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Development of contractor quality assurance system in Indonesia construction procurement

Dewi Larasati ZR

A dissertation submitted to
Kochi University of Technology
in partial fulfillment of the requirements
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by

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ABSTRACT

One of the efforts that are considered to improve the public welfare in Indonesia is provision of good infrastructure that accelerates country development. Although the investment of construction works in Indonesia tends to increase from year to year, however, the growth of investment is not accompanied by performance improvement of construction works project. In construction of infrastructure projects, contractor has difficulties to reach the minimum quality requirements that are specified in each project plan. Other examples of poor performance are delay of work completion and increasing cost of the project. The poor project performance causes low value for money of investments. Performance improvement of an infrastructure project by an even few percentage would save billion dollars of value for money. Therefore, the achievement of good performance of construction works project is very significant for supporting socio economic development of the country.

The government as a key stakeholder in the construction industry has been making various efforts to improve public works performance. However, the efforts have not shown significant impact to the project performance improvement. Nowadays, Indonesian public works have been facing many problems throughout project lifecycle that are caused by uncontrolled risk.

This research observes and analyzes the current condition of Indonesia construction works, in order to find the causes that the stakeholders cannot cope with construction risk during project lifecycle. It is found that some problems appear throughout project lifecycle in Indonesia construction works that lead the current condition to the poor performance. The appearance of the problems is influenced by some factors including economical, technical, relational and legal factors.

Review of current reform indicates that tight competition under insufficient past performance information leads to risk appearance in almost every stages of project delivery system. Under economic crisis the government forces to promote policy of budget savings by awarding the contract to the lowest bidder in public construction procurement. In this procurement scheme, the contractor is forced to bid at a very low price to be awarded in the procurement process.

Additionally, loss by corruption make the contractor has more difficulties to survive in the industry with insufficient project return. Under insufficient project budget, the contractors often have poor cash-flow for providing material supply that causes delay in works completion. In many cases, the contractors are “forced” to lower quality of works in order to increase profit margins for surviving in this business. The contractors often make claim for additional works from which they expect to get more profit. Poor contractor performance and the claim attitude result in the mutual distrust relationship, raise many disputes that also lead to adversarial relationship.

Under the adversarial relationship, each party involved becomes to have different objective and motivation in conducting project which tend to be opposed each other. These differences become a fundamental source of lack cooperation, limited trust, and inefficient communication between parties in the public works project. Each party tries to pursue their-own benefit and has less intention in risk control throughout project lifecycle. Eventually the uncontrolled risks are "transformed" to additional cost and delay in project completion. The adversarial relationship also becomes a source of insufficient communication among stakeholders which results in increasing transaction cost.

These undesirable characteristics are more prevalent in local governments and local construction industry, since the majority of public investment is managed by the local government that relate to local business entity, especially small and medium enterprises. If the current undesirable characteristics are not changed, good performance of local public works and sound development of the local industry are difficult to achieve.

Indonesian construction works need a change direction that can derive solutions to share optimum benefits among stakeholders involved in construction works. The change action in a comprehensive manner is required to enhance the performance of Indonesian construction industry. The question that often arises in the improvement process is what the first action should be done for the change process.

Review of performance improvement shows that the industry stability that can continually provide a performing product regardless of demand and is continuously improving the industry performance relates to the level performance, competition, and relationship. Additionally analysis lessons learned indicated the quality assurance mechanism is needed in increasing transparency and accountability of construction procurement to achieve best value performance. The lessons learned and literature studies show that the relationship with high alignment objectives through coalescing, partnering and collaborative relationships resulting a significant performance improvement.

Base on observation results of existing condition and the analysis result of lessons learned, a need analysis was conducted that the result indicated some necessary efforts as the antecedent action in eliminating negative consequence of current procurement scheme conditions. A system that can measure differences of performance of participants in construction procurement is needed. The objectives is to ensure that risks are allocated by the party who has good performance in managing risks during the project lifecycle, to ensure the capabilities construction firm by requiring past performance information, to ensure standard quality of stakeholders by measuring performance, to reduce transaction cost by increasing efficiency through utilization of information system, and to improve trust through greater public confidence by involvement of all stakeholders and development of strong social sanction system in order to make an attitude of good performance achievement.

The development of the system is through an integrated chain action for ensuring risk control capacity which is a cycle mechanism that provides input information to previous activities and gives feedback to next activities. The cyclic system is developed as electronic past-performance information on procurement (e-PIC) which based on reputation and best value procurement approach that involves all stakeholders. The e-PIC system consists of four sub-systems which are a registration and certification system of construction service enterprises and construction engineer, e-procurement, comprehensive evaluation for bidding system, and performance measurement under integrated supervision system that is supported by technical standard system

Moreover, analysis of the key components of change action demonstrates that in every change the related parties often resist and attempt to retain the existing patterns. Hence, it is necessary to determine a change action that has minimum difficulty in implementation process that considers historical background, considers local culture, and considers political constrain condition.

Proposed system preliminary evaluation through stakeholder survey demonstrates high confidence of stakeholder on performance improvement of proposed system implementation. Some current advantages condition and best practices in implementation concept of proposed system indicates optimality and feasibility of proposed system implementation.

The major contribution of the research is to derive the direction of construction works performance improvement action that focus on contractor quality assurance mechanism in providing more opportunity to good performer to give contribution in country development process.

Furthermore, the proposed system in this research is an initial guideline to provide the reform direction that encourages performance improvement of construction projects in Indonesia. Thus, a development of detailed process is needed in providing more advantage for Indonesia construction works performance improvement.

Key words: competitiveness, performance, procurement, quality, risk

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LIST OF CONTENTS

ACKNOWLEDGMENT.....	iv
LIST OF CONTENTS	vi
LIST OF DRAWING	x
LIST OF TABLE.	xiv
CHAPTER 1 INTRODUCTION	1
1.1 Introduction.....	1
1.2 Background	2
1.3 Problem statement.....	5
1.4 Research Objectives.....	5
1.5 Research methodology	6
1.6 Research Framework.....	7
1.7 Organization of Dissertation	9
CHAPTER 2 EXAMINATION AND FORMULATION OF CURRENT CONSTRUCTION INDUSTRY PROBLEMS IN INDONESIA	11
2.1 Current condition relates to characteristic of construction project	12
2.1.1 General issues of current condition in Indonesia construction industry	13
2.1.2 Review of process throughout project throughout project lifecycle.....	17
2.2 Analysis of factors influence external and internal to the current condition throughout project lifecycle	26
2.2.1 Cost and financial Problem	26
2.2.2 Technical Problem.....	30
2.2.3 Relational problem	34
2.2.4 Legal problems	34
2.3 Problem formulation	35

CHAPTER 3	REVIEW OF CURRENT IMPROVEMENT PROCESS	38
3.1	Analysis of the government report of public procurement reform in Indonesia	39
3.2	The contractor's views of public procurement reform in Indonesia	42
3.3	Stakeholder role in current reform	43
3.3.1	Review of government role in current reform	44
3.3.2	Society and community behavior in participating to current reform.....	47
3.4	Limitation of current reform process	49
3.5	Research question	52
CHAPTER 4	REVIEW OF CONSTRUCTION PERFORMANCE IMPROVEMENT	54
4.1	Component of construction industry performance.....	54
4.2	The important of construction procurement in industry stability.....	56
4.3	Component of industry stability in achieving best value performance	59
4.4	Lessons learned in construction performance improvement.....	61
4.4.1	Lessons learned from Japanese construction improvement process.....	61
4.4.2	Lessons learned from UK construction improvement process	64
4.5	Finding from literature review	66
CHAPTER 5	NEEDS ANALYSIS OF INDONESIA CONSTRUCTION PERFORMANCE IMPROVEMENT.....	68
5.1	The needs of performance improvement process.....	68
5.2	Needs to eliminate negative consequence of fierce competition	70
5.3	Need of risk control mechanism	72
5.4	Needs of collaborative relationship.....	74
5.5	The needs of support system in performance improvement process	75
CHAPTER 6	DEVELOPMENT OF ELECTRONIC PERFORMANCE INFORMATION ON CONSTRUCTION PROCUREMENT (E-PIC)	78
6.1	Framework for performance improvement	79
6.2	Development E-PIC (Electronic Past Performance Information in Construction Procurement) model	80

6.3	Process in the E-PIC model	81
6.4	Detail development of E-PIC system.....	82
6.4.1	Detail development of e-certification and registration system	82
6.4.2	Detail development of e-procurement system	83
6.4.3	Detail development of past comprehensive evaluation method	84
6.4.4	Detail development of past comprehensive evaluation method	85
6.5	Proposed system development	86
CHAPTER 7 EMPIRICAL STUDY OF OPTIMALITY AND FEASIBILITY OF SOLUTION IMPLEMENTATION.....		90
7.1	Stakeholder confidence of proposed project information system	90
7.2	Stakeholder views of problems and considerations in system development.....	94
7.3	Summary of survey results.....	96
7.4	Simulation of integrated supervision system development.....	97
7.4.1	Simulation of web-based system development	98
7.4.2	Component of evaluation	99
7.4.3	Simulation of evaluation process.....	102
7.4.4	Simulation result.....	103
7.4.5	Summary from system simulation.....	105
CHAPTER 8 DISCUSSION OF PRACTICAL FEASIBILITY AND OPTIMALITY OF PROPOSED SYSTEM IMPLEMENTATION.....		106
8.1	Potent and limitation of existing condition	106
8.1.1	The achievement of current e-procurement system under National Public Procurement Agency	106
8.1.2	Establishment of National Forum Community Action for Indonesian Construction (NFCA) 107	
8.1.3	Best practices from procurement of post-disaster housing reconstruction in Jogjakarta	107
8.1.4	Best practices from procurement reform in a university procurement division	109
CHAPTER 9 CONCLUSION AND RECOMMENDATION		116

9.1	Conclusion	116
9.1.1	Summary	117
9.2	Contribution	120
9.2.1	Practical contribution	120
9.2.2	Theoretical contribution	120
9.3	Limitation and issues for future development.....	121
9.4	Future needs of change development	122

REFERENCE

APPENDICES

Appendix A:
Appendix B-1: RESEARCH QUESTIONNAIRE
Appendix B-2: SURVEY RESULT
Appendix C: PAST PERFORMANCE EVALUATION FACTORS

LIST OF DRAWING

Figure 1. 1. Number of employment in Indonesia construction industry (source: Business Monitor International Data, quarter 3rd 2010).....	2
Figure 1. 2. Number of construction industry investment during 2007 to forecast 2014 in Indonesia (source: Business Monitor International Data, quarter 3rd 2010)	3
Figure 1. 3. The growth of construction industry development in Indonesia (source: Business Monitor International Data, quarter 3rd 2010).....	3
Figure 1. 4. Poor performance of Indonesia construction works that inhibit transportation and economic lines between cities and islands	4
Figure 1. 5. Research framework.....	8
Figure 2.1. General issue of construction project characteristic.....	13
Figure 2.2. Total construction works conducted by local government in billion rupiah (source: Indonesia Statistic Bureau, 2011).....	15
Figure 2.3. Distribution of construction industry enterprises in the 5 big islands in Indonesia (source: LPJK website- 2, download January 2011).....	15
Figure 2.4. Percentage value of construction completed by province based on total construction expenditure by local government in Indonesia islands at FY 2004 to 2009 (%)....	16
Figure 2.5. The growth of construction companies according to number of enterprises in Indonesia islands (source: Indonesian Statistic Center, 2011)	16
Figure 2.6. Problem pattern during project lifecycle	18
Figure 2.7. An example of the approval process of project budget (Source: observation result of a project of local government, 2006-2008).....	19
Figure 2.8. Examples of errors due to the incorrect determination of bench marks by contractor, so that the "as line" of column shifted during construction process, which results in some columns stand in the middle of the building aisle	24
Figure 2.9. The problem pattern during construction phases.....	25
Figure 2.10. Road length and construction cost data.....	27
Figure 2.11. The ratio of cost and road length tend to be steadily during FY 2004 – 2008	27

Figure 2.12. Indonesia is experiencing economic inflation from year to year, results in the unit cost of construction increasing every year (source: Statistic Data Center 2011)	28
Figure 2.13. Construction financial problem caused by corruption and tight price competition	29
Figure 2.14. Poor capacity of construction firm problem condition	31
Figure 2.15. Problem formulation throughout project lifecycle	37
Figure 3.1. Changing of public works procurement rule in Indonesia (Larasati and Watanabe 2010).....	39
Figure 3.2. Performance of Indonesia procurement reform based on Base-Line Indicator (BLI)	40
Figure 3.3. Indonesia construction works stakeholders	44
Figure 3.4. Stakeholders relationship in Indonesia	45
Figure 3.5. Defining years in Indonesian public expenditure allocation (sources: World Bank, 2007)	45
Figure 3.6. Detail condition of current reform.....	49
Figure 3.7. The risk of current procurement reform in Indonesia (Revision of Larasati and Watanabe 2009)	50
Figure 3.8. Vicious cycle of existing conditions.....	52
Figure 3.9. Research questions	53
Figure 4.1. Supply and demand issue in construction	57
Figure 4.2. Performance and competition as components of industry stability (Kashiwagi 2005)	59
Figure 4.3. Japanese construction industry performance improvement process which includes increasing quality, eliminate poor quality and ensure quality.	63
Figure 4.4. Performance improvement process in Japanese construction industry that move from quadrant III of industry sector to quadrant I and then move to quadrant II.....	63
Figure 4.5. Performance improvement process in UK construction industry which move from quadrant I of industry sector to quadrant III and then now try to move to quadrant II	66
Figure 5.1. Direction of Indonesia construction change process which is to move from Quadrant I to Quadrant III or II.....	68
Figure 5.2. Needs of performance improvement process based on lessons learned	70

Figure 5.3. Needs analysis in Indonesia construction existing condition to improve performance	71
Figure 5.4. Need of risk control mekanism	74
Figure 5.5. The needs of structural change in improving performance in Indonesia construction works current condition.....	76
Figure 6.1. Proposed performance improvement action.....	78
Figure 6.2. Framework of project implementation system for performance improvement ...	79
Figure 6.3. Integrated construction information system	80
Figure 6.4. E-PIC system for contractor quality assurance mechanism	81
Figure 6.5. Proposed e-registration and e-certification system.....	83
Figure 6.6. Proposed e-registration and e-certification system.....	84
Figure 6.7. Proposed comprehensive evaluation method	85
Figure 6.8. Proposed past performance measurement system	86
Figure 6.9. Proposed of system implementation.....	86
Figure 6.10. Proposed of simplifying existing system.....	87
Figure 6.11. Proposed of simplifying existing system.....	88
Figure 6.12. Needs for deregulation	89
Figure 7.1. Characteristic of 63 respondents that participate in survey	91
Figure 7.2. Stakeholders current access to past performance information	92
Figure 7.3. Stakeholder confidence that past performance information will improve transparency and accountability	92
Figure 7.4. Stakeholder confidence that past performance information will decrease corruption	93
Figure 7.5. Stakeholder confidence that past performance information will improve trust ..	93
Figure 7.6. Stakeholder confidence that past performance information will encourage contractor to maintain good reputation	94
Figure 7.7. Stakeholder opinion about existing constrain of proposed system development.....	94
Figure 7.8. Stakeholder opinion of the main constraint in developing proposed system	95

Figure 7.9.	Stakeholder view of consideration in developing proposed system.....	96
Figure 7.10.	Simple logic system of past performance information system.....	98
Figure 7.11.	Simulation of web-based performance measurement system.....	99
Figure 7.12.	Assessment components of past performance measurement.....	100
Figure 7.13.	Simulation of quality of product assessment in EPIC web system	101
Figure 7.14.	Weight matrix system in past performance evaluation measurement	102
Figure 7.15.	Evaluation result of 4 companies of their 3 projects	104
Figure 7.16.	Index of performance of each company	104
Figure 7.17.	Total index for each component	105
Figure 8.1.	Procurement reform at the Jogjakarta case study	109
Figure 8.2.	Procurement reform in a public university	111
Figure 8.3.	Reducing risks as objective of procurement reform.....	112
Figure 8.4.	The risk assessment during procurement process	113
Figure 8.5.	Percentage of user that satisfied with several performance indicator of the university logistic center (Source: The logistic center internal evaluation result 2009)	114
Figure 8.6.	The needs of support system in procurement reform	115

LIST OF TABLE

Table 2.1.	Indonesia construction workforce 2010	14
Table 2.2.	Construction services provider in Indonesia construction Industry	14
Table 2.3.	The chronological of budget proposal in a project that observed.....	20
Table 2.4.	The problem pattern during construction phases.....	36
Table 3.1.	Analysis of current result of procurement reform	41
Table 3.2.	Differences in objectives in client and contractor's views in Indonesian public works	46
Table 3.3.	Risk factors in Indonesia public procurement	48
Table 3.4.	Risk factors in Indonesia public procurement	51
Figure 4.1.	Reports of UK construction industry performance improvement process	64
Figure 6.1.	Limitation and proposal in developing e-certification and e-registration system.....	82
Figure 6.2.	Limitation and proposal in developing e-procurement system	83
Figure 6.3.	Limitation and proposal in developing comprehensive evaluation method	84
Figure 6.4.	Limitation and proposal in developing past performance measurement system.....	85
Figure 8.1.	Advantages, limitations and needs of current e-procurement system	107
Figure 8.2.	Comparative study of reconstruction process between Aceh and Jogjakarta.....	109

CHAPTER 1

INTRODUCTION

1.1 Introduction

One of the efforts that are considered to improve the public welfare in Indonesia is through the provision of good infrastructure that supports acceleration of country development. Factually, Indonesian construction works for infrastructure project perform poorly that cause poor infrastructure facilities which result in obstruction of the socio-economic development process in the country.

Although the investment of construction work in Indonesia tends to increase from year to year, the growth of investment is not accompanied by the improvement of construction industry performance. Construction works, particularly infrastructure projects or other public works projects, have difficulties in reaching the minimum quality requirements that are specified in a project plan. The poor performance of construction works results in delaying of work completion and increasing costs of the project. The poor project performance causes low value for money of investments. Improvement of performance of an infrastructure project by an even few percentage points in infrastructure project would save billion dollars of value for money. Therefore, the achievement of the good performance of construction works is very significant for supporting the country development.

Government as key stakeholders in construction industry makes various efforts to improve construction project performance, but the efforts have not shown significant impact to the project performance improvement.

Indonesian construction projects have been facing many problems nowadays. One of the problem sources is fragmentation in construction process throughout project life cycle. The project life-cycle consists of multiple phases and involves many parties. This characteristic puts the project in a high level of fragmentation and takes construction project into a high risk under uncertain conditions. Many problems appear throughout project lifecycle that are caused by uncontrolled risk. Other problems in Indonesia construction works are caused by low capacity and capability of stakeholders in many aspects such as financial, technical, relational and legal aspect.

This research analyzes and formulates the root of problems of construction works condition in Indonesia, in order to find the needs of action in current condition reform.

The result of current condition studies hopefully can identify the significant factors that influence the performance improvement. Based on the significant factors of the action of performance improvement, this research develops the possible solution of performance improvement model that is expanded upon the feasibility and optimality of solution implementation.

1.2 Background

According to The 2010-2014 National Medium-Term Development Plan (Ministry of National Development Planning Republic of Indonesia hereafter refers as BAPPENAS RI, 2010), the development of infrastructure in Indonesia becomes more important nowadays in country socio economic development for a number of reasons as following explanation. The acceleration of economic growth needs additional quantity and increased quality of the nation's infrastructure. Furthermore, agriculture revitalization is also considered not successful without an adequate infrastructure. Moreover, under inadequate infrastructure the transaction cost dominates in the cost structure of the final economic commodities. Additionally, poor households will not be able to participate in the economic growth process since they are isolated due to the absence of infrastructure. Environmental problems, such as water, air, soil pollution, and floods in urban areas, are also closely related to the absence of an inadequate infrastructure.

The important role of industry can be seen from a large amount of labor involved in this industry, where the numbers of employment tends to increase from year to year ((Figure 1.1).

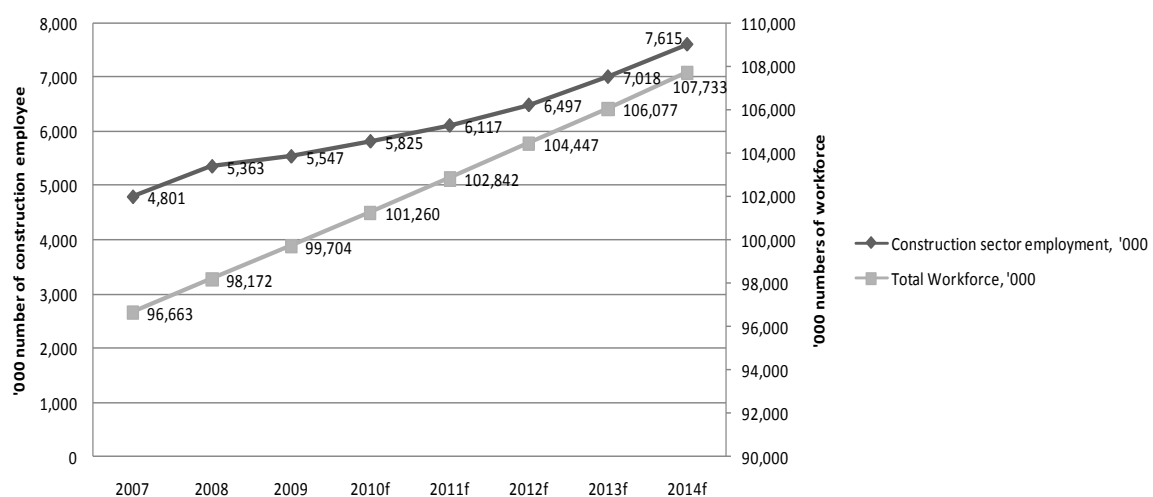


Figure 1. 1. Number of employment in Indonesia construction industry (source: Business Monitor International Data, quarter 3rd 2010)

Given the important role of the construction industry in country development process, thus, the government makes policy to increase the construction investment, which the investment is expected to increase continually in the years to come (Figure 1.2).

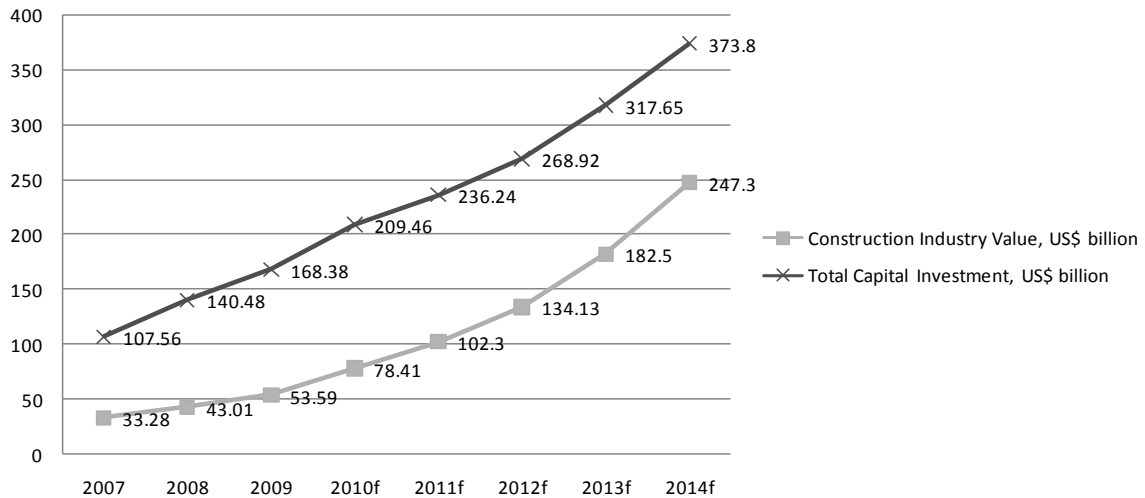


Figure 1. 2. Number of construction industry investment during 2007 to forecast 2014 in Indonesia (source: Business Monitor International Data, quarter 3rd 2010)

Although the amount of investment in the Indonesia construction industry increased from year to year according to the GDP since 2007 and is predicted to continue rising until 2014, according to Business Monitor International (2010) the growth of this industry tends to slow down year by year since 2006 with its highest growth compared with its growth of GDP (Figure 1.3). The slow growth of this industry might be caused by various problems that exist in the Indonesia construction industry. The problems result in the poor performance of construction works.

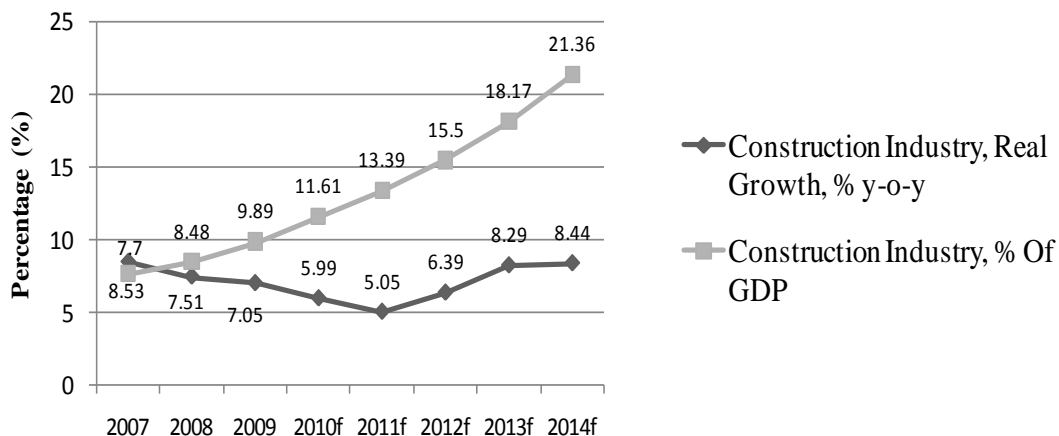


Figure 1. 3. The growth of construction industry development in Indonesia (source: Business Monitor International Data, quarter 3rd 2010)

Current condition indicates that even though budget expenditures in infrastructure have been increased, infrastructure gaps still exist, at the national as well as inter-regional levels. Initial observations in real condition of construction projects in Indonesia indicate that this poor performance is largely as the result of many risks that are not anticipated in projects implementation. On the other hand, the price-based selection of awarded contractor in the procurement process results in less attention to performance, risk control ability and supply chain of contractor. The poor procurement process also contributed to poor performance, such as over budget, time delays, and quality of construction product under minimum requirement, frequent substitution of key personnel during project implementation, also difficulties related to accountability.

Therefore, although the government increases the amount of investment in this industry, value for money of the investments is low. The investment cannot give significant impact in providing infrastructure that encourages public welfare enhancement (Figure 1.4). Changing the recent procurement process is needed to improve the performance of construction works in providing significant contribution for Indonesian development.



Figure 1. 4. Poor performance of Indonesia construction works that inhibit transportation and economic lines between cities and islands (source: Flickr, Indonesia infrastructure <http://www.flickr.com/search/?w=all&q=Indonesia+infrastructure&m=text>, download January 2011)

1.3 Problem statement

Indonesia needs a significant support of good infrastructure for the country development, but current condition of construction product is in poor performance that resulted in poor quality of infrastructure products. According to current situation, some questions that have to be answered in this research are:

1. What are the roots problems that cause the Indonesian construction industry cannot cope with the risk during the construction works that result in the construction product in poor performance.
2. Based on the root problems what are the factors that give significant influence on performance improvement process as consideration in finding possible solution.
3. Regarding the problem formulation and improvement factors what is the potential solution that can actually provide direction for development process.
4. In proposing the potential solution how the feasibility of proposal implementation and what are the future issues will be created by its implementation.

1.4 Research Objectives

Changing the recent condition is needed to improve the performance of construction works in providing significant contribution for Indonesia development. Indonesian government makes many efforts to reform the current condition. However, limited progress has been made in reforming current condition. The reforms have been inadequate and have not had the desired impact so that shortcomings still persist.

The purpose of this study is to find potential solution of Indonesia construction works performance improvement. The potential solution hopefully can be used as initial guidelines to give direction of construction works reform that encourages performance improvement of construction projects in Indonesia.

Therefore, this research examines and formulates the causes of the problems of poor performance in Indonesian construction projects in order to find the root problems of Indonesian construction industry. Finding of root problems is analyzed in aiming of considering the factors that have a significant influence on construction work performance improvement.

Based on the factors influence, the potential solution is developed due to existing problems that the focus of research is to develop quality assurance mechanism in performance improvement. The proposed solution is evaluated to see its advantages on

performance improvement of construction work in Indonesia, and the feasibility and optimality of applying the potential solution on the society.

Scope of the study is limited to the projects financed by public funds, including funds from international loan. In general, problems are viewed in a comprehensive manner for all the matters that relate to the construction industry in Indonesia. However, focus of the research is small and medium enterprises (SME) since 99% of construction firm that is involved in the industry are SMEs. Furthermore, the infrastructure investment is tended to transfer to local government that is conducted by the SMEs. According to World Bank (2007), the national expenditure transferred to region will increase for years to come. Hence, the achievement of the good performance of public works is very significant for the local government. Improvement of a few percentage points in public investment by the local government probably would save tens of trillions rupiahs (hundreds of millions dollars) of value for money.

1.5 Research methodology

In addition of the literature reviews on Indonesian construction works condition, field observations are conducted to find the root problems in construction phases during project lifecycle. The observations were conducted on two groups of projects, which are the construction works services for facilities maintenance and infrastructure provision of a public university and the public works projects of a local government in Eastern Kalimantan Island. By studying the current construction project problems, the explanation of current phenomena in Indonesian construction works can be found.

Furthermore, in order to obtain detail information on existing conditions, interviews were conducted to some key stakeholders that consist of the General Secretary of Construction Development Agency in the Ministry of Public Work, Board of Directors of Construction Service Development Board, the Directors of several local and foreign construction companies, the Directors of National Public Procurement Agency, academicians in construction management field, local public works procuring committee members, and the committee members of contractor associations and consultant association.

A survey to 63 respondents was conducted using questionnaire system, as preliminary evaluation of proposed system development. The survey respondents consist of the stakeholders in Indonesia construction works which are construction firms, public clients, community/ NGOs, and academicians and researchers. The objective of the survey is to see the stakeholders confident of proposed system utilization, and to

concern the stakeholder view of constraint and consideration of opportunity in developing the new system.

1.6 Research Framework

The framework of this research is a problem-based research, which based on problem in current practice existing condition as the starting point for all research process. The purpose of problem based research utilization is to find the significant component of the needs action for problem solution. Based on the current state differences from the ideal condition, research problem will be formulated which is defined as the general issue in conducting the research and concern in finding the problems solution.

Within the framework of problem-based research, the identification of problems is done through several methods that are literature studies, field observations throughout project life cycle, key stakeholder interviews, surveys through questionnaires, and lessons learned from the best practices.

In order to achieve the research objectives within the boundary of research scope and research framework, the major premise deliverables of this research comprise of the root problems identification and formulation, review of key component indicators of improvement action, needs analysis, and system development of performance improvement that contains of four subsystem development but focuses only in one subsystem that supported by possibility of system implementation and proposed system evaluation. The framework of research can be seen in Figure 1.5.

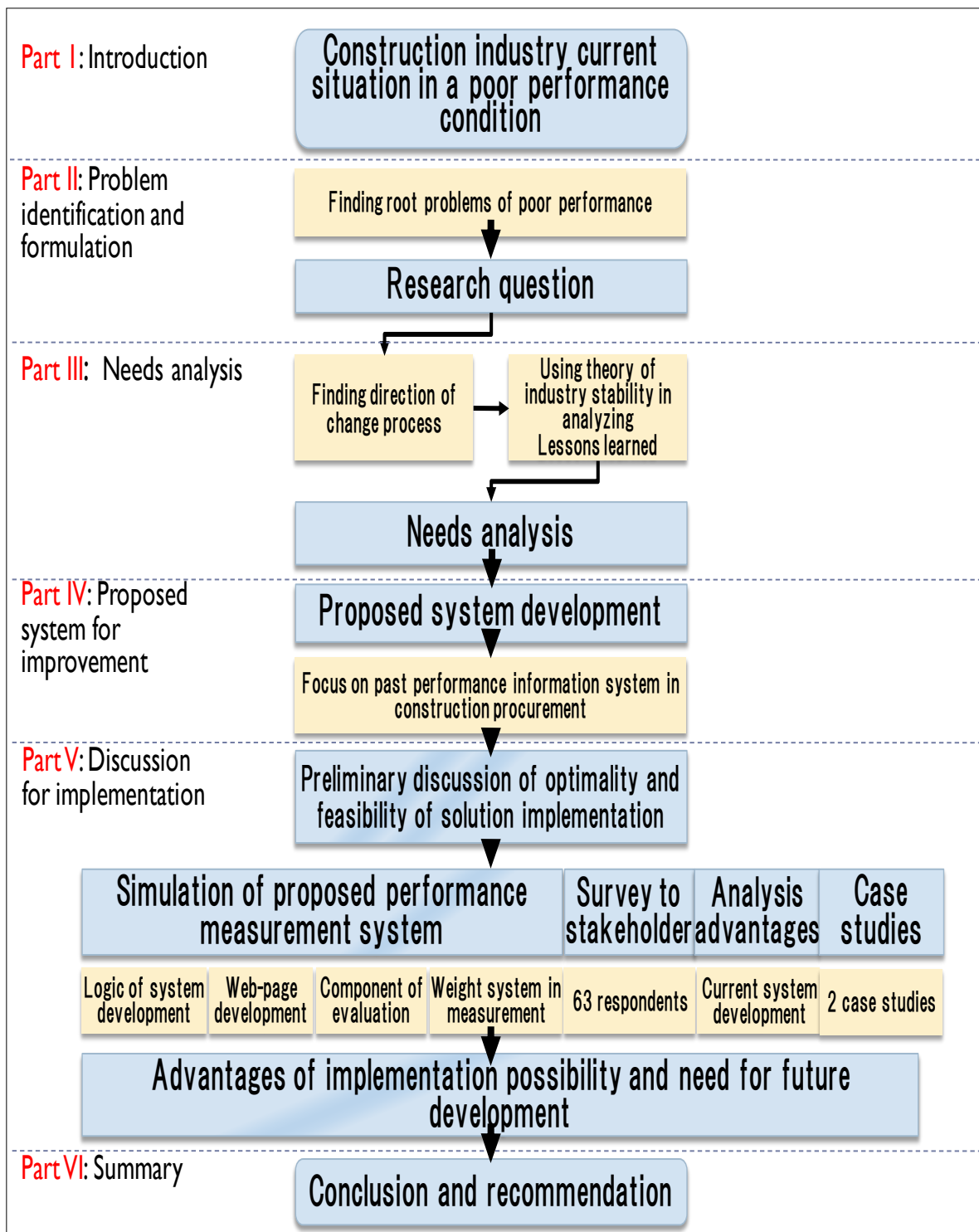


Figure 1. 5. Research framework

1.7 Organization of Dissertation

According to research framework (Figure 1.4), this dissertation consists of five parts of research explanation that are; Part 1: Research Introduction and Reviews, Part 2: Analysis factor of performance improvement model development, Part 3: Model of performance improvement development, Part 4: Model implementation and evaluation, and Part 5: Summary and conclusion. The contents of each part are described in the following explanation.

PART 1: Research Introduction consists of chapter 1 that explains research introduction, background, problem statement, research objective, research methodology and framework, and organization of dissertation.

PART 2: Problem identification and formulation consists of chapter 2 and chapter 3. Chapter 2 reviews current Indonesia construction industry problems according to characteristic of construction project and detail problem elaboration relates to project lifecycle. This chapter also deduces the problem formulation and determines the research questions. Chapter 3 describes problems in current reform process according to view points of stakeholders.

PART 3: Needs analysis of Indonesia construction performance improvement that consists of chapter 4 and chapter 5. Chapter 4 is literature reviews of performance improvement that conducted in order to find the direction of change action. This chapter includes the review of component of industry performance, component of construction industry stability, the important of procurement in performance improvement, several approaches of performance improvement and lessons learned from best practices of some construction works procurement reform process. Chapter 5 analyzes the needs of antecedent action of performance improvement, which includes analysis of the needs of performance improvement process, the needs of procurement reform in performance improvement process, and the needs of support system in performance improvement process. In the end of this chapter the finding from need analysis is explained as base on the development of proposed solution.

PART 4: Proposal of potential solution which consists of Chapter 6. The chapter provides explanation about development of electronic performance information process (E-PIC) as a potential solution in the change process that includes the development of risk control and quality assurance mechanism in an integrated construction information system. The development of proposed system focuses on past performance information, which consists of integrated registration and certification system, e- procurement system, comprehensive evaluation method, and past performance measurement mechanism.

This chapter also describes limitation and advantages of current condition and proposed new system based on the limitation and the advantages.

PART 5: Discussion of feasibility and optimality proposal implementation that consists of Chapter 7 and chapter 8. Chapter 7 explains the proposed system evaluation that consists of stakeholder confidence of propose project past performance information system, analysis of expected utility stakeholder in proposed system implementation, evaluation of advantage for performance improvement and expected controlled risk improvement. The simulation is also shown in this chapter that includes logic of system, web page of the system, and utilization of system development. Chapter 8 consists of some advantages in system implementation according to some achievement of current e-procurement system, the establishment of supported organization, the awareness of needs of deregulation, availability of initial data information, and some best practices in current condition.

PART 6: Conclusion and recommendation that consists of chapter 9. This chapter includes summary and conclusion of the research, which discusses the applicability, contribution of the research and some issues and recommendation for future development.

CHAPTER 2

EXAMINATION AND FORMULATION OF CURRENT CONSTRUCTION INDUSTRY PROBLEMS IN INDONESIA

Changing the Indonesia construction works recent condition is needed to improve the performance in providing significant contribution for the country development. Indonesian government makes many efforts to reform the current condition. However, limited progress has been made in reforming current condition.

In order to improve the performance, it is required to know the current status of Indonesia construction works. The study of the current condition should not only base on performance result oriented, but also base on the performance of process, so that an integrated understanding of current condition can be obtained in order to find the direction of future improvement. The process approach assumes that the problems are inherent in the process. Performance measurement with this approach provides the necessary information for process control and enables the establishment of feasible goals (Moon 2007).

Deming (1994), indicates in order to improve the performance, the management should work on a method for improvement of a process. The objectives are to understand and improve processes that produced the fault, defect, etc and to understand the distinction between common causes of variation and special causes, in order to understand the kind of action to take. Thus, to perform the ongoing construction projects efficiently, it is needed the ability to know the current status of the project process.

In addition of literature study, empirical information has been collected through field studies and stakeholders interviews in order to identify and classify the problems leading to poor performance in current conditions of Indonesia construction industry. By studying the current problems, explanation of current phenomena can be found. The purpose is to find the root problem of the poor performance in determination the key components of possible solution that give significant impact of performance improvement. Based on the current state differences from the expected condition, the problem formulation is defined as concern in finding the problems solution (Ellis 2008).

A problem formulation will be determined in the end of this chapter. It is based on problem identification in construction project characteristic, and some detail elaboration of identified problems.

2.1 Current condition relates to characteristic of construction project

Construction project consist of several phases in its life-cycle that involved various parties who have different responsibilities at each phase of the life-cycle. This characteristic results in high level of fragmentation of the project, contributes in increasing complexity and generates more interfaces of construction process throughout project life-cycle.

On the other side, the construction project cover a very wide spectrum from the slow, certain, and simple construction project at one side, to the quick, uncertain, and complex projects at the other side (Ballard and Howell 1998). The complexity level of construction project (Maylor 2003) is determined base on three dimensions; those are required resources complexity, technical complexity, and organizational complexity. Based on type, the construction project is classified into four categories (Hinze 1993 and Gould 1997); those are residential construction, building construction, heavy engineering construction, and industrial construction. Each category has specific character according to the project typology. In the project life-cycle according to project spectrum, the construction project has specific character as follow:

- Unique product, different on each construction product (custom made product).
- Running by temporary organization, the organization will be disbanded by the end of the project.
- Its product depends on specific location or site, where the physic condition (geographical condition, soil condition, water condition, etc.) and non-physic condition (regulation, traffic condition, etc.) are always different.
- Prime production process is conducted in site (on-site production), which depends on climate and uncontrolled environment condition.

According to the specific characteristic, construction project consists of various categories of nature that is very unique and high of uncertainty. Since the construction process itself consists of various phases, which is involving various stakeholders (multi-party), it takes a construction project into the environment that continues to change. Smith (1999) presented the following characteristic of construction works:

- Change is inherent in construction work
- In all construction projects, 'change' is a defining characteristic and is almost inevitable
- In construction project each of the three targets of cost, time and quality likely to be subject of risk and uncertainty

Change is associated with risk. Therefore, in obtaining a good performance construction industry development must be able to embrace change, considering the characteristics of the construction industry, and measure the information to have strategic decision

making. From the explanation above, it can be concluded that the construction project has a very complex characteristic (Figure 2.1).

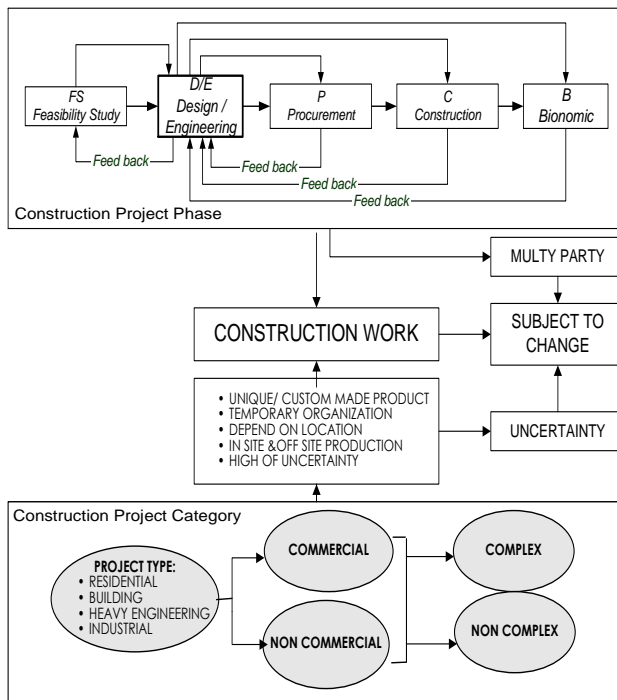


Figure 2.1. General issue of construction project characteristic

Problems in Indonesia construction industry indicates that the industry cannot cope with the characteristic of the project which is high risk under uncertainty condition. It required efforts and specific strategies to cope with changes condition caused by the characteristics. Following explanation is a description of existing conditions in Indonesia construction industry under high risk and uncertainty condition of industry characteristic.

2.1.1 General issues of current condition in Indonesia construction industry

In providing better understanding of Indonesia construction industry current condition in according to the industry characteristic, the secondary data from related institution are collected. The analysis result indicates the problems appeared in the industry that is explained in following description.

Data in 2010 of construction industry in Indonesia shows that direct contribution of the industry to the gross national product (GDP) was about 11.6% that employed 5-6% of the country's labor forces, which includes more than 5 billion employees (LPJK, 2010). Data from National Construction Service Development Board (hereafter refers as "LPJK") demonstrates that more than 93% of the construction employees are unskilled

labor (Table 2.1). It indicates that although this industry is very important in the country development, but this industry tends to have poor competitiveness ability since the quality of the labor involved mostly unskilled labor.

Table 2.1. *Indonesia construction workforce 2010*

	Workforce	Number	%
1.	Registered Engineers	103,403	1.89%
2.	Skilled labour	242,128	4.18%
3.	Unskilled/ unregistered labour	5,825,000	93.93%

Source: http://www.lpjk.org/modules/daftar_registrasi_tenaga_ahli.php

Furthermore, Table 2.2 shows that the industry involves 160,736 registered contractors of which almost 99% are small and medium enterprises. On the other side, according to internal study of Construction Development Agency Ministry of Public Works (2010) indicates that about 40% of the registered contractors did not have experience in conducting construction project. The contractors ask subcontractors to do their works, since the construction firm is only performing as a project agent or broker.

Table 2.2. *Construction services provider in Indonesia construction Industry (Source: LPJK website- 1, data search- January 2011)*

	Business Entity	National	Foreign Company
1.	Consultant	4,237	65 firms
2.	Contractor	160,736 firms	129 firms
	a. Small (Grade 1-3)	142,786 firms (89.9%)	-
	b. Medium (Grade 4-5)	16,480 firms (9.4%)	-
	c. Large (Grade 6-7)	1,102 firms (0.7%)	129 firms (100%)

Additionally, in construction works procurement, the client lacks of contractor performance information and tends to be weak of in evaluation. This condition leads the client awards inexperience contractor who incapable to conduct construction works project. As the incapable contractor has a poor capability in controlling risk, there is often additional work, reworking, or delay due to uncontrolled risks. Poor capability of contractor and weakness of public client results in low level of trust among parties. This condition has led to the emergence of an adversarial relationships and inappropriate risk allocation in construction works. The data of statistic center also indicates that Indonesia construction value of public work that conducted by local government tend to increase steadily during the five FY period since 2004 to 2009 (Figure 2.2).

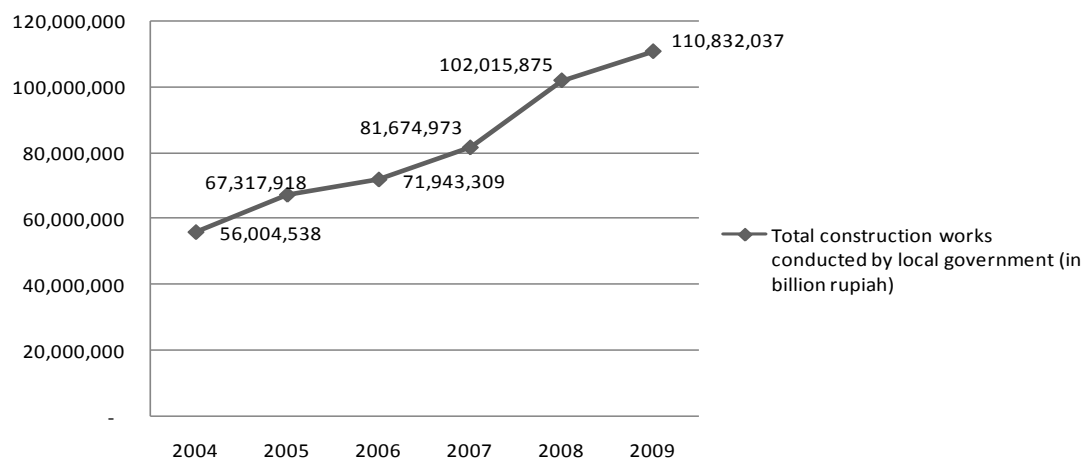


Figure 2.2. Total construction works conducted by local government in billion rupiah (source: Indonesia Statistic Bureau, 2011)

On one side, this condition can give an advantage for encourage development of industry related to the public work, since lessons learned from Japan construction industry experience indicated that during the high economic growth the mechanized construction technologies and construction management capabilities of the construction company in Japan public work sector improved significantly (Nishimaki 2006, Watanabe, 2007). But in the other side, since the local government has weakness in construction procurement process and local enterprises have low capability, the construction expenditure gives low value for investment as expected.

Moreover, the LPJK data shows that most of construction service firms in Indonesia are located in Java Island, more than 50% of big qualification enterprises and more than 35% medium and small enterprises are located in Java Island (Figure 2.3).

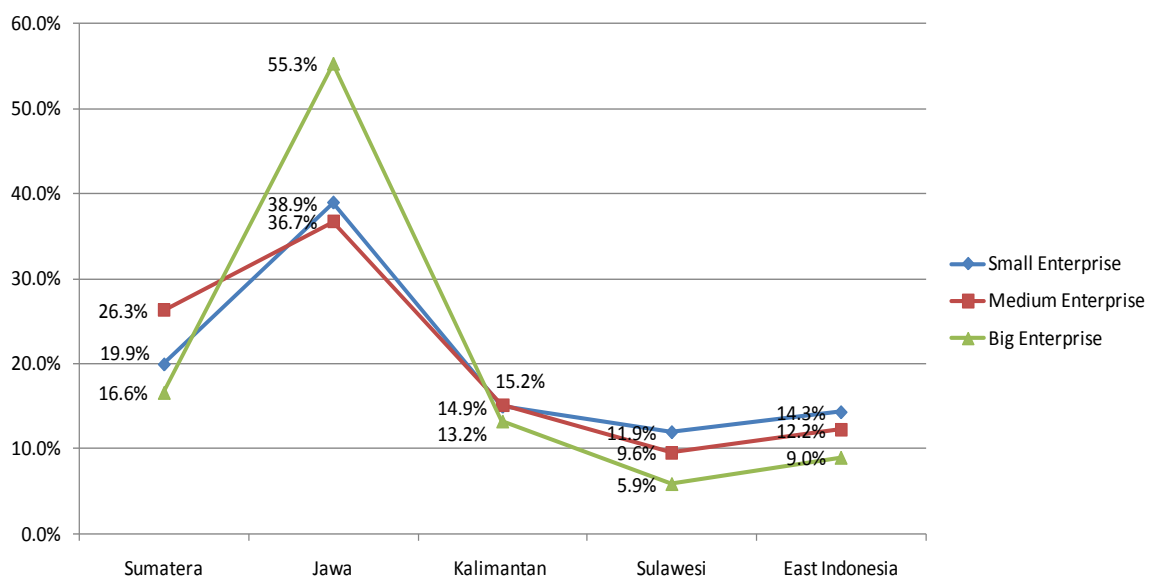


Figure 2.3. Distribution of construction industry enterprises in the 5 big islands in Indonesia (source: LPJK website- 2, download January 2011)

This condition results in a high level of competition between companies in Java Island rather than other islands that requires good ability of the company to survive. The competition among companies in Java Island becomes higher recently since policy of country development tends to focus the investment to the other areas instead of Java Island.

Data of Indonesia Statistics Center shows that the percentage of total construction expenditure in Java Island tends to decline from 2004 to 2009 (Figure 2.4). On the contrary, the numbers of company in Java island increases very fast during 2007 to 2009 compare with other islands (Figure 2.5). This condition results in the majority of contractors in Java Island experience higher competitiveness in getting a project.

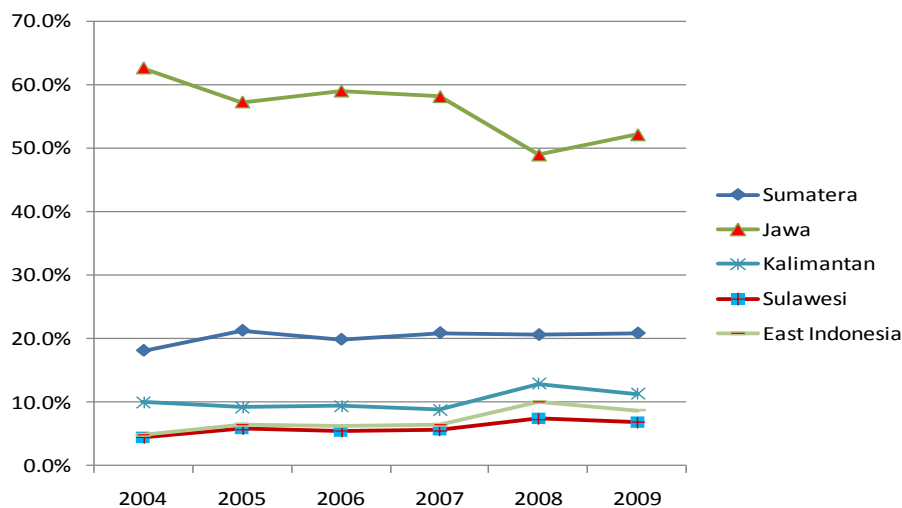


Figure 2.4. Percentage value of construction completed by province based on total construction expenditure by local government in Indonesia islands at FY 2004 to 2009 (%)

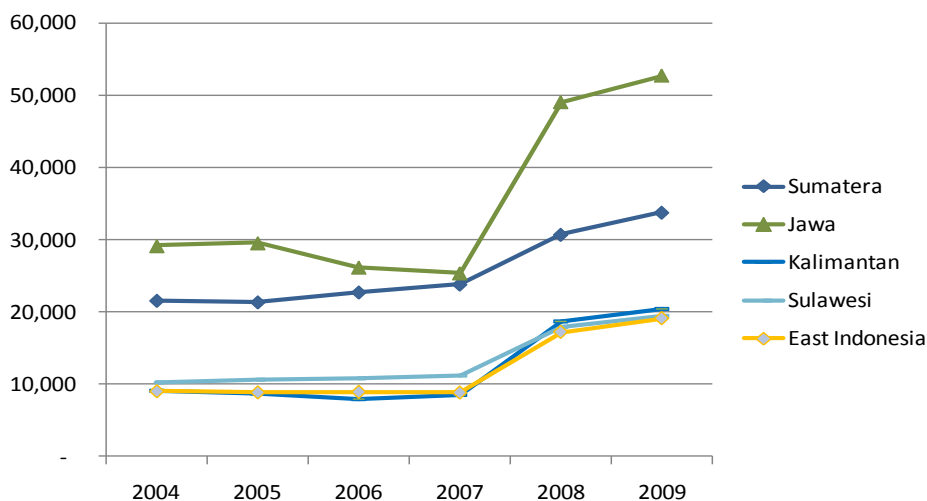


Figure 2.5. The growth of construction companies according to number of enterprises in Indonesia islands (source: Indonesian Statistic Center, 2011)

Additionally, since on the other island, annually percentage of value in construction expenditure increase every year, while the growth of numbers of company on these islands are very slow. This condition result in many important construction works in the islands is conducted by companies that located in Java Island. The differences between the construction firm location and the project location requires high transaction costs. Since the procurement system tends to price based competition, the lowest bid contractor have financial difficulties in coping with the high transaction cost.

Based on analysis results of the current condition of Indonesia construction industry characteristic, some general issues of the construction project condition in Indonesia can be found:

- Many unskilled labors of industry employee that leads the industry to poor ability in construction project competition.
- The majority of industry enterprises consist of 99% small and medium enterprises that employ a lot of unskilled labor, tends to have low capacity of risk control under high risk and uncertainty project characteristic.
- Poor capacity of local stakeholder that tends to cause low value of money of investment, especially in the construction project conduct by local government for the local infrastructure development.
- Level of competition in construction project is increasing, especially in Java Island. The construction firms in Java Island join the project in other region which has difficulties in achieving minimum requirement caused by lowest price procurement and high transaction cost.

Poor capacity of contractor that caused by many unskilled labor, poor risk control mechanism, insufficient capacity building in local development, and low competitiveness, is one of key factor that leads current poor performance. Since in the construction works procurement, the public client lack of contractor's performance information, it causes the public client awards the inexperience contractor that is incapable to conduct construction works project.

Therefore, Indonesian public works should change the existing paradigm of transparency which is to open accessibility and to give same opportunity of any participant in joining procurement process, to the proposed paradigm that open accessibility and give opportunity to only "qualified participant" in joining the procurement process, in order to improve performance and encourage the capacity development.

2.1.2 Review of process throughout project throughout project lifecycle

As shown in Figure 2.1, the general phases on the construction process consist of Feasibility Study (FS), Design and Engineering (D / E), Procurement (P), Construction

(C), and Post Occupancy Evaluation in relation to Human Biologic and Economic (Bionomic). Following explanation based on empirical observation of construction phases that has been conducted on two observation objects that are the construction work services for facilities maintenance and infrastructure provision of a public university and public work projects of a local government in eastern Kalimantan Island. The observation results (Larasati and Watanabe 2009) indicate existence of patterns on the project phases which are the cause of problem of poor performance in the construction project (Figure 2.6)

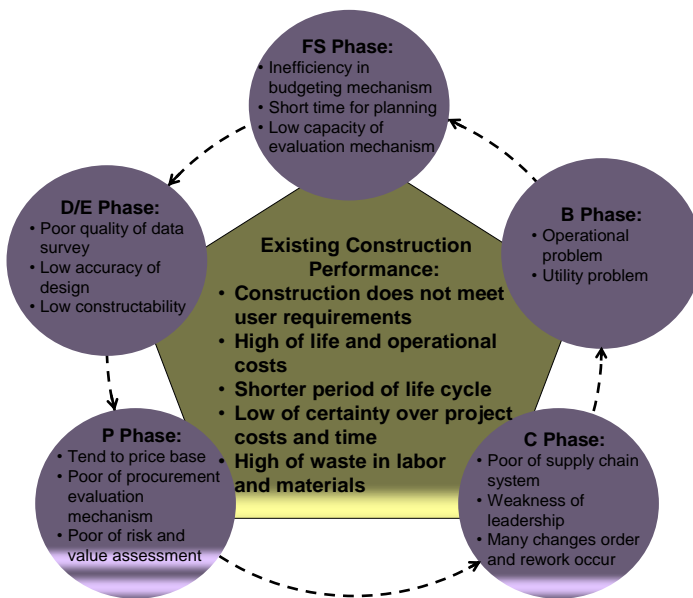


Figure 2.6. Problem pattern during project lifecycle

Following explanation describes observation result throughout project-lifecycle that indicates patterns of current construction works poor performance.

2.1.2.1 Existing conditions of Feasibility Study (FS) phase

According to the projects observed, Feasibility Study is conducted to propose the project budget based on preliminary planning or design. Some problem pattern can be seen clearly in the construction project of a hotel and sport facilities for national Olympic Games which lasted from 2006 until 2008. These projects are ordered by a local government in eastern Kalimantan.

The project observed indicated that problem started from requesting process for project budget by client to council of parliament. Most of the council members do not have background experience in construction field; thus, they have poor capability to evaluate planning document in determining the project budget. Moreover, the political and collusion atmosphere are stronger than atmosphere of making efforts to achieve a good performance on the project's results. This condition caused the emergence of additional

transaction costs in the FS phase, especially for accommodation cost of approval process.

Additionally, the public client has difficulties in defining the project requirement for the determination the budget, since the public client is not supported by adequate human resources. The document has been changed many times that result in the project approval process occurs several times due to request for the additional works beyond the budget that has been set before. Figure 2.6 shows an annual budget request pattern in the public building project.

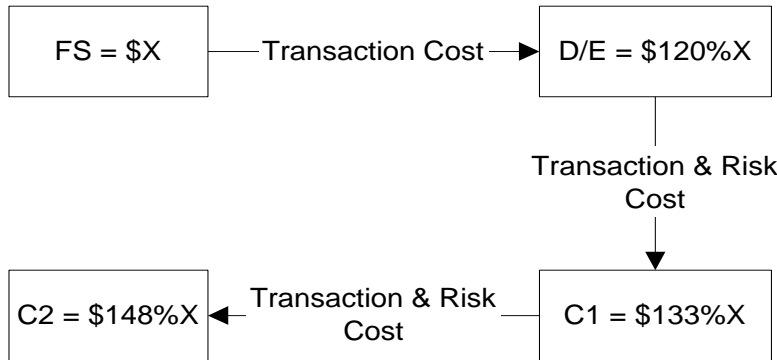


Figure 2.7. An example of the approval process of project budget (Source: observation result of a project of local government, 2006-2008)

The budget change followed by change order of the work and resulted in time delay up to 40% longer than predetermined schedule, while the construction product has not completed when it is needed to be used. Based on the case observed, the chronological of the funds requesting process is explained in Table 2. 3.

Thus, according to project observed, Figure 2.6 indicates that the additional funding for completed project reached 48% of the initial budget that had been proposed on the preliminary design. This condition is one of causes of poor cost performance in Indonesia construction works.

The transaction cost includes the cost of searching and collating information, communicating among parties, drawing up and revising agreement or contracts, and reaching transaction settlement (Rao 2005). The high intensity of transaction in budget determination process increases the transaction costs. On the other hand, the parties tend to justify and legitimate the increasing of transaction costs rather than try to improve efficiency of the transaction process.

Table 2.3. The chronological of budget proposal in a project that observed

No	Phase	Phenomena	Cause		Effect
1.	Preliminary design	The proposal documents contain many uncertainties and risks	Short time available for determining owner/user requirement in the FS document Poor ability of owner in proposal evaluation process Planners/ engineers lack of information about project real condition	Initial funding proposal based on the feasibility document and preliminary design	Project budget (\$ X) does not match with the real needs of the project (need additional cost)
2.	Detail Engineering Design (DED)	The DED documents are different from preliminary design	Design change is needed since there are many changes of client demand and many unanticipated risks in preliminary design document.	1st additional cost	20% additional cost regarding to change design (total new budget \$ 120% X)
3.	Construction of sub-structure	Significant changes in the construction documents	There are works addendum due to the difference between the real field condition and design document.	2nd additional cost	Need more 11% additional cost (total new budget \$ 133% X)
4.	Construction of upper-structure	Changes of work items due to the constructability problems of design document.	Needs works addendum due to anticipated risks in the award document and the low capacity of contractors in achieving minimum requirement.	The 3rd additional cost	Need more 11% additional cost (total new budget \$ 148% X)
5.	Bionomic (operational and maintenance)	Many effort for completing and repairing insufficient construction product	Construction product is insufficient and cannot use properly by user	The 4rd additional cost	There is other additional cost throughout project lifecycle
6.	Every phases	There is a nuance of corruption and collusion.	corruption and an unstable political conditions	Uncounted additional cost	There are additional transaction costs that become a burden on the project cost.

2.1.2.2 Existing conditions of Design and Engineering (D/E) phase

Main activity in D/E phase is to produce design documents which are generally conducted by a third party (i.e. design consultant or other special teams) as owner representative. According to the projects observed, the phenomena of the real practice conditions indicate that the document of design and engineering is one of the main

causes of construction project poor performance. The documents are considered to have many problems such as the following explanation.

The design document has significant differences compare with preliminary design document that needs significant changes, such as volume of works, change of project requirements, or change of construction specifications, which also required a budget change.

This change condition appears many times in the construction work project. An observation of a public building facility project demonstrated that the project change is caused by the owner requirements of room capacity are higher than the capacity that already determined in preliminary design document. It implicates to the need of additional budget and time for design revision.

On the other hand, almost all of projects observed has inadequate period for design process, since the needs of facilities or infrastructure is urgent. It causes inaccurate project requirement determination and less attention to project surveys, risk assessment mechanism, and value assessment during the design process. This condition causes the engineer conducts the design process based on inappropriate information. In the projects observed, incorrect data of site size and shape was used frequently, because of the time limitation of time for design process.

Additionally, the time limitation causes the design consultant cannot conduct a suitable detail survey and design development. For some cases, the consultant only use data provided by owner, which often contains minimum information. This situation leads to significant differences of information between design and real conditions because unclear or inaccurate data provided.

Other example is another educational building project in West Java province that was observed. There are 10 times differences of land grading volume between design and actual conditions, since the designer used inappropriate information of land slope data. It resulted in delay due to necessary of time for resurvey and redesign to obtain the accurate volume. In this condition, dispute according to determination of works volume also appeared that lead delay in project completion.

Moreover, Bill of Quantity (BoQ) error often occurred. The change order is necessary to achieve the expected performance in construction projects. One example according to observation of the hotel construction case, the building performs poorly due to error in calculating volume of sewage treatment plant. Thus, it needed time for change order to solve this problem.

The design consultants also have a little consideration in material supply system during the design process. It causes contractor difficult to fulfill the technical specification because of the weakness of contractors supply network. A project observed showed that

the specification of floor finishing material should be supplied from other island that lead to delay on material supply because of transportation problem.

In the all public construction works in Indonesia, it tends that all risks caused by the design errors during the construction process take by the owner which resulted in additional costs and delay of project completion.

2.1.2.3 Existing conditions of Procurement (P) phase

All the procurement processes in Indonesia that use public funds should refer to the Presidential Decree number 80/2003. Therefore, most of the procurement process is only trying to accord with the Presidential Decree, especially for the project conducted by the local government.

The observation results and interviews to tender committee members indicated that the lowest price bidder tends to be awarded even the procurement used multi-criteria evaluation system. This situation occurs because of internal risk of being afraid of facing inspection process by the monetary auditor team rather than reaching best performance. This problem appeared because the difficulties in making accountable and responsible reason due to unavailability of good evaluation mechanism in the procurement process.

Since the procurement tends to use price-based system, contractors only focus on Bill of Quantity (BoQ) documents that are provided by the client. In the most of cases observed, bidding contractors did not pay attention to the technical specifications, and other project document and only submitted bidding proposals based on BoQ. This condition implies that the information held by contractors on the project is minimal, especially the information about risk that will be appeared during construction project.

The contractors have less understanding of problems and risks that appeared in procurement documents during clarification process. Since the risk and uncertainty cause the change order, many work addendums occur throughout the construction process, which results in poor performance of project in terms of cost and time.

The observations also showed that contractors are awarded based on friendship relationship; thus, it causes financial problem during project realization. Under such condition the procurement evaluation process does not run well, especially in the project conducted by local government.

Other phenomena that can be captured in the procurement process are the tendency of paying less attention to evaluation process of contractor supply chain system by owner. Some projects indicated that contractors do not have their supply chains at the time of the procurement phase and at the commencement of construction phase. Weakness in

supply chain system makes delay of supply material. This is one of key variables that causes of delay in work and leads to additional cost.

2.1.2.4 Existing conditions of Construction (C) phase

It is typically observed at construction phases that due to the urgent project needs by the owner and the weakness of contractor supply chain, the contractor often replaces the material with the lower specification during the construction process. Hoping that the project delay is minimized, the owner is forced to accept this situation because the pursued targets of works completion. To eliminate accountability problems, some of the delays information is not recorded in the addendum clause of contract, due to the difficulty of administration procedure of contract addendum.

Another phenomenon related to difficulties of design issue is employment of many non-standardized work. As a result, many change orders occur during construction because the contractor has difficulties to complete the work. Since the change order requires certain procedures and relates to various parties, this causes delay in the work to be completed.

Some difficulties of coordination process among the parties at construction phase also exist which resulted in slow of decision-making. One of example is the slow approval process of color and type in architectural finishing process, since this approval related to many parties which resulted in delay of decision-making and work.

Other problem in the construction phase is labor problem. For example, the delay occurs due to desire of local workforce to join the project even if the workforces do not meet the standard capabilities required in the project, while the contractors who come from the other islands already have their own workers. Inefficient of labor management also occurs because of poor supply material in the project that lead waste time for the labor for waiting the material.

Other project showed that replacement of the Project Manager (PM) or a key person often occurred. In this situation the new PM has to collect the project information during in-progress project that causes time consumption. Sometimes the new PM has to solve the problem without adequate information, which resulted in unsuitable solution. Current condition indicates that is no comprehensive mechanism of evaluating the key person/ leader candidate during the procurement process in Indonesia construction works.

In construction phase, the owner also has to hire consultant supervision to assist the owner in ensuring that the required performance is achieved by the contractor. However, the supervisor also has a poor performance that leads the owner to force contractors to provide the minimum requirement. Owner often should encourage the contractor performance that is actually contractor's responsibility. Owner takes all risk during the

project running because the awarded contractor cannot control the risks appeared. The owner is often forced to accept the unsatisfied construction product, such as shown in Figure 2.8.



Figure 2.8. Examples of errors due to the incorrect determination of bench marks by contractor, so that the "as line" of column shifted during construction process, which results in some columns stand in the middle of the building aisle (Source: RFD Studio Consultant).

2.1.2.5 Existing conditions of Bionomic (B) phase

Post Occupancy Evaluation (POE) in the Bionomic (biologic and economic) phase shows that the results of poor performance of the project cause user's dissatisfaction. The resulting products of construction often encounter the following issue:

1. Cannot be used properly: The users are not being able to use facility properly. For example, the roads were flooded at the raining time because the road drainage system could not work properly.
2. Do not provide added value for public utilization: Poor construction product by a large investment cannot be used according to the investment objectives. For example, the gliding field construction that was built for the National Olympic Games in 2008 could not be used by the athletes during the Olympic event due to inaccuracy data of the land survey and incorrect determination of materials requirement for the field gliding base.
3. The operation period shorter than design objective. For example an education building complex for art department in the public university was planned to have service life (life-cycle) for 25 years. However, only after 15 years the buildings were planned to be demolished because many parts of the buildings cannot work properly anymore such as broken of toilet systems and reverberation of meeting rooms.

4. High cost of maintenance: Since the quality of construction work is poor, it needed high cost to operate, repair and maintenance the product. For example, the local government must expend money every year to improve Sumatera road traffic because the roads cannot bear the burden of the vehicle in accordance with the designed and construction performance. The repairing process obstructs the transportation flow that results in inhibition of economic development.

Therefore, many construction products provide less comfort for the user, which leads to low utilisation, high maintenance cost, shorter service life, and earlier demolition time. Thus, the investment for the projects cannot thoroughly accelerate the area development.

2.1.2.6 Key factor of current poor performance throughout project life-cycle

According to observations result, Figure 2.9 below shows the pattern of problems that appear during the construction process.

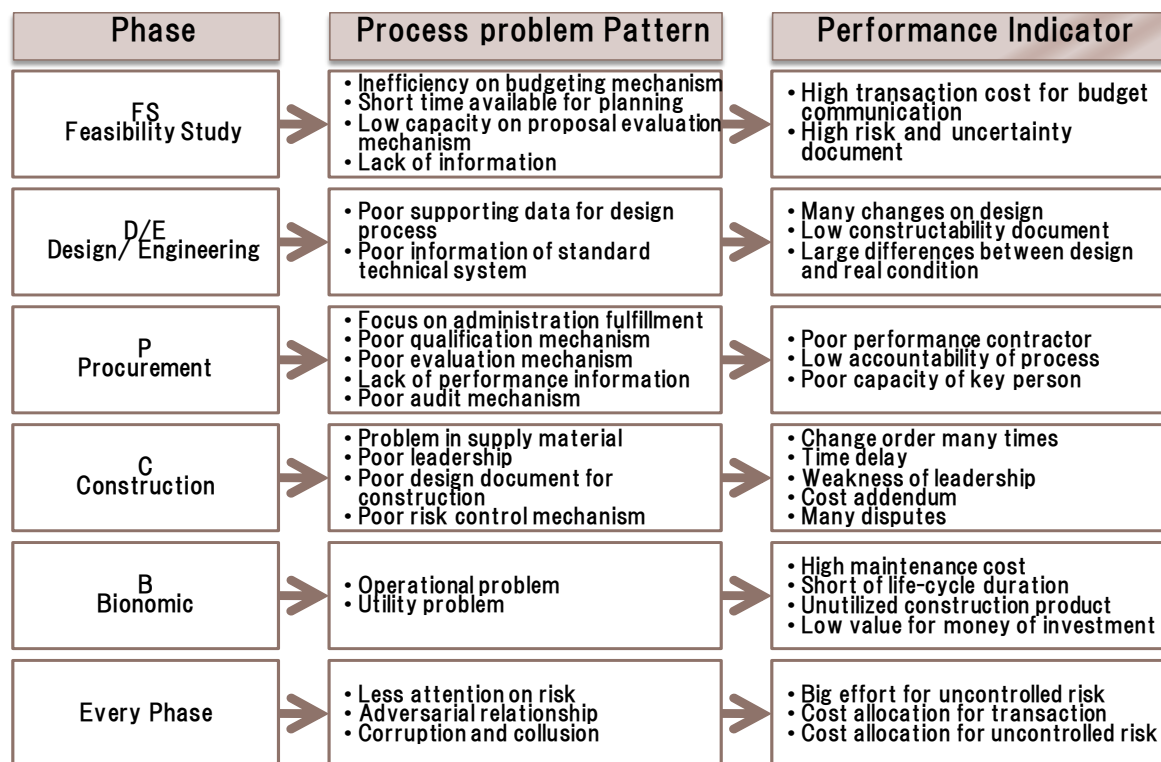


Figure 2.9. The problem pattern during construction phases

Process throughout the project life cycle is indicated as a cause of low performance condition in the construction works. Especially the procurement process has not been able to guarantee the achievement of high performance of construction projects. According to the patterns that appear from the analysis, each phase has problems that are related to the other problems in other phases.

In improving the construction performance, Indonesia construction industry must replace the current procurement practices which are mainly focusing on price competitiveness. The procurement should not only focus on price competitiveness but also focus on quality of works and should promote the growth of contractors in the long run who have done quality works. Therefore, in the procurement process, the development of clear measurement of performance and sustainable improvement in quality and efficiency are needed.

Since the procurement process is a crucial point in achieving the high performance of construction works, the intensive efforts should be made to increase existing performance through a fundamental change in this phase.

2.2 Analysis of factors influence external and internal to the current condition throughout project lifecycle

In order to find the potential solution of the problem, following explanation describes the detail problem elaboration that relates to external and internal factors in construction works. Empirical observations through interviews to key stakeholders and field observations on public construction projects also showed problems patterns that related to procurement process that can be classified into several types of problems, which are cost and financial problem, technical problem, behavioural problem, and legal problem. The following discussion is related to the types of problems.

2.2.1 Cost and financial Problem

The weakness of contractors' financial ability is one of the main problems that cause poor performance of construction projects in Indonesia. The interviews results of two foreign contractors who work with local contractors under Joint-Venture (JV) mechanism in several construction projects in Indonesia indicate that poor financial ability of Indonesian contractor causes project delays in completing works. The lack of financial capability in conducting project causes the contractor experiences difficulty in material supply. Suppliers are reluctant to send the construction materials that required by the contractor in the field, since the contractor tends to have financial problem for the supply payments. This condition results in waste of labour resources for waiting duration and delay in the completion of works. This phenomenon is one of the factors that cause the poor performance of Indonesia construction works.

Therefore, it is important to find the root problems of financial problem in order to find the proper direction of improvement process. The following explanation describes some causes of contractor poor financial capability in carrying out construction projects in Indonesia.

2.2.1.1 Financial problem caused by economic crisis

The condition of the world economy crisis also affects to Indonesia construction industry. The government made a policy of budget savings, one of its implementation is through lowest price competition in the procurement system. Success in budget savings through a tight competitive procurement is considered as one indicator of success in managing the budget for the procurement organization. Actually this condition causes the construction industry a financial problem, since they are forced to bid a construction project in a low price in order to be an awarded contractor.

Data of Indonesia Statistics Center show that the growth of construction costs for civil works (roads and pavements) are likely equivalent to the growth of the length of road segment during 2004 - 2008 (Figure 2.10). This indicates that the unit cost of construction in those years was not increased.

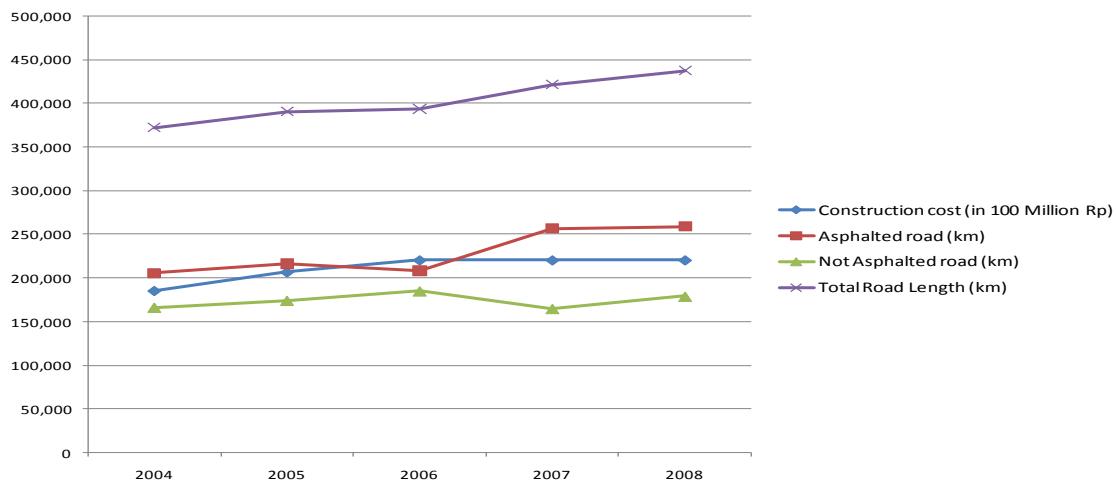


Figure 2.10. Road length and construction cost data

Figure 2.11 shows the ratio between the construction costs and the length of the road during 2004 to 2008, which describes that unit costs of construction do not increase during the span of time.

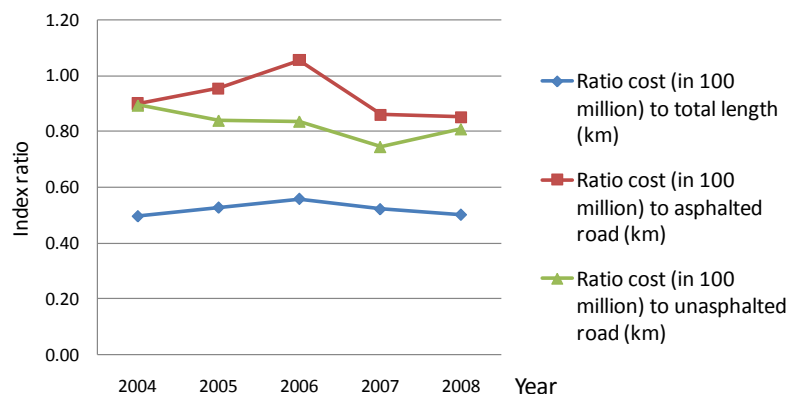


Figure 2.11. The ratio of cost and road length tend to be steadily during FY 2004 – 2008

On the other hand, economic conditions from year to year showed that Indonesia always experienced inflation (Figure 2.12), which the construction commodity is one of inflation sources. World Bank indicates that the construction material price give a significant contribution to inflation (World Bank, 2010). Additionally, the wage on construction cost also shows to continuous increase due to inflation.

Furthermore, the increasing price of construction materials and wages are very sensitive, but on the other side, the construction costs did not increase. This phenomenon indicates that the construction unit cost from year to year tends to decrease based on materials and wages cost, which is one of the reasons that explains why Indonesia construction industry experienced financial difficulties in doing construction work. This shows the relationship between the low bid contractors on the tight competition system against the decline of construction unit price, which due tight competition in procurement system the contractor is forced to bid in the very low price.

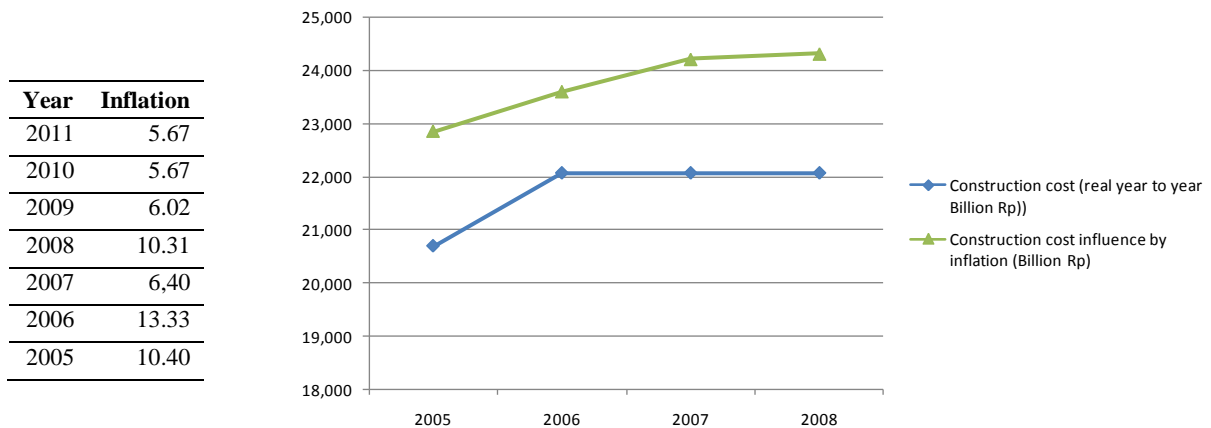


Figure 2.12. Indonesia is experiencing economic inflation from year to year, results in the unit cost of construction increasing every year (source: Statistic Data Center 2011)

Contractors forced to bid the project on a very low price in order to get a job. Data from the National Public Procurement Agency (hereafter refers as "LKPP"), 2009, shows that in the procurement process the average awarded cost is about 86% of the budget has been determined. This conditions results in the emergence of problems in the implementation of construction projects. Contractors often have financial difficulty in meeting project minimum requirements according of the contract. Other impacts are rarely the contractors are forced to reduce the quality of works in order to increase profit margins for surviving in this business. Thus the weakness of financial ability of contractor is one causes of poor performance of contractors in carrying out construction projects in Indonesia.

2.2.1.2 Financial problem caused by corruption

Based on literature study and some empirical studies that are derived from field observations and interviews to the construction stakeholders, corruption during

construction works procurement is one of key factors of poor performance. The State Ministry of Administrative Reform indicates that a public investment loss by corruption is about 30% to 50% of the project budget. Since the low bid competition causes the contractor is awarded with average 86% of project budget (LKPP, 2009), thus the construction firm conducts the project under 56% to 36% of the budget (Figure 2.12). This condition causes the difficulties for the contractors to survive in the industry within insufficient project return. It is hard for the contractor to complete the works in such budget and financial condition.

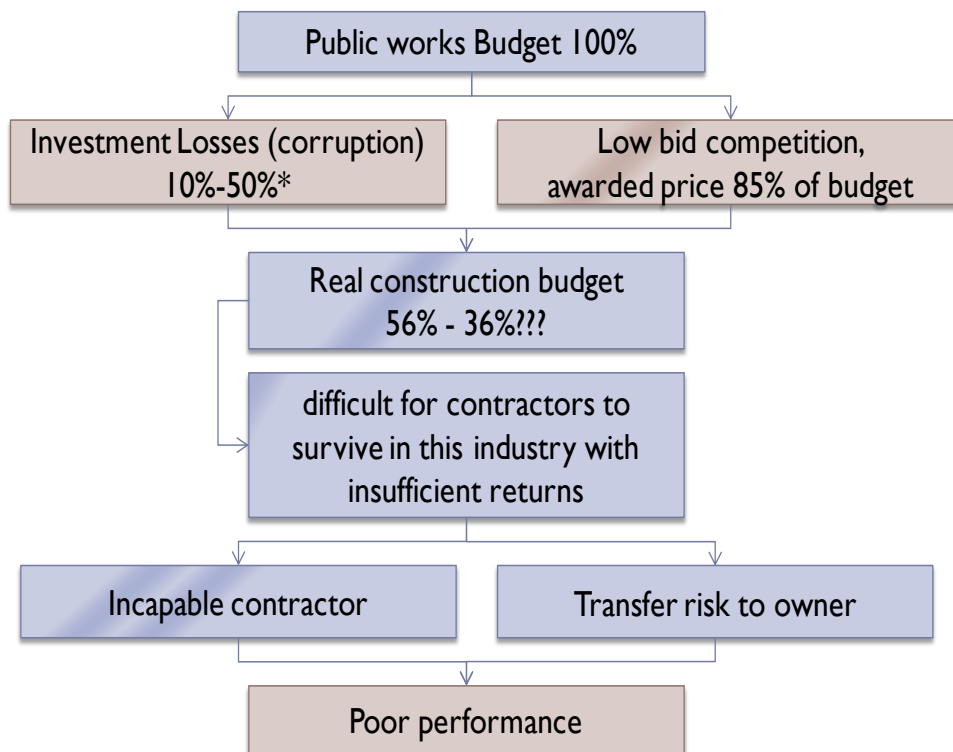


Figure 2.13. Construction financial problem caused by corruption and tight price competition

In such financial condition, in order to survive in the industry, the contractor reduces the quality of construction products under the specifications and often make claim asking for work addendum. Through the work addendum they expect to get a better profit margin. Poor contractor performance and the claim environment, results in the mutual distrust relationship and disputes occur during the construction projects.

Impact of this condition is the increasing of project problems during construction works, mainly due to stakeholders relationship tends to adversarial relationship, that influence to the performance of the project. The problems result in project poor performance, due to delay in project completion, increase project costs and poor quality construction products.

2.2.1.3 Financial problem due to poor financial support system

Table 2.2 shows that more than 99% of construction firms in Indonesia construction industry are small and medium enterprises (SME). In addition that they are in poor financial ability of the due to corruption and price base competition, these companies also have a weakness in the business capacity. Their ability to provide capital in conducting construction project is very poor, that results in difficulties for them to be able to do a good works.

Currently there is no funding system that supports the construction companies, especially SMEs, government policy regarding the construction financial support system limited only for large scale project such as Public Private Partnership scheme. Since there is no mechanism in financial support for small and medium business construction funding from the institution, it causes construction firm has more serious problems of funding and financial support, especially for small and medium enterprises (SME).

The poor performance of the construction industry creates no confidence environment of funding industry to the construction industry. Since the funding industry also less access to the construction industry information, this condition make the funding industry have difficulty in develop cooperation to the construction industry.

The impact is some good-performing companies have difficulty to get accessibility to funding agency when they require financial support. The construction industry is hard to access the funding industry, and vice versa.

2.2.2 Technical Problem

Although the contractor lack of capacity, the contractor still can join and be awarded the construction work, since the procurement system cannot identify clearly the ability of the construction company's performance and business capacity. The poor capacity of contractor has poor capacity of risk control mechanism that results in poor performance of in the construction work. The contractor has no capacity to achieve the minimum requirement of construction works that makes the contractor has bad reputation in conducting project. In this condition, trust cannot exist since the process is conducting under bad reputation environment, hence the relationship become adversarial relationship. Figure 2.14 describes problems due to poor contractor capacity.

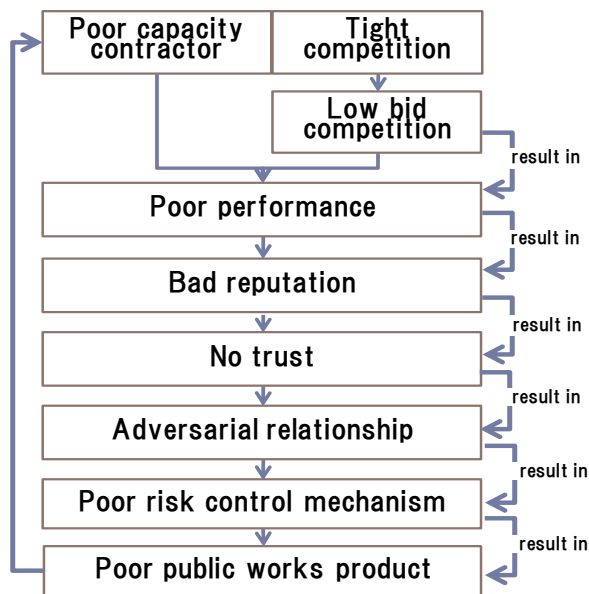


Figure 2.14. Poor capacity of construction firm problem condition

2.2.2.1 Poor risk control mechanism

Almost of Indonesian contractors are facing problems of project completion delayed. Delay of project completion is a serious problem in Indonesian construction project. In a certain case, delays often contribute to costly dispute and adverse relationship amongst the project participants such as clients, consultants, contractors, sub-contractors and suppliers. The disputes often occur during the construction phase, since many changes occur during this phase, which it leads to delay and additional cost.

The research by Sukirno et al (2007) indicated the main causes of disputes in Indonesia construction which are projects risk and uncertainty that results in changes in construction scope of work. The risks are including 'the external conditions' and 'the condition of the field', which total 46.43% of dispute causes by this reason. Another 37.5% of dispute creates by poor drawings document and poor technical specification document. And 16.07% dispute is caused by poor cost estimation, professional ethics problems, license problems and others. Those problems indicate that the construction industry in Indonesia cannot anticipate the risk and uncertainty appear during construction works, and this is a major cause dispute that result in inefficiency of Indonesian construction industry.

In Indonesian construction works, the stakeholders have less consideration in risk control. Many risks appear in construction works cannot be controlled by the parties involved. The stakeholders tend to have different risk perception in conducting project. The difference causes the risk communication and risk allocation between parties not optimal in risk control mechanism.

In most of government construction projects, public client transfers all the risk to contractor through a lump-sum contract method. While the incapable contractor has a poor capability in controlling risk, there is often additional work, reworking, or delay due to uncontrolled risks. Poor capability of contractor and the weakness of public client have been resulted in a low level of trust among parties. This condition causes the emergence of an adversarial relationships and inappropriate risk allocation in construction works. Sakkal (2005) stated that current adversarial relationship between the parties causes poor risk anticipation during construction works. In this adversarial relationships condition, each party involved has different objective and motivation in conducting project which tends to be opposed each other. Each party tries to pursue only their own short term benefit. These differences become a source of inefficient risk communication among stakeholders in Indonesian construction works.

2.2.2.2 Low capacity in project delivery system

Based on the main issues related to the characteristics of Indonesian construction projects, it is found that technical ability on project delivery system is also a critical part of the construction industry, since it does not run efficiently. According to literature study, some research was conducted to evaluate some problems in Indonesian construction project related to project delivery issues.

The production process in the construction industry in Indonesia is not running smoothly, this is indicated by a problem on project delivery system, such as lack of appropriate material, the necessity to waste valuable resource on rework, etc.

Wood et al (2003) revealed that the delivery of major international engineering projects in Indonesia has often been frustrated by the lack appropriate materials, the necessity to waste valuable resources on rework, absenteeism, interference and the basic skills of workers. On the other side, Kaming (Alwi 2003) who investigated into the performance and skill of Indonesian workforce compared with project target output, indicated that efficiency of working time is only 75% of percentage of working time to total time, and for the output index is only 87% of percentage of actual output to target output, than for the skill index is 67% of the index range from 0 – 100, with 100 is excellent. This shows the performance of the construction process in Indonesia is very low, with a high level of inefficiency.

According to Alwi (2003) the poor capacity of construction firms result in poor performance that caused by the contractor cannot cope with the risk. This condition generates the high level of project waste. The uncontrolled risk need cost allocation and time for many no added value works, such as repair on finishing works, waiting for materials, delay causes by poor productivity of worker, waste in using raw materials, and lack of supervision. Meanwhile, according the observation result, some key technical variable in Indonesia construction work that causes risk appear, which are:

- Poor design and planning document that result in design changes
- Lack of information that causes slow in making decisions
- Lack of labor skill that causes poor productivity and quality of works
- Inappropriate construction methods that causes poor efficiency of material usage and poor quality of construction result
- Adversarial relationship that causes poor coordination among project participants
- Poor supply mechanism that causes delay in supply material
- Poor planning and scheduling that cause poor efficiency of project

2.2.2.3 Lack of information

The poor capacity of technical skill is not supported by utilization of national standard production information. According to Reini, at all, 2009, current condition indicates that individual party has developed their own system of classifying and disseminating construction information to facilitate construction process. Since there is no standardized system of classifying and sharing of such information, a lot of data and information is lost along the interaction process.

LPJK (the construction services development board) in their website have been maintaining national database for construction industry purposes. But the LPJK site contains limited information, since the data only focus on updated lists and statistics of registered construction firms, certified professional and skilled workers, and accredited construction association and accredited training centers. It is less information about performance of construction firms and does not consists of technical standard information.

Factually, Indonesia has established the National Standardization Body (BSN) in 1997 as a non-departmental government institution with main responsibility to develop and conduct standardization activities, including for construction sector. Their products, namely SNI (Standard National Indonesia) are the only standards nationally applicable in Indonesia. SNI are classified according to International Classification for Standard (ICS). In 2009 there are 634 SNIs are for the construction sector. In order to have a wide acknowledgement from different stakeholders, an SNI is formulated in accordance with WTO Code of good practice. However, in current practice the implementation of SNIs is voluntary. Even it is compulsory to comply with SNIs which are relevant to public safety issues, the stakeholders have less attention in implementing the SNI, since it is not mandatory and no encouragement to implement the standards. There is also less socialization and promotion of standard implementation from the government to the stakeholders. Many stakeholders have low accessibility to the standard information, that result in their knowledge of standard is very poor.

Additionally another problem causes by the SNI for construction sector is relatively numerous, since it cover very limited aspects of construction operations, management,

and maintenance. The numbers of standards developed annually are decreasing, because of the high development costs, therefore in recent years many standards are more of adaptations (translations) from international standards that sometime not suitable for Indonesia condition.

According to the previous explanation, the problem in supporting poor technical ability by standard system meet many problems related to development, socialization, adoption and adaptation of the standard.

2.2.3 Relational problem

In Indonesian construction works, most of the relationship between parties is going with the traditional patterns, which lacks of clear lines of communication and lacks of good relationship. On the other hand, most of relationships do not embrace change, so it, delay, waste and dispute occur during the construction that increase adversarial relationship. For the most part this condition occurred due to an overall lack of trust of one another and unclear responsibility among stakeholders.

In adversarial relationships condition, each party involved has different objective and motivation in conducting project which tends to be opposed each other. Each party tries to pursue only their own short term benefit. These differences become a source of inefficient communication among stakeholders in Indonesian construction works. The parties have less intention to control the risks that appear during the construction project which the uncontrolled risks result in poor performance.

Additionally, fragmentation of project delivery process is still too enormous. This is indicated by a disintegrated relationship between the various parties involved among phases in the project lifecycle.

2.2.4 Legal problems

Many parties involved in the industry have to deal with legal issues, especially the public client. The current system of law enforcement of Corruption Eradication Commission, the Attorney-General, and the Police has a deterrent effect, which makes many public clients reluctant to be the project leader or to take responsibility as a tendering committee, since the current law has multi interpretation and has a legal risk for the public client. This condition results in slow project implementation that might inhibit the development process.

The procurement process of construction services for construction works in Indonesia is under the rules of presidential decree of the Republic of Indonesia Number 80/2003. All public procurement must be in accordance with the rules of the presidential decree. The inspection and evaluation system of construction works by auditor always refer to the level of compliance with the procedures that are stipulated in the decree. Therefore, in conducting public procurement, the main focus of practitioners is to follow the

procedure, and less intention towards finishing construction projects with a good performance.

Since the current rule does not provide clear guidelines, it can be differently interpreted in its implementation. The different interpretation is often used by the parties involved in public procurement to pursue their personal interests, especially in the procurement process that managed by the local government. Under unclear guideline and rule, the large amount of investment in public work is also resulting in the tendency of the corruption in public procurement. The act of corruption reduce the value for money in public investments, inhibit the realization of strong government institutions, and obstructions the growth of supporting industries.

2.3 Problem formulation

Based on the issues that have been described previously, the following Appendix A gives an overview of construction industry problem mapping in Indonesia (Appendix A):

The problem mapping that described previously is in line with the Indonesian construction industry issues that explained in the strategic plan of the Ministry of Public Works. The strategic plan of Ministry of Public Works 2010-2014 revealed some problems in Indonesia construction services that include (Ministry of Public Work 2010):

- Lack of capacity in utilization of construction technology by stakeholders
- Lack of capital support for the business entities in conducting construction services
- Poor quality of construction products
- Low responsibilities of stakeholders in the development process of construction services
- Construction association is more likely to prioritize the political interest
- Construction services forum less intention and not optimum in participation on construction works development process
- Poor certification for the business entities, which is not objective and expensive, led to certified expert is still slightly
- There is no appropriate qualification system and requirements of the company to join the procurement of construction works
- The rise of corrupt practices in the process of construction services procurement
- Poor managerial functions, especially the function of coordination, integration and synchronization between the parties involved.

The analysis of the problem pattern in project lifecycle indicated some phenomena that cause the poor performance of construction project, which can be summarized as follows (Table 2.4):

Table 2.4. The problem pattern during construction phases

Risk factor	Stakeholder response	Impact to performance
1. Strong political and collusion atmosphere	Increasing transactions during the process	Higher transaction costs and longer time
2. Short time available on document preparation process and poor quality of survey data	Issuing many change orders due to poor design document	Additional cost and time due to change orders and additional works
3. Price based procurement due to pressure of audit system	Contractors bid the project only based on Bill of Quantity (BoQ) with less attention to project risk information	Additional cost and time due to uncontrolled risk
3.a. Poor evaluation for supply system	Waiting for material	Delay and additional cost for labour wages
3.b. Poor evaluation of the key person	Replacement the key person during completing project works	Unnecessary time for a new key person to understand the project situation
3.c. Lack of contractor performance information	Contractors claim additional work to improve the profit margin	Higher budget and more accidents and disputes
4. Lack of technical standard information for support system	Poor supervision in ensuring quality	Higher maintenance and operational costs

Additionally the problem formulation relates to external and internal factors can be described in the following figure (Figure 2.15).

Based on problems indicate, analysis qualitative of problem pattern by classification process of identifying key words of the problem shows that:

1. problem relates to tight competitive bidding without clear past performance information that focus on price and less intention to risk control appears in the whole problem evaluation categories,
2. other problems that also significant since they appear minimal in three categories of evaluation such as high transaction cost, poor capacity, poor quality , dispute and claim environment, poor risk control, adversarial relationship, poor design/planning document and problem relates to characteristic industry which are consist of large number of small and medium enterprises.

	Existing conditions of Indonesian public works			
Current problem	Cost and financial Problem	Technical Problem	Relational Problem	Legal problem
Problem formulation	<ol style="list-style-type: none"> 1. Problem caused by low price competition 2. Problem caused by corruption 3. No financial support system 4. Poor capacity of cost control management 	<ol style="list-style-type: none"> 1. Poor risk control mechanism 2. Low technical ability 3. Lack of information 	<ol style="list-style-type: none"> 1. Adversarial relationship 2. Unclear responsibility 3. Low sanction system of poor performance 4. Low level of trust 	<ol style="list-style-type: none"> 1. Multi interpretation of rule 2. Focus on administration aspect 3. Unclear stakeholder rule
Detail of problem	<ul style="list-style-type: none"> • Contractor Financial problem • Incapable to finished work • Poor product 	<ul style="list-style-type: none"> • Poor performance • No trust • Adversarial relationship • High risk cost • Poor risk allocation 	<ul style="list-style-type: none"> • Pursue short term profit • Transfer risk to other • Claim environment 	<ul style="list-style-type: none"> • Abused the unclear rule for self interest • Manipulation of administration document • Unclear authority in construction industry development
Field of change	Improvement transparency and accountability	Integrated project structure and optimum risk allocation	Collaborative approach	Deregulation and strengthen stakeholders role
	What should be done?			

Figure 2.15. Problem formulation throughout project lifecycle

As a problem base research, the pervious explanation describes the formulation of construction works problems in Indonesia. Indonesian construction works need a change direction that can derive solutions to share optimum benefits between parties involved in construction works. The question that often arises in the improvement process is what should be done first for the change process. The action of change in a comprehensive manner is required to enhance the performance of Indonesian construction industry.

CHAPTER 3

REVIEW OF CURRENT IMPROVEMENT PROCESS

Realizing the need for improvements of the existing conditions, the Indonesian government makes various efforts to increase the performance of public works. One of the efforts focus is public procurement reforms

The procurement process of public works in Indonesia is under the rules of presidential decree of the Republic of Indonesia Number 80/2003. All public work procurements must be in accordance with the rules of the presidential decree. The inspection and evaluation system of public works always refer to the level of compliance with the procedures that are stipulated in the decree (Trepte 2004).

The existing condition appears that the main focus of public clients is only to follow the procedure. The public client concern is low towards finishing public work projects with good performance. This situation occurs in many public works that are managed by local governments. As a result, many public works product have poor performance.

Some efforts are required to find solutions to the poor performance of public work to accelerate the country development process. The problem pattern of project life cycle indicates that many factors cause the problem during the construction of public work. The analysis of the problem pattern suggests that focus on procurement process should be the first priority to develop improvement strategy of public work project (Larasati and Watanabe 2009).

Reform on the procurement process is an important point in realizing the performance enhancement of public work. Hence, recently many countries have been doing the reform of public work procurement including Asian countries such as Indonesia (Rawlinson 1999, Davidsen, et al. 2006).

As developing country Indonesia needs the integrated support of a good public work product. The fundamental change of procurement process expected to give contribution in enhancing the performance of construction work. Nowadays, some efforts are made by the public officials to improve performance of public work through reform the procurement process in Indonesian. In order to encourage performance enhancement, some of the efforts demonstrate good achievement, but the other does not provide a good result.

3.1 Analysis of the government report of public procurement reform in Indonesia

Historically, the rule of public procurement in Indonesia has been going through several changes since it was first formally issued in 1972 (Figure 3.1). However, these changes have not solved the main problem of Indonesia public procurement poor performance, since it tended to focus only on administration aspects.

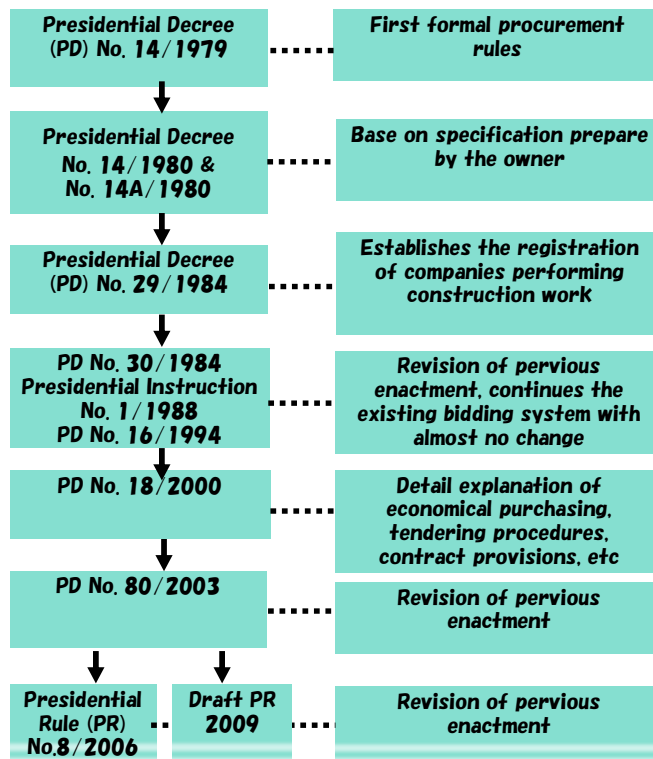


Figure 3.1. Changing of public works procurement rule in Indonesia (Larasati and Watanabe 2010)

Prior to 1998, Indonesia is in the 'New Order' era, the period of centralized development with a strong tendency of collusion and nepotism when reforms cannot be run well. Therefore, the changed procurement rule includes detailed explanations of procedures and standard contracts just made in 2000.

However, this rule does not provide clear guidelines that resulted in different interpretations in its implementation. The different interpretation is often abused by the parties involved to pursue their personal interests, especially in the procurement process which is managed by the local government.

At this point, the first evaluation was conducted by the World Bank in 2001. The issues that arise in this evaluation are as limited capacity of stakeholders and limited competition. The new decentralization regulations allow more than 300 local governments to establish their own arrangements for procurement with limited transparency and accountability that increase the risk of corruption.

The recommendations of the first evaluation result are responded through enactment of Presidential Decree 80/2003, which promotes basic principles of procurement of transparency, open and fair competition, efficiency, effectiveness, non-discrimination, and accountability. The main focus of the enacted rules is to solve the corruption problems, which is regarded as a significant cause of public works poor performance. Nowadays, the Presidential Decree 80/ 2003 has been changed four times. The last change by president rule is No.8 at 2006.

Then the performance evaluation of the Presidential Decree 80/2003 was conducted by the Organization for Economic Co-operation and Development (OECD) under Development Assistance Committee of Procurement Joint Venture at 2007 (Ministry of National Development Planning Agency 2007). The evaluation result showed that the procurement reform in Indonesia did not get optimum achievement yet.

The evaluation result indicated that the score of institutional development capacity, functional of public procurement market and appeals mechanism seems to be low, about 62% of success criteria of procurement reform that are established as an international Base-Line Indicator (BLI), which BLI optimum achievement is 100% (Figure 3.2). Therefore, the capacity improvement and improvement of transparency and accountability should be the focuses of the development of a new framework in the reform process.

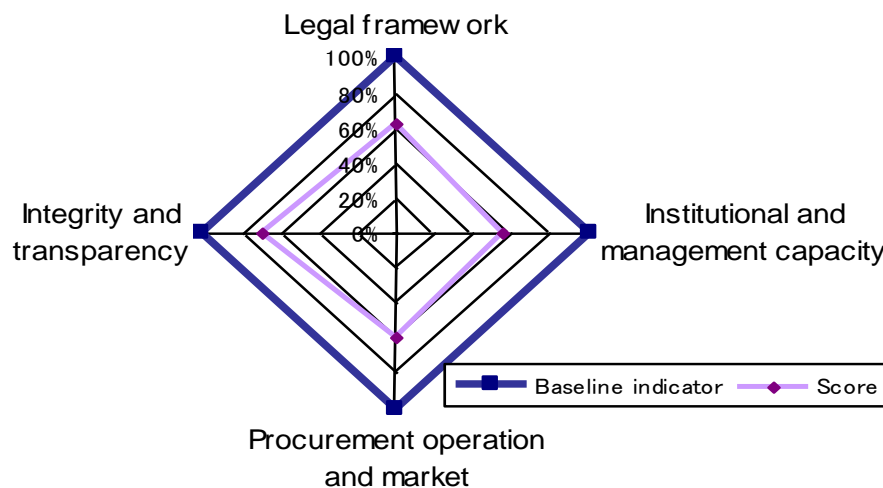


Figure 3.2. Performance of Indonesia procurement reform based on Base-Line Indicator (BLI)

Based on reports of the Head of Public Procurement Policy Development Agency of National Development Planning, Republic of Indonesia, the reform of public works procurement has started in 2003 and the results of the reform at 2007 namely are (Raharjo 2007):

1. Public client opened up the bidding process to be more competitive. In some case more than 100 participants join in one tendering opportunity, with the bidders offering only 60% - 70% of the owner-estimated cost.
2. Only a few institutions are practicing good procurement to achieve good performance.
3. According to a monitoring body, less than 40% of public clients are conducting procurement as required under the regulation.
4. The current system of law enforcement of Corruption Eradication Commission, the Attorney-General, and the Police has a deterrent effect, which makes many public clients reluctant to be the project leader or join the tendering committee if they do not understand and know government procurement well.
5. A National Public Procurement Agency (NPPA) was established that dedicated to develop public procurement policy.

According to the results of the reform mentioned above, the following table is an analysis of the conditions of the procurement reforms in Indonesia (Table 3. 1).

Table 3.1. Analysis of current result of procurement reform

Results of procurement reform described in the report	Analysis of reform result
1. Participation of many contractors in public work procurement that cause high competitiveness	Tend to use price-based evaluation system that pushes the contractor to bid in a very low price
2. Low performance improvement in practice to achieve good procurement	Tend to have difficulties in performance improvement since the system without sufficient past performance information
3. Public client has difficulties in complying with the regulation.	Lead to manipulate legal procedures in order to comply with regulation rather than focus on achievement of good performance
4. The public client is reluctant to carry out public procurement since the unclear regulation has multi interpretation	Inhibiting the process of project implementation
5. Development of public procurement agency and new regulation under unclear stakeholder role in development process	Tend to have resistance of stakeholder involved in implementation process

Table 3.1 indicates that the results of procurement reform have some constraints in achieving good performance. The process of procurement reform in Indonesia tends to focus only on legal procedure and price based competition. The government believed that against corruption through legal procedure and price based competition is one of key factors of performance improvement. Since the reform hardly pays attention to the

root problems of poor performance of public works such as adversarial relationship problems and lack of performance information of risk control ability, the reform has not generated good results in improving performance.

On the other hand, most of Indonesian public works use lump-sum contract mechanism in the procurement process in which the public client transfers all of the risks to the contractor. Given that the project is low profit under high competitiveness condition, it causes the contractor is unwilling to incur the additional costs necessary to cover the risk as this will erode its profit. As a result, the project is full of claims and counterclaims. The client seeks to impose the risk transfer provision, and the contractor seeks to resist incurring costs that make the project unprofitable.

Based on the above description, a main focus of the reform process is combating corruption rather than improving performance in order to increase the value of public works investment. The reform process in Indonesia has shown change of expectations in reducing corruption. According to a survey by Transparency International (2005) for Global Corruption Barometer, 81% of Indonesian people think that corruption could be decreased over the next 3 years. Only 10% of respondents think that it will get worse. This level of optimism was the highest of all the countries surveyed by Transparency International.

Despite peoples' high expectation, study by the International Transparency in 2010 (TI Indonesia 2010) indicated that improvement process of corruption eradication is still slow in Indonesia. Jones (2007) points out that this slow process is due to sanctions rarely applied, also the clandestine nature of many transactions, and weak enforcement systems. A permissive attitude to corruption that permeates nearly all levels of government and business is another important factor.

In a series of reforms implemented, intensive efforts to reduce corruption had been made. However, efforts to improve project performance had been hardly taken. Root causes of this poor performance such as adversarial relationship among parties and lack of risk control ability for each party had never been dealt with. Hence, the reform has not generated expected results in improving performance of public works project.

In accelerating country development, Indonesia needs a reform with its definite and rapid implementation and involvement of all the parties. The reform efforts are expected to significantly improve the performance of public works project.

3.2 The contractor's views of public procurement reform in Indonesia

According to the chairman of national association of Indonesian contractors (Kartasasmita 2006), public works procurement in Indonesia is in poor performance due to the existence of some causal factors such as misunderstanding and wrong perception

of the prevailing regulations and the weakness of the key party's capacity in carrying out public procurement.

In the contractor's views, the proper implementation of regulations depends on the parties involved, especially the public client. The contractors believed that the procurement process conducted by the public client contribute to 90% of role in determining the success of the project (Kartasasmita 2006). Therefore, the reform of public procurement plays an important role in improving performance of public works project.

The Japan International Cooperation Agency study on Indonesia public works quality improvement through questionnaire survey to 450 contractors in Indonesia demonstrates that the contractors expect the government to strengthen its role in Indonesian public works (JICA 2010). The study shows that 76% of contractors ask public client to improve the transparency of procurement system, 64% of them ask the government to avoid unfair system, 71% of them expect the government to improve corporate management, and 71% of them ask government to reward good quality contractors. These expectations are an expression of the need of improvement of the current poor performance.

In construction works procurement, the client hardly incorporates the contractor performance information which is needed to qualify and evaluate each contractor. This implies that the client awarded the contract to an inexperience contractor who is incapable of conducting a project. As the incapable contractor has a poor capability in controlling risk, there is often additional work, reworking, or delay due to uncontrolled risks. This condition has led to the emergence of an adversarial relationship.

3.3 Stakeholder role in current reform

In Indonesian construction works, stakeholders can be categorized into 3 groups. The first group is the government which has a significant role in determining policy, such as defining the quality level of a construction works product. Currently this government group is in a weak condition in utilizing their significant role for the performance improvement process. The other groups are group of business entities and the communities, where the recent conditions of the both groups are less active role in the change process. The following figure (Figure 3.3) describes the element of stakeholders in Indonesia construction works.

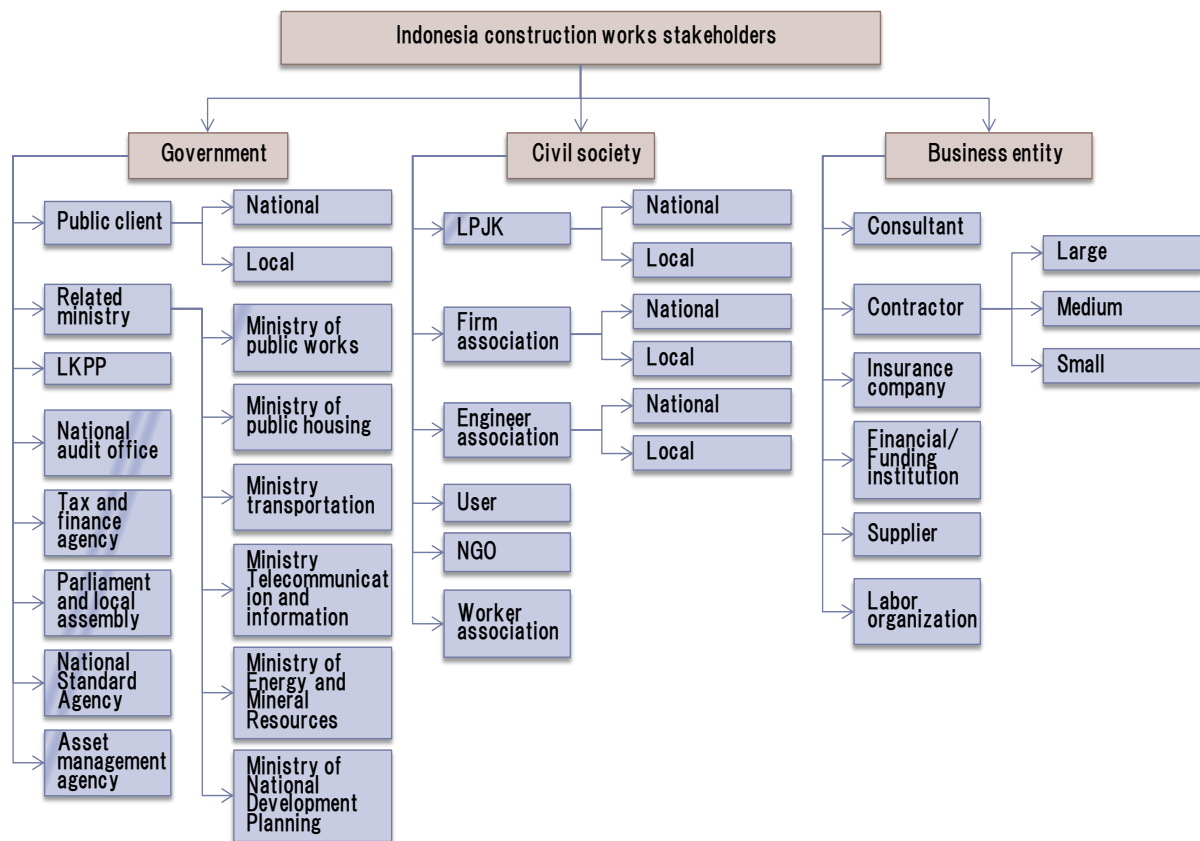


Figure 3.3. Indonesia construction works stakeholders

Deming (1994) stated that the success of the change process is related to stakeholders, especially for those who are closely associated with policy making. Therefore, the stakeholders have a significant role in improvement process. Following explanation describes current condition of stakeholder role in participating in performance improvement process of Indonesia construction works.

3.3.1 Review of government role in current reform

After experiencing 350 years of colonization, Indonesia government became a democratic- republic in 1945, and the last government reformed was occurred in 1997. The change of government system has resulted Indonesia under excessive democracy euphoria condition (Figure 3.4).

The pattern of relationship between parties in Indonesia may be affected by the change of government system. The democracy in Indonesia requires a high cost for buying the people votes in order to win the election. There are some indications that the public officials/ political leaders tend to abuse the public works budget for their election funding. The political leaders use their authority to arrange public works projects to engage with their constituent, even though the targets of the projects do not provide sufficient value.

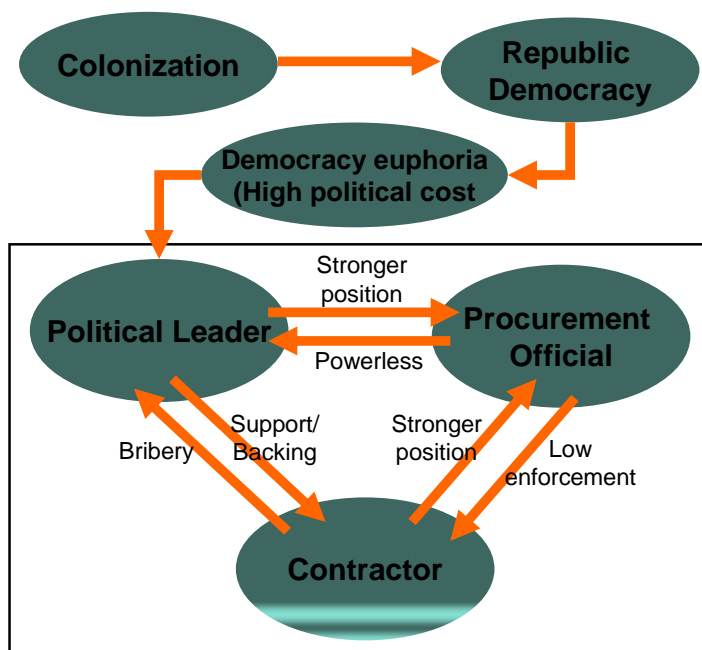


Figure 3.4. Stakeholders relationship in Indonesia

In 2006, 47% of central government expenditure was transferred to the regions. In terms of spending, Indonesia is now one of the most decentralized countries in the world (Ministry of National Development Planning Agency, 2007). The current transfer system will guarantee that this remains the case for years to come (Figure 3.5).

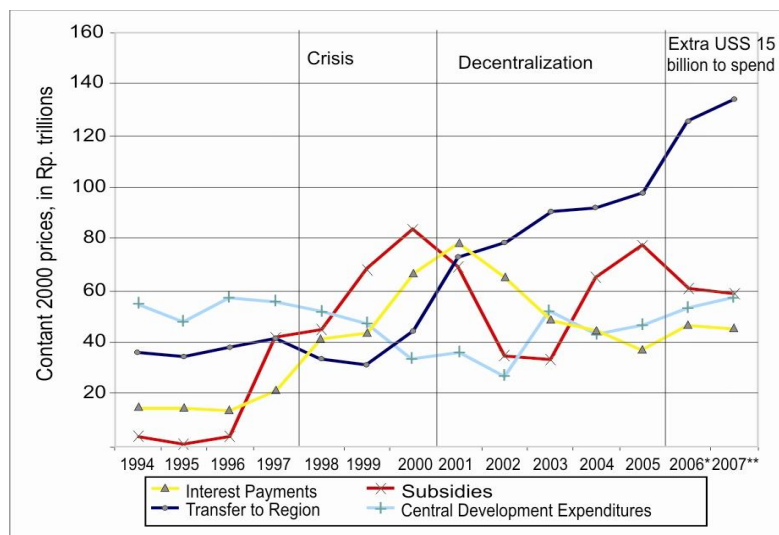


Figure 3.5. Defining years in Indonesian public expenditure allocation (sources: World Bank, 2007)

Since the majority of public investment is managed by the local government, the achievement of the good performance of public works is very significant for the local government. Improvement of a few percentage points in public procurement by the local

government probably would save tens of trillions rupiahs (hundreds of millions dollars) of value for money.

The procurement processes conducted by local governments tend to have high of transaction costs. Observation result of a project in the previous study⁵ demonstrates that the construction price of a public work project increased to 140% of initial budget because of transaction costs. The problem is the inappropriate system uses in conducting public procurement by the local government instead the decentralization system.

In order to support the increasing of public work efficiency, therefore, public work procurement in the local government supposes to be the focus of proposed public work procurement reform. Thus, the scale of framework development and also the cases study might be adjusted to the scale of local government.

Current practice indicates that almost in all procurement processes that conducted by local government, the undocumented transaction costs exist. Consequently, the cost of construction works is much higher than the real needs in the field. The transaction cost reduces the value of money of construction works investment, and also resulted the poor performance of public work because insufficient budget for the project operational cost.

The awarded contractor obtains insufficient risk information on the project. Many errors occur that lead to rework during the construction of public work. The contractors have difficulty to achieve the minimum requirement of project specifications. In many cases, therefore, the contractors often underperform the specification requirement.

On the other side, the current procurement system is under high competition condition which has tendency to create adversarial relationships between the public client and other parties. Each party involved has different motivation in the procurement process which tends to be opposed each other. Table 3.2 describes some differences in the objectives between the public client and contractor under high competition of public procurement.

Table 3.2. Differences in objectives in client and contractor's views in Indonesian public works

No	Public client objective	Contractor objective
1	Lower project cost with high quality	Higher volume of works with cost addendum
2	Good results of public works project (long-term objective)	Becoming awarded contractor (short-term objective)
3	Transferring all risk to the contractor	Asking client to pay all additional costs caused by risks and the uncertainty

These differences become a fundamental source of lack of cooperation, limited trust, and inefficient communication between parties in the public work project. Under these relationships each party tries to pursue her/his own objectives. The difference of motivations and objectives causes the parties have less intention in risks control during the construction project. Each party tends to depend on other parties in controlling risk. Since 'change' and uncertain conditions are defining characteristics of public work construction, paying less attention to risk in public works becomes an important cause of the poor performance.

Furthermore, the involved parties do not have good capacity or good support system such as contractor qualification systems, appropriate guideline, or standard of performance in conducting public works. The high competitive open tender without support by good qualification and performance standard system may force the client to choose a contractor who does not have good capability in controlling risk. There is also a possibility of moral hazard by the contractor to increase the volume of works due to risks that she/ he cannot control, and to ask the public client to expense all additional costs incurred by the risks.

It can be concluded that the current public work procurement in Indonesia is under inefficient risk control mechanism where the public client lacks performance information of contractor without appropriate qualification system of the contractor. This condition is abused by public leader to arrange the procurement system for their self interest. This condition might be the main causes of the poor performance of Indonesian public works.

3.3.2 Society and community behavior in participating to current reform

According to Organization for Economic Cooperation and Development (OECD 2008), the problems in Indonesia construction industry are arising due to the existence of LPJK (Construction Service Development Board) in undertaking its authorities and tasks. The problems arise due to the role of LPJK is considered only benefited several parties, such as business actors that encourage the establishment of LPJK. This condition happened according to the role of LPJK as a certification unit.

Confidentially, in the practice, business development is handed over the construction community role, which certification will not be only carried out by LPJK but also by the business association and appointed certification agency. Several actual facts show that the process of this certification became significant problem since this certification applied swiftly and cannot be utilized in various activities in construction industry. This occurs considering that almost 90% of business entities in Indonesia construction industry are small enterprises that could not complete standard on certification in accordance to LPJK regulation.

Table 3.3. Risk factors in Indonesia public procurement

Procurement element factor	Risk
<i>Procedure</i>	<ul style="list-style-type: none"> • Multi interpretation rule • Unclear procedure in every stage of process • Abuse of unclear procedure
<i>Technical Resource (TR)</i>	<ul style="list-style-type: none"> • Insufficient evaluation • Unclear procurement guideline • Limitation resource for technical resources development • Poor risk control mechanism
<i>Human Resource (HR)</i>	<ul style="list-style-type: none"> • Bad ethic and moral • Poor of HR development • Strong influence on thinking and behavioral of insufficient existing patterns • Unqualified resource
<i>Politik</i>	<ul style="list-style-type: none"> • High of political transaction • High of political leader interference • High of transaction cost • Low of law enforcement
<i>Document</i>	<ul style="list-style-type: none"> • Inappropriate design document • Unclear bidding document • Unclear contract document

In several bidding process, conspiracy was tend to exist by using authority of giving certification, such as the authority of business association in issuing certification used to discriminate certain competitor, tendency to establish certain business association with specific scope of work, and potency for construction agency (LPJK) as the mean for cartel in the industry with paid close attention to strong domination of business actors in the competition agency (LPJK), thus by the end this agency will transform as a formal institution where certain arrangement in construction industry will be determined by business actor indirectly.

KPPU (Commission for the Supervision of Business Competition) also indicates the complexity in this industry is caused by the high growth of construction companies and business associations that utilized the weakness of regulatory reform for personal interest. With regard to number of business associations every year, their numbers are increasing, even though several existing associations nowadays are still adequate to accommodate all construction companies. The main weakness was that there is inadequate policy to control these new business associations, and the weak infrastructure of LPJK that contribute to several competition violations in regional areas. Furthermore, there were also no regulations to control business association to achieve their competency.

Current poor performances of construction works have been caused to inhibit a lot of social and economic activities due to poor infrastructure product. Even a lot of

component of public society, especially the community wants a better condition in utilizing infrastructure services to improve their welfare, but they have low ability and less accessibility to participate in the change process, since the power of those who have authority are resistant to change process.

Existing paradigm of construction stakeholder in existing condition also causes the stakeholders less attention to participate in the change process. The paradigm includes permissive to attitude of corruption, weakness of enforcement of good performance, low integrity, lack of sanction system of poor performance, poor support system in empowering the stakeholders. Therefore, the government needs to empower common sector and society to participate in the change process. The community can be empowered by increasing participation that provides social sanctions for those who have poor performance and eliminates the permissiveness of low performance.

3.4 Limitation of current reform process

Based on the explanation of the reform result which is under the weakness of current condition that explained in the previous chapter, following figure describes the summary of the reform condition in Indonesia construction works (Figure 3.6).

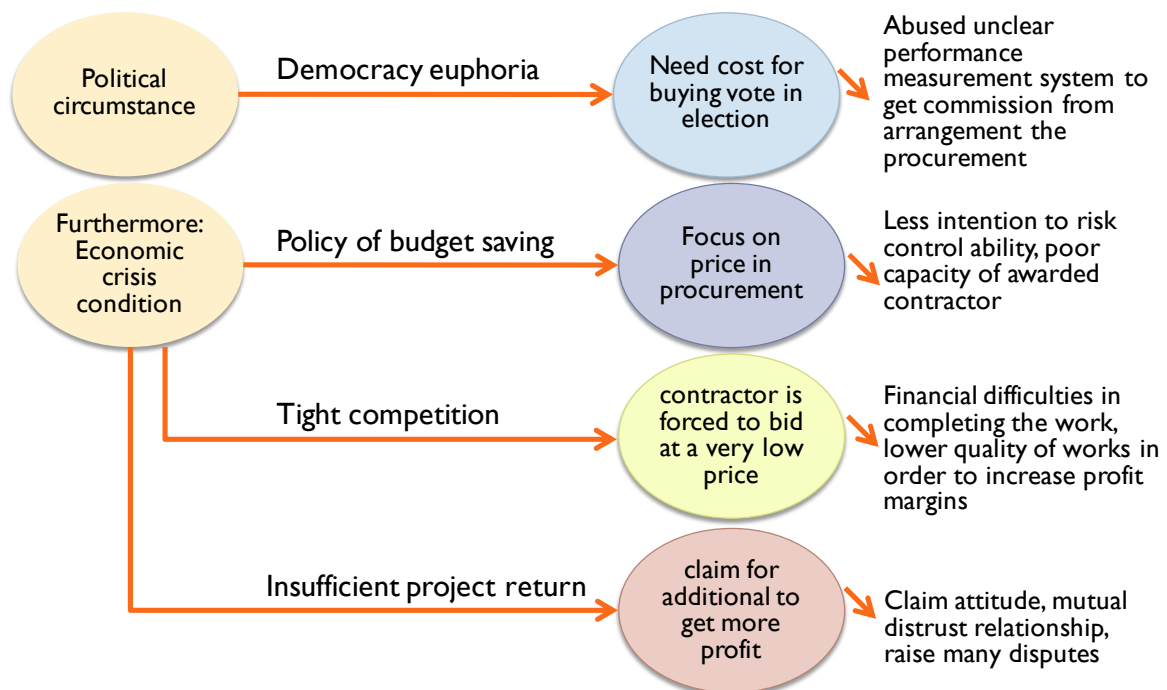


Figure 3.6. Detail condition of current reform

According to Figure 3.6, there are two conditions that influence current reform. First is political circumstance that democracy euphoria needs cost for buying vote in election,

which causes the political leader abused unclear performance measurement system to get commission from arrangement the procurement. On the other hand, since the economic crisis condition forces public client to promote policy of budget saving that tends to focus on price and less attention to risk control ability, it leads the public client awarded poor performance contractor. However, under tight competition in crisis condition contractor forces to bid at a very low price that make financial difficulties in completing the work and leads provides lower quality of works in order to increase profit margins. The tight competition with low bid price causes insufficient project return that leads the contractor claim for additional work to improve the profit. This claim attitude results in mutual distrust and dispute environment.

Fig. 3.7 represents the risk structure that indicated the Indonesia existing public procurement process which is influenced by the existing condition. The figure shows that in almost every stage of public procurement has specific problems related to legal/procedural, moral/ human resource, technical, political, and document factors.

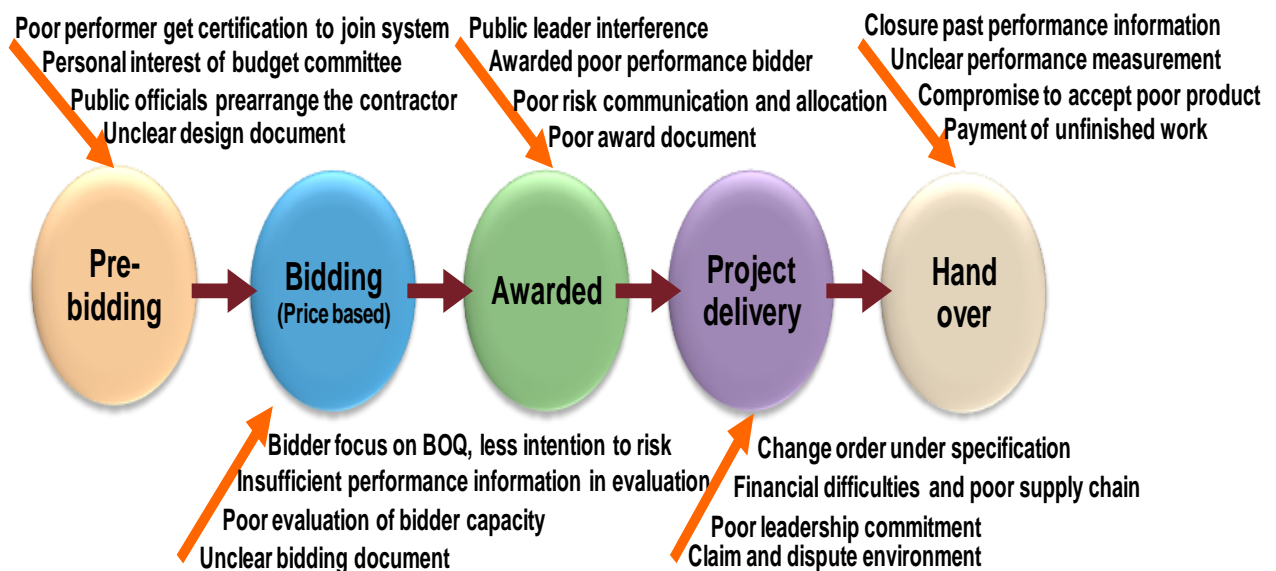


Figure 3.7. The risk of current procurement reform in Indonesia (Revision of Larasati and Watanabe 2009)

Almost in every stage of public procurement has specific problem that related to some risk factors. The problems pattern that appear in the Fig. 3.7 can be grouped based on the risks drivers that cause the problem, as can be seen in Table 3.3.

Table 3.4. Risk factors in Indonesia public procurement

Procurement element factor	Risk
<i>Procedure</i>	<ul style="list-style-type: none"> • Multi interpretation rule • Unclear procedure in every stage of process • Abuse of unclear procedure
<i>Technical Resource (TR)</i>	<ul style="list-style-type: none"> • Insufficient evaluation • Unclear procurement guideline • Limitation resource for technical resources development • Poor risk control mechanism
<i>Human Resource (HR)</i>	<ul style="list-style-type: none"> • Bad ethic and moral • Poor of HR development • Strong influence on thinking and behavioral of insufficient existing patterns • Unqualified resource
<i>Politic</i>	<ul style="list-style-type: none"> • High of political transaction • High of political leader interference • High of transaction cost • Low of law enforcement
<i>Document</i>	<ul style="list-style-type: none"> • Inappropriate design document • Unclear bidding document • Unclear contract document

These undesirable characteristics are more prevalent in local governments and local construction industry, since the majority of public investment is managed by the local government that relate to local business entity, especially small and medium enterprises. If the current undesirable characteristics are not changed, good performance of local public works and sound development of the local industry are difficult to achieve.

Figure 3.8 describes the vicious cycle associated with price based competitive bidding with insufficient past performance information, which causes poor performance of public works projects.

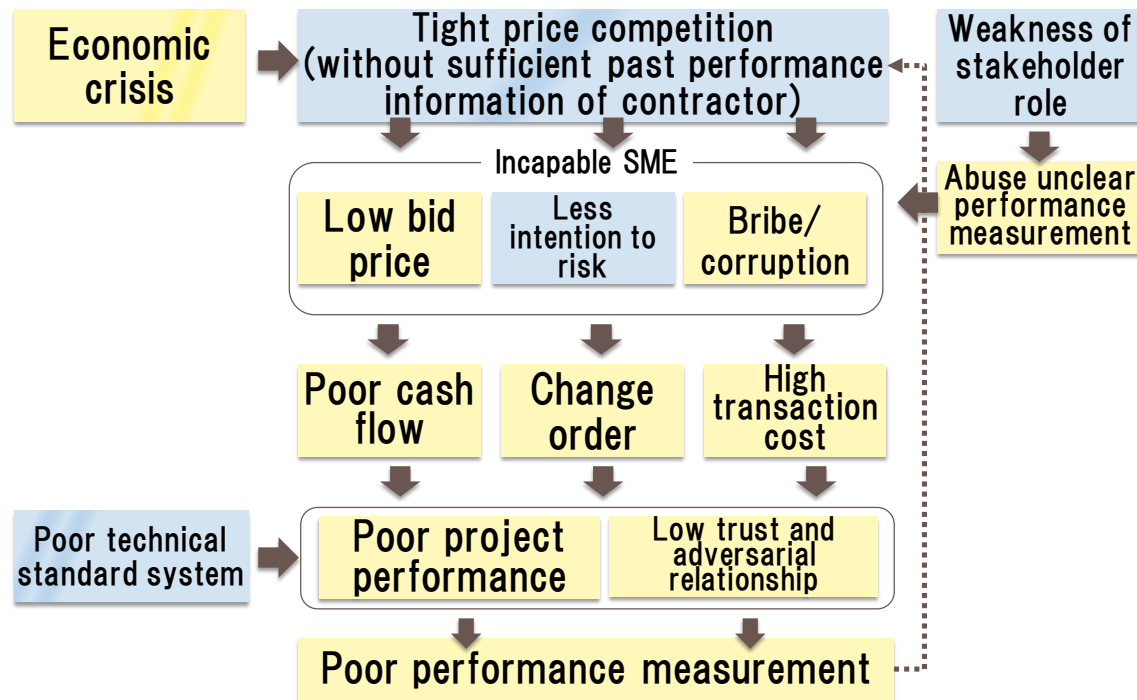


Figure 3.8. Vicious cycle of existing conditions

Changing this vicious cycle is needed to improve the performance of public works project in providing significant contribution for Indonesia development.

3.5 Research question

According to the key problems, several questions arise that relates to the needs in improving the performance (Figure 3.10), which are:

- What is the attendance action change the poor performance caused by the price based procurement system should be taken, regarding to the current paradigm which focuses on lowest price bid and tends to open accessibility and to give same opportunity for any unqualified participant in joining construction works.
- How to reduce the transaction cost, especially the cost for political interest, cost for corruption, cost for failure causes by lack of information, cost for inefficient transaction, and cost for uncontrolled risk.
- How to change the dispute and claim environment, regarding to change order caused by poor risk control mechanism and adverse relationship.
- What action to ensure the quality regarding to performance of completion work on time and on budget with good safety performance. And what kind of action to support and ensure the capacity regarding to supply system, human resources, business capacity. The actions regarding to poor support system, poor certification system and poor qualification and requirement system of the construction firm in joining the construction works. Since the major business

entity of the industry are SMEs that their poor capacity tends to lead the poor performance, how to make the change system that can adapt and adopt by small and medium enterprises.

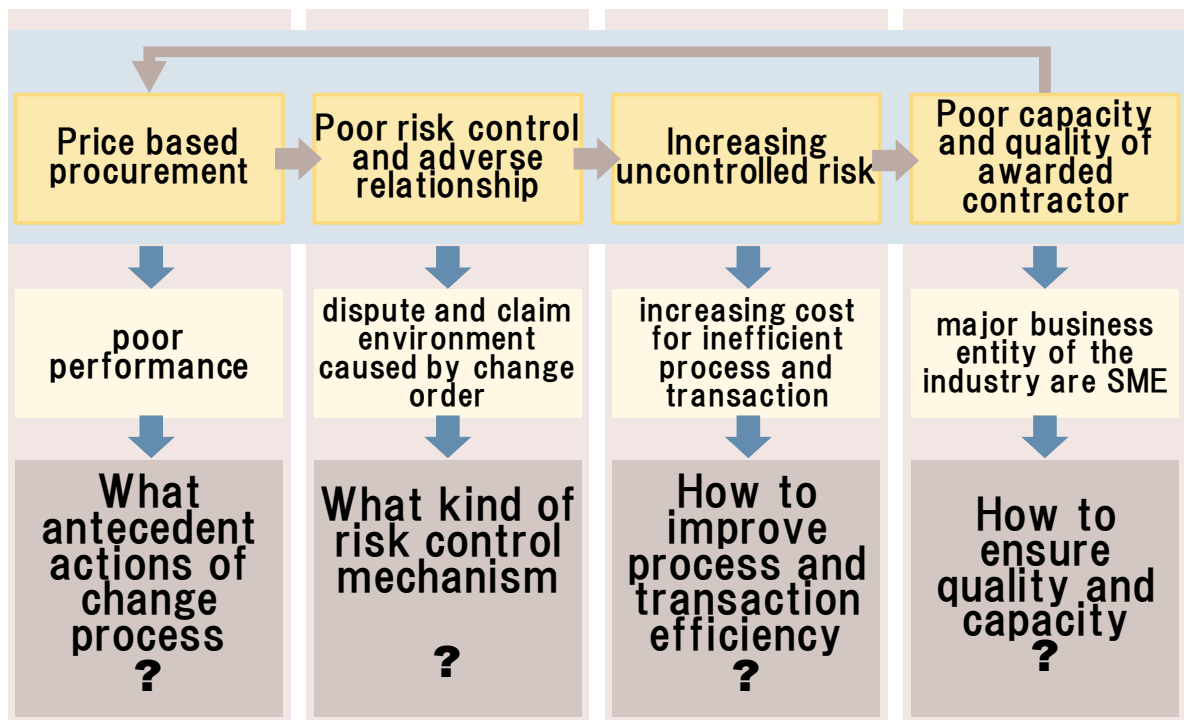


Figure 3.9. Research questions

According to the research question, the new intensive efforts should be made to change the existing conditions. However, the change would bring difficulty and even resistance in the implementation, because the existing conditions have a strong influence on thinking and behavioural patterns of each stakeholder. Therefore, theoretical approaches and lesson learned from the good practices of performance improvement strategies are also important in identifying the change direction that can be implemented and can provide advantages in the performance improvement process.

CHAPTER 4

REVIEW OF CONSTRUCTION PERFORMANCE IMPROVEMENT

This chapter aims to provide the comprehensive reviews of construction works reform relates to construction performance literatures, which the contents cover the general explanation of component in industry performance, theoretical approach in best value procurement, and lessons learned from some countries experience in construction work improvement process. The discussion in this chapter actually based on industry stability model theory and quality assurance theory which is as a foundation for the change guideline development.

4.1 Component of construction industry performance

Bettis (Richie 2007) indicates that performance in industry is dependent on three components that are industry characteristics, strategic decisions and risk. As an industry sector, construction industry performance also depends on these three components. In line with Bettis, Saqib et al. (2008) identified that decision making has stronger influence in determine the good performance of construction works. Saqib et al. identify variables that influence the success of project process, which in descending order of importance are effectiveness decision making, project Manager's experience, contractor's cash flow, contractor experience, timely decision by owner/ owner's representative, site management, supervision, planning effort, prior project management experience, Client's ability to make decision. Furthermore, as already mention before, the change theory of Deming (1994) indicates that the success of the change process in improving performance is related to policy making.

Since strategic decision, decision making, and policy making have strongly related to the stakeholder, therefore, stakeholder has a significant role in improvement process. Evaluation of stakeholder capacity and quality performance in decision making become an important action in order to ensure the success of the construction works.

Furthermore, the second component of industry performance is industry characteristic. In construction, 'change' is a defining the industry characteristic and is almost inevitable, since the life cycle of a construction project consists of various types and phases that are unique and involve various parties (Sakkal 2005). This characteristic put construction works at high risk under uncertain conditions that takes construction works into an environment that is constantly changing.

Given that the third component of industry performance improvement is risk and the construction industry characteristic is also risk, hence, the critical component of performance improvement in construction industry consists of two components that are 1) strategic decision that relates to stakeholder and 2) risks.

Oxford dictionary define terms 'risk' (Hornby 1995) as the possibility of meeting danger or of suffering harm or loss. In project management context, Niwa (1989) and Wideman (1992) define project risk as the chance of certain occurrences adversely affecting project objectives. Additionally, Flanagan and Norman (1993) indicated the risky situation is the situation when the probability distribution functions of the potential outcomes are known. Regarding to decision making, Flanagan and Norman (1993) stated that "a decision is made under risk when a decision maker can assess the information about the probability of a particular event occurring. Therefore, Kashiwagi (2010) states that the availability of risk information is required to control risk during the construction works in the aim of achieving best value performance in construction works.

However, the contractor as a key stakeholder in Indonesian public works have poor performance in risk control and the public client lack past performance information of risk control ability. This condition causes appearance of many risks during the public works projects which cannot be controlled by the parties involved (Larasati and Watanabe 2009).

Traditionally, in Indonesian construction works, owners seek to pass most of all risks to the contractors. Risks themselves are not transferred. Actually, they transfer the responsibility of those risks (Jirapong 2004). Levitt and Ashley (1980) stated that allocation of construction risks between owners and their contractors has a significant impact on the total construction costs paid by owners. The owner may have to pay twice for risks, which the owner thought that the risk is already transferred to other parties mainly contractors, but the poor capacity contractor cannot bear with the risk appeared. Because when the owner lost in court, the court will reallocate those risks to the owner. Eventually, the owner has to pay for the risks, whereas the contractors also are not making profit.

Inappropriate risk allocation, consequently, in this circumstance, all involved parties will suffer (Fisk 1997). There are the problematic issues related to risk allocation in contract along with bidding, contracting and construction processes that exist and cause poor construction performance. Therefore, it needs to ensure that all key risk areas have been addressed and the optimum procurement strategy has been selected. The evaluation plan is an internal document that lays out the steps in the evaluation process including: full details of the criteria and weightings, an explanation of the assessment methodology, details of the steps in the evaluation process, guidance regarding the scoring regime, details of what the tender participants are requested to address.

Kashiwagi (2008), indicates that future construction risk will be minimized by good performance of contractors who use a supply chain strategy that minimizes transaction costs and risk, best value selection, transferring risk to contractors who can minimize risk, having the contractors practice quality control to minimize both the risk that they

control and do not control, and putting a system of measurement of performance for all participants in the delivery chain that makes all participants accountable. It is needed an information environment that minimizes the flow of information, motivates the minimization of management, control, and direction, and minimizes decision making by those who are not accountable to minimize risk.

4.2 The important of construction procurement in industry stability

The term construction procurement system has become fashionable and more common in recent times with industry practitioners and researchers. In principle it determines the overall framework of responsibilities and authorities for participants within the construction process, and is a key factor contributing to project success and hence stakeholder satisfaction. Rwelamila (2010) indentified the definition of construction procurement according to many existing definition that the procurement is an organizational structure that defines and describes the roles of stakeholders, the relationships between them – both formal and informal, their individual responsibilities, the sequence of activities and timing of events required to provide a facility, as well as the practices and techniques of management that are used. The definition by Rwelamila indicates the important of the stakeholder role and relationship in construction procurement.

According to Nissen (2007), failure in procurement process lowers management effectiveness by 50% or even more during construction process. This is regarded that failure of procurement process is key component of the problems that leads to poor performance of the construction project. McDermott (1999) stated that procurement is a social science and implies that the disciplines of history, sociology, economic, and psychology. In a country where life sectors is dependent, the procurement mainstream does not only provide direct impact to the construction works performance, but also provide impact to economic, social, and environment sector as well.

Egan (2002) indicated that in improving the construction performance, the construction industry must replace the current procurement practices mainly focusing on price competitiveness with the practices focusing on not only price competitiveness but also quality of works and promoting growth of contractors in the long run who have done quality works. In order to do this, development of clear measurement of performance and sustainable improvement in quality and efficiency is needed.

According to the World Bank (2001), public procurement is one of central pillar in the government's ongoing efforts to improve governance. Therefore, an effective public procurement system is essential for good governance. A poor procurement process contributed to poor performance of public works product, such as over budget, time delays and quality of product is lower than the minimum requirement. The poor procurement also tends to increase the possibility of corruption, generate more

complaints and raise concerns about the integrity of the procurement process. In poor procurement condition, a good performance firms could be discouraged from participating in public work bidding; therefore repeal the country from receiving works and services of better quality. Improvement of the procurement (P) process is expected to reduce some of problems that arise in the previous process and anticipate the risks that will appear in the next process of project life cycle.

Additionally, characteristics of the construction industry are determined by supply and demand issues (Kashiwagi 2005). If the demand requires high performance, the supply will provide high performance and vice versa. In the construction industry the demand is represented by the procurement system. It is assumed that if the procurement system requires high performance, the contractor should provide high performance (Figura 4.1).

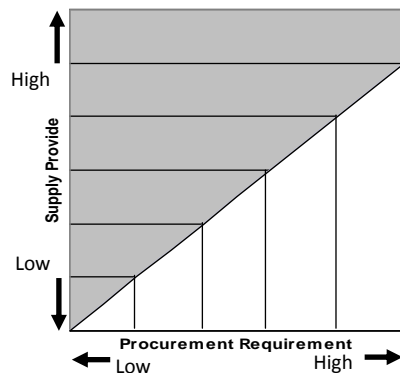


Figure 4.1. Supply and demand issue in construction

In improving the construction performance, the construction industry must replace the current procurement practices which are mainly focusing on price competitiveness, but also focus on quality of works and should promote the growth of contractors in the long run who have done quality works. Therefore, in the procurement process, the development of clear measurement of performance and sustainable improvement in quality and efficiency are needed.

Lo, et. al. (2009) indicate that the lowest price procurement is typically awarded the contract, and in this scheme the contractor's ability to control the project schedule and quality is generally not taken into account. In the lowest price procurement, according to Lo, et al., in order to be successful in the bidding many contractors may reduce their quote by reducing the quality of work, and obtain beyond-contractual rewards by "cutting corners" and making financial claims after initiating construction, both of which could negatively impact the quality of projects result. The shortcoming of a low-bid system is that it relies too heavily on price to evaluate contractors' competitiveness (Qin et.al 2010).

Waara and Brochner (2006) have stated that when awarding contracts owners should apply non-price criteria, such as quality provisions, technical solutions, and environmental policy and service, as a supplement of the price criteria. Lu et al. (2008) have added that the critical factors affecting a contractor's competitiveness in China, besides bidding price, are project management, organization structure, resources, competitive strategy, relationship, marketing, and technology. Other consideration is the introduction of the concept of supply chain to the construction industry, research on information sharing, risk allocation, resources, and performance management of the construction supply chain (Min and Bjomsson, 2008, Loosemore and McCarthy, 2008, Tserng et al., 2006, Jiang et al., 2003).

Kashiwagi (2010) proposed best value procurement which focuses of procurement in securing the best value construction firm for the owner, and transferring all project risk to the outsourced expert. It considers the construction firm past information of performance, ability to identify and minimize risk, preplanning foresight, and project knowledge. It requires the contractor to use their expertise to complete a project that fulfills the intent of the owner, and minimize controlled project risk at the beginning of the project. It forces accountability between all parties, and benefits vendors with foresight, experience, skill, and efficiency. It provides an environment that maximizes contractor profit, while minimizing owner resources (Kashiwagi, 2010).

Performance information procurement system (PIPS) is claimed by Kashiwagi that can be used to procure and deliver best value services, manage projects and minimize risk, align resources to optimize the supply chain, identify and define the optimal requirement of a client or user, measure the level of performance of employees and vendors, integrate different organizations in the supply chain, transfer risk and accountability to high performance vendors or individuals.

Khashiwagi indicated that in improving performance the utilization of PIPS will increase some characteristics of workplace environments, such as transparency, accountability, professionalism and technical skill levels, value, efficiency, effectiveness, and profits. Since the system minimizes bureaucracy, cost, communications, decision making, flow of information, management, direction, control, and transactions.

The objective of this approach is to eliminate the negative consequence of fierce competition by ensuring that contractor bid according to their real capabilities, thus hopefully it will reduce the amount of poor-quality work and number of uncompleted projects (Kunishima, 1995, Kashiwagi 2005).

Conducting periodic performance assessments during the administration of a contract not only provides a way to track contractor performance, but also encourages excellence in performance [US National institute of Health Environment Management System (NEMS) 2005]. Therefore, the contracting and program officials should consider past

performance in the evaluation and award of contracts, and evaluate contractor performance to provide information required in supporting future award decisions.

4.3 Component of industry stability in achieving best value performance

Porter (1985) and Kashiwagi (1991) define a stable industry as an industry that can continually provide a performing product regardless of demand and is continuously improving the industry performance. Kashiwagi (2005) developed the construction industry structure model in order to identify the relationship between the negotiated bid, partnering or limited competition high performance environment, the best value environment which compete both performance and price, and the price-based environment where the best value is the lowest bid using competition and performance (Figure 4.2)

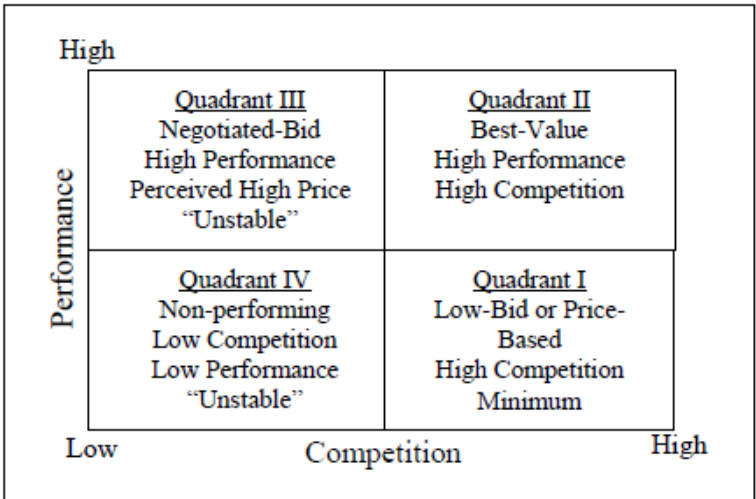


Figure 4.2. Performance and competition as components of industry stability (Kashiwagi 2005)

Figure 4.2 describes the relationship between level of performance and level of competition in industry stability that divides the industry into four quadrants (Kashiwagi 2004):

1. Quadrant I: Low- Bid or Price Based Sector where this sector is described by "high competition and low performance". In this sector the award is based on price. A minimum performance is allowed to participate. The contractors force the owner to identify when the performance does not meet minimum standards. The award is based on price. The lowest price is usually awarded the contract. In many instances the low bid may also go to contractors who forget to include activities, force subcontractors and manufacturers to lower their price, and employ the least expensive management and craftspeople.

2. Quadrant II: Best Value Sector where this sector is described by “high competition and high performance”. This sector is the best value quadrant. Users consider both performance and price. It requires performance information of risk minimization.
3. Quadrant III: Negotiated- bid Sector, where this sector is described by “high performance and low competition”. This sector is a negotiated contract. Users usually pre-qualify contractors, and subjectively select the best value. Since only pre-qualified contractor can join the procurement, this mechanism tends to have low competitiveness.
4. Quadrant IV: Unstable Sector, where this sector is described by “low competition and low performance”. This quadrant is unstable and cannot maintain itself. If a contractor has no competition, and cannot perform, they will not remain in business for a prolonged period of time. When a performer appears, the non-performer contractors will disappear. If competition appears, the noncompetitive will disappear.

According to Kashiwagi model, deductively, in Quadrants II and III, the high performance contractors are hired for their expertise. By definition, a high performance contractor practices quality control, and therefore minimizes the risk of non-performance. The model of Kashiwagi will be used in conducting analysis in next study, namely the analysis of lessons learned and the analysis in evaluating the needs of change process.

However, Kumaraswamy (2008) points out that in accelerating the development of construction industry, the industry should have good relationship in according to have better network as a basic requirement to achieve best value. Rowlinson also indicated a strong correlation between performance and competition in procurement with the stakeholders relationship (Rowlinson, and Cheung 2004).

According to Kumaraswamy the local character and culture based on strong trust, respect and grateful relationship is a foundation for good relationship. Hopefully it will build the loyalty, dedication, and responsibility as the foundation of better network. Therefore a collaborative and cooperative relationship is one of component of industry stability.

In the collaborative approach, the adversarial relationship is changed to a partnership, and the alliance became mindset of the relationship in delivering benefits (Walker and Hampson2003). This approach needs high mutual trust, loyalty and commitment between the parties. Research by Thompson and Sanders shows that the relationship with high alignment objectives through coalescing, partnering and collaborative relationships resulting a significant performance improvement (Walker and Hampson 2003). Therefore, the construction industry stability relates to the level of three components of the industry which are performance, competition, and relationship.

4.4 Lessons learned in construction performance improvement

In order to find the direction of the change process lessons learned from good performance country is conducted using industry stability model developed by Kashiwagi. The lesson learned study is conducted to Japanese and UK construction industry performance improvement processes, since the two countries have long experiences in improving their construction industry performance. As already mention before, the analysis of lesson learned will use the model of industry stability component.

4.4.1 Lessons learned from Japanese construction improvement process

Best practices of Japanese construction industry development indicated that during the high economic growth period, the competences of the contractors have been significantly enhanced. Contractors with good performance had been promoted. As well, the industry built a “mutual relationship” of pursuing a common goal of good works rather than adversarial relationship between the parties (Watanabe 2005).

The government is the most influential player to the construction industry because many public investments are spent each year to provide facilities and infrastructure for the development of the country. Thus, the government should be responsible for developing policies that can improve the critical situations through the appropriate mechanism on the management of public construction projects. In Japan, for example, the government has not only a face of the client but also a face of the public administrator of the construction industry.

During Japanese high economic growth the capacity of the private sector in Japan public works improved significantly (Nishimaki 2006, Watanabe 2007). To ensure the performance, a designated system is managed by the Japanese public client based on cooperative relationship under reputation based system that is supported by societal assurance system and strong social sanctions system. According to Confalonieri (2007), reputation based approach is a mechanism to build and to maintain a good reputation in ensuring that collective action delivers socially desirable results.

The success of this system causes by the emergence of high trust between the parties since the parties always maintain their good reputation. The existence of trust and good reputation cause the project conducted with such target cost based system and flexible design which encourages low occurrence of disputes between the parties. The relationship tends to collaborative which results in low transaction costs. Contractor development is driven by long-term relationship that allows the development of a strong supply chain system (Watanabe, 2007). According to model relationship of industry stability (Figure 4.3), at that time Japanese construction industry is in the position of quadrant III of industry stability which is under negotiated bid system, has high performance in collaborative relationship environment.

The problems in Japanese public works arise when two types of illegal activities were revealed: politicians' intervention into the public procurement and active involvement of many government officers with Dango, complementary and rotational bidding. The past performance evaluation on the designated competitive bidding systems is not considered transparent and less accountable. To enhance transparency and accountability, introduction of price competitive bidding was considered effective, which means the Japanese construction industry moved to quadrant I.

However, there was a strong apprehension about deterioration of quality of public works due to excessive price competition. Then, the Industry moves to quadrant II in order to improve competitiveness and performance in the effort of increasing accountability and transparency. The Japanese government enacts the act for promoting quality assurance and introduces the comprehensive evaluation method, which is to evaluate not only price but technical proposal with past performance of each bidder. The industry is supported by construction information system under Japanese Construction Information Center (JACIC). JACIC (2008) has promoted and provided information sharing environment, where information generated in the process of infrastructure facility life cycle is managed in digital form and circulated through communication network while avoiding re-input and enabling retrieval for reuse information.

Three lessons are drawn from the reform of Japanese public procurement. The first is the importance of collaborative relationship among stakeholders in pursuing common objectives that supported by reputation based procurement system and strong social sanction system. The second is the importance of the quality assurance mechanism that supported by past performance information system to increase the transparency and accountability of public procurement in achieving best value performance while eliminating the negative consequence of price-based competitive bidding. The other one is effectiveness of an integrated performance evaluation system that supported by utilization of electronic record of performance information. Figure 4.3 describes the industry improvement process in Japanese construction industry which always focuses on quality (Nishimaki 2006).



Figure 4.3. Japanese construction industry performance improvement process which includes increasing quality, eliminate poor quality and ensure quality.

Figure 4.4 shows the chorology of change action in Japanese construction industry movement that related to its movement in industry stability model.

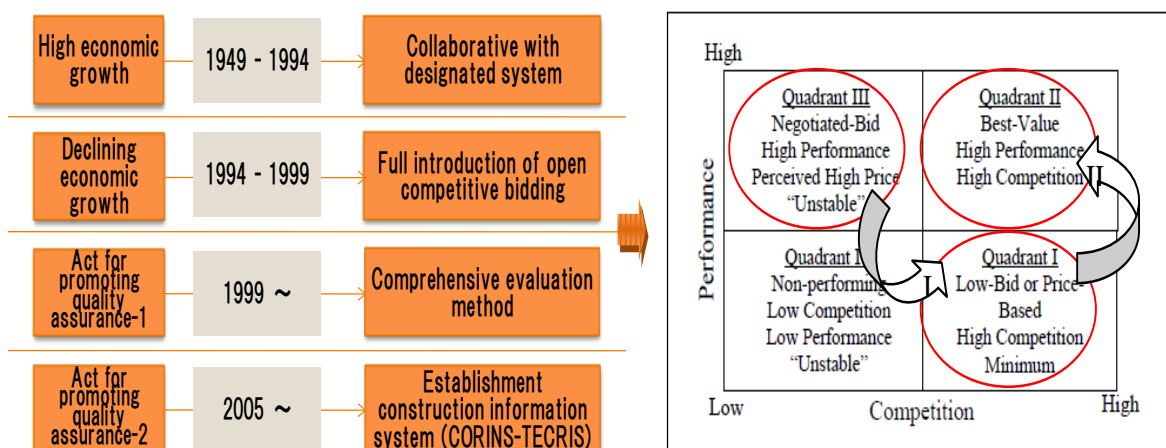


Figure 4.4. Performance improvement process in Japanese construction industry that move from quadrant III of industry sector to quadrant I and then move to quadrant II

4.4.2 Lessons learned from UK construction improvement process

Comparable to Japan, the UK construction industry also made various efforts to improve the industry performance. When Japanese construction industry moved from collaborative to competitive, UK tends to move from competitive to collaborative. Many reports of UK construction improvement process show the direction of the changes action that made by the UK government, since the Simon report 1944 (Table 4.1).

Figure 4.1. Reports of UK construction industry performance improvement process

Report	Title	Year
Simon Report	The Placing and Management of Building Contracts	1944
Emmerson Report	Survey of Problems Before the Construction Industries	1962
Banwell Report	The Placing and Management of Contracts for Building and Civil Engineering Work	1964
National Economic Development Office	Action on Banwell	1967
Tavistock Report	Interdependence and Uncertainty	1966
Latham 1	Interim Report – Trust and Monies	1993
Latham 2	Final Report – Constructing the Team	1994
Levene Efficiency Scrutiny	Construction Procurement by Government	1995
Egan Report 1	Rethinking Construction	1998
National Audit Office	Modernizing Construction	2001
Egan Report 2	Accelerating Change	2002
National Audit Office	Improving Public Services through better construction	2005
HM Treasury	Transforming government procurement	2007
HM Treasury	Infrastructure procurement: delivering long-term value	2008
HM Treasury	Operational Efficiency Program	2009

Since World War II a catalogue of reports have bemoaned the then current levels of performance of the UK construction industry and/or advocated change, e.g. Emmerson 1962; Bowley 1963; Banwell 1964; Higgins and Jessop 1965; Bishop 1972; NEDO 1978; Munday 1979; Ball 1980; Allen 1983; NEDO 1983, 1988; Latham 1994; DETR 1998 (UK, National Audit Office 2001). Latham (1994) report proposed to change the industry from the existing condition in Quadrant I moved to Quadrant I which is very competitive environment. The industry continued move towards a more negotiated condition to Quadrant III. The subsequent change continues through promotion of the principles in "rethinking construction" proposed by Egan, which started from 1998 that is still underway until 2000. The next changes made are related to the strengthening of industry in quadrant III.

According to Kashiwagi (2007), since the UK still tends to make efforts in changing the industry condition to Quadrant III, and the world economic conditions tends to experience a prolonged crisis, this conditions result in the change effort have not showed significant impact in industry performance improvement.

The data of UK construction industry performance improvement indicated slow performance improvement issues during construction industry movement. Since the first action of change process until 2000, the data indicated that only 68% of clients in the UK would give a 8/10 rating or better on satisfaction to the construction works, only 45% of clients in the UK stated that the costs were on target, only 62% of clients in the UK stated that the projects were completed on time (Kashiwagi 2007). The UK government made a lot of effort to continue the change process, but the direction of the process tends to focus on the Quadrant III until 2005. In 2009 HM Treasure of UK Government promotes 'Operational Efficiency Program' that utilizes IT system in improving efficiency in construction works (HM Treasure 2009).

UK CoST (Construction Sector Transparency Initiative) is promoted since 2010 that relies on cooperation between stakeholder groups to observe public construction and to highlight differences between specification and delivery. This initiative objective is to improve trust through greater public confidence in government and public works by involvement of Multi-Stakeholder Groups (MGS) in improving transparency and accountability for better social and economic returns of public work investment (UK CoST Multi-Stakeholder Group, 2010).

According to previous explanation, following figure describes the chorology of change action in UK construction industry movement that related to its movement in industry stability (Figure 4.5).

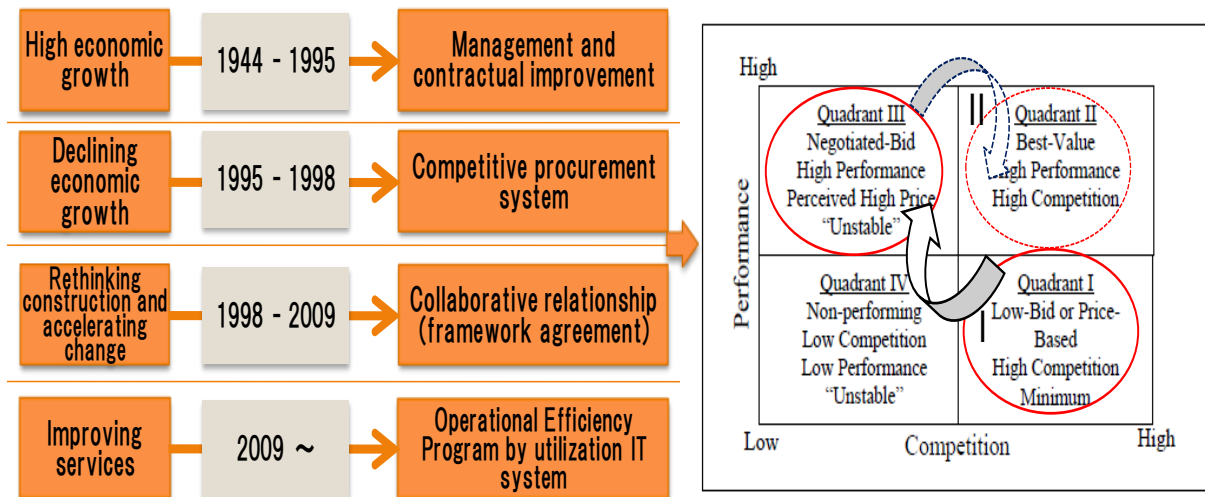


Figure 4.5. Performance improvement process in UK construction industry which move from quadrant I of industry sector to quadrant III and then now try to move to quadrant II

4.5 Finding from literature review

In the worldwide economic crises, government as the biggest public client in the country construction industry sought to procure a better value. The intention is not only to keep high quality, but also increase transparency and accountability including increase the competitiveness. According to industry stability model the industry should move from quadrant IV or quadrant I which are poor performance to Quadrant III or II that have high performance. However, instead of moving from Quadrant II, the majority of industry moved to Quadrant I caused by the inability to identify and measure the difference of performance which results in the awards being price based system.

Some conclusions can be drawn from the literature reviews include:

1. According to the industry stability model the construction industry stability relates to the level of two components of the industry which are performance and competition. However according to literature study, relationship also has strong influence in enhancing good performance. Therefore, procurement process should not only improve competitiveness, but also supposed to focus on performance by defining and describe the stakeholder role and relationship clearly in the process.
2. The procurement system needs to focus on performance and to give more opportunity to qualified participants that requires a system that can measure differences of performance in order to ensure good performer will become awarded contractor who has best performance in managing risks during the construction process.
3. Lessons learned from literature reviews also indicate the needs of some consideration in improving performance of construction industry, that consist of:

- Eliminating negative consequence of fierce competition by ensuring construction firm capabilities that requires past performance information
- Ensuring standard quality of public work components through technical standard information system
- Increasing efficiency by utilization of information system
- Improving trust and greater public confidence through disclosure performance information by involvement of multi-stakeholders
- Lessons learned indicate that the development of strong social sanction system could make an attitude to achieve good performance

CHAPTER 5

NEEDS ANALYSIS OF INDONESIA CONSTRUCTION PERFORMANCE IMPROVEMENT

According to industry stability model (Figure 4.3), currently construction Indonesia is in the Quadrant I where the industry is run by using a low price bidding system with a high level of competition without appropriate support of performance information. Indonesia needs to change the direction in achieving good performance by moving from Quadrant I to Quadrant III or II (Figure 5.1). To be able to move from Quadrant I, this chapter will analyze the needs of performance improvement process in the current Indonesian construction industry condition.

(Industry stability model of Kashiwagi 2004)

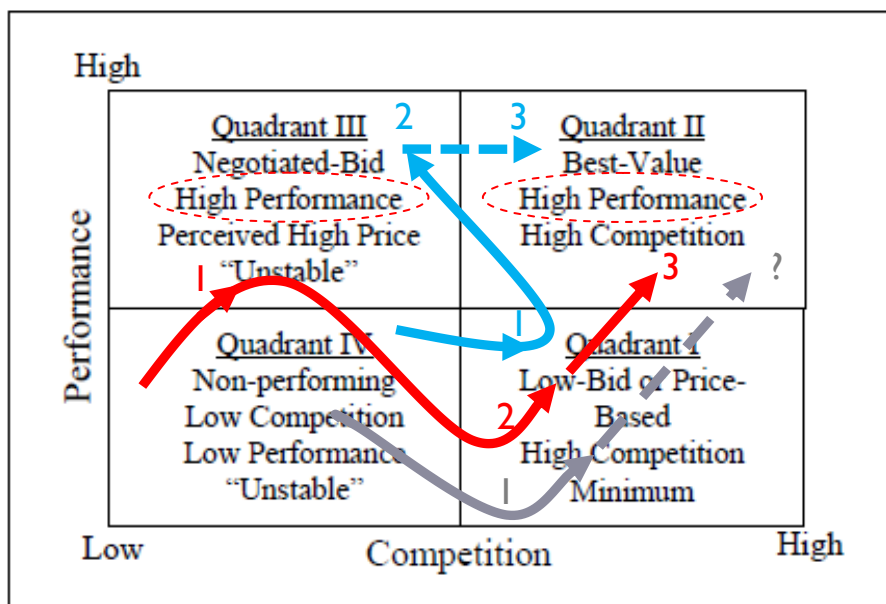


Figure 5.1. Direction of Indonesia construction change process which is to move from Quadrant I to Quadrant III or II

5.1 The needs of performance improvement process

Based on the description of the problem formulation in the existing conditions of construction process throughout project life cycle in Indonesia and some literature reviews including lessons learned, one of the main problem is characterized by price-based procurement without sufficient performance measurement system. In the low-bid environment, the public client hires supervisor consultant and asks internal inspectors to minimize the risk of nonperformance through management and inspection. The contractor bids, based upon the lowest price, allow the client's representative to

minimize the risk of nonperformance contractor through management and inspection. These functions are identified as inefficient and result in poor performance (Deming 1982, Luffy 2004, Feldman 2006, Khasiwagi 2007), since the risks cannot control by nonperformance contractor.

Therefore, it is necessary to make some efforts to change the existing priced-based procurement conditions into a new framework which consist of the following hypothesis:

1. Needs to eliminate the negative consequences of fierce competition which focuses on improvement of performance as well as enhancement of transparency and accountability in order to give more opportunity to qualified participants in contributing to the country development process with their best performance.
2. Therefore a system that can measure differences of performance of participants is needed in order to ensure that risks are allocated by the party who has good performance in managing risks.
3. The objectives of developing new systems are to ensure construction firm capabilities by requiring past performance information, to ensure standard quality of stakeholders by measuring performance, to reduce transaction cost by increasing efficiency through utilization of information system, and to improve trust through greater public confidence by involvement of all stakeholders and development of strong social sanction system in order to make an attitude of good performance achievement.
4. Needs to build consensus and improving trust among stakeholder by strengthening the stakeholder role and changing the dispute and claim environment to a collaborative relationship and risk communication enhancement.
5. Needs to ensure standard quality of public works component that focus on capacity building of small and medium enterprises, since the majority of business entities are SMEs whose poor capacities cause the current poor performance condition.

According to current condition and lessons learned Figure 5.2 shows needs analysis according to the new direction of change action that in accordance with the needs analysis based on current condition. According to the needs analysis, in developing new strategy of construction performance improvement, the integrated procurement reform that focus on performance measurement becomes the main concern at the first stage of change action.

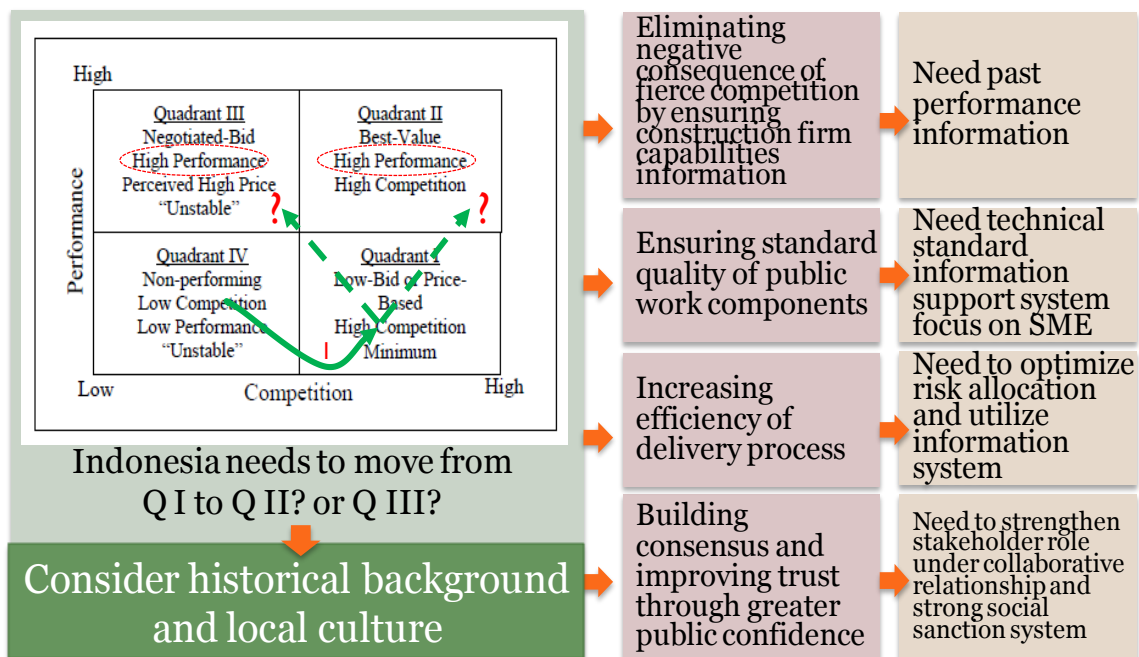


Figure 5.2. Needs of performance improvement process based on lessons learned

5.2 Needs to eliminate negative consequence of fierce competition

The theoretical review indicates that in developing new strategy of performance improvement, the procurement process might be one of the main concerns at the first stage. It is necessary to carry out some efforts to eliminate the negative impact of existing price-based procurement system. In accordance with the expected conditions, a proposed approach is promoted as shown in Figure 5.3.

The approach is focused on structural change of construction project phases in order to reduce the problem appear in the existing condition. The needs of proposed structural change are described as follows:

1. Need to improve the integration of the project process, through extending the procurement process to the previous process (D/E) and the following process (C) in order to reduce the risks that arise before procurement phases and anticipating the risks that will appear in the next phases.
2. Need to optimize risk allocation in order to improve the controlled risk that allocates the risk to the parties who are most able to control the risk.
3. Need to develop past performance measurement system as supported information of past performance evaluation in the procurement process.
4. Require effort to strengthen the supply chain through comprehensive procurement evaluation process.
5. Need leadership commitment in all project phases that tend to be collective leadership.

- Need a development of new procurement strategy that removes the adversarial relationship between the industry and clients.

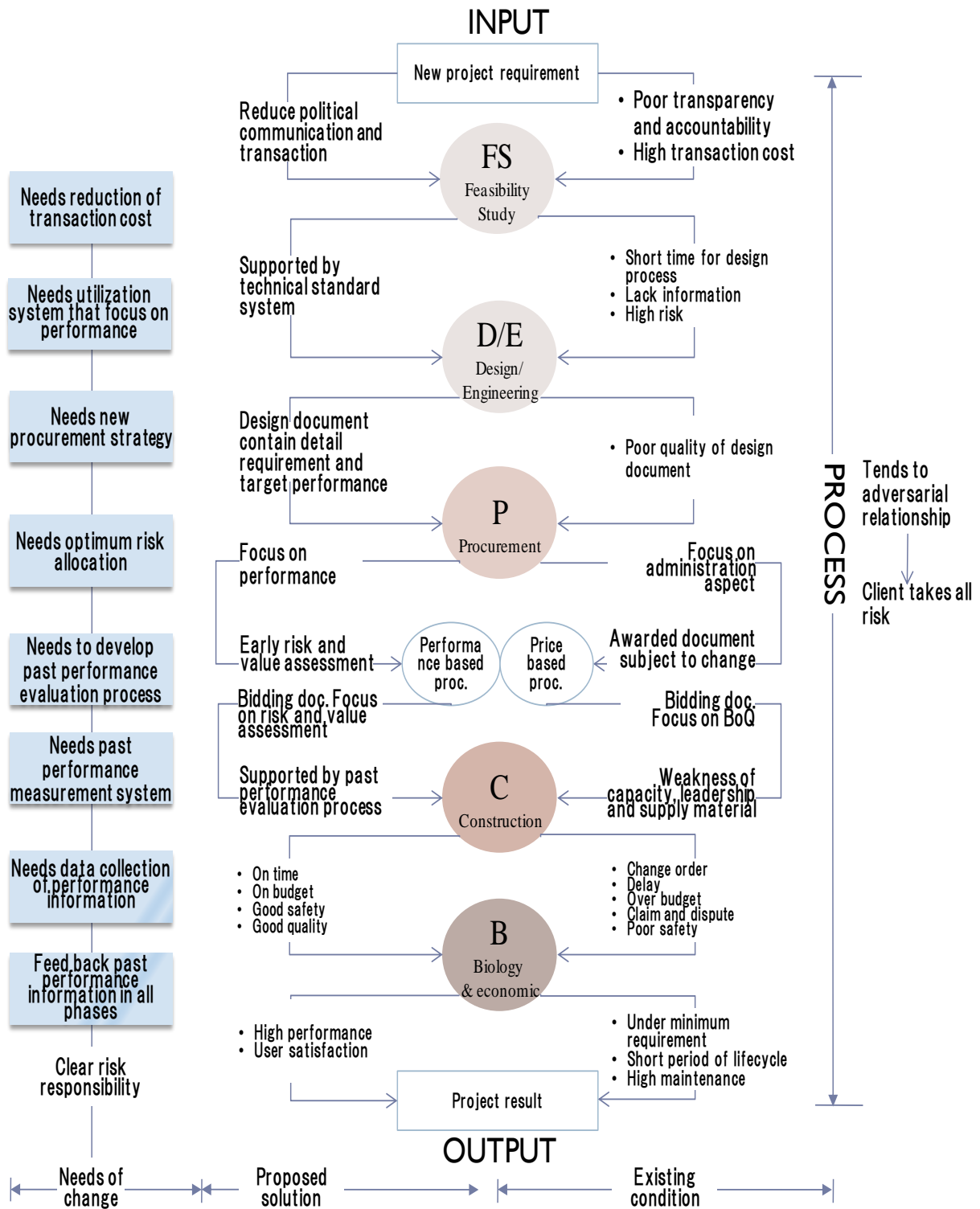


Figure 5.3. Needs analysis in Indonesia construction existing condition to improve performance

The construction process is expected to be performed in a comprehensive manner by changing the project life cycle structure that is more integrated. The change structure focuses on supply chain system, leadership commitment, risk and value assessment, and past performance information in improving the controlled risk.

Process integration for the construction industry has been an attractive topic for researchers and practitioners in this industry since integration can benefit all parties involved in a project. Fergusson et al. (1996) defined integration as the flow of knowledge and information in three dimensions: vertically (between industry functions), horizontally (between disciplines or trades), and longitudinally (through time), by organizational ('human-ware') and technical (software and hardware) modes. Nam and Tatum (1992) suggested four major means to increase construction integration: contractual (between parties for a relatively short time), organizational (physically in one organizational boundary under common leadership), information (integrated computer technology) and non-contractual (practical integration, such as owner's leadership and long term business relationships between parties).

Pudicombe (1995) classified integration as either organizational or technological. To achieve organizational integration, contractual and social/psychological approaches can be used. For technological integration, the use of integrated computer technology or information integration is necessary.

Therefore, the effort of integrating all of the project phases is required to leverage early contributions of knowledge and expertise of all parties involved and allow all parties to better realize their highest potentials in expanding the provided value throughout the project lifecycle.

5.3 Need of risk control mechanism

Based on the problem formulation and literature studies, the weaknesses in risk control mechanism is one of the significant causes of poor performance in Indonesia construction work. Therefore the development of performance improvement process in Indonesia construction works needs to consider risk control mechanism as one of the basis of development.

In the existing conditions of Indonesian public work procurement, the high competitiveness process tends to force the public client to push the contractor in achieving the minimum requirement. Whereas the contractor has the opposite view that the minimum requirement considered by the client is the maximum conditions that must be achieved. These different views of achieving requirement result in different perceptions in risk evaluation and tend to focus on self interest instead to achieve common objectives.

According to principle agent theory, the parties involved in the contractual relationship, naturally have a different coefficient of relative risk-aversion (Li and Rin 2007). In achieving the best value in the project, the parties involved should make efforts to optimize the risk allocation and get optimal risk sharing. Li and Rin (2007) discuss that in achieving the optimum allocation of risk, negotiation through effective communication has a special function in improving performance of the parties to manage risk, thereby reducing the costs allocated for controlling the risks.

Therefore, risk allocation mechanism is developed based on “communication system” approach. This system provides a continuum of possibilities for all parties, especially user to have participation in the process. This concept indicates that the better the communication of can minimize the differences of risk perception among stakeholders to enhance the number of the risk that can be controlled and to decrease the cost allocation for risk response. The cost allocation of risk anticipation becomes lower after communication process. Before the communication, each party has different estimation about the risk cost allocation under uncertain conditions. The communication process leads the appropriate risk allocation to the parties most able to control the risk that is expected to increase performance of each party in controlling risk.

In doing the risk communication, trust is essential to achieve optimal risk sharing because trust encourages sharing of information, knowledge, and resources between the parties involved. But in practice, building trust between parties is not easy and takes a time.

To simplify the explanation of risk control systems, Figure 5.4 describe the components of risk control mechanism that need in change action development of performance improvement process.

The good achievement of risk control occurs when the risk is controlled by the most capable party. Therefore, it is necessary to allocate the risks to the most capable party. In this concept, it needs to ensure the capacity of risk control mechanism of the parties involved. The objective is to empower all stakeholders to participate and give maximum contribution in accordance with its responsibilities in achieving good performance. The development of this concept is through chain action system for risk control which is a cycle mechanism that provides input to previous activities and gives feedback to next activities.

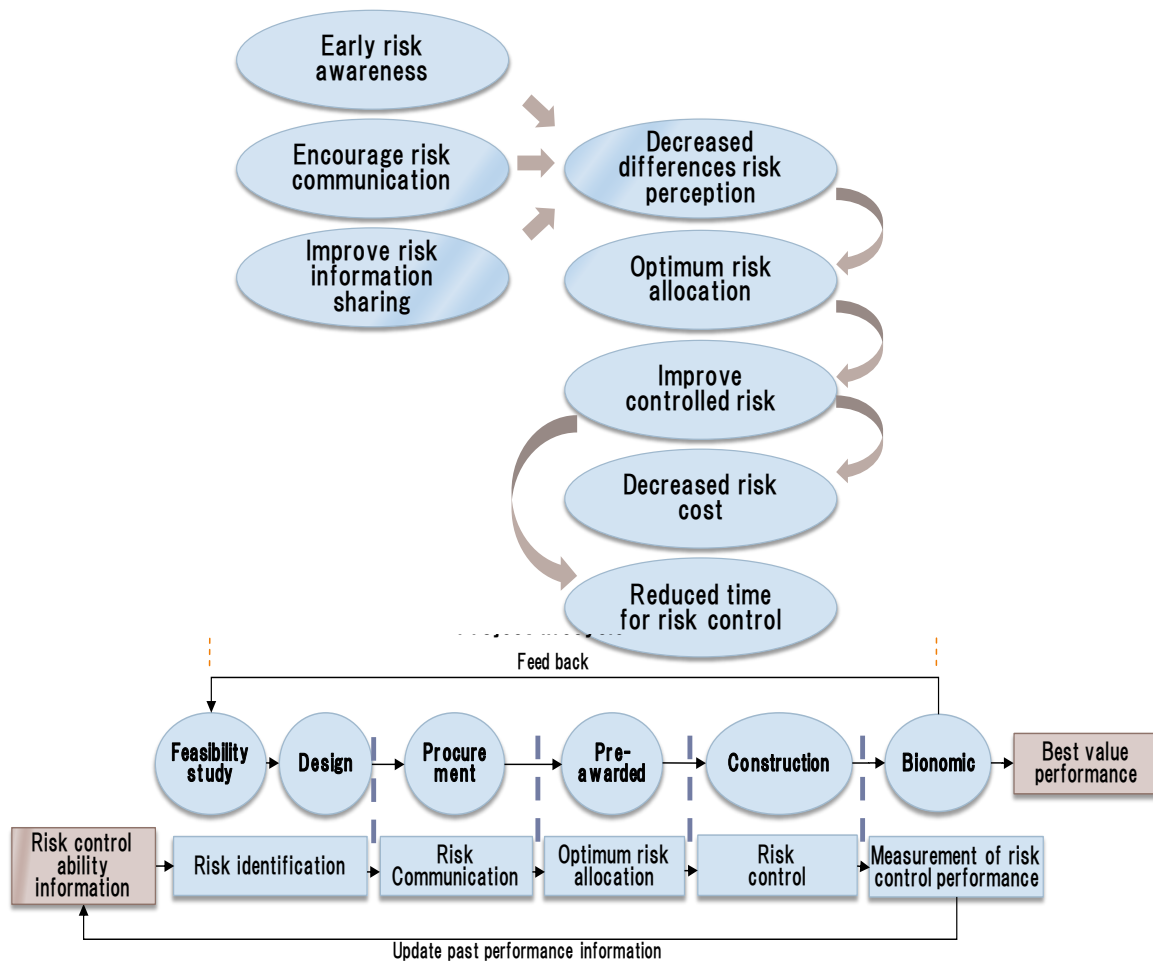


Figure 5.4. Need of risk control mekanism

5.4 Needs of collaborative relationship

The change towards a more integrated structure of the project life cycle must be supported through having more positive viewpoints and sharing activities. Changing the each party's own objective by working together in an optimum risk control is considered to increase the responsibilities of each party to achieve the best value together. The equation of risk perception in the negotiations will be successful optimum when the parties involved have same goal in achieving good performance of construction works.

In achieving best performance of the construction project, Kashiwagi (2005) suggested that all parties must equate the objective of carrying out public work projects. The direction of change should achieve solutions that provide benefits to multi-parties involved in construction process. The parties involved are expected to change the motivation and objectives for achieving a win-win solution. The optimum solution can be achieved if there is a change in existing relationship pattern between parties involved.

Since the existing procurement process that tends to be price-based, places the owner and the contractor on opposite sides with different objectives. In this condition the owner and the contractor is in opposite view, where the owner perceives a minimum level quality and the contractor views the minimum requirement as a maximum level of quality should be achieved. The new paradigm is expected to place the owner and the contractor to share the same objectives of achieving optimum benefit in project delivery process. Therefore, the change of procurement system will ensure that the best contractor who provides high performance with reasonable cost will be awarded. The risks that appeared in the construction process are responsibility of the most competent contractor. The procurement system must encourage the growth and the development of the contractor who has good performance. The stability of construction industry is expected to be realized, through increasing the construction performance in this manner.

Trust plays an important role in a relationship (Qin et al. 2010). Shek-Pui Wong and Cheung (2004) considered the development of trust among project partners as a premise of cooperation. Project partnering involves the parties of a construction project working together in a trustful and open environment, so that they can deliver the project efficiently with little dispute (Richard, 2004, Erik W. Larson, 1994, Carolynn et al., 2000).

In the term of construction works, trust can be raised if the parties involved have good reputation in conducting their responsibility. According to Japanese construction industry experience, reputation will build and maintain good reputation in ensuring that collective action delivers socially desirable results. This mechanism encourages the spirit to enhance the capacity and capability of the actors involved, which needs a balanced mechanism between the reputation system and society punishment or sanction system.

The existing adversarial relationship tends to focus on punishment and negative side rather than focusing on potential and positive side of the relationship. Therefore, changing the relationship from more positive viewpoints is expected to encourage performance enhancement. This concept is related to the risk and reward relationship, based on agreed targets, gain and pain share concept, encouraged alliance relationship, and allowed incentive for successful risk control.

5.5 The needs of support system in performance improvement process

The support system issue also plays an important role in the process of public procurement reform, as they relate to culture, politics, and social interaction. This issue holds a very significant point in determining the success of reform through strong leadership, good intention, good ethic and professionalism. Other soft system-based issues are trust culture and professional liability which ensures quality assurance in

public procurement. The organizational behavior and cultural institution change through a trust and open-mind approach already proven as a success factor in enhancement of public work performance.

In the process of procurement reform, the issue on technical systems such as poor technical standard information and evaluation method or technology utilization requires the innovation process. The innovation is used to reduce transaction costs through development system that utilize information technology, since the system reduces the interaction between parties that impact in reducing the transaction costs.

Integration of the construction industry can be achieved through the use of national standard production information. Different types of construction information are exchanged between the various parties for the purpose of communicating design, construction and contractual matters. Individual firms have developed their own means of classifying and disseminating construction information to facilitate this process. As there is no standardized system of classifying and sharing of such information, much of the data is lost along the way (Wirahadikusumah, D. et al, 2009).

Following Figure 5.5 describes the need of structural change that requires support system and focuses on integrated information system that relates to the issues of change implementation process. This needs analysis will be used as the basis of system development.

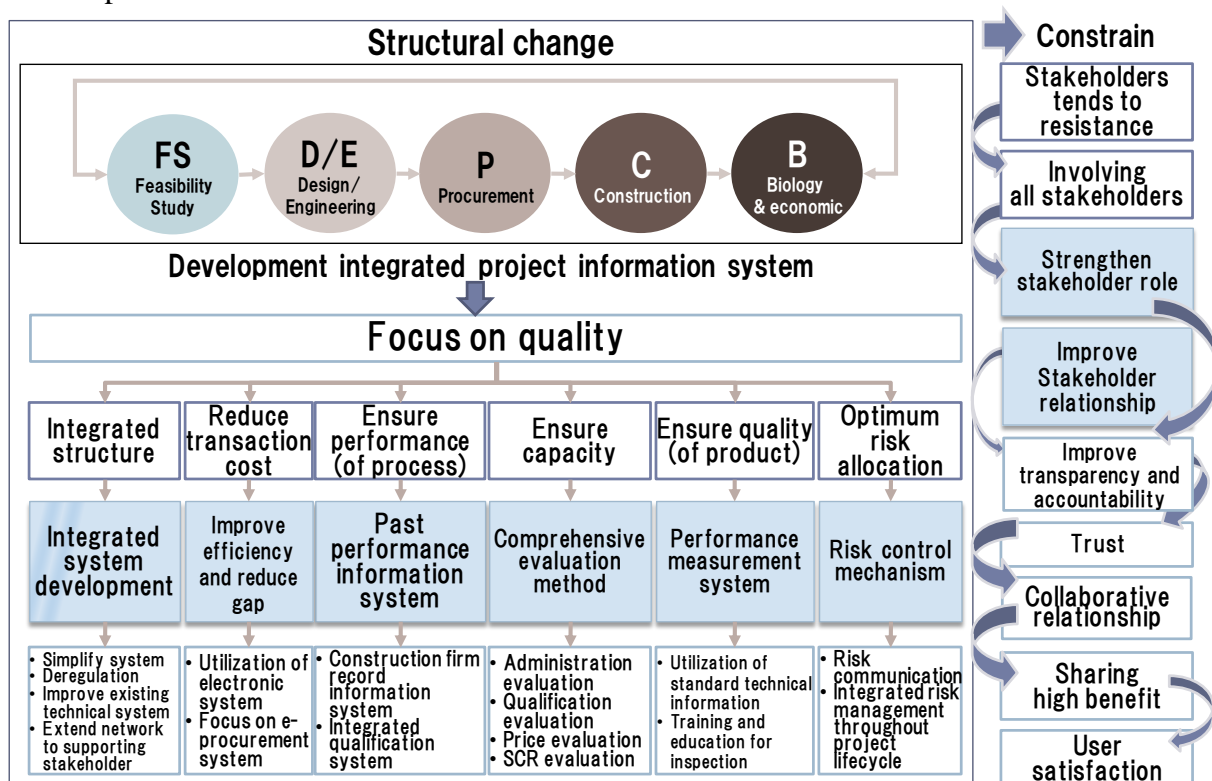


Figure 5.5. The needs of structural change in improving performance in Indonesia construction works current condition

It needs to develop technical mechanism as a support system that can be used for performance improvement. The support system must meet several criteria to be utilized effectively, which is simple, does not require complex technical skills, and can incorporate the characteristics of local conditions. It also needs to be evaluated and verified to ensure that it can be used the real practice condition. The development of infrastructure of support system for the change process should consider the user adaptation and adoption which focuses on Small and Medium Enterprises as the major business entity of the industry.

CHAPTER 6

DEVELOPMENT OF ELECTRONIC PERFORMANCE INFORMATION ON CONSTRUCTION PROCUREMENT (E-PIC)

Based on review and analysis results, Indonesia requires changing the existing conditions and increasing the capacity of parties involved in construction works. Therefore a framework for improvement is needed in order to give direction in the change process. The development needs to be directed in an integrated system. Based on several considerations that have been explained before, the system is developed with the following approaches which show in Figure 6.1.

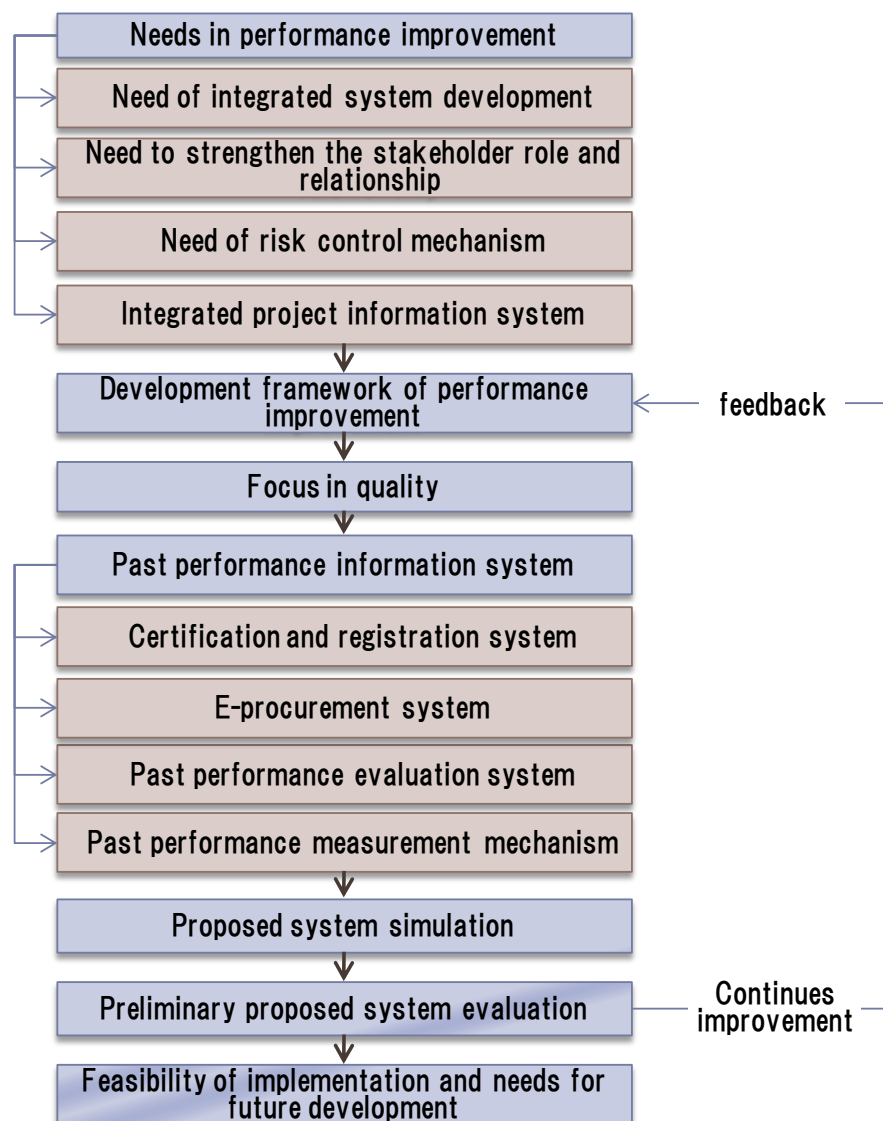


Figure 6.1. Proposed performance improvement action

6.1 Framework for performance improvement

Based on the existing condition, the review of current procurement reform in Indonesia and the need analysis, a new framework of performance improvement is developed that consists of three parts improvement processes, which are process improvement, product improvement and development of support system. Since the attendance action that needs in improving performance relates to the action of elimination the negative consequence of fierce competition, therefore, the focus of the development of change action in improvement process is the development of integrated past performance information system (Figure 6.2).

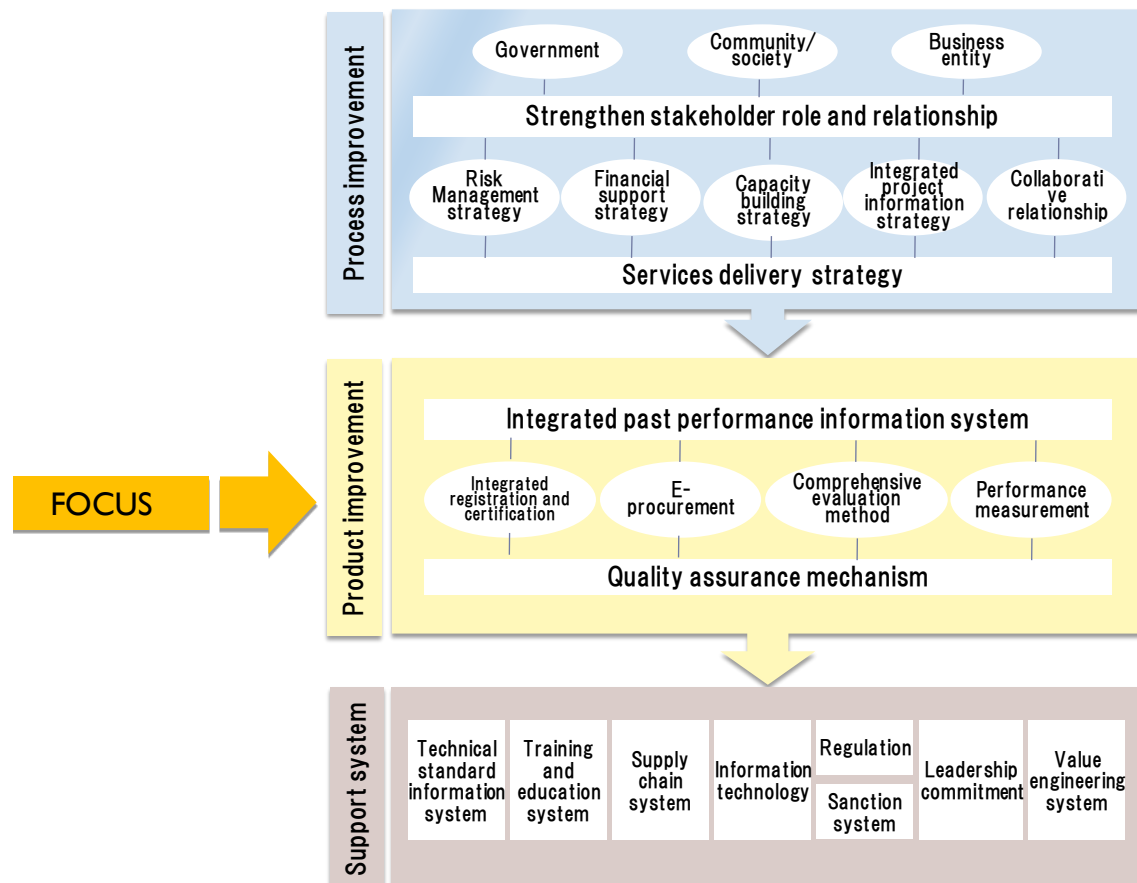


Figure 6.2. Framework of project implementation system for performance improvement

Each element of reform needs to have strategy and goals that are inter-related each other. The goals set in accordance with the objectives of public work procurement reform that stated in the Presidential Decree 2003.

The development detail action of the framework is expected to be implemented in improving the performance of construction works, especially construction that conducted work by Small Medium Enterprises (SME). The framework should be dynamic and can continue to evolve as needed. In the implementation of this framework, it is necessary to involve all of the parties involved in public work.

6.2 Development E-PIC (Electronic Past Performance Information in Construction Procurement) model

According to the framework of project implementation of performance improvement, a detail proposed potential solution is developed with consideration to the focus of development. In order to provide past performance information, it needs to develop integrated past- performance information, in order to optimize risk allocation, it needs to develop integrated risk control mechanism, in order to improve technical capacity, a detail past performance measurement under integrated supervision system is needed, and need to change the dispute and claim environment to collaborative relationship environment. That focuses on development integrated past- performance information.

In developing new strategy of construction performance improvement, the integrated procurement reform that focuses on performance measurement becomes the main concern at the first stage of change action. Therefore, a model of past performance information is developed based on reputation and best value procurement approach which is in comprehensive manner, and also involve all the parties. The electronic past-performance information in procurement (E-PIC) model has the following characteristics (Figure 6.3):

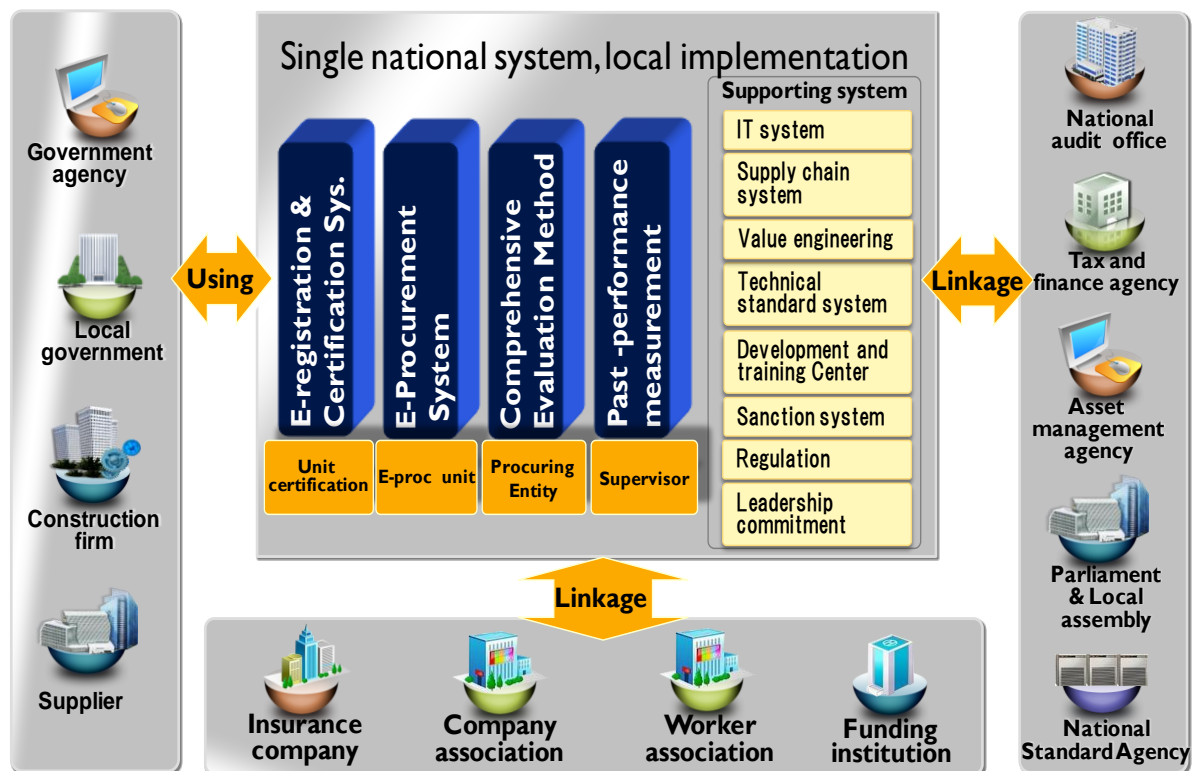


Figure 6.3. Integrated construction information system

- Integrated model development that consist of certification and registration system of construction service firm and engineer, e-procurement system, evaluation for bidding system, and past performance measurement system
- In the implementation of this framework, it is necessary to involve all stakeholders in public works where the system is used by key stakeholders, linkage to relate stakeholder and supporting stakeholder such as financial agency or other financial institution, and related to audit system, construction service tax system, asset management system, and construction data based system that involved multi parties.

6.3 Process in the E-PIC model

The risk mechanism model was developed to be E-PIC. The objective is to improve the performance of the price based competition that leads the poor performance to the best value procurement that has performance assurance mechanism. Therefore the system requires past performance measurement mechanism.

The cyclic system is an electronic past-performance information on procurement (e-PIC) which is developed based on reputation and best value procurement approach that also involve all stakeholders. The e-PIC system consists of four sub-systems which are a registration and certification system of construction service enterprises and construction engineer, e-procurement, comprehensive evaluation for bidding system, and performance measurement that is supported by technical standard system (Figure 6.4).

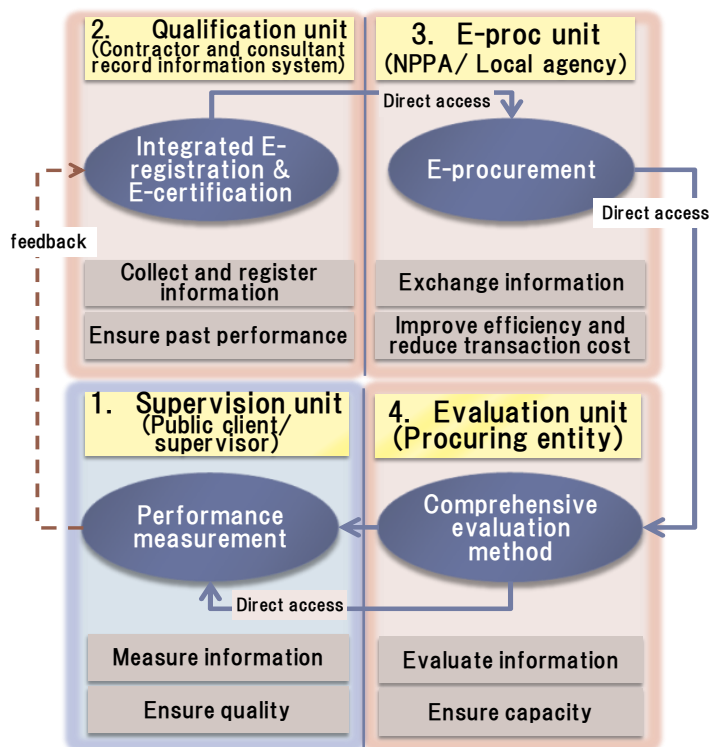


Figure 6.4. E-PIC system for contractor quality assurance mechanism

This system is an integrated system that the four sub-systems mutually support each other. Each system is interconnected and has direct information connection between one another.

The proposed system utilizes IT in its development. The objective of IT utilization system is to reduce inefficient activities and transaction cost by providing sufficient information sharing environment, managing information in digital form and circulating information through communication network, with avoiding re-input and enabling retrieval for reuse information.

Since the Small and Medium Enterprises are the majority of the construction firms that involve in public works projects, it is necessary to determine a change action that has minimum difficulty in implementation process for SMEs.

6.4 Detail development of E-PIC system

The detail development model based on limitation analysis of existing condition, which consists of the targets of improvement, the need of regulation support, the process development, as well as the need of information. The system developed also shows the relation between systems in E-PIC.

6.4.1 Detail development of e-certification and registration system

Table 6.1 below shows some of existing system limitations and proposes solutions in the development of certification and registration system in the E-PIC development.

Figure 6.1. Limitation and proposal in developing e-certification and e-registration system

Limitation of existing system	Proposed model
No direct information access to related process	Cyclic system, direct information access to related process
Fix data for long time, update per 3 years	Dynamic data system, update automatically according to the latest information
Repeated entry data	Single entry data
Long procedure	Simplify procedure
Lead to high transaction cost for approval	No needs approval, only data verification
No data base of qualification	Data is collected as qualification data base

Based on table 6.1 the following figure describes the development of the registration and certification system. This system is connected directly to the system of past performance measurement, and the data of this system can be accessed directly on next process which is e-procurement system (Figure 6.5).

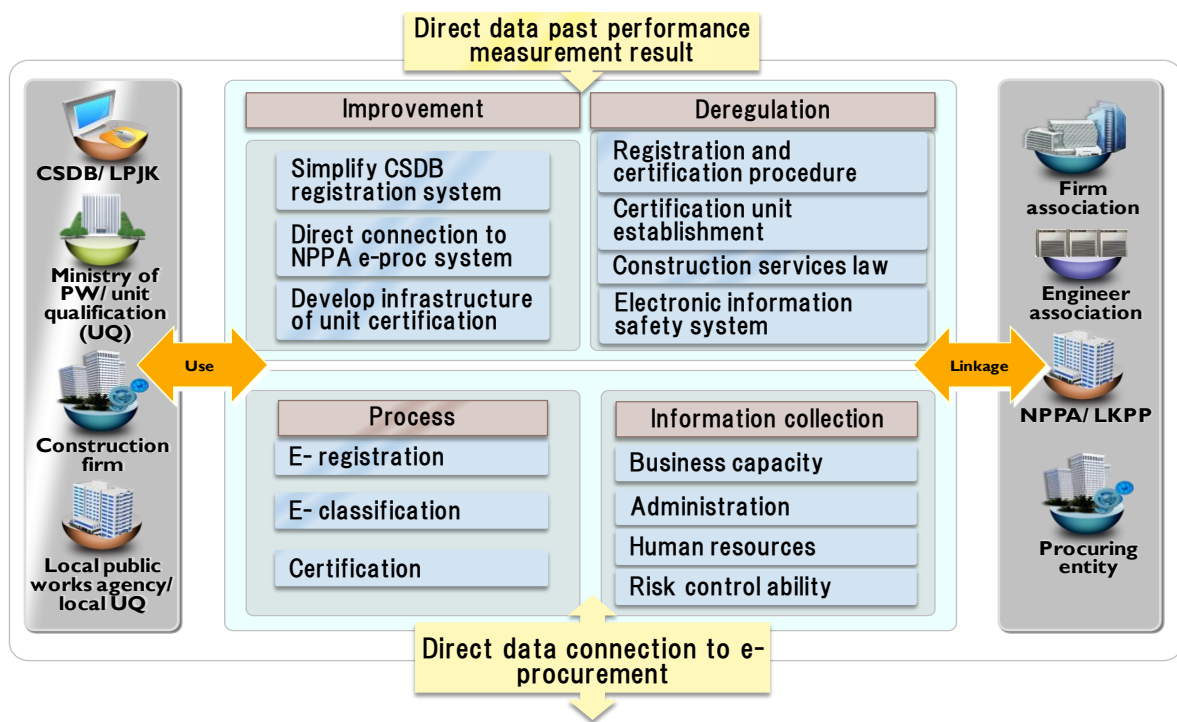


Figure 6.5. Proposed e-registration and e-certification system

6.4.2 Detail development of e-procurement system

Table 6.2 below explains some of existing limitations and proposes some potential solutions in the development of e-procurement system.

Figure 6.2. Limitation and proposal in developing e-procurement system

Limitation of existing condition	Proposed model
Need re-registration	No need re-registration, only input registration code for data connection
Re-input data , without sufficient technical data, CSR data, etc	No needs to input data that already input in previous process
Re-verification data	Using verified data from certification
Needs long time for repeated activity	Shorter time without repeated activity
Uses insufficient information since there is time limitation for verification process	Using comprehensive and valid information support by previous process
No access information to related process in construction works	Direct access to previous and next process in construction works

Based on table 6.2 the following figure describes the development of e-procurement system. This system is connected directly to the system of the registration and certification system, and the data of this system can be accessed directly on next process which is e-procurement system (Figure 6.6).

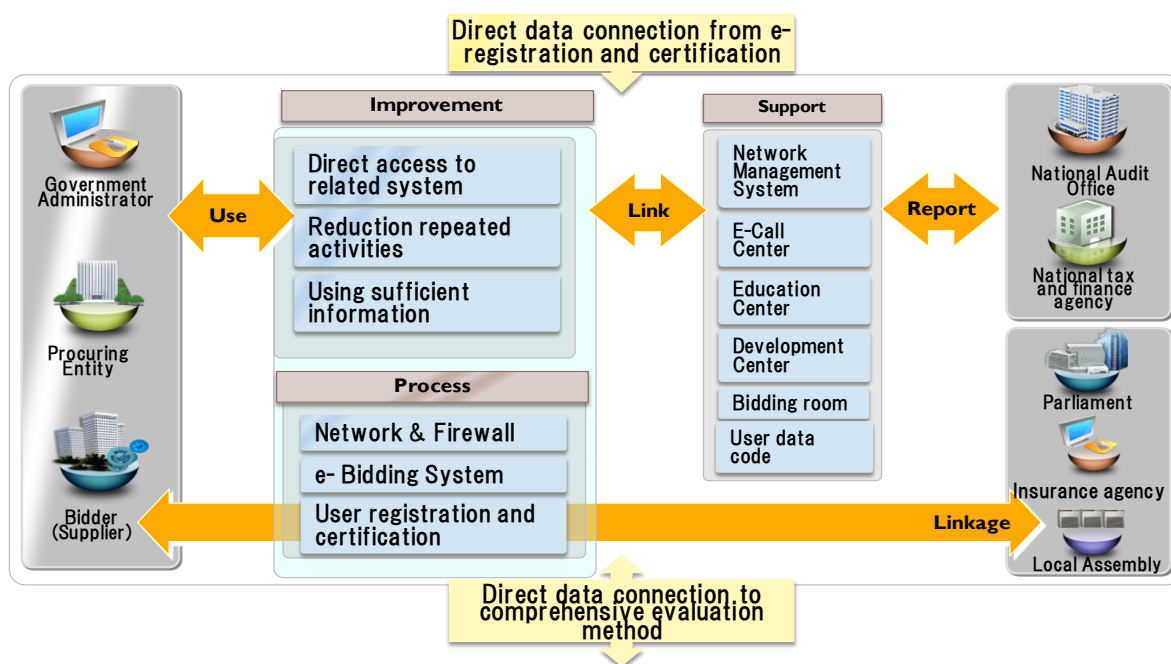


Figure 6.6. Proposed e-registration and e-certification system

6.4.3 Detail development of past comprehensive evaluation method

Table 6.3 below explains some of existing limitations and proposes some potential solutions in the development of comprehensive evaluation method.

Figure 6.3. Limitation and proposal in developing comprehensive evaluation method

Limitation of existing condition	Proposed model
Without risk control ability information	Consider risk control ability
Without project past performance information	Consider related project performance information
No incentive for good performance	Provide incentives for good quality
No encouragement of risk identification	Evaluate the proposal of risk identification
No value assessment	Evaluate the proposal of Value engineering
No incentive for social responsibility	Provide incentives for social activity involvement
No access information to related process in construction works	Direct access to previous and next process in construction works

Based on table 6.3 the following figure describes the development of comprehensive evaluation method. This system is connected directly to the system of e-procurement system, and the data of this system can be accessed directly on next process which is e-procurement system (Figure 6.7).

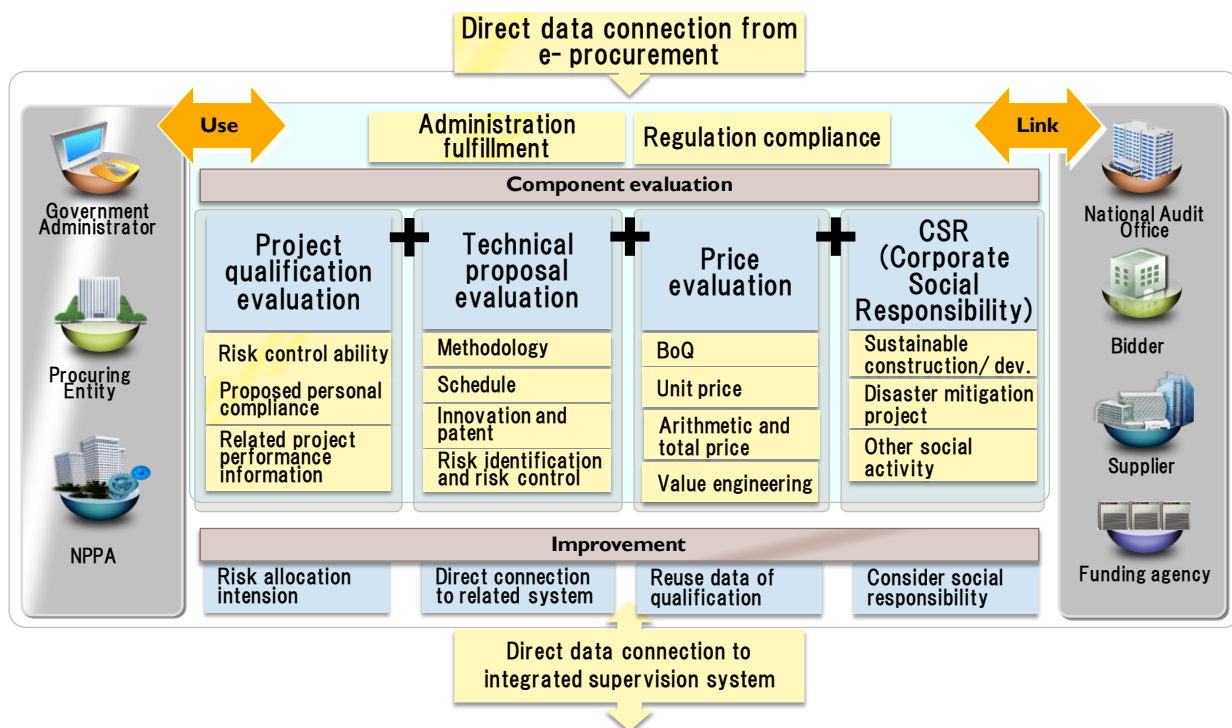


Figure 6.7. Proposed comprehensive evaluation method

6.4.4 Detail development of past comprehensive evaluation method

Table 6.4 below explains some of existing limitations and proposes some potential solutions in the development of past performance measurement system.

Figure 6.4. Limitation and proposal in developing past performance measurement system

Limitation of existing condition	Proposed model
Without support of technical standard information	Provide technical standard information
No training and education for supervisor	Supported by training and education system
Poor contract document and reporting system	Improve and provide sufficient standard contract document and procedure of reporting system
No data base of past performance information data collection	Develop data base of past performance measurement result information
No information announcement of performance result	Disclosure information and involve multi-parties
Poor sanction system	Develop sanction system

Based on table 6.4 the following figure describes the development of past performance measurement system. This system is connected directly to the system of comprehensive

evaluation method, and the data of this system can be accessed directly on next process which is e-procurement system (Figure 6.8).

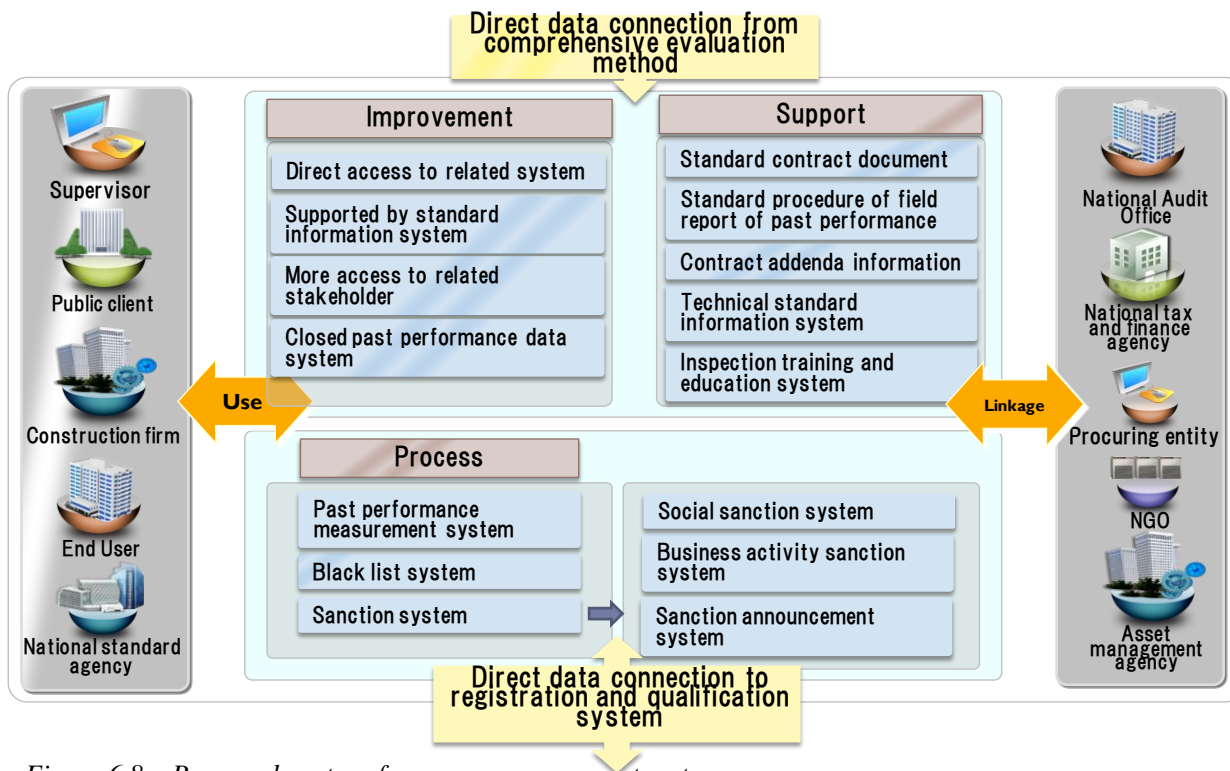


Figure 6.8. Proposed past performance measurement system

6.5 Proposed system development

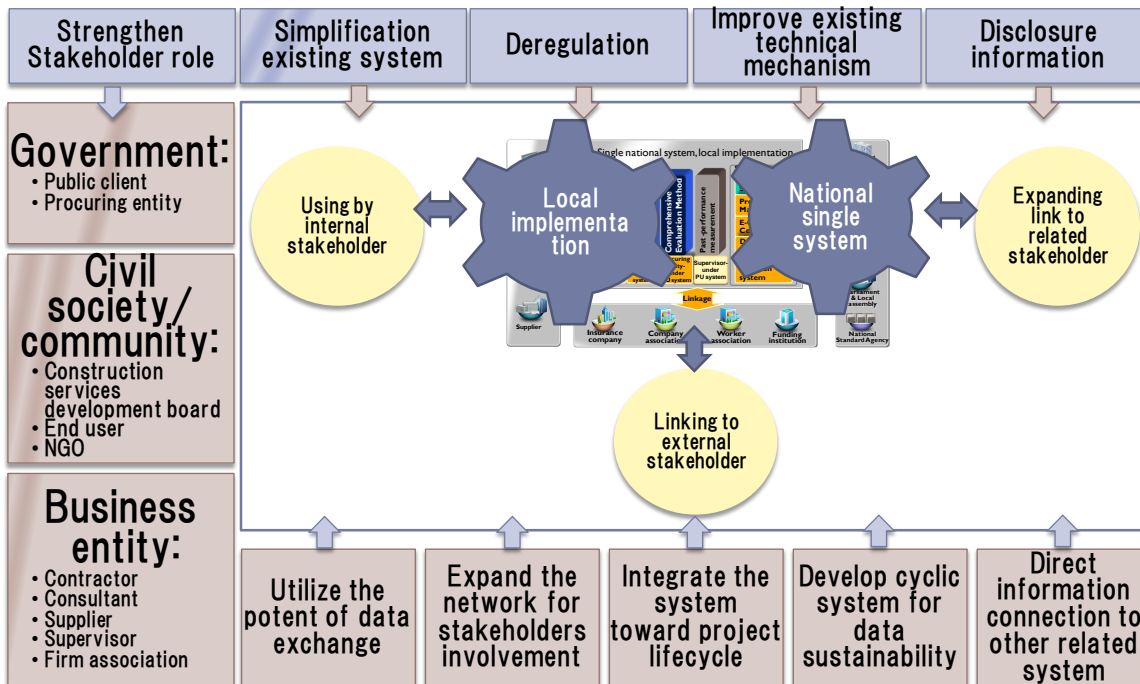


Figure 6.9. Proposed of system implementation

In order to facilitate communication and accessibility information among stakeholders, the proposed system is developed nationally, but the management can be conducted locally. The objective is to empower local capacity. Although it is managed locally, the system is accessible for national utilization, since it uses same system nationally. The system is particularly used by internal stakeholders and focused on quality in promoting transparency and accountability (Figure 6.9).

The proposed system is developed by simplifying the existing system in order to make the process more effective and sustainable. By simplifying the existing systems, the structure and the responsibilities of each stakeholder in information system become clear in every construction phases, and it can be implemented accordance with the capacities and capabilities of each party (Figure 6.10).

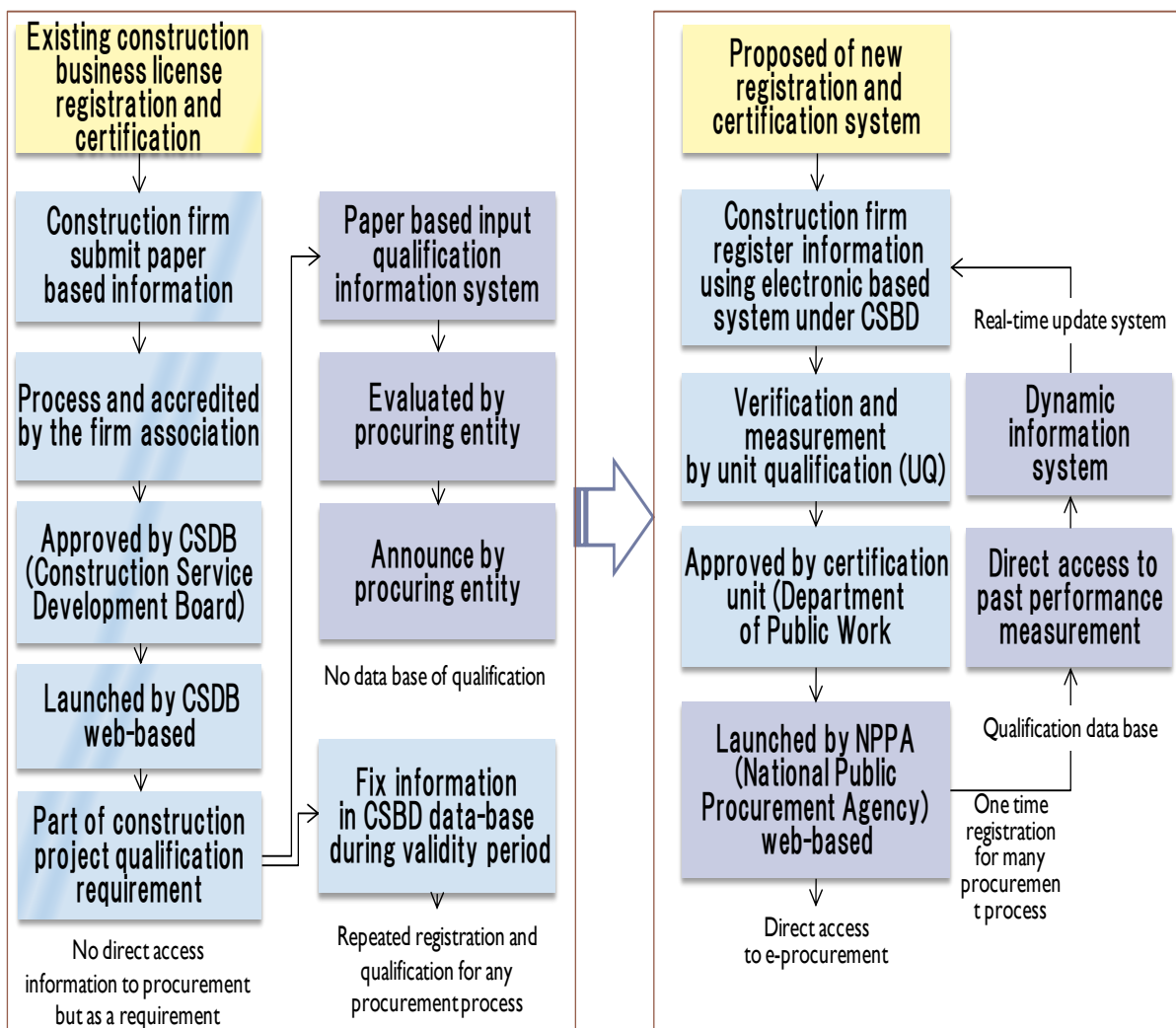


Figure 6.10. Proposed of simplifying existing system

In addition, in order to implement the change process, internal stakeholders need support from the external stakeholders. The internal stakeholders are the key stakeholders in the construction work, which consists of clients, consultants and contractors. Hence, the new system is linked to external stakeholders such as funding institution that expected to empower all the parties (Figure 6.11).

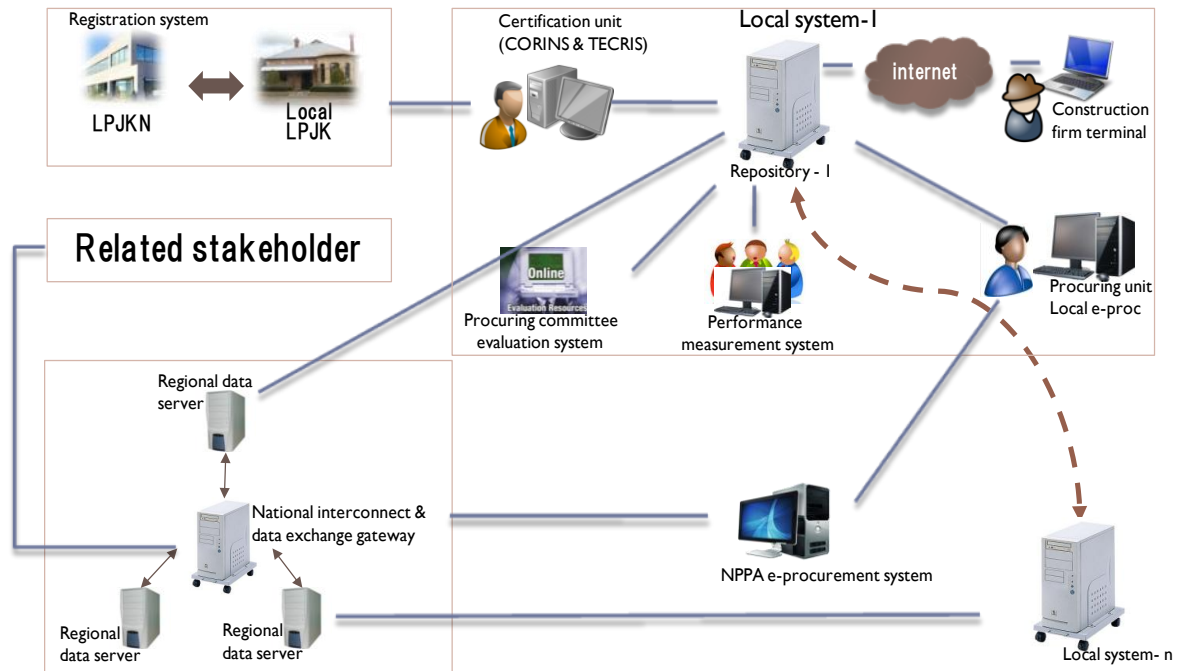


Figure 6.11. Proposed of simplifying existing system

Furthermore, in developing support system of the change process, some regulations need to be empowered. The existing regulations need a support by clear guidelines to provide convenience for stakeholder in implementation the regulations, which is focus on quality. Since the objective of change is performance improvement, the government needs to develop rules that support the establishment of a credible performance information system, especially in enhancing mutual trust in the change process. It also needs to develop several supporting regulations relate to performance measurement systems, in providing assurance of quality aspect. One of the actions is development data base system of Indonesian construction industry, through the development integrated systems and utilization information technology (IT). The system is integrated throughout project life cycle, so that the information can be accessed and updated directly in every phase.

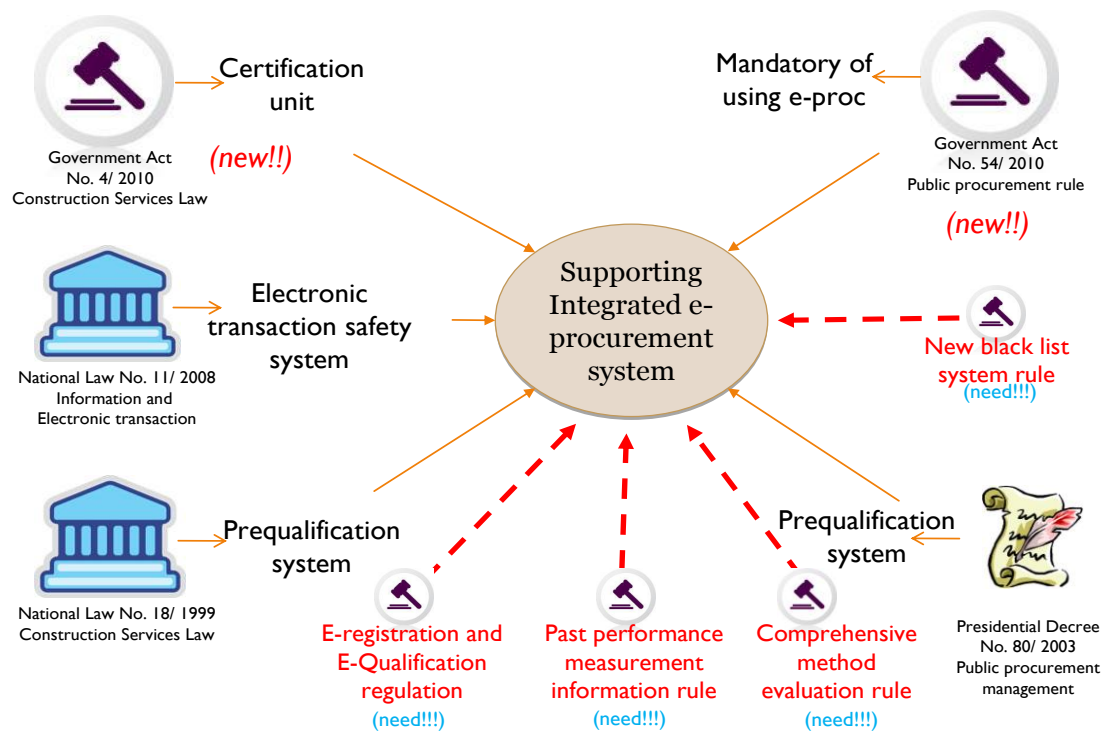


Figure 6.12. Needs for deregulation

The proposed is also complemented by a performance measurement system that includes comprehensive performance measurement for legal, technical, financial, and social aspects. The measurement uses a weighting system that focus on performance. The weight for measurement based on risks identification result of the works to be done.

In this new system, a community forum is established in order to empower the community which is supported by assistance, training and education system. The objective is to provide space for communication and for community insight into the performance of stakeholders. The forum is expected to encourage the establishment of community performance measurement system and strengthen the social sanctions system. The community supervision system and a strong social sanctions system might encourage all stakeholders to give their best performance, since the result of community assessment and the provision of social sanctions will make those who perform poorly cannot be accepted for further work in the industry.

According to the consideration, in developing the proposed system, it needs to know the stakeholder confidence of possibility of the proposed system development, and consider the view of stakeholder for detail development. Therefore, a survey that introduces the proposed system which asks the stakeholder opinion and confidence for the development of the system is conducted in this research. The explanation about the survey result is explained the next chapter.

CHAPTER 7

EMPIRICAL STUDY OF OPTIMALITY AND FEASIBILITY OF SOLUTION IMPLEMENTATION

In every change there is often resistance from related parties to retain the existing patterns. Therefore, in discussing the optimality and feasibility of proposed solution implementation, two empirical studies are conducted. The studies include survey of stakeholder confidence of possibility proposal implementation and model solution implementation.

Survey about the possibility of proposed system development to stakeholders is expected to obtain information about the feasibility of system utilization by stakeholder and development consideration according to stakeholder view is needed. The model simulation is intended to evaluate the optimality of model implementation process. The results of the study hopefully will enhance stakeholder confidence that the direction of change will be in accordance with the expected objectives, specifically strengthening the construction industry and its supply chain.

7.1 Stakeholder confidence of proposed project information system

Therefore, a survey to 63 respondents in five stakeholder categories of academia, government, construction firm, NGO, and public community was conducted during the study. The survey introduces the proposed past performance information system and asks stakeholders opinion about their confidence of performance improvement by implementation the system. Survey also collects opinion of stakeholder about the potential problem and the needs of consideration in system development (Appendix B).

49% of respondent are construction firms, therefore, in order to get detail information on existing conditions, interviews were conducted to other stakeholders that consist of ministry staff in the Ministry of Public Work, Board of Directors of Construction Service Development Board as construction community, the Directors of National Public Procurement Agency, academicians in construction management field, local public works procuring committee members, and the committee members of contractor associations and consultant association.

Almost of respondents of the surveys has more than 5 years experiences in involving to Public works project which the average age of respondent is between 36 to 45 years old (Appendix B for detail survey result). Figure 7.1 shows the some information about the respondents.

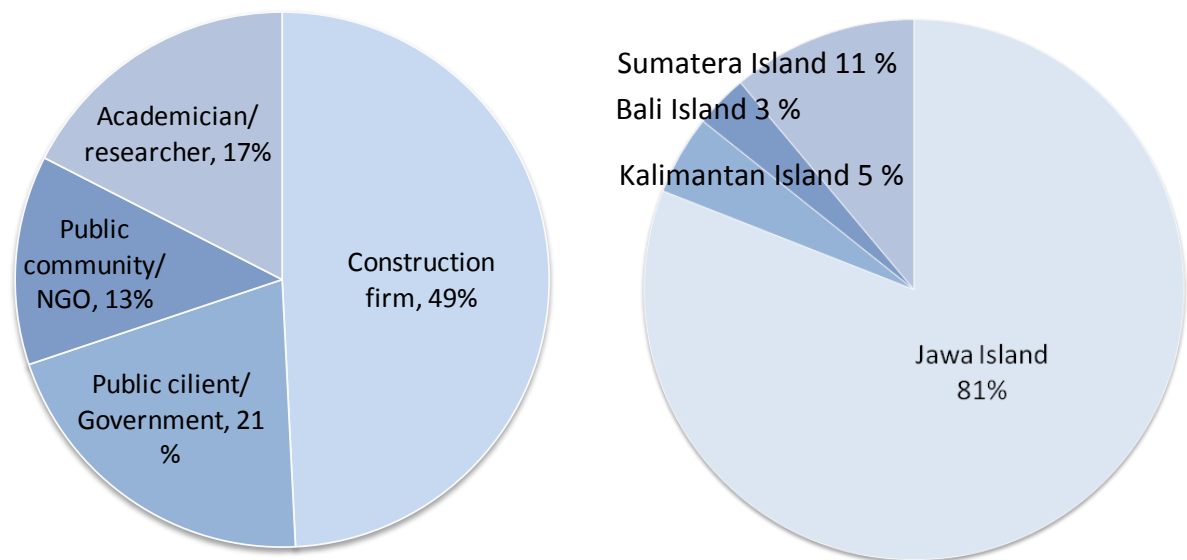


Figure 7.1. Characteristic of 63 respondents that participate in survey

The survey asks some opinion to stakeholder relates to the proposed system that the questions are:

- The importance of initiative for transparency enhancement
- The importance of transparency and accountability improvement
- The importance of integrated past performance information
- The importance of past performance information access
- The important of access to measure performance
- Confidence that past performance information will improve transparency and accountability
- Confidence that past performance information will decrease corruption
- Confidence that past performance information will improve level of trust
- Confidence that past performance information will encourage contractor to maintain their good reputation
- Current access to past performance information

According to the results of survey the stakeholders have strong opinion that the initiative of transparency and accountability improvement, as well as integrated past performance information are important in order to improve the performance of construction works product (more than 95% respondent).

However, even though the stakeholders think that it is important to have access to past performance information, current condition indicates that the stakeholder has less access to the information, only public clients have direct access to the information (Figure 7.2).

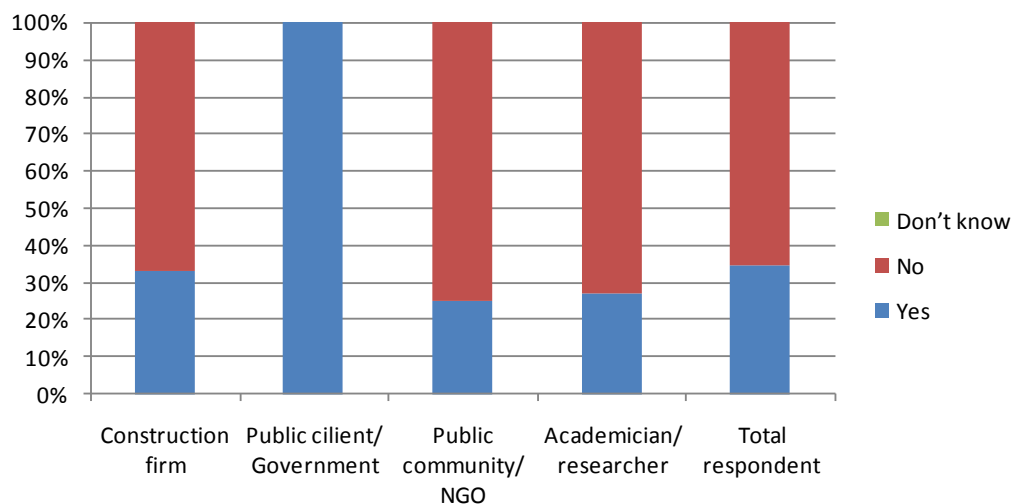


Figure 7.2. Stakeholders current access to past performance information

The survey results also indicates the stakeholders confidence that the past performance information system will improve transparency and accountability, where 100% of construction firms, community/ NGO, academia/ researchers of respondents have confidence of the improvement, only less than 15% of public clients have no confidence of the improvement (Figure 7.3).

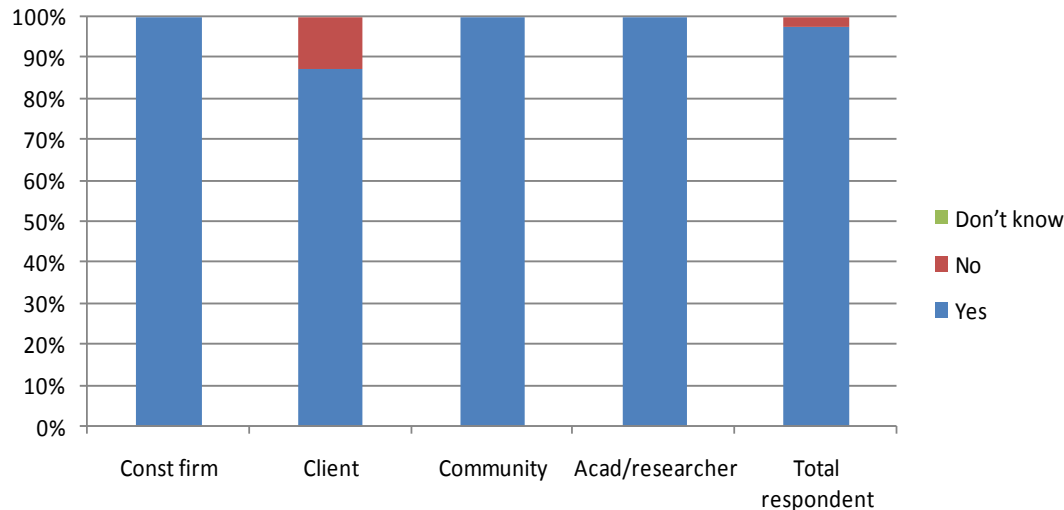


Figure 7.3. Stakeholder confidence that past performance information will improve transparency and accountability

Additionally, the survey results shows that the stakeholders less confidence that the past performance information system will decrease the corruption. Since less than 70% of construction firms and public clients and less than 80% of academia/ researchers have confidence of the improvement (Figure 7.4).

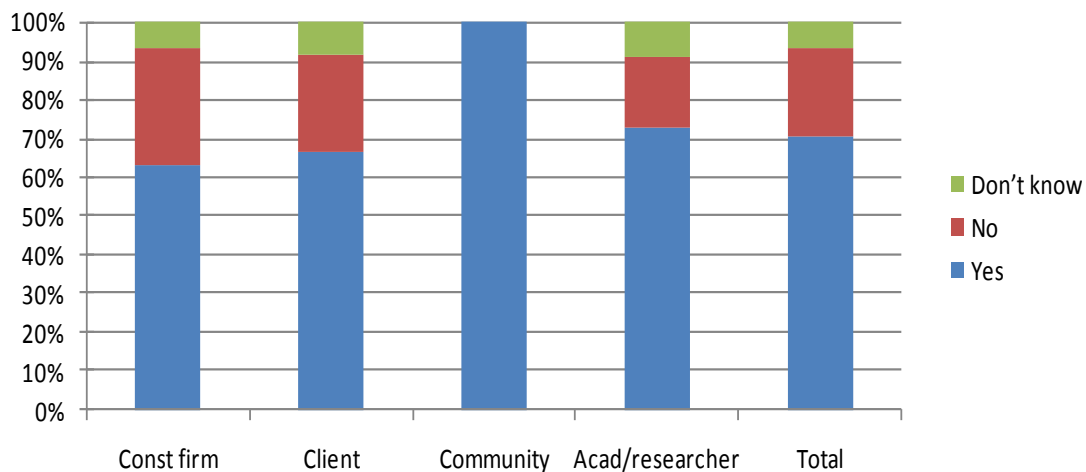


Figure 7.4. Stakeholder confidence that past performance information will decrease corruption

Furthermore, the survey results also indicates that the stakeholders have strong confidence that the past performance information system will improve level of trust among stakeholders, except the public clients since only about 75% of public clients have confidence of the improvement (Figure 7.5).

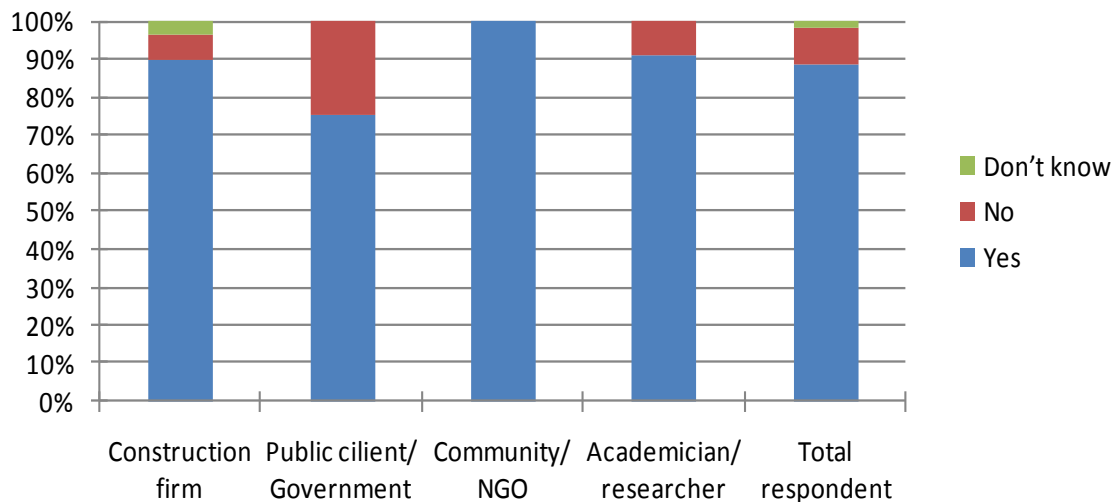


Figure 7.5. Stakeholder confidence that past performance information will improve trust

The survey results also indicates more than 90% of respondents have confidence that the past performance information system will encourage contractor to maintain their good performance. But about 20% of public client have no confidence that the system will encourage the contractor to maintain their good performance (Figure 7.6).

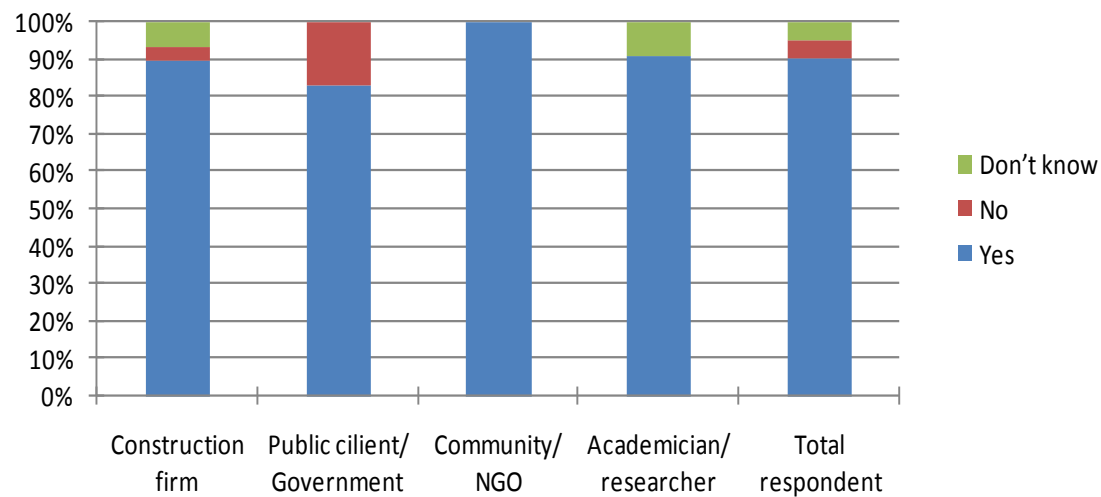


Figure 7.6. Stakeholder confidence that past performance information will encourage contractor to maintain good reputation

According to the survey results, the public clients or government staffs have less confidence of performance improvement by utilization past performance information system, if it compares with other stakeholders. Since the government have strong behavior of current pattern and there are some resistances of public clients to the change process. This constraint is an important consideration in process for future development.

7.2 Stakeholder views of problems and considerations in system development

The survey also asks opinion according to constraint in developing the proposed system. Figure 7.7 shows that almost of the stakeholders believe there is constraints exists in the development of proposed system.

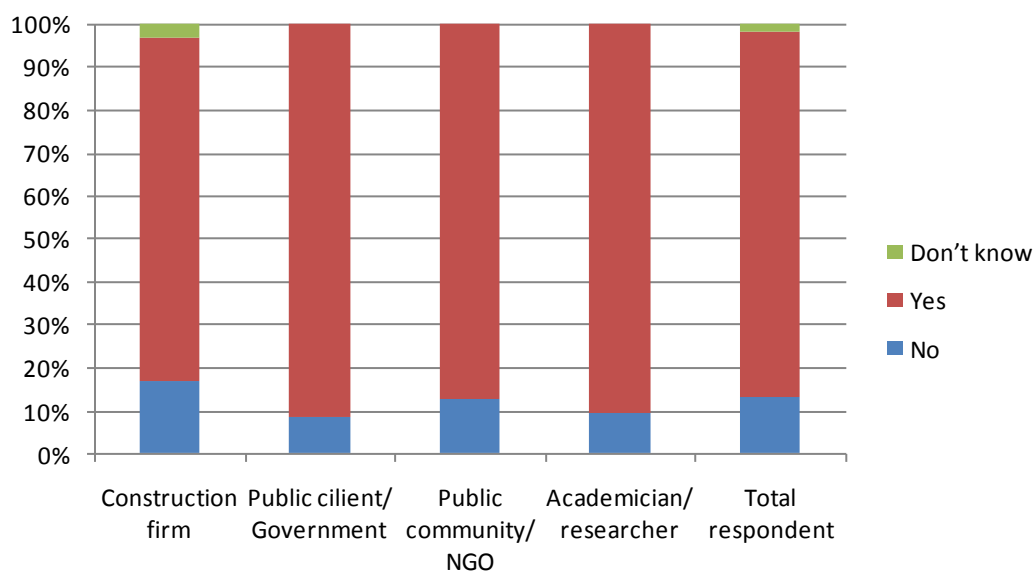


Figure 7.7. Stakeholder opinion about existing constrain of proposed system development

Based on the opinion of stakeholder, the resistance of stakeholder in utilizing the new system is the main constraint in developing new system.

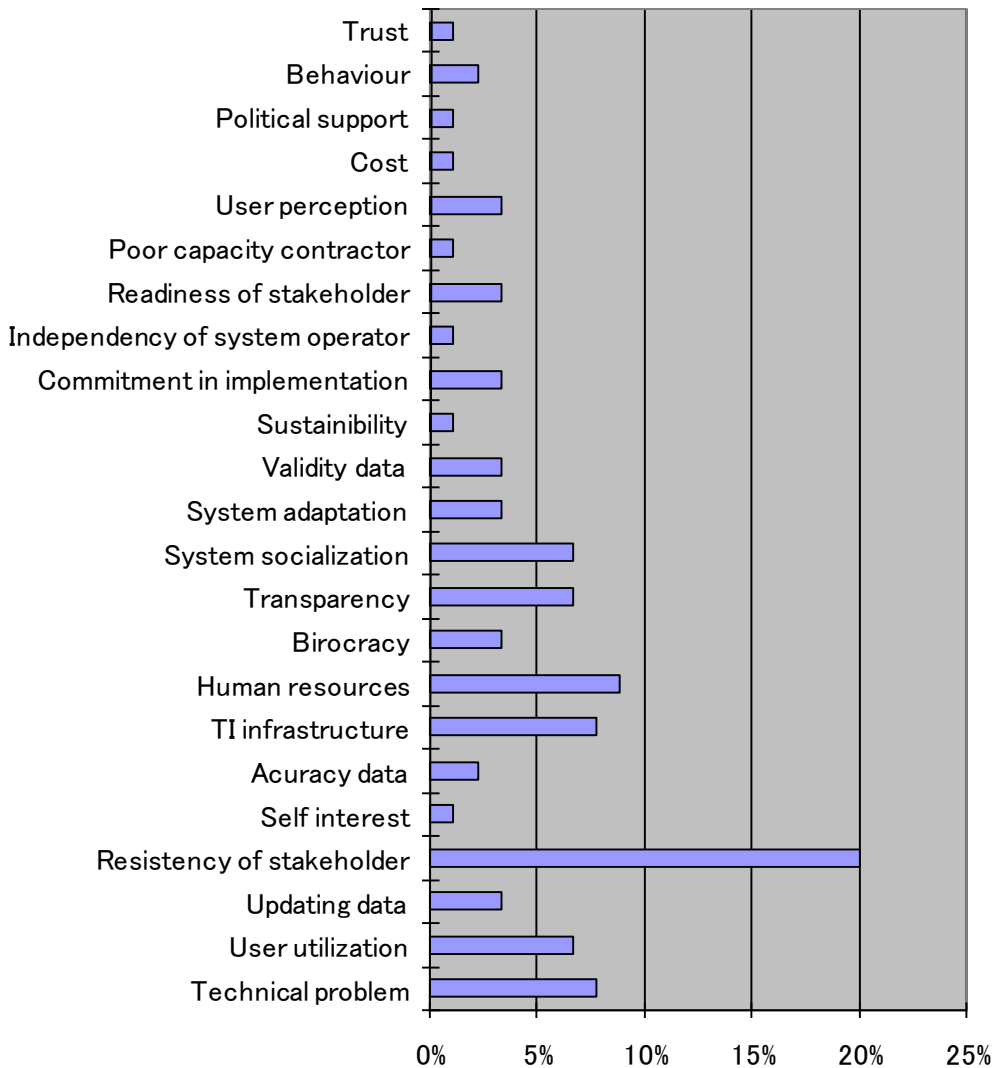


Figure 7.8. Stakeholder opinion of the main constraint in developing proposed system

Other constraint relate to technical problem, such as infrastructure development, system utilization and socialization, and human resources problem.

In another hand, according to the opinion of stakeholder the main consideration in developing the system is data accuracy and validity, data accessibility and other technical system development (Figure 7.9).

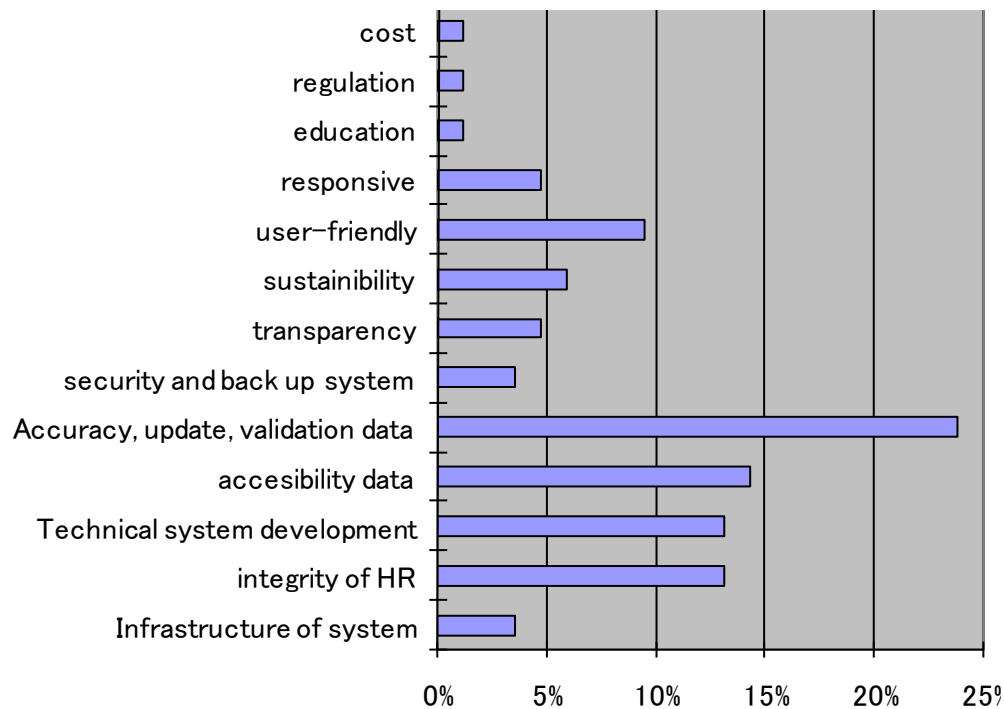


Figure 7.9. Stakeholder view of consideration in developing proposed system

7.3 Summary of survey results

According to the explanation of the survey results analysis, some information that are important in the proposed system development including:

- It is important for stakeholder to have more access to past performance information, since current condition indicates that the stakeholder has less access to the information. Therefore, one of the objectives in developing the new system is to disclosure the information to stakeholders.
- Since the public clients have strong behavior of current pattern and there are some resistances to the change process, hence, understanding the political realities might be needed for future development.
- According to stakeholders opinion, some consideration in developing new system relates to the data system, including accuracy, validity, accessibility, other consideration relate to technical consideration that focus on user adaptation and adoption, such as socialization and utilization of the system.

7.4 Simulation of integrated supervision system development

According to the analysis the performance measurement is important to ensure the quality of contractor in tight price based system scheme that utilize in Indonesia current construction procurement. Therefore, the first action as focus of system development and simulation is performance measurement system. In developing the proposed system, the survey results become one of main consideration. The objective of system simulation is to obtain the simulated the measurement of contractor past performance.

Based on the consideration, following is the concept of simulation of system development:

- In this simulation process, the system utilizes web-based system in order to improve efficiency and give more accessibility to the stakeholder in accessing the information and employed simple spreadsheet application in data evaluation which this application is common and user friendly
- The evaluation uses weight system based on risks identification of the project type, which the objective is to give flexibility in evaluation and be more appropriate with the project needs.
- The system need some verification of information in maintaining the validity of information

The proposed system is a simple system that developed includes several procedural steps below (figure 7.10):

1. Started by entering the project code, and proceed with the verification of project data. If the project data according to the code is appropriate, the measurement can be preceded.
2. The second step is verification of data stakeholders. Started by entering user name and password. The goal is to maintain the validity of data by ensuring clear information about the stakeholders who make the measurement. If the information about stakeholder in accordance with their involvement in the project, then the process of performance measurement can be done directly.
3. This performance measurement process includes seven components of the assessment, and each component has several sub-components of the assessment.
4. Having conducted an assessment of the various components, the process will continue to precede data assessment. Result of assessment is index of performance, which is the recapitulation of the various components according to the weight assessment.
5. Stakeholders can also give their opinion, which will be used as additional information in the performance evaluation.
6. The system is integrated with other EPIC systems, and equipped with standard manual techniques for the type of project performance is measured, a standard

document contract, document standard database, standard procedure field reporting, project contract, project report, addenda information, black list information, and index records data base of contractor

Figure 7.10 shows the logic of system development which is a simple mechanism.

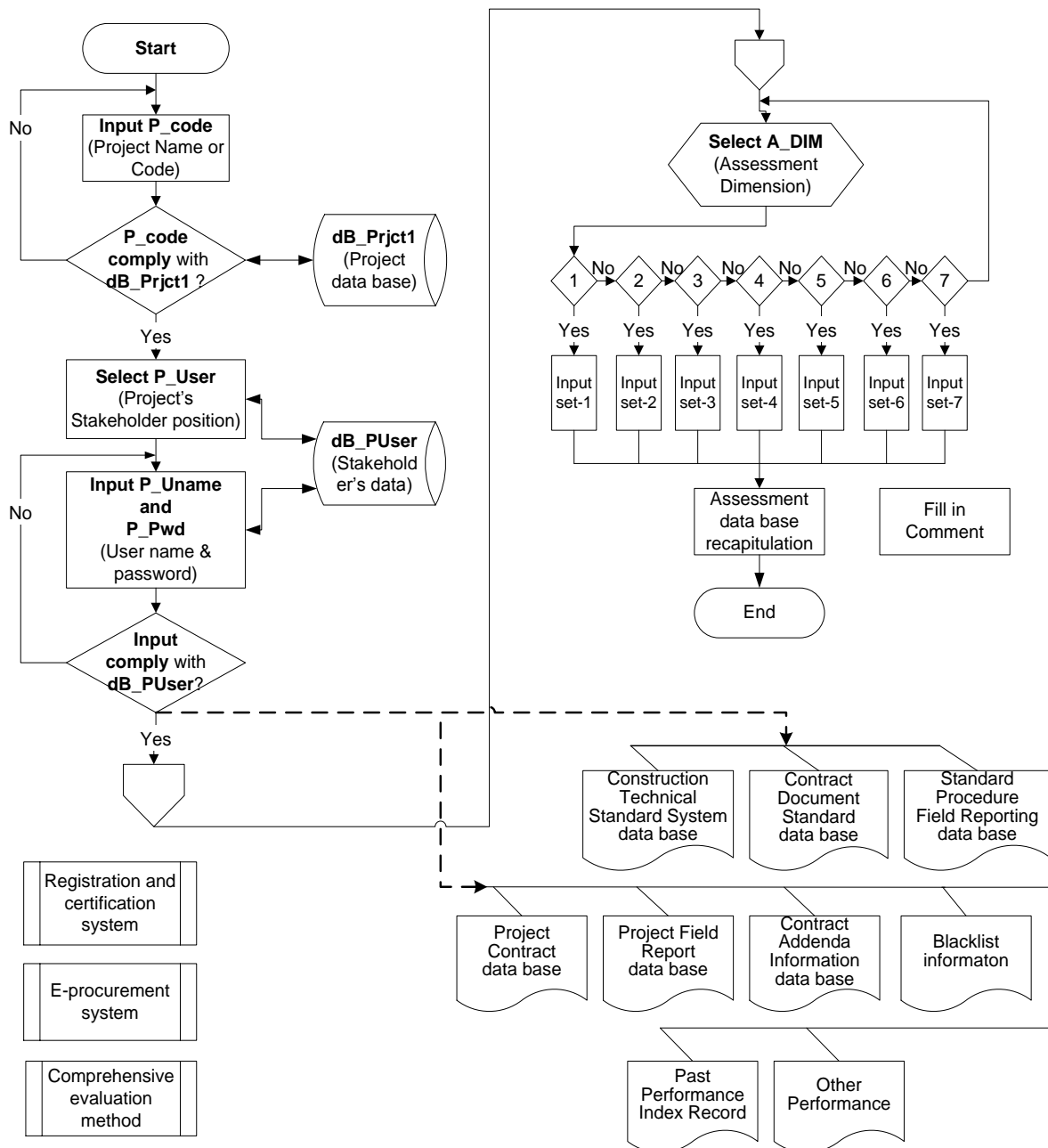


Figure 7.10. Simple logic system of past performance information system

7.4.1 Simulation of web-based system development

Figure 7.11 below shows the home page of past performance measurement system which is web-based system. This system can be accessed directly by the related stakeholders in everywhere by using the internet connection access. The high accessibility of this system allows stakeholders to assess and record the past performance information directly in the field.



Figure 7.11. Simulation of web-based performance measurement system

7.4.2 Component of evaluation

Some considering factors in obtaining information includes nature of information requirement, performance risk associated with the requirement, the importance of past performance information related to other factors, local characteristic condition, and the weight of each evaluation factor. This factor based on construction risks in most commonly used delivery methods (Yamaguchi 2001), and past performance measurement developed by US National institute of Health Environment Management System (NEMS 2005).

The past performance measurement consists of some assessment components which are (Figure 7.12):

1. S1. Quality of service
2. S2. Business relation
3. S3. Manager performance
4. C1. Cost control
5. T1. Timeliness
6. P1. Quality of product
7. O1. Safety performance
8. O2. Customer satisfaction
9. O3. Additional comments
10. O4. Sub-contractor performance:
 - 10.1 Sub-contracting plan
 - 10.2 Business goals
 - 10.3 Customer satisfaction of sub-contractor

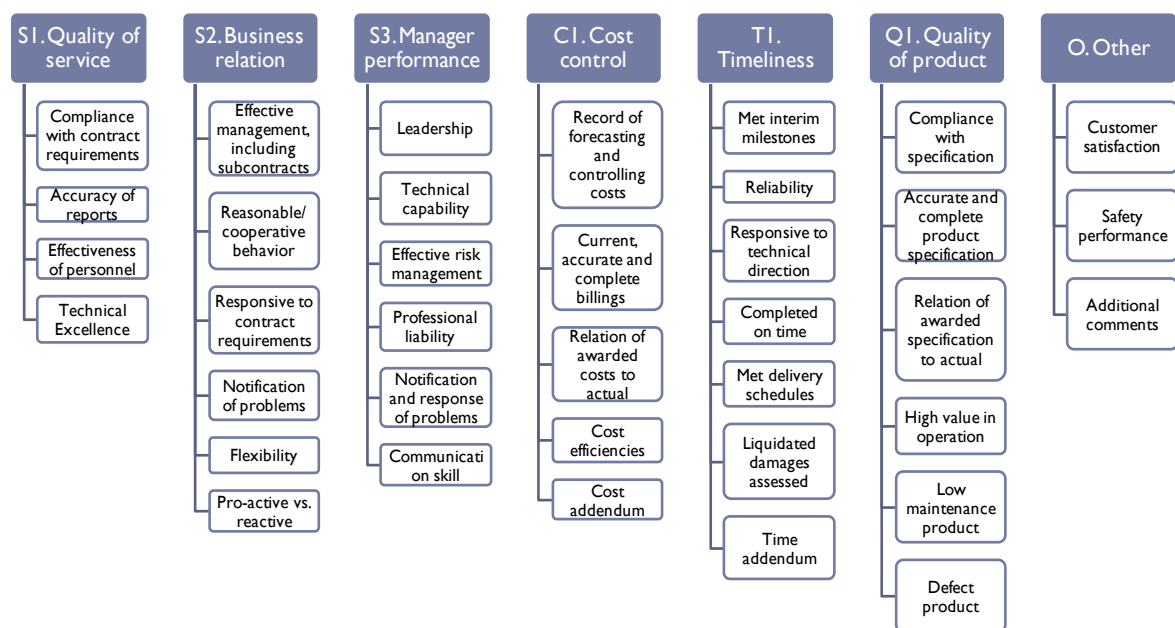


Figure 7.12. Assessment components of past performance measurement

Following figure shows an example of component of assessment in web-based past performance measurement system (Figure 7.13). Detail assessment component can be seen in Appendix C.

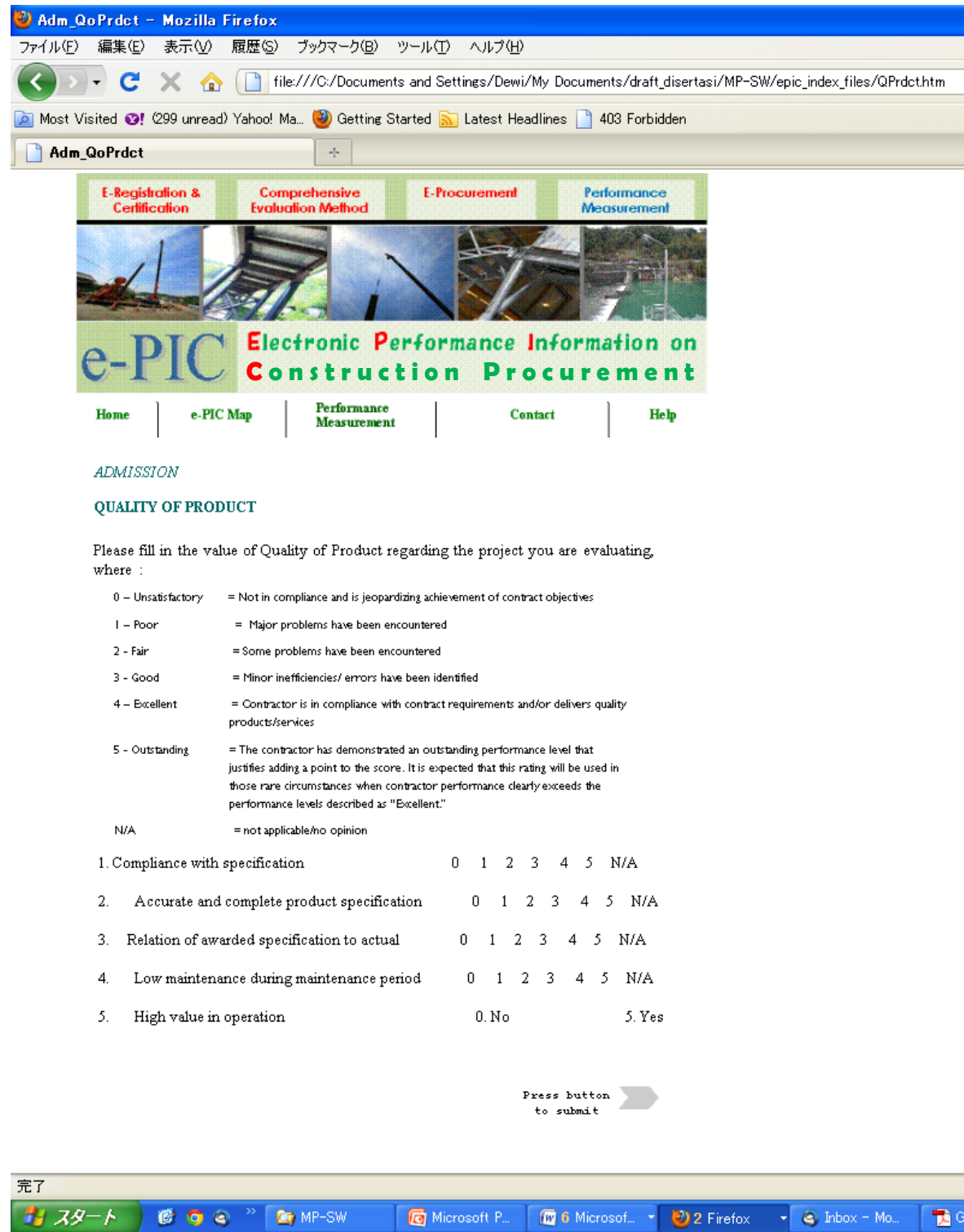


Figure 7.13. Simulation of quality of product assessment in EPIC web system

7.4.3 Simulation of evaluation process

As already mention before, the evaluation uses weight system that consider to risks identification result of the type of construction works to be done. In the weight system the components factors evaluation are grouped into five categories:

(α , β , λ , Ω , μ = weight of priority)

1. α = The weight of cost control
2. β = The weight of quality of product
3. λ = The weight of timeliness
4. Ω = The weight of quality of services
5. μ = The weight of other performance

The following figure shows the position of the weights for the four components of the main factors (Figure 7.14). At the center of the matrix indicates the weight balanced between all the components of the evaluation. The amount of weight for each category is determined by the public client, depending on the needs of the project, but still refers to the provisions of applicable regulations. Maximum weight should be attributed to one category does not exceed 25%.

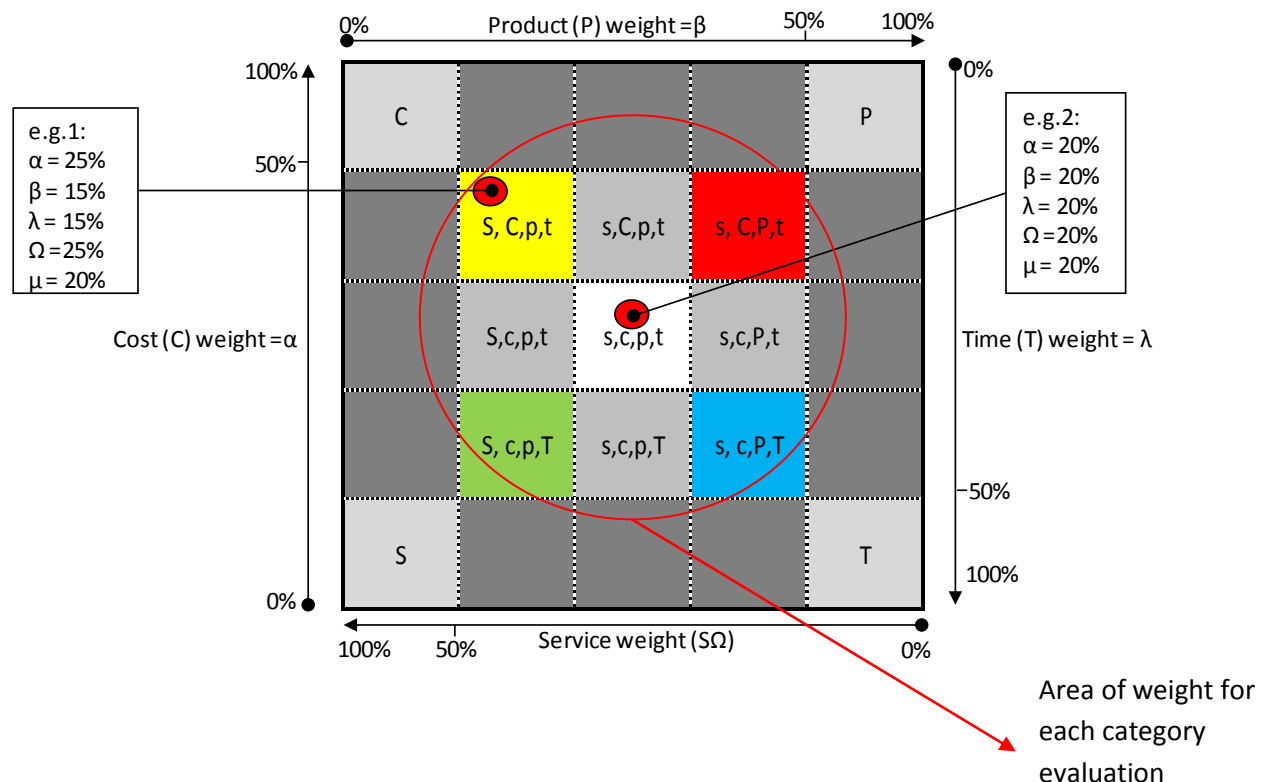


Figure 7.14. Weight matrix system in past performance evaluation measurement

The evaluation system uses simple mechanism that hopefully can be implemented for Small and Medium Enterprises. The following equations are used in the evaluation system using a spreadsheet application:

$$C_p = C_o/C_t, P_p = P_o/P_t, T_p = T_o/T_t, S_p = S_o/S_t, O_p = O_o/O_t$$

- ▶ ...p= performance
- ▶ ...o= output
- ▶ ...t= target = requirement
- ▶ C= Cost control, P= Quality of product, T= Timelines, O= other component

$\alpha, \beta, \lambda, \Omega, \mu$ = weight of priority

Where, $\alpha + \beta + \lambda + \Omega + \mu = 100\%$

- ▶ Target = Maximum point or level of threshold value or level of passing grade

$$\text{Final IP} = \frac{\text{IP}(\text{project 1}) + \text{IP}(\text{project 2}) + \text{IP}(\text{project 3}) + \dots + \text{IP}(\text{project n})}{n}$$

- ▶ IP = Index of performance

7.4.4 Simulation result

Using the previous evaluation mechanism a simulation of project evaluation was conducted to 4 companies which for each company 3 projects were evaluated. The result of the evaluation process can be seen in Figure 7.15.

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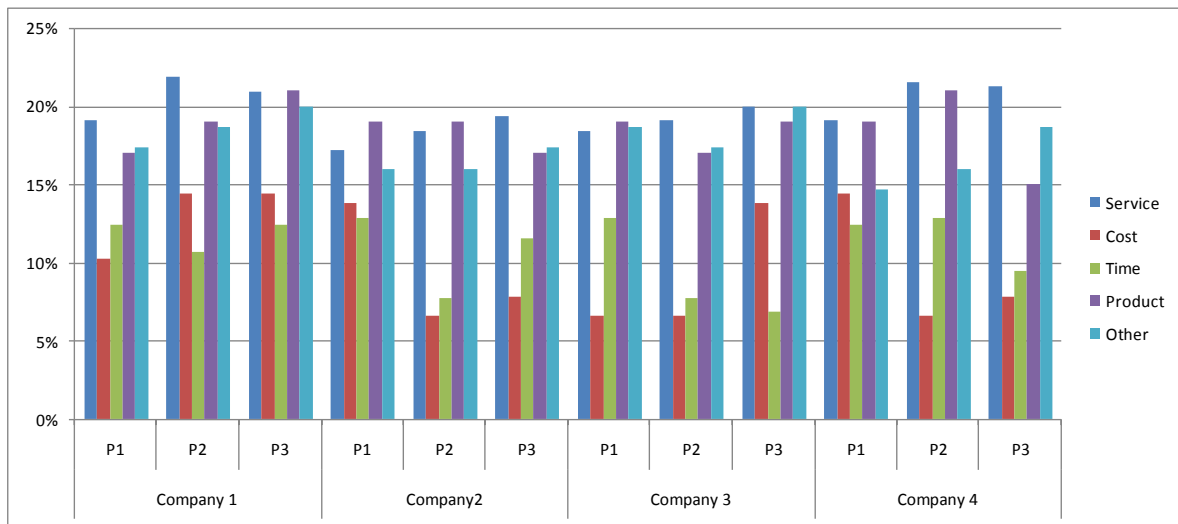


Figure 7.15. Evaluation result of 4 companies of their 3 projects

According to Figure 7.15, the simulation result without index system has difficulties to analyze the comprehensive capacity of each company. Therefore in this proposal, an index system is promoted. The index result can give more accountable information of past performance. Figure 7.16 shows the index performance for each company according to 3 projects experiences.

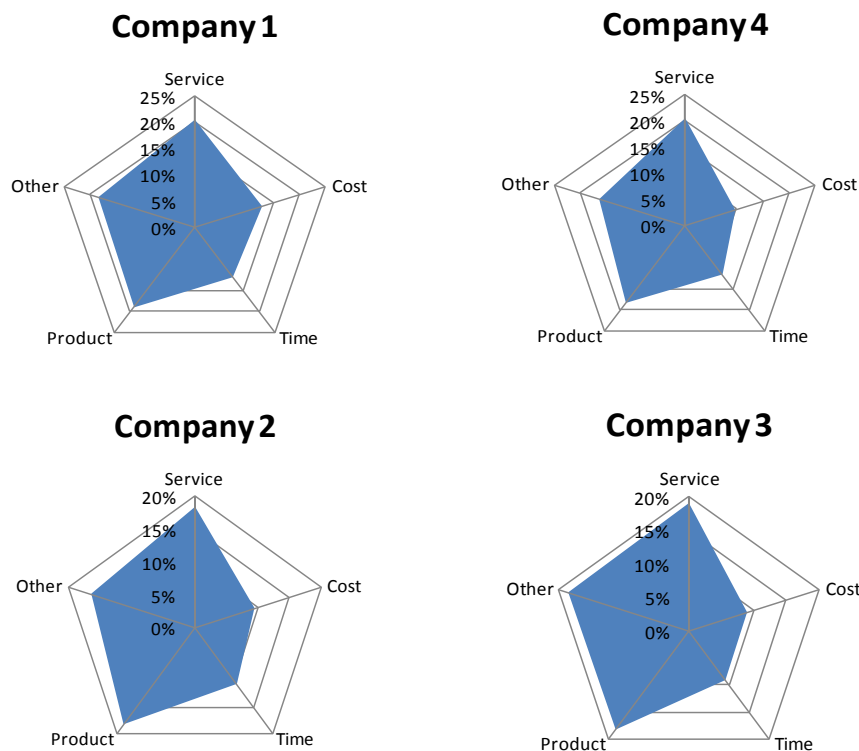


Figure 7.16. Index of performance of each company

Following Figure 7.17 shows the total index performance of the companies.

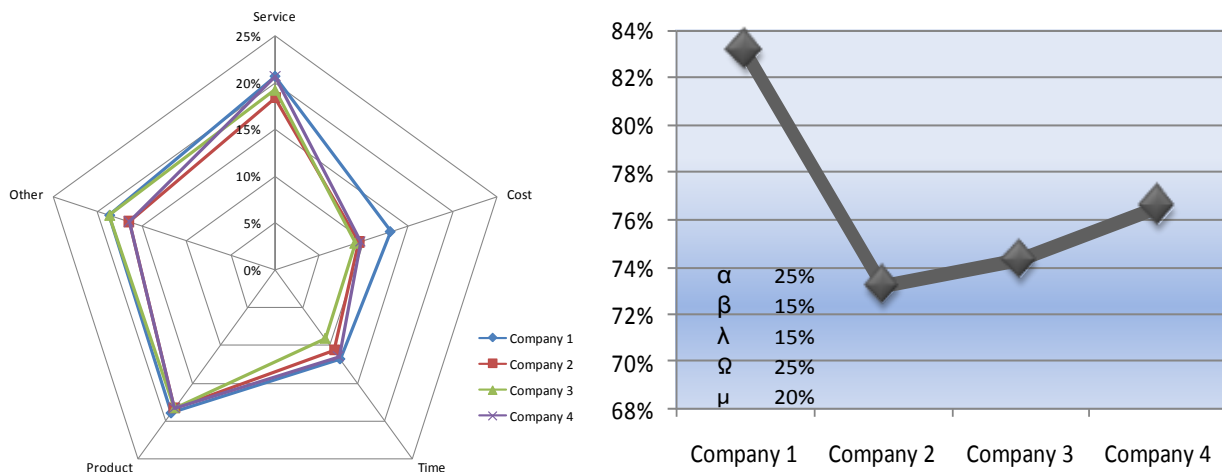


Figure 7.17. Total index for each component

7.4.5 Summary from system simulation

Some of the conclusions of the simulation of developed system are:

- The survey results become one of main consideration. The objective of system simulation is to obtain the simulated the measurement of contractor past performance.
- Improving accountability with clear and transparent contractor comparison process using index system.
- Improving efficiency by utilizing web-based system which this system also disclosure the information and give more accessibility to the stakeholder in accessing the information
- Employed simple by using spreadsheet application in data evaluation which is common and user friendly, hopefully can be adapted and adopted for evaluating Small and Medium Enterprises as majority of Indonesia construction industry
- Flexibility in evaluation according to project needs by using weight system in performance evaluation
- Provide verification of information in maintaining the validity of information
- Providing access information for support standard system, such as technical standard, contract standard, and procedure of evaluation.
- Considering the component factor of evaluation that includes comprehensive performance measurement for legal, technical, financial, and social aspects
- Utilizing support system that can improve efficiency of the system
- Consider the user adaption and adoption capacity in order to improve the possibility of system implementation.

CHAPTER 8

DISCUSSION OF PRACTICAL FEASIBILITY AND OPTIMALITY OF PROPOSED SYSTEM IMPLEMENTATION

Since the implementation process is the most important part in developing the new framework of performance improvement which may contribute to give significant positive effects in changing the existing conditions, hence, evaluation practical condition is requires in order to see the possibility of developing the system so that concretely can be implemented.

8.1 Potent and limitation of existing condition

Existing condition demonstrates some potent and limitation towards the performance improvement in implementation of new proposed system. The potent are important as triggered in order to realize the change process.

8.1.1 The achievement of current e-procurement system under National Public Procurement Agency

The development of e-procurement system by National Public Procurement Agency shows some advantages of existing system implementation. Established in 2008, this system is already implemented by 23 Provinces, 60 e-procurement unit, 156 local and national agencies for 5.754 project packages until the third quarter of 2010. Some achievement of the system implementation demonstrates time reduction of every procurement process from 36 days to 18 days, and transaction cost reduction is about 14% budget efficiency for whole national procurement using the e-procurement system (NPPA 2009).

Even though the system has some advantages, it also has some limitation, because the system has not focus on quality improvement, uses insufficient information in process, has no connection to related process, and has no utilized some potential information for improvement process. Therefore, the development of new proposed system the improvement process needs to utilize the potent of the existing system e-procurement system in an integrated manner.

Another potential of current e-procurement system that developed by the NPPA is the availability of data of contactors and projects that have not been utilized. Since this system has been used nationally, the development of a new system that uses the same infrastructure and network has possibility to be implemented.

Table 8.1 below shows the advantages, limitations and needs for development of the current existing system.

Figure 8.1. Advantages, limitations and needs of current e-procurement system

ADVANTAGE	LIMITATION	NEEDS FOR FUTURE DEVELOPMENT
<ul style="list-style-type: none"> • Support by Presidential Decree 80/2003, ITE law No. 11/2008 • Using by 23 Provinces, 60 e-proc, 156 agencies • Utilize for 5.754 project packages • More than Rp.10 trillion of project cost • Reducing time (36 days to 18 days for one procurement) • Reducing transaction cost (budget efficiency 14%) 	<ul style="list-style-type: none"> • Focus on legal aspects • Insufficient information • Not relates to other process/ phases • Without risk communication • Poor support past performance data system 	<ul style="list-style-type: none"> • Development information support system • Potent of utilization of contractor and project data • Potent of infrastructure and network development • Structural change by integrating the system to the project whole lifecycle

8.1.2 Establishment of National Forum Community Action for Indonesian Construction (NFCA)

Another advantage in developing new system is the establishment of a National Forum Community Action for Indonesian Construction (NFCA). The objective of this forum is to provide room for stakeholder contributions in the community concerns of construction industry development in Indonesia. The forum is initiated by the academicians, government, together with other construction works stakeholders that was began active since 2006. This forum establishment indicates the emergence of strong desire of change. However, this forum is an informal forum that causes the implementation of some agreement in this forum was not binding the parties involved. Some agreements are very difficult to be developed for further comprehensive policy development. For the future development, it is important to strengthen the role of this organization to give significant influence in improvement of policy development.

8.1.3 Best practices from procurement of post-disaster housing reconstruction in Jogjakarta

Best practices of procurement reform indicated in the case of procurement process of more than 154,000 houses that were completely destroyed and 260,000 houses that suffered from some damage by the disaster in Jogjakarta (Government of Jogjakarta, 2007). Jogjakarta was hit by the earthquake disaster that damaged most of central Java in 2006. It is realized that post-disaster procurement process commonly complicated, since the

reconstruction process in particular is rooted in country's socio-political-economic contexts.

Field observation result indicates that in coping with the complexity of the problems in the reconstruction process, an integrated procurement process is conducted in Jogjakarta with focus on community as the key participant. This approach is different from the tender approach based on the presidential decree 80/2003. Usage of this method is possible in according to addendum of Presidential Decree 2006, which allows the special procurement process in certain cases such as post-disaster conditions.

Housing construction process in Jogjakarta carried out with the collaborative relationships approach, involving all stakeholders, including the community, local governments, donors, NPO, and university. Each party controls the risks in accordance with their best capacity in controlling risk. Local government controls the management of organization that requires strong leadership. In this area the governor has strong leadership abilities that can control the risks arising due to interaction of the parties involved. The government also manages the financial risk. Under collaborative relationship with the donors, the government involves the community in the implementation of the budget since the community is considered as the most capable party in determining their own requirement.

The university member and the construction works division control the technical risks in the construction process. The community together in a collaborative relationship with NPO conducted the design and supervision process because the community as a user is the party that has the best understanding about their own needs for their settlement. Through this approach, the optimal risk allocation can be achieved since the negotiation process is well managed by the government.

In this case, most of the construction processes are carried out by the communities and supported by local labor. The result of reconstruction product is appropriate with the community requirement.

Comparing with Aceh reconstruction process in northern Sumatra that was also hit by enormous tsunami disaster in 2004, the procurement process of reconstruction in Jogjakarta reached better performance. Some achievement parameters in Jogjakarta are much better: higher satisfaction of users, faster construction speed with higher than twice, and the lower average cost by 50% in Aceh's case (Table. 8.2).

The cost reductions are achieved through better risk control and a utilization of local resources with the local supply system network based on trust relationship and reuse of material such as wall bricks, roof tiles, doors and windows component. The material supply approach avoid problems that usually appear in the reconstruction process since the needed of material is required in short time and large amount at the same time.

Figure 8.2. Comparative study of reconstruction process between Aceh and Jogjakarta (Larasati and Zakiyatus 2007)

BREAKDOWN COMPARISON	ACEH	YOGYAKARTA
1. type of disaster	earthquake + tsunami	earthquake
2. number of houses ⁶	15% less than Yogyakarta	±154.000 replace, ±260.00 repaired
3. % completed 1 st year	Less than 25 % of target	60% of target
4. utilizing used material	none	numerous
5. type of construction	Competitive bidding	Collaborative construction
6. sense of belonging of user	low	high
7. vacant house phenomenon	Numerous (28%)	none
8. usage of local material	none	most of them
9. type of relationship	competitive/ contract based	collaborative/ target cost based
10. leadership	weak of local leadership	strong leadership by governor
11. stakeholder involvement	low participation	high participation

The procurement systems in the case studies indicate that the achievement of the good performance is in line with the developed proposed framework (Figure 8.1).

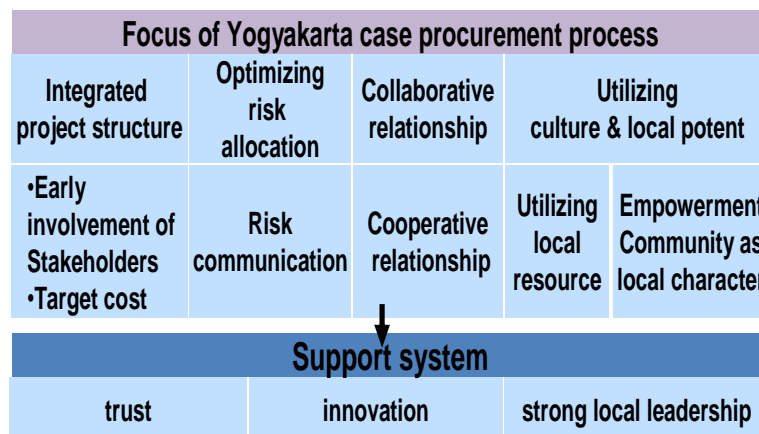


Figure 8.1. Procurement reform at the Jogjakarta case study

8.1.4 Best practices from procurement reform in a university procurement division

In this best practice, the reform process in the procurement was started with establishment of a new logistic unit that manages the integrated procurement process in

the university. This unit was a new procurement division with a main function of supporting and reforming the procurement process in the existing procurement division. The leader of the division realized that poor performance was caused by the unanticipated risks in the procurement process. Therefore, the team determined the objective of reform implementation as controlling all the risks that appear in the procurement of public work such as procedure risk, technical risk, human resources risk, political risk, and document risk.

In order to change the existing condition, observation result of a procurement division of a public university shows the efforts that successfully reduce some risks in Indonesia procurement process.

The improvement process at the university occurred since the establishment of logistic units that manage the integrated procurement process in 2003. This unit is a new procurement division that supported the existing division and reformed the process of the existing condition.

Since the university uses public funds to carry out the procurement process, the procurement should comply with the Presidential Decree 80/2003 as a procurement rule in Indonesia. There are indications that the problems pattern occurred in local government construction works also occurred in the existing division of the university.

In order to make improvement in the procurement process performance, the new procurement team is formed to manage procurement through behavior organizational and institutional culture changes under the strong leadership and good intention of the procurement manager. The new team consists of new personnel who have different behavior compare with previously existing team. They are endorsed to keep the strength of good ethic and professionalism as spirit and culture of institution.

When the new division becomes established and proficient to apply the principles of open and transparent process, then the new division was merged with the previous division in 2005. This merged division is supported by the development of new systems and technical tools. Network-based computer is employed in the new system, and caused the job descriptions for all division members become clearer. As a result, the process becomes easier to be traced. In the case some problems appear in procurement process, the new system can recognize the source of the problem and the responsible division. The new system also succeeds reducing the transaction cost through minimizing the transaction process. The reducing of transaction cost gives significant impact to whole budget efficiency.

The significance of budget efficiency by reducing the transaction cost also proven in Japan public work. A research by Watanabe et.al (2008) calculated that the total cost for

public work delivery process in Japan local government become lower when the transaction cost was reduced.

Additionally, in developing new procurement system, the procurement division received funding support from World Bank at FY 2006. The provision of funds is granted for a couple of years, since the development process indicated a significant result in increasing performance. Figure 8.2 shows the change process in the observation study.

The success of procurement reform in the public university indicated that the performance improvement in public procurement significantly related to organizational behavior and institutional culture such as good intention, strong leadership and good ethic.

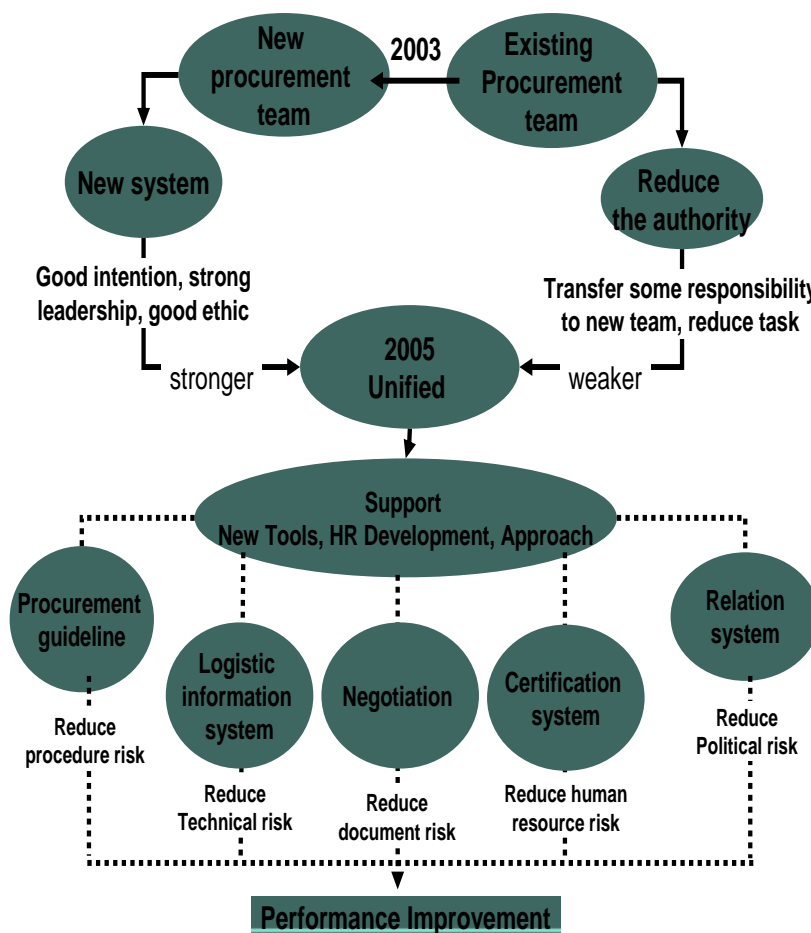


Figure 8.2. Procurement reform in a public university

The development strategy is continued with the developing support system of the public procurement system that consists of technical tools and human resource development, as follows:

- Procurement guide line that involves the development of management system, procurement method, and transaction administration procedure.

- Logistic Information System (LIS) development consists of computer based purchasing system and performance measurement evaluation system.
- Certification system for public procurement official supported by lecturer, simulation, internship, and examination program.
- Social system development, such as user complaint mechanism, ethic-code system, professionalism improvement, open-mind relationship, and communication technique.

The objective of strategy implementation in developing support system is to reduce the risks that appear in procurement process, such as procedure risk, technical risk, human resource risk and political risk (Figure 8.3).

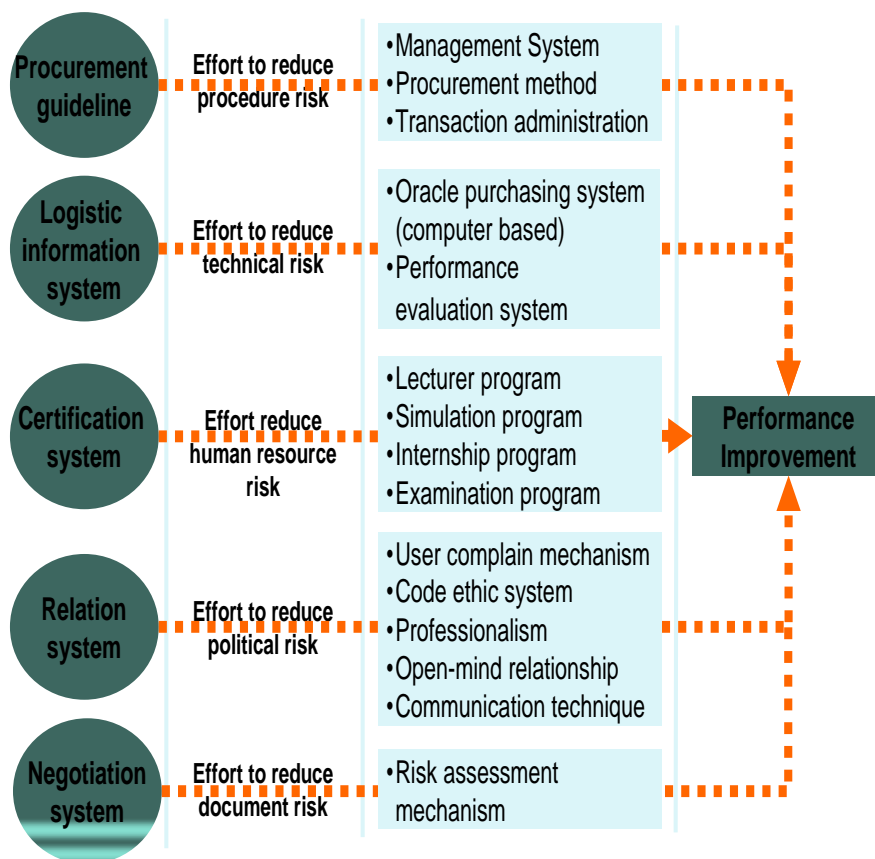


Figure 8.3. Reducing risks as objective of procurement reform

In addition, the logistics center developed a risk assessment mechanism at each stage of procurement. The risk assessment mechanism consists of (Figure 8.4):

1. 'Clarification meeting' of the design document between public clients, users, and designers during the bidding preparation, which aims to avoid the risks that rise in the design documents.

2. 'Description meeting' at bidding process, in this meeting public client, user, and the entire bidder evaluate the bidding document before award document is given to the contractor.
3. 'Bidding clarification meeting' between client and prospective contractor to clarify the contractor bidding document, and to ensure the contractor commitment.
4. 'Kick off (preconstruction) meeting', before award is signed, between all parties involve to explain the project scope and the responsibility of each party, also to ensure that all risk already distributed to the party who most able to control the risk.
5. Regularly meeting among all stakeholders as a part of construction management process.
6. Stakeholders check list process to re-ensure that construction result meets the user requirement.

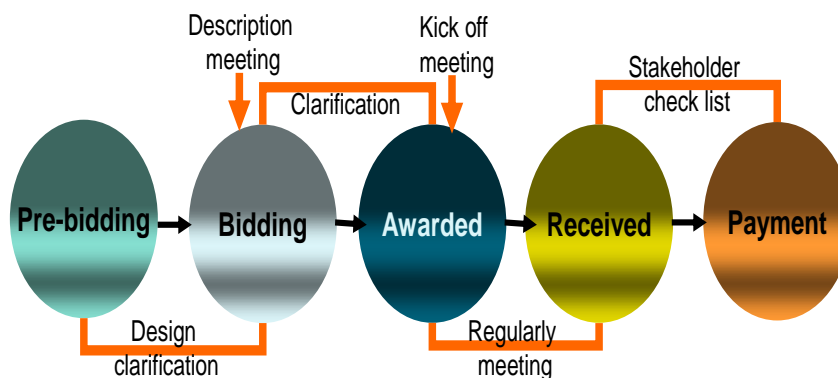


Figure 8.4. The risk assessment during procurement process

The risk assessment that was developed based on negotiation approach. Negotiation is believed playing significant role in improving performance of public work. Nowadays, many developed countries use negotiation approach in public procurement, such as the US and UK adopt negotiated-procedure, while France adopts the competitive dialogue-procedure¹¹.

Figure 8.5 shows the user that satisfaction evaluation results of logistic center the performance of in the University procurement at FY 2006, 2007 and 2008. The user is 66 units under the university organization that are provided service by the logistic center. During the three FY periods the user that satisfied with the performance increased steadily.

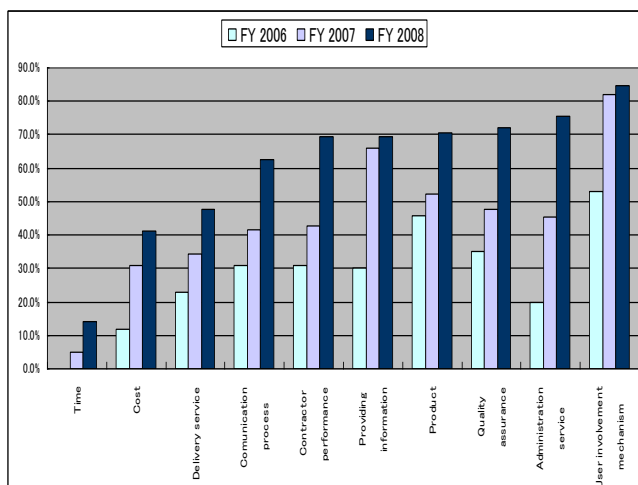


Figure 8.5. Percentage of user that satisfied with several performance indicator of the university logistic center (Source: The logistic center internal evaluation result 2009)

Although there is many factors that still need to be improved, the success of some performance indicator enhancement of procurement reform in the public university indicates that the good achievement of reform can also happen in hard circumstance condition such as in Indonesia by strong support of soft system and technical system.

Nowadays, the procurement reform process in this university is still continued, and it is supported by the high level policy of university. The policy is very important in order to strengthen the leadership of the organization and to encourage law enforcement in carry out the procurement.

Based on previous descriptions, there are some important points that could be the lessons learn from the good practices of public procurement reform. In the process of procurement reform, the issue on technical systems such as evaluation method or technology improvement requires the innovation process. In the case of the public university, the innovation is used to reduce transaction costs through development of procurement system which is computer-based. The computer-based procurement system reduces the interaction between parties that impact in reducing the transaction costs.

The soft system-based issue also plays an important role in the process of public procurement reform, as they relate to culture, politics, and social interaction. In the case study of the public university this issue holds a very significant point in determining the success of reform through strong leadership, good intention, good ethic and professionalism. Other soft system-based issues are trust culture and professional liability which ensures quality assurance in public procurement. The organizational behavior and cultural institution change through a trust and open-mind approach already proven as a success factor in enhancement of public work performance.

Other important point as good practice in performance improvement in public work is negotiation. Negotiations as early risk assessment process are expected to reduce the risk and uncertainty in public work. Because the characteristic of the public work is subject to change, reducing the risk on early stage is expected to avoid the delays and change orders in construction.

Figure 8.6 demonstrates the detail of strategy support system in public procurement reform based on the lesson learn from current practices that are explained.

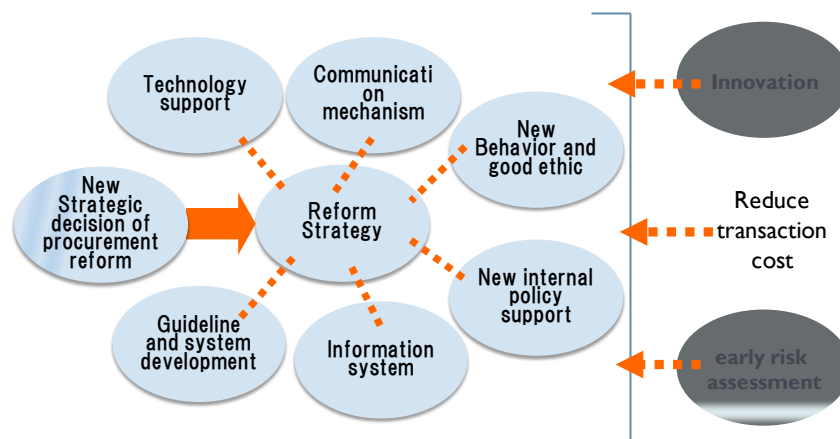


Figure 8.6. The needs of support system in procurement reform

In order to support the reform implementation process, there are some efforts could be the strong point of existing condition in Indonesia public procurement, such as the strong desire to change of some practitioners, procurement specialist license program acceleration that encouraged by central government, intensive procurement training to support license program, good policy and some support funding from international organization such as World Bank and Asian Development Bank.

According to the lesson learn, procurement reform process must be done continuously, consists of best practices that deal with development and maintenance activities that cover the project lifecycle from conception through delivery and maintenance process of the system.

CHAPTER 9

CONCLUSION AND RECOMMENDATION

9.1 Conclusion

Poor performance product of Indonesia construction works such as under minimum requirement and shorter period of lifecycle is as the background of this research. The poor process of construction works such as not on time in completing work and increasing the project budget is also another reason as the background of this research.

To accelerate infrastructure development, some efforts are required in improving poor performance of public works. Observation result indicated that currently the stakeholder in construction industry cannot cope with the risk appear during project lifecycle that causes by many factors including:

1. Cost and financial problem that caused by very low bid priced under corruption circumstance, contractor conducts the project without financial support from funding agency, and poor capacity in cost control management
2. Technical problem that caused by poor risk control mechanism, low technical ability of contractor and public client, and lack of technical information
3. Relational problem that caused by adversarial relationship among stakeholder, especially relationship between client and contractor, unclear responsibility in controlling risk, low sanction system of poor performance, and low level of trust among stakeholder throughout project lifecycle.
4. Legal problem relates to abused multi interpretation of rule and weakness of stakeholder role in the industry development process.

The analysis of problem formulation and review of current reforms shows that the tight competitive bidding without performance measurement could be one of the root problems that cause many uncontrolled risks. The analysis result indicates some circumstance in tight competition condition without sufficient past performance information that causes some risk appearance during project lifecycle, which are:

1. Unclear performance measurement that abused by public (political) leader to arrange the procurement process for their self interest
2. Focus on price in evaluation process that less intention to risk control ability that allowed the poor performer become awarded contractor and less opportunity for good performer to give contribution in infrastructure development for country development process.

3. Contractor is forced to bid in very low price to become awarded that causes financial difficulties in achieving minimum requirement and completing work. In order to get more profit contractors may reduce their quality of work.
4. Claim attitude for additional work to get more profit causes distrust relationship among stakeholder and leads to disputes environment under adversarial relationship

Lesson learned from Japanese construction industry performance improvement indicates that the change process always focuses in quality. Chronologically the change process consists of improve the quality, eliminate poor quality, and ensure the quality of construction process.

The need analysis suggests that new procurement reform should focus on ensuring contractors' performance in order to give opportunity to the qualified participants in giving more contribution in country development process that needs quality assurance mechanism.

Key points of the proposed change are integration risk control mechanism throughout project life cycle, utilization of past performance information in competitive procurement system, and improvement of stakeholder role and relationship.

The objective of integrated risk allocation is to optimum risk allocation among stakeholder that leads the appropriate risk allocation to the parties most able to control the risk that is expected to increase risk can be controlled during the construction works process.

The proposed system focuses on developing past performance measurement process focus in disclosure information in order to encourage stakeholders to maintain their good performance which involves multi-parties. This process is supported by technical standard system, utilization of IT system which integrates the process of exchanging information throughout the project life cycle. The development of infrastructure for the change process should consider the user adaptation and adoption which focuses on Small and Medium Enterprises by revitalization of current system and supported by deregulation of new framework implementation.

The limitation of the proposed system has not much elaborated the stakeholder role and relationship improvement since this improvement process relates to culture and political realities condition.

9.1.1 Summary

Based on analysis results in this research, reducing the risk is one component that can support the achievement of performance improvement. Target improvement of this action is to achieve optimum risk allocation in order to improve the controlled risk.

Since in a construction works project, each party tends to have different risk perception under uncertain conditions, hence, the better communication of risk hopefully can minimize the differences of risk perception among stakeholders in order to increase the number of the risk that can be controlled and to decrease the cost allocation for risk response. An integrated system of risk control mechanisms that requires enhancement of risk communication in project procurement is developed based on problems analysis and needs analysis, which is expected to find appropriate risk allocation in which a certain problem allocates to the parties who are most able to control the risk do so. In this concept, each party is expected to be responsible for the risks that he/she can control. The objective is to empower all stakeholders to participate and give maximum contribution in accordance with its responsibilities in achieving good performance. The development of this concept is through chain action system for ensuring risk control capacity which is a cycle mechanism that provides input to previous activities and gives feedback to next activities. In the developed proposed system, the cyclic system is electronic past-performance information on construction procurement (e-PIC) which is developed based on reputation and best value procurement approach. This system involves multi parties in order to provide more confidence to past performance measurement result.

The e-PIC system consists of four processes that are performance registration and certification, performance qualification, performance evaluation and performance measurement. This sub-system is developed to four sub systems which are:

1. Electronic registration and certification system of construction service enterprises and construction engineer,
2. E-procurement system
3. Comprehensive evaluation method for bidding system
4. Performance measurement in supervision mechanism that is supported by technical standard system.

This system is an integrated system that the four sub-systems mutually support each other. The first action as a starting point of information collection could be performance measurement system that includes comprehensive performance measurement for legal, technical, financial, and social aspects that involves multi-parties and is supported by technical standard system. The measurement uses Information Technology (IT) system that directly links to evaluation system using a weight valuation system. The weight valuation system is based on risks identification result of the type of public works to be done. The objective of IT utilization system is to reduce inefficient activities and transaction cost by providing sufficient information sharing environment, managing information in digital form and circulating information through communication network, with avoiding re-input and enabling retrieval for reuse information.

In the implementation of this framework, it is necessary to involve all stakeholders in providing credible information, where the system is used by key stakeholders and linked to external stakeholders in order to provide support system.

Since the Small and Medium Enterprises are the majority of the construction firms that involve in public works projects, it is necessary to determine a change action that has minimum difficulty in implementation process for SMEs through simplifying system and utilizing common application.

Empirical studies and practical evaluation results indicate some opportunity of implementation feasibility and optimality of proposed system including:

1. Survey by questionnaire to practitioners indicates high confidence of proposal implementation that will improve transparency and accountability in construction works procurement process, and will encourage the stakeholder to maintain their good performance in order to enhance the performance of construction works.
2. Proposed system simulation signifies the important of data validation and user adaptation and adoption consideration by simple system utilization in order to optimize the system implementation process.
3. According to need analysis and preliminary valuation, the new proposed system requires good support of system infrastructure that current e-procurement system already has some good achievement according to network and infrastructure development of electronic system in procurement. There is possibility to expand the current capacity under integrated system throughout project lifecycle. In this new system, the establishment community forum is needed in order to empower the community, which current National Forum Community Action for Indonesian Construction (NFCA) already provides room for stakeholder contributions in the community concerns of construction industry development in Indonesia. Strengthen the role of the community forum is possible to give more influence in developing the new system.
4. Some procurement reforms in local agencies indicate best practices in implementation of the concept of new proposed system. Jogjakarta disaster reconstruction process indicates that the construction works projects is carried out with collaborative relationships that involves all stakeholders, which each party controls the risks in accordance with their best capacity in controlling risk. The result of reconstruction product is appropriate with the community requirement. Comparing with disaster area, the procurement process of reconstruction in Jogjakarta achieved better performance, such as higher satisfaction of users, faster in construction process, and the lower average cost. The case in public university logistic center indicates integrated risk control mechanism efforts that successfully reduce some risks during the construction process, by developing support system of risk control mechanism that includes developing integrated risk assessment system throughout project lifecycle.

9.2 Contribution

9.2.1 Practical contribution

Practically, the research gives description of entire problems in Indonesia construction works process and construction industry that probably happens in many developing countries. The description hopefully can be used to develop framework in giving direction of change action of construction performance improvement. In general, the main problem is the existence of gap between performance enhancement reform effort that the effort of performance improvement is not in accordance with the current reform efforts which leads to poor performance of construction product. Practical evaluation shows that existing construction procurement scheme give possibility to poor performer to be awarded contractor, hence the good performers have less opportunity to give their contribution in country development process. The problem description gives direction in developing change action that should be made in order to achieve performance improvement.

Based on the development and application of past performance information system, this research provides a number of contributions, which constitute its originality and uniqueness. The provided contributions are categorized into four main categories comprising of:

1. Risk mapping of tight competition bidding without sufficient past performance information system,
2. Frameworks of integrated structure of past performance information system development
3. Development EPIC model that gives more intention to risk control mechanism, with the objectives is to provide more opportunity to good performer in contributing on country development process
4. Detail development of past performance measurement system

9.2.2 Theoretical contribution

It is a possibility to explore theoretical approach for practical system development, which the proposed system development is not only derived from theoretical needs, but also practical needs which is unique and depend on country characteristic

- 1 The utilization of industry stability theory in evaluating existing conditions and lessons learned enables a clear depiction of the direction of change toward performance improvement process.
- 2 Since the characteristics of project are similar, some of identified problems possibly occur in other construction works.
- 3 Lessons learned indicate that focus on quality and the development of strong social sanction system could make an attitude to achieve good performance

9.3 Limitation and issues for future development

The challenges of implementation process are:

1. There is gap between education efforts that many efforts focus on improvement expertise capabilities and the factuality of construction procurement process. The existing scheme less intention to risk control mechanism and gives possibility to poor performer to be awarded contractor, while good performer has less access and tends to pessimistic in contributing to construction work implementation process.
2. In implementation of change action, some stakeholders tend to resistance to change process and tend to carry on their self of interest in taking advantage of existing condition.
3. The pessimism of good performers to contribute in change process leads less support to the government action in change process, that results in weakness of government role in implemented the actions
4. The current construction regulation puts the government in weak position in construction development decision making. Therefore, it is hard for government to make strong strategic decision in improvement process. There should be a essential change of construction regulation in strengthen the stakeholders role.
5. Government's willingness to strengthen its role in the development of construction services requires a strong legal framework. However the current political climate, as the sole determination of the law in Indonesia, has many constraints in providing appropriate legal support on the change processes.

Some important consideration, that it did not elaborate yet in this research, need to be considered in future development that explained in following explanation:

1. According survey result, the resistance of stakeholder is the main problem in implementing proposed system. World Bank indicated that changes in public sector institutions and governance systems in developing countries may be relatively easy to achieve technically, but very tough to implement politically. It needs to understand the current political realities in Indonesia that shape the incentives of key stakeholders in building consensus.
2. Since the proposed system is developed in integrated structure that needs to strengthen the stakeholder role and relationship, deep elaboration of stakeholder role and relationship is seem required for future development
3. The proposed system is an initial guideline that hopefully can give direction to change process, however it needs detail development in the future development.

9.4 Future needs of change development

As a multicultural country Indonesia has strong local character and culture. But the existing procurement reform has not incorporated this potential yet. Local character and culture in Indonesia tends to be communal rather than personal. Thus, the community has a significant role in the country development process. It has been widely accepted by the practitioners that the involvement of community is one of the key factors to enhance the performance of public services¹³. Therefore, the procurement approach that relies on the community is one of the implementation solutions in improving performance of construction works such as in Jogjakarta case.

In doing the procurement reform, trust is essential to achieve good performance because trust and open-mind encourages sharing of information, knowledge, and resources between the parties involved. But in practice, building trust between parties is not easy and takes time.

In the application of various approaches, integrating and customizing the applications based on local characters and culture is expected to increase the sense of belonging of the parties involved. The local values are usually not compulsory and not written. It is strongly inherent and established for a long time, and its influence is very strong in society. The foundation of its application is trust. Hence, local character and culture can be utilized to accommodate the needs of trust which is one of the most essential elements to realize the best value in procurement process. Since building trust between parties in the procurement reform takes time, utilizing the local characters and culture that is already established hopefully will accelerate the reform process.

It is also necessary to create innovation in an effort to improve performance. The objective is to produce tools that can be implemented. In every change, the related parties often resist and attempt to retain the existing patterns. Through the innovation, the information about the appropriate implementation strategy might be obtained, so that the direction of change will be in accordance with the expected objectives, specifically in strengthen the parties capacity.

In the case of the university procurement division, new systems and technical tools to support the procurement process is developed as an innovation. A network-based computer is employed in the new procurement system to minimize the transaction cost which improves the whole budget efficiency significantly.

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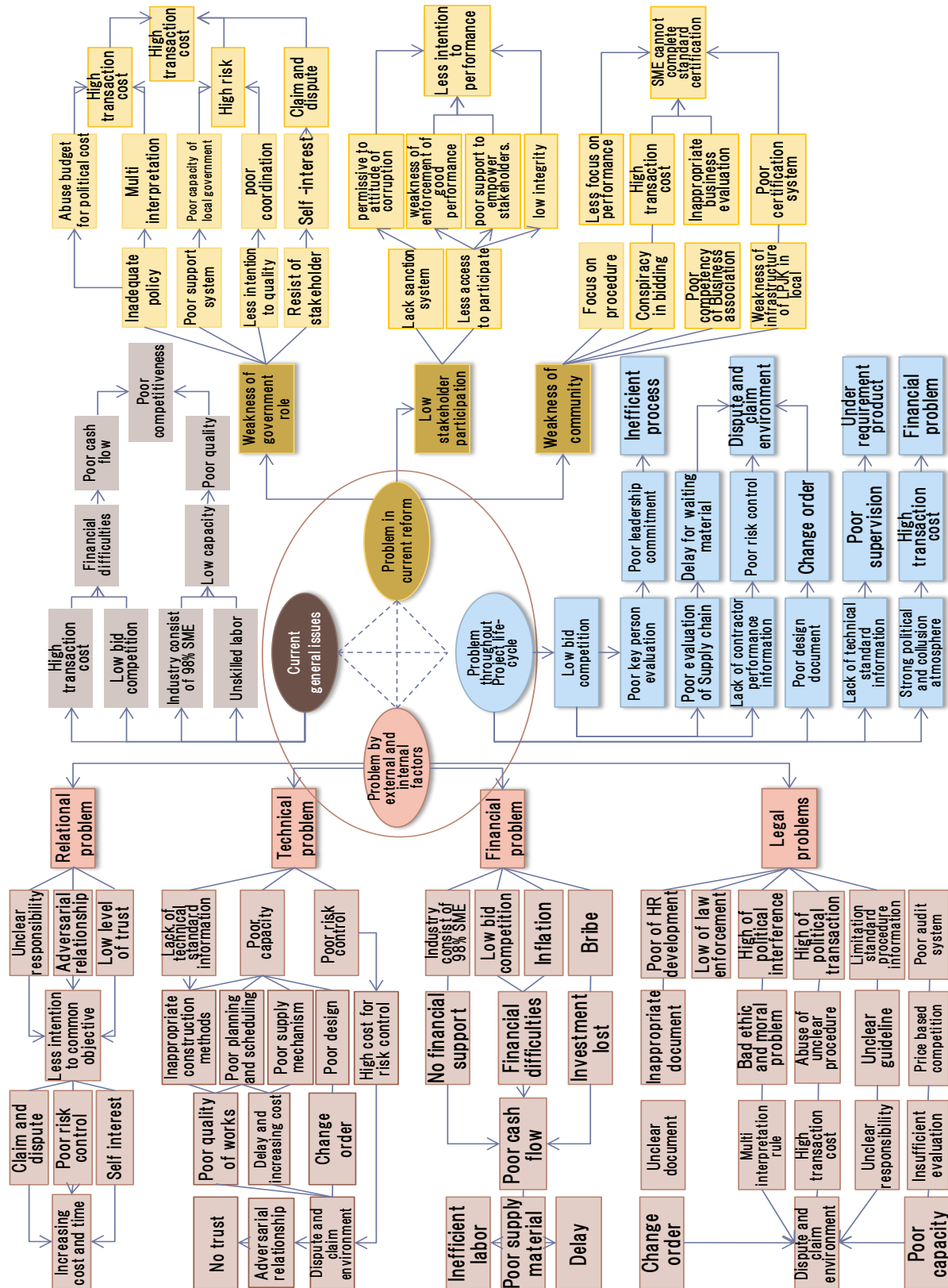
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APPENDICES

APPENDIX A:



APPENDIX B-1: RESEARCH QUESTIONNAIRE

Research questionnaire of research on development construction quality assurance system in Indonesia construction procurement

Dear Mr./Ms./Friend/Colleague

Recently, I am conducting research on the importance of the contractor performance information systems in order to develop proposal in improving quality of Indonesia construction works projects. The goal of the research is to disclosure information in order to encourage stakeholders in maintaining performance during construction process by increasing transparency and accountability in the procurement process of public works. In this proposal, a system is developed that expected to support the objective of the research. The system developed is an integrated contractor performance information system that consists of four sub-systems, which are registration and certification of information systems, electronic procurement system, comprehensive evaluation system in procurement process, as well as performance measurement system in implementation of construction projects. The following figures show the model of past performance information system that is developed.

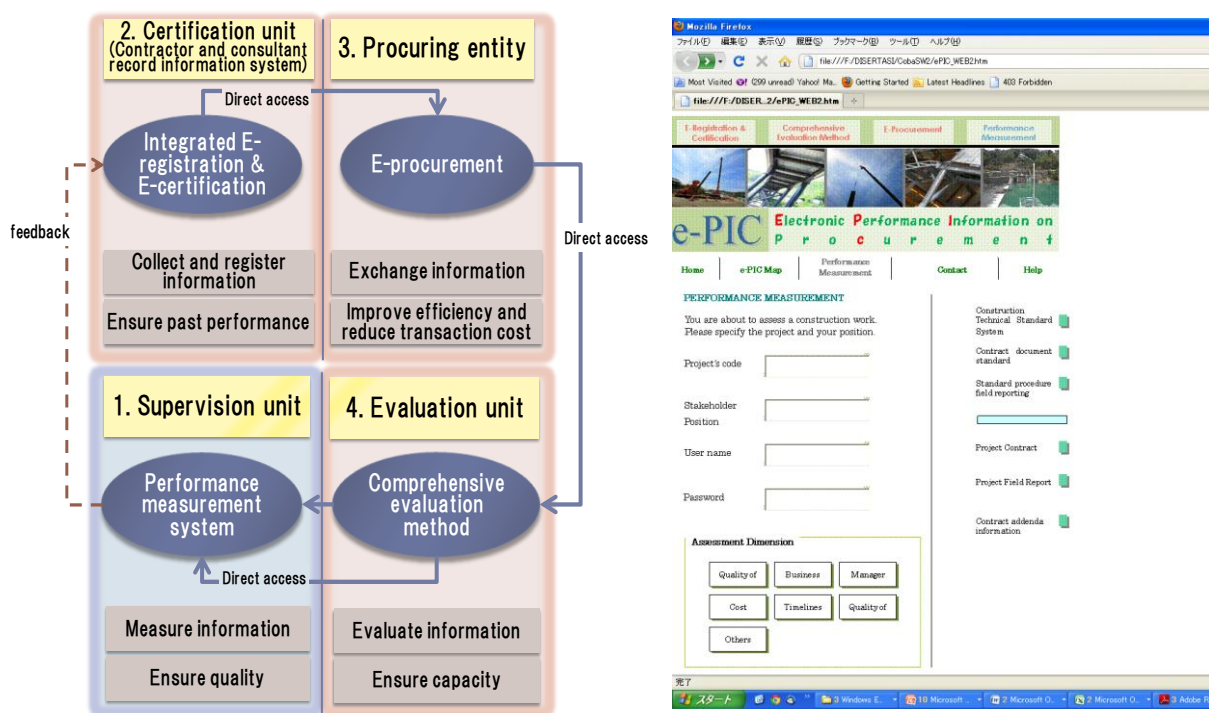


Figure: Proposed Electronic Performance Information in Construction Procurement (EPIC)

Related to the research, I really need your suggestion about the possibility of the system implementation and for further development. Here are some questions according to the research development process.

Since your time is very valuable, thank you very much for taking the time to fill in this questionnaire.

1. Affiliation in construction works:

1. Client/ Government
2. Construction firm
3. Community/ NGO
4. Researcher/ Academia
5. Other

.....

2. Gender:

1. Male
2. Female

3. Age :

1. Less than 25 years
2. 25-35
3. 36-45
4. 46-55
5. 56-65
6. Elder (more than 65years)

4. Experience in Indonesia construction works:

1. 0- 5 year
2. 5-10
3. 10-15
4. 15-20
5. More than 20 years

5. Domisili:

City.....Province.....

Please circle the number to give your opinion.

6. In your opinion, does it need to increase transparency and accountability in the procurement process for construction works services in Indonesia?

1. Need
2. No need
3. No opinion

7. In your opinion, in order to improve transparency in public works procurement process, does it need initiative to disclosure information that makes the information easily accessible by the public?

1. Need
2. No need
3. No opinion

8. In your opinion, does it need the existence of an integrated information system in the process of procurement of public works that can be accessed by the public?
1. Need 2. No need 3. No opinion
9. As part of the construction stakeholders, whether you believe that the past performance information system in public works performance that can be clearly communicated to the public, will enhance the construction works performance?
1. Yes 2. No 3. No opinion
10. Whether you believe if the past performance information system can be clearly communicated to the public, will reduce corruption in construction works procurement?
1. Yes 2. No 3. No opinion
11. Whether you believe that the past performance information system will increase transparency and accountability to the organizers of public works?
1. Yes 2. No 3. No opinion
12. Whether you believe that the past performance information system in construction works procurement that can be clearly accessed by the public will encourage stakeholders to maintain their good reputation in conducting construction works?
1. Yes 2. No 3. No opinion
13. As one of the parties who participated in construction works, do you need to access information about performance of stakeholders in construction work?
1. Need 2. No need 3. No opinion
14. As one of the parties who participated in construction works, do you need to have access in giving measurement of construction works performance?
1. Need 2. No need 3. No opinion
15. Do you know current system of construction works performance information that can be accessed by public?
1. Yes 2. No
16. In developing past performance information system of construction works that can be accessible to the public, do you think there any constrain that should be consider?
- No, there is/ are no constrain 2. Yes, there is/ are constraint in development process, such as:

.....

.....

.....

.....

.....

17. In developing past performance information system of construction works that can be accessible to the public, do you think what kind of media should be used?
1. Electronic media 2. Paper based media

18. In your opinion when a past performance information system of public works will be developed, what is most important think should be considered?

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.....
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Your participation is very valuable to me in developing past performance information systems for performance improvement in Indonesia construction work, and hopefully it can be used to optimize in supporting the country development process in the future.

Thank you very much for your participation and cooperation.

Best regards,

Dewi Larasati ZR

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APPENDIX B -2: SURVEY RESULT

Number	Q1. Name	Q2. Affiliation	Q3. Gender	Q4. Age	Q5. Experience	Q6. Location	Q7. Province	Q6	Q7	Q8	Q9	Q10	Q11	Q12	Q13	Q14	Q15	Q16
1	Respondent 1	Contractor Firm	M	25-35	< 5	Bandung	Jawa Barat	1	1	1	3	1	1	3	1	1	2	2
2	Respondent 2	Contractor Firm	F	25-35	5_10	Bandung	Jawa Barat	1	1	1	1	1	1	1	1	1	2	2
3	Respondent 3	Contractor Firm	M	25	5_10	Bandung	Jawa Barat	1	1	1	1	1	1	1	1	1	1	2
4	Respondent 4	Researcher/ Academia	F	36-45	10_15	Tangerang	Banten	1	1	1	1	1	1	1	1	1	2	2
5	Respondent 5	Researcher/ Academia	M	36-45	10_15	Bandung	Jawa Barat	1	1	1	1	3	3	3	1	1	2	2
6	Respondent 6	Researcher/ Academia	M	25-35	5_10	Bandung	Jawa Barat	1	1	1	1	1	1	1	1	1	2	1
7	Respondent 7	Contractor Firm	M	25-35	5_10	Bandung	Jawa Barat	1	1	1	1	1	1	1	1	1	1	2
8	Respondent 8	Contractor Firm	M	25-35	10_15	Bandung	Jawa Barat	1	1	1	1	2	1	1	1	1	2	1
9	Respondent 9	Researcher/ Academia	M	25-35	10_15	Jogjakarta	D.I Jogja	1	1	1	1	1	1	1	1	1	2	2
10	Respondent 10	Client/Government	F	25-35	5_10	Cimahi	Jawa Barat	1	1	1	1	1	1	1	1	1	2	1
11	Respondent 11	Researcher/ Academia	M	36-45	15_20	Bandung	Jawa Barat	1	1	1	1	1	1	1	1	1	2	2
12	Respondent 12	Contractor Firm	M	36-45	5_10	Purwokerto	Jawa Tengah	1	1	1	1	2	1	1	1	2	1	2
13	Respondent 13	Researcher/ Academia	F	25-35	5_10	Bandung	Jawa Barat	1	1	1	1	1	1	1	1	1	1	2
14	Respondent 14	Client/Government	F	36-45	5_10	Batam	Kep. Riau	2	1	1	1	1	1	1	1	1	1	2
15	Respondent 15	Researcher/ Academia	M	36-45	10_15	Kabupaten Bandung	Jawa Barat	1	1	1	1	1	1	1	1	1	2	2
16	Respondent 16	Researcher/ Academia	M	36-45	10_15	Bandar Lampung	Lampung	1	1	1	1	2	1	1	1	1	1	2
17	Respondent 17	Researcher/ Academia	F	25-35	10_15	Kendari	Sulra	1	1	1	1	1	1	1	1	1	2	2
18	Respondent 18	Contractor Firm	F	25-35	10_15	Bandung	Jawa Barat	1	1	1	1	1	1	1	1	1	1	1
19	Respondent 19	Client/Government	F	25-35	5_10	Cirebon	Jawa Barat	1	1	1	1	1	1	1	1	1	1	2
20	Respondent 20	Researcher/ Academia	M	36-45	15_20	Kabupaten Bandung	Jawa Barat	1	1	1	1	1	1	1	1	1	1	2
21	Respondent 21	Client/Government	F	36-45	10_15	Kudus	Jawa Tengah	1	1	2	2	2	1	1	1	1	2	2
22	Respondent 22	Contractor Firm	M	36-45	10_15	Bandung	Jawa Barat	1	1	1	1	1	1	1	1	1	1	2
23	Respondent 23	Contractor Firm	F	36-45	10_15	Bandung	Jawa Barat	1	1	1	1	2	1	1	1	1	2	2
24	Respondent 24	Contractor Firm	M	36-45	5_10	Bandung	Jawa Barat	1	1	1	1	3	1	1	1	1	2	2
25	Respondent 25	Community/ NGO	F	36-45	10_15	Palembang	Sumatera Selatan	1	1	1	1	1	1	1	1	1	2	2
26	Respondent 26	Contractor Firm	F	36-45	10_15	Bandung	Jawa Barat	1	1	1	1	1	1	1	1	1	2	2
27	Respondent 27	Contractor Firm	F	25-35	5_10	Bandung	Jawa Barat	1	1	1	1	1	1	1	1	1	2	2
28	Respondent 28	Contractor Firm	F	36-45	5_10	Jakarta	DKI Jakarta	1	1	1	1	1	1	1	1	1	2	1
29	Respondent 29	Community/ NGO	F	36-45	10_15	Tangerang	Banten	1	1	1	1	1	1	1	1	1	2	1
30	Respondent 30	Contractor Firm	F	25-35	5_10	Bandung	Jawa Barat	1	1	1	1	1	1	1	1	1	1	2
31	Respondent 31	Contractor Firm	M	36-45	10_15	Bandung	Jawa Barat	1	1	1	1	2	1	1	1	2	2	2
32	Respondent 32	Contractor Firm	F	25-35	5_10	Palembang	Sumatera Selatan	1	1	1	1	1	1	1	1	1	2	2
33	Respondent 33	Contractor Firm	M	25-35	5_10	Bandung	Jawa Barat	1	1	1	1	1	1	1	1	1	2	0
34	Respondent 34	Contractor Firm	F	25-35	5_10	Bandung	Jawa Barat	1	1	1	1	1	1	1	1	1	1	1

[illegible]

APPENDIX C: PAST PERFORMANCE EVALUATION FACTORS

- S1. Quality of service
- S2. Business relation
- S3. Manager performance
- C1. Cost control
- T1. Timeliness
- P1. Quality of product
- O1. Safety performance
- O2. Customer satisfaction
- O3. Additional comments
- O4. Sub-contractor performance:
 - ▶ Sub-contracting plan
 - ▶ Business goals
 - ▶ Customer satisfaction of sub-contractor

S1. Quality service

1. Compliance with contract requirements	0	1	2	3	4	5	N/A
2. Accuracy of reports	0	1	2	3	4	5	N/A
3. Effectiveness of personnel	0	1	2	3	4	5	N/A
4. Technical Excellence	0	1	2	3	4	5	N/A

Note of consideration:

- ▶ 0 – Unsatisfactory = Not in compliance and is jeopardizing achievement of contract objectives
 - ▶ 1 – Poor= Major problems have been encountered
 - ▶ 2 - Fair= Some problems have been encountered
 - ▶ 3 - Good= Minor inefficiencies/ errors have been identified
 - ▶ 4 – Excellent= Contractor is in compliance with contract requirements and/or delivers quality products/services
 - ▶ 5 - Outstanding= the contractor has demonstrated an outstanding performance level that justifies adding a point to the score. It is expected that this rating will
-

be used in those rare circumstances when contractor performance clearly exceeds the performance levels described as "Excellent. "

- ▶ N/A= not applicable/no opinion

S2. Business relation

1. Effective management, including subcontracts N/A	0	1	2	3	4	5
2. Reasonable/cooperative behavior N/A	0	1	2	3	4	5
3. Responsive to contract requirements N/A	0	1	2	3	4	5
4. Notification of problems N/A	0	1	2	3	4	5
5. Flexibility N/A	0	1	2	3	4	5
6. Pro-active vs. reactive N/A	0	1	2	3	4	5

Note of consideration:

- ▶ 0-Unsatisfactory= Response to inquiries, technical/ service/ administrative issues is not effective
- ▶ 1-PoorResponse to inquiries, technical/ service/ administrative issues is marginally effective
- ▶ 2-Fair= Response to inquiries, technical/ service/ administrative issues is somewhat effective
- ▶ 3-Good = Response to inquiries, technical/ service/ administrative issues is usually effective
- ▶ 4-Excellent = Response to inquiries, technical/ service/ administrative issues is effective
- ▶ 5-Outstanding = the contractor has demonstrated an outstanding performance level any of the above four categories that justifies adding a point to the score. It is expected that this rating will be used in those rare circumstances when

contractor performance clearly exceeds the performance levels described as "Excellent. "

- ▶ N/A = not applicable/no opinion

S3. Manager performance

1. Leadership	0	1	2	3	4	5	N/A
2. Technical capability	0	1	2	3	4	5	N/A
3. Effective risk management	0	1	2	3	4	5	N/A
4. Professional liability	0	1	2	3	4	5	N/A
5. Notification and response of problems	0	1	2	3	4	5	N/A
6. Communication skill	0	1	2	3	4	5	N/A

Note of consideration:

- ▶ 0-Unsatisfactory = Response to inquiries, technical/ service/ administrative issues is not effective
- ▶ 1-Poor = Response to inquiries, technical/ service/ administrative issues is marginally effective
- ▶ 2-Fair = Response to inquiries, technical/ service/ administrative issues is somewhat effective
- ▶ 3-Good = Response to inquiries, technical/ service/ administrative issues is usually effective
- ▶ 4-Excellent = Response to inquiries, technical/ service/ administrative issues is effective
- ▶ 5-Outstanding = the contractor has demonstrated an outstanding performance level any of the above four categories that justifies adding a point to the score. It is expected that this rating will be used in those rare circumstances when contractor performance clearly exceeds the performance levels described as "Excellent. "
- ▶ N/A = not applicable/no opinion

C1. Cost control

1. Record of forecasting and controlling costs	0	1	2	3	4	5	N/A
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2. Current, accurate and complete billings	0	1	2	3	4	5	N/A
3. Relation of awarded costs to actual	0	1	2	3	4	5	N/A
4. Cost efficiencies	0	1	2	3	4	5	N/A
5. Cost addendum	0. Yes					5. No	

- ▶ 0-Unsatisfactory = Contractor is unable to manage costs effectively
- ▶ 1-Poor= Contractor is having major difficulty managing costs effectively
- ▶ 2-Fair= Contractor is having some problems managing costs effectively
- ▶ 3-Good= Contractor is usually effective in managing costs
- ▶ 4-Excellent= Contractor is effective in managing costs and submits current, accurate, and complete billings
- ▶ 5-Outstanding = the contractor has demonstrated an outstanding performance level any of the above four categories that justifies adding a point to the score. It is expected that this rating will be used in those rare circumstances when contractor performance clearly exceeds the performance levels described as "Excellent. "
- ▶ N/A= not applicable/ no opinion

T1. Timeliness

1. Met interim milestones	0	1	2	3	4	5	N/A
2. Reliability	0	1	2	3	4	5	N/A
3. Responsive to technical direction	0	1	2	3	4	5	N/A
4. Completed on time including wrap-up and contract administration	0	1	2	3	4	5	N/A
5. Met delivery schedules	0	1	2	3	4	5	N/A
6. Liquidated damages assessed	0. Yes 5. No						
7. Time addendum	0. Yes 5. No						

Note of consideration:

- ▶ 0-Unsatisfactory = Contractor delays performance of contract objectives
- ▶ 1-Poor= Contractor is having major difficulty meeting milestones and delivery schedule

- ▶ 2-Fair= Contractor is having some problems meeting milestones and delivery schedule
- ▶ 3-Good= Contractor is usually effective in meeting milestones and delivery schedule
- ▶ 4-Excellent= Contractor is effective in meeting milestones and delivery schedule
- ▶ 5-Outstanding = The contractor has demonstrated an outstanding performance level any of the above four categories that justifies adding a point to the score. It is expected that this rating will be used in those rare circumstances when contractor performance clearly exceeds the performance levels described as "Excellent. "
- ▶ N/A= not applicable/ no opinion

P1. Quality of product

1. Compliance with specification	0	1	2	3	4	5	N/A
2. Accurate and complete product specification	0	1	2	3	4	5	N/A
3. Relation of awarded specification to actual	0	1	2	3	4	5	N/A
4. Low maintenance during maintenance period	0	1	2	3	4	5	N/A
5. High value in operation	0. No		5. Yes				

Note of consideration:

- ▶ 0-Unsatisfactory= Contractor is unable to achieve minimum standard of specification
- ▶ 1-Poor= Contractor is having major difficulty achieving minimum standard of specification
- ▶ 2-Fair= Contractor is having some problems achieving minimum standard of specification
- ▶ 3-Good= Contractor is usually effective in achieving minimum standard of specification
- ▶ 4-Excellent= Contractor is achieve best value of product
- ▶ 5-Outstanding = the contractor has demonstrated an outstanding performance level any of the above four categories that justifies adding a point to the score. It is expected that this rating will be used in those rare circumstances when contractor performance clearly exceeds the performance levels described as "Excellent. "

- ▶ N/A= not applicable/ no opinion

O. Others

O1. Customer satisfaction

1. The contractor is committed to customer satisfaction.

▶ 0 1 2 3 4 5 N/A

2. Would you recommend selection of this firm again?

▶ 0. No 5. Yes

O2. Safety performance

1. Effective safety management 0 1 2 3 4 5 N/A

2. Number of accident

▶ 1. More than 5 2. 4 to 5 2. 4 to 3 3. 1 to 2 1. Zero

IX. Additional comments

- ▶ (Evaluation using content analysis)