



Decision Support Tools for Selecting Organisational Improvement Initiatives: a Review

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Abstract

Decision support tools are used in many organisations to support organisational decision making activities. However, very limited studies have been found focussing on the decision support tools for selecting organisational improvement initiatives. Improvement initiatives are approaches, management systems, tools and/or techniques that can be used for managing and improving organisations, such as Lean, ISO9001 and Improvement Team. Four existing decision support tools were reviewed and compared. All four decision support tools consist of decision matrix, rating and ranking to assist in selecting appropriate improvement initiative. Finally, several potential future studies have been proposed.

Keywords: Decision support tool, Selection of organisational improvement initiatives, Total Quality Management, Business Excellence

1. Introduction

To remain relevant in current uncertain and complex environment, organisations need to improve their performance in order to meet the purpose of their existence, and to satisfy and exceed the expectations of customers, employees, shareholders, supply chain partners, community and other stakeholders. In order to improve organisational performance, many organisations need guidance on how to select appropriate improvement initiatives. 'Improvement initiatives' refers herein to approaches, management systems, tools and/or techniques that can be used for managing improving organisation and include, for example: Six Sigma, Lean, ISO9001, Business Continuity Management, and Environmental Management System [1-3].

Unfortunately, numerous organisations are facing problems in selecting appropriate improvement initiatives due to more than one thousand improvement initiatives currently available in the market. Even more challenging is that the number of improvement initiatives increases every year, which makes it even harder to select the most appropriate initiative [4-6].

The adoption of initiatives requires time, resources, financial and knowledge. To avoid unnecessary waste and frustration, it would be better for people to select the appropriate improvement initiative that will fit with organisation's context and provide value to the organisation [1][7]. To address this issue, it is important to conduct further studies on the decision support tools for selecting appropriate organisational improvement initiatives.

2. Review of the Existing Decision Support Tools for Selecting Organisational Improvement Initiatives

Table 1 summarises four existing decision support tools for selecting organisational improvement initiatives, which includes Thawesaengskulthai (2007) [7], Wieleman (2011) [8], Mohammad (2012) [1], and Hussein (2014) [9]. Decision support tools developed by Thawesaengskulthai (2007) [7], Wieleman (2011) [8], and Mohammad (2012) [1] were part of the steps in overall guidance model for selecting organisational improvement initiatives and used Microsoft Excel. In contrast, Hussein (2014) [9] developed a web based decision support tool using Dreamweaver and PHP software.

Table 1: Brief description of several decision support tools for selecting organisational improvement initiatives.

Author (Year)	Platform	Description
saengskulthai (2007) [7]	Microsoft Excel	<ul style="list-style-type: none"> • Decision support tool is part of the steps in overall improvement initiatives selection framework. • Decision making technique: Simple Additive Weighing (SAW). • Improvement initiatives listed: 4 initiatives (TQM, Lean, ISO, Six Sigma). • Decision criteria: Strategic fit, pay-off, organisation fit and fashion. • Main contents / elements: <ul style="list-style-type: none"> ○ List of 4 improvement initiatives ○ Complete decision matrix for the selection of organisational improvement initiatives. ○ Graphical representation of the decision rating and ranking • One of the outcomes from case studies conducted in Thailand.
Wieleman (2011) [8]	Microsoft Excel	<ul style="list-style-type: none"> • Decision support tool is part of the steps in overall framework for selecting business improvement initiatives. • Decision making technique: Weighted Product Model (WPM). • Improvement initiatives listed: 5 initiatives (Total Quality Management, Lean, Six Sigma, Business Process Reengineering and Business Process Management). • Decision criteria: Project Goals, Expected Pay-Off and Popularity. • Main contents / elements: <ul style="list-style-type: none"> ○ List of 5 improvement initiatives ○ Complete decision matrix for the selection of organisational improvement initiatives. ○ Graphical representation of the decision rating and ranking • One of the outcomes from interviews conducted in Netherlands and India.
Mohammad (2012) [1]	Microsoft Excel	<ul style="list-style-type: none"> • Decision support tool is part of the steps in overall guidance model for selecting organisational improvement initiatives. • Decision making technique: Simple Additive Weighting (SAW). • Improvement initiatives listed: 30 improvement initiatives. • Decision criteria: Feasibility, Organisation Fit, Value / Benefit. • Main contents / elements: <ul style="list-style-type: none"> ○ Identify areas for improvement based on enablers of two Business Excellence Frameworks ○ Identify and shortlist three relevant organisational improvement initiatives (users can refer to the description of 30 improvement initiatives) ○ Complete decision matrix for the selection of organisational improvement initiatives. ○ Decision rating and ranking • One of the outcomes from a global exploratory survey, expert interviews and evaluation survey conducted in New Zealand, Malaysia and Singapore.
Hussein (2014) [9]	Web	<ul style="list-style-type: none"> • A computer aided decision support tool was developed using Dreamweaver and PHP software. The contents mainly based on study conducted by Mohammad (2012). • Decision making technique: Simple Additive Weighing (SAW) • Improvement initiatives listed: 45 improvement initiatives. • Decision criteria: Feasibility, Organisation Fit, Value / Benefit • Main contents / elements: <ul style="list-style-type: none"> ○ Identify areas for improvement based on enablers of Malaysia Business Excellence Framework ○ Identify and shortlist three relevant organisational improvement initiatives (users can refer to the description of 45 improvement initiatives). ○ Decision matrix for the selection of organisational improvement initiatives. ○ Graphical representation of the decision rating and ranking • One of the outcomes from a survey conducted in Malaysia.

Thawesaengkulthai (2007) [7], Mohammad (2012) [1], and Hussein (2014) [9] used Simple Additive Weighing (SAW) technique for the selection of improvement initiatives. SAW technique is perhaps the most commonly used and well known method, particularly in single dimensional cases [10-11]. The SAW method is also known as Weighted Sum Model (WSM) [7]. Meanwhile, Wieleman (2011) [8] uses Product Model (WPM) for decision making process. The WPM can be used in single and multi-dimensional decision-making problems [8].

Thaweseangkulthai (2007) [7] and Wieleman (2011) [8] listed four and five improvement initiatives in the decision support tools. Mohammad (2012) [1] and Hussein (2014) [9] provided 30 and 45 initiatives so that the users can shortlist three most relevant initiatives according to the area for improvement. The area for improvement is based on enablers of Business Excellence Framework (BEF). BEF can be considered as a Total Quality Management (TQM) framework [12-13]. BEF can be described as a non-prescriptive organisational framework based on several main criteria that can be categorised as 'enabler' and 'result' [14][2]. Areas for improvement in Mohammad (2012) [1] were based on integration of 2011-2012 Baldrige Criteria for Performance Excellence [15] and the 2010 EFQM Excellence Model [16]. The areas for improvement includes: (1) Leadership and social responsibilities, (2) Strategy, (3) Customer focus, (4) Process management, (5) Workforce focus and (6) Partnership and resources. Hussein

(2014) [9] derived areas for improvement based on Malaysia Business Excellence Framework [17], which covers Leadership, People, Customer, Process, Planning and Information.

Decision support tool developed by Thaweseangkulthai (2007) [7] consist of four main decision criteria: (1) strategic fit, (2) pay-off, (3) organisation fit and (3) fashion / popularity. Wieleman (2011) [8] adopted three main decision criteria: (1) Project goals, (2) Expected pay-off and (3) Popularity. Meanwhile, Hussein (2014) [9] used the same main criteria as Mohammad (2012), which includes: (1) Feasibility, (2) Organisation fit, and (3) Value / benefit.

The four existing decision support tools were developed based on case studies, surveys and/or interviews conducted in Thailand, Netherlands, India, New Zealand, Malaysia and/or Singapore.

All the decision support tools have a decision matrix to assist in selecting appropriate improvement initiative. The decision matrix consists of decision criteria and/or sub-criteria, several shortlisted improvement initiatives for selection, weightage of criteria, score for each initiative, calculation of weighted score, and/or overall weighted score for the shortlisted improvement initiatives.

Users are required to provide input or click onto values at several areas in the decision matrix to allow the automatic calculation of the weighted score and overall weighted score for the shortlisted

improvement initiatives. All the decision support tools provided decision rating and ranking.

3. Conclusions and Suggestion for Future Research

Four existing decision support tools have been reviewed and compared. All four decision support tools consist of decision matrix, rating and ranking to assist in selecting appropriate improvement initiative. The decision support tools will help organisations to select appropriate improvement initiative that will fit with organisation's context and provide value to the organisation.

Unfortunately, the existing decision support tools have limited accessibility and compatibility. Thawesaengkulthai (2007) [7], Wieleman (2010) [8], and Mohammad (2012) [1] used Microsoft Excel, which sometimes has compatibility issues when using other versions of the program. Although Hussein (2014) [9] had developed a web-based decision support tool, it has some compatibility issues if used in mobile devices. In the future, the decision support tools are expected to be accessed and compatible with various platforms of devices, including desktop, laptop, tablet and smart phones.

Data accuracy and security of the decision support tool can be improved further. Artificial intelligence can be embedded in the decision support tools. Furthermore, the performance of decision support tools should be enhanced in term of easy-to-use and effectiveness.

Mohammad (2012) [1] and Hussein (2014) [9] had included the identification of areas for improvement before completing the decision matrix for the selection of initiative. However, the areas for improvement were based on previous version of BEFs. Further research should be carried out using current version of BEFs, such as 2017-2018 Baldrige Excellence Framework [18] and the 2013 EFQM Excellence Model [19].

It is also found that none of the existing decision support tools explicitly provide comprehensive organisational assessment or diagnosis to identify area for improvement. Further study should be conducted to integrate organisational assessment or diagnosis with the selection of organisational improvement initiatives.

In addition, more case studies should be conducted on the actual implementation of decision support tools in various types and sizes of organisations worldwide. All these case studies should be recorded and presented as examples of how to use the decision support tools in different situations.

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