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RESEARCH AREA: Project Management

Reappraisal of JKR Quality Management System to Effectively Improve the Quality of JKR Projects

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Presentation Outline

- Introduction
- Problem Statement
- Aims & Objectives of Study
- Scope & Limitation of Study
- Research Methodology
- Literature Reviews
- Results & Findings
- Discussion
- Conclusion

Introduction

- In July 1996, KSN had instructed all Government departments to obtain ISO 9001 certification.
- JKR had implemented an ISO 9000-based quality management system (QMS) since January 1999.
- JKR had obtained the MS ISO 9001 certification in June 2000.
- QMS implementation is mandatory for all projects with contract cost of more than RM500K.

Problem Statement

- There was a substantial gap between expected benefits of the certification and what has been achieved.
- Quality of products delivered are perceived as far from meeting the clients' expectation and satisfaction.
- Staffs complaint that the QMS is too much paper-driven and less emphasis was given on quality improvement.
- Staff also complaint that QMS is too rigid and restrict their creativity in producing quality products.

Aims and Objectives of Study

- Overall aim is to reappraise the implementation of JKR QMS in order to effectively improve the quality of projects delivered.
- The objectives of the study are:
  - To investigate current implementation of QMS in JKR projects.
  - To identify factors that impede the successful implementation of QMS in JKR projects.
  - To propose strategy to improve the effectiveness of QMS implementation in JKR projects.

Scope & Limitation of Study

- Due to time constraint, scope of study was limited to:
  - Implementation during construction phase
  - Quality management at project sites
  - Data collected from projects implemented in Peninsular Malaysia

Research Methodology

Research design

- Aims & objectives
- Scope & limitation

Literature review

- Journal, papers, proceedings, books
- Perceived/potential critical success factors

Exploratory interviews

- Interviews with expert panel to determine current extent of practice, identify implementation problems and evaluate expectation.

Research Methodology

Document search

- Management Review meeting report, internal quality audit reports, customer satisfaction survey, QMS training program & non-conforming reports.

Problem identification

- Comparison between current practice with best practices

Data collection

- Questionnaire survey
  - to review current practice
  - to identify problems that impede effectiveness

Research Methodology

Data analysis

- Interview content analysis
- Frequency analysis, relative important index analysis & correlation analysis

Strategy development

- Propose implementation strategy (implementation model/process flow based on PDCA)
- Validation by expert panel

Literature Reviews

Definition of quality:

- A degree of excellence, goodness or worth.
- Conformance to requirements (Crosby, 1984).
- Fitness for purpose (Juran & Gryna, 1980).
- Customer satisfaction (Juran & Gryna, 1993).
- Degree to which a set of inherent characteristics fulfils requirements (International Organisation for Standard, (ISO), 2005).

Literature Reviews

Quality Management System (QMS)

- Quality management is the process of identifying and administering the activities needed to achieve the quality objective of an organisation (Juran and Gryna, 1993).
- QMS is a system to direct and control an organisation with regard to quality (ISO, 2005).

Literature Reviews

Quality Management System (QMS)

- ISO QMS model (ISO 9000) is built on eight quality management principles:
  1) Customer focus
  2) Leadership
  3) Involvement of people
  4) Process approach
  5) System approach to management
  6) Continual improvement
  7) Factual approach to decision making
  8) Mutual beneficial supplier relationship.

Literature Reviews

Implementation of QMS in Construction Projects

- Construction industry can be considered slow in responding to customer needs.
- Contractors and consultants should have an appropriate framework to control construction processes to ensure customer satisfaction.
- In 1999, CIDB Singapore had make it mandatory for G6 to G8 contractors and consultants eying for public projects to be certified to ISO 9001.

Literature Reviews

Implementation of QMS in Construction Projects

- In 2010, there were 12,672 contractors registered with Pusat Khidmat Kontraktor under Class A to Class E.
- However there were only 150 contractors certified to ISO 9001/MS ISO 9001, and only eight were registered under the scope of “General construction of buildings and civil engineering works” (Malaysian Certified, 2010).

Literature Reviews

Benefits of QMS in Construction Projects

- If well implemented, ISO 9001 certification can result in greater efficiencies, cost reductions, and improved productivity, which leads to quality improvement and customer satisfaction (Curkovic and Pagell, 1999).
- Reworks & building defects can be reduced by implementing ISO 9001-based QMS (Low and Wee, 2001).

Literature Reviews

QMS Implementation Success Factors

- Main success factors, according to ranking, (Mohamad, 2006); 1) Top management participation, 2) Recognition or award on achievement in quality, 3) Implementation of internal quality audit, 4) Monitoring on implementation by top management, 5) Education and training, 6) Teamwork, 7) Work planning and communication, and 8) Shared vision.

Literature Reviews

QMS Implementation Success Factors

- Mohamad (2006) lists problems and success factors based on his study on implementation of ISO 9001-based quality system in Malaysian construction industry. They are as follow:
  - Additional work procedures
  - Documentation requires additional time
  - Increase in documentation workload
  - Unnecessary documentation

Literature Reviews

QMS Implementation Success Factors

- An organisation will reap the benefits of certification if the reason for certification mainly in order to improve internal procedures, and much less to satisfy market demand and pressure (Gotzamani & Tsiotras, 2002).

Literature Reviews

Quality Issues Faced by JKR

- Quality of JKR projects perceived as far from meeting clients' expectation and satisfaction.
- The percentage of projects managed to score 70% for CSI, were 93% (2007), 98% (2008) and 96% (2009).
- The percentage of projects managed to get customer complaints of not more than ten, were 94% (2007), 94% (2008) and 97% (2009).
- CFSB Acceptance Criteria; only 78% of completed building projects in 2009 managed to score Level A or B.

Literature Reviews

Quality Issues Faced by JKR

- Project failures, although not included in JKR quality performance measurement, do reflect the quality of JKR projects.

Literature Reviews

Struktur bumbung runap dalam masa 10 saat

Stadium baru setahun diguna sudah runtuh

Literature Reviews

Literature Reviews

Research Instruments

1. Semi-structured Interview

- Sixteen personnel were interviewed:
  - Five IQA Lead Auditors
  - Three Head of Quality Section (Quality Manager)
  - Four Senior Project Managers
  - Four District Engineers (senior project manager at district level)

Research Instruments

2. Questionnaire Survey

- A total 157 usable responses were received, constituted a response rate of 58%.
- 79% respondents are from JKR and 21% from contractor/consultant.
- Comprised of 49% professional, 11% sub-professional, and 40% support staff.
- Level of experience – 36% below 5 years, 20% between 5 to 10 years and 44% above 10 years.

Results & Findings

1. Current QMS Practice compared to "best practices"

Table 1: Ranking for Current QMS Practice compared to "best practices"

Item Code	Items	Average Index	Rank
B.3	QMS is required to ensure quality.	4.29	1
B.1	QMS implemented in all projects.	4.20	2
B.5	QMS effectiveness is assessed regularly.	3.89	3
B.6	Issues are recorded & maintained.	3.83	4
B.7	Implementation issue escalated & mitigated.	3.73	5
B.4	Leaders lead QMS implementation.	3.73	6
B.2	Voluntary implementation of QMS.	2.38	7

1. Current QMS Practice compared to "best practices"

Findings from Expert Panel & Document Search

- Project team aware of QMS importance, but believed it was limited to ISO 9001 certification.
- No assessment of QMS effectiveness was conducted, assessments made were limited to closing non-conforming reports (NCR) issued during internal and external quality audits.
- Leaders did not lead the QMS implementation.
- Project teams did not implement QMS voluntarily.

2. Extent of Practice Related to "Critical Success Factors"

Table 2: Ranking for extent of practice related to "critical success factors"

Item Code	Items	Av. Index	Rank
C.8	Root-causes need to be identified to control quality.	4.20	1
C.7	NCR is an effective tool to control quality.	4.15	2
C.3	Staff level of quality acceptance varied greatly.	3.67	3
C.10	Staffs are clear about their roles & responsibilities.	3.47	4
C.1	Staffs understand & have knowledge about QMS.	3.44	5
C.4	Inspection checklists are easy to understand.	3.41	6
C.2	Staffs have competency in process execution.	3.39	7
C.6	Staffs spent more time on record, neglect quality.	3.39	7
C.9	QMS procedures too rigid & restrict creativity.	3.32	9
C.5	Most of items in checklist are necessary.	3.10	10
C.11	Staffs have positive attitude towards QMS.	2.82	11

2. Extent of Practice Related to “Critical Success Factors”

Findings from Expert Panel & Document Search

- Root cause analysis and corrective action for NCR were not conducted properly.
- Lack of knowledge & understanding to implement QMS.
- Trainings were focus on preparation & maintenance of quality records. Less emphasis given on process effective.
- Staffs’ positive attitude towards QMS perceived as lacking

3. Development of QMS implementation strategy

Table 3: Frequency score for QMS implementation strategy

No	Items	Frequency (%)		
		X	N	Y
D.1	Implementation of QMS is necessary to ensure competitive edge.	4.4	5.7	89.9
D.2	If properly implemented, could achieve customer satisfaction.	2.5	1.9	95.6
D.3	QMS documentation helps to uncover problems in the processes or procedures.	1.9	3.2	94.9
D.4	Should set up dedicated teams to facilitate proper QMS application in projects.	7.6	12.1	80.3
D.5	Team members are committed to implement QMS.	44.0	27.4	28.6
D.6	Regular training is required to improve team members' competency in QMS implementation.	0.6	7.7	91.7
D.7	The trainings provided were effective.	6.4	11.5	82.1
D.8	Successfully implementation in selected project can encourage implementation in other projects.	7.0	12.1	80.9
D.9	Monitoring and controlling of QMS implementation is adequate.	53.5	21.7	24.8
D.10	Progress & achievement made were recognised and rewarded.	54.8	29.9	15.2

Note: X = Disagree, N = Neutral, Y = Agree

Discussion

Review of current implementation of QMS

- Survey respondents highly agreed that QMS need to be implemented to ensure that quality could be achieved. However “voluntary implementation” was ranked the lowest. Mandatory implementation is one of the barriers to successful implementation of QMS (Zeng, 2007).
- Correlation analysis indicated that staffs would implement QMS voluntarily if “dedicated teams is set up to facilitate proper QMS application in projects” and “recognition and rewards are given for progress and achievement made in the implementation”.

Discussion

Review of current implementation of QMS

- Respondent indicated that leaders lead the QMS implementation, however the expert panel believed the opposite. This impeded successful implementation (Crosby, 1980).
- Expert panel believed that the project leaders did not regard QMS is an important quality program. Some of the panel members perceived that the leaders did not believe in ISO 9001-based QMS.
- This should be mitigated because people perform to the standard of their leaders (Crosby, 1980).

Discussion

Extent of practice related to critical success factors

- Survey respondents highly agreed that NCR & root cause analysis is an effective tool to ensure quality.
- Expert panel indicated that closing of NCRs were not conducted properly thus making it not impactful.
- Expert panel perceived that IQA was not use as a tool to evaluate performance and seek opportunity to continuously improve procedures.
- The effectiveness and the completeness of auditing mostly depend on the qualification and experience of auditors (Zajarskas, 2010).

Discussion

Extent of practice related to critical success factors

- Survey respondent indicated that they are moderately competent to execute QMS processes.
- Expert panel believed that project team members did not adequate competency in process execution. Records indicated that they were only trained in preparation and maintenance of quality records.
- As mitigation, training programs should be reviewed and restructured to match roles & responsibilities of different level of personnel.

Discussion

Extent of practice related to critical success factors

- Commitment by the workforce is one of the critical success factors (Muhamad et al., 2003).
- Commitment by project teams will improve if:
  - Dedicated team is set up to facilitate proper QMS application in projects.
  - Recognitions and rewards are given for progress and achievement made in the implementation.

Discussion

Proposed QMS implementation strategy for JKR

- Implementation strategy was developed based findings of this study & other researches reviewed.
- The strategy was modelled against Plan-Do-Check-Act (PDCA) cycle.
- The strategy encompasses top management leadership, people management, education and training, process management, measurement and feedback, continuous improvement, and sustainable implementation.
- It was presented to the JKR expert panel and was validated.

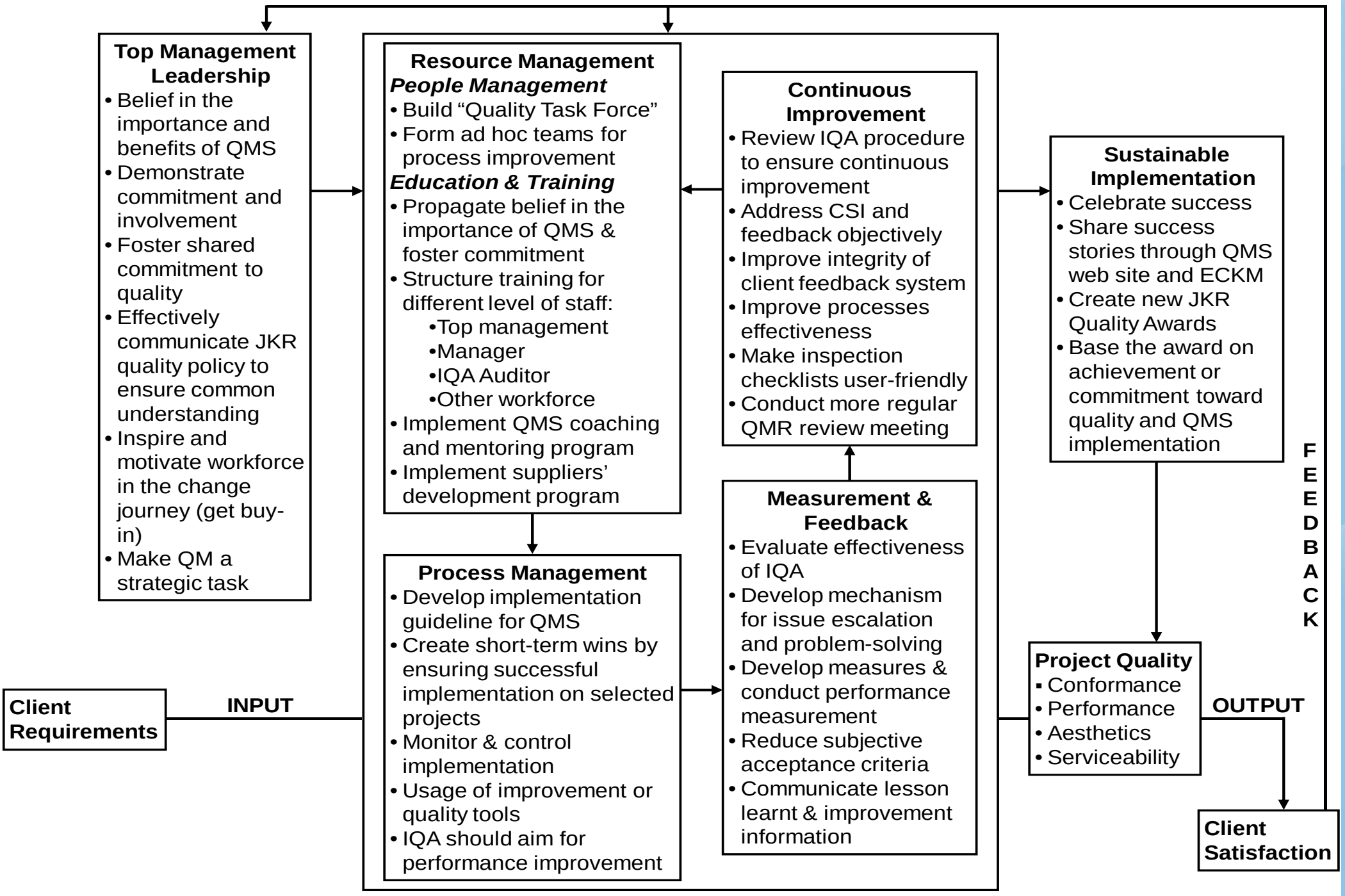

Figure 6.1:Proposed QMS Implementation Strategy for JKR

Conclusion

- The study suggested that there was no significant benefit in the implementation of QMS in JKR projects except process standardisation and better quality record maintenance.
- The survey result indicated that the level of practice compared to critical success factors was moderate.
- Since QMS is a new way of doing work, its implementation should be considered as a change program.
- Successful implementation requires commitment from all level of the workforce, including suppliers.

THANK YOU