



ENABLERS FOR INTEGRATED OPERATIONS DIAGNOSIS AND IMPROVEMENT

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ABSTRACT

In order for organizations to improve their performance, they shall identify their operations opportunities for improvement. The process to identify the opportunities for improvement is referred herein as “diagnosis” process. The most common systematic operations diagnosis and improvement approaches are Quality Audit, Organizational Assessment based on Business Excellence Framework and Project Selection for Lean and Six Sigma. All these three approaches should be integrated in order to grasp the fruitful benefits for the organizations. The benefits include; minimize redundancies, improve the operations performance and eventually assist in achieving certification and award. This paper proposes the enablers for operations diagnosis and improvement based on integration of ISO19011 Quality Audit framework, Business Excellence Framework and Lean Six Sigma approaches.

Keywords: quality audit, business excellence assessment, six sigma, lean, diagnosis and improvement process.

INTRODUCTION

The need to improve operations performance has been a major discussion due to competitive pressure in the industry. In order to achieve a high competitiveness level, organizations must be able to continually improve by identifying the current operations performance and realign their strategies, operations and process to improve the operations performance [1]. Operations have been defined as product realization process in ISO 9001 [2]. According to Slack and Lewis [3], “operations is the activity of managing the resources and processes that produce products and services”.

Currently, the trend of industries adopting Quality Management System standard are increasing with more than one million organizations have certified to ISO9001 [4]. The method to identify the effectiveness and opportunities for improvement in ISO9001 quality management system toward Quality Management System compliance and certification is Quality Audit. On the other hand, Business Excellence Frameworks (BEFs) have received more attention over the past two decades for the organizations to pursue for performance improvement [5]. BEFs are being adopted by at least 94 national Quality/Business Excellence (BE) Awards in 83 countries worldwide [6]. The BEFs utilizes the organisational assessment to identify the improvement opportunities. There are also increasing trend on Six Sigma and Lean improvement approaches [7]. Lean and Six Sigma improvement initiatives utilize Project Selection to identify improvement opportunities such as reduction of operations waste and variation.

Hence, the most common and popular operations diagnosis are: (1) ISO9001 Quality Audit; (2) Organisational Assessment according to Business Excellence Framework (BEF); and (3) Project Selection for Six Sigma and Lean project.

The main objective of this paper is to explain a proposed conceptual framework for operations diagnosis

and improvement that enables the organizations to utilize the integrated approaches to identify the operations effectiveness and opportunities for improvement.

IDENTIFICATION AND SELECTION OF THE ENABLERS

Any improvement initiatives shall have the enabler(s) to ensure successful implementation. Total Quality Management (TQM) and Business Excellence implementation enablers can be utilized to identify the enablers for operations diagnosis and improvement process. TQM enablers can include; Roles of top management, Human Resources Management, Product and service design, Supplier quality management, Process management, and Quality data and reporting [8].

Besides that, ISO9001 [2] adopted the enablers as the requirements and combined the product and service design, supplier quality management and process management into one element which is Product Realization. Other elements of ISO9001 include; Quality Management System, Management Responsibility, Resource Management, and Measurement, Analysis and Improvement.

According to Baldrige Performance Excellence Program 2015-2016 [9], seven critical aspects of managing and performing as an organization are; Leadership; Strategy; Customer; Measurement, Analysis and Knowledge Management; Workforce; Operations, and Results.

Most of TQM, ISO9001 and BE frameworks agree that top management, organization resources, process management, tools and techniques and reporting as the important factor for continual improvement [10]. Hence, focused on the above factors were considered during the identification of the enablers for operations diagnosis and improvement.

Based on TQM and BE frameworks, the enablers for operations improvement diagnosis may include, 1) Top



Management commitments and organization structure, 2) Application of quality tools and techniques, 3) Quality of person who conduct the diagnosis,

The summary of the approaches in diagnostic process and diagnostic process enablers as per Table-1.

Table-1. Enablers for successful operations diagnosis and improvement.

Enablers for successful operations diagnosis and improvement	ISO 19011 [11]	Baldrige performance excellence program [9]	Lean, Six sigma [12] [13] [14]
Operations Diagnosis Process	√	√	X
Top Management / Leadership	X	√	√
Tools and Technique	X	X	√
Person that conduct diagnosis	√	√	X
Results	X	√	√

DISCUSSION ON RELEVANT ENABLERS FOR OPERATIONS DIAGNOSIS AND IMPROVEMENT PROCESS

The integrated operations diagnosis and improvement process is the combination of generic steps in the Quality Audit, BE Assessment and Lean Sigma project selection as shown in figure 1. The main purpose of the process is to identify and propose the operations improvement opportunities.

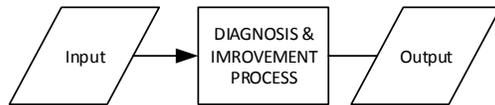


Figure-1. Operations diagnosis and improvement process.

Each enabler should be compatible with operations diagnosis process. Within each of enablers, there are factors that ensure effective implementation of operations diagnosis and improvement process. Hence, preventing the failure of operations diagnosis and improvement process. Based on TQM and Six Sigma integration model [14], [15] and ISO [16] and BE framework [5], the enablers include the 1) Top Management and Leadership, 2) Person that conduct the diagnosis and 3) Tools and Techniques.

Top management and leadership

Each ISO9001 and BE Framework identifies the management responsibility, top management and leadership as the requirements for organization [2], [9]. The top management and leadership is considered as the indicator for management to receive the diagnosis and prescription. The factors include the policy and objectives establishment, provision of resources and review process. However the guideline for diagnosis such ISO 19011 [11] does not cover detailed requirements on top management and organization culture for the organization that provide diagnosis and prescription. In comparison with Baldrige BEF, the organization leadership is defined for the assessed organization. In contrast with Lean and Six

Sigma, the structure of the top management is defined such as role of champion and identify the need to approve and review the improvement process [17] [18].

Person who conduct the diagnosis (Auditor or Assessor)

The ISO framework has extensively established the standard requirements for auditor qualifications and competency [19] [16] [20]. Hence the factors for effective diagnosis can rely on ISO standard. The first part of ISO 19011 [11] published in 2011 focused on the quality of auditor which are auditor principles and auditor competency requirement. The auditor principal was mainly discussed with the argument that the auditor principles will provide credible audit and to make the audit an effective and reliable tool in support of management policies and controls, providing information on which an organization can act to improve its performance. The framework indicated that adherence to auditor principles is a prerequisite for providing audit conclusions that are relevant and sufficient and for enabling auditors working independently from one another to reach similar conclusions in similar circumstances. There are five auditing principles which are: 1) Ethical conducts, 2) Fair presentation to report truthfully and accurately an audit findings, audit conclusions and audit reports reflect truthfully and accurately the audit activities. 3) Due professional care for the application of diligence and judgment in auditing, 4) Independence as the basis for the impartiality of the audit and objectivity of the audit conclusions and 5) Evidence-based approach. Based on Rajendran and Devadasan [16], there were no flaws on these principles and these principles provide the baseline for the quality audit. As part of the independent requirements, the auditor is not allowed to provide suggestions and consultancy in their diagnosis process. This is in contrast with Hepner [21] argument, the study indicated that the organizations audited were pleased if the auditor provide example of corrective actions and suggestions in audit results.



The auditor competency requirements, divided the body of knowledge required by the auditor into: 1) Knowledge on audit program; 2) Knowledge on the audit criteria including applicable legal requirement; 3) Knowledge of audit team leader. This framework compliments with the study conducted by Hepner [21]. The study indicated that an effective audit requires competent auditor with required auditor training. The study was conducted on the food industries in which the continual improvements were initiated through advice from the qualified auditors who had received the training from the authorities alongside industrial experiences.

Tools and techniques

The term “tools and techniques” refer to any tool or technique that can be utilized to make the diagnosis and improvement process simpler and easy to implement. Mohammad [22] has developed a GUIDE model for selecting organisational improvement initiatives. The proposed GUIDE model representing the five key steps to select improvement initiatives are: (1) Goal setting, (2) Understanding relevant improvement initiatives, (3) Identifying decision criteria, (4) Deciding on the appropriate initiatives, and (5) Evaluating the decision. Diagnosis processes are part of step 1 ‘Goal setting’. Step 1 also provide examples of tools and techniques for gap analysis / diagnosis which include organizational assessment based on BEF, benchmarking, SWOT analysis and business performance review.

Even when framework for ISO and Baldrige identify the diagnosis process, there were minimum discussions on what type of tools and techniques should apply for each of the diagnosis process. Several tools and techniques during diagnosis process have been defined in lean such as Value Stream Mapping, Project Charter, Benchmarking etc. In six sigma and lean project selection [16] [30], tools may include statistical and non-statistical especially on decision making process.

ENABLERS INTERACTION FOR SUCCESSFUL OPERATIONS DIAGNOSIS AND IMPROVEMENT

In order to conduct successful operations diagnosis and improvement, the interaction of enablers is proposed in Figure-2.

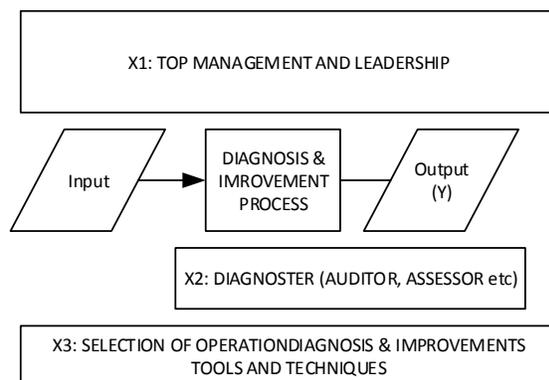


Figure-2. Proposed enablers interaction.

The selection of Y as the response for the process is to measure the performance of operations diagnosis and improvement initiatives. The success and failure of Y (the improvement prescription) depends on the enablers Xs.

The first enabler, enabler X1 (top management) have been widely discussed in prior BE framework [22], Quality Audit framework [16] and Lean Sigma project selection [13]. However the prior frameworks does not discussed in detail how the organization top management should be ready to initiate the diagnosis process and receive the improvement prescriptions. Hence the interaction of Top Management and Leadership with the operations diagnosis and other enablers such as selection of diagnoser, selection of tools and techniques play important roles in successful implementation of operations diagnosis and improvement.

The second enabler, diagnoser (X2) require to select operations diagnosis and improvement tools and techniques (Enabler X3) during operations diagnosis process. Diagnoser can utilize the GUIDE model [22] to provide operations improvement prescription. Even though the GUIDE model focused on BE Assessment, the diagnoser can also use other operations diagnosis including Lean and Six Sigma project selection criteria.

CONCLUSIONS AND FUTURE FOCUS

With more than a million organizations certified to ISO9001 and need to undergo quality audit, the integrated operations diagnosis and improvement framework will provide valuable approaches to identify and prioritize the opportunities for improvement. The integrated approach will also minimize the multiple operations improvement diagnostic practice.

The future research should focus on expanding each of the enablers, including developing the guidelines and procedures for operations diagnosis and improvement process through survey and interviews with the operations improvement practitioners and experts. The integrated approach should be empirically tested in actual application.

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