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Employees' Perception of Lean Six Sigma Implementation to Business Performance on Low-cost Budget Hotels

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ABSTRACT

This study aims to identify the critical success factors (CSFs) of Lean Six Sigma (LSS) at low-cost budget hotels, which are affiliated with virtual hotel operators (VHOs) that provide some knowledge on how CSFs influence the LSS implementation and how LSS can affect operational and organizational performances on the basis of employees' perception. To achieve this objective, the researcher surveyed 120 respondents who work in hotels that are affiliated with VHOs, such as Airy Rooms, RedDoorz, and OYO Rooms at Semarang City. The result indicates that among the six CSFs that were determined, only three affected the LSS implementation, namely, management involvement and commitment, linking LSS to business strategy, and project selection and prioritization. LSS has a weaker direct influence on organizational performance than its relationship with operational performance. This study focused on hotels that have partnerships with VHOs, which do not implement LSS in their business environment. This research was based on employees' perception if LSS was implemented in their working environment to give some points of view on what CSFs could successfully affect the LSS implementation and whether it could effectively boost the performances.

At the end of part of the discussion, the authors attempted to explain the importance of CSFs in the hotel industry, especially hotels that are affiliated with VHOs, and how they can influence the success of LSS and finally can affect hotel performance.

KEYWORDS

Critical success factors; lean six sigma; hospitality; virtual hotel operator; business performance

Introduction

Lean Six Sigma (LSS), as a strategy and business methodology, has been proven to improve the performance of a process to produce customer satisfaction (Snee, 2010). LSS, as an integrated methodology, combines the speed of Lean to smoothen the process and the robustness of Six Sigma through a disciplined and systematic approach to solve problems (Antony et al., 2018). Lean focuses on eliminating activities that do not add value to the final product, whereas Six Sigma focuses on eliminating variations in the process. Both goals create an effective production system to meet customer

satisfaction by creating a good-quality product (Dogan & Gurcan, 2018). The application of Lean and Six Sigma in parallel is noted in many case studies in the manufacturing and service sectors (Albliwi et al., 2014). In service organizations, Lean intends to reduce waste in terms of time and making processes more efficient than before; meanwhile, Six Sigma focuses on improving the process by reducing the variability to achieve the result of efficiency close to 99.9997% of the time (Antony et al., 2017).

Semarang, as the capital of Central Java Province, apart from being the center of all activities in the regional government and economy, has adequate transportation infrastructures, such as airports, train stations, and terminals that support Semarang as the center of transit in Central Java Province. This characteristic is quite attractive for investors to develop tourism activities to bring in large numbers of domestic and foreign tourists. Investors also certainly do not overlook this opportunity to build inns and hotels, which suit the needs of tourists. Based on Semarang City Hospitality Statistics 2018, a total of 106 non-star (budget) hotels exist, which is higher than that of star hotels. However, the highest rate occupancy is dominated by three-star hotels (Central Bureau of Statistics for the City of Semarang, 2018). This finding suggests that hotel customers believe that with prices that are slightly higher than budget hotels, they obtain much better service.

To catch up on the occupancy level, budget hotels collaborate with virtual hotel operators (VHOs). VHO partners mostly come from economy class hotels to middle class and local brands. Meanwhile, VHO customers are those classified as budget travelers who are looking for affordable accommodation with good value offered (Wiastuti, 2016). A VHO serves as a mediator between a hotel and a customer. The VHO makes it easy for the partner to be easily found by the customer under the name VHO that houses the partner. After providing complete data on a room to be rented out, the VHO markets the room, so that it can be booked by the customer through OTA, the official VHO website or through the VHO application on a smartphone. After the customer/guest of the inn books the room from the partner, the customer pays the room rent and service fee to the VHO. From these costs, the VHO pays the agreed room rental price to the partner as much as 65%–70% of the total paid by the customer. For certain classes, VHOs guarantee partners full profits without any deductions for a certain period even if such partners do not meet the sales target. Indirectly, customers have rented rooms from partner hotels, and in return, partners provide rooms that have been rented by VHO customers.

In real day-to-day cases, VHOs are faced with problems where hotel workers have below-average skills when serving hotel customers. The reason is that not all employees understand the ins and outs of hospitality and have an education that supports their performance in the hospitality industry. Although VHOs aim to provide good service and quality above the standard

of quality service, the workforce of low-budget hotels can face problems such as lack of experience, lack of training, lack of fluency in speaking a foreign language, lack of positive attitude toward work, and an un-ergonomic workplace (Bhat et al., 2014; Shofia et al., 2020).

These problems can be resolved by implementing Lean and Six Sigma in hotels. By combining both, LSS is proven to be able to improve performance in many departments in a hotel even in a small hotel with a limited budget (Lancaster, 2011). LSS has benefits such as removes non-value-adding activities (wastes), reduces damaged products/transactions, shortens cycle times, and delivers the right product/service at the right time in the right place (Laureani, 2012). Other benefits are LSS can help companies utilize resources (human, financial, and system) efficiently (Kabir et al., 2013) and gain operational and organizational improvement benefits (Jayaraman et al., 2012).

The understanding about what and how LSS is from the company point of view remains lacking. Kamar (2014) revealed the barriers in introducing the Six Sigma process to the hotel industry, such as resistance to change and the desire to maintain the quality currently used in the hotel, lack of knowledge of Six Sigma, lack of adequate information about Six Sigma, and lack of clarity about the expected benefits. From the management point of view, the situation when companies implement LSS, they must implement the cost and subsequent implementation of Lean adoption before they can commit is misunderstood (Achang et al., 2006). This reason explains why only few hotels, including VHOs that are broadly spread all over the nation, especially in Semarang City, do not apply LSS.

Managers must further concentrate on readiness factors to formulate the execution process of LSS for the continuous improvement of their organization (Vaishnavi & Suresh, 2020). To help companies implement Lean and avoid costly failures, previous researchers suggested several critical success factors (CSFs) (Netland, 2016). CSFs can be defined as “some things that must go well to ensure success for managers or organizations; therefore, they represent managerial areas or companies that must be given special attention continuously to produce high performance” (Netland, 2016; Boynton and Zmud, 1984).

To introduce the knowledge of LSS to the hospitality industry, this study aims to identify LSS implementation to business performance on low-cost budget hotels, which are affiliated with VHOs on the basis of employees' perspective by identifying the CSFs of LSS. This research gives some points of view on how CSFs influence the LSS implementation and how LSS can affect operational and organizational performances on the basis of employees' perception. According to the problem formulation in this study, the following questions arise: what CSFs can successfully influence the LSS implementation in low-cost budget hotels in Semarang City? What is the relationship between LSS implementation and company performance comprising operational and organizational performances?

This study includes previous studies on LSS to consider the CSFs of LSS.

Review of literature

CSFs of LSS implementation

Based on Table 1, according to Shofia et al. (2020), LSS has nine CSFs, which have already concluded to be measured at LSS implementation in the low-cost budget hotel industry at Semarang City: management involvement and commitment, communication, organization infrastructure, education and training, linking LSS to business strategy, project selection and prioritization, project management skill, understanding LSS tools and techniques, and cultural change.

However, not all CSFs mentioned above are used in this study, such as organizational infrastructure, project management skills, and understanding of LSS tools and techniques. Previous studies revealed that organizational infrastructure and project management performance are not factors that influence LSS implementation, although they have a slight impact. The understanding of LSS tools and techniques in this study is deemed inappropriate because in reality, the object of research is that only few understand LSS implementation; therefore, the fact that the research object does not understand LSS tools and techniques can also be understood. – –

Table 1. CSFs of Six Sigma, Lean, and LSS from previous research.

Author CSF	A	B	C	D	E	F	G	H	I	J
Management involvement and commitment	√	√	√	√	√	√	√	√	√	√
Education and training	√	√	√	√	√	√	√	√	√	√
Project selection and prioritization	√	√	√	√	√	√	√	√	√	√
Organization infrastructure	√		√	√	√	√	√	√		√
Communication	√	√	√	√	√	√	√			√
Linking LSS to business strategy	√		√	√	√					√
Understanding LSS tools and techniques	√		√	√		√	√			√
Cultural change	√		√				√		√	√
Project management skills	√		√	√		√				√
Linking LSS to suppliers	√		√				√			
Linking LSS to awards and recognition		√		√		√				
Awareness						√	√			
LSS project tracking and review		√				√			√	
Management performance					√				√	
Vision and plan statement			√							
LSS staff selection						√				
Data-based approach						√				
Linking LSS to supply chain						√				
LSS financial accountability		√				√				

Source: Shofia et al. (2020)

Notes: A = Brun (2011), Jeyaraman and Teo (2010), Timans et al. (2012), Manville et al. (2012), Psychogios et al. (2012), Laureani and Antony (2012), and Albliwi et al. (2014); H = Dora et al. (2013); I = Kamar (2014); J = . Shofia et al. (2020)

Table 2 presents no significant differences in the CSFs that affect LSS implementation in the manufacturing and service industries. Previous research agreed that management involvement and commitment are the most important CSFs in LSS implementation. Management involvement and commitment are two important elements to a successful implementation of LSS in any organization (Albliwi et al., 2014). When a management does not have any commitment, implementing Lean in the organization is difficult, which is a major obstacle (Zhou, 2016). Top management has an important role in the creation and management of process management systems, and direct participation is necessary to realize the successful implementation of LSS. Brun (2011), Manville et al. (2012), and Laureany and Antony (2012) found that management involvement and commitment are the factors that influence the successful implementation of LSS. Netland (2016) revealed that managers must commit to and involve themselves in implementation activities to succeed by implementing the Lean program. Laureani and Antony (2018) suggested that organizations must have leaders who are committed to inspire their employees and build a different culture continuously to obtain the benefits of the implementation of LSS.

H₁: Management involvement and commitment have a positive influence on the successful implementation of LSS.

Communication is also an important element for managers to explain how LSS works and how much LSS benefits in doing work to subordinates to spread business strategies, meet customer needs, and form a solid work team. Timans

Table 2. CSFs that affect Lean, Six Sigma, and LSS in the manufacturing and service industries.

Author	Top CSF of Lean/Six Sigma/LSS
Manufacturing Industry Brun (2011)	Management involvement and commitment Cultural change
Manville et al. (2012)	Linking Six Sigma to business strategy Senior management commitment Linking LSS to business strategy Linking LSS to customer
Timans et al. (2012)	Linking LSS to customer Vision and plan statement Communication
Dora et al. (2016)	Top management commitment Training Resources
Service Industry Psychogios et al. (2012)	Top management support and involvement Organizational culture Training
Kamar (2014)	Project selection Linking LSS to business strategy Committed leadership and capabilities Education and training

Table 3. Business performance elements in the hospitality industry.

Business Performance	Element
Operational Performance	Customer satisfaction
	Customer relationship
	Improvement of strategic forecasting
	Improvement of service/product quality
	Improvement of internal process efficiency
	Improvement of productivity
	Improvement of waste elimination
Organizational Performance	Increase of profitability
	Cash flow (liquidity)
	Increase of operating revenue
	Cost reduction
	ROI
	Improvement of a competitive advantage
	Increase of sales
	Development of a new market

et al. (2012) revealed that communication has an influence on the successful implementation of LSS. Noori (2015) argued that effective communication at all levels vertically and horizontally is one of the factors that influences the success of Lean. Lack of effective communication can also have an impact on the failure of LSS implementation (Albliwi et al., 2014).

H₂: Communication has a positive effect on the successful implementation of LSS.

Education and training also have a significant role in communicating the “why” and “how” and the LSS project. Kamar (2014) found that an appropriate training program aims to ensure that managers and employees can use and implement the Six Sigma techniques effectively. With the LSS knowledge provided, employees, especially operators, can easily work effectively and efficiently. Meanwhile, training is an important factor for the successful implementation of LSS and procedures because reducing time on LSS implementation can make savings for companies and reduce labor costs (Albliwi et al., 2014).

H₃: Education and training have a positive effect on the successful implementation of LSS.

Furthermore, the connection between the LSS project and business strategy can be shown in nominal terms that can help the development of a business strategy. Brun (2011), Setijono et al. (2012), and Kamar (2014) suggested that linking LSS and business strategy is a CSF that is considered important in implementing LSS. Manville et al. (2012) revealed that many companies believe that LSS helps them achieve their strategic goals. Noori (2015) stated that the Lean program must be related to the company strategy to obtain a successful and improved performance in the long run.

H₄: Linking LSS to business strategy has a positive effect on the successful implementation of LSS.

In addition, Albliwi et al. (2014) believed that top management must be able to choose the right project for the right people to succeed in LSS. The selected projects must be those that have business goals or company goals. According to Netland (2016), a continuing need for proper planning, follow-up, and funding for the Lean program exists. Timans et al. (2012) argued that companies must design systems to prioritize and select projects, which contain standards for different projects with different time frames, from short projects (one to five days) to long-term projects.

H₅: Project selection and prioritization have a positive effect on the successful implementation of LSS.

Last, the application of LSS requires significant changes to the company culture in carrying out business operations in terms of structure and infrastructure. An awareness of the needs and benefits and LSS must exist, so that LSS projects can run smoothly and successfully. Noori (2015) argued that good cultural change is the result of a continuous combination of training and Lean projects. Setijono et al. (2012) and Dora et al. (2016) revealed that organizational culture is one of the success factors in implementing LSS.

H₆: Cultural change has a positive effect on the successful implementation of LSS.

Relationship between LSS implementation and business performance

The performance level in a company is measured through operations and organization (Jayaraman et al., 2012). Operational performance in the service industry is measured on the basis of customer satisfaction, customer relationships, increased forecasting strategies, improved product quality services, and increased efficiency of internal processes (Kamar, 2014).

Ismail Salaheldin (2009) measured organizational performance on the basis of return on investment (ROI), market share growth, investment in research and development, and market orientation. Jayaraman et al. (2012) measured organizational performance on the basis of financial aspects, such as revenue growth, net profit, profit-to-income ratio, and

return on assets, and non-financial aspects, such as the capacity to develop competitive profiles, new product development, and market development.

Nawanir et al. (2013) elaborated the relationship between LSS implementation and business performance. Lean manufacturing has a positive influence on operational performance in manufacturing companies. Meanwhile, Kamar (2014) stated that some hotels that implement the Six Sigma are aware of the fact that Six Sigma is one of the most effective strategies to improve product/service quality, improve internal processes, and develop the overall operational excellence.

H₇: LSS implementation has a positive effect on operational performance.

From the aspect of organizational level, LSS helps companies achieve stronger competitive advantages so that they become more competitive and then have an effect on better financial improvement. Improved performance and productivity by creating a higher product reliability and lower volatility at the level of internal process operations, reducing company exposure to economic risk, is directly proportional to increased profitability and ROI.

H₈: LSS implementation has a positive effect on organizational performance.

In the relationship between operational performance and organizational performance, Ismail Salaheldin (2009) suggested that operational performance has a strong influence on financial performance, but it is quite weak on non-financial performance. Similarly, García-Bernal and Ramírez-Alesón (2015) indicated that operational performance has a positive effect on financial performance. Nawanir et al. (2013) stated that the better the operational performance, the better the organizational performance.

H₉: Operational performance has a positive effect on organizational performance. - - - - -

According to the hypothesis building in the literature review, CSFs, such as management involvement and commitment, communication, education and training, linking LSS to business strategy, project selection and prioritization, and cultural change, have a positive relationship with LSS implementation. Meanwhile, LSS implementation has a positive relationship with operational and organizational performances; operational performance also has a positive relationship with organizational performance. These relationships are illustrated in Figure 1. - - - - -

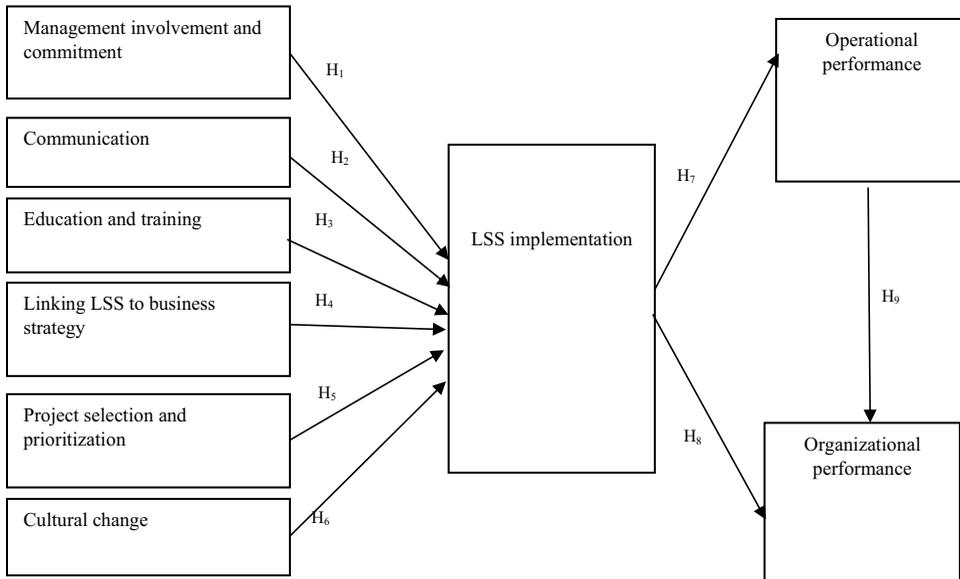


Figure 1. Research framework.

Research methodology

The primary data collection in this study was to conduct interviews and distribute questionnaires directly to respondents who are related to this research from January 2020 to early February 2020. At the time this research was conducted, the VO population in Semarang City consisted of 33 inns in collaboration with Airy Rooms, 34 inns with Reddoorz, and 20 OYO inns.

The measurement scale used in the questionnaire was the Likert scale. To prevent worse scenarios and bias results, researchers believed that the “neutral” option in the questionnaire must be eliminated. Ten scores starting from strongly disagree to strongly agree were used. The Partial Least Square–Structural Equation Modeling (PLS–SEM) method was employed to analyze the questionnaire data, and the SmartPLS 2.0 program was used to process such data. PLS is an SEM technique based on an iterative approach that maximizes the explained variance and endogenous construction (Fornell and Bookstein, 1982; Hair et al., 2014). This method was used to determine the CSFs that affect the LSS implementation and the relationship between LSS and hotel performance.

Researchers distributed the questionnaires by visiting hotels that are affiliated with VHOs. Some of the questionnaires were left out for a few days, whereas others were filled out right away. Since the population of VHO was not much, researchers decided to spread out the questionnaires about 2–4 questionnaires for each hotel.

This result was clear, considering that low-budget hotels rarely have a manager, and the owners are the direct supervisors. However, meeting the owners was difficult; thus, many questionnaires were filled out by operational

employees. The respondents were the employees who has direct contact to customer, also the managers (if they have one), and also the owner of the hotels. Unfortunately, most employees neither knew the meaning of LSS nor the uses of LSS tools. To prevent misunderstandings, the researchers waited while the respondents were filling out the questionnaire, so that they could explain terms that the respondents did not understand.

Result

Sample demographic

The first part of the survey asked the respondents to identify their biographical information. This study divided the function of the position into two, namely, managerial and operational levels. The managerial level includes managerial and supervisory positions, whereas the operational level comprises employees who have operational functions at the hotel where they work. Table 3 shows that the respondents were dominated by those with positions at the operational level with a total of 78%, and the remaining 22% were workers at the managerial level. Moreover, the respondents were dominated by workers who had worked for more or less one to three years. Meanwhile, workers who worked for more than three years ranked second with a total of 20%, followed by workers who worked less than one year with a total of 17%. - - - - -

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Table 4. General profiles of surveyed hotels.

Attribute	N = 120	%
Based on job function		
Managerial	26	22%
Operational	94	78%
Based on VHO partner		
Airy Rooms	39	33%
OYO	19	16%
RedDoorz	62	52%
Based on the length of partnership		
One to two years	27	23%
< one year	72	60%
> two years	21	18%
Based on the understanding of the LSS concept		
No	85	71%
Yes	35	29%
Based on the LSS implementation in the workplace		
No	91	76%
Yes	29	24%
Based on the length of LSS implementation		
Not implementing	91	76%
< one year	11	9%
> two years	8	7%
One to two years	10	8%

Source: Primary data processing

At the time of this research, hotels in partnership with RedDoorz were easier to find and more open than those in partnership with Airy Rooms and OYO. As a result of this survey, respondents from hotels in partnership with RedDoorz had the highest number, accounting for 52%, followed by Airy Rooms 32% and OYO 16%. Table 4 presents that most hotels have only started partnering less than a year. Respondents with the lowest percentage are hotels that have partnered for more than two years.

As presented in Tables 4, 71% of workers do not yet understand the LSS project, and approximately 76% of hotels do not implement LSS in their place of work. Moreover, 22% of the total sample have applied fully, 8% have applied LSS for approximately one to two years, and 9% have only applied LSS for less than a year. Meanwhile, 7% of hotels have implemented LSS projects for more than two years.

Data analysis

The specification of the model in this study is based on the framework in Figure 2 and the indicators of the latent construct depicted in Figure 2. Figure 2 illustrates the inner and outer models, which are the sub-models of this analysis. -----

Figure 2 shows that management involvement and commitment (MIC) comprise four indicators, communication (COM) consists of two indicators, education and training (TRAIN) comprise three indicators, linking LSS to

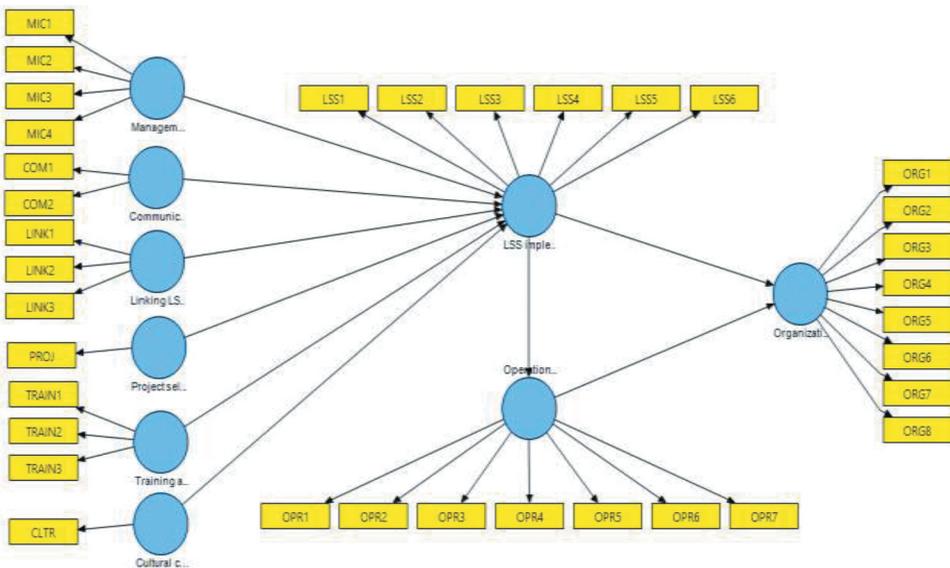


Figure 2. Model specification. Source: SmartPLS 2

business strategy (LINK) consists of three indicators, and project selection and prioritization (PROJ) and cultural change (CLTR) comprise one indicator only.

Meanwhile, LSS implementation (LSS) consists of three variables, operational performance (OPR) comprises seven indicators, and organizational performance (ORG) consists of eight indicators.

Ghozali and Latan (2015) suggested that validity can be measured by considering the values of convergent validity and discriminant validity. Convergent validity on SmartPLS 2 that can be seen in the outer loading value is > 0.70 . Table 5 presents that ORG5 and LSS3 do not fulfill the requirement of convergent validity because the outer loading value is below 0.7. Thus, for the next measurement step, LSS3 and ORG5 are deleted. – – –

In the validity test, each construct has a value above 0.5 in the AVE. Table 6 shows that each construct has fulfilled these criteria and can be declared valid. – – – – –

Table 5. Outer loading.

	CLTR	COM	LINK	LSS	MIC	OPR	ORG	PROJ	TRAIN
CLTR	1.0								
COM1		0.965938							
COM2		0.956954							
LINK1			0.926519						
LINK2			0.919266						
LINK3			0.928913						
LSS1				0.768345					
LSS2				0.900812					
LSS3				0.565966					
LSS4				0.751917					
LSS5				0.876308					
LSS6				0.839231					
MIC1					0.898345				
MIC2					0.917903				
MIC3					0.831125				
MIC4					0.874325				
OPR1						0.855090			
OPR2						0.883351			
OPR3						0.877623			
OPR4						0.860631			
OPR5						0.876026			
OPR6						0.873884			
OPR7						0.822886			
ORG1							0.814056		
ORG2							0.778680		
ORG3							0.861403		
ORG4							0.875370		
ORG5							0.613395		
ORG6							0.818436		
ORG7							0.841193		
ORG8							0.834357		
PROJ								1.0	
TRAIN1									0.894770
TRAIN2									0.886357
TRAIN3									0.837098

Source: Primary data processing

Table 6. Construct reliability and validity.

	Cronbach's Alpha	Composite Reliability	AVE
Communication	0,924	0,961	0,924
Cultural change	1,000	1,000	1,000
LSSimplementation	0,891	0,921	0,700
Linking LSS to business strategy	0,855	0,947	0,855
Management involvement and commitment	0,776	0,933	0,776
Operational performance	0,944	0,954	0,747
Organizational performance	0,928	0,942	0,700
Project selection and prioritization	1,000	1,000	1,000
Training and education	0,763	0,906	0,763

Source: Primary data processing

Table 6 also presents that each construct has an AVE value above 0.5, indicating that the value of convergent validity in this research model is very good. The AVE value of 1 means that the indicator of the magnitude of the variance contained in the construct is perfect. This value occurs in constructs that only have one indicator.

To obtain the value of discriminant validity, the value of one variable construct is compared with that of another variable construct. Table 7 shows that the value of relationship between the two variable constructs is greater than that of the relationship between a construct and another variable construct. Therefore, this model can show that latent constructs predict indicators in their blocks better than indicators in other blocks. Moreover, this research model meets the discriminant validity criteria. -----

Apart from the construct validity test, a construct reliability test is also conducted using two criteria, namely, composite reliability and Cronbach's alpha from the indicator block measured from the construct. The construct is declared to be reliable if both criteria meet a value of more than 0.70. Table 6 presents that each construct has a composite reliability value, and Cronbach's alpha is all worth more than 0.70. Therefore, the constructs in this research model have a fairly high reliability and are good.

To measure the inner model in this study, the value of R² is observed. Table 8 shows that LSS implementation, operational performance, and organizational performance have construct values above 0.70. Thus, each construct has a substantial degree of accuracy. Another interpretation is that LSS implementation can be influenced by CSFs by 77.6%, whereas the remaining 22.4% can be influenced by other constructs that are excluded from the model in this study. The construct of operational performance in this research is influenced by the construct of LSS implementation by 76.4%; the remaining 23.6% can be influenced by other constructs that are excluded from the research model. The construct of organizational performance can be influenced by the constructs of LSS implementation and



Table 7. Cross loadings.

	CLTR	COM	LINK	LSS	MIC	OPR	ORG	PROJ	TRAIN
CLTR	1.00000	0.604484	0.588185	0.608523	0.673616	0.681398	0.590768	0.635030	0.671065
COM1	0.578996	0.965908	0.538026	0.549048	0.804269	0.562332	0.459008	0.391509	0.776367
COM2	0.583952	0.956987	0.489393	0.489917	0.775367	0.515082	0.468540	0.373412	0.661708
LINK1	0.523974	0.447635	0.926357	0.724348	0.538658	0.706133	0.631997	0.617398	0.639467
LINK2	0.572668	0.538624	0.918155	0.789256	0.565344	0.747918	0.653095	0.586884	0.558306
LINK3	0.533848	0.495920	0.930172	0.800020	0.549475	0.743702	0.585424	0.595725	0.638471
LSS1	0.611592	0.625152	0.651468	0.780215	0.703238	0.631615	0.489871	0.621455	0.830088
LSS2	0.601467	0.463131	0.692735	0.899815	0.507942	0.798728	0.718939	0.756858	0.566804
LSS4	0.585103	0.466813	0.715374	0.742437	0.457229	0.623820	0.717856	0.515999	0.488862
LSS5	0.453584	0.393073	0.739467	0.893575	0.365337	0.825272	0.712570	0.617065	0.440135
LSS6	0.319015	0.353831	0.695592	0.855778	0.325110	0.755693	0.752897	0.538054	0.422897
MIC1	0.602638	0.814214	0.596605	0.584948	0.900849	0.555528	0.443634	0.438984	0.712196
MIC2	0.587739	0.716539	0.527595	0.487380	0.919484	0.452954	0.358973	0.502045	0.773439
MIC3	0.564639	0.700032	0.477522	0.395888	0.827571	0.457205	0.356855	0.305532	0.676773
MIC4	0.621380	0.646695	0.479295	0.447563	0.872597	0.511110	0.377427	0.503280	0.667894
OPR1	0.521732	0.442284	0.732605	0.849416	0.468909	0.854899	0.660997	0.597179	0.562251
OPR2	0.522820	0.509898	0.678783	0.808109	0.422116	0.883417	0.733409	0.596633	0.503206
OPR3	0.713189	0.576645	0.695973	0.766759	0.513764	0.878070	0.751403	0.657453	0.551125
OPR4	0.592193	0.533318	0.682590	0.730482	0.528933	0.860667	0.745604	0.604536	0.553708
OPR5	0.609681	0.498102	0.733705	0.721185	0.508135	0.875943	0.793159	0.640592	0.527367
OPR6	0.561041	0.408097	0.646672	0.744827	0.493124	0.873611	0.644252	0.670396	0.522649
OPR7	0.606522	0.416589	0.618525	0.656228	0.483943	0.822858	0.646233	0.576792	0.479078
ORG1	0.545906	0.479389	0.542310	0.750029	0.415779	0.803720	0.825352	0.574735	0.501676
ORG2	0.493723	0.444009	0.577112	0.612507	0.314147	0.584852	0.811159	0.493063	0.445064
ORG3	0.635918	0.451976	0.662678	0.734741	0.425151	0.689933	0.890320	0.607983	0.421359
ORG4	0.551248	0.342522	0.599019	0.716332	0.328657	0.699005	0.894217	0.590083	0.350836
ORG6	0.296430	0.225212	0.473032	0.622023	0.334855	0.592622	0.779149	0.533551	0.357794
ORG7	0.538524	0.486119	0.546198	0.655011	0.406889	0.754253	0.849172	0.633186	0.415574
ORG8	0.361283	0.368308	0.540328	0.670329	0.333601	0.665226	0.802276	0.600172	0.275414
PROJ	0.635030	0.398227	0.648187	0.730148	0.500619	0.717692	0.690704	1000000	0.544057
TRAIN1	0.583566	0.577561	0.568874	0.625940	0.630812	0.572788	0.478363	0.607569	0.893482
TRAIN2	0.629244	0.778919	0.637022	0.582966	0.715502	0.562563	0.481353	0.384212	0.883368
TRAIN3	0.541143	0.613892	0.519566	0.458752	0.788572	0.452591	0.246965	0.415313	0.842839

Source: Primary data processing

Table 8. R².

	R ²
LSS implementation	0.776
Operational performance	0.764
Organizational performance	0.718

Source: Primary data processing

Table 9. Path coefficient.

	Operational Performance	Organizational Performance
LSS implementation	0.874	0.408
Operational performance		0.468

Source: Primary data processing

operational performance by 71.8%; the remaining 28.2% can be influenced by other constructs that are excluded from the research model. - - - - -
- - - - -

The next evaluation of the inner model is to look at the path coefficient. **Table 9** shows that the LSS implementation has a relationship with operational performance as much as 0.874. Meanwhile, through operational performance, LSS implementation influences organizational performance as much as 0.409. By contrast, LSS implementation can also influence organizational performance but only 0.408. Although the values are relatively close, this research reveals that LSS implementation can affect organizational performance further by considering operational performance. - - - - -
- - - - -

Hypothesis testing

At this stage, the model is evaluated using the t-test. The t-test is used for hypothesis testing, which is performed through the bootstrapping procedure on the SmartPLS 2 program. The significant level used is 95% ($\alpha = 0.05$) with a t-table of 1.96. If the t-statistic value ($| O/STDEV |$) is smaller than 1.96, then the hypothesis is rejected. - - - - -
- - - - -

Table 10 presents three CSFs, which have a positive relationship with LSS implementation, namely, management involvement and commitment (H₁), linking LSS to business strategy (H₄), and project selection and prioritization (H₅). Other CSFs, such as communication (H₂), education and training (H₃), and cultural change (H₆), do not have a positive relationship with LSS implementation.

The relationship between LSS implementation and operational performance (H₇) and that between LSS implementation and organizational performance (H₈) are proven positive. Moreover, operational performance has a positive relationship with organizational performance.

Table 10. Hypothesis testing.

	LSS Implementation	Operational Performance	Organizational Performance	Hypothesis Testing
Communication	0,170			REJECTED
Cultural change	0,345			REJECTED
LSS implementation		37,627	2,556	ACCEPTED
Linking LSS to business strategy	5,755			ACCEPTED
Management involvement and commitment	2,009			ACCEPTED
Operational performance			3,083	ACCEPTED
Organizational performance				ACCEPTED
Project selection and prioritization	4,456			ACCEPTED
Education and training	0,855			REJECTED

Source: Primary data processing

Discussion

Relationship between CSFs and LSS implementation

Previous studies revealed that MIC have an influence on the successful implementation of LSS in a company. Albliwi et al. (2014) and Laureani and Antony (2012) revealed that MIC are the most critical factors in implementing the LSS project. If no involvement from management is observed, then the LSS project in the company fails and results in no improvement in the company. In line with previous research, the present study also reveals that MIC have a positive relationship with LSS implementation.

Dora et al. (2016) argued that the lack of an appropriate communication structure is a major obstacle in the adoption of Lean manufacturing. Timans et al. (2012) revealed that communication has an important role in LSS application. However, according to Manville et al. (2012), an effective communication plan is in the bottom five rank of CSFs of LSS. In the current research, communication is also not considered a factor by respondents. In general, communication is important for top management to communicate the aim of LSS implementation in a company. However, in this research, building the awareness of LSS implementation benefits before building the communication between top management and operational workers is important.

Education and training are not only for practice but also increase the insights of workers to develop their soft skills to become more professional in the field of work they pursue. Dora et al. (2016) found that training is an important factor in the successful implementation of LSS. By contrast, training can be a significant burden for the limited budget of such companies (Brun, 2011). This reason can explain why in this study, education and training are not factors that influence the successful implementation of LSS. Basically, all hotel employees are willing to be trained

and educated by VHOs to improve their ability to provide the best service for hotel guests. However, whether VHOs have adequate capabilities and facilities to train employees is a huge challenge for VHOs.

Brun (2011) revealed that the relationship of LSS with business strategy is believed to help the successful implementation of LSS. Likewise, Laureani and Antony (2012) stated that the link between LSS and business strategy can significantly influence the successful implementation of LSS. In line with previous studies, the results of the statistical analysis test in this study reveal that linking LSS to business strategy has an influence on the successful implementation of LSS.

Only few previous studies suggested that project selection and prioritization is the determining factor for the successful implementation of LSS. Nevertheless, Manville et al. (2012) and Kamar (2014) stated that project selection and prioritization is the determining factor for the successful implementation of LSS. In line with this thinking, the present study finds that project selection and prioritization have a positive relationship with the successful implementation of LSS in hotels that are in partnership with VHOs.

According to Laureani and Antony (2012) and Brun (2011), cultural change has a significant influence on the successful implementation of LSS. However, Timans et al. (2012) argued that cultural change has no influence on the successful implementation of LSS. In line with such previous research, the statistical results on the variable of cultural change show that it has no influence on the successful implementation of LSS. These results can be obtained if an understanding of what and how LSS works for employees is lacking. They assume whether an LSS project is implemented in their work environment, and the results are the same without changing anything.

Relationship between LSS implementation and operational performance

Nawanir et al. (2013) stated that Lean manufacturing has a positive influence on operational performance. Similarly, Kamar (2014) revealed that the Six Sigma implementation has a significant effect on operational performance in the service industry. The success of LSS implementation is measured by the efficiency of the service process at hotels, which are in partnership with VHOs. These efficiencies (time, cost, and resource) can result in an increase in employee performance and an increase in service quality that can increase customer satisfaction at inns, which are in partnership with VHOs.

Relationship between LSS implementation and organizational performance

Nawanir et al. (2013) added that Lean manufacturing has a positive relationship with financial and non-financial performances. In line with such research, the present study suggests a positive relationship between the

successful implementation of LSS and organizational performance. Certainly, the efficiency carried out in the LSS project process reduces unnecessary costs, thus increasing hotel profitability. In addition, by running the LSS project, hotels in partnership with VHOs can highlight competitive advantages compared with other hotels of the same class to increase room rental sales.

Relationship between operational performance and organizational performance

Nawanir et al. (2013) stated that the relationship between operational and organizational performances is interdependent. The better the operational performance, the better the organizational performance. Meanwhile, Kamar (2014) argued that operational performance has a positive effect on financial performance, which is part of organizational performance. The present study adds that operational performance has a positive relationship with organizational performance. If a hotel has a good operational performance system and is organized, so that it can improve the quality of workers and customer satisfaction, then the sales level of hotel profitability can also increase.

Relationship between LSS implementation, operational performance, and organizational performance

According to the path coefficient in Table 8, the direct relationship between LSS implementation and organizational performance is weaker than the indirect relationship between LSS implementation and operational performance. This observation is in line with the research of Kamar (2014) who stated that if organizational performance is indirectly affected by LSS implementation, then it can be influenced by operational performance. Clearly, LSS implementation can improve operational performance, which can boost organizational performance financially and non-financially.

Conclusion

LSS, as a strategic tool and continuous improvement, can be basically used in various sectors of industries such as manufacturing and service industries, including the lower middle-class hospitality industry. CSFs in LSS implementation must be introduced to hotel stakeholders to improve operational and organizational performances. This study reveals that three out of the six CSFs of LSS have a positive relationship with LSS implementation in low-cost budget hotels in Semarang City, namely, MIC, linking LSS to

business strategy, and project selection and prioritization. The research also suggests that LSS can influence operational and organizational performances.

In addition, this study has some implications for VHOs and hotels. By implementing the LSS in the right way, low-cost budget hotels may have some chances to fix their service quality, including human and material resources, which can affect their financial and non-financial performances.

MIC are the most basic factors. Without a strong commitment from top management, businesses certainly cannot run well. Linking LSS to business strategy is also inseparable from the intervention of top management and employees to find the best way to make a continuous improvement in line with the business strategy. Supported by the project selection and prioritization of the right LSS project, the business goals of hotels in partnership with VHOs can be achieved to improve their business performance.

The implementation of LSS has the benefits of ensuring that services are in accordance with consumer needs, removing activities that do not add value (non-value added), reducing the incidence of damaged transactions, shortening the work cycle time, and providing the right service at the right time (Laureani, 2012). With these benefits, the performance quality of operational employees is influenced to gain customer loyalty, which also affects their satisfaction. Efficiency in the LSS process implementation reduces unnecessary costs to increase hotel profitability. In addition, by running the LSS project, hotels that are in partnership with VHOs can highlight competitive advantages compared with other hotels from the same class to increase room rental sales.

As revealed by Nawanir et al. (2013), the better the operational performance, the better the organizational performance. If VHOs choose to implement LSS, then the working environment changes and slowly affects the productivity of workers that can also increase customer satisfaction, which can improve organizational performance financially and non-financially.

All elements of CSFs are important to consider in the introduction of the LSS method in hotels that collaborate with VHOs. This study suggests staying focused on building communication, providing education and training, and applying different cultures consistently to apply the LSS method in a sustainable manner, even though the results of this study have a negative relationship with the successful implementation of LSS.

However, this research certainly cannot be separated from a limitation. Although basically, it aims to give advice to VHOs regarding LSS implementation to support improved operational and organizational performances, the reality is rather difficult because partners themselves do not understand LSS, although it has been implemented informally. Lack of respondents' understanding of the LSS concept became the main obstacle for the researchers in collecting the questionnaire. The bustle of the workers and innkeepers also slowed down the data collection and thus took a long time before the data

could be processed. Based on the limitations that the authors faced, two recommendations are presented. First, a comparative research between hotels that are and are not implementing LSS is suggested to determine the CSFs that can be considered in the LSS implementation in hotels and to figure out the impact to the performances of hotel industries. Second, future studies can conduct comparative research about the condition before and after implementing LSS and determine the difference in performance between late and future hotels with LSS implementation.

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