LEAN READINESS INDEX FOR MALAYSIAN HOSPITALS: AN EXPLORATORY STUDY

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ABSTRACT

This paper presents an exploratory study on the development of lean readiness index for Malaysian hospitals. A questionnaire survey were obtained from 118 public hospitals and lean readiness model was developed using structural equation modeling (SEM) and the relevant constructs were identified using confirmatory factor analysis. The Lean Readiness Index (LRI) is formulated and a ruler in associate with the LRI were proposed as to meet the objective of the study. The finding to emerge from this study is that only 10.1% of Malaysian public hospitals have 'good' readiness status. The study also revealed the overall LRI's value is 0.617 and, the majority of the hospitals were categorize as having 'fair' and 'weak' readiness status. The result indicated that training had the strongest association towards lean readiness while communication is the least. This study had revealed the readiness level for lean implementation in Malaysian public hospitals and proposed the required foundation that need to be enhanced before implementing lean.

Keywords: *Lean Healthcare, Lean Readiness Index, Lean Malaysia*

RESEARCH HIGHLIGHTS

The result highlights from the research are as following:

1. Using structural equation modelling (SEM), the final lean readiness model was established which consist of nine constructs with total of 31 measurement items. These items had directly influenced the level of lean readiness in Malaysian hospitals.
 2. The results of SEM and correlation analysis implied that the relationship between hospital organization behavior (HOB) and lean readiness (LR) was high, thus indicates organizational behavior of Malaysian hospitals has strong impact in influencing the level of readiness towards lean implementation.
 3. The study shows only 10.1% of Malaysian hospitals had 'good' lean readiness status. It also found that based on the overall LRI's value of 0.617, the majority of the hospitals were categorized as having 'fair' (49.5%) and 'weak' (32.7%) readiness status.
 4. The result proved lean manufacturing critical success factors were significantly correlated and are applicable in determining lean readiness for hospitals.
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GRAPHICAL ABSTRACT

Fig. 1. The structural model linking the hospital behaviour to its lean readiness

Research Objectives

Recognizing the need to improve its healthcare service delivery, Malaysian government had planned to embark lean healthcare in public hospitals as part of its transformation program (BERNAMA, 2014).

Prior to adopting lean, interested organization is suggested to perform lean readiness self-assessment exercise (Al-Najem et al., 2013; Ramakrishnan and Testani, 2012). This would permit top management teams to take the lead and understand their actual level of readiness before making a commitment to lean transformation. In brief, the purpose of a lean readiness assessment is to analyse the preparedness of the conditions, behaviors and resources need for lean system to happen successfully (Awang et al, 2020).

The aim of this study is to assess the level of readiness for lean implementation within Malaysian public hospitals which lead to the development of a lean readiness model and Lean Readiness Index (LRI). This study then aims to develop a clearer idea of what foundational mechanisms are needed to ensure a successful lean implementation at each identified hospital. The development of LRI is the prime objective of this research as study shows previously there is no formal structure of measurement index on lean readiness exist for hospital applications.

Methodology

The study was conducted through four phases; literature review; structural model development; establish questionnaire; and readiness index development.

The first phase establish the research gap by using systematic literature review (SLR) technique on subjects related to lean readiness, its critical success factors, hospital's organizational behavior and various readiness index measurements. The second part formulated research measurement models using structural equation modelling (SEM) and the research hypotheses while the third phase focused on questionnaire development and data collection. In the fourth phase, based from confirmatory factor analysis (CFA), the final lean readiness model was established and finally the lean readiness index (LRI) is developed.

LRI measures the level of readiness towards lean implementation utilizing constructs and measurement items extracted from the final model. The researcher used weighted sum of the R-squared to establish weighted factor that correlates between all the constructs. Next, developing the Construct Index (CI); an index representing lean readiness level for each contributing construct. The CI is the product of the overall mean score of measurement items belong to a particular construct against its weighted factor. The summation of all contributing construct indexes formed the overall LRI.

Results

In this study, the researcher had determined the casual effect of hospital behavior on lean readiness. The results of SEM and correlation analysis supports the positive argument that the organizational behavior of Malaysian public hospitals has strong impact towards influencing the level of readiness towards lean implementation.

The final model consists of nine constructs with training being the strongest association follows by enterprise alignment, process alignment, leadership, teamwork, engagement, organization culture, customer alignment; and the least on communication. These results also proved that lean manufacturing critical success factors are significantly correlated and applicable in determining lean readiness in hospitals.

Results from this research shows that only 10.1% of Malaysian public hospitals had 'good' readiness status. The research also found that based on the overall LRI's value of 0.617, the majority of the hospitals were categorized as having 'fair' (49.5%) and 'weak' (32.7%) readiness status. Nevertheless, those 'fair' categorized hospital are already in 'ready mode' and should be able to transform themselves into 'good' readiness status with some minor improvement works. On the other hand, only a small percentage (7.7%) of the hospitals having poor readiness status that require major improvements before to start embarking lean.

Findings

This research has developed a model to assess the impact of hospital organizational behavior towards lean readiness, also had assessed the applicability of manufacturing critical success factors in healthcare hospital setting. The results of this research revealed that generally the same factors are applicable to both manufacturing and healthcare in determining the level of readiness. The findings of this study have identified factors influenced lean readiness in Malaysian public hospitals. The implication of LRI enable authority to access lean readiness on each of its hospital, and taken appropriate actions to ensure successful lean implementation.

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Author's Biography

Mazlan Awang, is a quality engineering senior lecturer and the Director of Lean Centre of Excellence at Universiti Kuala Lumpur, Malaysian Institute of Industrial Technology. Besides being the academicians, he also a certified trainer with lean six sigma black belt. Extensively conducted lean healthcare training and consultancy at various private and public hospitals. Focus research interest is on lean management in service industry.