

THE EFFECT OF TECHNOLOGICAL, ENVIRONMENTAL, AND INDIVIDUAL CONTEXTS ON CBEG: THE ROLE OF TRUST AS A MEDIATOR

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ABSTRACT

Cloud-based E-Government (CBEG) offers several advantages to governments. However, the adoption rates of CBEG among institutions of public sectors in developing countries are still limited. The E-Government development and participation index in Iraq is lower than the regional and global averages. This research seeks to pinpoint the most influential factors affecting the intention to adopt CBEG from the perspectives of technological, individual and environmental contexts in Iraq. Based on relevant theories, this study proposed that technological, environmental and individual factors affect the CBEG. In addition, trust was proposed as a mediator. Data are collected from 366 decision-makers as the target respondents of this study through five institutions responsible for the E-Government project in Iraq. Data analysis was performed with SMART-PLS 4. The findings showed that technological, individual, and environmental variables had statistically significant effects on the adoption of CBEG. Social influence was insignificant. Further, trust mediated the proposed relationships. More focus on technological, environmental, and individual factors will enhance the adoption of CBEG.

Keywords: *CBEG, TOE, DOI, SET, Trust.*

1. INTRODUCTION

The progress of E-Government initiatives differs significantly between nations. Findings reveal that 60% of E-Government projects fall into the categories of either complete failures or partial successes. In developed regions, approximately 25% of these projects failed to progress beyond the initial growth phase of their life cycle, while 33% did not achieve the maturity outlined in the project's initial scope. While in the case of developing regions, 35% of E-Government systems' implementation is considered a complete failure, 50% partly failure, and only 15% of E-Government projects were considered to be successful [1]–[3]. This is because most E-Government in developing countries is one-way communication that presents only descriptive information about the services and the procedures to obtain the service [4].

Developing countries such as Iraq, are facing increasing challenges that are related to the high level of poor management and lack of

transparency in public decision-making processes, leading to inadequate provision of public services [5]. Furthermore, there are significant shortcomings when it comes to ICT capabilities, inadequate technology infrastructure, and a dearth of resources. Unfortunately, in the latest survey of the United Nations, Iraq occupied the rank of 143rd (out of 193) in terms of the E-Government Development Index (EGDI) and the rank of 158th in terms of the e-participation index, which indicates that the citizens are not utilizing the E-Government services [6]. This discovery indicates that the state of Iraqi E-Government surpasses that of its regional counterparts. Conversely, numerous studies propose the transition to cloud-based E-Government (CBEG) as a strategy to overcome challenges in developing E-Government projects and attain heightened efficiency in delivering services to citizens [7], [8].

CBEG provides several advantages such as scalability, and the use of software, hardware,

and applications on-demand basis [9]. Several countries such as developed countries i.e., Japan, the US, and EU, and the UK have started to move to CBEG to strengthen the public services and increase the service offered to citizens and organizations in the country. The move is not limited to developed countries, Malaysia, Thailand, and other emerging nations have also started migrating to CBEG services [10].

Against this background, prior literature focused on the practice and adoption of CC in the private sectors (health sector, education sector, industry sector, and small and medium enterprises) while few examined its implications for the public sector. Further, the focus of previous studies was on the users, IT experts, students, and employees while few studies examined the adoption from decision makers' perspective. Furthermore, previous studies were exploratory, reviewing, and conceptual. Lack of empirical studies on CBEG. In addition, few studies used the mediator variable to enhance the explanatory power of CBEG adoption. In addition, most previous studies focused on technological and organizational variables while the individual and environmental perspectives received less attention.

On the other hand, most previous studies of CBEG utilized a single framework such as TOE, TAM, Theory of Reasoned Action (TRA), Diffusion of Innovation (DOI), UTAUT, and Social Exchange Theory (SET). The majority of past research has concentrated on CBEG in developed countries while the issue has been investigated in a few studies concerning developing countries such as Iraq [11]–[13].

However, earlier research focused examined the issue from a technological or organizational standpoint. As the subject is relatively novel and there is a dearth of awareness regarding the successful implementation of CBEG, it is imperative to adopt a comprehensive framework like the TOE model. Further, the use of explanatory variables such as a mediator or conditional variables is limited in the context of CBEG. Furthermore, in terms of the respondents, previous studies mainly asked end-user (citizens), IT professionals, and IT experts. While the decision to adopt CBEG is mainly made by the decision-makers and few studies examined the perception of decision-makers.

Based on the discussion above, there are various gaps in the literature about the adoption of

CBEG. The literature overwhelmingly relies on a single theory. For this reason, this study will combine the theory of TOE, DOI, UTAUT, and SET. The UTAUT model which includes the variables of performance expectancy (PE), effort expectancy (EE), and social influence (SI), focuses only on the individual aspect. While TOE model in the technological aspect includes availability (AVA), and security & privacy (SP) and compatibility (COMP) variables from DOI. Furthermore, the environmental aspect includes (government regulation (GR) and citizen pressure (CP). Further, variables such as trust (TR) are critical for using CBEG.

According to SET theory, TR is vital in any exchange of technology and is essential for deciding to adopt the technology. Many studies have employed TR to adopt new technologies [14]–[16]. They found that the TR factor was significant. Otherwise, [11], [17], [18], found that the TR factor was insignificant. Therefore, this study employed TR as a mediator. Therefore, this study aims to examine the phenomenon of CBEG and identify the contributing factors that support such a transition, employing the PLS4. The subsequent sections of this research delve into the literature review, research methodology, findings, discussion, and conclusion.

2. LITERATURE REVIEW

2.1 Theoretical Framework

In formulating this research model, a multi-perspective theoretical framework was utilized by integrating the TOE, DOI, UTAUT, and SET. This study used TOE. The TOE as a multi-perspective framework was developed in 1990 [19]. The investigation into adoption is only conducted through the application of the TOE framework, addressing technological, organizational, and environmental perspectives. Under the technological context, the most important factors influencing the choice to adopt new technology are compatibility, availability, relative advantage, accessibility, complexity, scalability, reliability, privacy, and security, [20]. Under organizational context includes the variables such as top management support, organizational readiness, and size of the organization [15]. Under environmental context includes external pressure and GR [21]. However, TOE was criticized for not having clear constructs or a reliable model for linking the elements that influence organizational acceptance decision-making. To better understand why organizations are increasingly embracing IS

innovations, researchers have proposed combining TOE with other theories [22].

One of the most frequently accepted theories among academics researching the adoption of new technologies is the DOI theory. It is deemed a crucial theoretical framework in the realm of technology diffusion research [23]. DOI theory is used to show the mechanism of adoption and to help anticipate whether and how an invention will be successful. Thus, the UTAUT was developed as a result of the shortcomings of the earlier models in understanding IT adoption in organizations [24]. The model comprises eight prominent IT models. The variance of behavior intention (BI) of technology explained by the UTAUT is up to 70%. UTAUT consists of four core constructs that determine usage intention and behavior. They are PE, EE, SI, and facilitating conditions. Furthermore, [24] incorporated moderating constructs such as age, gender, experience, and voluntariness to enhance the understanding of technology acceptance.

SET is used in this study to explain the mediating role of TR. SET was first created to analyze behavior in humans and it was then used to comprehend behavior in organizations [25], [26]. In the field of organizational behavior, SET theory is among the most significant models. When individuals conform to social norms, they usually anticipate reciprocal advantages, including personal affection, TR, economic returns, and gratitude. In this light, interpersonal interactions are viewed from a cost-benefit perspective, representing exchanges wherein participants seek to gain specific benefits [25]. Consequently, an extensive corpus of research indicates that TR played a crucial role in influencing how quickly new technologies were adopted [27]. In this study, TOE has been integrated with DOI, UTAUT, and SET models successfully in numerous studies. Hence, according to this study, the TOE framework is combined with DOI, UTAUT and SET to propose an integrated multi-perspective theoretical framework. The goal of this integration is to clarify how each independent variable relates to the adoption of CBEG by Iraqi decision-makers.

2.2 CBEG Adoption

The term CBEG is “a new E-Government paradigm that incorporates the advantage of CC include resource pooling, measurable service, on-demand self-service, quick flexibility, and extensive network access.” [9], [28]. By allowing

partner institutions to share ICT resources, systems, and business processes, the CBEG system lowers operating costs for each institution [29]. In addition, CC offers high-capacity storage space, facilitating the processing of more data and assisting the government in making informed decisions [30]. Moreover, the utilization of CC services allows for simplified access and widespread delivery of services, irrespective of time and location. This facilitates enhanced, integrated, and timely feedback across various public service domains [7]. Additionally, since resources in the cloud can be automatically managed and distributed according to business needs, Applications are being deployed and upgraded more quickly and nimbly [7], [31], [32]. To anticipate the uptake of new technology, such as CC, various established theories within the IS domain could be recommended and/or applied. It is imperative to select appropriate technologies and methods for effective adoption practices that yield valuable results. Iraqi E-Governments face limitations, obstacles, challenges, and issues in their development and implementation processes, adversely impacting their overall effectiveness [13], [33], [3], [34], [35], [12], [36], [5], [37], [38]. The incorporation of CC into the Iraqi E-Government necessitates a thorough analysis of influencing factors in this adoption process. Identifying these factors becomes crucial for constructing a valuable framework that can aid the Iraqi government in overcoming challenges and difficulties within its E-Government system. Consequently, this study aims to formulate a framework intended to help Iraqi decision-makers improve the adoption of technologies like the CBEG.

2.3 Critical Analysis

Table 1 presents a summary of the latest articles on CBEG. The table indicates that the majority of studies have been thoroughly reviewed in the literature. Notably, there is a scarcity of research focused on CBEG, and previous studies have not provided a comprehensive examination of CBEG usage.

Table 1. Summary of the selected studies

Author/year	Country-Industry	Approach	Technological Factors	Individual Factors	Environmental Factors	Mediating of Trust
[39]	Bangladesh	Quantitative		Social Influence		
[22]	Semiconductor Industry	Case Study	Availability			
[40]	Indonesia	Quantitative		PE, EE, SI		
[18]	Malaysia	Quantitative				
[41]	Turkey	Quantitative				
[42]	Malaysia	Quantitative	Compatibility & Security	PE, EE, SI		
[4]	Libya	Quantitative	Compatibility			
[43]	Lebanon	Quantitative	Security, Privacy Compatibility			
[44]	Public sector	Review				
[45]	Australia	Mixed method	Security & Privacy			
[11]	Iraq	Mixed method	Security, Privacy Compatibility			
[46]	Iraq	Qualitative	Compatibility Security, Privacy			
[47]	Iran	Quantitative	Compatibility Security			
[48]	The upstream oil & gas industry	Conceptual	Security Privacy			
[21]	Saudi Arabia	Quantitative				
[49]	Bangladesh	Mixed method	Security Privacy	PE, EE		
[12]	Iraq	Quantitative	Compatibility Security, Privacy		Government Regulation	
[50]	Developed & Developing countries	Review	Compatibility Security, Privacy			
[51]	Germany	Quantitative				
[52]	US	Quantitative				
[53]	Jordan	Quantitative				
[54]	Public sector	Review				
[55]	Oman	Quantitative	Compatibility Security, Privacy			
[56]	Europe, Asia, and US	Quantitative	Compatibility			
[57]	Public sector	Quantitative		Performance expectancy		
[58]	India	Quantitative				
[59]	South Africa	Qualitative				
[60]	Pakistan	Quantitative				
[61]	Private Sector	Case Study				
[62]	Jordan	Quantitative		PE, EE, SI		
[63]	China	Quantitative	Compatibility Security			
[64]	Nigeria	Quantitative	Compatibility		Government Regulation	
[65]	Bahrain	Quantitative				

Based on the Table 1. It can be seen that most of the studies did not include technological, individual, and environmental factors. Moreover, previous studies did not include trust as a mediator. Furthermore, few of the previous studies examined the adoption of CBEG and few have been

conducted in developing countries such as Iraq. Therefore, this study fills the gaps in the literature and examines the factors that affect the usage of CBEG by decision-makers in the public sector in Iraq.

2.4 Conceptual Framework and Hypotheses

The framework emphasizes three basic building components that are critical in determining CBEG adoption. The eight independent variables found in the literature are categorized according to technological context (COMP, AVA, and SP), and

environmental context (GR, CP). Individual context (PE, EE, and SI). Besides, the TR factor is proposed as a mediator. This study's conceptual framework is shown in Figure 1.

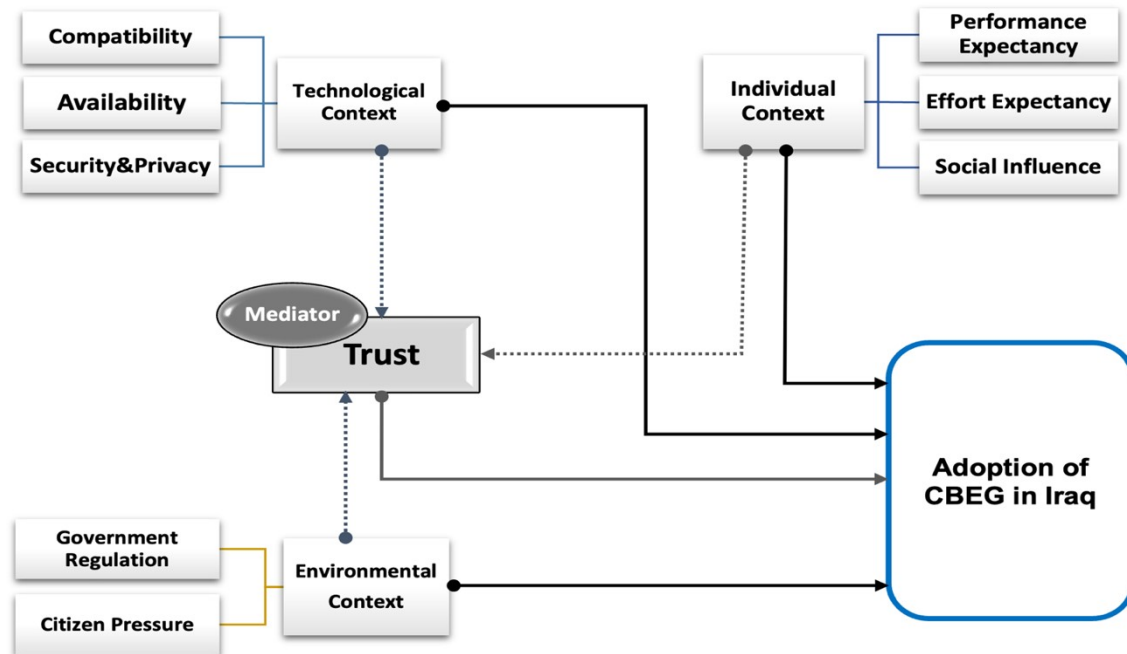


Figure 1: Conceptual framework

2.5.1 Technological Factors and CBEG

The impact of technological context is interconnected with technologically oriented factors, including COMP, AVA, SP. Most studies categorized these factors as technological dimensions. Besides, various studies have used these factors that significantly or insignificantly influence CC adoption in different fields in the literature. Prior literature deployed these variables as technological factors e.g., [4], [12], [48]. Moreover, a comprehensive examination of existing literature demonstrates a correlation between these factors and the inclination to utilize technology. This study includes three factors and considers them as technological factors (COMP, AVA, and SP). Building upon the aforementioned information, the hypothesis that follows is:

H1: There is a positive effect of technological factors on the BI of decision-makers to adopt CBEG in Iraq.

A. Compatibility (COMP)

Compatibility was extensively employed in the examination of CC adoption. The findings of the literature in terms of COMP are inconsistent. For example, researchers [16], [20], [66], [67] found that COMP as a technological factor has a positive effect on the adoption of technology such as CC or CC e-learning. On the other hand, researchers [12], [47], [48], [50] discovered that the COMP factor significantly influences technology adoption. In this study, it is hypothesized:

H1A: There is a positive effect of COMP on the BI of decision-makers to adopt CBEG in Iraq.

B. Availability (AVA)

Availability is “the continuous and uninterrupted provision of services” [68]. AVA stands as a crucial variable for organizations contemplating the adoption of CC. Given that cloud technology is an online service, its continuous

AVA is paramount. Attaining this objective necessitates a reliable service underpinned by a highly redundant infrastructure to mitigate the risk of failure at any given moment. Few studies used the AVA in CC adoption. For example, [1], [15], [48]. These found that the AVA factor was significant under the technological context. To encourage decision-makers and users to implement the CBEG in Iraq, this research defines AVA as the capacity and desire to provide authorized subjects with the necessary information when needed. As a result, the hypothesis that follows is:

H1B: There is a positive effect of AVA on the BI of decision-makers to adopt CBEG in Iraq.

C. Security & Privacy (SP)

A user's sense of safety and autonomy concerning their data when using the internet is characterized as "SP." [69]. Most of previous studies used security and privacy as a factor in the technological context. For example, [50]. Certainly, a recent test indicates that security and privacy are indeed concepts, akin to two sides of the same coin [45]. The study expects that a high level of security and privacy is important and has a positive influence on the decision to adopt CBEG in Iraq. As a result, the hypothesis that follows is:

H1C: There is a positive effect of SP on the BI of decision-makers to adopt CBEG in Iraq.

2.5.2 Environmental Factors and CBEG

The environment context includes "government agencies considering every conceivable environmental and institutional factor when determining whether or not to implement E-Government clouds" [31]. Such as GR and CP. Various studies have used these variables in the context of CC adoption in different fields in the literature [11], [21], [70]. This study has considered these variables as environmental factors that will have an important effect on the BI of DMs to adopt CBEG in Iraq. Two variables have been identified as environmental factors which include GR and CP. As a result, the hypothesis that follows is:

H2: There is a positive effect of environmental factors on the BI of decision-makers to adopt CBEG in Iraq.

A. Government Regulation (GR)

Government regulation means "sets of rules that govern how sensitive business data is used". The main goal of these rules is to protect

customers' privacy and safety by creating rules for things like privacy, honesty, accessibility, and responsibility. Previous studies found a significant effect of GR on the adoption of CC [7], [71]. Other studies found that the effect is not significant [11], [20]. In this study, GRs refer to the support provided by E-Government to make regulations clearer and more precise of policies that govern the use of sensitive data to encourage the decision-makers and users to use the CBEG in Iraq. As a result, the hypothesis that follows is:

H2A: There is a positive effect of GR on the BI of decision-makers to adopt CBEG in Iraq.

B. Citizen Pressure (CP)

The term "used to describe the demand of citizens for improved services that are of quick response, high quality, informativeness, and connectivity" [10]. CP is critical to modify the decision of the government and lead them to take action for specific matters. The adoption of ICT by the government is highly affected by the pressure of citizens [72]. A study found that CP is critical for the adoption of CC by the government [21]. Nevertheless, little research has been conducted that has investigated the impact of CP as an external factor on the government's choice to adopt new technologies. In this study, CP refers to citizens' belief to improve online service quality and reduce costs which has become a pressure for governments, this is believed to positively influence them to adopt innovations like CBEG in Iraq. As a result, the hypothesis:

H2B: There is a positive effect of CP on the BI of decision-makers to adopt CBEG in Iraq.

2.5.3 Individual Factors and CBEG

The individual context focus on the employees in government organizations. Organizational personnel are crucial since the E-Government is dependent on their utilization. Additionally, technology and IT skills can help apply the implementation of E-Government in the government sector, which is crucial for the success of this project. Citizens' capacity to utilize these technologies can also prohibit them from utilizing them. Thus, Iraqi E-Government programs may fail. Most studies classified these characteristics as individual dimensions like PE, EE, and SI. In addition, several studies have used these characteristics to influence CC acceptance in diverse sectors. For example, [39], [40], [42]. This study has considered PE, EE, and SI as individual

factors and expected the effect of individual factors to be positive. As a result, the hypothesis:

H3: There is a positive effect of individual factors on the BI of decision-makers to adopt CBEG in Iraq.

A. Performance Expectancy (PE)

Mixed findings have existed in the literature in terms of the effect of PE on BI. For instance, prior literature found that the effect of PE on technology adoption is important [39], [40], [42], [49]. However, the study by [17] found PE has an insignificant effect. In this study, PE is defined as the advantage that decision-makers and users can gain from adopting the CBEG in Iraq. As a result, the hypothesis:

H3A: There is a positive effect of PE on the BI of decision-makers to adopt CBEG in Iraq.

B. Effort Expectancy (EE)

The findings of researchers regarding EE is inconsistent. For instance, researchers [40], [49] found that EE was an important predictor of technology adoption. On the other hand, [42], [73] found that EE has an insignificant effect on technology adoption. In this study, EE is defined as the removal of physical effort in completing transactions that decision-makers and users can gain from adopting the CBEG in Iraq. As a result, the hypothesis:

H3B: There is a positive effect of EE on the BI of decision-makers to adopt CBEG in Iraq.

C. Social Influence (SI)

Social Influence is a measure of how influential prominent individuals or groups, such as family and friends, in shaping their decision to adopt a certain technology. [49]. Researchers [40], [42], [74] found that SI has an important effect on the adoption of CC. Other researchers [17], [39], [73] found that the SI was insignificant. In this study, SI is defined as the effect of using new technology from decision-makers and users can gain from adopting the CBEG in Iraq. As a result, the hypothesis:

H3C: There is a positive effect of SI on the BI of decision-makers to adopt CBEG in Iraq.

2.5.4 Mediating Role of Trust

Many studies have employed TR to adopt new technologies [48], [49], [74]. They found that the TR factor was significant. Other researchers

[11], [17], [18] found that the TR factor was insignificant. [70] found that the TR dimension plays a significant mediating role. This research establishes effective security principles and protections to build TR in information, government, and the system, which can affect a strong intention toward the adoption of CBEG in Iraq, which is gaining the attention of decision-makers and users. In conclusion, this study embedded the TR factor as the central component of SET theory as a mediator in the effect of technological, individual, and environmental contexts. Therefore, these hypotheses are proposed:

H4: TR mediates the effect of technological context on adoption of CBEG in Iraq.

H5: TR mediates the effect of environmental context on adoption of CBEG in Iraq.

H6: TR mediates the effect of individual context on adoption of CBEG in Iraq.

3. RESEARCH METHODOLOGY

The study was carried out in Iraq, specifically focusing on five organizations within the public sector, including the Ministry of Planning, The Ministry of Communication, the Council of Representatives, the general secretariat of the Council of Ministers, and the Iraqi Presidency. These institutions are generally responsible for E-Government and adopting new technology. This study is quantitative and uses an online survey-based questionnaire. The item was framed on a five Likert-Scale from 1 ("strongly disagree") to 5 ("strongly agree"). All factors were measured using items from prior research. COMP was adopted from [7], [28], [75], [76]. AVA adopted from [77]. Security and Privacy were adopted from [78], [79]. PE, EE, and SI were adopted from [24], [80], [81]. GRs were adopted by [7]. CP was adopted from [82]. TR was adopted from [27], [81], [83].

A validation process was conducted, and eight (8) experts validated the questionnaire. Comments and feedback from experts were addressed accordingly. Since the respondents are native Arabic speakers with little English knowledge, the questionnaire was translated into Arabic using back-to-back translation to obtain measurement equivalences. Pilot participants numbered 36. Above 0.70, all Cronbach's Alpha are acceptable, indicating that the measurements were

reliable. The study distributed 384 questionnaires. The research found that 10 replies had over 15% missing values of the required answers. Therefore, a total of 10 responses were removed. Outliers were examined using the boxplot as recommended by [84]. A total of eight (8) responses were deleted based on the fact that they were far from the mean score and the central tendency. This has resulted in 366 complete and usable responses. In addition, the study examined the normality by checking Skewness (greater than absolute 1) and Kurtosis (greater than absolute 1) and also examined the multicollinearity by checking the variation inflation factors (VIF<5) and tolerance (T) (>0.20). Table 2 shows that the conditions of normality and multicollinearity were achieved indicating that The data exhibits a normal distribution, and there are no issues of multicollinearity.

Table 2. Normality and Multicollinearity Analysis

	Normality		Multicollinearity	
	Skewness	Kurtosis	T>0.20	VIF<5
First Order				
CBEG	-.474	-.073	-	-
COMP	-.477	-.040	.485	2.062
AVA	-.480	-.349	.395	2.531
SP	-.773	.039	.462	2.164
GR	-.409	-.697	.564	1.774
CP	-.528	-.626	.719	1.391
PE	-.657	.008	.595	1.681
EE	-.528	-.582	.455	2.196
SI	-.573	-.080	.678	1.475
TR	-.275	-.719	.430	2.324
Second Order				
TF	-.581	-.350	.445	2.247
EF	-.713	-.044	.527	1.897
IF	-.680	-.116	.493	2.030

4. FINDINGS OF THE STUDY

4.1 Descriptive Analysis

In this study, 366 respondents participated. The 366 respondents are distributed based on their age. The largest percentage of the respondents 131 or 35.8% are in age between 30-40 years. Followed by 126 or 34.4% in the age between 41-50 years, 90 or 24.6% in the age group between 51-60 years, and 19 or 5.2% in the age of more than 60 years. In terms of gender, the respondents are divided into 283, or 77.3% males and 22.7%, or 83 females. The education of the respondents as shown in Table 4.3 is divided between 196 or 53.6% are holders of bachelor's degrees followed by 114 or 31.1% are holders of master's degrees and 56 or 15.3% are

holders of Ph.D. degrees. Position of the respondents showed that 117 or 32.0% are other and they described themselves as academic staff, IT experts, or consultants this is followed by 84, or 23.0% are heads of departments, 66, or 18.0% are deputy directors, 29, or 7.9% are directors, 24 or 6.6% are deputy general manager. A total of 19 or 5.2% of the respondents indicated that they were general managers, 17 or 4.6% were advisors, and 10 or 2.7% were members of parliament. The respondents are distributed into five institutions. The higher number came from the presidency with counts of 101 and 27.6%. This is followed by the Ministry of Planning with counts of 85 and a percentage of 23.2%. The Ministry of Communication accounted for 79 or 21.6% of the respondents. This is followed by the Council of Representatives with counts of 57 and a percentage of 15.6%. The General Secretariat for The Council of Ministers accounted for 44 or 12.0%.

4.2 Measurement Model

The structural model assessment is two-stage. First discusses the validation of the measurement model, which is conducted by assessing the factor loading, reliabilities (Composite Reliability and Cronbach's Alpha), and validity, which includes convergent validity and discriminant validity. Table 3 presents the results of evaluating the measurement model. All the factor loadings above 0.70 except for some items were deleted due to low factor loading. Moreover, reliability and convergent validity are achieved.

Table 3: Assessment of Measurement Model

Second order	First order	CA> 0.70	CR> 0.70	AVE> 0.50
Technological Factor CA= 0.914 CR=0.915 AVE=0.545	AVA	0.873	0.872	0.729
	SP	0.918	0.918	0.829
	COMP	0.906	0.908	0.682
Environmental Factors CA= 0.898 CR=0.911 AVE=0.568	CP	0.769	0.807	0.680
	GR	0.933	0.934	0.750
Individual Factors CA= 0.931 CR=0.936 AVE=0.598	PE	0.932	0.934	0.830
	SI	0.865	0.870	0.788
	EE	0.918	0.918	0.889
TR		0.917	0.917	0.882
CBEG		0.917	0.918	0.826

The discriminant validity is assessed using two methods. The Fornell-larcker and HTMT. Table 4 shows that Both criteria are achieved. The root square of AVE is above the cross loading. Thus, the discriminant validity is achieved. For the HTMT, the correlation is less than 0.85.

Table 4: Discriminant Validity

Fornell-Larcker										
	AVA	CBEG	COMP	CP	EE	GR	PE	SI	SP	TR
AVA	0.854									
CBEG	0.629	0.909								
COMP	0.730	0.648	0.826							
CP	0.335	0.566	0.427	0.825						
EE	0.517	0.607	0.509	0.414	0.943					
GR	0.478	0.582	0.490	0.468	0.464	0.866				
PE	0.366	0.502	0.396	0.358	0.625	0.350	0.911			
SI	0.374	0.394	0.366	0.238	0.532	0.324	0.481	0.888		
SP	0.517	0.552	0.576	0.328	0.473	0.377	0.391	0.257	0.910	
TR	0.618	0.906	0.610	0.513	0.529	0.560	0.450	0.397	0.50	0.939
	EF	IF	TF							
EF	0.754									
IF	0.511	0.773								
TF	0.562	0.583	0.738							
HTMT's Correlation										
	AVA	CBEG	COMP	CP	EE	GR	PE	SI	SP	TR
AVA	-									
CBEG	0.690									
COMP	0.817	0.705								
CP	0.384	0.623	0.496							
EE	0.565	0.638	0.547	0.468						
GR	0.529	0.623	0.533	0.529	0.492					
PE	0.405	0.534	0.43	0.409	0.659	0.376				
SI	0.428	0.432	0.412	0.272	0.581	0.359	0.533			
SP	0.566	0.582	0.620	0.377	0.497	0.401	0.415	0.283		
TR	0.672	0.945	0.652	0.555	0.55	0.592	0.475	0.432	0.522	-
	EF	IF	TF							
EF	-									
IF	0.552									
TF	0.607	0.616	-							

4.3 Structural Model

In the second stage, the structural model comprises R-square, F-square, and path coefficient. Figure 2 shows this study's structural model.

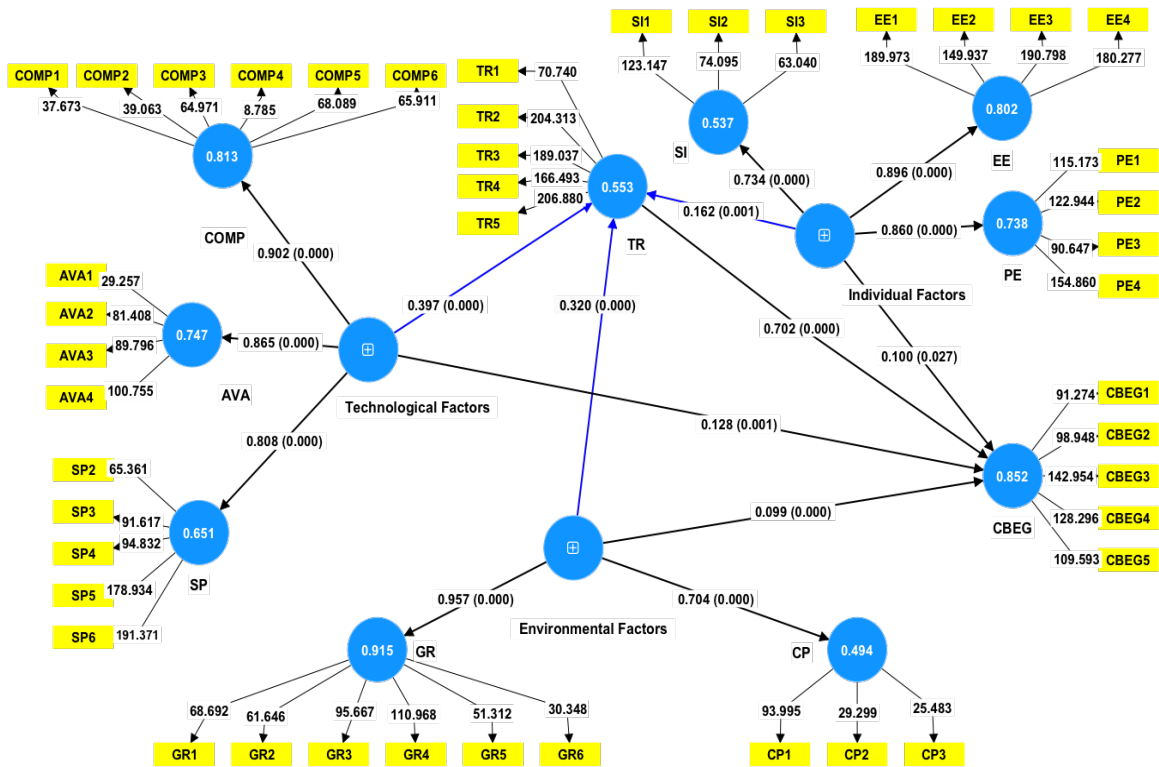


Figure 2: Structural Model

The R-square of TR is 0.553 and 0.852 for CBEG. This indicates that 55.3% of TR and 85.2% of CBEG can be explained by the variables in this research. The effect size (F-square) of the path is

shown in Table 5 as well as the result of the hypotheses. F-square for all the paths is above 0.02 except for the effect of SI on CBEG.

Table 5: Results of Hypotheses Testing

H	Path	B	Std.	T-value	P values	F-square	Conclusion
H1	Technological Factors -> CBEG	0.128	0.037	3.438	0.001	0.053	Supported
H1a	COMP -> CBEG	0.144	0.049	2.919	0.004	0.024	Supported
H1b	AVA -> CBEG	0.181	0.052	3.478	0.001	0.041	Supported
H1c	SP -> CBEG	0.124	0.039	3.218	0.001	0.028	Supported
H2	Environmental Factors -> CBEG	0.099	0.028	3.589	0.000	0.037	Supported
H2a	GR -> CBEG	0.173	0.042	4.156	0.000	0.055	Supported
H2b	CP -> CBEG	0.259	0.044	5.929	0.000	0.134	Supported
H3	Individual Factors -> CBEG	0.100	0.045	2.218	0.027	0.040	Supported
H3a	PE -> CBEG	0.086	0.044	1.969	0.049	0.022	Supported
H3b	EE -> CBEG	0.136	0.047	2.912	0.004	0.024	Supported
H3c	SI -> CBEG	0.004	0.043	0.091	0.927	0.001	Rejected
H4	Technological Factors -> TR -> CBEG	0.279	0.044	6.297	0.000	-	Supported
H5	Environmental Factors -> TR -> CBEG	0.225	0.038	5.989	0.000	-	Supported
H6	Individual Factors -> TR -> CBEG	0.113	0.037	3.087	0.002	-	Supported

The impact of technological factors on CBEG is detailed in Table 5. The effect of COMP, AVA and SP on CBEG is supported because the P-value is less than 0.05. Therefore, H1, H1a, H1b, and H1c are supported. For H2, the effect of environmental factors and its dimension of GR and CP on CBEG is positive and significant. Thus, H2, H2a, H2b are supported. For the effect of individual factors and its dimension PE and EE, they are supported. This indicates that H3, H3a and H3b are supported while H3c which is related to the effect of SI on CBEG is not supported. H4 proposed that the impact of technological factors on CBEG is mediated through TR. The findings showed that TR partially mediated the effect of technological factors on CBEG. Similarly, the effect of environmental factors and individual factors on CBEG was mediated by TR. Therefore, H5 and H6 are supported, and TR partially mediated the effect of environmental and individual factors on CBEG.

5. DISCUSSION

The study examined the effect of technological factors and their dimensions on CBEG. The findings showed that the impact of technological factors on CBEG is important. Similarly, COMP, AVA, security, and privacy effects on CBEG are positive. Therefore, increasing technological factors will enhance the level of CBEG adoption by decision-makers in Iraq. The findings of previous studies are similar to the findings of this study. For example, the effect of COMP is positive [4], [12], [50], similarly the effect of AVA [22], [48], and SP [49], [50].

This study's findings point out that the impact of environmental factors on CBEG is significant. The findings showed that the effect of GR is significant. An increase in GR will enhance the level of CBEG adoption by decision-makers in Iraq. GR is important, and the result of previous studies are similar to the findings of this study. For example, [21], [70]. These studies found a positive effect of GR on the adoption of CC. The findings showed that the effect of CP is significant. Previous research matches this study's findings. An example, [21]. This study confirmed that CP in the environmental context is a predictor for the adoption of CBEG by decision-makers in Iraq.

The result of this study showed that the impact of individual factors on CBEG is significant. Therefore, H3 is supported, and the increase in the level of individual factors will lead Iraqi decision-makers to adopt CBEG. Therefore,

H3A is supported, and an increase in PE will enhance the level of CBEG adoption by decision-makers in Iraq. The findings of previous studies are similar to the findings of this study [42], [74], [85]. The results indicated EE significant impact. An increase in EE will enhance the level of CBEG adoption by decision-makers in Iraq. Previous research matches this study's findings [17], [40], [49], [86].

The findings showed that the effect of SI was not supported. This indicates that SI does not contribute to the CBEG adoption. This could be explained by the fact that SI in Iraq is still limited because CBEG is still a new technology and those who support the use of the technology are still in the early stages. Previous research matches this study's findings. For instance [17], [39], [73] found that the SI was insignificant. The study results revealed that TR mediated partially the effect of technological factors, environmental factors, and individual factors on CBEG. Therefore, TR acts as a mediator. TR is an important factor, Previous research matches this study's findings [70], [87]. This study confirmed that TR as a mediator can explain partially the relationship between TEI factors and CBEG adoption by decision-makers in Iraq.

6. IMPLICATION

This study makes significant contributions to understanding the factors that can affect CBEG adoption in developing countries such as Iraq. The studies on CBEG are limited. Thus, the study enriched the body of literature. Most of the prior research is either review studies or exploratory studies. Therefore, this study contributed empirically to the examination of factors that affect the CBEG. The study contributed to the behavioral aspect by examining BI, while previous studies focused on the technical perspective. This study also contributed to the literature by examining the mediating role of TR. Further, this study contributed to the literature by examining the perspective of decision-makers. The study also contributed to the literature by examining the public sector. Further, this study contributed to the literature by integrating more than one theory and explaining the CBEG from a multi-theoretical perspective. Previous studies found mixed findings. Therefore, this study fills the gaps and enriches the existing literature through the comprehensive multi-perspective theoretical framework used to examine the factors that impact to adoption of CBEG by decision-makers.

From a practical perspective, decision-makers have to focus on technological factors. Establishing systems that are compatible with CBEG will increase the adoption of CBEG. In addition, the AVA and reliability of the system are critical. Therefore, decision-makers must ensure that the CBEG is available and reliable. Security and privacy are critical, and decision-makers can ensure the security of the data as well as confidentiality. The technological factors and their dimensions, GR and CP, are critical. Regulation of government must be established to ease the process of moving to CBEG. The awareness of citizens regarding the usage of CBEG must be increased. This can be done by educating citizens about the benefits that can be gained by CBEG.

The individual factors are critical. Explaining the benefits and procedures of using CBEG can enhance the adoption of CBEG. This can be done by writing procedures for step-by-step usage of CBEG for all the tasks. The social influence was not significant. However, Decision-makers should boost the awareness of the public and others who have the power to decide on the adoption of CBEG. This can be done by conducting a public lecture series. TR is a mediating variable, indicating that it can complement the technological, environmental, and individual factors to enhance the adoption of CBEG. Therefore, decision-makers are recommended to establish TR among citizens and CBEG. This can be done by enacting laws that protect the privacy, security, and rights of citizens.

7. CONCLUSION

This study expands the knowledge about CBEG adoption in the public sector in Iraq. The findings showed that technological, environmental, and individual factors are critical for the adoption of CBEG. TR mediated the effect of the TEI variables on CBEG. The study contributed to the understanding of the predictors of CBEG. However, there are some limitations. The study was conducted in Iraq and, in particular, on five public organizations. Thus, the findings are limited to the perspectives of decision-makers in these five organizations. The sample size of this study consists of 366, and the variables were limited to TOE and other theories. To expand the findings of this study, future work is recommended to examine the CBEG in different countries. Future research is recommended to include other variables, like organizational factors. Further, future studies can include another mediator or moderator.

Organizational innovativeness is an essential variable. Further, other respondents, such as academic staff in universities, can be the sample for future studies. The sample size can be increased to enhance generalizability. Using mixed methods can be a direction for future work to enhance the understanding of CBEG.

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