

# Lean Six Sigma Practices and Job Performance among University's Admin Staffs

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## Abstract

Empirical findings suggest that Lean Six Sigma (LSS) is an effective approach for enhancing both job and organizational performance across service and manufacturing industries. In recent years, LSS has been adopted in higher education institutions, offering a structured methodology to identify inefficiencies and implement sustainable improvements. However, research on LSS implementation within administrative functions in universities remains limited. Therefore, this study aims to examine the level of LSS practice implementation among administrative staff in a Malaysian public university (Research Objective 1), and to explore the relationship between these practices and job performance (Research Objective 2). Drawing from relevant literature, five key LSS practices were identified: Top Management Support, Continuous Improvement Culture, Communication, Training, and Employee Recognition and Rewards (ERR). This quantitative study employed a structured questionnaire distributed to 320 administrative staff, yielding 171 valid responses. Descriptive analysis showed that Top Management Support had the highest level of implementation, while Training was rated the lowest. Pearson correlation analysis revealed that all five LSS practices are significantly and positively correlated with job performance among the administrative staff. These findings offer valuable insights into how LSS practices influence job performance and underscore the importance of prioritizing LSS practices for successful LSS implementation and improved individual job performance.

**Keywords:** Lean Six Sigma, Job Performance, Top Management Support, Continuous Improvement Culture, Communication, Training, Employee Reward and Recognition

## Introduction

Lean Six Sigma (LSS) has been widely applied across various industries to enhance organizational performance, reduce waste, and improve quality (Sreedharan and Raju, 2016). In recent years, LSS practices have also been adopted by the higher education sector to improve the quality of education and services provided to students, faculty, and other stakeholders (Galdino et. al., 2017). However, empirical research on LSS within higher

education institutions has primarily focused on the adoption of Lean practices by management staff (Sunder and Antony, 2018). Despite the critical role of administrative personnel in the functioning of higher education institutions, there is a lack of research examining LSS implementation from the perspective of administrative staff.

Implementing LSS practices among administrative staff has the potential to enhance work performance, operational efficiency, and customer service (Albliwi et. al., 2015). Investigating the link between LSS practices and job performance among administrative staff is essential for higher education institutions aiming to improve their internal operations and maintain competitiveness in today's rapidly evolving environment. Such research can help institutions identify areas for improvement, design targeted training programs, and ultimately deliver better services to their stakeholders.

This study holds significant importance for the administrative workforce in Malaysian higher education institutions. It specifically addresses their needs and concerns by exploring the adoption and influence of LSS practices on their job performance. The study seeks to fill the gap in understanding the relationship between LSS practices and job performance among administrative staff in a Malaysian public university, through the following research objectives:

RO1: To determine the level of Lean Six Sigma practices among administrative staff in the public university.

RO2: To investigate the relationship between Lean Six Sigma practices and job performance among administrative staff in the public university.

By highlighting the potential of LSS practices to enhance job performance, this research aims to promote a culture of continuous improvement within Malaysia's higher education sector, ultimately contributing to institutional excellence.

#### *Previous Study on Lean Six Sigma Practices*

LSS combines Lean manufacturing and Six Sigma principles to enhance organizational performance by eliminating non-value-added activities and utilizing statistical tools for problem-solving (Antony et al., 2017). While LSS is widely implemented in manufacturing, it has also gained traction in service industries and higher education, offering a structured approach to identifying inefficiencies and implementing sustainable solutions (Murmura et al., 2021). A review of empirical studies on LSS practices reveals several common elements consistently identified by researchers as critical for effective LSS implementation across both manufacturing and service sectors. These practices are summarized in Table 1.

Table 1

*Previous Studies on Lean Six Sigma Practices*

LSS Practices	Antony et al. (2017)	Lande et al. (2016)	Henderson and Evans (2000)	Desai et al. (2012)	Bhat et. al (2020)	Singh & Rathi (2019)
Top Management Support	✓	✓	✓	✓	✓	✓
Employee Involvement		✓		✓		✓
Training and Education	✓		✓		✓	✓
Process Focus		✓				✓
Cultural Change		✓			✓	
Project Selection			✓		✓	
Continuous Improvement Culture	✓			✓	✓	✓
Communication	✓		✓		✓	✓
Reward and Recognition	✓	✓			✓	

This review synthesizes findings from various studies, highlighting essential LSS practices that support successful integration. Notable practices include Top management support, Employee involvement, Comprehensive training, Process focus, Cultural change, Strategic project selection and Continuous improvement.

Each of these practices plays a distinct role in LSS success. Top management support lays the foundation for transformation; employee involvement fosters collaboration and ownership; effective training ensures workforce readiness; process focus targets key improvements; cultural change encourages a learning mindset; strategic project selection aligns initiatives with institutional goals; and continuous improvement ensures long-term gains through monitoring and feedback.

However, with reference to Table 1.0, some practices, specifically project selection and process focus are beyond the job scope and responsibilities of the targeted population in this study, namely administrative staff in a public university. Therefore, these practices are excluded from the present research. Additionally, the practice of employee involvement was excluded as well, since administrative staff in the studied context typically do not have direct subordinates whose involvement could be assessed. Lastly, the practices of cultural change and continuous improvement are conceptually integrated into a single practice “continuous improvement culture” to streamline the framework. Accordingly, this study focuses on the following five LSS practices, Top management support, Training and education, Continuous improvement culture, Communication, Reward and recognition.

*Top Management Supports*

Top management support (TMS) refers to the active involvement and commitment of senior leaders in driving LSS initiatives and providing the necessary resources for their successful implementation (Gijo et. al, 2019). The significance of TMS in LSS deployment is consistently emphasized across various industries and organizational settings (Sordan et. al., 2020). Antony et al. (2017) highlighted that TMS plays a pivotal role in overcoming challenges and ensuring the success of LSS initiatives within higher education institutions. Their study underscores the importance of leaders actively championing and supporting LSS projects,

thereby demonstrating their commitment to process improvement and fostering a culture of continuous improvement. Based on this, the following hypothesis is proposed:

H1: There is a significant relationship between top management support practices and job performance among administrative staff in the public university.

#### *Training and Education*

Several studies have highlighted that training plays a critical role in the successful implementation of LSS. Bhat et. al (2020) emphasized the importance of comprehensive training programs in enhancing employees' understanding and proficiency in LSS tools and techniques. They recommended that training be tailored to meet the specific needs of both the organization and its workforce. Similarly, Henderson and Evans (2000) underscored the necessity of training in building a competent workforce for effective Six Sigma implementation. They emphasized the value of both technical and soft skills training to ensure employees are equipped with the required knowledge and capabilities. Furthermore, Jeyaraman and Teo (2010) stressed the importance of continuous training in sustaining an LSS culture and ensuring that employees remain updated on the latest tools and practices. Based on this, the following hypothesis is proposed:

H2: There is a significant relationship between training and education practices and job performance among administrative staff in the public university.

#### **Continuous Improvement Culture**

Continuous Improvement Culture (CUL) is critical to the success and sustainability of Lean Six Sigma (LSS) initiatives. It involves cultivating an organizational culture that prioritizes continuous improvement, promotes employee engagement, and supports ongoing learning and development (Cudney et. al. 2014). Several studies have highlighted the importance of CUL in driving LSS success. Desai et al. (2012), for example, assessed the critical success factors for LSS implementation in Indian industries, emphasizing that a strong CUL is vital for sustaining LSS practices and achieving long-term success. Their research underlines the need for organizations to create environments where employees are encouraged to participate in improvement initiatives, share knowledge and best practices, and adopt a mindset of continuous learning and development. Similarly, Antony et al. (2017) stressed the importance of fostering a CUL within higher education institutions. Their study suggests that cultivating a culture of continuous improvement enables organizations to overcome challenges, embrace change, and achieve sustainable benefits over the long term. Based on this, the following hypothesis is proposed:

H3: There is a significant relationship between continuous improvement culture practices and job performance among administrative staff in the public university.

#### **Communication**

The successful implementation of LSS initiatives is highly dependent on effective communication. Clear and timely communication ensures smooth information flow across all organizational levels, promotes collaboration, and facilitates alignment of goals and objectives (Timans et. al., 2012). Numerous studies have highlighted the critical role of communication in achieving LSS success. For instance, Singh & Rathi (2019) underscore the importance of communication in LSS implementation within higher education institutions. Their study highlights the need for well-established communication channels and strategies to disseminate information about LSS practices, engage stakeholders, and foster a shared

understanding of goals and expectations. Effective communication, particularly when it is timely, transparent, and inclusive, helps build trust, supports informed decision-making, and addresses challenges that may emerge during the implementation process (Raval et al., 2018). Based on this, the following hypothesis is proposed:

H4: There is a significant relationship between communication practices and job performance among administrative staff in the public university.

### **Reward and Recognition**

Employee recognition and reward (ERR) is a critical factor in the successful implementation of LSS initiatives. Bhat et al. (2020) emphasize the importance of acknowledging and rewarding employees' contributions to LSS projects, highlighting that a well-structured reward and recognition system can significantly enhance motivation, increase employee engagement, and promote a culture of continuous improvement. Similarly, Lande et al. (2016) identify employee recognition as one of the critical success factors for LSS implementation, particularly within small and medium enterprises. They argue that recognizing employees' efforts and achievements not only strengthens their commitment to LSS initiatives but also drives sustained organizational improvement. Based on this, the following hypothesis is proposed:

H5: There is a significant relationship between reward and recognition practices and job performance among administrative staff in the public university.

### **Research Methodology**

The population of this study comprises administrative staff at the public university, spanning various departments such as the bursary, student affairs, security, colleges, registrar's office, and faculties. According to the public university's Annual Report 2021, a total of 1,316 administrative staff participated in the Upskilling and Reskilling programs; this figure is therefore used to estimate the total population. Determining an appropriate sample size is crucial, and based on Krejcie and Morgan's sampling table, a sample of 306 respondents is deemed adequate for a population of 1,316. The sample of 306 administrative staff was selected using simple random sampling to ensure fair representation across departments and to enhance the generalizability of the study's findings.

The questionnaire, adopted from Kader, Ali, Choong, and Jayaraman (2016), comprises seven sections. Table 2 presents the detailed structure of the questionnaire. During the data collection process, confidentiality and ethical considerations were strictly observed. The collected data were checked for completeness and accuracy, then organized and prepared for analysis.

Table 2

*Structure of Questionnaire*

Part	Dimension	No. of Item
A	Demographic data	3
B	Top Management Support (TMS)	5
C	Continuous Improvement Culture (CUL)	5
D	Communication (COM)	5
E	Training (TRA)	6
F	Employee Recognition and Rewards (ERR)	5
G	Job Performance	6

Descriptive analysis was conducted to summarize demographic details and to address Research Objective 1 (RO1). To address Research Objective 2 (RO2), Pearson's correlation analysis was used. This statistical test measures the strength and direction of linear relationships between two continuous variables. Pearson correlation coefficients (r-values) range from -1 to +1, where values close to +1 indicate a strong positive relationship, values near -1 indicate a strong negative relationship, and values close to 0 suggest a weak or no linear relationship. Statistical significance will be assessed using p-values, with results below the threshold of 0.05 considered statistically significant.

The study garnered 171 responses from participants across various university departments. Initially, the questionnaire was distributed exclusively online, which resulted in a lower response rate. To improve participation, a physical version of the questionnaire was introduced alongside the online method. This combined approach significantly enhanced the response rate and provided broader representation across departments within the public university, ultimately enriching the dataset.

*Normality and Reliability Test*

A normality test was conducted on the organizational variables, Top Management Support (TMS), Continuous Improvement Culture (CUL), Communication (COM), Training (TRA), Employee Recognition and Rewards (ERR), and Job Performance to assess the distribution of the data. Based on the criteria outlined by Hair et al. (2010) and Byrne (2010), data are generally considered normally distributed when skewness values fall between -2 and +2, and kurtosis values lie between -7 and +7. The results indicated negative skewness values ranging from -0.784 to -1.063, suggesting a slight asymmetry toward higher scores, while positive kurtosis values ranging from 0.547 to 1.527 indicated a modestly peaked distribution. Although these figures deviate somewhat from a perfect normal distribution, the deviations remain within acceptable thresholds for further parametric analysis.

Reliability was assessed using Cronbach's Alpha for the constructs TMS, CUL, COM, TRA, ERR, and Job Performance. The results demonstrated high internal consistency, with Cronbach's Alpha values ranging from .910 to .933, well above the recommended minimum threshold of 0.70 suggested by Hair Jr. et al. (2015). These findings confirm the reliability of the measurement instruments, indicating that the items within each construct consistently measure the intended underlying dimensions.

*Addressing RO1: The Adoption Level of Lean Six Sigma Practices*

Descriptive analysis was employed to assess the extent of Lean Six Sigma (LSS) practices among UTM's administrative staff (RO1). This approach captured respondents' perceptions of various LSS-related elements, including top management support, continuous improvement culture, communication, training, employee recognition and rewards, and job performance. The results, summarized through mean scores and standard deviations (refer to Table 3), revealed varying levels of perceived implementation across these practices.

Table 3

*Descriptive Analysis Result*

<b>Variables</b>	<b>Mean</b>	<b>Std. Deviation</b>
Top Management Support (TMS)	3.8684	0.7877
Continuous Improvement Culture (CUL)	3.7427	0.7488
Communication (COM)	3.8754	0.7395
Training (TRA)	3.5230	0.7437
Employee Recognition and Rewards (ERR)	3.7509	0.7764

Among the dimensions, Communication (COM) received the highest mean score of 3.8754, indicating strong communication practices within the organization. This was closely followed by Top Management Support (TMS) at 3.8684, reflecting a high level of perceived leadership involvement in LSS initiatives. Employee Recognition and Rewards (ERR) and Continuous Improvement Culture (CUL) also received favorable ratings, with mean scores of 3.7509 and 3.7427, respectively, signaling a supportive culture that encourages improvement and acknowledges staff contributions.

In contrast, Training (TRA) recorded the lowest mean score of 3.5230, suggesting that this area may require further attention to enhance its effectiveness and alignment with LSS objectives. While the overall perceptions of LSS practices were positive, the relatively lower score for training highlights a potential gap that organizations could address to strengthen the overall impact of LSS implementation.

Comparisons with previous studies, such as Antony et al. (2017) and Henderson and Evans (2000), consistently highlight the pivotal role of top management support in the successful implementation of LSS across various organizational contexts. Although this study does not explicitly identify the lowest-rated practice, it does indicate that Training (TRA) received a comparatively lower mean score of 3.52, suggesting a potential area for enhancement in training programs related to LSS among administrative staff at the public university. In summary, the findings align with prior research, reaffirming the universal importance of top management support in driving LSS success. Meanwhile, the relatively lower score for training underscores an opportunity to refine and strengthen training initiatives to further improve LSS adoption within the university's administrative framework.

*Addressing RO2: The Relationship between Lean Six Sigma practices and Job Performance*

To address Research Objective 2 (RO2), which aims to assess the relationship between LSS practices and the job performance of convenience store administrative staff, a Pearson correlation test was conducted using SPSS to examine the relationships between the mean scores of the independent and dependent variables. The results are presented in Table 4.

Table 4  
*Pearson Correlation Analysis Result*

Hypo	LSS Practices	Correlation with Job Performance		
		p-Value	Coefficient (r)	Hypo test result
H1	Top Management Support (TMS)	<.001	0.938	Supported
H2	Continuous Improvement Culture (CUL)	<.001	0.943	Supported
H3	Communication (COM)	<.001	0.955	Supported
H4	Training (TRA)	<.001	0.952	Supported
H5	Employee Recognition and Rewards (ERR)	<.001	0.942	Supported

As shown in Table 4, the analysis indicated that the p-values for all hypotheses were less than 0.001, with correlation coefficients ranging from 0.938 to 0.955. These results suggest a significant and strong positive correlation between the five LSS practices, Top Management Support (TMS), Continuous Improvement Culture (CUL), Communication (COM), Training (TRA), and Employee Recognition and Rewards (ERR) with job performance. Consequently, all five hypotheses (H1, H2, H3, H4, and H5) are supported.

These findings align with prior research, which similarly emphasizes the positive relationships between LSS practices and job performance. Studies by Antony et al. (2017), Lande et al. (2016), Henderson and Evans (2000), Desai et al. (2012), Jeyaraman and Teo (2010) have identified critical practices, challenges, and tools for effective LSS implementation. The present study contributes to this body of literature by specifically demonstrating the strong linkage between LSS practices and job performance in the context of university administrative staff.

### Implication and Conclusion

This study, conducted at a public university in Malaysia with the participation of 171 administrative staff across various departments, employed a quantitative data collection approach to comprehensively assess the implementation level of Lean Six Sigma (LSS) practices. The combination of physical and online questionnaire distribution significantly improved the response rate, ensured broader departmental representation, and enriched the overall quality of the data collected.

Descriptive analysis provided a nuanced understanding of staff perceptions toward key LSS practices—Top Management Support (TMS), Continuous Improvement Culture (CUL), Communication (COM), Training (TRA), and Employee Recognition and Rewards (ERR). The findings offer implications on two key fronts. In relation to Research Objective 1 (RO1), the results highlight the need for organizations to develop training programs that are responsive to the specific roles and challenges faced by administrative staff. Emphasis is placed on tailoring training content for greater relevance and incorporating continuous feedback mechanisms to support iterative improvement.

To address Research Objective 2 (RO2), a Pearson correlation analysis was conducted to examine the relationships between LSS practices and job performance. The results revealed statistically significant and strong positive correlations between all five LSS practices and job performance, with correlation coefficients ranging from 0.938 to 0.955. These findings underscore the critical role of leadership support, a culture of continuous improvement,

effective communication, quality training, and employee recognition in enhancing job performance.

In light of these findings, the study recommends the implementation of a robust monitoring and evaluation system to assess the long-term impact of LSS practices on job performance. Regular feedback solicitation from administrative staff is also advocated to ensure that improvements remain adaptive and aligned with the evolving needs of the workforce.

In conclusion, the study emphasizes the importance of embedding LSS practices into organizational strategies to support effective implementation. Strengthening top management commitment, cultivating a culture of continuous improvement, ensuring clear and consistent communication, enhancing staff training, and recognizing employee contributions can collectively foster a high-performance work environment and promote operational excellence within the administrative functions of higher education institutions.

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### **References**

- Albliwi, S. A., Antony, J., and halim Lim, S. A. (2015), "A systematic review of Lean Six Sigma for the manufacturing industry", *Business Process Management Journal*, Vol. 21 No. 3, pp. 665-691, doi: 10.1108/BPMJ-03-2014-0019.
- Antony, J., Snee, R., and Hoerl, R. (2017), "Lean Six Sigma: yesterday, today and tomorrow", *International Journal of Quality and Reliability Management*, Vol. 34 No. 7, pp. 1073-1093.
- Bhat, S., Gijo, E. V., Rego, A. M., and Bhat, V. S. (2020), "Lean Six Sigma competitiveness for micro, small and medium enterprises (MSME): an action research in the Indian context", *The TQM Journal*, Vol. 33 No. 2, pp. 379-406.
- Cudney, E., Elrod, C. and Stanley, S. (2014), "A systematic literature review of Six Sigma practices in education", *International Journal of Six Sigma and Competitive Advantage*, Vol. 8 Nos 3/4, pp. 163-175
- Desai, D. A., Patel, M. B., & Patel, A. M. (2012). Lean manufacturing practices in the Indian automotive industry: a survey. *Journal of Manufacturing Technology Management*, 23(5), 599-614.
- Galdino de Freitas, J., and Gomes Costa, H. (2017), "Impacts of Lean Six Sigma over organizational sustainability. A systematic literature review on Scopus base", *International Journal of Lean Six Sigma*, Vol. 8 No. 1, pp. 89-108.
- Gijo, E. V., Jiju, A., and Vijaya, S. M. (2019), "Application of Lean Six Sigma in IT support services – a case study", *The TQM Journal*, Vol. 31 No. 3, pp. 417-435.
- Henderson, K., & Evans, J. R. (2000). Successful implementation of Six Sigma: benchmarking General Electric Company. *Benchmarking: An International Journal*, 7(4), 260-282.
- Jeyaraman, K., and Teo, L. K. (2010), "A conceptual framework for critical success factors of lean Six Sigma," *International Journal of Lean Six Sigma*, vol. 1, no. 3, pp. 191–215.
- Lande, M., Shrivastava, R. L., & Seth, D. (2016). Critical success factors for Lean Six Sigma in SMEs (small and medium enterprises). *The TQM Journal*, 28(4), 613-635.

- Murmura, F., Bravi, L., Musso, F., & Mosciszko, A. (2021). Lean Six Sigma for the improvement of company processes: the Schnell SpA case study. *The TQM Journal*, 33(7), 351-376
- Raval, S. J., Kant, R., and Shankar, R. (2018), "Lean Six Sigma implementation: modelling the interaction among the enablers", *Production Planning and Control*, Vol. 29 No. 12, pp. 1010-1029
- Singh, M., and Rathi, R. (2019), "A structured review of Lean Six Sigma in various industrial sectors", *International Journal of Lean Six Sigma*, Vol. 10 No. 2, pp. 622-664
- Sordan, J. E., Optime, P. C., Pimenta, M. L., Chiabert, P., and Lombardi, F. (2020), "Lean Six Sigma in manufacturing process: a bibliometric study and research agenda", *The TQM Journal*, Vol. 32 No. 3, pp. 381-399
- Sreedharan, V. R., and Raju, R. (2016), "A systematic literature review of Lean Six Sigma in different industries", *International Journal of Lean Six Sigma*, Vol. 7 No. 4, pp. 430-466, doi: 10.1108/IJLSS-12-2015-0050.
- Sunder, M. V., and Antony, J. (2018), "A conceptual Lean Six Sigma framework for quality excellence in higher education institutions", *International Journal of Quality and Reliability Management*, Vol. 35 No. 4, pp. 857-874.
- Timans, W., Antony, J., Ahaus, K., and Solingen, R. (2012), "Implementation of Lean Six Sigma in small and medium-sized manufacturing enterprises in The Netherlands", *Journal of Operational Research Society*, Vol. 63 No. 3, pp. 339-353