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INTERNAL LEAN PRACTITIONER'S CHALLENGES IN LEAN PRINCIPLES IMPLEMENTATION

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ABSTRACT

The purpose of the work presented in this paper is to uncover the challenges faced by internal lean practitioners and provide recommendations on how to overcome the challenges of implementing lean principles in own organization. The approach to this paper is to answer the questions such as "how does internal management commitment impact the Lean principles?", "how does Supply Chain Management practices impact the lean principles?", "can Supply Chain Management practices be embedded with internal management commitment?" The relationship proposed in the framework was analyzed using Partial Least Square Structural Equation Modeling (PLS-SEM). The key findings of this paper has shown that higher level of internal management commitment in Supply Chain Management Practices and lean principles implementation is critical in overcoming the challenges faced by internal lean practitioners.

Keywords: supply chain management practices; lean principles; internal management commitment.

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1. INTRODUCTION

Today, there are many company have attempted to implement lean principles with the hope to

improve performance and deliver business result. Majority of these lean principles implementation focused on the implementation in a single operation facility or business unit such as manufacturing. Also, several standalone lean tools are applied instead of an integrated system of tools. Therefore, the business results from these companies are not significantly improved and sustained after the implementation of lean principles. This research aims to uncover the challenges faced by internal lean practitioners and provide recommendations on how to overcome the challenges of implementing lean principles in own organization. By conducting extensive literature review and questionnaires from a number of lean practitioners, data will be collected and analyzed using Partial Least Square Structural Equation Modeling (PLS-SEM).

2. METHODOLOGY

2.1. Research Framework

Fig. 1 depicts the research framework developed in this research. The framework proposes that lean principles implementation is directly impacted that by internal management commitment and internal management commitment is one of the key elements of SCM practices.

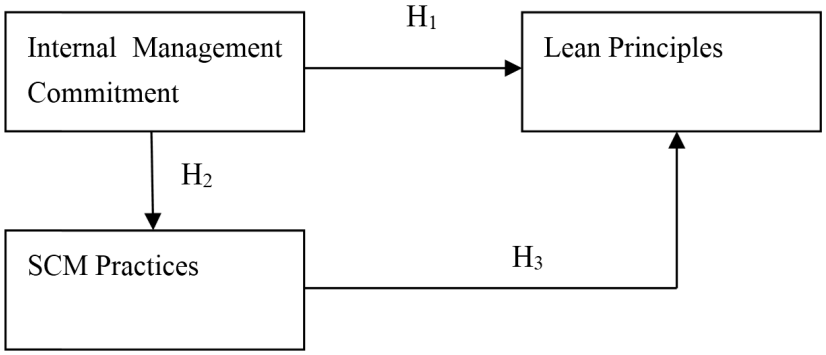

Fig.1. Research framework of internal management commitment, SCM practices and lean principles

Internal management's commitment is referred to the willingness of an organization internal management team to commit in words and actions on specific something [6, 8, 12]. In this research, this is referred to the organization's internal management's commitment to lean principles and SCM practices implementation in words and actions. The internal management of any organization is referred to anyone in the organization who holds the position in management

level (mid-level to most senior level management). Management level in any organization typically has the responsibilities of managing people and other organization resources. In implementing any change management initiatives such as lean principles and SCM practices; these are the group of people in any organization who need to buy in the change effort for it to be successful. This is because any change management initiatives will require the organization's internal management to commit resources to support the initiatives. Most of the lean principles implementation failed to deliver the expected business result due to lack of support and commitment from the organization internal management team. Many organizations rely on a single senior management team member who leads typically the operational excellence department to roll out the lean principles in a large and complex organization. Due to the amount of tasks required to deploy lean principles in the organization, this senior management team member, in turns, delegate the tasks of rolling out lean principles such as training, coaching and facilitating to a few relatively junior level employees. These relatively junior level employees will typically face resistance when trying to influence other management team members and their subordinates to buy in the lean principle initiatives. This is because in order to buy in the lean principle initiatives, other departmental managers will need to divert some of their people to support the lean principles deployment. This may create distraction in their on-going departmental activities. Furthermore, it is unlikely that the relatively junior employees in an organization are having adequate practical experience to drive and coach others in lean principles. This leads to partial or unsustainable business result in the organization which further reinforces others to believe that investing resources in lean principles implementation is not a priority as compare to daily departmental activities.

The hypothesis statements in this research are as follow.

H1: There is a positive significant relationship between internal management's commitment and Lean Principles

H2: There is a positive significant relationship between SCM Practices and Lean Principles

H3: SCM Practices mediates the relationship between internal management's commitment and Lean Principles

2.2. Research Methodology

Research design is critical when organizing research activities, including the collection of data in order to achieve the research objectives [14]. Quantitative research can emphasize the large scale sets of data of the respondents that need to be collected and analyzed numerically as well as enhancing the validity and reliability of the observation [15]. Hence, quantitative research allows data generalization to represent a large population and the research costs could be lower [11]. Instruments are being increasingly designed for online surveys [10]. An online survey tool i.e. Google Form is used in this research. In this research, the SmartPLS 3.0 software is used for analyzing the independent and dependent variables of this study. SmartPLS 3.0 is a user-friendly modeling package for partial least squares analysis is supported by a community of scholars centered at the University of Hamburg (Germany), School of Business under the leadership of Prof. Christian M. Ringle. The variables in partial least squares are known as latent variables. PLS-SEM is also known as composite-based SEM or variance-based SEM.

3. RESULTS AND DISCUSSION

Validity and reliability is important to establish the truthfulness of the constructs the sample intended to measure and that they are representative of the population. To access validity, three types of validity were examined: convergent, discriminant and content validity. Content validity was established based on the content of the corresponding items, it contains expert opinions, literature review and pretesting questionnaires. Convergent validity was established by PLS-SEM in the areas of factor loadings, average variance extracted (AVE) and composite reliability [4, 13]. Addresses convergent validity, which is the extent to which a construct converges in its indicators by explaining the items' variance. Composite reliability is preferred over Cronbach's alpha as a test of convergent validity in a reflective model. Typically, a value of 0.7 is adequate [16]. The composite reliability of internal management, SCM Practices and Lean Principles are 0.70, 0.72 and 0.79 respectively. Average variance extracted (AVE) across all items associated with a particular construct. Typical value of AVE should be greater than 0.5 [3, 5] as well as greater than the cross-loadings, which means factors should explain at least half the variance of their respective indicators. The AVE of internal management, SCM Practices and Lean Principles are 0.50, 0.52 and 0.57 respectively. Discriminant validity was

established by PLS-SEM in the areas of square root of AVE and cross loadings [4, 13]. This analysis reveals to which extent a construct is empirically distinct from other constructs both in terms of how much it correlates with other constructs and how distinctly the indicators represent only this single construct. In a good model, the loadings of each indicator with its latent variable should be greater than 0.7 and its cross-loadings (i.e. correlation) with other indicators associated with the same latent variable should be lower than 0.3. In reflective model, the researcher can use either cross-loadings or AVE or both to assess the discriminant validity of the model. In this research, the analysis of using PLS-SEM consists of 2 stages i.e. stage 1: reflective measurement model assessment and stage 2: structural model assessment. The "consistent PLS algorithm", which is the default PLS modelling approach in SmartPLS 3.0 was used for running the path model in this research. This default setting in SmartPLS use path weighing scheme which maximizes the R^2 of endogenous variables in the model based on regression approach [9] which is the recommended methods by [4, 16]. Since the path coefficients computation in PLS do not assume any known distribution and hence the usual p-value significant levels can be calculated. Hence, it is essential to also run the PLS bootstrapping to compute the bootstrapped significance coefficients.

3.1. Reflective Measurement Model Assessment

In outer model, SmartPLS 3.0 will compute the standardized loadings value for each of the path connecting the indicators and the latent variable. The loadings value measures the absolute contribution of the indicator to the definition of the associated latent variables. In SmartPLS, loadings value can range from 0 to 1 and the larger the values, the stronger and more reliable the measurement model. The loadings itself can be considered as a form of item reliability coefficients for the reflective models i.e. the closer the loadings to 1.0, the more reliable that latent variable. The indicator reliability can be calculated by taking the squared of each loading [4]. The preferred value of indicator reliability is more than 0.7. If it is an exploratory research, 0.4 or higher is acceptable [7]. For a well-fitted reflective model, the path loadings should be greater than 0.70 [16] which means that more than half of the variance in the indicator can be explained by its latent variable. In empirical practice, if the indicator's loading is not high (< 0.5) and is non-significant, the data do not support the

contention that the indicator is relevant to the measurement of its factor and it may be dropped from the model [2].

3.2. Structural Model Assessment

A path model is a diagram that displays the hypotheses and variable relationships to be estimated in PLS-SEM analysis [1]. The path model of this research with independent variable (latent variable or construct) i.e. internal management commitment, mediating variable i.e. SCM practices and dependent variable (latent variable) i.e. Lean Principles is as shown in the Fig. 2. The model below consists of inner model i.e. the circles and the arrow connecting the circles and outer model i.e. the rectangles and the arrows connecting them. The inner model is also called the structural model whereas the outer model is known as measurement model. There are two types of latent variables in the following model i.e. exogenous variables or independent variables (internal management commitment) and endogenous variable or dependent variable (lean principles). Multicollinearity is not an issue in reflective model since the latent variable is modeled as a single predictor of its associated indicators. However, there is potential multicollinearity at the structural level for reflective model i.e. the latent variables may be multicollinear between each other. After running the model using Smart PLS 3.0, the standardized path coefficients will be placed on the arrows in the inner model and loadings will be placed on the outer model. Note: INM 1-4 denotes the indicators of internal management commitment latent variable and L1-5 denotes the 5 principles of lean.

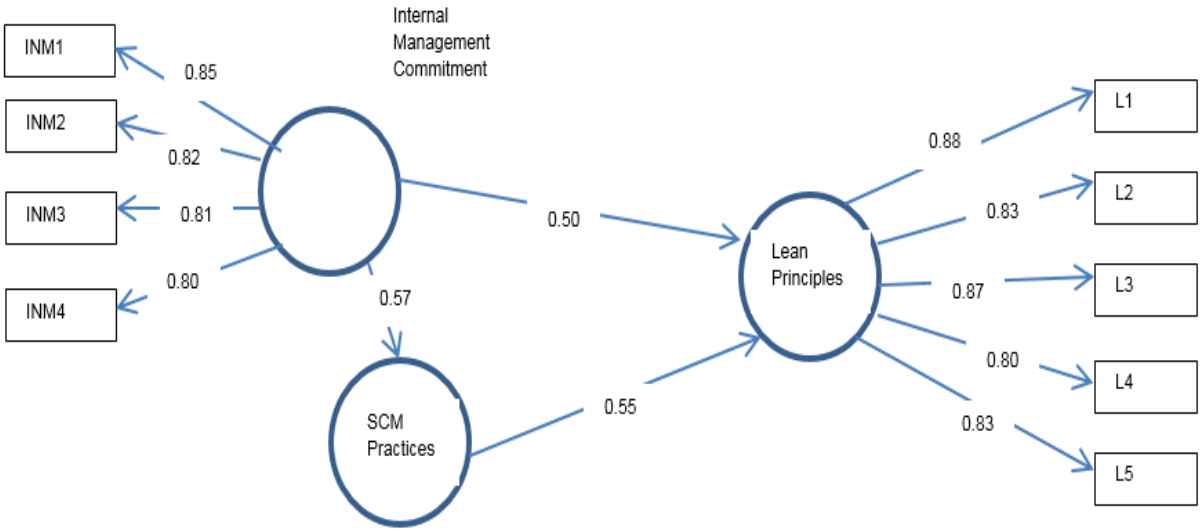

Fig.2. Inner and outer model of internal management commitment, SCM practices and lean

principles

From the result of analysis, it can be concluded the following hypothesis testing result. All the 3 paths connecting the hypothesis have standardized path coefficients greater than 0.50 and associated p-value lesser than 0.05 indicating that all 3 hypothesis are supported.

Table 1. Summary of PLS-SEM analysis results

Path Estimates/Loadings	P-Values	Hypothesis
0.50	0.03	H1 supported
0.57	0.01	H2 supported
0.55	0.00	H3 supported

4. CONCLUSION

The present study validates the internal management commitment is one of the key element in SCM practices and impact the lean principles implementation in a company. Although some company are already implemented SCM practices and lean principles, they do not know the exactly how to implement both initiatives in an effective way due to a lack of understanding of the impact of internal management commitment that need to be managed continually. By proposing, developing and demonstrating the internal management commitment as one of the key element in SCM practices which at the same time with direct impact to lean principles implementation, the present study provides Lean practitioners with a useful model for evaluating the comprehensiveness of their current Lean principles and SCM practices implementation. Through the analysis of the relationship of Lean principles with internal management commitment and SCM practices, we have shown that SCM practices can serve as mediating variable that enhance the impact of internal management commitment to lean principles implementation rather trying to implement each of SCM practices and lean principles in isolation. The findings of this research thus point to the importance of embed SCM practices into lean principles implementation to the organization. The findings of this research support the view that embedded SCM practices into internal management commitment can have discernible impact on Lean principle implementation. In terms of research limitations, this research is aiming on company that implementing lean principles

using its own internal lean practitioners and does not include those company that use external lean consultant for its lean principles implementation. Hence, the research implications could not be generalized to other company that use external lean consultant for its lean principles deployment.

This paper provides empirical justification for a framework that identifies internal management commitment as one of the key dimensions of SCM practices and describes the internal challenges of internal lean practitioners in implementing lean principles in a company. It examines three research questions: (1) how does internal management commitment impact the Lean principles? (2) how does SCM practices impact the lean principles? (3) can SCM practices be embedded with internal management commitment?. For the purpose of investigating these issues a comprehensive, valid, and reliable instrument for assessing SCM practices was developed. The instrument was tested using rigorous statistical tests including convergent validity, discriminant validity, reliability and the validation of the structural equation modeling. This study provides empirical evidence to support conceptual statements of company that has higher level of internal management commitment, coupled with leveraging the existing SCM Practices, in lean principles implementation is critical in overcoming the challenges faced by internal lean practitioners. As lean practitioners' major challenge is overcome, the lean principles implementation is more successful as compare to other organizations that has low level of internal management commitment.

5. REFERENCES

[1] Bollen K A. Latent variables in psychology and the social sciences. Annual Review of Psychology, 2002, 53(1):605-634

[2] Cenfetelli R T, Bassellier G. Interpretation of formative measurement in information systems research. MIS Quarterly, 2009, 33(4):689-708

[3] Chin W W. The partial least squares approach to structural equation modeling. Modern Methods for Business Research, 1998, 295(2):295-336

[4] Hair J F, Ringle C M, Sarstedt M. Partial least squares structural equation modeling: Rigorous applications, better results and higher acceptance. Long Range Planning, 2013,

46(1-2):1-12

[5] Höck M, Ringle C M. Strategic networks in the software industry: An empirical analysis of the value continuum. In International Federation of Scholarly Associations of Management (IFSAM) VIIIth World Congress, 2006, pp. 1-21

[6] Holmemo M D, Ingvaldsen J A. Bypassing the dinosaurs?-How middle managers become the missing link in lean implementation. Total Quality Management and Business Excellence, 2016, 27(11-12):1332-1345

[7] Hulland J. Use of partial least squares (PLS) in strategic management research: A review of four recent studies. Strategic Management Journal, 1999, 20(2):195-204

[8] Jaiswal P, Kumar A. Analyzing barriers of lean manufacturing adoption in Indian SMEs using an integrated approach of grey decision making trial and evaluation laboratory (DEMATEL). In World Congress on Engineering, 2016, pp. 688-691

[9] Lohmöller J. B. Latent variable path modeling with partial least squares. Berlin: Springer Science and Business Media, 2013

[10] Ritter L. A., Sue V. M. The use of online surveys in evaluation: New directions for evaluation, number 115. California: Jossey-Bass, 2007

[11] Ticehurst G W, Veal A J. Questionnaire surveys'. In A. J. Veal (Ed.), Business research methods: A managerial approach. Illinois: Addison-Wesley Longman Incorporated, 2005, pp. 135-158

[12] Womack J P, Jones D T. From lean production to the lean enterprise. Harvard Business Review, 1994, 72(2):93-103

[13] Bowen N. K., Guo S. Structural equation modeling. England: Oxford University Press, 2011

[14] Easterby-Smith M., Thorpe R., Jackson P. R. Management research. SAGE Publications, 2012

[15] Blaxter L., Hughes C., Tight M. How to research. New York: Open University Press, 2006

[16] Henseler J, Ringle CM, Sarstedt M. Using partial least squares path modeling in advertising research: Basic concepts and recent issues. In S. Okazaki (Ed.), Handbook of

research on international advertising. Massachusetts: Edward Elgar Publishing, 2012, pp. 252-276

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