A concept to evaluate procurement principles implementation of public construction project in Surabaya

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Abstract. Public construction procurement is a Government program to meet infrastructure needs. As a government program that uses the public budget as a source of funding, public procurement tends to be vulnerable to various problems and criticisms, especially related to public trust as users. Therefore, the government must prove that the implementation of procurement including the procurement of construction can be relied upon, so it must be carried out professionally and ethically. To guarantee that, construction procurement must adhere to the principles set out in the regulation. Presidential Regulation of the Republic of Indonesia Number 16/2018 regulates Public Procurement of Goods and/or Services and establishes 7 principles of procurement implementation, including: efficient, effective, transparent, open, competitive, fair, and accountable. This paper is an initial stage of research to evaluate the implementation of the principles of construction public procurement. The purpose of this study is to identify the indicators that must be met by the government in the implementation of these principles. These principles will become the research variables, while the indicators are obtained from related literature studies. The data in this study were obtained by distributing questionnaires and interviews with several parties concerned with the public procurement in Surabaya. According to the experts’ opinion, there are found that 48 indicators of the principles which could be used to evaluate the principles of the implementation of public construction project procurement in Surabaya.

1. Introduction

The construction sector as an inseparable part of the procurement system is also strengthened by the general definition of procurement as the acquisition of goods, services, or construction, from a third party, at the best possible price, in an appropriate quantity, at the right time and place [1]. Specifically, in the construction projects, procurements are the acquisition of new buildings, space in the buildings, either by directly buying, renting, or leasing from the open market or by designing and building the facilities to meet a specific need [2].

Procurement and construction, especially those related to government projects are complex things. Procurement is very complex because it involves cultural, leadership, management, economic, environmental and political issues [3] while construction is very complex because it must integrate the interests of a large number of stakeholders towards the ultimate goal to realize the facilities being built. Furthermore, government procurement is very vulnerable to public trust because it uses the
State/Regional Government Budget, which is a public fund as a source of funding [1]. The use of public funds has an impact on the vulnerability of public trust in the procurement system.

To address the vulnerability of public trust and various problems in a procurement, the government as well as other countries use information technology (IT)/ electronic procurement (e-procurement) as a medium for the procurement of goods and services, including construction sector. E-procurement is a system that can be relied upon by an organization in making contracts for product acquisition and service purchase by utilizing IT systems. [4]. E-procurement positively contributes to helping developing countries that tend to experience problems with transparency, accountability, and public participation to access information [5]. Specifically, e-procurement has good benefits in reducing labor costs and errors, reducing material costs with strategic purchases, enabling companies/government to more efficiently and accurately capture and aggregate how much they spend on the company for the various products purchased, and has an overall impact on the company/government's asset base [6].

Besides the problems that have been explained before, there are some barriers in the implementation of e-procurement including security of transaction issues, high technology costs, lack of legal framework, lack of technical expertise, lack of knowledge related to e-procurement, and lack of working relationships with business partners [7]. Therefore, the implementation of this system must be carried out carefully and professionally, and develop continuous strategies and innovations.

One of the cities in Indonesia that first implemented e-procurement and was considered successful is Surabaya. E-procurement has been started and developed in Surabaya since 2004. The procurement system in Surabaya was even adopted as a national pilot system in Indonesia. Surabaya is considered as the most successful city in implementing e-procurement in Indonesia and is often used as a model for other regions in Indonesia. This is very interesting to review as well as to find out how Surabaya implemented the system when there were many problems and obstacles that occurred globally as previously explained.

One thing that can be evaluated is how Surabaya applies the policies and procedures in the form of procurement principles. This is because procurement principles are the cornerstones of public procurement implementation which in detail should regulate public procurement management, including the framework and code of conduct of public procurement for all relevant parties [8]. The principle is clearly stated in Presidential Regulation of the Republic of Indonesia Number 16/2018 which stipulates seven principles of procurement implementation, including: efficient, effective, transparent, open, competitive, fair, and accountable.

Based on the description of these conditions, this research wants to find out the indicators of procurement principles that can be used to evaluate the implementation of procurement principles, specifically in the construction project sector in Surabaya. The 7 principles will become the research variables while the indicators are obtained from related literature studies. The data in this study were obtained by distributing questionnaires and interviews with the experts. After identifying the indicators, it can be known what indicators are relevant to be used in evaluating the implementation of the principles of public procurement in Surabaya, and which can be used as a benchmark for improvement for further analysis.

2. Literature review

2.1. Public procurement
Public procurement is a product of public policy issued and endeavored by the government. It is defined as a very important government system for spending public money with the aim of obtaining goods, jobs and services needed for public programs and projects [9]. The main purpose of public procurement is a guarantee of the effectiveness of the contract to related parties, both to contractors or suppliers who meet the requirements to provide goods and services required to support public services in accordance with established principles and regulations [8].
2.2. **Electronic procurement (E-Procurement)**

E-procurement is a procurement system that is applied to an integrated database system and wide area internet-based communication system network in part or all of the purchasing processes [10]. Generally, e-procurement is defined as a comprehensive process in which organizations use IT systems to establish agreements for the acquisition of products or services (contracting) or to purchase products or services in exchange for payment (purchasing) which includes electronic ordering, internet bidding, card purchases, auctions, and automatic procurement system integration [11].

E-procurement offers promising opportunities as regards the efficiency, transparency, and opening up of public procurement, ensuring that public contracts are awarded to the bidder offering the best value for money [12].

E-procurement is often exposed to issues of quality of resources or the performance of procurement and provider employees, procedural errors, lack of transparency, and so forth. One research found that the problem of professional resistance is one of the very serious problems in e-procurement. This is indicated by the lack of understanding related to bureaucracy and finance which leads to the less competitive preferences so that e-procurement also leads to certain bidders [13].

2.3. **Construction procurement**

Construction helps capital formation and employment [14]. Construction procurement is the purchase of construction-related services with the ultimate goal of creating new buildings or new structures, including all related work or location changes, repairs, maintenance, expansion, or demolition of new buildings or existing structures [1].

The procurement activities are distributed among multiple parties in each project phase, according to the selected procurement method. The activities of construction procurement are described into 4 phases: (i) the pre-contractual phase: define requirements, plan the procurement process, pre-tender survey, obtain the necessary approvals, bid solicitation; (ii) the contracting phase: bidder selection, pre-bid conference, tender evaluation, purchase order; (iii) the contract administration phase: monitor progress, follow up on delivery, administer progress payments; and (iv) the post-contractual phase: file final action contractor agreement to final claim, issue final contract amendment, complete of financial audits, check for proof of delivery, return of performance bonds and close-out, and ensure completeness and accuracy of file documentation [1].

2.4. **Principles of public procurement in Indonesia**

The principle of public procurement regulates the management of public procurement, including the establishment of a framework for implementing the code of conduct for all parties directly or indirectly involved in the process of implementing public procurement [8].

Each country basically has its own principle of public procurement based on economic, political, and other circumstances and conditions in the country. In Indonesia, these principles are emphasized in Presidential Regulation of the Republic of Indonesia Number 16/2018 which stipulates 7 principles of procurement implementation, including: efficient, effective, transparent, open, competitive, fair, and accountable.

Efficiency can be seen as a situation where procurement can reduce losses or waste of resources, but with these limitations, it is able to produce benefits and better output in terms of time, cost, and energy [17] [4]. This principle requires that the government procurement process be proportional to the values and risks of the project that underlie the activity, which is generally related to time sensitivity and delay avoidance, meaning that with a minimum budget the quality of public procurement results can be obtained [9].

The effective principle can be interpreted productively, namely the available resources obtaining goods and services that have the highest benefits [18]. This principle is a condition where the use of government procurement can achieve the desired results [17] [19].
Transparent is the provision of complete information to all prospective participants. The transparent is a principle that requires the disclosure of relevant information related to procurement to the public through sources that are easily accessible and widely available at reasonable prices or at no cost, the existence of reporting related to the implementation of activities, and the use of confidentiality in contracts [20]. A research in Scandinavia found that one of the causes of the low corruption rate in Scandinavian countries was the application of information transparency, namely providing maximum freedom for the public to access documents owned [21].

Open principle provides opportunities for all competent providers of goods and services to be involved [20]. This principle also emphasizes the involvement of the community in carrying out social control to meet the demands of civil society for information needs [22].

Competitive principle refers to the involvement of two or more bidders, preventing competition restrictions [23]. That competition is based on ethics and norms including avoiding the practices of Corruption, Collusion, and Nepotism [20].

Fair principle is related to the equal and equitable treatment of each individual or organization that offers, which means that the supervisor of the applicant is in legal and factual circumstances [8], [9], [21]. This principle also needs a code of conduct as which reflects the policies, practices and procedures, and the same perceptions for all parties [24].

The principle of accountable refers to the existence of an effective control mechanism with a clear chain of responsibility based on the authority of the parties involved at each stage and complementary internal and external controls to ensure the principles of procurement benefits, the handling procurement complaints and disputes in accordance with the mechanism apply, and the involvement of the civil society organizations, the media and the wider community to participate in evaluating the procurement implementation process [25].

The reviews above are just a few of the many opinions and reviews from various literatures. Therefore, table 1 containing summary of opinions is provided as an indicator of procurement principles and the result of the survey.

3. Research methodology
This research method is to identify the indicators of variables, preliminary surveys involving experts, and survey analysis. The preliminary survey was conducted by involving four experts who were directly involved in public procurement in Surabaya. The experts in this survey are those who have experienced at least 5 years in this field.

The preliminary survey is to verify the indicators of the principle of public procurement that have been identified from literatures. This stage is also to get opinions from experts if there are indicators of a principle that overlaps with other principle indicators. To verify the indicators, the preliminary survey used a 1-5 scale representing highly irrelevant to highly relevant. Then the indicators are considered relevant if the mean of the variable is greater than three (>3).

4. Result and analysis
Based on the preliminary survey analysis, there are some indicators that are omitted because they are considered irrelevant with a value of less than 3, or have similarities with other indicators in the principles. There are total 48 relevant indicators and 14 irrelevant indicators in this survey. The results of the survey can be seen in table 1.

| NO | Indicators                              | Source                 | Rank | Mean | STD  |
|----|----------------------------------------|------------------------|------|------|------|
| A. | EFFICIENT                              |                        |      |      |      |
| 1. | Utilization of electronic system       | [26]                   | 1    | 4.50 | 0.58 |
| 2  | Less time process                     | [4], [9], [17], [18],  | 2    | 4.25 | 0.96 |
|    |                                        | [27]                   |      |      |      |

Table 1. Indicators of public procurement principles and the result of survey
### 3. Decreasing number of claims

|   |   |   |
|---|---|---|
| [28] | 3 | 4.25 | 0.50 |

### 4. Single point access

|   |   |   |
|---|---|---|
| [26] | 4 | 3.75 | 1.50 |

### 5. Less cost process

|   |   |   |
|---|---|---|
| [4], [17], [27], [28], [29] | 5 | 3.75 | 0.96 |

### 6. Reduction of human error

|   |   |   |
|---|---|---|
| [28] | 6 | 3.75 | 1.26 |

### 7. A classification system for goods, works, and services

|   |   |   |
|---|---|---|
| [26] | 7 | 3.50 | 1.73 |

### 8. Decreasing number of administrative staff

|   |   |   |
|---|---|---|
| [28] | 8 | 2.50 | 1.73 |

### 9. Increased number of participation

|   |   |   |
|---|---|---|
| [31] | 9 | 2.25 | 0.96 |

### 10. A classification of procurement value

|   |   |   |
|---|---|---|
| [26] | 10 | 1.00 | 0.58 |

**B. EFFECTIVE**

1. Achievement of procurement goals

|   |   |   |
|---|---|---|
| [17], [30], [32] | 1 | 5.00 | 0.00 |

2. Completion on time

|   |   |   |
|---|---|---|
| [19], [60] | 2 | 4.50 | 0.58 |

3. In accordance with people needs

|   |   |   |
|---|---|---|
| [61], [62] | 3 | 4.25 | 0.96 |

4. Program integration

|   |   |   |
|---|---|---|
| [30], [33] | 4 | 4.25 | 0.50 |

5. Control mechanism that regulates procurement

|   |   |   |
|---|---|---|
| [26] | 5 | 4.00 | 0.82 |

6. System quality

|   |   |   |
|---|---|---|
| [32] | 6 | 3.75 | 1.89 |

7. Minimize face to face communication

|   |   |   |
|---|---|---|
| [34] | 7 | 3.75 | 1.89 |

8. There is a management that regulates the communication process, strategy, innovation, and program adaptation

|   |   |   |
|---|---|---|
| [15] | 8 | 2.75 | 1.50 |

**C. TRANSPARENT**

1. Rules and procedures are simple and easy to apply

|   |   |   |
|---|---|---|
| [35], [36],[37], [38] | 1 | 4.75 | 0.50 |

2. Access to information

|   |   |   |
|---|---|---|
| [21],[26], [34], [37], [38], [40], [39], [42], [40], [41], [42] | 2 | 4.75 | 0.50 |

3. Information availability

|   |   |   |
|---|---|---|
| [8], [9], [20], [34], [39], [43], [23] | 3 | 4.50 | 0.58 |

4. Ease of accessing the system

|   |   |   |
|---|---|---|
| [20] | 4 | 4.50 | 0.58 |

5. Budgeting visibility

|   |   |   |
|---|---|---|
| [38] | 5 | 3.75 | 1.89 |

6. Monitoring and sanctions mechanism

|   |   |   |
|---|---|---|
| [35] | 6 | 3.75 | 1.89 |

7. Archiving documents

|   |   |   |
|---|---|---|
| [38] | 7 | 3.50 | 1.91 |

8. Mass media participation

|   |   |   |
|---|---|---|
| [37], [38] | 8 | 3.00 | 1.62 |

9. Society participation

|   |   |   |
|---|---|---|
| [44] | 9 | 2.50 | 1.91 |

10. Information justification

|   |   |   |
|---|---|---|
| [8] | 10 | 2.25 | 1.50 |

**D. OPEN**

1. Admission based on qualifications

|   |   |   |
|---|---|---|
| [8] | 1 | 4.75 | 0.50 |

2. Blacklist/suspend list publication

|   |   |   |
|---|---|---|
| [16] | 2 | 4.50 | 0.58 |

3. Dissemination of procurement information

|   |   |   |
|---|---|---|
| [45] | 3 | 3.50 | 0.58 |

4. There are no restrictions on participants based on origin, location, religion, ethnicity, or political orientation

|   |   |   |
|---|---|---|
| [20] | 4 | 3.25 | 0.58 |

5. Utilization of local resources

|   |   |   |
|---|---|---|
| [26] | 5 | 2.25 | 1.50 |

6. Privacy protection policy

|   |   |   |
|---|---|---|
| [8] | 6 | 2.25 | 1.73 |

**E. COMPETITIVE**

1. There was no intervention from any party

|   |   |   |
|---|---|---|
| [8] | 1 | 4.75 | 0.50 |

2. Clear procedures and requirements related to procurement competition

|   |   |   |
|---|---|---|
| [42], [23], [49] | 2 | 4.75 | 0.50 |

3. The same opportunity to compete

|   |   |   |
|---|---|---|
| [42] | 3 | 4.25 | 1.50 |

4. Procurement Agency is not affiliated

|   |   |   |
|---|---|---|
| [48] | 4 | 4.25 | 0.96 |

5. The completeness of document

|   |   |   |
|---|---|---|
| [42] | 5 | 4.25 | 0.96 |
|   | Involving three or more bidders | [42], [23], [46] | 6 | 4.00 | 1.41 |
|---|---|---|---|---|---|
| 7. | Obey the procurement norms and ethics | [20], [50] | 7 | 3.50 | 0.58 |
| 8. | The proportion of the number and value of direct appointment contracts is smaller | [47] | 8 | 2.50 | 0.58 |
| 9. | Participation of small and medium enterprise (SME) | [58] | 9 | 2.25 | 1.00 |

**F. FAIR**

1. Determination of winners based on qualifications | [8] | 1 | 4.75 | 0.50 |
2. Avoiding conflicts of interest | [22] | 2 | 4.75 | 0.50 |
3. Equal distribution of rights and obligations between candidates | [9] | 3 | 4.50 | 0.58 |
4. Code of Conduct | [24] | 4 | 4.50 | 0.58 |
5. Equal opportunity and treatment for participants | [8], [9], [21], [39], [42], [51], [52] | 5 | 3.75 | 1.89 |
6. The technical specifications required do not refer to specific brands | [26][59] | 6 | 3.75 | 1.89 |
7. The low number of complaints received | [54] | 7 | 3.75 | 1.89 |
8. Bidding considerations are based on compliance | [21] | 8 | 3.25 | 1.71 |
9. Credible mechanism to solving complaints | [53] | 9 | 2.75 | 1.53 |

**G. ACCOUNTABLE**

1. There is a control or supervision mechanism | [8], [38], [41] | 1 | 4.75 | 0.50 |
2. Internal and external audit | [34], [38], [41] | 2 | 4.75 | 0.50 |
3. Open reporting system | [26] | 3 | 4.50 | 0.58 |
4. Professionalism standard | [56] | 4 | 4.25 | 0.96 |
5. Action due to performance in the form of rewards and sanctions | [8], [38], [42], [57] | 5 | 4.00 | 1.41 |
6. Organizational framework | [38], [55] | 6 | 3.75 | 1.26 |
7. Conflict/complaint resolution | [25], [38] | 7 | 3.25 | 1.71 |
8. Evaluation by society | [25], [42] | 8 | 2.75 | 1.26 |
9. Supervisory agency | [42] | 9 | 2.25 | 1.73 |
10. Publication of uncompetitive procedures | [42] | 10 | 2.00 | 1.53 |

Fourteen (14) irrelevant indicators (<3) of each principle are as follows: 3 out of 10 Efficient principles include irrelevant, they are decreasing numbers of administrative staffs, increased numbers of participations, and a classification of the procurement value, while the most relevant indicator is the Utilization of Electronic System.

One (1) of 8 indicators of Effective principle is irrelevant, namely the management that regulates the communication process, strategy, innovation, and program adaptation, while the most relevant indicator is the Achievement of procurement goals. For the principle of transparency, 2 of 10 indicators are irrelevant, they are society participation and information justification. For relevant indicators, there are 2 most relevant namely Rules and procedures are simple and easy to apply and Access to information. For the open principle, there are 2 of 6 indicators are irrelevant. They are utilization of local resources and privacy protection policy while the most relevant indicator is admission based on qualifications.

There are 2 of 9 indicators of competitive are irrelevant. They are the proportion of the number and value of direct appointment contracts is smaller and participation of small and medium enterprise (SME). On the other hand, the most significant relevant indicators are there was no intervention from any party and clear procedures and requirements related to procurement competition. One (1) of 9 fair principle indicators are irrelevant namely credible mechanism to solve complaints while the most relevant are determination of winners based on qualifications and avoiding conflicts of interest.
For accountability principle, there are 2 of 10 indicators are irrelevant. They are publications of uncompetitive procedures and supervisory agency while the most relevant indicators are: There is a control or supervision mechanism and internal and external audit.

5. Discussion

There are total 14 indicators that are categorized as irrelevant, so it is necessary to explain a number of things as the main reasons for which they were given a low score and then not relevant.

Indicator decreasing number of administrative staff is basically related to the use of electronic systems, which then results in the number of staff that should not be as many as if using a traditional system. However, experts believe that the indicator is not very big if used to measure procurement efficiency because the needs of resources (staff) are very dependent on the internal needs of the organization. Indicator increased number of participations, according to experts, is irrelevant because the number of bids is basically not limited, this is due to every incoming bid regardless of the amount to be selected in accordance with the provisions of the terms and conditions set for each type of work. Indicator a classification of procurement value is irrelevant because detailed procurement rules have classified each type of work into the procurement category with their respective methods with the amount of the value of their respective projects.

Indicator the management that regulates the communication process, strategy, innovation, and program adaptation, according to the expert, is irrelevant because this relates to the procurement rules themselves. This indicator is related to upper management because it is related to the character of each organization. Indicator society participation is irrelevance in transparent principles. Transparency does prioritize access to information, but the right to information for the community in a system can be accessed through the website system. In addition, the role of the community can be directly categorized more or less the same as mass media participation, in which the results of the analysis include relevant indicators.

Indicator information justification is basically related to the provisions of the categorization of types of information whether the information is public or confidential information so that it can be a reference, whether it can be accessed publicly or not. According to experts, this indicator is less significant because basically all types of information must be displayed to the public, except if it has entered the realm of procurement which indeed at this stage must be kept secret. Indicator utilization of local resources is related to the alignment of local resources. According to experts, this can be categorized as irrelevant because in the rule of non-local resources, including certain brands may be used on condition that the resources or specifications cannot be met domestically.

Privacy protection policies, is not related to open principles. According to experts, this is basically the same as indicator information justification, which is related to information, but there should be nothing to keep secret if it follows the participant data. Indicator the proportion of the number and value of direct appointment contracts is smaller, is similar to indicator a classification of procurement value, that the experts argue that procurement rules explicitly regulate and categorize the types of work in the procurement system based on the amount of each value with their own method. Therefore, the size of the amount and the value of procurement indeed affect each type of work.

Indicator Participation of Small and Medium Enterprise (SME), according to experts, cannot be used as a measurement tool for competitive principles. This indicator is similar to indicator the proportion of the number and value of direct appointment contracts is smaller, that the SME has its own portion in the type of work in the procurement system, including construction. The participation requirements are basically explained in each type of work, including the level of business of the participant.

On the principle of fair, there is one irrelevant indicator which is indicator credible mechanism to solve complaints. According to experts, this indicator is more inclined to the principle of transparency for
the indicator of monitoring and sanctions mechanism. This is because basically it has the same intention related to handling complaints and giving sanctions that must be known and understood as rules for the participants.

In the principle of accountable, there are 3 irrelevant indicators. Indicator evaluation by society is the same as indicator society participation, that this role can already be achieved through the participation of the media depicted in the mass media participation indicator. Indicator publication of uncompetitive procedures, according to experts, is every action that leads to fraud should be processed internally and the final result in the form of a new blacklist action can be disclosed to the public, as confirmed in an open principle indicator: Blacklist publication. Finally, indicator supervisory agency in which the experts stated that the indicator is the same as the internal and external audit, indicator of the principle of accountable.

6. Conclusion and recommendation

In accordance with the background of this study, this study aims to obtain indicators that can be used to evaluate the implementation of the principles of public procurement. Based on the literature studies, 62 indicators were obtained which were grouped into 7 Indonesian public procurement principle variables. After the preliminary survey analysis with the experts, 48 indicators were obtained which could be used to evaluate the implementation of the principles of public procurement and 14 other indicators were declared irrelevant. This research is expected to help further research in evaluating and designing strategies for improving public procurement for government.

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