



## RESEARCH ARTICLE

## Development of Selection Model for Quality Improvement Initiative

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ARTICLE INFO	ABSTRACT
Received: May 19, 2024	<p>The adoption of strategic improvement initiatives in the organization is tremendously increase especially to retain the competitiveness. Even though the strategic improvement initiative are widely deployed in businesses around the world, the project failure is still frequently reported due to the absence of explicit key decision criteria whereby the decision maker use irrational decision making to select the most appropriate IMI to be adopted. This study aims to fill research gap by investigating the rational selection for IMI adoption based on the phenomena and developing a theory of selection to aid decisions making by bringing all influential criteria together in one model. Based on rigorous SLR steps, 164 publications were used to extract and synthesize the information. The information from the SLR enable development of empirical model for selection of IMI through providing wide angle of selection and provides holistic decision support for decision maker. The quantitative research approach was adopted to ensure generalization of the model with 239 respondents' feedback from various organization which has been adopted the strategic IMI. The Smart PLS was used to analyze and validate the rational selection model. Through validation of the model, there are six selection views with 33 attributes need to be considered by decision maker prior making decision which IMI most suitable to be adopted in their organization. The outcomes of this research enable organization to select the IMI in structured manner through wider selection view and its attribute which is part of the need for organization to manage and carefully select improvement initiative in order to evade the problem of initiative overload and ensure successful implementation.</p>
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## INTRODUCTION

The strategies to attain competitiveness advantages drive the companies to review and re-examine their strategies (such as operational, innovation and strategical marketing) in the global business market [1]. In the case of companies which encompass improvement initiative as part of their activities, competitive advantage can be obtained by creating and adopting the suitable improvement initiative. All companies are currently facing the challenges for their sustainability. Whereby, their survival and growth mainly depend upon the capacity they possess to renew the innovation system; the effectiveness of the improvement process; and the ways in which they create and deliver the offering.

Improving the quality of processes and maintaining acceptable levels of performance quality are critical factors in

the success of any organization and remain competitiveness. Over the past thirty or so years there have been waves of interest and application of several seemingly different approaches beginning with the Total Quality Management (TQM) “revolution of the 1970’s and 80’s and including Six Sigma, BPR, Lean, etc. The success, profitability and overall competitiveness of a manufacturing organization are closely attributed to the effectiveness of its operations [2].

## **LITERATURE REVIEW**

### ***Selection Dilemma***

Two authors [3] and [4] in their finding summarize several issues on the improvement activities by the organization in order to enhance their performance. The researcher found that, organization start to aware the important of IMI for sustainability of their business especially with increasing of market competitiveness [5]. However, in managing improvement activities, the main concern is on the management ideas of improvement whereby the numbers of IMI have significantly increased and the pace of development of IMI has advanced rapidly. Compared to the initial introduction of IMI, there are limited number of IMI available to be implemented in organization. However, as of today there are over 700 IMI available to choose by the organization start from the small improvement called as a tool, techniques until strategic improvement initiative such as improvement methodology and continuous improvement.

The chosen of IMI is a critical since it will affect the effectiveness of improvement activity whereby the improvement can be very effective in the right hands and they can be dangerous in the wrong hand. It is very important to know how, when and which methods to be used in improvement activities [6][7]. Eventhough there are over 19000 journal publish on IMI in two prominent index journal which are Web of Science ISI and Scopus, lack of reference for the organization on providing assistance and guidance on how to select the suitable IMI to be adopted based on their requirement [8][9]. Most literature focusing on describing the concept, methodology, and tools of each approach [4] whereby the literature often also providing empirical evidence on strengths, weaknesses, and critical success factors [10][11].

The conventional selection of IMI relies heavily on the skill and experience of those who implementing it. Selection are rarely structured, and the selection criteria are inconsistent and may vary between managers; hence, the adoption of improvement initiatives is based on ambiguous judgments and is prone to follow fashion [4][12]. In order to know the selection practice in Malaysia, the short survey involving well knowledge and experience expert with different background in IMI conducted to get some indicator on IMI selection. Based on answer given, the selection might be varied and align with statement given by [4][9][13] whereby the selection tendency based on the follow fashion or management fads and not structured. This effected the successfulness implementation of IMI whereby a lot of number of organizations adopted IMI over the time however, the failures of the implementation due to poor selection still happened. The failure effected the motivation of organization to implement the IMI since the adoption of these programs consumes a large amount of time and resources as an example General Electric required over RM 53M for implement Six Sigma. Organizations normally face constraints in terms of budget, time, and personnel, and as improvement projects may also disrupt normal operations and standard routines. Thus, the effective and efficient selection and alignment of them with organizational objectives is critical for the success of any improvement initiative adopted.

### ***Rational Selection***

Through reviewing the dilemma for decision maker to select most suitable IMI to be adopted and implication of selection, the rational decision making provide empirical evidence as a proven technique to solve the problem. The adoption of rational selection is important to the decision maker since the incorrect decision resulted irreversible damage to the organization [14]. Rational selection enables the organization to make decision when facing difficult situation to choose which option provide optimal solution or fit to the objective or goals. As the increasing of human authorities and responsibility, decision making through rational selection becomes more imperative [15].

The decision making is more effective through rational selection. [16] in her research mention that the selection through rational manner by looking at the extensive reviewing alternative courses enable virtuous decision to be made compare with decision made in an irrational manner.

Decision maker in diverse situations have tendency to use their experience and knowledge in order to ensure the quality of decision to be taken. The rational decision making can avoid the biased judgement by the decision maker. By extending the view of rational selection, decision maker must be cognitively alert with an increased awareness of structured judgment without decision biases [17][18].

Some judgements are taken so simply without much attention required but on the other hand there are bundle of time required to make decision [15]. In most of the times, due to limitation of time and resources, the decision making does not look at the rational selection which consist of wide view prior to make the decision. Thus, decision maker more than anything else required structured and reliable methods to help them making decision.

## **METHODOLOGY**

This research incorporates two main phases as per indicated in start with comprehensive literature searching through adoption of SLR and to provide a theoretical grounding on selection of improvement initiative. SLR required dedicated protocol which involve structured step to ensure the information extract in literature comprehensively drive and govern the information required by the researcher. However, there are lots of contradiction on number of stages and step adopted for SLR by different researcher [19],[20],[21],[22]. This issue has been addressed by introduction key characteristics of a SLR defined by the Cochrane Collaboration [23]. Through screening the key characteristic of SLR, this research adopted three phases with seven steps for SLR start with proposal preparation, development of protocol, literature searching. quality assessment, screening, data extraction and lastly report writing.

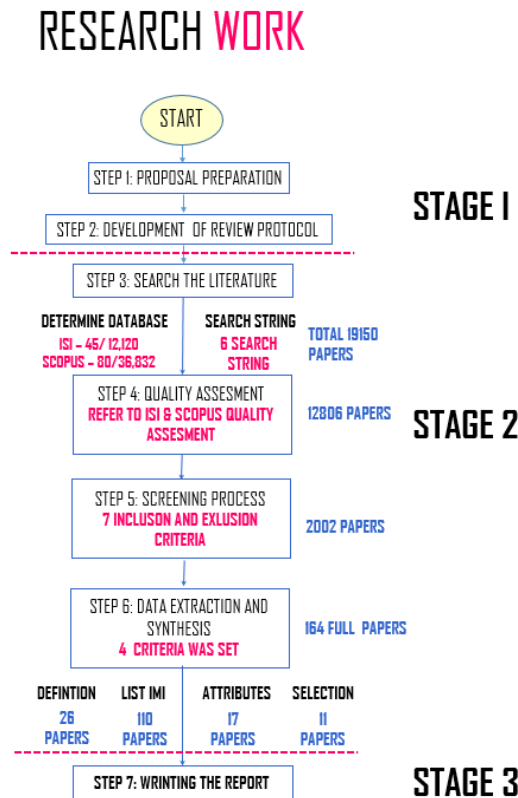
The second phases focusing on the development of the confirmatory model through quantitative research approach. The survey generally will start with development of questionnaire, the verification of questionnaire through expert opinion, pilot study, determination of population and sample size, conducting full survey, data screening and analysis which enable to fulfil the desired outcome. After assured the reliability of the instrument, the questionnaire was then distributed amongst randomize respondent from the population derived from list of source information gathered from sample frame. The initial respondent was 357 based on [24] sampling technique. In order to take into consideration on non-respond issue, the researcher provide two methods to channel the questionnaire to targeted respondents which are hardcopy survey and electronic survey. As the prospect respondents are midst higher level position in their organization, the respondent is first being identified, contacted personally, and get their agreement to participate in this study beforehand. They are also being asked on the preferred way of answering the questionnaire.

The data collect was used to be analyzed by Smart PLS software to analyze the sequential equation model. analysis started with the measurement model for reflective constructs. The reflective measurement model involves internal consistency (Cronbach's alpha and composite reliability), convergent validity (indicator reliability and average variance extracted) and discriminant validity.

## **RESULT**

### ***Systematic Literature Review***

Based on SLR step mention previously, the total number of papers related to the research is 164 papers which almost equivalent one percent from total paper listed in excel database earlier. The summary finding from each SLR step can be referred in figure 1:



**Figure 1: Summary paper finding for SLR**

Based on the 17 papers reviewed, there are total 84 attributes and nine constructs mention in previous research. This information will be used to develop conceptual model for selection of improvement initiative. The more angle of selection provides greater option for decision maker identify suitable improvement initiative to be adopted in their organization. However, through removing the duplication and reviewing each construct and attributes, the final selection view is seven with 35 attributes. This information will be used as conceptual model prior conducting quantitative data analysis for confirmatory model. The list of selection view and attribute can be referred in table 1:

**Table 1: Summary Selection View and Attribute**

SELECTION VIEW	CODE	ATTRIBUTE
Competitive Priorities (CP)	CP1	Duration
	CP2	Improvement Goals
	CP3	Improvement Needs
	CP4	Nature of Problem
Influencer Setting (IS)	IS1	Best Practices
	IS2	Expert Suggestion
	IS3	Knowledge resources
	IS4	New Trends
	IS5	Past Experience
External Factor (EF)	EF1	Competitor Strategies
	EF2	Market Standard

	EF3	Stakeholder Pressure
	EF4	Customer needs
Organization Fit (OF)	OF1	Achievement Possibility
	OF2	Area of Implementation
	OF3	Capabilities
	OF4	Infrastructure
	OF5	Management Support
	OF6	National Culture
	OF7	Organizational Maturity
	OF8	Organization Operation
	OF9	Readiness
	OF10	Availability Resources
Pay Off (PO)	PO1	Company Performance
	PO2	Customer Satisfaction
	PO3	Human Resources
	PO4	Market Performance
	PO5	Organizational Impact
	PO6	Process Improvement
	PO7	Shareholder Benefits
Strategic Fit (SF)	SF1	Company Direction
	SF2	Company Needs
	SF3	Expectation
	SF4	Goals
	SF5	Weakness
Rational Decision (RD)	R1	Important
	R2	Effective Decision Making
	R3	Avoid Biased
	R4	Structured Decision

### **Response Rate and Sample Size**

Based on the feedback from the respondent, 74 out to 357 questionnaires distribute received for method 1 and 165 out of 357 questionnaires distribute received for method 2. This gave a survey response rate of 20.7% for method 1 and 46.2% for method 2 with overall 33.7%. The study conducted by [25] specifically on response rate based on literature in several journals from year 2000

until 2005 found that the range of response rate for individual response is 3% to 91.2% and organization response rate is between 10% to 91%. Thus, this research fulfills the minimum samples size requirements.

### **Structural Equation Model Analysis**

[26] mention that SEM is a multivariate technique that combines aspects of factor analysis and regression, enabling the researcher to simultaneously examine relationships among measured variables and latent variables as well as between latent variables. Research model analysis involved formative and reflective constructs based on PLS-SEM [26]. In this study, SmartPLS software was used to develop the model. The advantages of Smart PLS enable research model with formative measurement. The discussion flow of the model is based on PLS-SEM step by step analysis by [26]. The measurement model which involves the reliability and validity of the constructs and the indicators. These steps involve Confirmatory Factor Analysis (CFA) which was conducted to test the reliability, convergent validity, and discriminant validity of all items in the measurement scale.

Referring to result generated from PLS-SEM, all constructs of achieved the requirement of convergent validity except for Organization Fit whereby the value of AVE is 0.421. According to [26] the final decision of retaining the reflective item is Average Variance Extracted (AVE) value. Thus, to improve value of AVE greater than 0.5, two items should be removed which are OF5 and OF10. Even though some of item with outer loading less than 0.7 such as CP2, EF3, OF3, OF5, OF6, OF7, OF9, OF10, PO1, PO4 and PO5, researcher could retain the item with less than 0.7 if the AVE achieved 0.5. Beside convergent validity, the Internal Consistency Reliability should be considered to retain the item in the model. In the study, all constructs achieved acceptable value for internal consistency and reliability.

**Table 2: Result for Internal Consistency Reliability and Convergent Validity**

Selection View	Item	Convergent Validity		Internal Consistency Reliability	
		LOADING (>0.7)	AVE (>0.5)	CR (>0.6)	CA (>0.7)
CP	CP1	0.7667	0.582	0.847	0.759
	CP2	0.6607			
	CP3	0.8368			
	CP4	0.7757			
IS	IS1	0.8541	0.664	0.908	0.873
	IS2	0.7757			
	IS3	0.7249			
	IS4	0.8675			
	IS5	0.8424			
EF	EF1	0.7346	0.637	0.874	0.824
	EF2	0.9253			
	EF3	0.7061			
	EF4	0.8090			
OF	OF1	0.7251	0.421	0.870	0.842
	OF2	0.6665			
	OF3	0.7331			
	OF4	0.6523			

	OF5	0.2478			
	OF6	0.6853			
	OF7	0.7392			
	OF8	0.2991			
	OF9	0.6994			
	OF10	0.7873			
PO	PO1	0.6570	0.527	0.885	0.847
	PO2	0.7410			
	PO3	0.8361			
	PO4	0.6482			
	PO5	0.6409			
	PO6	0.7063			
	PO7	0.8232			
SF	SF1	0.8618	0.604	0.883	0.838
	SF2	0.7490			
	SF3	0.6882			
	SF4	0.8399			
	SF5	0.7317			
RD	RD1	0.8358	0.781	0.934	0.906
	RD2	0.9075			
	RD3	0.9273			
	RD4	0.8605			

The next step of analysis is proceeded with assessing discriminant validity using table propose by [27]. Based on Fornell and Larcker's result in Table 3, it is confirmed that the measurement model for reflective constructs has adequate discriminant validity. All off-diagonal elements of SS and SL construct are lower than the square roots of AVE for each construct. Thus, Fornell and Larcker's criterion was met and confirmed that valid measurement model has satisfying discriminant validity.

**Table 3: Fornell and Larcker's table.**

	CP	EF	IS	OF	PO	RD	SF
CP	0.77						
EF	0.23	0.79					
IS	0.16	0.14	0.81				
OF	0.34	0.20	0.11	0.72			
PO	0.53	0.21	0.19	0.48	0.73		
RD	0.57	0.33	0.24	0.52	0.60	0.89	
SF	0.58	0.34	0.13	0.46	0.51	0.63	0.78

The result of Measurement Model using Smart PLS fulfill both criterions required. Thus, the rational selection model can be referred in figure 2 provide comprehensive review for decision maker decide the most suitable IMI to be implemented their organization.

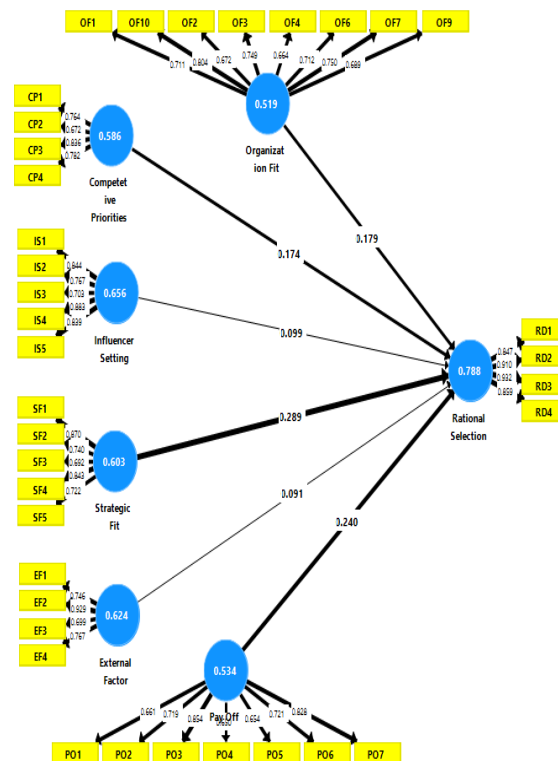


Figure 2: Rational Selection Model for Improvement Initiative

## CONCLUSION

As a conclusion, this empirical study provides rational decision making for selection of IMI by providing wide angle criteria which avoid subjective judgement which lead to the failure of improvement in the organization. The rational selection model enable organization to improve their performance through identify the correct improvement initiative to be adopted. Through comprehensive and systematic literature review, all influential factor able to be identified and this factor was transformed into a respective model. The model was validated through Confirmatory Factor Analysis with help of Smart PLS software. Through the confirmation and validation of the selection model, this model produced an independent process of IMI selection which can avoid bias [28] because it can be used without heavily rely on the experience worker or influence by the popularity of certain IMI.

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