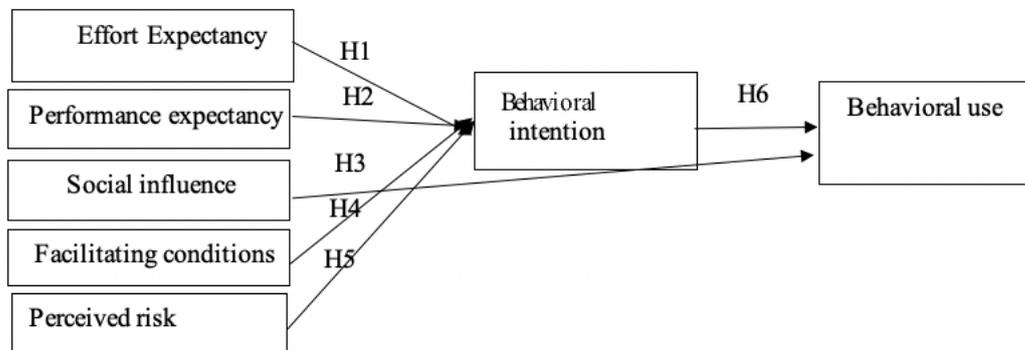
In this same framework, Robertson (1971) approves the negative correlation between the adoption of innovations and perceived risk. Ostlund (1969) explained, for his part, that the lower the level of perceived risk, the more we see a high adoption rate. The perceived risk is thus a determining factor in the adoption of a new product.

H5: The perceived risk of the e-CRM system has a negative effect on the intention to adopt it.

2.6 Behavioral intention and behavioral use of e-CRM system in financial service

Behavioral intention is defined as "*the subjective probability that a person will engage in the behavior in question*" (Fishbein & Ajzen, 1975). Indeed, previous research indicates that the user shows a greater willingness to adopt the new system when supported by the organizational or technological structure (Chiu & Wang, 2008; Venkatesh *et al.* 2003).

H6: The behavioral intention of using e-CRM system has a positive effect on the intention to use it.

Figure 1*Conceptual model*

3 RESEARCH METHODOLOGY

3.1 Data collection

In CRM research, the study populations typically consist of companies with large customer databases operating in highly competitive sectors that drive the need for differentiation particularly firms in B2C industries (Coltman *et al.*, 2011). In this study, we focused on financial service companies that maintain customer databases. A judgmental (a priori) sampling method was adopted, as the banks selected for inclusion were those considered, prior to data collection, to possess crucial information relevant to the study. Data were gathered through a questionnaire survey administered to 240 Tunisian managers using e-CRM systems in their respective banks. The final sample included respondents with varying levels of experience: 42% managers with less than one year of experience, and 50% with between one and five years of experience and 8% without experience.

3.2 Measurement of variables

All items were measured using a 5-point Likert scale. Furthermore, the measurement instruments were adapted from previous studies in which they demonstrated strong validity. In order to strengthen the rigor of the study, the wording of these scales was carefully refined and adjusted to fit the specific context of CRM system use.

Table 1*Measurement of variables*

Variables	Items	Authors
Effort expectancy(EE)	3 items	Venkatesh (2003)
Performance expectancy(PE)	3 items	Venkatesh (2003)
Social influence(SI)		
Facilitating condition(FC)	3 items	Venkatesh (2003)
Perceived risk(PR)	2 items	Ozdemir et trott (2009)
	1 items	Im (2008)
Behavioral intention(IU)	2 Items	Venkatesh,(2008)
Behavioral use(U)	2 items	Venkatesh,(2008)

3.3 Method of data analysis

We employed the structural equation modeling (SEM) method, a confirmatory statistical technique used to test and validate research hypotheses. Data analysis was conducted using SPSS 23 and AMOS 23 software.

4 SEARCH RESULTS**4.1 The psychometric quality of scales and convergent validity**

To assess internal consistency, Cronbach's alpha coefficients were used. The results showed that all constructs had alpha values above 0.67, indicating acceptable levels of reliability in line with the findings of Lin and Huang (2008). Moreover, each construct exceeded the minimum recommended threshold of 0.60 proposed by Nunnally (1970), thereby confirming the reliability of the measurement scales (cf. table 2).

To evaluate convergent validity, the **average variance extracted (AVE)** were examined. As suggested by Fornell and Larcker (1981), an AVE value greater than 0.50 indicates acceptable convergent validity. This condition was satisfied in the present study, confirming that the measurement items adequately represented their respective constructs.

Table 2*Jöreskog's rho and construct reliability indicators (n = 240)*

	Jöreskog's rho	AVE
Effort Expectancy(EE)	0.678	0.787
Performance expectancy(PE)	0.697	0.861
Social influence(SI)	0.231	0.761
Perceived risk	0.687	0.728
Behavioral intention	0.871	0.710
Behavioral use	0.745	0.871

3.2 Discriminant validity of constructs

As illustrated in Table 3, the square root of each construct's AVE is greater than its correlations with other constructs, thereby confirming discriminant validity (Hair *et al.*, 2011).

Table 3*Discriminating validity indicators of buildings (n = 240)*

	EE	PE	CF	SI	PR	IU	U
EE	0.776						
PE	0.184	0.830					
CF	0.268	0.112	0.794				
SI	0.288	0.102	0.202	0.787			
PR	0.119	0.205	0.231	0.157	0.807		
IU	0.118	0.235	0.102	0.01	0.285	0.775	
U	0.57	0.105	0.195	0.021	0.116	0.371	0.864

The discriminant validity of all the constructs is verified.

In conclusion, since the criteria for both convergent and discriminant validity were satisfied, the measurement model was considered valid and statistically sound. Subsequently, structural equation modeling (SEM) was conducted using the maximum likelihood estimation (MLE) method. The results indicated that the model achieved an acceptable fit with the data, consistent with the recommendations of Akrouf (2018) (see Table 4).

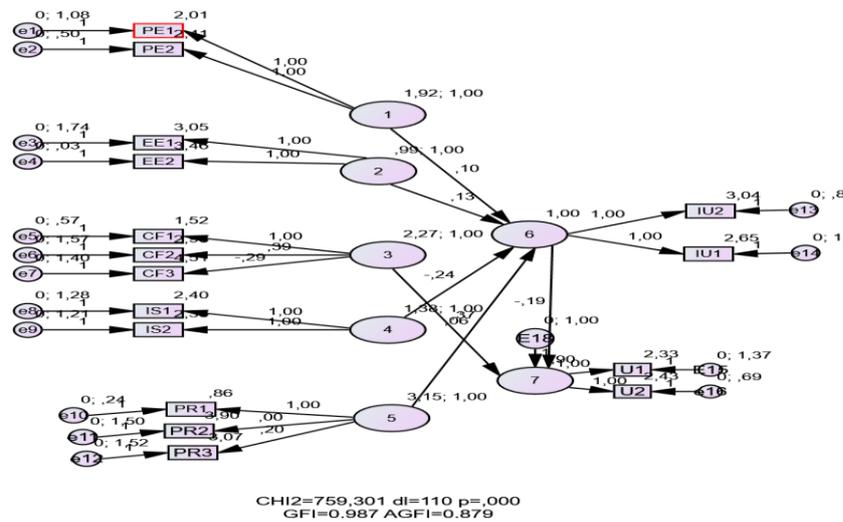
Table 4

Goodness-of-fit of measurement model

Indice	Chi-Deux	DL	P	GFI	AGFI	NFI	TLI	RMR	RMSEA
Valeur	759	110	,00	0,987	0,879	,983	,80	,054	,034
Seuil	-----	-----	>0.05	≥0.9	>0.9	>0.9	>0.9	0	<0.08

Figure 2

Structural model



5 HYPOTHESIS TEST AND DISCUSSIONS

To determine whether each hypothesis is supported, the regression relationships were examined. A relationship is considered statistically significant when the Critical Ratio (CR) exceeds 1.96 and the p-value is less than 0.05.

Table 5

Verification of the assumptions about the regression relationships

			Estimate	S.E.	C.R.	P	H
IU	<---	EE	,018	,371	,039	,661	Not confirmed
IU	<---	IS	,066	,145	,244	,721	Not confirmed
IU	<---	CF	2,079	,554	4,802	***	Confirmed
IU	<---	PE	,574	,225	3,361	***	Confirmed

IU	<---	RP	-,155	,083	-3,002	***	Confirmed
U	<---	IU	,094	,011	4,612	***	Confirmed

The results show that effort expectancy and social influence do not have a significant positive effect on behavioral intention, leading to the rejection of these hypotheses. This finding is somewhat surprising, as it contradicts the results of previous studies conducted within the UTAUT framework (Venkatesh *et al.*, 2003).

However, the results of the current study indicate a significant positive relationship between facilitating conditions and the intention to adopt the e-CRM system. This finding is consistent with the work of Venkatesh *et al.* (2003). Facilitating conditions are often theorized to have a direct effect on behavioral intention and system use (Venkatesh *et al.*, 2003). Similarly, Venkatesh *et al.* (2003) and Chiu and Wang (2008) found that when users have sufficient resources and technical support, they exhibit a more positive attitude toward adopting new information technologies.

From a managerial perspective, this suggests that marketing managers should be encouraged to integrate e-CRM systems within their organizations. Since the system is easy to use and does not require advanced computer skills, its adoption can be facilitated through appropriate support and training.

In addition, the study reveals a significant positive relationship between performance expectancy and behavioral intention, which aligns with the findings of Wang (2008). Performance expectancy remains one of the strongest predictors of behavioral intention in the UTAUT model, as users perceive the system as useful for marketing and decision-making functions. The e-CRM system assists managers regardless of their level in analyzing daily operations and making informed decisions. The software's periodic reporting and activity management functions further enhance performance and strategic control. Therefore, it is recommended that organizations adopt e-CRM systems, as they effectively support business operations, problem-solving, and performance improvement.

Moreover, the study validates the hypothesis that behavioral intention to use an e-CRM system positively influences its adoption. This result is consistent with previous research (Chiu & Wang, 2008; Venkatesh *et al.*, 2003), which demonstrates that as users gain experience, behavioral intention becomes a stronger predictor of actual system use. Accordingly, financial service companies should provide organizational and technological support that meets users' expectations. When leaders receive adequate

training and organizational backing, the likelihood of successful adoption and effective use of the e-CRM system increases.

Finally, the hypothesis stating that perceived risk has a negative effect on behavioral intention is confirmed. This finding aligns with prior studies (Im *et al.*, 2008; Pavlou, 2003; Toufaily, Daghfous & Toffoli, 2009; Robertson, 1971; Ostlund, 1969). Therefore, service companies must ensure the security and confidentiality of customer information when implementing e-CRM systems, as reducing perceived risk strengthens users' trust and intention to adopt the technology.

6 CONCLUSION AND FUTURE RESEARCH DIRECTIONS

Based on the Unified Theory of Acceptance and Use of Technology (UTAUT), this study aimed to identify the main factors influencing the use of e-CRM systems in the financial services sector in Tunisia. The UTAUT model (Venkatesh *et al.*, 2003) was applied and extended by incorporating perceived risk as an additional construct, given that concerns related to data security and privacy are particularly relevant in this context. The findings of this research are consistent with previous studies (Venkatesh *et al.*, 2003; Rogers), confirming the importance of the UTAUT variables in shaping the intention to use e-CRM systems within the service sector. This study is primarily based on a literature review focusing on the UTAUT model. As such, future research could build on this work by integrating additional theoretical frameworks to provide a more comprehensive understanding of the determinants influencing e-CRM adoption in financial services. One promising avenue would be to combine the UTAUT model with the Information Systems Success Model (ISSM) (DeLone, 2003), which could offer complementary insights into system quality, information quality, and user satisfaction. Another limitation of the present study lies in the non-integration of certain relevant variables. Future studies could incorporate user satisfaction as a variable influencing the intention to use e-CRM systems. Bhattacharjee (2001) demonstrated that satisfaction with an information system is a powerful determinant of continued system use.

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Authors' Contribution

Both authors contributed equally to the development of this article.

Data availability

All datasets relevant to this study's findings are fully available within the article.

How to cite this article (APA)

Tebourbi, S., & Khemakhem, R. FACTORS INFLUENCING E-CRM USE IN TUNISIAN FINANCIAL SERVICES: AN EXTENDED UTAUT MODEL WITH PERCEIVED RISK. *Veredas Do Direito*, e223648.

<https://doi.org/10.18623/rvd.v22.n5.3648>