Received 6 March 2015
Revised 16 April 2015
Accepted 23 April 2015

# Making e-procurement work in a decentralized procurement system

## A comparison of three Indonesian cities

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### Abstract

**Purpose** – The purpose of this paper is to investigate the implementation of initiative e-procurement in decentralized system on Indonesia's local government system.

**Design/methodology/approach** – The authors combine quantitative and qualitative methods. The central finding of this research is that human resources are the pivotal factors that determine the performance of local e-procurement in three cities. This research focusses on three local governments in Indonesia – Yogyakarta City, Tangerang City, and Kutaikartanegara Regency.

**Findings** – The central finding of this research is that human resources are the pivotal factors that determine the performance of local e-procurement in three cities. However, Tangerang City is going institutionalization phase in e-procurement initiative to ensure its sound local regulation.

**Research limitations/implications** – There are several limitations to this study including the recent nature of decentralized procurement in Indonesia, limited standardized and disaggregated data on local government procurement expenditures and performance.

**Practical implications** – The study recommends that human resources management in procurement needs to be addressed by both local and central government.

**Originality/value** – e-Procurement is an important instrument for preventing corruption in goods and services procurement. Indonesia has been implementing an e-procurement policy since 2008 based on a Presidential Decree. The president has issued annual orders (presidential instructions), and all central ministries and local governments have been required to comply with them to obtain their budget through the e-procurement system. However, as of 2012 fiscal year, only around 10.26 percent of the central government institution procurement budget and 10 percent of the local government procurement budget in Indonesia went through the e-procurement system, with wide variations among cities.

**Keywords** Corruption, Institutionalization, e-Procurement, Local procurement governance

**Paper type** Research paper

## Introduction

Corruption is one of the most serious problems badgering public institutions of many developing countries, including Indonesia. Many cases of corruption that occur in the institutions of Indonesia's government take place in the procurement of goods and

International Journal of Public Sector Management
Vol. 28 No. 3, 2015
pp. 198-220
Emerald Group Publishing Limited
0951-3558
DOI 10.1108/IJPSM-03-2015-0035

services. In this regard, the use of information-communication technology (ICT), more specifically e-procurement, is considered to be one way to prevent corruption by increasing transparency and accountability of the budget process. In 2008, the Indonesian government created INAPROC, a national e-procurement system, in order to procure and deliver goods and services electronically. In five years, there have been increasing numbers of e-procurement instruments: the number of system providers went up from 11 in 2008 to 491 in 2012; service providers from three in 2009 to 43 in 2012; provincial coverage from nine in 2008 to 33 in 2012; and user agencies from 11 in 2008 to 731 in 2012. This trend was followed by the increased number of tenders issued through e-procurement. In 2008, there were only 33 tenders, but the number of tenders increased to 119,797 in 2012. INAPROC claimed that there was a savings of 10.89 percent in 2012.

Until now only a small amount of research has been conducted on Indonesian e-procurement. Kodar (2010) found that the implementation of e-procurement at Yogyakarta Municipality in 2009 was visible but not accountable. Nightisabha *et al.* (2009) found that the procurement committee and the e-procurement suppliers of goods and services had different perceptions. Utama (2009) found in the experience of Yogyakarta City that strong leadership, underlying laws/regulations/policies, available resources (human, budget, infrastructure), as well as changes in management had an influence on the smooth process of implementing e-procurement. But the existing research stands insufficient for providing an adequate analytical framework for e-procurement development in Indonesia. In particular, it fails to explain variations in e-procurement implementation in different parts of Indonesia since the policy was launched in earnest in 2008. The Committee for the Monitoring of Local Autonomy (KPPOD, 2012) found that only 62 percent of the Kabupaten/Kota level regencies and cities carried out e-procurement – and with varying degrees of implementation. The Executive Director of the Committee Robert Endi Jaweng says that the situation is not in accordance with Regulation No. 54/2010. According to him, the regulation requires the entire ministries/agencies/units of work device region/other institutions be already implementing e-procurement as of the end of 2012 at the latest. Regencies or cities in Indonesia have varied widely in adopting and implementing the e-procurement initiative led by the central government. However, the lack of telecommunication infrastructure is a crucial problem for improving e-procurememt management at the level of the local government. Owing to Indonesia's archipelagic geography, technological connectivity is achieved via submarine cables and via satellites. Therefore, urban areas on the most-populous islands of Java and Bali have much better information access compared to other areas.

On May 20, 1998, Soeharto resigned from his presidential position due to strong pressure from a civil movement. Habibies, as a new president, formulated the new democratized law on democratic decentralizaion law between May 1998 and October 1999 managed to lay the foundation for a more democratic and decentralized political system have been causing much political change at the local level. Local governments in particular have become more independent than before and more democratic at the local level. Many experts noted the successful approach of big bang theory has at least empowered many to build local areas with the limited central government control. A 2008 survey funded by the US Agency for International Development found that trust in local officials grew from 42 percent in 2006 to 55 percent in 2008. And 70 percent of respondents said that local government executives were accountable to the people of their area, an increase from 61 percent in 2006. Some successful stories of

locally autonomous policy implementation are the creativity of local governments in handling specific local problems, such as street trader management in Solo City with Joko Widodo, information technology use introduced by Yogyakarta' mayor Herry Zudianto in Yogyakarta, and local agriculture policy done by Damassara as a new autonomous regions. Bennett (2011) noted that the hope for decentralization in Indonesia was that with greater autonomy at the local level, constituents could increase the accountability of their local leaders. Along with the authority given to regional governments, however, these authorities have not been balanced with accountability, there for the cases of corruption in the local government. In line with the majority of the theoretical literature, we argue that the monitoring of bureaucrat's behavior is an important determinant of the relationship between decentralization and corruption (Lessmann and Markwardt, 2009).

One of the causes of corruption is the lack of accountability of the procurement of goods and services in the local government. The study of Indonesia Procurement Watch on 793 respondents of government goods and services providers in Jabotabek (Jakarta, Bogor, Tangerang, and Bekasi) found that 92.7 percent respondents had bribed government officials, while it was only 1.3 percent said that they never practiced bribery. Studies conducted by the Anti-Corruption Agency in 2012 of Aceh's goods and services procurement showed similar phenomena. This study also found that the number of alleged incidents of corruption in procurement and the complexity of the procurement process did not affect the willingness to appoint procurement committee chairmen. Based on the survey, only 34.2 percent of respondents are unwilling to be appointed as chairman of the committee on procurement. Concerning e-procurement, most respondents answered that the new system and the integrity of the human resources were not yet ready.

We developed hypotheses in relation to efficiency and effectiveness of e-procurement with dependent variabels: leadership, policies and regulations, human resources, policy and planning, infrastructure and standarization, and private integration. We advance an alternative approach to the measurement of correlational approaches in the multiple informant surveys and qualitative analysis of secondary data. Against this backdrop, this paper asks: what explains regencial variations in e-procurement implementation in Indonesia? How do policies, institutions and regulations, system and infrastructure, and human resources affect e-procurement performance by local governments in Indonesia?

## A theoretical overview: factors affecting e-procurement implementation

The objective of the implementation of e-procurement in the public sector is reformation process of goods and services procurement. From the various studies done based on the experience of the countries around the world, the implementation of e-procurement is to prevent or to reduce the level of corruption (Neupane *et al.*, 2012). e-Procurement can improve the efficiency over traditional procurement methods (Chang, 2011; Hanna, 2011). The process of goods and services procurement electronically has obviously omitted the use of paper for the providers or the budget users. The providers just upload all documents by the existing web site without coming to the office. e-Procurement can also reduce the less necessary projects (Achterstraat, 2011). With e-procurement, only the projects needed by the people need be sold at auction. However, this assumption is only valid in the economically advanced countries. In developing countries, many projects are proposed by politicians for their personal interests (Murray, 2007).

e-Procurement is also a procurement automatization process (Henriksen and Mahnike, 2004) which improves the competition among the competitors (Mahmood, 2001; Thai, 2001) and reduces the human intervention in the process of bidding (Khanapuri *et al.*, 2011; Magrini, 2006). Automatization through the internet makes the competition open, because any supplier can monitor the bidding process online at anytime. As a result, human intervention in bidding process is becoming lower and lower. e-Procurement also encourages bidding automatization in bidding process (UN, 2006), in order to monitor better (Achterstraat, 2011; Hanna, 2011; Zang and Yang, 2011), to make a procurement process faster and easier (Hanna, 2011), and to obtain the best quality/price ratio (Kaliannan and Awang, 2009). In their discussion on the success factors affecting e-procurement both at private sector and the public sector, Barahona and Elizondo summarized with the above table. Explicit diffusion and change management strategy are the factors affecting the successful e-procurement project mentioned by the most researchers. In public e-procurement, state capacity to adopt innovations, leadership, and political support are found in 13 research articles. However, they did not differentiate between the public sector and private sector, each of which have distinct characteristics. In Indonesia's case, local governments that have adopted the e-procurement project are both likely to have implemented Independent Procurement Units and more likely to have a higher number of staff-certified in procurement (Sacks *et al.*, 2014). Some researchers (Sacks *et al.*, 2014; Kodar, 2010; Nurmandi, 2013; Wahid, 2012) found that the influence of e-procurement implementation at the local level, particularly leadership, human resources, planning and management, policies and regulations, system integration, infrastructure and standarization, and the dependent variable of the efficiency and effectiveness of e-procurment.

## Leadership

Much previous research on e-procurement points to a positive relationship between leadership and organizational innovation, particularly the application of information technology in government organizations. Addressing the issue from the angle of technological diffusion, MacManus (2002) found that leadership was a key factor encouraging the implementation of public e-procurement systems and consequently offered a cautious and incremental perspective on their diffusion. Coggburn (2003) conducted an exploratory study to understand the political, socioeconomic, demographic, and geographic factors affecting the adoption of procurement reforms. Wahid (2012) also found that leadership was an important factor affecting e-procurement institutionalization process in developing countries. The top management teams (e.g. steering committees) must involve the project manager, consultants working with the committee, and agency staff to develop an implementation strategy (ECOM Group, 2002). Utama (2009) found in the experience of Yogyakarta City that strong leadership, underlying laws/regulations/policies, available resources (human, budget, infrastructure), as well as changes in management all had an influence on the smooth process of implementing e-procurement. In this regard, considerable attention and support need to be provided by senior management to ensure that the procurement reform is well understood in the agency (Stenning & Associates Pty Ltd (S&A), 2003). Furthermore, the executive management team is responsible for setting the vision and goals, bringing about collective commitment to change in process and organizational structures, and formulating the policies and strategies necessary for putting an e-procurement initiative in place (World Bank (WB), 2003):

*P1.* The high level of top management support is positively associated with the efficiency and effectiveness of an e-procurement initiative.

**Human resources**

The adoption of e-procurement in the government requires the support of human resources. More capable human resources affect the speed of adoption of e-procurement. Henriksen and Mahnke (2004) observe that public managers need sufficient resources and the mandate of the political leadership to successfully adopt e-procurement. Political structures need to be considered as much as the economic rationalities to better explain e-procurement adoption. Apart from IT sophistication, organizational factors only moderately influence the adoption of e-procurement. But employee acceptance, financial resources, political commitment, and centralization are found to be the strongest determinants of e-procurement adoption in Germany (Veit *et al.*, 2012). The Office of Government Commerce (OGC) (2002) recommends that increased change in underlying processes requires more learning and effort on the part of users. Consequently, some researchers found that the lack of technical, personnel, and financial capacities is perceived to be major barriers to the development of e-government in many municipalities of USA (Lim, 2010a, b; Moon, 2005):

*P2.* The high degree of human resources program is positively associated with the efficiency and effectiveness of an e-procurement initiative.

*Planning and management*

e-Procurement projects in many countries need clear plans, support, and well-prepared management systems. A UNPAN Report (2012) noted that it was therefore vital to e-government transformation that governments appoint an official with real authority across departmental and ministerial boundaries to facilitate strategy and decision making regarding the country's ICT architecture, and to assist agencies in their efforts to run more effective and efficient programs. Therefore, a clearly defined e-procurement strategy not only emphasizes the importance of e-procurement in the public sector but takes into consideration major institutional changes from the procurement process perspective as well as from the organizational perspective (WB, 2003):

*P3.* A clear plan and management execution of an e-procurement implementation strategy is positively associated with the efficiency and effectiveness of an e-procurement initiative.

*Policies and regulations*

Another key variable affecting e-procurement is relevant policies and regulations. At the public procurement policy level, there is a fundamental and accepted difference between public procurement and private procurement (Murray, 2007). Since the public sector has different characteristics from those of the private sector, public procurement is mainly a process of political decisions on how the government gets public goods and services at efficient costs. Contrary to Europe, Asia has not yet adopted a specific e-procurement regional policy or legal framework. Nevertheless, elements for legal validity of e-procurement can already be found in the "e-ASEAN Reference Framework for Electronic Commerce Legal Infrastructure." However, this instrument is not compulsory. Instead, it serves only as a guideline. At the national level, many Asian countries such as China, Malaysia, the Philippines, and the Republic of Korea, have undertaken massive reform of their public procurement legal environment as part of their national e-government action plan (UN ESCAP, 2006; Vaidya *et al.*, 2009). In public procurement, public procurement managers need to insulate and protect themselves against the possible conflicting demands of various stakeholders (Ancarani, 2009; Purchase *et al.*, 2009). Also, in terms of application of rules, a wide range of variations

were found, and these variations were heavily driven by a hierarchical downward flow of verbal and non-verbal instructions based on varying degrees of interpretation of respective rules and standard procedures (Khan, 2013). In sum, MacManus (2002) said that the public sector's regulatory restrictions and organizational dimensions were the biggest deterrents to e-commerce:

*P4.* The policy and regulatory support is positively associated with the efficiency and effectiveness of an e-procurement initiative.

*System integration*

In Taiwan, the limited integration of e-government creates repetitive information building, inconsistent information content, and information security problems (Chiang and Hsieh, 2007). Government needs to provide a comprehensive system to integrate complex online systems and databases. It is also critical to link the e-procurement system to the financial management system in order to facilitate the process of online payment to suppliers (WB, 2003). Given its disruptive nature, national state-wide e-procurement should be done by an independent new agency with resources, processes, persons, and values different from those of the incumbent procurement officers (Baharona *et al.*, 2012). It is necessary for purchase transactions to be carried out through an electronic ordering transaction support system (Vaidya *et al.*, 2009):

*P5.* The high degree of system integration is positively associated with the efficiency and effectiveness of an e-procurement initiative.

*Infrastructure and standardization*

For many developing countries, the information infrastructure is the main problem for e-procurement initiatives. Based on Soekiman and Saputra's (2010) research findings regarding the Lampung Province, Indonesia, the five most influential barriers to e-procurement implementation are the lack of planning, infrastructure, standardization, enthusiasm, and security. Another study found that the reliability and capability of an organization's infrastructure (particularly network connectivity) had a direct impact on the operational performance of the e-procurement system (Croom and Brandon-Jones, 2009; Engström *et al.*, 2009; Vaidya *et al.*, 2009; Ha and Coghill, 2006):

*P6.* The degree of infrastructure quality is positively associated with the efficiency and effectiveness of an e-procurement initiative.

## Research method

Three cities are selected in this study in order to investiagte the differences and complexity of e-procurement initiative, namely Yogyakarta City in Yogyakarta Special Province, Tangerang City in West Java Province, and Kutaikartanegara Regency in East Kalimantan. Yogyakarta City, the capital city of Yogyakarta Special Province, has successfully won an e-government award since 2009, granted jointly by the Ministry of Information and Telecommunication and *The Economist* magazine of Indonesia. This city is considered to have successfully implemented smart city governance supported by information technology.Tangerang City, a second research case city, has also successfully earned an e-government achievement in four times from same ministry. This city also has been granted as an "unqualified opinion" in its financial report by the National Audit Board (BPK) six times since 2008. Meanwhile, Kutaikartanegara Regency is in the early steps of developing an e-government program and was recognized as an ICT Pura in 2012, considered to be a local government having good e-readiness to e-government.

As Murray (2007) mentioned the validity of e-procurement research is rarely because of the research design and the interface by politicians. The research focus of e-procurement is based on operational management and strategic management research. Then other reseachers, Hardy and William (2011) called for the research of procurement involving trans-diciplinary and interactive research design. Therefore, in this research we try to use not only comparative-explanatory studies among three cities in Indonesia, but also to go beyond this utilizing multiple informant and secondary data analysis.

All variables are operationalized into some indicators (see the Appendix) and trnsformed into questionaire in Indonesian language (*bahasa*). Primary data for the current research were collected using a cross-sectional survey conducted in the three local governments of Indonesia, i.e., Yogyakarta City, Tangerang City, and Kutaikartanegara Regency. The randomly selected sample was comprised of 230 elements representing procurement management units. Before the commencement of the survey, focus group discussion meetings were held, and pre-testing of the measuring instrument was conducted. In both exercises, the procurement practitioners were involved to enable the assessment to have face validity. Such pre-field deployment research tasks allowed for the study's questionnaire to be improved by either rewording or deletion of the items found to be ambiguous during the pilot phase. The pilot study, which involved 30 procurement practitioners, facilitated the improvement of the research instruments as well as the determination of the reliability of the scale items. Response from the final survey involved 150 fully completed questionnaires, 25 incomplete questionnaires, and 33 unreturned questionnaires.

The questionnaire was refined via several rounds of experts' reviews and pre-testings before the actual distribution took place. For content validity purposes, an extensive review of the literature was undertaken to gain an understanding of each construct and its items, and to ensure that no important dimensions were neglected. Ten e-procurement practitioners and ten academicians/researchers participated in this process. Each item on the questionnaire was reviewed for its content, scope, and purpose. Their feedback resulted in several modifications to the items. Two rounds of pre-testings were carried out to ensure that the instrument was well designed and contained items that would really measure the constructs. Table I summarizes the results of these pre-testings.

*Data analysis and result*

We applied Pearson's correlation and regression test to verify relationship between six independent variables and the dependent variable. The test was carried out as follows.

| | Item-total staticstics | | | | |
|---|---|---|---|---|---|
| | Scale mean if item deleted | Scale variance if item deleted | Correcetd item-total correlation | Squared multiple correlation | Cronbach's $\alpha$ if item deleted |
| P1 | 26.8667 | 5.844 | 0.567 | – | 0.914 |
| P2 | 26.8000 | 6.372 | 0.680 | – | 0.894 |
| P3 | 27.1333 | 5.913 | 0.808 | – | 0.879 |
| P4 | 27.1667 | 5.868 | 0.847 | – | 0.875 |
| P5 | 27.1667 | 5.868 | 0.847 | – | 0.875 |
| P6 | 26.8667 | 6.257 | 0.680 | – | 0.894 |
| P7 | 27.2000 | 6.303 | 0.659 | – | 0.896 |

**Table I.**
Validity and reliability test

Tables II and III present descriptive statistics and the bivariate correlations of this study's measures, respectively. Most of the relationships were not significant and negative at different local settings. In Yogyakarta City, only human resources variable were quite strongly positively related to effectiveness and efficiency of e-procurement. Meanwhile, in Tangerang City, leadership (0.438), planning and management (0.52), infrastructure and standarization (0.498), system integration (0.708), and e-GP system (0.625) were positively associated with the dependent variable. In the third case of Kutaikartanegara Regency, human resources, planning and management, and e-GP system were positively related to effectiveness and efficiency of e-procurement. These variables showed statistically significant ($t$-test) $p < 0.05$ and correlation values ranged from 0.38 to 0.418. We further test the correlation by using the significancy test in Table IV.

In Yogyakarta City and Tangerang City, only human resources variable were quite strong positively related to effectiveness and efficiency of e-procurement. Meanwhile, in Tangerang City, leadership (0.438), planning and management (0.52), infrastructure and standarization (0.498), system integration (0.708), and e-GP system (0.625) were positively associated with the dependent variable:

*H1*. The high level of top management support is positively associated with the efficiency and effectiveness of an e-procurement initiative.

This hypothesis is not supported with regard the municipalities intiative result. The procurement initiative in three cities has already take placed in ten years. In other words, the stage of the e-procurement implementation depends on continuing improvement rather than leadership that is very important at the early evolutionary step of e-procurement intitiative. Third, findings confirm the previously research in Italy that generally top manager within organization should work to empower the organization and HR staff units as well as invest more in mangerial evolution of administrative personnel; by focussing on the procurement departments and need to manage public-private relations, developed the needed competencies, make organizational choices and apply reengineering processes while adopting new e-procurement solutions (Bof and Previtali, 2007):

*H2*. The high degree of human resources program is positively associated with the efficiency and effectiveness of an e-procurement initiative.

We can learn several things from the analyses presented in this paper. First of all, the results demonstrate that human resources have an important influence on general e-procurement initiatives in Yogyakarta City and Kutaikartanegara Regency. As seen in Table IV, mayors' or regents' regulations served as a legal basis for implementing e-procurement projects. The legal background of such projects was Presidential regulation (No. 54 Year 2007) and National Procurement Agency (NPA) Decrees. The city of Yogyakarta has had a Procurement Service Unit (ULP) since 2009. The following factors must also be considered: there had been unsound procurement of goods/services handled by the Local Government Secretariat and the relevant units of work; procurement committee still couldbe intervened by the city leadership; the high number of work packages for local government agencies; limited number of certified procurement committees; and the city government was required to standardize the procurement document. The legal basis for the establishment of the ULP is the Mayor Regulation of Yogyakarta No. 91 in 2008 about the Procurement Services Unit.

**Table II.**
Descriptive statistics

| No. | Variables | | Tangerang | | | | Yogyakarta | | | | Kutaikartanegara Regency | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | *n* | Min. | Max. | Mean | SD | Min. | Max. | Mean | SD | Min. | Max. | Mean | SD |
| 1 | Infrastructure and standarization | 30 | 44 | 55 | 47.9 | 5.16 | 44 | 55 | 49.6 | 4.07 | 44 | 55 | 49.0 | 4.49 |
| 2 | Policy and regulations | 30 | 42 | 51 | 44.2 | 2.09 | 40 | 55 | 45.0 | 3.81 | 41 | 55 | 45.6 | 4.27 |
| 3 | System integration | 30 | 38 | 50 | 41.1 | 2.99 | 40 | 50 | 45.6 | 3.85 | 38 | 46 | 40.2 | 2.14 |
| 4 | Planning and management | 30 | 36 | 45 | 40.0 | 4.07 | 30 | 45 | 39.9 | 4.16 | 36 | 45 | 40.5 | 4.00 |
| 5 | Leadership | 30 | 31 | 44 | 38.4 | 3.51 | 31 | 45 | 38.3 | 3.08 | 34 | 45 | 40 | 3.24 |
| 6 | Human resources | 30 | 35 | 45 | 38.1 | 2.51 | 37 | 44 | 39.6 | 2.01 | 37 | 44 | 39.2 | 1.95 |
| 7 | Efficiency and effectiveness of e-Proc | 30 | 27 | 35 | 29.4 | 3.15 | 27 | 35 | 31.5 | 2.85 | 27 | 35 | 32.0 | 3.01 |
| | Valid *n* (listwise) | 30 | | | | | | | | | | | | |

| Independent variables | B Tangerang | Yogyakarta | Kutaikartanegara Regency |
|---|---|---|---|
| Leadership | 0.08 | 0.06 | 0.05 |
| Human resources | −0.474* | 0.635* | 0.617* |
| Planning and management | −0.263* | 0.097 | 0.0342 |
| Policy and regulations | 0.619* | 0.054 | 0.076 |
| Infrastructure and standarization | 0.075 | 0.089 | 0.089 |
| System integration | 0.804* | 0.076 | 0.0576 |
| $R$ | 0.804 | 0.448 | 0.400 |
| $R^2$ | 0.64 | 0.201 | 0.160 |
| Adjusted $R^2$ | 0.802 | 0.172 | 0.130 |
| SE of the estimate | 0.770 | 2.59 | 2.80 |
| $n$ | 51 | 36 | 45 |

**Note:** *$p \leq 0.05$, 5 percent

**Table III.** Significance test of regression

| | Yogyakarta City | Tangerang City | Kutaikartanegara Regency |
|---|---|---|---|
| Decree | Mayor Regulation No. 84 Year 2010 | Mayor Regulation No. 40 Year 2010 | Regent Regulation No. 2 Year 2012 |
| Start of e-procurement | 2010 | 2010 | 2012 |
| Background | Presidential Regulation and NPA Decrees | Presidential Regulation and NPA Decrees | Presidential Regulation and NPA Decrees |
| e-procurement status | Autonomous e-procurement (LPSE) | Autonomous e-procurement (LPSE) | Autonomous e-procurement (LPSE) |
| Unit | Under Secretary | Under information and Communication Agency | Under information and Communication Agency |
| Human resources | *ad hoc* procurement job | *ad hoc* procurement job | *ad hoc* procurement job |

**Table IV.** Regulations, status, and human resources procurement independent unit

In 2008, the ULP Government of Yogyakarta was attached at the city Government Secretariat Area Development Control Agency with membership consisting of the person in charge, the director, manager, and members shared in procurement team.

Meanwhile, Tangerang City Government set up a Procurement Service Unit (ULP) in 2010 based on Mayor Regulation No. 40 Year 2010 (see Table IV). The main objective of the unit was to prevent corruption in good and service procurement purchasing. This unit was recognized by the NPA in 2011 and 2012, based on its having the highest proportion of local budget purchased through e-procurement. In other words, in Tangerang city, human resources in public procurement is permanent job. To do so, their daily activities are to deal with public procurement. In contrast to the case of Yogyakarta City which is under the City Government Secretariat, the ULP in Tangerang City and Kutaikartanegara Regency are managed by Information and Technology Agency with echelon IV. However, the procurement unit has a great deal of independence, as in Yogyakarta City. In Kutaikartanegara Regency, the procurement unit is managed by the Information and Communication Agency, which has 42 procurement officials.

The Independent Procurement Unit of Yogyakarta City is a permanent unit established by the Decree of Mayor. This unit is attached to the Control and Monitoring Section at the Secretariat of City Government, which is headed by an echelon III staff and supported by deputies and a procurement team. Currently, there are 45 certified procurement officers. IT infrastructure capacity consists of the internet at a speed of 2.5 Mbps and an intranet environment in Yogyakarta City government, as well as an IBM System x3650M2-72A server, Debian Linux Operating System, 8 GB of memory and two 300 GB hard disks. The Independent Procurement Unit has been facilitating from within an office building and recruiting procurement officials from different city agencies, so they may not fully do the procurement job. Its means this job is done by procurement officials beeing part time job based on the number of published government projects. The position of the procurement unit in the organization is a self-contained unit and the ad hoc Secretariat is under the General Secretariat/Secretariat of the region. The head of the unit and Secretariat staff is not derived from the structural unit and functions related to the procurement of goods/services. The members of procurement team are staff officials at the structural unit. However, under ad hoc positions, there are some important challenges in human resources issues. First, there is a digital gap between the committee and the procurement of goods/services providers. This gap is not outrageously wide, but it must be addressed and bridged by the e-procurement system (Nightisabha *et al.*, 2009). In Kutaikartanegara Regency and Tangerang City, human resources are an important issue that affects the effectiveness of e-procurement. Second, we must note the recruitment of procurement manager and staff. The three main difficulties faced by the local governments is the lack of ability of procurement officials, the lack of willingness of civil servants to be procurement officials, and the ability of the provider in information technology (Nightisabha *et al.*, 2009). e-Procurement initiatives need to ensure a long-term commitment of resources, and to unify different factions (Furuholt and Wahid, 2008). Under the current regulation, procurement officials are recruited based on projects (i.e. on ad hoc jobs or temporary jobs). Interviewing the key persons involved in a procurement unit revealed some important information, such as what the head of the procurement unit in Tangerang City stated:

Our challenge is how to get permanent procurement officials and fully working jobs in dealing with procurement in local government. The second challenge is a good provider according to the real administrative condition that they upload in the e-procurement site. So, the problem is the proof of their documents in procurement process. This means that e-procurement systems do not guarantee governments will get good private providers.

Figure 1 reveals that the most important reason of civil servant is reluctant to be procurement official as follows: 46-47 percent of them stated that procurement official is high-risk job (probably engaged in corruption case); 21-29 percent of them said that procurement job is unprospective career; and 11-13 percent of them stated that compensation is very low. This fact confims that human resource variable is influencing factor on e-procurement implementation.

However, the current development initiative of e-procurement in Yogyakarta City and Kutaikartanegara Regency hint that the other factors such as planning and management, policy and regulations, leadership, and system integration are not influencing factors. Those cities have developed local regulations related with procurement and settled system integration. Meanwhile in Tangerang City, planning and management, policy and regulations and system integration were positively and significantly associated with the efficiency and effectiveness of e-procurement. In sum,

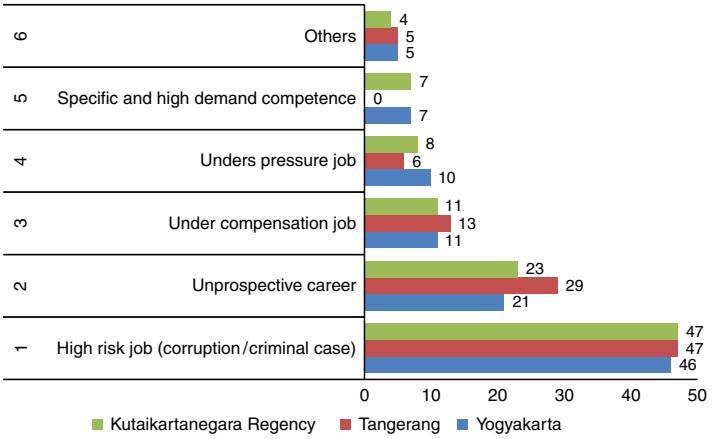



**Figure 1.**
Reluctant reasons to be procurement official (%)

Yogyakarta City has achieved the best performance compare with Kutaikartanegara Regency and Tangreang City:

*H3.* A clear plan and a well-managed execution of an e-procurement implementation strategy is positively associated with the efficiency and effectiveness of an e-procurement initiative.

From data analysis found that there is no significant relationship between planning and management and effectiveness and efficiency of e-procurement initiative. Under current Indonesia's procurement strategy based on the presidential instruction to the implementation of e-procurement, not a local government public procurement strategy. For 2013, he issued a presidential instruction No. 1 Year 2013 on corruption eradication and prevention in which the instruction affirmed the obligation to use the e-procurement system. In fiscal year 2012, the goods and services expenditure of ministries/institutions at 100 percent, and 40 percent of local government expenditure have to use e-procurement. Consequently, NPA Head issued Letter No. 17/KA/02/2012 on e-procurement obligation:

(1) ministries, non-ministry institutions, and local governments have to submit a Public Procurement Plan (RUP) to NPA portal via e-mail: rup.inaproc@lkpp.go.id, not later than March 31, 2013;

(2) Independent Procurement Unit/procurement committee may carry out the procurement of goods/services electronically by using the nearest LPSE; and

(3) governor/regent/mayor may set up independent e-Procurement Unit (LPSE):

*H4.* The policy and regulatory support is positively associated with the efficiency and effectiveness of an e-procurement initiative.

This is supported by the evidence in Tangerang City. Why are the cities which have different histories of e-procurement initiative, particularly on local policy and regulation. From the theory of institutional change, we can address these differences. Yogyakarta City and Kutaikartanegara Regency have achieved the institutionalization phase through typification, where certain actions (such procurement planning and tenders) came to be associated with certain actors (such as departments, procurement

unit and e-procurement unit) (Wahid, 2012). The e-procurement system, in this phase, might be seen as having become institutionalized, as its existence was no longer dependent on powerful actors (Avgerou, 2000). In the institutionalization phase, Tangerang City developed local regulations related with procurement and settled system integration. The following evidences are key factors to assess the degree of policy and regulations, planning and management, and system integration in Tangerang City. However, Tangerang City's officials considered that local regulation on procurement is needed to be strenghtened by central government regulation, not only presidential regulation, but also special law or act on public procurement:

*H5*. The high degree of system integration is positively associated with the efficiency and effectiveness of an e-procurement initiative.

Based on the hypothesis testing found that the relationship between two variables was only significant in Tangerang City, not in two others. One of procurement officials in Tangerang City considered that the current system is not enough to manage the complexity of public procurement, particularly the connection with the vendors of private sector. They do want to have the updated data on vendors in order to get the bonafide vendors.

On e-procurement policy, they said that:

> We did support the e-procurement policy to prevent corruption at our local government. You can see that our budget expenditure involved an increase of use of the e-procurement-mechanism year by year.

Head of procurement unit in Tangerang City said that:

> Our challenge is how to get a good provider according to the real administrative condition that they upload in the e-procurement site. So, the problem is the proof of their documents in procurement process. This means that e-procurement systems do not guarantee governments will get good private providers.

The last problem which must be countered by Tangerang City is local procurement planning and management. The head of the e-procurement office confirmed that the lack of a procurement plan on private standardization. Learning from Korea experience (KONEPS) is a representative e-procurement system which integrates characteristics of e-commerce into government for business procurement activities with active responses and support from stakeholders and related participants in the procurement system are important part of successful adoption of e-government (Li *et al.*, 2008). In the other hand, in Yogyakarta City and Kutaikartanegara Regency, e-procurement system has already set up the link between government and private vendors:

*H6*. The degree of infrastructure quality is positively associated with the efficiency and effectiveness of an e-procurement initiative.

Based on the significancy test revealed that there were no significant relationship between independent variables and dependent variable in three research area cities. This means that the infrastructure quality of those cities have achieved the good standard for e-procurement initiative, as supported by the city award of ICT given by Ministry of Information Technolgy.

## Discussion

The decentralized e-procurement system in Indonesia may have different local scenarios depending on the conditions of a specific locality, such as in case study

cities (see Figure 2). The relationship between the NPA and the Local Government Procurement Agency is missing link. The main task of the NPA is to supervise the local governments' procurement, but the NPA does not have the authority to impose sanctions. Thus, the performance of local governments' e-procurement is determined by the local government itself such as in Tangerang City. Looking at the institutions involved in the procurement, it is fair to say that fragmentation and decentralization of institutional procurement occurs. Each region has authority to conduct its own procurement, and there is no enforcement to implement the e-procurement. The National Procurement Agency (LKKP) is an institution which is responsible for e-procurement, based on the Presidential Decree No. 54, 2010.

Each ministry, non-ministry institution, and local government can set up an independent Procurement Service Unit which is separated from the organization units which make the budgets. This separation function is aimed to avoid the collusion and the autonomy of the procurement process. Each Institution which is called ULP (Procurement Service Unit) is created based on Minister Decree or Head of non-ministry institution and regional head. Yayan Rudianto's (2011) study on legal format mentioned that based on the President Decree No. 54, 2010, that National Procurement Agency (LKKP) is the only non-department institution in Indonesia which has the authority to improve and formulate the policy of government goods/services procurement. Test results prove this analysis results in the previous test showing that the main weaknesses of the implementation of e-procurement is a legal vacuum or less strong legal basis that became the foundation for implementing procurement at the local level. One of the vacuums in e-procurement regulation is public watch regulation in order to prevent corruption in public purchasing. "one of (the) factor(s) causing deviation of procurement is the vacuum of regulation on surveillance done in whole procurement phases and processes, so it creates the potential state budget loss or misuse"stated by non government organization activist." In line with above statement, Transparency International interviewed some businessmen and confirmed the conclusion:

> Participants agreed that decentralization has made procurement much less transparent. They noted that many of the provinces and local governments have different procurement regulations, which are not consistently applied. Moreover, on the provincial and local level, responsibility and reporting duties are not very clear. The representative of National Public Procurement Organization (LKKP) noted two problems at the provincial and

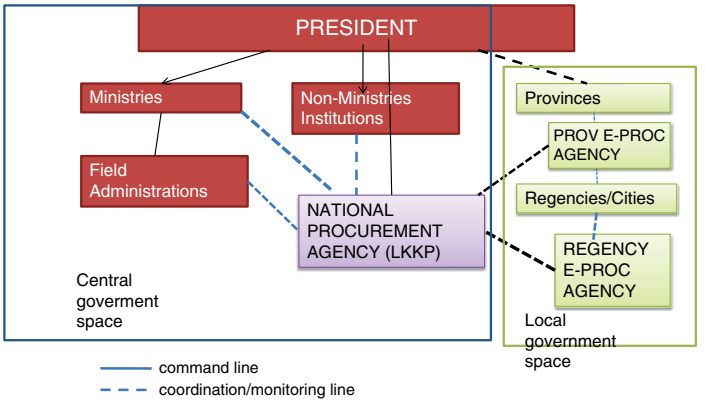



**Figure 2.** Fragmented central and local procurement system within the executive branch

local level: 1) there are many different interpretations of the procurement rules and 2) there is political pressure to favor certain bidders. National Public Procurement Organization is drafting a national procurement law but it is not expected to become law until 2014 or 2015 (Transparency International-USA and Center for International Private Enterprise, 2011).

Regardless of its legal standing, a presidential regulation has many weaknesses in terms of regulating the procurement of good and services. APEC Procurement Strategy (2012) noted that there are three weaknesess of the regulation. However, it does not address a number of problems in Indonesia's procurement system and it does not apply to all state-owned companies, particularly national oil and mining companies. The regulation is also missing interaction between the Presidential Regulation and other existing laws applicable to procurement, such as the Construction Services Law (Act No. 18/1999) and the Law on State-Owned Enterprises. The relationship between the former and the latter is not clear since both these laws also have provisions governing procurement. Second, the regulation also does not contain provisions specifically authorizing civil society monitoring of procurements and third the Presidential Regulation does not have a sufficiently high legal status to truly standardize the public procurement system throughout Indonesia, but rather there exist a "plethora of decrees, regulations, and instructions" ranging from ministers and provincial governors to district officials and municipal mayors "that contain conflicts and inconsistencies."

As a result, the implementation of regulations is less powerful. Second, many legal institutions (police and attorney offices) have different interpretations in the field. Various cases found in some local governments that many goods and services procurement committees resigned from their position because of frequent conflicts of interest and strong pressures from the internal and external environment in the procurement process, such as the Local Council Office of Rangkasbitung (Serang Post, February 1, 2009). Another case is the resignation 35 members of the entire procurement committee caused by a suspect decision of the Local Attorney Office on its five members in the case of a road and pedestrian project (Tabalongpost, April 13, 2013). Panda *et al.* (2010) did same study in India and found that the lack of an enabling national legal procurement law has allowed overly flexible interpretation of government policies by corrupt officials for vitiating public procurement process.

In addition, the systems integration factor became a problem, which is important for the implementation of e-procurement, since the absence of the same standard in e-procurement system and the lack of good monitoring of the NPA cause serious problems. e-Procurement Unit (LPSE) was developed by the Centre for Policy of Good and Service Procurement, the National Planning Agency in 2006 in accordance with Presidential Instruction No. 5 Year 2004 on Accelerating Corruption Eradication. e-Procurement is becoming one of the important programs under the coordination of Bappenas. In early implementation in 2007, this method has been performed electronically by Bappenas and the Ministry of National Education. At that time there was a new server for the e-procurement unit residing in Jakarta with the address: www.pengadaannasional-bappenas.go.id, which was managed by Bappenas.

In 2010, the NPA developed an NPA digital certificates (OSD) collaborated with the Code State Institute. This system embodies the concept of a Public Key Infrastructure (IKP) whose development started in 2009 and was expected to be implemented gradually in 2010. Through the application of OSD, every provider of goods/services will have a digital certificate that can be used to do the bidding securely.

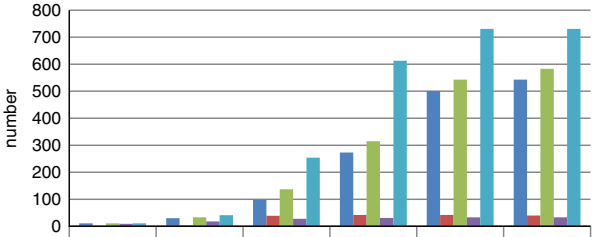
The independent e-procurement model brings consequences for the many scattered and fragmented e-procurement units (see Figure 3). Providers must first register in each auction to follow at e-procurement of NPA. In Jakarta, for example, a provider will register and verify in e-procurement unit of Ministry of Finance or Ministry of Education or National Police Office, and Ministry of Health. In 2010 LKPP developed the aggregation system through INAPROC which allows providers to simply register and verify at one e-procurement unit, after which they can follow auctions across all e-procurement units. This system was implementated gradually starting from the city of Yogyakarta and provincial e-Procurement Unit.

NPA currently manages, limits, and monitors three types e-procurement: e-Procurement (LPSE) system providers, e-Procurement (LPSE) service providers, and autonomous e-Procurement (LPSE):

(1) The provider LPSE has system LPSE organizations such as are described below, and have hardware which is not limited to network devices and servers that have installed electronic procurement systems (SPSE). As for the other functions which fall under the responsibility of the field system administration, this type of LPSE also carries out other functions: socialization of PPK/procurement committee and goods/services providers; training for the procurement committee and PPK/goods/services providers; serving the PPK/procurement committee to get the access code; and verifying the document (Deed, SIUP, TDP, a business license compliance field, ID card owner and/or director of the company, etc.), for goods/services providers who previously have done registration to obtain an access code online; and other functions. With this the applicant LPSE will have its own web address.

(2) LPSE service provider: the service provider LPSE manages non-owned web-LPSE server that has installed SPSE such as Tasikmalaya City Government web site with the address: www.lpse.jabarprov.go.id (this address belongs to LPSE West Java province).

(3) Autonomous e-Procurement (LPSE) belongs to autonomous agency.




| | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 |
|---|---|---|---|---|---|---|
| LPSE System Provider | 11 | 30 | 98 | 273 | 501 | 543 |
| LPSE Service Provider | 0 | 3 | 39 | 42 | 42 | 40 |
| LPSE | 11 | 33 | 137 | 315 | 543 | 583 |
| Prov. Service Coverage | 9 | 18 | 28 | 31 | 33 | 33 |
| User Agencies | 11 | 41 | 254 | 613 | 731 | 731 |

**Source:** Nurmandi (2013)

**Figure 3.**
e-Procurement progress implementation (2008-2013)

## Conclusion

In this paper, we focussed on confirming that conventional variables actually affect the efficiency and effectiveness of e-procurement. Second, we try to answer why some variables have no effect on the dependent variable. Throughout the test, the impact of all independent variables on efficiency and effectiveness of e-procurement were not statistically significant at any of the local governments. Although these differences does tell us the relative effectiveness of the e-procurement initiative. The varying degrees of success in e-procurement implementation and a different mix of determinants affecting e-procurement efficiency and effectiveness in three Indonesian cities imply that it is crucial to consider local contexts in carrying out reforms. The synergy between the central government and local governments, the effective response of local governments to the central government, and reinforcement of local capacity and willingness to fight corruption and carry out e-procurement programs are important factors for successful e-procurement implementation.

A crucial question arising is whether, there has been significant sub-national variation in the e-procurement implementation, we are witnessing the better performance of local government in doing e-procurement project. By observing three cases of procurement above, we try to build the theory of joint project between central government and local government is built on a simple model of local implementer, which I capture as a repeated prisoner's dilemma game between a central government as an enforcement agent and the implementer (Osborne, 2004). The presence of a strong local government policy to e-procurement will not in itself secure implementation. In other word, the local government needs to secure support from the central. However, if the central government remains indiscipline then prosecution is much less likely and dependent on the extent of local government discipline (see Table V).

Table V captures this game with static payoffs; it shows that in a one-shot game both players will obey and receive but that they could neglect. This simplifies the dynamic formation of local government and central government alliances by assuming that the game is played. Each government can either discipline or neglect in terms of president's instruction on e-procurement implementation. If central government do discipline way then local government prefer to neglect.

## Implication

The result of this study has practical implications to improve the performance of e-government at local level. Studies still need to be carried out concerning some strategic policies, namely to speed up the law deliberation on public procurement; to make the NPA more powerful in terms of its power to execute procurement policy and to speed up e-procurement implementation at central government. One urgent step of the central government is to create a national procurement plan covering the variation of local government capacity in implementing e-procurement. The practical plan for

**Table V.**
Central government and local government relation

| | | Central government discipline | | |
|---|---|---|---|---|
| | | Weak | Strong | None |
| Local government obedience | Weak | Unlikely | Possible | na |
| | Strong | Possible | Likely | na |
| | None | na | na | na |

Indonesia's complexity of government administration is to divide the procurement plan according to big islands and their characteristics, such Sumatera, Java, Kalimantan, Sulawesi, Maluccous, and Papua. Those characteristics are geography, ICT infrastructure, human resources, and local government capacity. Sacks *et al.* (2014) found that procurement reform across Indonesia points to a strong association between the wealth of a district and the adoption of procurement reform. A crucial question which arising is whether there has been significant sub-national variation in the e-procurement implementation. We are witnessing better performance of local government in e-procurement projects. By observing the three cases of procurement above, we try to build the theory of joint projects in the context of a decentralized procurement system between the central government and local governments. This is built on a simple model of a local implementer, which I capture as a repeated prisoner's dilemma game between a central government as an enforcement agent and the implementer (Osborne, 2004). The presence of a strong local government policy to e-procurement will not in itself secure implementation. In other words, the local government needs to secure support from the central government. However, if the central government remains undisciplined, then prosecution is much more dependent on the extent of local government discipline.

## Acknowledgments

This work is supported by an International Scholar Exchange Fellowship (for the academic year of 2013-2014) of the Korea Foundation for Advanced Studies (KFAS), Seoul, Korea. The authors also wish to thank anonymous reviewers for their insightful comments and suggestions. The last version of this paper was presented in International Conference on Public Procurement, Dublin Irlandia, August 14-16, 2014.

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**Appendix**

| Variables | Indicators |
|---|---|
| Leadership | (a) Government has vision and objective on good public procurement |
| | (b) There is vision consultation mechanism with stakeholders |
| | (c) Publishable vision and objectives |
| | (d) Government has public procurement master plan |
| | (e) Government has specific independent public procurement |
| | (f) Clear policy on e-procurement such as governance, budget, human resources, standard operating procedure, and technology |
| | (g) Government tries to involve private sector and community in procurement process |
| Human resources | (a) There is official dealing with human resources of procurement |
| | (b) There is clear policy on certification of procurement |
| | (c) Education and training of procurement |
| | (d) Education and training of public procurement for suppliers |
| | (e) Career development for procurement official |
| | (f) The willingness of government officials to be procurement official |
| Planning and management | (a) Local government has clear and visionary plan on procurement |
| | (b) Procurement plan is linked with e-Government plan |
| | (c) Following e-procurement international standard |
| | (d) Procurement unit monitors daily procurement processes |
| | (e) Clear standard operating procedure |
| | (f) Disciplined implementation of procurement procedure |
| | (g) Accountable and open decision making processes |
| | (h) Time schedule of procurement according the regulation |
| Policy and regulations | (a) Strong and coherent government policy on public |
| | (b) Specific and independent procurement institution |
| | (c) Procurement policy for small and medium enterprises |
| | (d) Competitiveness of procurement process |
| | (e) Local government policy on permanent procurement unit. |
| | (f) The cycle of procurement process |
| | (g) Procurement unit has obligation to share information on procurement process and its output |
| | (h) Accountability policy process is available |
| | (i) Suitability of law and regulation in response to technological change and environmental change |
| Infrastructure and standard | (a) Availability of ICT |
| | (b) Accessibility of supplier |
| | (c) Bandwidth capacity |
| | (d) The availability of human resources of software and hardware |
| | (e) e-Procurement standard is sound and clear |
| | (f) Well implemented standard |
| | (g) Availability of security system in e-procurement |
| | (h) The increasing number of supplier of good and services |
| | (i) There no discrimination based on locality |
| System integration | (a) Stability and availability of e-procurement systems |
| | (b) Feedback systems in e-procurement |
| | (c) Training for private suppliers |
| | (d) Good monitoring systems |
| | (e) Good monitoring systems on procurement processes |
| | (f) web-based systems |
| | (g) Online systems on procurement regulation and procedures |

(*continued*)

**Table AI.**

| Variables | Indicators |
|---|---|
| Efficient and effectiveness of e-procurement | (a) e-Procurement guarantees the selection of the best provider<br>(b) Procurement process is an efficient process according to regulations<br>(c) Efficient process of procurement<br>(d) Benefit of e-procurement for suppliers such as efficient, fairness, competitiveness<br>(e) Equitable process<br>(f) Transparent procurement process<br>(g) Prevention of corruption in procurement |

**Table AI.**

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