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Article

The Role of E-government in Combating Corruption in the Public Sector in Yemen

Ikhlas Sharaf Alhammadi *, Prof. Ahmed Alhadramy

Saba University

Article info	Abstract

Corruption is generally considered to be one of the most significant impediments to economic development and good governance; while E-government is considered as a tool to promote transparency and reduce corruption. It is more than true, especially in the least developed countries; Countries that have invested more in e-government have also seen more reduction in the levels of corruption. Clearly, there was a need for strengthening research on e-government as a tool for combating corruption, which at present is largely a-theoretical and descriptive. This research focused on different projects of e-government in Yemen and that might be helpful to reduce corruption. The statistical analysis used a modified Klitgaard corruption model, which included factors of intervention of middlemen in addition to monopoly power, the discretion of officials and the absence of transparency. The purpose of this research was to study the direction and significance of the relationship between e-government and combating corruption in the public sector in Yemen. The results of this research revealed that the use of ICT in the form of e-government can make important headway to reduce corruption. Also, the results of this research support the hypotheses that e-government limits both positively and significantly monopoly power, discretion, and intervention of middlemen, as well as increases transparency.

* Corresponding author: Ikhlas Sh. Alhammadi
 E-mail: ikhlasalhammadi@gmail.com

1. Introduction:

Combating corruption is one of the most important challenges facing countries around the world. In this decade, countries, both developed and developing, are vulnerable to corruption. Also, corruption has become a threat to the general objectives of the governmental development, disruption of its programs, plans, projects, and helps the aggravation of the economic crises.

Recent researches in information and communication technology (ICT) have given hope to the idea that new technologies in the form of e-government practices can be used to combat corruption in the public sector. Indeed, different studies[1],[2],[3],[4] show that different e-government projects that are initiated in countries have one thing, in which all the projects succeeded, that is elimination or combating of corruption to a great extent.

In general, the need to have better transparency and to combat corruption is not restricted to the Western Countries; it is more urgently required in developing countries.

Yemen is considered as one of the developing countries, and it has failed to combat corruption despite its efforts in this area. Corruption in Yemen has increased remarkably between 2005 and 2015 based on Transparency International rank countries[5].

The public sector in Yemen suffers from many f-orms of corruption which became a big problem rooted in all departments and govern- ment bodies in Yemen. [6] In recent years, many countries have considered administrative reform as a crucial step towards strengthening their economy and better management of their social development.[7].

Yemen, however, as one of the least developed countries seeks to improve its e-government development index which is 0.22 in 2016.[8] The aim of this research is to examine the role of e-government in combating corruption in the public sector in Yemen, and to investigate if e-government reduces significantly monopoly power, discretionary authority, and middlemen's intervention, as well as increases transparency.

1.1. Background of the problem

Although several laws, rules, prosecution and recovery of public properties have been made through years, but corruption is still growing rapidly. Most Yemeni have the view that the fight against corruption is sometime selective, while others believe that some people can involve in corruption without being noticed [9]. However, public officials often intentionally cause some of the delays in various public offices because they expect citizens offer bribes in order to fast-tract the services.

In view of the above listed and other related reasons, it is necessary to research for other approaches of fighting corruption. One of such measures is the adoption of Information Communication Technology (ICT). Generally, ICT in controlling corruption operates by shining a bright light on institutional processes. ICT enhances transparence, while offering opportunities for easier access to public records.[10]

The researches of the role of e-government in combating corruption in Yemen are still new. In fact, most of the researches on the role e-government in combating corruption focused on samples from some countries such as India[11][12].

Also, a common recommendation in corruption and ICTs studies is that the next step in this kind of research should examine if there is a positive effect of e-government on corruption [1],[2],[3],[4]. Hence, the present research is an attempt to explore answers to the following core question:

"What is the role of E-government in Combating Corruption in the Public   Sector in Yemen?"

2. Literature Review

2.1 E-Governance :A Way to reduce corruption

E-government may offer a weapon against corruption. Recent innovations in information and communication technology (ICT) and scholars have given hope to the idea that new technologies in the form of e-government systems can be used to combat corruption in the public sector. Combating corruption considered to the extent that increased transparency, accountability and

predictability (of rules and procedures) are made priorities.

In addition, the findings from the study presented by Shim & Eom (2008) suggested that ICT has a strong potential to reduce corruption through the promotion of "good governance and enhancing relationships between government employees and citizens".

Besides all these cost-efficiency benefits that Communication and ICT can provide to governments, it is believed that e-government can strengthen good governance and decrease corruption levels through increased transparency and accountability and[13].

2.2 Drivers of Corruption

Studies argue that illicit behavior flourishes when public servants have a monopoly power over citizens, when agents have great discretion, and when accountability of agents to the principal is weak [14] [15]. So, as many researchers did, the researcher adopted the drivers of corruption that are mentioned by [16],[17] which is summarized in the following functional equation:

Corruption = Monopoly Power + Discretion – Transparency (in governance)".

But, in line with the forms of corruption in Yemen, the researcher adds one variable, Middlemen's Intervention to the equation, which is considered the most important driver based on different studies. Middlemen's Intervention is defined as the direct interacti-on between officials and citizens. [18].

2.3 E-government Practices in Yemen

Yemeni government has many attempts to apply the concept of e-government. Some ministries and government bodies have adopted e-government practices to build technological computer systems that are working to help various institutions to do their work efficiently and effectively, and to perform numerous functions of help desk and doing accounting tasks[19]. The government has successful attempts to adopt e-government project such as E-gate for application and admission for the Yemeni universities project (electronic registration for students at universities) that has been implemented by Ministry of Higher Education and Scientific Research[20]. In addition, Procurement Management Informa-

tion System (PMIS) project was initiated by the Higher Authority for Bids and Offers Control. They managed to launch an interactive website of draft laws and regulations and allowed the public and civil society organizations to submit comments[21].

Furthermore, Yemen Civil Service Modernization Project has started reforms to rationalize government employment and limit ghost workers by Yemen Civil Service Ministry.

The main objective of this project is to reduce corruption in registration procedure in the civil service. The project struggled as a result of strong bureaucratic resistance; and absence of institutional building to carry out a complex multifaceted reform program. Before this project became operational, the Yemeni government, at the Crossroads Report, was described; "the government's patronage system involves 'employing' thousands of Yemenis in government positions, they have more than one wage with no performance or duties", and the Yemeni government had not had an accurate survey of Yemen's workers [22].

Furthermore, the USAID report stated that The Civil Service Modernization Program created the first civil service survey, which initially found that between 473,000 employees in civil service, 15,000-30,000 were either having double –job or so-called" double- dippers" (those who receive more than one government salary) or 'ghost employees (those who did not perform any duties) .[9]

2.4 Related studies

For the present discussion, literature addressing the e-government and its role in combating corruption is organized along two dimensions: first, studies which take a micro view and focus on the description and outcome of specific e-government projects; and second, studies which do not focus on any particular e-government project, but take a macro view of the outcomes of e-government in a country/state.

First: the linkage between e-government and corruption at country/state level has been addressed by relatively few studies, and these are discussed individually.

The case study presented by [11] reported a sig-

nificant effect of e-government on corruption in Estonia, and focused on four factors could be the most effective way to reduce corruption through e-government. These factors are increased transparency, better accountability, disappearance of the "middlemen" and bridging the gap between public workers and citizens. The results reported by [23] in Kuwait suggested that the transition to e-government limits the intervention of individuals in the public sector in Kuwait. Thus it reduces many kinds of corruption related to individual emotion through favoritism, nepotism and bribery. Additionally, this study showed that the presence of e-government can be seen as one of the tools that can help reducing the discretion of government officials. Furthermore, the results reported by[24] are supported of a positive connection between e-government and reduction in corruption in Fiji and Ethiopia. This study, using a structured questionnaire, explored the perceived role of e-government in reducing corruption amongst 800 respondents each from Fiji and Ethiopia. This study also noted that while e-government is important to anti-corruption, it also has its limits because many ICT projects fail because of the insufficient planning capacity and political instability. In order to overcome these challenges, the researchers mentioned that successful implementation requires matching the right technologies with capable and progressive reformers and government systems.

Second: the linkage between e-government and corruption at specific e-government projects; it has been addressed by relatively few studies, and these are discussed individually. The case study of Punjab presented by[11] explored the five e-governance projects in Punjab that really decreased the level of corruption in different states in India. The findings of this study suggested that the services of government should be available Online to help reduce corruption. If services are available Online, procedures will be streamlined and will take less time. There will be also no need to pay extra money for speeding up the process. The results suggested also that e-government must be firmly embedded in the existing government processes and must be supported both politically and technically by the governments. The study presented by [4] explained one particular case in South-Korea. They tried to examine the OPEN (Online Procedures Enhancement for civil applications) system of the Seoul Metropolitan Government. The findings brought out that implementing OPEN was the most effective tool to reduce corruption, and the strong leadership was crucial for its success. They also brought out that e-government eliminates discretion from the equation by removing intermediary services and allowing citizens to conduct transactions themselves.

3. Objectives and Methodology

The objective of this study is to investigate the relationship between e-government practices and the following major drivers of corruption:

Monopoly of power, discretionary authority, middlemen's intervention, transparency Fig 1. The study hypothesizes that e-government practices are positively related to corruption reduction.
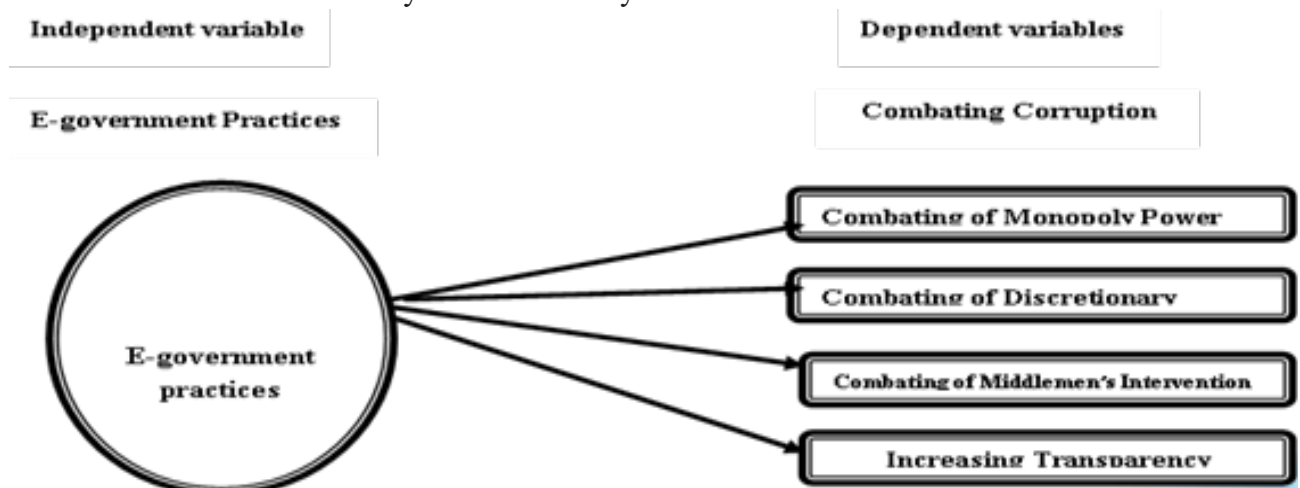

Fig1. Research mode

We adopted the drivers of corruption that are mentioned by [14] which is summarized in the following functional equation:

Corruption = Monopoly Power + Discretion + Middlemen's Intervention– Transparency

The purpose of this model was studying the direction and significance of the relationship between e-government and combating corruption (monopoly power, discretion, middlemen's intervention, and transparency) in the public sector in Yemen

The monopoly power is defined as having control or access to material or human resources, as well as control procedures that allow third parties to fulfill the mandate of the government [25].

While discretion defined as the presence of ability or power to freely make some choices in an unconstrained manner.[26].

Middlemen's Intervention is defined as the direct interaction between officials and citizens [18].

Finally, transparency refers to the public avail- ability and increased flow of timely, comprehensive, relevant, high quality and reliable information concerning government activities [27].

• **The Study Sample**

The study sample included 370 employees who are working in organizations that were carefully chosen for this research based on the extent of using the ICT, or e-government practices.

The organizations chosen are as follow: Ministry of Finance, Ministry of communication & Information Technology, National Information Center, Ministry of Civil Service, Customs authority, Ministry of Higher Education and Scientific Research, The Higher authority for Bids and Offers Control, The authority for Bids and Offers, and Taxes authority. 261 respondents returned the questionnaire.

Respondents were selected using stratified random sampling technique. Table 1 presents the demographic profile of the 261 respondents (N=261) selected for the study.

Demographic profile			
		Frequency	Percent
Gender	Male	192	73.6%
	Female	69	26.4%
	Total	261	100.0%
Academic Qualification	Secondary School	5	1.9%
	Diploma	24	9.2%
	Bachelor	181	69.3%
	Master	50	19.2%
	PHD	1	0.4%
	Total	261	100.0%
Position	Employee	108	41.4%
	Director	73	28.0%
	Manager	59	22.6%
	General manager	21	8.0%
	Total	261	100.0%

Table 1: the demographic profile of the 261 respondents

•**Study Tool**

We prepared the study tool, a questionnaire, to collect the necessary data on the subject of the study. The questionnaire used 5 -point likert scale (A five-point Likert Scale rating from 1 to 5 where 1= Strongly Disagree,2=Disagree, 3=No View, 4=Agree, 5 =Strongly Agree).

The questionnaires were divided into different sections for easy reading and completion, and were accompanied by a short, simple and informative cover letter that informs respondents about the aims and importance of the research. The questionnaire was written carefully using clear language to encourage participants to provide honest and unbiased information, and emphasize the privacy and confidentiality measures are in place.

The questionnaire included 43 items (12 items concerned on the availability of ICT in the public sector organization ,8 items concerned on the role of e-government in combating of monopoly power, 10 items concerned on the role of e-government in combating of discretionary authority, 4 items related to the role of e-government in combating of middlemen's intervention, and 9 items related to the role of e-government in increasing transparency), besides the personal and organization's information.

The study used the following research hypotheses:

•**Hypothesis** 1: Higher level of e-government practices is significantly associated with higher level in combating monopoly of power in public sector organizations

•**Hypothesis** 2: Higher level of e-government practices is significantly associated with higher level in combating discretionary authority in public sector organizations.

•**Hypothesis** 3: Higher level of e-government practices is significantly associated with higher level in combating middlemen's intervention in public sector organizations

•**Hypothesis** 4: Higher levels of e-government practices is significantly associated with higher level in increasing transparency in public sector organizations

The reliability of this questionnaire was assessed using Cronbach's Alpha (Which was reliable - Cronbach's Alpha =92.2%).

To test the Validity of the questionnaire it was presented to a group of administrators and PhD legal professionals at the Sana'a University (Faculty of commerce).

The questionnaire was modified accordingly.

4. Results and Discussion

•**Testing normality**

Normality of the distribution is the underlying assumption for most statistical tests.

As a consequence, all the variables in the current research (E-government, combating of Monopoly Power, combating of Discretionary authority, combating of Middlemen's intervention, and increasing Transparency) were tested for normality of distribution of the score of measures to ensure that this fundamental assumption was met before proceeding with inferential examination to prove the proposed hypothesis.

Statistics in term of skewness and kurtosis for the five variables were illustrated in Table 2.

The data is considered to be normally distributed when the skewness value is between +/- 3. And for the kurtosis the value must be between +/- 10 to meet the normality assumption. (Cohen, Cohen, West & Aiken, 2003)[28]

Descriptive					
	E-government	Combating of Monopoly Power	Combating of Discretionary authority	Combating of middleman's Intervention	Increasing Transparency
Mean	3.4662	3.2088	3.2130	3.1149	3.5185
Std. Deviation	0.58978	.75055	0.756906	.93114	0.70334
Skewness	-.142	-.020	.195	.977	-.840

Std. Error of Skewness	.151	.151	.151	.151	.151
Kurtosis	-.419	-.304	-.513	6.228	.919
Std. Error of Kurtosis	.300	.300	.300	.300	.300

Table 2 Skewness and Kurtosis Analysis of first part of questionnaire

•**Hypothesis Testing**

The results of hypothesis testing are as follows:

Hypothesis 1: Higher level of e-government practices is significantly associated with higher level in combating of monopoly of power in public sector organizations.

As mentioned in Table 3, this relationship was investigated by running Pearson's Correlation test. The result demonstrated a medium positive and significant relationship between e-government and combating of monopoly power (r = .360 **, p=.000 < 0.001).

Accordingly, it could be inferred that government organizations who scored high in e-government would report a high level in combating of monopoly power.

Therefore, Hypothesis 1 was supported.

Correlations			
		E-government	Combating of Monopoly Power
E-government		1	.360**
	Sig. (2-tailed)		.000
	N	261	261
**. Correlation is significant at the 0.01 level (2-tailed).			

Table 3 Correlation analysis for combating of Monopoly Power level and E-government level

Hypothesis 2: Higher level of e-government practices is significantly associated with higher level in combating of discretionary authority in public sector organizations.

This relationship was investigated by running Pearson's correlation test.

The Result demonstrated a medium positive and significant relationship between e-government and combating of discretionary authority (r = .302**, p=.000 < 0.001).

Accordingly, it could be inferred that organizations who scored high in E-government would report a high level in combating of discretionary authority. Therefore, Hypothesis 2 was supported. Table 4 provides correlation analysis between the factors under study.

Correlations			
		E-government	Combating of Discretionary authority
E-government	Pearson Correlation	1	.302**
	Sig. (2-tailed)		.000
	N	261	261
**. Correlation is significant at the 0.01 level (2-tailed).			

Table 4 Correlation analysis for combating of Discretionary authority and E-government

Hypothesis 3: Higher level of e-government practices is significantly associated with higher level in combating of middlemen's intervention in public sector organizations.

The results revealed a medium positive relationship between e-government and combating of middlemen's intervention (r = 0.297**, p=.000 < .001).

Consequently, public organizations which perceived a higher level of e-government also were likely to develop a higher level of combating of middlemen's intervention.

Correlation			
		E-government	Combating of middleman's Intervention
E-government	Pearson Correlation	1	.297**
	Sig. (2-tailed)		.000
	N	261	261
**. Correlation is significant at the 0.01 level (2-tailed).			

Table 5 Correlation analysis for combating of Middlemen's intervention and E-government

Hypothesis 4: Higher level of e-government practices is significantly associated with higher level of increased transparency in the public sector organizations.

This hypothesis suggested a direct relationship between e-government and increased transparency.

The correlation was examined by running Pearson's correlation coefficient. There was a statistically significant (p=.000 < 0.005) but rather weak

Therefore, Hypothesis 3 was accepted. Table 5 provides correlation analysis between the factors under study.

positive correlation (r =. 144*) between increasing transparency and e-government.

Thus, e-government increases significantly transparency in the public sector organizations. Table 6 provides correlation analysis between the factors under study.

Accordingly, it could be inferred that organizations who scored high in e-government would report a high level in transparency. Hence, Hypothesis 4 was accepted.

Correlations			
		E-government	Transparency
E-government	Pearson Correlation	1	.144*
	Sig. (2-tailed)		.000
	N	261	261
*. Correlation is significant at the 0.05 level (2-tailed).			

Table 6 Correlation analysis for increasing Transparency and E-government

5. The Conclusion

This paper does not seek to identify whether there is corruption in the government sector of the State of Yemen, but to identify if there is a relationship between e-government and combating corruption in the public sector in Yemen. Corruption is the main problem all over the world that cannot be ignored. Corruption in many ways resembles viruses, whose survival mechanisms are so robust that containing or eliminating them, proves an extra-ordinarily challenging task.

 Combating corruption in countries across the globe has proven very difficult, regardless of var-

ious administrative reforms.

E-government has shown promise in this regard, and in many instances, it has eliminated or at least reduced corruption in public services delivery. E-government, however, does not guarantee the end of corruption.

Officials who master technology-empowered processes can find new opportunities for rent-seeking. Such circumstances, fighting corruption should be part of the e-government vision. If fighting corruption is included in the government's vision, the next key question is when to announce the anti-corruption goal to the public.

 If fighting corruption is publicly announced as a

major part of the e-government agenda, it could help build coalitions and public pressure for anti-corruption results. Also, the awareness is necessary; the public should be made aware of all the government policies and online services. The media also would play a great role in this regard. The conditions required for successful e-government as an anti-corruption tool in Yemen are: the commitment of higher leaders, the legal environment, and the growing ICT sector. Without these factors, it would be impossible to create the comprehensive e-government services.

Finally, this work proved that the use of ICT in the form of e-government can make important headway to reduce corruption. Also, the results of this research supported the hypotheses that e-government limits positively and significantly monopoly power, discretion, and intervention of middlemen, as well as increases transparency.

6. Recommendations

Building upon the results achieved, this research offers number of recommendations for government, organizations, and managers.

• It is highly recommended to work closely with ICT specialists to ensure that the design of the ICT system is coordinated with other reform processes.

Sometimes, ICT may even provide an opportunity for more corruption. Securing the ICT system is important to prevent corruption by those who know how to manipulate the ICT system.

•Installing a controlling system that relies on a computer system to follow up the work of individuals by using algorithms to track, control, and save every process that has been done to the public.

If decisions and transactions will be documented and easily tracked to individual officials, officials will think twice before committing a corrupt behavior.

•Each department should establish complaints and inquiries handling regime through organization's websites that fits its and customers' needs. Complaint channels should be clearly advertised to both the public and staff.

The improvement in the complaint handling regime would increase the public's confidence and trust in the system, it may result in reduction of corruption.

•Bridging the digital divide. Even if the government information is available in all government sites, and the citizen does not have access to technology or field to use the same capabilities, ways of combating corruption will be futile. Therefore, government should give citizens convenient access to government information and services from everywhere anytime, via multiple channels

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