OPTIMIZATION OF INDONESIAN CONSTRUCTION SERVICES’ PERFORMANCE USING QUALITY MANAGEMENT SYSTEM

M. Fanshurullah Asa¹, Yusuf Latief², Ismeth S. Abidin³

ABSTRAK

Tujuan penelitian ini adalah untuk mengoptimasi kinerja perusahaan Indonesia dalam bidang jasa konstruksi dengan menggunakan Sistem Manajemen Kualitas (SMK) untuk memperkuat daya saingnya. Penelitian ini memfokuskan pada bagaimana jasa-jasa konstruksi dapat mencapai kinerja yang baik lewat Sistem Kualitas dari titik pandang industri konstruksi. Untuk memperoleh hasil yang baik penelitian, pertanyaan penelitian diformulasikan dan makalah didasarkan pada studi kualitatif dan data empiris dikumpulkan dari AKI, INKINDO, GAPENS dan ahli-ahli di bidang SMK. Analisis statistik dijalankan dan temuan-temuan menunjukkan bahwa untuk mengoptimasikan kinerja jasa konstruksi Indonesia harus melakukan persiapan yang cukup untuk mensinergikan berbagai konsep Manajemen Kualitas yang mana ditentukan oleh 4 faktor yaitu menyediakan pelatihan SMK kepada pegawai, memastikan auditor eksternal fokus pada perbaikan dan nilai tambah kepada proses bisnis, mengubah dari kebiasaan lama ke kebiasaan baru ketika menjalankan aktivitas rutin dalam rangka memenuhi manual bersertifikat dan persyaratan prosedur dan menjalankan kajian manajemen secara periodik untuk menjamin efektivitas SMK.

Keywords: Manajemen Kualitas, kinerja, ISO 9001, TQM

ABSTRACT

The overall objective of this research is to optimise the performance of Indonesian companies in the field of construction services using Quality Management System, in order to strengthen its competitiveness. This research study focuses on how construction services can achieve good performance through Quality Management from a construction industry standpoint. To gain a deeper grasp of the research topic, a fourth research question was formulated and the paper is based on a qualitative study and the empirical data was collected from AKI, INKINDO, GAPENRI and experts on QMS. Statistical analysis was run and the findings show that to optimise the performance of Indonesian construction services should do proper preparation for sinergy of various Quality Management concept which is determined by 4 factors, that is, to provide QMS training to employees, to ensure external auditor focussing on improvement and added value to business process, to transform from old habit to new habit when conducting routine activities in complying certified manual and procedure requirements and to carry out management review periodically in order to ensure the effectiveness of QMS.

Keywords: Quality Management, performance, ISO 9001 and TQM.

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1. INTRODUCTION

The development of modern management at the western countries had been sta Kiwus. Christopher H. and Williams. Trefor P. (2001 Kiwus. Christopher H. and Williams. Trefor P. (2001 broken industry. Since then the quality awareness to develop country becoming more important. In year 1953, Japan introduced the concept of Company Wide Quality Control (CWQC), at that time Japan had also joined to be a member of ISO since year 1952 and actively involve in the ISO organisation since year 1960. International organisation of ISO was established in year 1947 and Geneva is their head office.

Japan implemented modern management since Meiji restoration under the influence of western Europe and United State after World War II (Suryohadiprodjo, S. 1982). Efforts was made by Japan to adopt and evaluate the weakness of SQC which was implemented by western countries and was adjusted against Japan culture which has a group solidarity from Bushido principle through The Union of Japanese Scientist and Engineering and was pioneered by Dr. Kaoru Ishikawa (Hardjosoedarmo, S. 1996) with the involvement of management expert from USA such as Dr. W. Edward Deming & Dr. Josep Juran (Hardjosoedarmo, S. 1996), then quality management approach ala Japan was introduced and known as CWQC.

Historical records showed that TQM and CWQC contributed a lot in preparing and improving quality management system standard ISO 9001, therefore ISO 9001 is one of quality management system which is under the umbrella of TQM (Wiryodiningrat, P. ,1996) and the key point is to provide the basis for continuous improvement (Wiryodiningrat, P. ,1996).

Total Quality Management (TQM) defined as an operational philosophy developed from a set of basic management principles (McIntyre, C. and Kirschenman, M., 2000) and techniques can be applied to improve construction processes. Potentially, TQM offers techniques that can reduce construction problems, lower costs, and reduce delays in project completion (Kiwus, C.H. and Williams. T.P. 2001).

The concept of ISO 9001:2000 is a process approach (Badan Standarisasi Nasional, 2001)(Standards Australia, 2000). Quality management system Model with process approach describes process relationship which is explained in the clause 4, 5, 6 ,7 and 8 in the international standard ISO 9001:2000 where contents quality management system requirements. ISO 9001 can be implemented in the organisation internally or for certification purpose with the contractual basis. ISO 9001 focuses on the effectiveness of quality management system to meet customer requirements (Marash. S.A      ).

Today many people associate quality with ISO 9000. ISO 9000:2000 quality system standards serve as a subset of TQM overall requirements. ISO 9000 requires of an organization to define and document the way it does business, and compliance can provide the basic quality system structure that can be improved further. ISO 9000 is a starting point on a journey to a world-class quality system and certification to these standards can be an excellent starting point for TQM implementation.
2. METHODOLOGY

The purpose of research is to analyse the optimazation of construction services’ performance when implementing QMS.

In this research, quantitative method is used for collecting and analysing questionnaires and secondary data from construction companies who have implemented quality management system more than 3 years.

Based on the research purpose explained above, hypothesis was developed to determine the model and questionnaire.

Statistical analysis to test hypothesis use SPSS program version 16 to obtain t-test, Anova test, (R) test, correlation, factor analysis and linear regression which was conducted in this research. Furthermore, the result of statistical analysis will bring to key findings and conclusion of this research.

The empirical studies are limited to construction organizations. However, almost all the companies are certified to ISO 9001:2000.

Respondents were only limited to big qualification contractor and consultant from Gapenri, AKI and Inkindo who have implemented QMS and have been certified more than 3 years by accredited certification body.

It’s about 200 questionnaires were distributed to construction service’s companies who are member of construction and consultant association such as AKI, GAPENRI, INKINDO and selected experts on QMS until 10 July 2008, only 40 companies who have filled and returned the questionnaire back to the researcher. There are 169 variables which are divided into 4 groups to answer four research questions that are as follows:

1. WHY implementing quality management system in construction service (25 variables).
2. WHAT kind of QMS is implemented in Indonesian construction services (29 variables).
3. HOW are benefits and weaknesses in implementing QMS (66 variables)
4. HOW is optimazation type of QMS to increase the performance of Indonesian construction services (23 variables)

Statistical Analysis using SPSS software version 16 is run to answer the above four research questions based on the following steps:
- Compile incoming data from respondent in the form of tabulation based on number of sample and variable.
- Prepare 4 group of data which is in line with 4 research questions.
- Calculate the correlation among variables and use the variable which has significant level 0,05% (one star) or 0,01% (two star) based on SPSS table.
- Determine the performance ((Yn) which is taken from one of existing variable based on literature study and input from expert of this research.
- Confirm the calculation results of correlation meeting the requirement and use them to perform a factor analysis with condition that factor group is taken when its eigenvalue is more than and equal to 1
- When a factor group meets the above requirement, then the model will be more representative having more than and equal to m independent variable.
- When the calculation of factor
analysis meet the above requirement, then the regression analysis can be calculated.

- Regression analysis is considered feasible when Adjusted R square is more than 0.5 or close to 1
- When Adjusted R Square is less than or equal to 0.5 then iteration must be done as many as possible until the result show \( R > 0.5 \) or close to 1
- When the above point meets the requirement, then model or regression equation can be obtained.

Questionnaires were disseminated to about 30 people who are expert on quality management and returned to researcher only 12 questionnaires which have been validated by experts. There are two kinds of feedback, first experts agreed to design of questionnaire proposed by researcher, and second experts give inputs on minor correction against content and variable writing.

3. RESULTS AND DISCUSSION

Based on questionnaire results were found a significant 23 variable data and the results of statistical analysis are as follows:

3.1. Correlation analysis

There are 23 variables which was analysed and found correlation among variables where 14 independent variables related to performance were making sinergy of QMS which represent other independent variables. the model and correlation analysis was made.

The description of the above variables is explained in the table 1.

3.2. Factor analysis

Factor analysis was conducted against calculated 14 variables which have correlation to performance and grouped to be 3 group factors (result of statistical analysis). First factor is business improvement, second is continual improvement and third factor is cost of quality. Furthermore, variable should be determined at each member of group which has an Eigenvalue \( \geq 1 \), that show a significant relationship to certain independent variable. Detailed results of factor analysis are kept on file.

3.3. Model and Regression Equation

From two groups of independent variable factor, only 2 dominant factors which influence optimazation of quality management system (QMS) by developing sinergy among quality management system (\( Y_{Q8} \)), that is, independent variable \( X_{Q12} \) (provide a suitable training to employees regarding the implementation of QMS), \( X_{Q17} \) (ensure external auditor giving an added value to business process system and focus on improvement) and \( X_{Q14} \) (change routine activities and old habit which are not giving direct benefits to business process and follow certified manual and procedures based on ISO 9001), \( X_{Q5} \) (have a management review meeting periodically and focus on whether a QMS is effective, procedures are suitable and still relevant to business). Furthermore, by doing iteration about 19 times to get asignificant R square 0.861 then model or regression equation was presented as shown below:

\[
Y_{(Q8)} = 2.236 + 0.1(X_{(Q12)} \cdot X_{(Q17)})+ 0.052 (X_{(Q14)} \cdot X_{(Q5)})
\]
### Tabel 1. Correlation Among Variables

<table>
<thead>
<tr>
<th>Variable</th>
<th>Description</th>
<th>Remark</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>Y (Q0) = Integrated QMS</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Q2</td>
<td>Develop a risk based audit program for all activities of construction services.</td>
<td>**</td>
<td>0.477</td>
</tr>
<tr>
<td>Q3</td>
<td>Conduct an internal audit consistently according to audit program &amp; schedule and use process approach as checking media.</td>
<td>**</td>
<td>0.513</td>
</tr>
<tr>
<td>Q4</td>
<td>Ensure all internal audit findings are taken corrective action according to agreed schedule and search for the root cause of audit findings.</td>
<td>*</td>
<td>0.488</td>
</tr>
<tr>
<td>Q5</td>
<td>Have a management review meeting periodically and focus on whether the QMS is effective, procedures are suitable and still relevant to business.</td>
<td>**</td>
<td>0.383</td>
</tr>
<tr>
<td>Q6</td>
<td>Perform construction services activities according to approved procedures and supported by qualified worker and proper construction equipment.</td>
<td>*</td>
<td>0.368</td>
</tr>
<tr>
<td>Q10</td>
<td>Provide a comprehensive project quality management plan for all existing project.</td>
<td>**</td>
<td>0.515</td>
</tr>
<tr>
<td>Q11</td>
<td>Require all subcontractor implementing QMS based on their own business</td>
<td>**</td>
<td>0.508</td>
</tr>
<tr>
<td>Q12</td>
<td>Provide a suitable training to employees regarding the implementation of QMS.</td>
<td>*</td>
<td>0.359</td>
</tr>
<tr>
<td>Q14</td>
<td>Change routine activities and old habit which are not giving direct benefits to business process and follow certified manual and procedures based on ISO 9001.</td>
<td>*</td>
<td>0.379</td>
</tr>
<tr>
<td>Q15</td>
<td>Do simplicity process and cut the beaurocracy and still focus on complying customer requirements.</td>
<td>**</td>
<td>0.509</td>
</tr>
<tr>
<td>Q16</td>
<td>Ensure internal auditor giving an added value to business process system and focus on improvement.</td>
<td>**</td>
<td>0.558</td>
</tr>
<tr>
<td>Q17</td>
<td>Ensure external auditor giving an added value to business process system and focus on improvement.</td>
<td>**</td>
<td>0.580</td>
</tr>
<tr>
<td>Q18</td>
<td>Implement quality cost concept consistently.</td>
<td>**</td>
<td>0.472</td>
</tr>
<tr>
<td>Q19</td>
<td>Report quality cost regularly related to cost of internal and external failure.</td>
<td>**</td>
<td>0.512</td>
</tr>
</tbody>
</table>

Legend: * ..........0,05 % Significant level  
** ..........00,1 % Significant Level

This equation describes that optimization of quality management system for Indonesian companies of construction services should be able increased by developing sinergy among existing QMS through putting a serious attention on conduct of training, conducting a regular audit, demonstrating a strong commitment to change for systemic quality culture and performing a consistent management review meeting. This is in line with TQM and QMS approach, that is, Plan-Do-Check-Act using improvement cycle.
of QMS. Audit – Corrective action – management review - Action

4. CONCLUSION
Optimization of quality management system (QMS) by developing synergy among quality management system \(Y_{Q8}\) is strongly determined by 4 factors that is \(X_{Q12}\) (provide a suitable training to employees regarding the implementation of QMS ), \(X_{Q17}\) (ensure external auditor giving an added value to business process system and focus on improvement) and \(X_{Q14}\) (change routine activities and old habit which are not giving direct benefits to business process and follow certified manual and procedures based on ISO 9001), \(X_{Q5}\) (have a management review meeting periodically and focus on whether a QMS is effective, procedures are suitable and still relevant to business).

Model or regression equation was found as follows:
\[
Y_{(Q8)} = 2.236 + 0.1(X_{Q12} \cdot X_{Q17}) + 0.052 (X_{Q14} \cdot X_{Q5}) \text{ for } R^2 = 0.861
\]

where:
- \(Y_{(Q8)}\) = Sinergy among QMS model
- \(X_{Q12}\) = Training for employees
- \(X_{Q17}\) = Conduct of regular audit
- \(X_{Q14}\) = Quality Culture
- \(X_{Q5}\) = Conduct of management review

REFERENCES
Badan Standarisasi Nasional (2001), Sistem Manajemen Mutu – Persyaratan, Standar Nasional Indonesia (SNI 19-9001-2001, ICS 03.120.10 hal .vi-vii
Chatab, N. (2007), Diagnostic Management (R2), Serambi
Ishikawa. K. (1985), What is Total Quality Control (The Japanese Way), Prentice Hall, Inc, USA, pp. 16
Marash, S. A ( ), A Process Approach to ISO 9001:2000, Adhering to A Specific Process Approach is Essential to Success
Wiryodiningrat, P. et. al ( 1997), ISO 9000 Untuk Kontraktor, Gramedia Jakarta

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