

INVESTIGATING THE FACTORS EFFECTING SERVICE QUALITY UNDER LEAN IMPLEMENTATION WITHIN COMMERCIAL AIRLINES INDUSTRY IN THAILAND

Walwisa Pongugsorn¹ and Nattapan Buavaraporn²

^{1,2} International school of management, University of the Thai Chamber of Commerce

126/1 Vibhavadi Rangsit Rd., Dindang, Bangkok 10400, Thailand

¹ire.walwisa@gmail.com, ²nattapan_bua@utcc.ac.th

Abstract

Lean has been widely adopted in organizations as the strategy for attaining the equilibrium between quality, productivity, cost, profitability and customer's contentment with proven result from a number of business improvement engagement. This research aims primarily to investigate the factors effecting service quality under Lean Implementation within the major commercial airlines industry in Thailand. Based on extant literature, six main factors are of processes, planning and control, HR, top management and leadership, customer relations and supplier relations. Through the interviews conducted with airlines practitioners, the employee engagement is considered another additional factor affecting the effectiveness of Lean implementation. In total, 400 questionnaire survey were gathered from four commercial airlines implemented lean as part of strategic improvement initiatives. The findings indicated that there are significant positive relationships of HR, top management & leadership, process, planning & control, customer relations, supplier relations, and employee engagement toward the overall service quality of Airlines.

Introduction

Following the report of UNWTO (2011), more than half of all international tourists arrived at the destination through air transport, in which the growth of air transport which is the major element of civil aviation is naturally connected to

the enlargement of tourism industry. The majority of international air passengers are travelling for the purpose of leisure or professional tourism mainly, and thus the aviation is key success for domestic tourism development in many countries (UNWTO, 2011). Further, air transportation has become the key



component for global economic development. Together with tourism industry when taking all direct, indirect and convinced effect into account, it is representing the single importance economic sector (Oxford Economics, 2012). Thailand's airport capability is the third biggest in the ASEAN region after only Singapore and Malaysia (ICAO, 2013). Airport of Thailand (AOT) forecast that in the year 2015, AOT will serve more than 56 million passengers in response to growing demand from tourism sector.

AOT (2014) reported that revenues of Thailand's aviation business in 2013 was THB260 billion, which contributed mainly by low cost airline and full service airline for approximately THB35 billion and THB224 billion, respectively. Since 2009-2013, the average overall revenues from over Thai airlines had grown by 9.1% with the majority of growth from low cost airlines, whose average revenues growth was 31.5 percent; while the full service airline revenue growth was only 6.9 percent. From this percentage of total revenue, showing that low cost airlines has been increasing in market shares. Though full service airline presently govern the market share but market share of low cost airlines are now growing quickly and cultivating the market share from the main players in other segment.

This research aims to provide a guideline for the overall commercial airline industry in Thailand focusing on the service quality improvement under Lean implementation, and to overcome the barriers that act as obstruct in the Lean implementation within major commercial airline industry in Thailand. Additional, the overall service quality

under Lean framework can be used for any airline industry, irrespectively of location, as it consolidates all Lean requirements. Moreover, the findings of this research can further offer comprehension into ASEAN Airlines Industry in general and particular, as most of ASEAN countries share similar features, exceptionally with consider to external factors. Finally, the Lean operation framework can be used as a checklist for managers who want to consider in implementing service quality assurance under Lean in the future or to prepare for Lean readiness, as it will empower them to learn whether the organisation meets the essential for implementing Lean, as suggested by Al-Najem (2014).

Literature review

Lean operation

Lean is described as a rule of optimization methodology that focuses on improving the efficiency and effectiveness of a process by eradicating activities that do not add value to the customers (Jones and Mitchell, 2006). Lewis (2000) argued that Lean can help organization within any divisions to complete important performance improvement. The improvement can be in many measurements, including those of productivity, quality, cost capabilities with profitability and result of customer satisfaction (Ohno, 1998). Womack et al (1990) preserved the claim that Lean is a business methodology and not naturally a compilation of tools and techniques. Liker (2004) agreed with this concept by claiming that Lean is management interference and greatest test is either can lead to the better performance.



Lean has its roots in the manufacturing especially in the car industry which having been developed from the Toyota Production System (Ohno, 1998). Later it has been adapted and enlarging quickly into the new sectors such as many private manufacturing, construction, logistics & transportation and service organizations such as health, insurance, education, bank and aviation, as suggested by Wallace (2006). According to Bergmiller and McCright (2009), Lean can help to increase efficiency, reduce customer response time, reducing costs, improve profitability and enhance the organisation's attraction. In additional, Lean can lead to sustainable development by increasing customer satisfaction and communication, and reducing cost and delivery time as it is a systematic approach that helps managers to identify wastes and exclude them from the organisation at every stage in the operation, which will lead to better organisational performance and make the company waste-free (Upadhye et al., 2010a).

Lean represents a useful philosophy that can be employed in any organizations regardless of their activities, sizes, or sectors. However, these benefits cannot be achieved unless the organisation addresses the important issues involved in Lean. According to Holweg (2007), the biggest challenge facing

organizations is the understanding of Lean's core value as a philosophy and the appreciating how the organization can deal with national and organizational culture differences. Indeed, organizational culture is the main driver for creating strategies to achieve the goals of the organization (Wong, 2007). Boyer and Sovilla (2003) said that the main obstacles for Lean include misunderstanding and undervaluing the managerial and cultural impacts of it and the fact that many organizations do not know the requirements for creating a Lean culture, conflicting measures and illusions regarding the progress, a failure to maintain Lean principles and using Lean as a set of tools rather than a philosophy for doing business.

Service quality under lean implementation

The literature revealed several factors and issues that can obstruct Lean implementation, and several essential aspects that need to be taken into account to implementing Lean. These factors are the bases of Lean Systematic that organizations need to consider these factors; and without them Lean cannot be established or sustained. Based on the previous research of Al-Najem (2014), the required factors for implementing Lean shown in the figure 1 below.

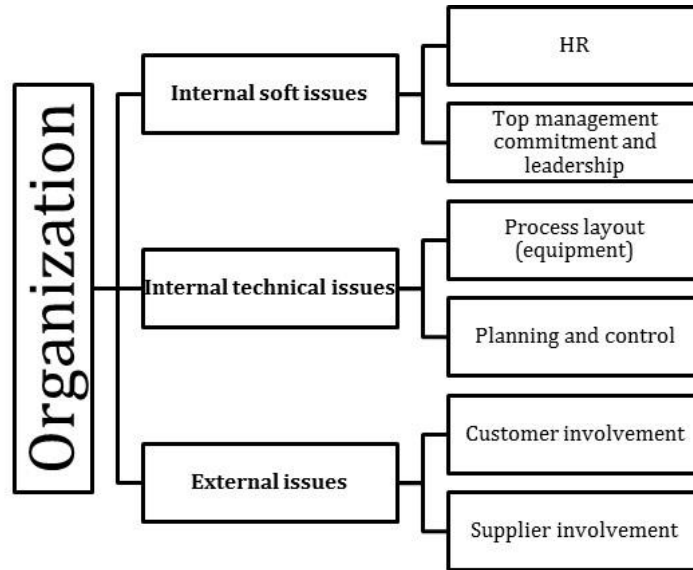


Figure 1 Factors effecting service quality under lean implementation

Source: Al-Najem (2014)

While there are only six factors affecting the Lean operation, as cited in the previous study of Al-Najem (2014) that investigated the factors affecting the readiness of Lean operation in manufacturing sector in Kuwait in six areas, including HR, top management & leadership, process, planning & control, customer relations, and supplier relations. Following the qualitative research with the in depth interviews with airlines' management people in Thailand, however, this research proposed that employee engagement is another important factor that would affect the success of Lean, especially in the service industries such as airlines.

Further, the previous study focused on the readiness in the implementation of Lean operation, but this research aims to investigate the impact of Lean toward the overall service quality of the airline, not its readiness as all the airlines in this study had already implemented Lean. In other words, the improvement in seven areas, including HR, top management & leadership, process, planning & control, customer relations, supplier relations, and employee engagement under Lean would lead to better performance, which in turn would help to enhance the competitive advantage in the competitive marketplace.

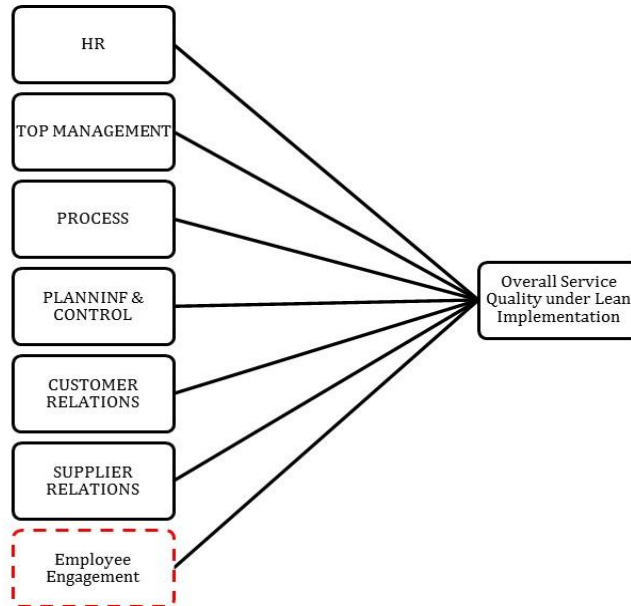


Figure 2 Conceptual framework

Human resource (HR)

Training, empowerment, involvement and recognition are important factors in terms of Lean success (Kumar et al., 2009; Zu et al., 2010; Mefford, 2009; Zhang et al., 2012; Goodson, 2002), and are required in order to produce high-quality products. Employees are the core of the company, and therefore need to be encouraged and involved in company strategy and direction, especially when implementing Lean. Without skilled workers, Lean will not last (Tsang and Antony, 2001). This category represents the core of Lean, as many authors and researchers have stressed the role of HR.

Top management and leadership

The level of top management commitment and leadership is crucial for Lean. This commitment is manifest in

many forms, such as providing clear vision, allocating resources and funding, and providing strategic leadership (Tsang and Antony, 2001). To ensure the success of Lean implementation, it is essential for top management to create a quality culture by empowering other employees (Zhang et al., 2012). This factor has been emphasized in various articles (Zu et al., 2010; Mefford, 2009; Kumar et al., 2009; Achanga et al., 2006; Panizzolo, 1998). Without top management and leadership commitment, Lean implementation will not succeed.

Processes

Process management is one of the most important factors in terms of identifying non-value-adding activities and increasing quality. Ineffective processes lead to more waste and lower



productivity per employee (Zhang et al., 2012; Goodson, 2002; Lewis, 2000). Service processes are defined by Lovelock (2010) as “an activity or a series of activities of more or less intangible that normally (but not necessarily) take place in interactions between customers and service employees and/or physical resources or goods and/or systems of the service provider, which are provided as solutions to customer problems”.

Planning and control

Lewis (2000) and Goodson (2002) had highlighted the importance of planning and control, in which the use of quality control systems and scientific methods is employed to solve problems, as well as to ensure the quality standard as it is key for enhancing the firm’s performance and eventually leads to higher levels of customer satisfaction. Lovelock (2010) pointed that service firms normally encounter more problem in quality management than those of manufacturing firms as service cannot be inventoried while consumers may have different experience and perception when the service was delivered.

Customer relations

As highlighted by Zu et al. (2010) and Panizzolo (1998), maintaining good customers is the aim of any company, since all departments are ultimately working to satisfy the customers’ wants and needs. To this end, the company must understand its customers’ requirements (Zhang et al., 2012). Moreover, the

organization needs to respond quickly to customer complaints. Meanwhile, Lean is unlikely to be applicable if the customer demands are unstable or unpredictable, so they organisation must have close relationships with its customers.

Supplier relations

Similarly, this factor had been mentioned in Zu et al. (2010), Zhang et al (2012), and Panizzolo (1998) which suggested that quality suppliers enable companies to produce quality products. It is important in Lean, as the long-term relationships with suppliers will enable the company to perform JIT, which is essential for Lean. They further explained that having fewer suppliers and long-term relationships with them, and making suppliers’ part of the firm’s team, is healthy and essential for Lean.

Employee engagement

As suggested by Kahn (1990), employee engagement is an approach in workplace resulting in the right conditions for all organizational members for giving their best each day, committing to the organizational goals and values instead of one’s goals or values, inspiring to contribute to the organizational achievement, as well as enhancing their well-being. Kahn (1990) also pointed out that employee engagement relies on the establishment of integrity, trust, two-ways commitment and communication among the organization itself and members, which can lead to more chances of business success, better



organizational and individual performance, productivity and well-being. Further, employee engagement can be changed over time even better or worse, fast or slow.

Research methodology

Research approaches & data collection

Following the suggestion of Creswell (2003) mixed methodological approach was adopted, in which qualitative research intended to investigate in depth understanding toward the issues and to further explore the another factor affecting the Lean implementation and its effectiveness; and quantitative research was applied to test the hypothesis and verified the theoretical framework mentioned in previous studied in the case of Thailand's aviation industry. A mixed method was designed to avoid the weakness of a single method and to enhance credibility and validity by collecting data from multiple sources. The qualitative research was conducted with one manager from four commercial airlines each through face-to-face interviews. Meanwhile, the quantitative research was conducted with questionnaire survey for 400 respondents with 100 respondents from four commercial airlines each with the adoption of convenience sampling method, as suggested by Zikmund et al (2012)

Data analysis

The reliability test was performed to make sure that there was internal consistency to carry on doing further analysis. Descriptive analysis was used to summarize the data that had been gathered in term of frequency, percentage, mean, and standard deviation. For the hypothesis testing, the independent sample t-test was used to compare the mean scores for two different groups to see if there was a significant difference between two groups of full service airlines and low cost airlines. Further, Pearson correlation and multiple linear regression was carried out with different variables to understand the relationship between two or more variables.

Research results

Results of qualitative research

The finding from the qualitative research revealed that the key strengths of their airlines were ranging from the route network, quality of service, hospitality of service staffs, and reasonable service fees, as well as international reputation of the airline. The frequency of flying with large number of passengers provided the low cost airline with relatively lower fixed costs for a unit, which in turn allows the airlines to offer a service to diverse group of customers to gain large customer base at relatively low costs. To further enhance the service, low cost airline may need to have a wide network



with other airlines worldwide. Meanwhile, the capital investment for upgrading the aircrafts involves with very high investment. For full service airlines, it is very difficult to take the advantage from economy of scale and higher prices of service. Admittedly, management people from full service airlines pointed out that the operation costs of airlines were very high.

From the observation, most of service staffs from both full service airlines and low cost airlines were very friendly and polite, while aircrafts were also modern, clean, and tidy. The management people viewed that service price, flying schedule, the quality of service, and reputation and image were the most important factors affecting the customers' decision in selecting the airline for their air travel. Despite tough competition in the industry, the airline industry in Thailand as well as in the region would remain positive, thanks to lower service charge, and growing tourism across the globe. Further, political conflict, global recession, as well as crimes and security concerns were the major factors that might adversely affect the operations. In focusing on lead operations, the management people viewed that people plays the vital role in driving the Lean operations. In other word, the key success in quality management is to focus on the ways to achieve it. For the airline industry, the major goal of quality management is to build customer

satisfaction, in which management practices are considered as an upstream of quality management. Aside from the managers at all level, the airline's key staffs include pilot, co-pilot, flight engineer, flight attendance, and ground service staffs. There is no worry about the increased competition after the implementation of AEC as the airline industry in Thailand stands better position in the international market as compared to those in ASEAN region.

Results of quantitative research

From 400 respondents who were the existing employees of airlines, namely Thai International Airways, Bangkok Airways, Air Asia, and Nok Air. About 57% were males, and 43% were females. Respondents' ages were in a range of 21 years old to over 50 years old. Most of them were between 21 -35 years old and were single. Bachelor's degree was the biggest group of respondents' education level, followed by lower than Bachelor's degree, and Master's degree, respectively. None of them had education of higher than Master's degree. Respondents' monthly incomes were ranging between lower than 20,000 baht to more than 80,000 baht a month. They earned about 20,001 – 40,000 baht per month mostly. Based on respondent's working experience with the airline, most of them had worked for the airline for about 4 – 10 years.

**Table 1** Profiles of respondents (N=400)

Items	Frequency	Percent (%)
Airline:		
Thai International Airways	100	25.0
Bangkok Airways	100	25.0
Air Asia	100	25.0
Nok Air	100	25.0
Gender:		
Male	228	57.0
Female	172	43.0
Age:		
21 - 35 years old	187	46.8
36 - 50 years old	150	37.5
more than 50 years old	63	15.8
Marital status:		
single	198	49.5
married	184	46.0
others	18	4.5
Level of education:		
lower than Bachelor's degree	79	19.8
Bachelor's degree	263	65.8
Master's degree	58	14.5
Monthly income (Baht):		
less than 20,000 baht	32	8.0
20,001 - 40,000 baht	228	57.0
40,001 - 80,000 baht	98	24.5
more than 80,000 baht	42	10.5
Length of staying:		
less than 6 months	24	6.0
6 - 12 months	65	16.3
1 - 3 years	118	29.5
4 - 10 years	136	34.0
more than 10 years	57	14.2

From the hypothesis testing, Pearson correlation coefficient was used to investigate the relationships between HR, top management & leadership, process,

planning & control, customer relations, supplier relations, and employee engagement toward the overall service quality of Airlines.

Table 2 Pearson correlation analysis

		HR	Top management & Leadership	Process	Planning & Control	Customer Relation	Supplier Relation	Employee Engagement	Overall service quality
HR	Pearson Correlation	1	.663**	.346**	.685**	.573**	.025	.152**	.362**
	Sig. (2-tailed)		.000	.000	.000	.000	.621	.002	.000
Top management & Leadership	Pearson Correlation	.663**	1	.393**	.487**	.290**	-.158**	.148**	.303**
	Sig. (2-tailed)	.000		.000	.000	.000	.002	.003	.000
Process	Pearson Correlation	.346**	.393**	1	.144**	.111*	.008	0.0890448	.183**
	Sig. (2-tailed)	.000	.000		.004	.026	.867	.075	.000
Planning & Control	Pearson Correlation	.685**	.487**	.144**	1	.716**	.246**	.508**	.617**
	Sig. (2-tailed)	.000	.000	.004		.000	.000	.000	.000
Customer Relation	Pearson Correlation	.573**	.290**	.111*	.716**	1	.445**	.495**	.568**
	Sig. (2-tailed)	.000	.000	.026	.000		.000	.000	.000
Supplier Relation	Pearson Correlation	.025	-.158**	.008	.246**	.445**	1	.512**	.562**
	Sig. (2-tailed)	.621	.002	.867	.000	.000		.000	.000
Employee Engagement	Pearson Correlation	.152**	.148**	0.0890448	.508**	.495**	.512**	1	.643**
	Sig. (2-tailed)	.002	.003	.075	.000	.000	.000		.000
Overall service quality	Pearson Correlation	.362**	.303**	.183**	.617**	.568**	.562**	.643**	1
	Sig. (2-tailed)	.000	.000	.000	.000	.000	.000	.000	

From the table 2, the finding indicated there is a significant relationship of HR, top management & leadership, process, planning & control, customer relations, supplier relations, and employee engagement toward the overall service quality of Airlines, with the level of confidence of 99%. The relationship of these factors toward the overall service quality of airlines are positive. Among them employee engagement had the strongest impact toward the overall service quality ($r = 0.643$), followed by planning & control ($r = 0.617$), customer relations ($r = 0.568$), supplier relations ($r = 0.562$), HR ($r = 0.362$), top management & leadership ($r = 0.303$), and process ($r = 0.183$), respectively. Further, the finding from multiple linear regression analysis suggested that the

elements of Lean operation can be used to explain the overall service quality of airlines. Following the results of t-test, the finding indicated that there are only four elements of Lean operation that can be used to explain the overall service quality of airlines under this model, which are top management, planning and control, supplier relations, and employee engagement.

Also, the independent sample t-test was used to explore the difference of service quality and management practices under Lean operation. There are four airlines in this study, in which Thai International Airways and Bangkok Airway are classified as full service airline; while Air Asia and Nok Air are classified as low cost airline.

Table 3 The independent sample t-test

	Airline	N	Mean	Std. Deviation	Sig.
Overall service quality	Full Service	200	4.0165	.32762	.000
	Low Cost	200	3.7350	.46900	
HR	Full Service	200	3.8050	.50263	.625
	Low Cost	200	3.8320	.59696	
Top management & Leadership	Full Service	200	3.8867	.47663	.789
	Low Cost	200	3.9000	.51877	
Process	Full Service	200	3.8038	.35344	.217
	Low Cost	200	3.7538	.45007	
Planning & Control	Full Service	200	3.8275	.35390	.174
	Low Cost	200	3.7738	.43236	
Customer Relation	Full Service	200	4.1025	.58681	.000
	Low Cost	200	3.8863	.61124	
Supplier Relation	Full Service	200	3.9990	.36834	.000
	Low Cost	200	3.5440	.43843	
Employee Engagement	Full Service	200	4.0700	.51305	.479
	Low Cost	200	4.1040	.44426	

From table 3, the results suggested that there is significant difference in service quality between full service airlines and low costs airlines, seeing the p-value of less than 0.05. The service quality of full service airlines seemed better than those of low cost airlines. Meanwhile, the finding indicated that there is significant difference in the management practice of customer relations and supplier relations between full service airlines and low costs airlines, seeing the p-value of less than 0.05. The customer relations and supplier relations of full service airlines seemed to be greater than those of low cost airlines. Also, the finding indicated that there is no significant difference in management practices of HR, Top management and Leadership, planning and control, Process, as well as Employee engagement between full service airlines and low costs airlines, seeing the p-value of more than 0.05. The management practices of both types of

airlines in these areas are considered as high based on the mean values.

Conclusions

The finding indicated significant relationships of HR, top management & leadership, process, planning & control, customer relations, supplier relations, and employee engagement toward the overall service quality of Airlines, with the level of confidence of 99%. The relationship of these factors toward the overall service quality of airlines are positive. Among them, supplier relation had the strongest impact toward the overall service quality, followed by employee engagement, planning & control, top management & leadership, customer relations, HR, and process, respectively. Further, the finding from multiple linear regression analysis suggested that there are only three elements of Lean operation that can be



used to explain the overall service quality of airlines under this model, which are top management & leadership, supplier relations, and employee engagement. Also, the results suggested that there is significant difference in service quality between full service airlines and low costs airlines. The service quality of full service airlines seemed better than those of low cost airlines. Meanwhile, the finding indicated that there is significant difference in the management practice of planning and control between full service airlines and low costs airlines. The planning and control of full service airlines seemed to be greater than those of low cost airlines. Further, the results showed that there is significant difference in the management practice of supplier relations between full service airlines and low costs airlines. The supplier relations of full service airlines seemed to be better than those of low cost airlines. Meanwhile, the finding indicated that there is no difference in management practices of HR, top management and leadership, process, customer relation, as well as employee engagement between full service airlines and low costs airlines.

The recommendation of this research is to focus on these three elements of Lean operations, which are top management & leadership, supplier relations, and employee engagement for the further improvement of service quality on continuous basis. First, the airline should try to further enhance the leadership through empowerment in the

organization. The appropriate training and development program should also provide to management people to ensure that they can encourage and coach their subordinates. The management should put more effort in arranging people in the position where they can utilize their skills, qualifications, and experience. Also, leader may need to motive them through providing job security and career advancement. The finding revealed that there is a strong positive relationship between top management and leadership toward HR functions in the organization. It can be concluded that the effectiveness of top management and leadership will help to enhance the effectiveness and efficiency of HR functions; while the improvement of effectiveness and efficiency of HR functions will lead to enhance the effectiveness of top management and leadership within the organization. Second, it is suggested that the airline should employ more local suppliers to avoid shipment delays to enhance the supplier relations. The development of effective communication between and airlines and suppliers would help suppliers to have better cooperation and commitment to maintain a long-term relationship. Only the good suppliers should be maintain as to reduce the number of suppliers in each category. Third, for the enhancement of employee engagement, employees should be treated honestly and fairly in every transaction. The airline should provide them with attractive incentive and growth opportunities. Finally, for full service



airline, the overall service quality remained better than those of low cost airlines but the gap is relatively small. The full service airline should try to further enhance its service quality, especially in the enhancement of top management and leadership, planning and control, and employee engagement to be better than those of low cost airlines in order to survive in the market.

For the future research, the outcomes of this research may be limited to only them that have already implemented its strategies under the Lean and may not be applicable for other airlines even they are in the same industry or even same geographical locations based on cultural

factor. Therefore, further study would be suggested to take place in other airlines in other geographical location for the generalization of the study. To learn more about organizational factors that might affect the service quality, extensive study should include facts like organizational cultures, structures, sizes, income level, and others to know opinions of respective operators. For example, there might be some difference in Lean among small and large airlines. And thus, the outcomes of future research will reach to a wider range of airline industry. In addition to these, further study should analyze the difference between customers and employees' perspective toward the issue in this study.

References

- Achanga, P., Shehab, E., Roy, R., and Nelder, G. (2006). "Critical success factors for lean implementation within SMEs". *Journal of Manufacturing Technology Management*, 17(4), 460-471.
- Al-Najem, M., Dhakal, H., and Bennett, N. (2012). "The role of culture and leadership in lean transformation: a review and assessment model". *International Journal of Lean Thinking*, 3(1), 119-138.
- AOT (2014), "Annual Report 2014". Viewed 15 November 2015, from http://www.airportthai.co.th/uploads/files/Annual_Report_of_2014_2.pdf
- Bergmiller, G. G., and McCright, P. R. (2009). "Parallel Models for Lean and Green Operations". *Industrial Engineering Research Conference*. Miami, Florida.
- Boyer, M., and Sovilla, L. (2003). "How to identify and remove the barriers for a successful lean implementation". *Journal of ship production*, 19(2), 116-120.
- Creswell, J.W. (2003). *Research Design: Qualitative and Quantitative Approaches*. Sage Publications: Thousand Oaks, CA.



- Frank, F.D., Finnegan, R.P. and Taylor, C.R. (2004) 'The race for talent: retaining and engaging workers in the 21st century', *Human Resource Planning*, 27(3), pp12-25
- Goodson, E. (2002). "Read a plant fast". *Harvard Business Review*, 105-113.
- Holweg, M. (2007). "The genealogy of lean production". *Journal of Operations Management*, 25(2), 420-437.
- ICAO (2013), *Global Air Transport Outlook to 2030 and trends to 2040*. ICAO: Montréal, Canada.
- Jones, D. and Mitchell, A. (2006). *Lean Thinking for the NHS*. NHS Confederation, London.
- Kahn, W. A. (1990). "Psychological conditions of personal engagement and disengagement at work". *Academy of Management Journal*, 33, 692-724.
- Kotler, P. (2012). *Marketing Management*. Prentice Hall. N.Y.
- Kumar, M., Antony, J., and Douglas, A. (2009). "Does size matter for Six Sigma implementation?: Findings from the survey in UK SMEs". *The TQM Journal*, 21(6), 623-635.
- Lewis, M.A. (2000). "Lean production and sustainable competitive advantage". *International Journal of Operations & Production Management*, 20(8), pp.959-78.
- Liker, J. K. (2004). *The Toyota Way: 14 Management Principles from the World's Greatest Manufacturer*. New York, NY: McGraw-Hill.
- Lovelock, C. H. (1991). *Services marketing*. Englewood Cliffs, NJ: Prentice-Hall Inc.
- Maxwell, J. (2000). *Developing the Leader Within You and The 21 Irrefutable Laws of Leadership and Failing Forward*. The INJOY Group.
- Mefford, R. N. (2009). "Increasing productivity in global firms: The CEO challenge". *Journal of International Management*, 15(3), 262-272.
- Ohno, T. (1998). *The Toyota Production System: Beyond Large-Scale Production*. Portland, OR: Productivity Press.
- Oxford Economics (2012), "Aviation: Benefits Beyond Borders", viewed 12 October 2015, from http://www.aviationbenefitsbeyondborders.org/sites/default/files/pdfs/AB_BB_Medium%20Res.pdf
- Panizzolo, R. (1998). "Applying the lessons learned from 27 lean manufacturers: The relevance of relationships management". *International Journal of Production Economics*, 55(3), 223-240.



- Tsang, J., and Antony, J. (2001). "Total Quality Management in UK service organizations: some key findings from a survey". *Managing Service Quality*, 11(2), 132-141.
- UNWTO (2011), "Global Air Transport Outlook to 2030 and trends to 2040", ICAO: Montréal, viewed 10 October 2015, from http://dtxtq4w60xqpw.cloudfront.net/sites/all/files/pdf/unwto_2030_ga_2011_korea_1.pdf
- Upadhye, N., Deshmukh, S. G., and Garg, S. (2010a). "Lean manufacturing system for medium size manufacturing enterprises an Indian case". *International Journal of Management Science and Engineering Management*, 5(5), 362-375.
- Wallace, J. (2006). *Aerospace notebook: putting 'lean' processes into all of Boeing*. Seattle Post-intelligencer.
- Womack, J. P., Jones, D. T., & Roos, D. (1990). *The Machine That Changed the World*. New York, NY: Simon & Schuster.
- Wong, M. (2007). The role of culture in implementing lean production. *International Federation for Information Processing (IFIP)*. 246, pp. 413- 422.
- Zikmund, W. G., Babin, B. J., Carr, J., and Griffin, M. (2012). *Business Research Methods (9th ed.)*. Mason, USA: South-Western College
- Zhang, Q., Abbas, J., Zhu, X., and Shah, M. (2012). "Critical success factors for successful lean six sigma implementation in Pakistan". *Interdisciplinary journal of contemporary research in business*, 4(1), 117-124.
- Zu, X., Robbins, T. L., and Fredendall, L. D. (2010). "Mapping the critical links between organizational culture and TQM/Six Sigma practices". *International Journal of Production Economics*, 123(1), 86-106.



Appendix A

Questionnaire

Kindly complete all questions by marking “✓” in the space given below. There is no right or wrong answer,

Airline

- Thai Airways Bangkok Airways
 Nok Air AirAsia

Part 1: Respondent general information

1. Gender

- Male Female

2. Age

- Less than 20 years old 20 – 35 years old
 36 – 50 years old More than 50 years old

3. Marital Status

- Single Married Others

4. Educational Background

- Lower than Bachelor's Degree
 Bachelor's Degree
 Master's Degree
 Higher than Master's Degree

5. Monthly Income

- Less than THB 20,000
 THB 20,000 – THB 40,000
 THB 40,001 – THB 80,000
 Over than THB 80,000

6. How long you been an employee of the airline?

- Less than 6 months
 6 -12 months
 1-3 years
 4 - 10 years
 More than 10 years



Part 2: Attitude toward factors

Please use the following scales 1= Strongly Disagree, 2= Disagree, 3= Neutral, 4= Agree and 5= Strongly Agree						
Item No.	HR	1	2	3	4	5
A1	Employees are qualified enough to contribute to solving problems and are able to work as a team.					
A2	Employees are able to perform different tasks.					
A3	Incentive and bonuses are available for employees who help to improve processes and eliminate unnecessary moves.					
A4	Each employee has a clear understanding of his job description.					
A5	Departmental and employee relation are good, and conflict barely occurs.					
A6	Employees are empowered that their suggestions and ideas are actively used and implemented.					
A7	Employees act according to the group's interest in which the evaluation is based on group performance.					

Item No.	Top management and leadership	1	2	3	4	5
B1	Manager encourages and coaches employees by visiting the workplace on a regular basis					
B2	People are located in the organization where they can utilize their skills, qualifications, and experience.					
B3	People have a job security and they are regularly promoted to managerial positions.					
B4	The organization invests in training program and encourages cross job training					
B5	The organization uses external experts and consultants for evaluating the overall organizational performance as well as for improving quality level.					



Item No.	Process	1	2	3	4	5
C1	The processes used within similar operations are placed close to each other for eliminating unnecessary moves.					
C2	Each working zone is controlled and operated by qualified and well-trained employees.					
C3	The process flow of service is smooth and continuous as the staffs and equipment are grouped.					
C4	Services are not produced unless orders for them are received from customers.					
C5	Service staffs are trained on a regular basis so that they can provide the highest level of service quality.					

Item No.	Planning & control	1	2	3	4	5
D1	A focus group of service employees is conducted on a regular basis to identify wastes and quality gap as well as to solve the problem through generating new ideas and solutions, which are then submitted to managers and related parties.					
D2	There is an awareness of the wider industry performance, and a clear strategy is followed to benchmark performance with the top-class airline.					
D3	There are standard procedures for producing and delivering services.					
D4	Problem solving techniques such as TQM are used to identify the causes of quality problem.					
D5	Up-to-date information showing key performance indicators, progress and job activity are available and displayed.					



Item No.	Customer relation	1	2	3	4	5
E1	There is an awareness of what service features that they value and are willing to pay for.					
E2	Feedback from customers is sought regularly for the improvement of service design and quality.					
E3	Customers participate in the initial design process.					
E4	Customers help the airline by providing information about their future demands.					
E5	There is a system in place for collecting customer complaints so that problems can be eliminate and avoided in the future.					

Item No.	Supplier relations	1	2	3	4	5
F1	A clear strategy is in place by which to evaluate supplier performance in term of quality, delivery and prices.					
F2	Local suppliers are used to avoid shipment delays.					
F3	Suppliers are aware of service designs and participate heavily during design and development.					
F4	Raw material are received on time from the date of order.					
F5	Suppliers are cooperative and committed to maintain a long-term relationship.					
F6	Active steps are taken to reduce the number of suppliers in each category.					



Item No.	Employee engagement	1	2	3	4	5
G1	I enjoy working with the airline.					
G2	The best way for me to advance my achievement is to stay with the airline.					
G3	The airline probably has a reputation as being an excellent employer.					
G4	The airline treats me honestly in every transaction.					
G5	I am loyal to the airline.					

Part 3: Attitude toward factors (Overall service quality)

Please use the following scales 1= Strongly Disagree, 2= Disagree, 3= Neutral, 4= Agree and 5= Strongly Agree						
Item No.	Overall service quality	1	2	3	4	5
H1	The airline performs the service right the first time.					
H2	The airline does something what they promised by a certain time.					
H3	The airline services are highest safe.					
H4	The behavior of employees in the airline makes customer feel confidence.					
H5	Employees of the airline are able to answer customers' questions.					
H6	The airline inform customers exactly when services will be performed.					
H7	The employees of the airline are always ready to service the customers.					
H8	The employees of the airline are always willing to help customers.					
H9	Services of the airline are fast					
H10	The airline is willing to give customer's best interests.					
H11	The airline shows a sincere interest to help customers resolve.					
H12	The employees of the airline understand the needs of customers.					
H13	The airline has modern looking equipment and appealing physical facilities.					
H14	The airline's employees are neat appearing.					



Interview questions

Section 1

- Self-introduction by Interviewer.
- Explain the objective of this research, and procedure of interview

Section 2

- How many year have you worked with the airline?
- Have you known about lean operation? Please explain
- Have your airline engaged in lean operation? Why or why not?
- Who are the target customer of your airline?
- What are the major strengths and weakness of your airline?
- What are the advantages and disadvantage among large and small airline?
- What are the factors affecting the success of lean operation?
- Explain the prospects of the airline industry in Thailand?
- In your opinion, what are going to affect your airline the most after the implementation of AEC in 2015?

