The Role of Government Chief Information Officer (GCIO) in Fighting Corruption

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Abstract

Government is the most severe victims of corruption. The use of ICT in government, under e-government umbrella, is admitted as a strategy to curb corruption. However, contribution of ICT in detecting and preventing corruption is very low compare to other method for such purposes. This paper stated that GCIOs should take a role in strengthening the government institutions to eradicate the corruption especially in the institutions where they belong to. Using multi-method approach for the research, this paper found that, at first, GCIOs should focus on IT Governance instead of IT Management. The second, GCIOs should be at good effort to exterminate information asymmetry. Lastly, GCIOs should have an expertise in Enterprise Architecture since they are responsible for designing collaborative works with other government institutions and engaging the stakeholder's participation.

Keyword: GCIO, Corruption, Anti-Corruption

1. Introduction

In November 2013, all APEC leaders accorded the corruption great disruption on state economic growth. There is no country free from corruption, however, the developing country is the most severe countries from corruption [1]. A country needs international cooperation and collaboration to fight corruption as stated on the APEC Leaders' Declaration[1]. In 2014, the APEC declaration still placed the international cooperation for curbing the corruption[2].

The two consecutive years in the declaration have emphasized the strong cooperation, collaboration, networking, and coordination among organizations which have authority for eradicating corruption in accordance with law enforcements.

Association of Certified Fraud Examiner (ACFE) shows that government is the top three victims from fraud together with banking and manufacturing. The type of fraud that most frequently occurred in government is corruption. From the corruption point of view, government institution is more vulnerable than banking or manufacturing [2]. The report also found that the contribution of Information and Communication Technology (ICT) on detecting fraud is very low. ICT's contribution is only 1.1% in detecting fraud [2].

On contrary to the ACFE's report, many researchers positively argued that e-government, the use of ICT in government, is the best tool for combating corruption. The increasing transparency through e-government has a significant impact on decreasing the corruption [3] [4] [5] [6]. For e-government to be at the best performance, Waseda Institute of e-government has put the existence of Government Chief Information Officer (GCIO) as an indicator in investigating and creating the annual international e-government ranking [7].

GCIO is regarded as the highest authority for orchestrating the Information and Communication Technology (ICT) in government institution. GCIO is expected to modernize the government process using a globally recognized project named e-government. The ultimate objective of GCIO is to provide a better public service delivery for stakeholders. GCIO is the change agent of government transformation process from traditional into network forms. In a government network operation, a GCIO has privileges to identify the external parties which should be brought in to the network [8].

Most countries in the world has recognized e-government as a tool to create a better government by improving the relationship with citizen, business enterprise, and other government agencies. Improving the relationship among governments is going to be the great importance according to the APEC Leaders' Declaration. Not only is the government's relation within a country but also across country needed to curb corruption. However, referring to the ACFE's report, e-government has a very low contribution on detecting corruption.

Researches in the area of CIO and corruption is very limited. Focusing on GCIO and corruption, this paper will be uncovering the role of GCIO and the competency that should be attained by GCIO to take roles in combating corruption.

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[1] 2013 APEC Leaders' Declaration. Stated on

http://apec.org/Meeting-Papers/Leaders-Declarations/2013/2013_aelm.aspx

[2] 2014 APEC Leaders' Declaration. Stated on

http://apec.org/Meeting-Papers/Leaders-Declarations/2014/2014_aelm.aspx

2. Literature Review

2.1 Corruption: The Concept

Corruption is a multidimensional conception. In general, corruption is a dishonest and illegal act; it is the "impairment of integrity, virtue, or moral principle" [3]. Corruption occurred not only in public sector but also in private. The most common use terminology of corruption is introduced by Rose-Ackerman, i.e., the "misuse of public office for private gain [9]. This definition implies that the corruption is close to government and the misuse of government's power took place. In that sense, corruption would likely occurred when an organization or a person has a monopoly power over goods or services, has discretion to decide who will receive it and how much that person will get, and neither it is transparent nor accountable [10]. Using Agent-Principal patronage, Klitgaard stated that "corruption occurs when an agent betrays the principal's interest in pursuit of their own". Corruption is caused by the lack of transparency and accountability. Therefore, Klitgaard represents the corruption as seen on the *Figure 1*.

Corruption = Monopoly + Discretion – Accountability (in governance)

Figure 1: Corruption Equation

Not only does the definition has a multifaceted, the forms of corruption also differ among famous researchers on corruption. Lambsdorff,, for example, has listed bribery, extortion, embezzlement, and fraud as the forms of corruption [11]. Andvig [12] lists bribery, embezzlement, fraud, extortion, and favoritism as the forms of corruption. United Nations Development Programme (UNDP) has the most comprehensive list of corruption. Corruption may occurs in the following 13 forms; bribery, fraud, money laundering, extortion, kickback, peddling influence, cronyism/clientelism, nepotism, patronage, insider trading, speed money, embezzlement, and abuse of public property [13].

However, some professional organization such as Association of Certified Fraud Examiner (ACFE), American Institute of Certified Public Accountant (AICPA), and Institute of Internal Auditor (IIA) has a narrow term of corruption. They use the occupational fraud tree as the framework for defining the corruption. The framework states that corruption is a part of fraud along with Asset Misappropriation and Financial Statement Fraud [14].

Currently, 69% of countries worldwide have a serious problem on corruption [15]. These percentage is similar to the one on the previous year index [16]. However, these two year indexes show an improvement compared to the index for year 2011, 2010, and 2009 [17] [18] [19]. All of those that have serious problem on corruption are the developing countries. The following table shows the percentage of countries worldwide which have a serious corruption problem.

Year	Total Countries	Countries with serious corruption problem	Percentage
2014	177	123	69
2013	176	123	69
2012	183	134	73
2011	178	131	73
2010	180	129	71

Compiled from Corruption Perceptions Index year 2010-2014

2.2 Anti-corruption strategy

As the corruption is considered a worldwide issue, many countries and international organizations set the agenda to countermeasure the corruption. UN stated that anti-corruption strategy should be inclusive, comprehensive, integrated, factual, non-partisan, and impact oriented [20]. It incorporates six components; institutional building, creating a situational prevention of corruption, raising awareness and public participation, ratifying the national laws against corruption, dealing with illicit transfer of proceeds, and monitoring and evaluation anti-corruption implementation [20]. UNDP noted that several countries have established or were planning for creating an independent anti-corruption agency as part of institutional building strategy [21]. Supreme Audit Institution (SAI) of Netherland (ARK) developed a tool to help management in increasing integrity which is believed for preventing corruption. The tool is named INTOSAI Self-Assesment on Integrity (IntoSAINT). IntoSAINT has been introduced to many SAI from Asia, European, Africa, and South America [4]. Sarbanes-Oxley Act of 2002 required the public companies to establish an anonymous reporting channel for employee to disclose questionable accounting practices. ACFE on the Report-to-the-Nation found that this anonymous reporting of wrongdoing, which is called whistleblowing system, is the best tool for detecting and combating corruption [2]. This system engages not only the employee but also public for reporting questionable act of public officers.

2.3 E-Government vs Corruption

E-Government has long been considered as a tool to curb corruption. E-Government refers to any use of information technologies by government institutions that enable them to transform their way to communicate and interact with citizens, businesses, and other government institutions [22]. E-Government enables government institution to be more collaborative with stakeholders and with other government institutions [23]. As a result, benefits of e-government can be less corruption, increased transparency and accountability, and cost reductions. Andersen (2009) argues that e-government can be considered as a solution for the combating corruption, especially in developing countries [3] [4] [5] [6].

Contrary to the above researches, Smith (2010) found that the advance of ICT development amplify the opportunity for crime. He also found that the information contained in ICT, the high commercial value of it, and the exclusiveness of its environment are the potential factors for

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[3] "Corruption." Merriam-Webster.com. Merriam-Webster, n.d. Web. 13 Jan. 2015. <http://www.merriam-webster.com/dictionary/corruption>.

[4] http://www.courtofaudit.nl/english/Publications/Topics/IntoSAINT

ICT to be the target of corruption. Instead of increasing accountability, the ICT may lead to increase the discretion and monopoly [24].

2.4 Previous researches on Government CIO.

Research on Government CIO is very limited. Only few researchers investigating the GCIO; the role, the competencies, and the model. Estevez et al (2013) introduced the nature and the responsibilities of GCIO [25]. Taking experiences on several disasters in some countries, Iwasaki highlighted the role of GCIO for ensuring the government business continuity [26]. Government faces the problem of not onlythe disaster but also the population where the ageing people is increasing gradually. GCIO should be innovative so that the elderly can take the benefit of ICT in an optimal way [27]. Despite its lack of researches on GCIO, Lawry et al (2007) shed the light that the role and responsibility of GCIO are evolving like what is going with CIO in business enterprises [28].

In government institutions, especially in developing countries, finding a position of CIO is problematic. Some of them have a position which is similar to CIO such as Head of IT Bureau, Head of IT Division, and IT Director. However, only some of them have a responsibility like CIO has [7]. Those who does not have such responsibilities are considered as an IT Manager instead of a CIO.

Grembergen & de Haes (2004) has clearly distinguished the difference between IT Governance and IT Managament [29] thus implying the difference between CIO and IT Manager. While some functions are overlap each other such as IT budgeting, IT Planning, and IT Implementation, there is one function that is unique for CIO; supporting communication with external parties.

3. Research Design

From literature review, this study use the corruption equation provided by Klitgaard [10] where Corruption exists due to the high monopoly practice, high discretion power, lack of accountability, and lack of transparency. These four factors are considered as the causal factors of corruption. Using the Principal-Agent Theory in theorizing the corruption, these causal factors of corruption lead to the existence of asymmetric information between the principal and the agent.

Asymmetric information is caused by the absence of information governance which is a part of IT Governance practices [29]. In a government institution, there is a key person who has the highest authority in ICT implementation including information governance, i.e., Government CIO. From this amalgamation, this study posits that GCIO has a big opportunity to take significant role in fighting against corruption by avoiding the occurrences of asymmetric information.

The summary of the research questions together with the proposed hypothesis to be investigated in this study and source for the prospective measurement items is presented in the following table.

Research Question:		
- What is the role of Government CIO in combating corruption in government institution?		
- What is the competencies needed by GCIO to participate in anti-corruption strategy?		
Hypothesis	**Construct**	**Source of Measurement Items**
H_1: The better GCIO, the lesser Information Asymmetry	GCIO	IAC-Waseda e-Government Ranking
	Information Asymmetry	Open Government as a proxy for Information Asymmetry. Obtained from Open Government indicators in IAC-Waseda e-Government ranking.
H_2: The lower information asymmetry, the better the Corruption Index	Corruption	CPI provided by Transparency International.

4. Methodology

Quantitative data analysis in this study employed two indicators from the IAC-Waseda International e-Government ranking for e-government development perspective and Corruption Perceptions Index by Transparency International for corruption perspective. These two indicators are GCIO and Open Government. Since the Information Asymmetry is immeasurable, this study use Open Government as a proxy variable of Information Asymmetry. Among nine indicators in IAC-Waseda e-Government ranking, Open Government Data has the closest correlation to Information Asymmetry in which both are about transparency and providing equal opportunity to acquire information. To answer the research question about the competencies required by GCIO, this study use a qualitative approach by employing a document analysis [30].

5. Data Analysis and Findings

This study employs linear regression to find out the coefficient relationship of GCIO to Open Government Data (OGD) and the coefficient relationship of OGD to Corruption. At first, the regression coefficient between GCIO and OGD is calculated using `lm` function in R language. The syntax and the result are shown on *table 2* below.

```
Call:
lm(formula = OG ~ GCIO, data = dataset)

Residuals:
    Min      1Q  Median      3Q     Max
-37.177  -9.659   2.841   9.711  20.815

Coefficients:
            Estimate Std. Error t value Pr(>|t|)
(Intercept)  18.0902     3.0040   6.022 1.40e-07 ***
GCIO          0.4379     0.1020   4.294 7.03e-05 ***
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

Residual standard error: 12.18 on 56 degrees of freedom
Multiple R-squared:  0.2477,  Adjusted R-squared:  0.2343
F-statistic: 18.44 on 1 and 56 DF,  p-value: 7.035e-05
```

Table 1: Regression Coefficient Sub 1

As shown on **table 2**, there is a significant impact from GCIO to Open Government Data. With the coefficient at 0.4379, GCIO contribute 24.77% to the increasing of Open Government Data. There are 75.23% contribution come from unobserved variables which are beyond of this study. The result show that the better GCIO will lead to the better Open Government Data. This implies that the better GCIO, the lesser information asymmetry thus supporting the first hypothesis.

Next, the regression coefficient between OGD and Corruption is calculated same way with the previous one. The syntax and the result are shown on the **table 3**.

```
Call:
lm(formula = CPI ~ OG, data = dataset)

Residuals:
    Min      1Q  Median      3Q     Max
-31.303 -13.606  -0.039  11.498  35.001

Coefficients:
            Estimate Std. Error t value Pr(>|t|)
(Intercept)  29.0545     5.5269   5.257 2.37e-06 ***
OG            0.8944     0.1720   5.199 2.93e-06 ***
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Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

Residual standard error: 18.08 on 56 degrees of freedom
Multiple R-squared:  0.3255,  Adjusted R-squared:  0.3135
F-statistic: 27.03 on 1 and 56 DF,  p-value: 2.928e-06
```

Table 2: Regression Coefficient Sub 2

As shown on **table 3**, there is a significant impact of OGD on Corruption. With the coefficient at 0.8944, OGD contribute 32.55% to the increasing of Open Government Data. There are 67.45% contribution come from unobserved variables which are beyond of this study. The result show that the better OGD will lead to the better Corruption Index. This implies that the lower information asymmetry, the better the Corruption Index thus supporting the second hypothesis.

The regression analysis shows that there is no significant impact of GCIO directly to Corruption if combined simultaneously with OGD as shown on the **table 4**.

```
Call:
lm(formula = CPI ~ GCIO + OG, data = dataset)

Residuals:
    Min      1Q  Median      3Q     Max
-32.021 -13.224  -1.901  10.043  37.254

Coefficients:
            Estimate Std. Error t value Pr(>|t|)
(Intercept)  26.9633     5.6726   4.753 1.48e-05 ***
GCIO          0.2454     0.1730   1.418 0.161708
OG            0.7556     0.1966   3.844 0.000317 ***
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

Residual standard error: 17.92 on 55 degrees of freedom
Multiple R-squared:  0.3493,  Adjusted R-squared:  0.3257
F-statistic: 14.76 on 2 and 55 DF,  p-value: 7.374e-06
```

Table 3: Regression Coefficient Together

As shown on **table 4**, the result suggests that even though the GCIO is positively related to corruption, the impact is no longer significant which is indicated by its p-value (0.161708) greater than 0.05. This multiple regression analysis supports the proposed model which apply a full mediation in formulating the impact of GCIO to Corruption Index.

To find out the competencies for GCIO to involve in anti-corruption solution, author uses content analysis as a method to analyze the qualitative data which is textual. The data source is taken from 2012 Clinger-Cohen Core Competencies 2012 [31]. Based on the literature review, the analysis uses the thematic analysis of text on the 2012 Clinger-Cohen Core

Competencies; Governance, Open Government, Transparency, Collaboration, and Architecture. These five themes are aligned with the aforementioned research design.

Using WordStat in the QDA Software, the following figure shows the phrase distribution in Clinger-Cohen Core Competencies. The analysis uses the maximum word of five and minimum occurrences of two, there are eight phrases that is frequently mentioned in the Clinger-Cohen document. They are Enterprise Architecture, Collaborative Technology, Open Government, Agency Information Sharing, Governance Enterprise Architecture, Interoperability Data, Service Oriented Architecture, and Shared Services.

By analyzing these phrases on the 12 competencies in Clinger-Cohen, the top four competencies which are close related to anti-corruption strategy are Enterprise Architecture, Policy and Organization, Information and Knowledge Management, and Technology Management and Assessment.

The result of Content Analysis concludes that the top three competencies for GCIO related to anti-corruption strategies are Enterprise Architecture, Policy and Organization, and Information and Knowledge Management.

Putting the result to the practices in Japan and Indonesia, all GCIOs are responsible for coordinating and collaborating the government agencies. For example, GCIO in Japan has responsible for coordinating e-government strategies in all ministries by initiating and promoting the Kasumigaseki Cloud for all ministries. Another example is the CIO at Audit Board of The Republic of Indonesia. The CIO has focused on how to promote and to arrange a functional collaboration between Audit Board Office and all government institutions which is based on government auditing framework.

6. Conclusions

GCIO as the highest authority on ICT implementation in a government institution can take the role in fighting corruption by creating inter government collaboration through innovative works on open government and IT Governance practices. GCIO should be at good efforts to exterminate information asymmetry. In order to take the role in anti-corruption strategy, GCIO should be equipped with competencies on Enterprise Architecture, Policy and Organization, and Information and Knowledge Management. Working closely with the external stakeholder for arranging

inter government collaboration using ICT is the eminent action of GCIO.

7. Limitation and Contribution

This study has limitation since it only uses one year data and purposively use only the IAC-Waseda e-Government ranking. The reason of using the IAC-Waseda e-Government ranking is only that ranking has put GCIO as an indicator for assessing e-government development worldwide.

This study attempts to enrich literature about Government CIO. In addition, this study offer the insight for anti-corruption practitioners about the role of GCIO for curbing corruption from inside government.

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