

## CRITICAL REVIEW OF SYSTEM METHODOLOGY

**Adisthy Shabrina Nurqamarani**

*Faculty of Economic*

University 17 Agustus 1945 Samarinda

Jl. Ir. H. Juanda No. 80 PO BOX 1052 Indonesia Telp/Fax: 0541 743390

[adisthy.shabrina@gmail.com](mailto:adisthy.shabrina@gmail.com)

### **ABSTRACT**

*This article contains critical review of system methodology. The aim was to explore different types of system methodology and its implication on management. The background of this article is due to the use of system methodology that is assumed beneficial to tackle management problem. A review of research articles that examined the variety of system methodology includes lean system methodology and system of system methodology is presented in this paper. The review suggests that implementation of system methodology should embrace a unitary purpose and control in order to be effective. As recommendations of the implementation of system methodology, managers and leaders may improve their employees' performance by considering and addressing the aspects that affect the implementation on system methodology to be succeeds.*

**Keywords:** *Lean System Methodology, System of System Methodology (SOSM), Operational Research*

### **INTRODUCTION**

Over the past decades there has been increasing forces to tackle real world problem due to the failure of reductionist thinking (Jackson, 2003). The attempt to devise such methodologies as a means of tackling real-world problems began around the time of the Second World War, and its immediate aftermath, that the methodologies of Operational Research (OR), Systems Analysis (SA) and Systems Engineering (SE) which

labelled as hard system thinking were born (OPDM, 2005)

System Methodology refers to a set of conceptual and analytic methods used for system thinking and modelling (Cavana and Maani, 2000). This system thinking offered managers and management, scientists a means of seeking to optimize the performance of a system in pursuit of clearly identified goals (Jackson, 2003). However, the critiques of hard system thinking on its weakness to overcome complexity of

real world problem had led to this system in crisis. Since then, the development took place to overcome the weakness of hard system thinking and produced a variety of system methodologies namely Lean System Methodology, Organizational Cybernetics, complexity theory, etc. However, the primary focus on this report is on Lean System Methodology.

Lean system Methodology is an adaptation of Lean system founded by Taiichi Oono, that could address the complexity situation in manufacturing industry which traditional approach could not achieve and able to handle a lot of variety of customer demand (Seddon, 2003). So far, this method has been successfully implemented in various fields of service industry, and therefore this essay seeks to critically examine literatures of Vanguard lean system methodology claimed by Seddon against other Author's perspectives.

### **Critical Evaluation of Literatures on System Methodology**

In order to evaluate Lean System Methodology, the author uses a system of system methodologies to evaluate its strengths and weaknesses compared with different system methodologies.

First of all, the author will review key principles of Lean System Methodology and evaluate the condition when Lean System might succeed and when it might fail according to the literatures.

### **Vanguard Lean System Methodology**

Seddon (2003, pp 8-10) developed Lean system methodology to discover a better way to make the work works by applying Toyota Lean manufacturing strategy which focuses on managing flow. Toyota's approach was adopted in service companies to redesign the processing order to achieve better services and lower cost by reducing waste and maximizing customer value Seddon (2003). In its implementation, this approach has three systemic steps cycle which are check, plan, and do. These steps are carried out to understand 'what and why' of current performance as a system, identifying levers for change and taking direct actions on the system (McJackson et al, 2008).

One could argue on the sequence of this approach as initially this check plan do cycle is adopted from PDCA cycle of Deming, whereby Plan is put first than Check (Seddon, 2003, p114). However, Vanguard approach put checks in the first step as it is necessary

to see the actual performance of the system to identify waste and value work first before providing solution of the waste occurred in the organization (Seddon, 2003), and thus 'do' is put in last sequence as it explains how the solution should be applied within the organization.

### **Vanguard Lean System's Key Principles**

Seddon (2003, p115) claimed that all the work should be based and started on purpose according to customer's perspective. This point of Vanguard approach was argued by Jackson who noted that there will be disputes on purposed as background are varied and thus Lean system approach might fail to address different view of purpose (OPDM, 2005). McJackson et al (2008, p195) also pointed out that Vanguard approach would suit condition when a clear definition can be easily obtained and if there is a common purpose of the system. Thus, it could be argued if Vanguard approach principle that prioritize on one purpose can be implemented in all occasions as it fails to pay due attention to the variety of possible purposes (McJackson et al, 2008)

Furthermore, Vanguard Lean System emphasized that design of the system should against demand and therefore the design of facilitating systems, such as IT systems, should follow and support design of the key activity system and not precede it or be done independently (OPDM, 2005)

The principle above showed that Vanguard Lean System tends to redesign the system with little reference to other parts which could result on disruption of the whole system (McJackson et al, 2008). As added in OPDM (2005) "Vanguard methodology often comes up against demands imposed by other systems that do not necessarily seem to serve the customers' purpose in the process of attempting to 'clean-stream' the work".

Difficulties arise, however, when an attempt is made resulted on disruption of other system, and neglect other parts or levels which assumed not bring value to achieve the purpose. This could lead to negative implication. Jackson argued if it could lead to problem when other parts must be involved in bringing significant benefit for customers (ODPM, 2005).

Therefore, it could be argued that Vanguard approach is more suitable in a

condition where sub-systems are relatively independent rather than more complex problem situations where sub-systems share close interrelationships and exist in a turbulent environment (McJackson et al, 2008).

Additionally, one criticism of the literature on Vanguard Lean System claimed that monitoring and modelling variety makes it more predictable which results on reduced variety (Seddon, 2005, pp 20-23). However, Jackson pointed out that environment is made up of complex systems which are unpredictable and difficult to interact with unpredictable results. By using tools of Vanguard approach to predict such variety, he claimed that this approach could fail organisation in times of significant change, leading them to miss opportunities or leaving them subject to catastrophic failure as it is less-well developed compared to other systems (ODPM, 2005)

Thus, in the following section, the author will apply SOSM to review the Lean System Methodology based on the key principles discussed above. Jackson's Review using System of System Methodology.

The author employs System of System Methodologies (SOSM) to

review the Vanguard Lean System Methodology. "System of systems methodologies is developed as the interrelationship between different methodologies is examined along with their relative efficacy in solving problems in various real-world problem contexts" (Jackson and Keys,1984,p.473).

Numerous studies have attempted to employ this framework to examine system methodology against other methodologies, in terms of its strength and weakness (MC Jackson et al, 2008; ODPM, 2005; Warren, 2000).

System of System Methodology aims to understand the development of system thinking by classifying system methodologies based on two categories; complexity of systems and diversity of participants who are interested in problem situation (Jackson, 2003). First, analysing the ideal-type' grid of problem situations or problem contexts (Jackson, 2003) to illustrate in which category the lean methodology fits in.

		<b>Participants</b>		
		<b>Unitary</b>	<b>Pluralist</b>	<b>Coercive</b>
<b>System</b>	<b>Simple</b>	Simple-Unitary	Simple-Pluralist	Emancipatory
		Hard System Thinking (machine)	Soft System Thinking (culture/organism)	System Thinking (Culture/Coercive)
	<b>Complex</b>	Complex-Unitary	Soft System Thinking (Culture/Organism)	Emancipatory
		Organizational Cybernetics		System Thinking (Culture/Coercive)

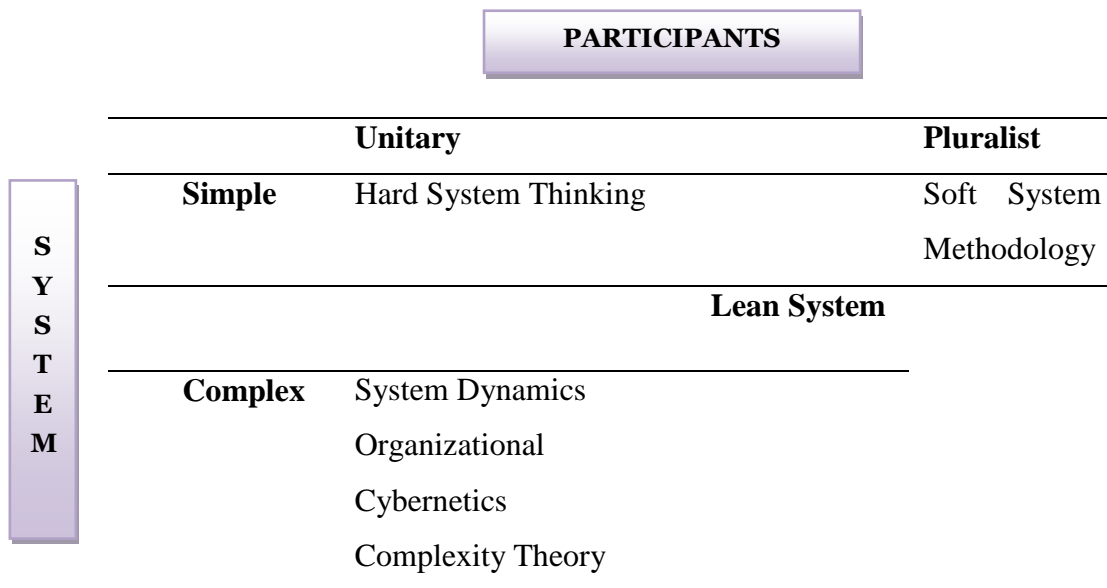
**Figure 1: SOSM Grid Model**  
Sources by: Jackson, 2003

Referring to earlier discussion, it shows that Lean System methodology has a **unitary** purpose as it emphasizes on one common purpose which is for customers’ satisfaction. As supported by Seddon (2003, pp 90-91) who stated that the system should be against demand to achieve customer’s purpose and therefore whole parts should endeavour to achieve this common goal.

However, Mc Jackson et al (2008, p196) placed the lean methodology in a movement between two axes as they

perceived it as coping with some aspects of **complexity** (comprehensive investigation and redesign the system based on six checks of organization which have numerous parts that are integrated each other) and some aspects of **pluralism** (involvement of people who do the work in “plan”) in a degree that not as greater as other system methodologies.

For that reason, it is not classified in the centre of the axis (shown in figure 2)



**Figure 2: SOSM Grid Model**  
Sources by: Mc Jackson et al, 2008

However, as Jackson & Keys (1984) stated “the classification of a system as a complex or simple, and whether it is unitary, pluralist, or coercive will depend upon the observer of the system and upon the purpose he has for considering the system” . Therefore, the classification of the system will back into those who observe the methodology, and also its position between two axes within the framework does not indicate that it is better than other system (McJackson et al, 2008).

As each Methodology has its strength and weakness, and The Vanguard methodology would suit to be employed well in situations of medium complexity where it is possible to

provide clarity around specific purposes to ensure the implementation. (ODPM, 2005)

**DISCUSSION AND CONCLUSION**

In reviewing the literatures, it is clearly shown that Lean System Methodology could improve performance of service organization. However, there are some key principles of Seddon which argued by Jackson, result on inefficiency to achieve better performance. It includes the purpose prioritization, redesign against demand, and system that able to predict variety.

Besides some key principles which were argued by Jackson, the critical reflection on the use of Lean System also showed inconsistency in the sequence of checks claimed by Seddon.

The team found that demand should be analysed before the purpose while Seddon claimed the checks should be sequential from purpose to management thinking. Additionally, some additional tools and data also required to support the quality of finding and analysis.

Furthermore, it is interesting to note the result on reviewing the LS by using System of System Methodology that suggest if Lean System Methodology would fit into complex unitary due to its thorough investigation of the system and interrelation between its part (complexity) and one common purpose (unitary).

It is encouraging to compare this figure with that found by ODPM (2005) who suggest that Lean System Methodology would fit into complex pluralism due to its redesigning system against demand (complexity) and involvement of people in decision making (pluralism). Additionally, there are similarities between the findings of the use of SOSM to review Lean System and those described in ODPM, 2005 & MCJackson et al, 2008. Even though the result remains poles apart, a possible explanation for this might be that difference of view in applying the LS in SOSM Framework.

In conclusion, the Lean System Methodology can be recommended as a useful methodology for bringing improvement to system in service organization, particularly in housing agencies. Apparently, however, Lean system has its strength and weakness, so as other methodologies. Therefore, more research on this topic needs to be undertaken to better explore its merit and drawback to improve service delivery.

## REFERENCES

- Cavana, R.Y and Maani,K.E, 2000. *A Methodological Framework for System Thinking and Modelling (ST & M) Interventions*. New Zealand: Victoria University of Wellington and The University of Auckland. Available at: <http://ceur-ws.org/Vol-72/019%20Cavana%20Methodological.pdf> [Accessed 23 November 2017].
- Clegg, B and Orme, R., n.d. 2013. *Systems of Systems pure and Applied to Lean Six Sigma*. Available at: [http://cdn.intechopen.com/pdfs/30418/InTech-Systems\\_of\\_systems\\_pure\\_and\\_applied\\_to\\_lean\\_six\\_sigma.pdf](http://cdn.intechopen.com/pdfs/30418/InTech-Systems_of_systems_pure_and_applied_to_lean_six_sigma.pdf) [Accessed 24 November 2017]
- Fuchs,C., 2004. *Knowledge Management in Self-Organizing Social System*. [e-journal]. Available through: <http://www.tlainc.com/articl61.htm> [Accessed 24 November 2017]

- Haines Centre for Strategic Management Asia. 2017. *Systems Thinking: The natural way the world works [Online]*. Available at: [http://www.hainescentreasia.com/concepts/systems\\_thinking\\_approach.htm](http://www.hainescentreasia.com/concepts/systems_thinking_approach.htm) [Accessed 23 November 2013]
- Iles, V. 2013. *Briefing Paper One: System Thinking [Online]*. Available at: [http://www.reallylearning.com/Free\\_Resources/Systems\\_Thinking/systems\\_thinking.html](http://www.reallylearning.com/Free_Resources/Systems_Thinking/systems_thinking.html) [Accessed 23 November 2017]
- Jackson, M.C., n.d. 2013. *Fifty Years of System Thinking for Management [Online]*. Available at: [http://incose.org/newsevents/news/docs/Fifty\\_years\\_of\\_systems\\_thinking\\_for\\_management.pdf](http://incose.org/newsevents/news/docs/Fifty_years_of_systems_thinking_for_management.pdf) [Accessed 23 November 2017]
- Jackson, M.C., Johnston N., and Seddon, J., 2008. *Evaluating System Thinking in housing*. Journal of the Operational Research Society 59, Pp 186-197.
- Jackson, M.C., 2003. *System Thinking: Creative Holism for Managers [e-book]*. Chichester: Wiley. Available through: [http://orgcomplexitynet.groupsites.com/uploads/files/x/000/02f/e18/Systems\\_Thinking\\_Creative\\_Holism\\_for\\_Managers.pdf](http://orgcomplexitynet.groupsites.com/uploads/files/x/000/02f/e18/Systems_Thinking_Creative_Holism_for_Managers.pdf) [Accessed 23 November 2017]
- Jackson, M.C. & Keys.P., 1984. *Towards a System of Systems Methodologies*, [e-journal] 35 (6), pp 473-486. Available through: <http://www.jstor.org/discover/10.2307/2581795?uid=3738032&uid=2134&uid=2&uid=70&uid=4&sid=21103067624393> [Accessed 22 November 2017]
- Office of Deputy Prime Minister, 2005. *A Systematic Approach to Service Improvement*. London: OPDM
- Sange, Peter., 1990. *The Fifth Discipline*. Available at: [http://www.vedpuriswar.org/book\\_review/the\\_fifth\\_discipline.PDF](http://www.vedpuriswar.org/book_review/the_fifth_discipline.PDF) [Accessed 22 November 2017]
- Seddon, J., 2005. *Freedom from Command and Control. 2nd Ed.* Vanguard Education. Buckingham.
- Vanguard, 2013. *System Thinking for Service Organization [Online]*. Available at: <http://www.systemsthinking.co.uk/1.asp> [22 November 2017]
- Warren, L., n.d. 2013. *Total System Intervention. System Science and Cybernetics vol.2*. Available through: <http://www.eolss.net/sample-chapters/c02/E6-46-02-09.pdf> [Accessed 24 November 2017]
- Zokaei, K. Elias, S. Donovan, B. Samuel, D. Evans, B and Goodfellow, J., 2010. *Lean and System Thinking in the Public Sector in Wales [Pdf]* Lean Enterprise Research Centre. Available at: [http://www.wao.gov.uk/assets/englishdocuments/Systems\\_Thinking\\_Report\\_eng.pdf](http://www.wao.gov.uk/assets/englishdocuments/Systems_Thinking_Report_eng.pdf) [Accessed 22 November 2017]