

SUGGEST TRUST AS MEDIATION TO ADOPT ELECTRONIC VOTING SYSTEM IN IRAQ

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ABSTRACT

There are huge benefits that offered by e-government, which can increase the number of users with big platform for transparency, as in this time the use of information technology promises to revolutionize both the provision of government services and the vibrancy of democracy. One of the solutions in many developing and developed countries is electronic voting system (E-voting) which can eliminate the needs for subjective recounts, fast and reliable delivery services, with big possibility to prevent such kind of fraud, or manipulate in results during the delivering process. The aimed of this paper is to find the factors that involved in applying E-voting systems in Iraq. This paper explores the impact of Trust in E-voting as mediation between electronic voting adoption and Security, Privacy, Usability and Reliability as dependent and independent variables are respectively. The samples conduct registered voters of six colleges within six different provinces in Iraq by using survey, the total sample of '299' respondents participate, with the use of linear regression and bootstrapping analysis through SPSS. The results revealed positive and significant direct effects of the independent factors on electronic voting adoption, while trust in electronic voting mediated independent and dependent factors hypothesized. Overall, the paper can reveal facts for Iraqi government about adopt an electronic voting system as a replacement for the paper-based system to perform voting electoral operation efficiently and effectively

Keywords: *Trust in E-Voting, Security, Privacy, Usability, Reliability.*

1. INTRODUCTION

Any parliamentary elections in any country can determine the direction of this country in the present and future, of course, during this period the country's economy and its growth will be in a recession, because the plan and trends of the previous government will be expired waiting for the current government, which will put its own plans of trends to serve the country. Whenever the period between the elections and the announcement of results goes long, the longer the economy dormant, which is the main artery for the growth and development of countries.

Iraq, like many other countries, is suffering from various problems concerning the parliamentary elections (nation wild election), which happening every four years. the status of Iraq become unstable security situation from 2003 and until this day, which helps to increase problems with the electoral process, like the percentage of the money that spend every

election up to tens of billions, in addition to the very long period of announcing results which can reach up to weeks from the date of the elections. For all that and more, a fast and reasonable solution need to apply to the electoral system in Iraq to change or enhance the use of paper-based voting system which been using for many years.

In this digital age, democratic systems more and more progressively resort to technology as a bolster, compliment, or perhaps remodel political processes. The developing utilization of assorted electronic, implies in decisions reflects, the final tendency of expanded digitalization, great outreach and improved quality of services in our societies. Administrations round the world of elections undergoes important transformations with the modernization of various procedures in the electoral cycle and experimenting with technological means to achieve a better quality and performance (efficiency, transparency, accuracy etc.). Because of the increased in size of the population with taking

into consideration the different distances and also the importance of the time it takes to complete the electoral process, all that and more factors such as accuracy, efficiency (speed score), and comfort made the paper-based ballot not suitable for Iraq and rang the bell to change to the electronic vote system unavoidable.

The foremost vital objectives for schemes of electronic voting (E-voting) is privacy, robustness and universal verifiability. Elections allow individuals to select their own representatives, with honesty and integrity of electoral process which are powerful keys to uprightness associated with democracy by itself. An actual electoral system needs to be strong enough in order to endure the assortment of deceitful conduct behavior also should be adequately straightforward as well as easily understandable that both candidates and voters can accept such kind of outcome results from the determination [1].

While pencil and paper voting have it own long record of voter fraud, many continues provided great solution by using the information and communication technology (ICT) in form of electronic voting system, as it strong solution to the diverse problems of the paper-based system. Cost effectiveness and time saver system [2] which it easy to verify without any particular skill or tool. Moreover, real-world experiences have contradicted the claimed usefulness of E-voting in terms of addressing declining voter turnout, exclusion of some social groups, and high costs [3].

Adoptions of successful and execution E-voting system (EVS) in Estonia, Brazil and India, also the pilot projects in Canada, Austria, United Arab Emirates (UAE), Australia, and many European countries such as United Kingdom (UK), Belgium, France, Germany, Ireland, Norway, Spain, Portugal and Switzerland, all demonstrates that adopting E-voting technology is secure, reliable, as well as solid, likewise; adoption E-voting system happen it took a place by other countries, just like recent developing democracies for example: Qatar, Ghana and Nigeria [4, 5].

2. 2010 IRAQI ELECTION

After the end of the period allocated to the elected government in 2006, the time has come to start working to elect a new government, on March 7th, 2010 electoral competed almost '6281' candidates, after week of cutting off all institutions, schools, universities and all kinds of day jobs as a vacation to let people having more free time to elect. The

Independent High Electoral Commission (IHEC) postpone the announcement of the final results until May 2014 instead of April 2014, due to disagreements over results and sorting/counting votes, forced to re-calculate the polls again in Baghdad on April 19, 2010.

On May 14th the IHEC announced the final results, as an outgrowth of that; opened the new parliament on June 14, 2010. After more than two months from the actual election date, the announcement of the official results, and more than three months a new government began to work [6].

As a result of the delay in announcing the results, Iraq continued without a government for more than ninety days after finishing the previous government its powers to make decisions and approval of any development projects. And unlike the conflict parties on the Iraqi streets through the bloody events that occurred in some provinces, particularly in the capital Baghdad before and after the elections to try to shake and withdraw any confidentiality that left in the new government even before it start.

3. 2014 IRAQI ELECTION

The voting system used in the parliament Iraqi elections from 2005 until 2014 the paper-based voting system. The paper-base system has the advantage of being a simple procedure for most voters. By simple verifiable which by providing couple original identification cards.

In 2014 election, first parliamentary election start since the United States invasion recession from Iraq in 2011, and the third since 2003. IHEC introduced a new component, implemented to reduce time that been spend in voting procedure of checking voter identification process. This extra component uses a smart card reader or smart identification card (SID) which is save a biometric fingerprint scanner and personal information for voters. '22' million Iraqis who must be voting in these elections, the number of candidate lists issued by IHEC is '9045' candidates, compete for '238' seats in the Chamber of Deputies [7], the election started on 30 April 2014 and the results were announced on 19 May 2014, which is more than nineteen days after the actual polling date.

4. COMPLICATIONS THE ELECTION PROCSS IN IRAQ

We live in a democratic country now, and voting is one of the basic tasks within the community. Iraq using manual voting system for many years and still until this day, many problems inherent in the paper-

based voting systems; security as an example; it has a different kind challenge such as double vote, frauds and guaranteeing the secrecy. Also privacy of the ballot vote exposed after the voting period ends, the paper ballots are powerless to malice. Another element must mention like distance; sometimes people could be in village/countryside registration, and because of that reason they don't feel fulfil as their duties do voting. Furthermore; the time required for the different levels of the electoral procedure tended to be extremely huge as printing votes, tabulation, distribution and tally votes. However, the voting process has caused some complications for the public:

- (1) Security consideration; especially there had been so many cases of threatening in Iraq at polling stations, led people to deny this process by avoid donating their votes.
- (2) Lots of wasting time and many problems are occurring on votes counting process and declaring the results from this activity is done manually.
- (3) Due to manual voting process, there is lots of money spend on papers, forms... etc. before, during and after election.
- (4) Prevent voters from manipulation as a way of cheating, or sabotage their votes by checking more than one choice of a candidate, and that will be led to count the vote as a non-acceptable vote (terminate the vote).
- (5) In a few cases, voter is registered in more than one area, so there are chances of a vote recorded twice.

5. THEORY APPROACH

Based on the study of Diffusion of Innovation (DoI) theory by Rogers as a theoretical framework [8]. Rogers identifies the diffusion as “the process by which an innovation is communicated through certain channels over time among the members of a social society”. DoI usually a theory about why, what also how, the revolutionary ideas rate as well as technology that distributes among cultures, operate at the different firm and level. Models of diffusion usually not worried along with regardless of whether a good development may be adopted, yet or will not [9]. Lee and other researchers taking into account the model of DoI had offers underlined of how the properties of new technology associated as the innovation key to be determinant with the adoption [10].

This really could be one of the several reasons that took into account to decide considering this study.

The theory of DoI indicated by Rogers tries to clarify the factors and process that impact the adoption of new innovations. The study utilizes three constructs based on the DoI framework, compatibility, relative advantage and complexity. The three characteristics' innovation had a huge reliability connection with innovation adoption. They give a case expressing that “if the use of an innovation violates a cultural or social norm it is less likely to be adopted”[11].

6. WHY WE NEED TO ADOPT E-VOTING IN IRAQ?

E-voting is the merge of ICT within the election system. An electronic device is used in the procedure of record, store and process the voter's ballot action directly in the mean of digital form into the device. In this manner, rather than dealing with old, standard, manual, paper-based physical ballots, voters can manage devices in form of an electronic interface that displays virtual digital advanced ballots. Subsequent to settling on voters' choices, they do not have to convey their ballots to the electoral board. An ICT based system can do this kind of job on voter's behalf of engaging communication networks, digital storage systems, and many more in the background, and that's called Electronic voting (E-voting) system. The existing ballots in a digital form (E-voting) in general, it has many numbers of potential benefits points over traditional paper-based voting systems, they are:

- (1) Saves materials that needed for purpose of printing and distributing ballots.
- (2) Speedup (advance) the process as well as the accuracy of the ballot tabulation.
- (3) The design is perfectly flexible which can be modified until the last minutes.
- (4) For disabilities and old people, the system Offers better accessibility.
- (5) Multi languages supported for different type of voters.
- (6) Prevents unexpected mistakes by voters.
- (7) Permits accesses to any information with respect to voting choices.

7. FACTORS DETERMINING ADOPTION E-VOTING IN IRAQ

7.1 Security of E-Voting System

Researchers exploration proclaims that E-voting system needs the preferable protection insurance against distinctive sorts of attack because it depend on computer-based system to access [12, 13]. Some of attacks may be from outside or even worst from inside actor and either have accidental or purposeful

[14]. A multidimensional idea of E-voting security can be arranged as a set of parameters for the purpose of keeping security under radar; for instance Hoffman and other researchers define them as: physical security, data access, data integrity, control and authentication of all involved parties [12].

7.2 Privacy of voters

Privacy characterized as the incapability to connect any vote to a voter in middle or after the election researchers put privacy in two sections: first; user namelessness (the voter's decision could not be uncovered (seen) to anyone else except himself), second; data confidentiality or ballot's secrecy (the contained of votes must no else knows about it) [12, 15–19]. Other researchers contend that privacy ought to be secured at the time of electoral, as of now; also in the future against diverse other parties [20].

7.3 Usability of E-voting system

Usability means in this discussion, the quality characteristic which assesses the simplicity regarding using the voter (as user) an interface interaction. Zahra and Nielsen says; additionally mention in purpose to serve techniques of improve and enhancing through the outline process [21]. Gritzalis contends which usability manages the consistency within the actual user interface [22], this presence with context delicate help; furthermore, accessibility of preparing materials on the nature of user documentation, because the actual E-voting system should give distinctive interfaces in order to conceal the diverse types and needs for different voters (users) (e.g. different disabilities, languages, etc.).

7.4 Reliability of E-voting system

The IPI speak-out that whereas security is worried within system's imperviousness to serve the purpose of attacks, and also the ability of the system to manage as well as maintain in case of any failures [23], any system should function as it planned as it all goes underneath system reliability that must handle it for both software or hardware. Researchers all suggests that reliability of the whole voting system ought to work smartly with the goal of no votes will be lost regardless any failures happen [15–17, 19]. Additionally; the system should guarantee that each one vote is checked and correctly counted. In the same manner.

7.5 Trust in the E-voting system

Randell and Ryan state trust as it new products or services such as a computer-based system can influence people's acceptance [24]. Tassabehji and Elliman declare the idea about trust actually is gigantically intricate and also incorporates on

numerous points besides the trouble of measure as well as watch trust itself straightforwardly [25]. Cetinkaya and Cetinkaya in 2007 declare that mechanical perspective accepted electronic form of election was not an issue as critical piece of the populace which they are using technology as a part of diverse aspects of their everyday activity [16]. Oostveen contends that if trust wants to be earned for voting system, the system should satisfy the major pillars of the computer-based system as they are accountability economic requirements, security and privacy [26]. Hoffman and researchers argue likewise as user point of view side, usability, security, audit, reliability, privacy and verification, as well as user desire, all are the components of expecting trust in [12].

8. CONCEPTUAL MODEL

The public may have a confidence with a new technology as well as new election in particular. Which can return to equal rank with relative connected to self-assurance that men and women have trust in the political system and the government. Consequently an absence of trust as well as confidence in election processes perhaps lower the trust in the system, also the opposite means all-around. The unique attributes of this relation are subject for further research. In this particular part, a concentration on trust and the confidence of the public in security, privacy, usability and reliability regarding the election system as the main factors that affecting the adoption of EVS [27]. Figure-1 shows the conceptual framework for this research paper, beside the hypotheses that been used to build this framework.

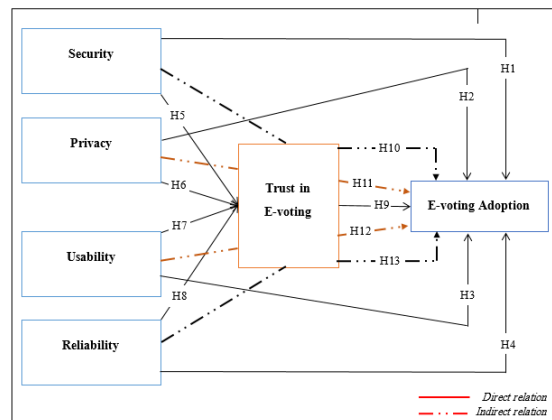


Figure-1 : Conceptual Model

9. METHODOLOGY

The research relies plan depends on the classification the way of which researcher collecting information from participants. A pursuit design of this research refers by executing the plan to capture and use the data so that it can obtain the required information accurately and transparently enough. The study made based on cross-sectional survey research methodology. Where the research approach and gather information on the population in one spot at the right time.

The unit of investigating of this study was addressed lecturers and students of Science College in selected universities in different provinces which them (University of Technology in Baghdad, University of Babylon in Babylon, University of Kufa in Najaf, University of Basrah in Basrah, University of Salahaddin in Erbil and University of Sulaimani in Sulaymaniyah), as shown their percentage in Figure-2, and use survey methodology to make decisions about the E-voting adoption that want to apply in Iraq. The sample that's been taken in this study was conducted from a technique that presented by Krejcie and Morgan 1970 [28], thus (299) out of (351) been selected.

The reasons of choosing those two categories are: Lecturers; they represent the best group to deliver and spread a good idea, where the Students are representing the mix of educated side and public side indeed. Plus part of the category (lecturers and students) having experiences in electronic technology as part of them pertains to IT department, and the last consider the hard-stone pillar of the electronic technology.

For all practically purposes, the data have to check and interpreted, by various statistical techniques that made for examining the data as per the nature of the study [29].

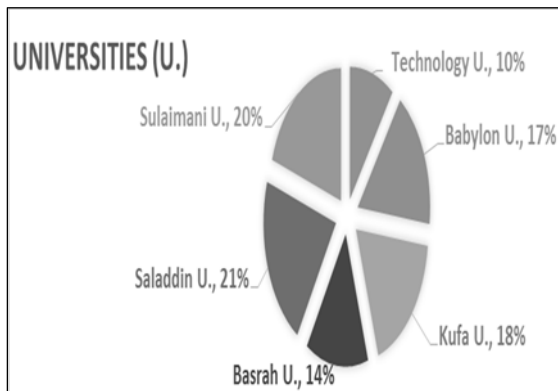


Figure-2 : Universities Percentage Distribution

10. DATA COLLECTION AND RESPONSES RATE

The quantitative research approach conducted to be able to measure and examined the relationship between different factors. Quantitative research is defined in 2003 by Aliaga and Gunderson as "collecting numerical data that are analyzed using mathematically based methods (in particular statistics)" [30].

For this study distributed (351) questionnaires to total members of respondents, (40) questionnaires were not filled and received back. After checking the questionnaires' answers, (12) response's discards because of not qualifying, randomize and wrong data provided, as (4) responses have not voted before (at any elections), and (8) responses provide random answers, furthermore; the (8) responses failed to pass the trip questions that made to test the reliability of the answers. Thus; any random data provided will effect on making discussion regarding E-voting adoption. Therefore, (12) responses had been removed, and the final number of valid responses was (299), thusly; rate of (85.18%) of the responses responded to the survey.

11. DEMOGRAPHIC PROFILE ANALYSIS

As mentioned previously, in the first section of the questionnaire which includes a demographic profile of respondents. Thus, the characteristic's keys of the respondents are summarized in Table-1 Later on, details are presented to show the graphical representation of the demographics categories; these categories are gender, age, education, position, language and department. In this section, the research analysis used SPSS software to provide this information below.

Table-1 : Demographic Analysis

Measure	Item	Frequency	Percentage
Gender	Male	202	68%
	Female	97	32%
Age	18-24	236	79%
	25-34	24	8%
	35-44	18	6%
	45-54	13	4%
	55 and above	8	3%
Education	Undergraduate	239	80%
	Bachelor	19	6%
	Master	31	11%
	PhD	10	3%
Position	Lecturers	60	20%
	Students	239	80%
Language	Arabic	225	75%
	Kurdish	74	25%
Department	Science General	27	9%
	Computer	53	18%
	Mathematic	30	10%
	Geology	30	9%
	Physics	38	13%
	Chemistry	44	15%
	Biology	38	13%
	Environment	21	7%
	Laboratory Investigation	18	6%

the most respondents are males (N=202; 68%) and the rest of respondent females (N=97; 32%), where the age group of 18 to 24 years has the highest percentage with (79%) and the lowest frequency for age between 55 or above is amounted to 3%, as the range of respondents are approximately 18 years and above, and reason of chosen this age because of the right age to make a person eligible to vote.

All the respondents are well educated, and 20% percent of them are fully educated those are represented by Bachelor, Master and PhD lecturers, while the rest are students at different levels of colleges, as shown in Table-1 above, the most of the respondents were holding an undergraduate degree which was 80% followed by the respondents having a Master degree which was 11%. Two categories were grouped for the position title of the respondents, lecturers and students, where Prof, Doctor and lecturer all indicate under the same group.

The data were gathered via survey questionnaires where English, Arabic and Kurdish, whereas English is the official language that use for teaching in universities within Iraq, where Arabic and Kurdish languages used to help understanding and give better idea to the items (questions). The universities were best setting to conduct this kind of study due to increased level of education in the urban area locality which is suitable for better understanding of the measures used of both languages, according to Butt and other researchers [31]. (75%) of the respondents

are speaking Arabic language, and the rest are speaking Kurdish language which they are representing (25%).

The departments of universities where data collected are vary in size and the percentages are close, likewise; this data will offer great analysis for the research, also present clear results regarding the differential perspective understanding of E-voting system from the respondents' background, as shown above in Table-1., (18%) of respondents from the Computer department were the highest number of respondents from both lecturers and students, and the lowest number of respondents were from Laboratory Investigation department by (6%) only.

12. CORRELATIONS, MEAN, STANDARD DEVIATION AND RELIABILITY

Six factors were extracted in this study (four independents variables; one mediator and one dependent variable). These factors are Security, Privacy, Usability and Reliability as independents variables, Trust in E-voting as mediation and E-voting adoption as the dependent variable. Annexure-1 disclose the relationship between variables on a scatterplot, that been used in this study. The value range of correlation's coefficient (r) should be always between (± 1) [32, 33].

The (r) results from Annexure-1 showed that Security (r = .751), Privacy (r = 0.716), Usability (r = 0.704), Reliability (r = 0.710) and Trust in E-Voting (r = 0.629) was positively and significantly associated with E-voting adoption, also all the relationships showed to have ($p < 0.01$), where 0.01 refer to the correlation percentage of significant level that equal to (**).

The correlation results from Annexure-1 showed that Security (r = .428), Privacy (r = 0.688), Usability (r = 0.764), and Reliability (r = 0.323) was positively and significantly associated with Trust in E-Voting, also all the relationships showed to have ($p < 0.01$), where 0.01 refer to the correlation percentage of significant level that equal to (**). Annexure-1 also shows the mean and standard deviation of independent, dependent and mediation variables.

In-addition; an important step that can do to ensure the validation of the instrument is to test out reliability outcomes, which describes their state scale yields; the test was to ensure the accuracy measuring as well as minimizing measuring error [34]. A Cronbach's alphas or (α) determined in line with the average inter-item correlations, were last used to calculate internal consistency, which can be seen in bold parentheses as the values bigger than (0.7), as the last signs to measures the variables are reliable.

13. HYPOTHESES ANALYSIS

In this paper and for the integration between the hypotheses, questionnaire components and data analysis of the research. SPSS used as statistical analysis tools to test the dependent (E-voting adoption), independent (Security, Privacy, Usability and Reliability), mediation (Trust in E-voting) variables and present the discussion of results that obtained from these tests. First; linear regression analysis was used to test the dependent variables (E-voting adoption, Trust in E-voting) with independent variables, as mediation typify as dependent variable here in this test, hypothesis one to nine (H1//H9) showing that Figure-1. Second; bootstrapping test implemented to test the mediation variable with independent variables, which can be seen in hypothesis ten to thirteen (H10//H13) as seen in Figure-1.

This paper assessed the relationships between variables, where research seeks to understand the intentions of the electronic voting system by looking at more comprehensive viewpoints. By present the final outcomes which can give better understanding to how people determine the value of adoption a new system. Table-2 showed the relationship between research hypotheses, dependent, independent and mediation variables, as all hypotheses were found to be a significant.

The study indicated the importance of the variables (Security, Privacy, Usability, Reliability and Trust in E-voting) as they can play an important role to pull the intention to adopt a new system as well as electronic voting system (E-voting). A linear regression analysis was used to test the hypotheses (H) and explain the relationship between variables.

Table-2 : Hypotheses Analysis

Model	(β)	R Square	Δ R Square	Sig
E-voting Adoption				
Security	.747	.567	.551	.000
Privacy	.712	.514	.498	.000
Usability	.699	.500	.484	.000
Reliability	.705	.510	.495	.000
Trust in E-voting	.625	.397	.381	.000
Trust in E-voting				
Security	.416	.196	.171	.000
Privacy	.679	.478	.453	.000
Usability	.756	.592	.567	.000
Reliability	.313	.122	.098	.000

First linear regression test showed a significant relationship between Security (S) and E-voting adoption (EVA) as in H1. The analysis showed that many respondents answers strongly agreed regarding the existing relationship between S and EVA which have (β = .747), (R2 =.567, p< 0.001), a 56.7 % variation in EVA was explained by S. Therefore; the research hypothesis is accepted.

Second linear regression test showed a significant relationship between Privacy (P) and EVA as in H2. The analysis showed that many respondents strongly agreed regarding the existing relationship between P and EVA which have (β = .712), (R2 =.514, p< 0.001), a 51.4 % variation in E-voting adoption was explained by P. Therefore; the research hypothesis is accepted.

Third linear regression test showed a significant relationship between Usability (U) and EVA as in H3. The analysis showed many respondents answers strongly agreed regarding the existing relationship between U and EVA which have (β = .699), (R2 =.500, p< 0.001), a 50.0 % variation in EVA was explained by U. Therefore; the research hypothesis is accepted.

Forth linear regression test showed a significant relationship between Reliability (R) and EVA as in H4. The analysis showed many respondents answers strongly agreed regarding the existing relationship between R and EVA that have (β = .705), (R2 =.510, p< 0.001), a 51.0 % variation in EVA was explained by R. Therefore; the research hypothesis is accepted.

Fifth linear regression test showed a significant relationship between Security (S) and Trust in E-voting (TEV) as in H5. The analysis showed that many respondents answers moderately agreed regarding the existing relationship between S and TEV that have (β =0.416), (R2 = 0.196, p< 0.001), a 19.6 % variation in TEV was explained by S. therefore; the research hypothesis is accepted.

The sixth linear regression test showed a significant relationship between Privacy (P) and TEV as in H6, also the analysis showed that many respondents answers strongly agreed regarding the existing relationship between P and TEV that have (β =0.679), (R2 = 0.478, p< 0.001), 47.8% variation in TEV was explained by P. Therefore; the research hypothesis is accepted.

The seventh linear regression test shown a significant relationship between Usability (U) and TEV as in H7. The analysis showed many respondents answers strongly agreed regarding the existing relationship between U and TEV which have (β =0.756), (R2 = 0.592, p< 0.001), a 59.2 % variation in TEV was explained by U. Therefore; the research hypothesis is accepted.

The eighth linear regression test showed significant relationship between Reliability (R) and TEV as in H8. The analysis showed that many respondents answers slightly moderately agree regarding the existing relationship between R and TEV that have ($\beta = 0.313$), ($R^2 = 0.122$, $p < 0.001$), a 12.2 % variation in TEV was explained by R. However; the research hypothesis is accepted.

Last but not least; the ninth linear regression testing Trust in E-voting (TEV) and E-voting adoption (EVA) as in H9 which showed a significant relationship between TEV and EVA. The analysis showed that many respondents answers slight strongly agreed regarding the existing relationship between TEV and EVA that have ($\beta = 0.625$), ($R^2 = 0.397$, $p < 0.001$), a 39.7 % variation in EVA was explained by TEV. Therefore; the research hypothesis is accepted.

All the results of analyzing regression were shown a positive relationship and observed to be statistically significant to prove and accept all the ninth previous hypotheses as shown in Table-2.

This research used SPSS software and SAS macros by Hayes model 4 as shown below in Figure-3 [35], the procedure used to implement a bootstrapping test on the hypotheses below, also discussed the similarity between each data, and found that most respondents prefer the adoption framework in Iraq to increase the transparent of voting system.

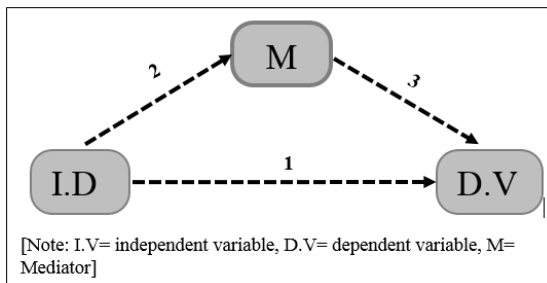


Figure-3 : Bootstrap test model 4

The tenth hypothesis that shown in Figure-1 from running bootstrapping test (H10: Trust in E-voting mediates the relationship between Security and E-voting adoption), sequence steps (regression tests) were required to know the statistically outcome of the hypothesis. One; a regression test to predict the path relation of (S with EVA), and the relationship was positive and statistically significant, $\text{coeff} = .4704$, $p < .001$. Two; a regression test was performed to predict (S with TEV), the results of this regression provided the path coefficient (coeff), which was $\text{coeff} = .3871$, $p < .001$ also significant. Three; a regression test performs mediation process

to predict the outcome of (TEV with EVA) that controlled by S variable, the results were significant also, $\text{coeff} = .3321$, $p < .001$. Thus; step number three provides information that can help evaluate how much controlling for the TEV as a mediate variable to reduce the strength of association between (S and EVA). A Sobel test was conducted and found full mediation in the model ($z = 6.3953$, $p < .001$).

The eleven hypothesis (H11) from running bootstrapping test as in (H11: Trust in E-voting mediates the relationship between Privacy and E-voting adoption), One; a regression test to predict the path relation of (P with EVA), positive and statistically significant relationship found, $\text{coeff} = .3267$, $p < .001$. Two, a regression test was performed to predict (P with TEV), the results was $\text{coeff} = .4745$, $p < .001$ also significant. Three; a regression test performs mediation process to predict the outcome of (TEV with EVA) that controlled by the P variable, the results were significant, $\text{coeff} = .2287$, $p < .001$. A Sobel test was conducted and found full mediation in the model ($z = 4.6158$, $p < .001$).

The twelve hypothesis (H12) from running bootstrapping test as (H12: Trust in E-voting mediates the relationship between Usability and E-voting adoption), showed one; a regression test path predict of (U with EVA), and the relationship was positive and statistically significant, $\text{coeff} = .4869$, $p < .001$. Two; a regression test performed to predict (U with TEV), the results was $\text{coeff} = .7861$, $p < .001$ also significant. Three; a regression test performs mediation process to predict the outcome of (TEV with EVA) that controlled by U variable, the results were significant, $\text{coeff} = .1929$, $p < .001$, A Sobel test was conducted and found full mediation in the model ($z = 3.4371$, $p < .001$).

Finally the thirteen hypothesis (H13) as shown in figure-1 from running bootstrapping test as (H13: Trust in E-voting mediates the relationship between Reliability and E-voting adoption). One; the mediation model that test a regression to predict the relation of (R with EVA), and the relationship was positive and statistically significant, $\text{coeff} = .4037$, $p < .001$. Two; a regression test was performed to predict (R with TEV), and the results was $\text{coeff} = .2613$, $p < .001$ also significant. Three; mediation process performed to predict the outcome of (TEV with EVA) that controlled by R variable, the results were significant, $\text{coeff} = .3936$, $p < .001$. A Sobel test was conducted and found full mediation in the model ($z = 5.3391$, $p < .001$).

Overall results, all hypotheses were proved to be a significant. The study indicated the importance of

variables (Security, Privacy, Usability, Reliability and Trust in E-voting) as they can play an important role to pull the intention to adopt a new system as well as electronic voting (E-voting).

14. CONCLUSION

Whenever technologies thoughtlessly applied into elections, it may produce a number of challenges beside risks which can tremble in the public's self-confidence within elections. Nevertheless, the actual technology itself will offer correct solutions. It is important to boost the bar that associated with security standards to keep the ethics as well as self-confidence of elections. Beside public, election industry and election experts must get involved.

The development of the electronic voting system addresses the common problems that arose in the traditional voting procedure. In such electoral system, voters are obligated to trust the result of the election as it is. They do not have the option to verify the authenticity of their cast ballot. Here, the election officials must be trustworthy. However, in most of the cases, their credibility is doubtful. As a result of this, with the evolution of information technologies, researchers have proposed implementation of the electronic voting system as a feasible solution.

This particular research offered numerous contributions towards the literature upon trust in E-voting. At the beginning, the research pulls a plan for an appropriate framework associated with E-voting circumstances that match Iraq case, The idea of E-voting in Iraq being covered through examining the needs of citizens to trust the system as well as other prizes technical besides social issues associated with E-voting. Next, the research ties the actual requirements of trust in numerous models into a single framework associated with trust in E-voting. Hence, this research offered a better and bigger image to present such as work can cover the conceptual trust in numerous environments which could be implemented. Finally, the researcher predicted that the fairness of the accessibility would have to be an important parameter inside the trust in E-voting.

After considering the results, it had been found that particular variables such as (Security, Privacy, Usability and Reliability) had direct and significant effects on Trust in E-voting parameter, which points to the successful variables that lead to the adoption of electronic voting system. Last but not least, introducing this specific technology effectively not an easy thing, which required an acceptance of big range of public of those who consider election a sensitive concern. At the same level, there are many

topics could affect introduction such as technology like technical and legal matters.

15. LIMITATIONS OF THE STUDY

Aspects of this study may limit to collecting data from Iraqi universities, which may not be representative of the whole actual voting system in Iraq. The measure limits both the sample of this study's findings generalizability to the overall concept of Iraq. The study also focused on educated voters who have access to the computer, smartphone and the Internet. This study provides insight into the factors that influence the use of electronic voting technology in the context of Iraq's environment.

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ANNEXURES

Annexure-1 : Correlations, Mean, Standard Deviation and Reliability

	Mean	Std. Deviation	S	P	U	R	T	EVA
S	2.64	0.776	(.771)					
P	2.66	1.018	.541**	(.788)				
U	2.81	0.683	.575**	.722**	(.707)			
R	2.66	0.868	.245**	.374**	.269**	(.703)		
T	2.98	0.702	.428**	.688**	.764**	.323**	(.738)	
EVA	2.65	0.619	.751**	.716**	.704**	.710**	.629**	(.752)
<p>Notes: “ ** Correlation is significant at the 0.01 level (p < 0.01)” “Cronbach’s Alpha (α) of the reliability are given in bold parentheses” “ S=Security, P=Privacy, U=Usability, R=Reliability, T=Trust in E-voting , EVA=E-voting Adoption”</p>								