Universidad de Lima

Facultad de Ingeniería

Carrera de Ingeniería Industrial

A SYSTEMATIC REVIEW OF THE IMPLEMENTATION OF LEAN SIX SIGMA TOOLS TO IMPROVE THE LOGISTICS OF RETAIL BUSINESSES

Tesis para optar el Título Profesional de Ingeniero Industrial

Renzo Melgar Torres

Código 20170944

Nestor Javier Plasencia Machuca

Código 20171199

Asesor

Rafael Mauricio Villanueva Flores

Lima – Perú

Junio de 2023

A Systematic Review of the Implementation of Lean Six Sigma Tools to Improve the Logistics of Retail Businesses

Renzo Melgar Torres, Néstor Javier Plasencia Machuca and Rafael Mauricio Villanueva Flores
Facultad de Ingeniería y Arquitectura
Universidad de Lima, Perú
20170944@aloe.ulima.edu.pe , 20171199@aloe.ulima.edu.pe,
RVillan@ulima.edu.pe

Abstract

Currently, retail businesses must be as competitive as possible, and for this, their logistics system must be efficient and optimal; however, it is known that these have various problems such as longer delivery times, product delivery errors, offering a quality of service that meets customer expectations, etc. To solve these problems, the implementation of Lean Six Sigma tools was proposed, and a systematic review of the literature was carried out to determine which Lean Six Sigma tool is the most frequent and expose the benefits provided to the logistics system of retail businesses. A combination of keywords was used in prestigious databases such as Web of Science, Scopus and Pro-Quest to search for academic articles. On the other hand, for the analysis and classification of each article, categories and subcategories were used for synthesizing the information from each research work. To determine which tool is the most frequent, the number of articles were quantified if they applied an LSS tool and met the inclusion and exclusion criteria. Regarding the results, after carrying out the systematic review of the literature, the DMAIC tool was the most frequent and provided benefits such as a reduction in the number of complaints, a reduction in lead time, operations costs reduction, among others.

Keywords
Lean Six Sigma, Retail, Logistics System, Continuous Improvement, Lean Six Sigma Tools

1. Introduction
Digitalization and globalization have caused retail businesses to evolve due to the strong competition caused by new trends (Olsson et al. 2019). This is why, by opting for the online channel, the inherent difficulties with existing logistical issues are intensifying (Campbell and Fransi 2021).

The logistical problems of the online channel are mainly related to longer delivery times, product delivery errors, among others (Zhang et al. 2016). On the other hand, companies are constantly struggling to obtain a balance between service quality, cost of meeting expectations, customer deadlines, and reducing costs (Chen et al. 2013).

It is known that online purchase intention increases as companies offer faster delivery, reliable logistics carriers and high fulfillment rates (Riley and Klein 2019); therefore, retail businesses had to consolidate online sales, a sales modality that was on the rise but was not within the company's focus. It is necessary to highlight that consumers consider as a priority a rate adequate to the quality of service, then the delivery times and finally whether on the stipulated date, the delivery will be day or night (Nguyen et al. 2019).

The problems described above can be addressed by the Lean Six Sigma (LSS) methodology, offering several tools with the appropriate functionality to try to solve the various drawbacks in the logistics system of retail businesses.

1.1 Objectives
The objectives of this investigation are to determine by a systematic review, which Lean Six Sigma tool is the most frequent and to expose the benefits provided to the logistics system of retail businesses, collected from each article analyzed.

2. Literature Review

To follow a correct path in research it is necessary to clarify some theoretical concepts. The Lean Six Sigma model combines two methodologies, "Lean" and "Six Sigma". The first model is a production philosophy implemented in the Toyota production system in Japan, which seeks to eliminate waste and create value to produce goods or services at minimum cost (Celis and García 2012).

On the other hand, Six Sigma, which originated in the Motorola company, encompasses the implementation of DMAIC (Define, Measure, Analyze, Implement, Control), SIPOC (Supplier, Inputs, Process, Outputs, Customer), cause-effect diagram, among others, to reduce process variability and reduce the number of defects (Rahman and Rahman 2012; Rosa and Broday 2018). The purpose of implementing Six Sigma is to improve business profits as well as the effectiveness and efficiency of all operations performed by the company, so as to reduce costs and improve quality (Celis and García 2012).

Combining both methodologies result in an improved model called "Lean Six Sigma", where there is a synergy in the application of Lean and Six Sigma, this continuous improvement tool manages to maximize the value-added content, minimizing variation in quality and process characteristics, improving customer satisfaction (Andersson and Pardillo-Baez 2020; Gutierrez-Gutierrez, de Leeuw, and Dubbers 2016).

The DMAIC cycle in Six Sigma implementation programs aims to identify the root causes of defects, this tool consists of five distinct stages: defining the scope of the project, measuring major problems, analyzing the causes of problems, improving by implementing process changes, and controlling process variables (Singh et al. 2017; De Souza Pinto et al. 2017a).

The 5S method is a tool to properly manage the workspace and to keep it organized in five steps according to Japanese terminology. These 5 steps are: sort (Seiri), the distinction between unnecessary and necessary things; set in order (Seiton), the organization of items; shine (Seiso), keeping machines or tools and the workplace clean; standardize (Seiketsu), continuous practice and application of the above-mentioned points; sustain (Shitsuke), developing a habit of self-discipline by setting standards with 5S (Gupta and Chandna 2020; Horzela and Semrau 2021).

The term Kaizen consists of two concepts: "change" (Kai) and "for the better" (Zen). Kaizen consists of small improvements; it is a never-ending effort to improve organizations. It has three fundamental characteristics: process orientation, small improvements, and people orientation (Awad and Shanshal 2017; Rossini et al. 2019).

Value Stream Mapping is a visual tool that facilitates continuous process improvement by identifying value-added activities and eliminating or modifying tasks that do not add value to the process. This tool consists of an analysis and a drawing of the map of the current state of the process, where value-added and non-value-added activities are contemplated. There are key performance indicators (KPIs) of the process, such as lead time, which are generally measured before VSM to establish a baseline of the initial situation (Acero et al. 2020; Ghosh and Lever 2020).

Retail businesses belong to a sector that plays a major role in the economy of most countries. These businesses include consumers, suppliers, supply chains, investors, etc., making it one of the largest and most diverse industries in the world, and essential for end users or consumers (Dekimpe 2020; Quintero Arango 2015).

On the other hand, the term logistics is used to describe the flow of materials and information in a supply chain (Gutierrez-Gutierrez et al. 2016). Likewise, logistics includes transportation, warehousing, inventory management and control, order fulfillment, among other services (Noelle 1976).

3. Methods

The methodology used in this research is the systematic review of the literature. The process adopted was referenced according to the article by Denyer & Tranfield, which includes 5 steps: formulation of questions, location of studies, selection of studies and evaluation, analysis and synthesis, and discussion of the results.

The first one consists of the formulation of questions (Denyer and Tranfield 2009), where it is evaluated which Lean Six Sigma tool is mostly used to address and improve the problems that arise in the logistics system of retail businesses.

The second step consists of the search of academic articles (Denyer and Tranfield 2009), for which the combination of certain keywords in databases such as Web of Science, Scopus and Pro-Quest was used. The keywords chosen for this research are Lean Six Sigma, Retail, Logistics System, Continuous Improvement and Lean Six Sigma Tools.
The third step consists of the selection of scientific articles (Denyer and Tranfield 2009), for which certain inclusion and exclusion criteria were determined. For the inclusion criteria, only academic articles published between 2000 and 2021 that preferably applied one of the LSS tools mentioned above were used. Likewise, preference was given to those articles that had objectives similar to those of our research topic. Finally, only academic articles written in English, Spanish or Portuguese were included in this literature review.

On the other hand, for the exclusion criteria, we have chosen not to include scientific articles that do not belong to scientific journals indexed in the aforementioned databases. Likewise, literature written in languages other than English, Spanish or Portuguese was not included.

The fourth step consists of the analysis and synthesis of the information collected (Denyer and Tranfield 2009). For this purpose, categories and subcategories were determined that served to organize the information from each scientific article. The categories determined were scientific production, scope and focus of the research, type of study, type of retail, type of logistics, LSS tools studied, expected benefits found and unexpected benefits found (Table 1).

Table 1. Categories and Sub-Categories

Categories	Sub - Categories
Scientific Production	Year of publication of the article
	Journal
	Journal Quality (Q)
Scope of Research	Exploratory
	Explanatory
	Descriptive
	Correlational
Research Approach	Quantitative
	Qualitative
	Mixed
Study Type	Case Study
	Theory-Based
	Action - Research
Retail Types	Online
	Mass Merchants
	Department Stores
	Supermarkets
	Convenience Stores
	Apparel
	Drugstores
	Specialists
	Restaurants / Fast Food
Logistics Type	Inbound Logistics
	Internal Logistics
	Outbound Logistics

LSS Tools	DMAIC	
	5S	
	VSM	
	KAIZEN	
	OTHERS	
Expected benefits found	Lead Time Reduction	
	In Full Deliveries	
	Reduction of the number of complaints	
	Reduction of logistics costs	
	Inventory reduction	
Unexpected Benefits Found	Reduction of Operating Costs	
	Productivity Increase	

Table 1 shows the nine categories considered for this systematic review, as well as the subcategories that each one contains.

Table 2. Coding of each Sub-Category

Categories	Sub - Categories	Code
Scope of Research	Exploratory	EXPLO
	Explanatory	EXPLA
	Descriptive	DESC
	Correlational	COR
Research Approach	Quantitative	QT
	Qualitative	QL
	Mixed	MX
Study Type	Case Study	CS
	Theory-Based	TB
	Action - Research	AR
Retail Types	Online	ON
	Mass Merchants	MM
	Department Stores	DS
	Supermarkets	SM
	Convenience Stores	CNS
	Apparel	AP
	Drugstores	DR
	Specialists	SP
	Restaurants / Fast Food	RT
Logistics Type	Inbound Logistics	IBL
	Internal Logistics	IL
	Outbound Logistics	OL
LSS Tools	DMAIC	DMAIC
	5S	5S
	VSM	VSM

	KAIZEN	KZ
	OTHERS	OTHERS
Expected benefits found	Lead Time Reduction	LT
	In Full Deliveries	IF
	Reduction of the number of complaints	RNC
	Reduction of logistics costs	RLC
	Inventory reduction	IR
Unexpected Benefits Found	Reduction of Operating Costs	ROC
	Productivity Increase	PI

As seen in Table 2, coding of each subcategory was elaborated for the subsequent analysis of the results, to be able to show them in a more summarized and compact form.

It should be noted that to determine which LSS tool is the most frequently used to try to solve the problems in the logistics system of retail businesses, the LSS tools used in each of them and the improvements provided were taken from the selected academic articles, and a double-entry matrix was prepared, where the title of the article analyzed was placed as rows and the LSS tool used as columns, and in another column, the improvement provided.

Finally, in the discussion of results, with the proposed matrix and with the help of a spider graph, it will be possible to obtain the number of times each LSS tool was used and to determine which one is more frequent to try to solve the problems in the logistics system of retail businesses.

4. Results and Discussion
In this chapter, a systematic literature review of the existing knowledge on the implementation of LSS tools to improve retail logistics will be carried out.

4.1 Scientific Production
Regarding scientific production, 28 articles were obtained, which were distributed between 2001 and 2021. It should be noted that 53.57% of the articles are from 2015 onwards, which means that they contain more updated information on the implementation of LSS tools in retails (Table 3).

Table 3. Organization of the Journals' information

Journal Name	Number of Papers
Academy of Strategic Management Journal	1
International Journal of Production Economics	1
International Journal of Retail and Distribution Management	3
Joint Commission Journal on Quality and Patient Safety	1
Resources	1
Total Quality Management and Business Excellence	1
Business Process Management Journal	1
International Journal of Productivity and Performance Management	2
Technology and Health Care	1
Enterprise Information Systems	1
Journal of Operations Management	1
Waste Management	1
Journal of Manufacturing Technology Management	1

IFIP International Federation for Information Processing	1
Journal of Marketing Development & Competitiveness	1
Energies	1
International Journal of Lean Six Sigma	2
Production Planning and Control	1
Problems and Perspectives in Management	1
MATEC Web of Conferences	1
Supply Chain Management: An International Journal	1
Fibres and Textiles in Eastern Europe	1
Brazilian Journal of Operations & Production Management	1

Table 3 shows the distribution of the selected papers by journal, the 28 articles analyzed are distributed among 23 journals, in which the International Journal of Retail and Distribution Management stands out with 3 of our 28 articles. Finally, in the scientific production section, using the Scimago Journal & Country Rank tool, it was possible to classify the journals in quartiles, which is an indicator that positions the journal in comparison with all those in its area. Fifty percent of the journals belonged to Q1, which means that the articles analyzed were published in high-prestige journals; 38.9% of the journals belonged to Q2, and 11.1% to the third quartile. On the other hand, none of the journals belonged to Q4.

4.2 Methodology Strategy
The methodological strategy is composed of the scope and approach of each research collected. Regarding the research approach, of the 28 academic articles reviewed, 11 were quantitative, 10 were of mixed approach and the rest were of qualitative approach. On the other hand, regarding the methodological scope, 46% of the articles had a descriptive scope, 32.1% had a correlational scope and 10.7% had exploratory and explanatory scopes.

4.3 Study Type
Regarding the type of study, 82% of the articles were case studies, 14% were of the action research type and only 4% of the articles were theory-based.

4.4 Retail Types
As indicated in Figure 1, regarding the types of retail where LSS tools were applied and benefits were obtained, 8 academic articles were obtained that focused on specialist retails. These types of retail, as the name implies, specialize in a specific type of business such as mobile operators, insurance companies, etc. (Madhani, 2020).
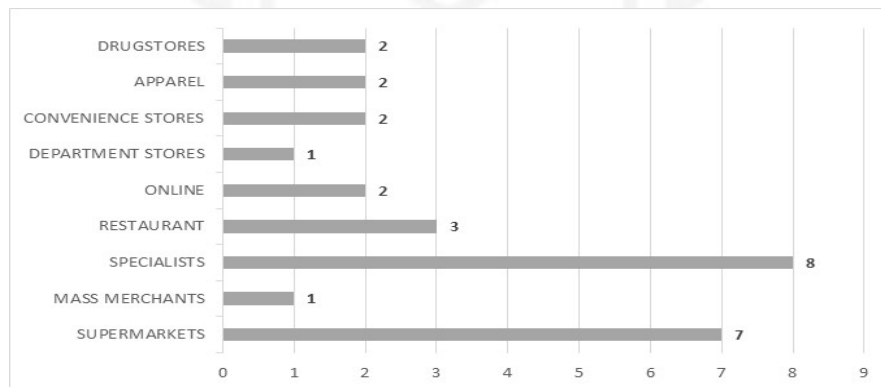

Figure 1. Types of retail in which LSS tools were used

4.5 Logistics Type

The benefits provided by the LSS tools were focused on the retail logistics system. Within the logistics system, 57% were focused on internal retail logistics, followed by 32% and 11% for outbound logistics and inbound logistics respectively.

4.6 LSS Tool

As shown in Figure 2, DMAIC was the most frequently applied LSS tool with 12 opportunities; it should be noted that there are articles in which more than one tool was applied and also articles that did not apply any of the proposed LSS tools, considered as "others".

Figure 2. LSS tools used in academic articles

Within our systematic literature review, it was ideal to find articles with the tools proposed above, however, it was very likely that we would find other LSS tools applied in academic articles. Figure 3 shows all the other LSS tools found in our research.
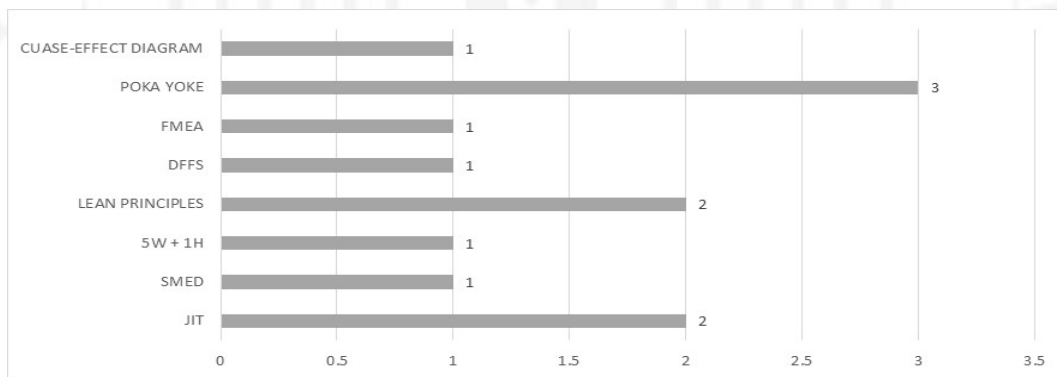

Figure 3. Other LSS Tools Used

4.7 Expected benefits found

As seen in Figure 4, concerning the expected benefits found, lead time reduction was the most repeated benefit with 15 occurrences, followed by the reduction of complaints found on 10 occasions and the reduction of inventory turnover on 8 occasions.
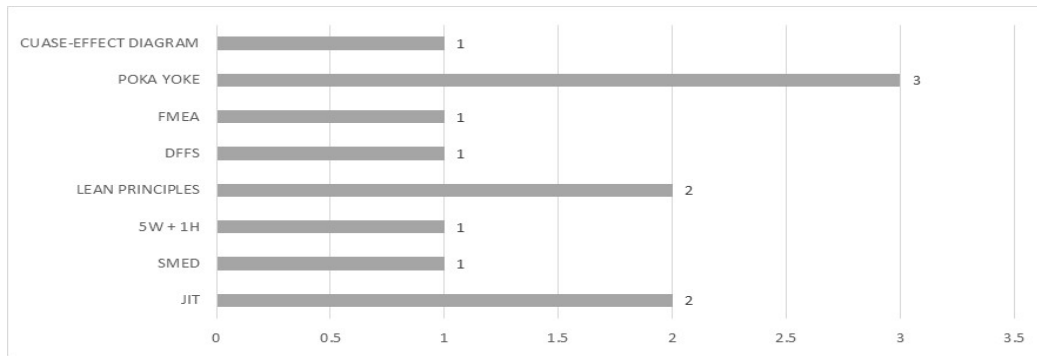
Figure 4. Expected benefits found

4.8 Unexpected Benefits Found

For the unexpected benefits found, only two were found, the first is the reduction of operating costs with 6 participations and the second is the increase in productivity with only one appearance.

4.9 Results Organization

A double-entry matrix was prepared to show the articles reviewed, the LSS tool applied, and the expected and unexpected benefits provided (Table 4).

Table 4. Double Entry Matrix with the scores obtained for each article

Article	LSS Tool	Expected. Benefits	Unexpected. Benefits
Applying lean manufacturing to retail business to prevent the spread of covid 19	5S	LT	-
Case study: Optimizing order fulfillment in a global retail supply chain	OTHERS	LT & IF	-
Retail marketing strategies and logistical operations at a Japanese grocery supermarket chain – case study of Summit Inc.	OTHERS	RNC & IR	-
Using Six Sigma to reduce medication errors in a home-delivery pharmacy service.	DMAIC	RNC & IF	-
Lean management approach to reduce waste in horeca food services	5S	LT & IR	-
Lean thinking with improvement teams in retail distribution: A case study	OTHERS	LT	PI
Australian food retail supply chain analysis	KZ & 5S	IR	ROC
Achieving customer service excellence using Lean Pull Replenishment	DMAIC	RNC	-
Consumer purchase process improvements in e-tailing operations	DMAIC	RNC & IF	-
Six sigma tools in integrating internal operations of a retail pharmacy: A case study	OTHERS	RNC & IF	-
Improved service system design using Six Sigma DMAIC for a major US consumer electronics and appliance retailer	DMAIC	RNC	-
Supply chain analysis of e-tailing versus retailing operation – a case study	DMAIC	LT & IF	-

Lean Six Sigma Deployment in Finance and Financial Services: Enhancing Competitive Advantages	VSM	IR	ROC
Improving the carbon footprint of food and packaging waste management in a supermarket of the Italian retail sector	DMAIC	-	ROC
Reducing the delivery lead time in a food distribution SME through the implementation of six sigma methodology	DMAIC	LT & RNC	-
From toyota production system to lean retailing. Lessons from seven-eleven Japan	OTHERS	LT	-
Integration of Lean Operation and Pricing Strategy in Retail.	KZ	LT	-
Implementation of lean management as a tool for decrease of energy consumption and CO2 emissions in the fast food restaurant	5S, VSM & KZ	LT	-
Improvement of claim processing cycle time through lean six sigma methodology	OTHERS	LT & RNC	-
Using Lean Six Sigma to improve mobile order fulfilment process in a telecom service sector	DMAIC	LT	ROC
Management support for the application of Lean Six Sigma methodology to improve customer satisfaction in a South African telecommunications company	DMAIC & 5S	RNC	-
Design of facility layout with lean service and market basket analysis method to simplification of service process in the supermarket	OTHERS	LT	-
A Lean Approach for Reducing Inventory for a Mexican Convenience Store Network	VSM	RNC & IR	-
Lean thinking in the luxury-fashion market	VSM & 5S	LT & IR	ROC
Using Six Sigma to improve replenishment process in a direct selling company	DMAIC	IR y RLC	-
Lean Tool Implementation in the Garment Industry	VSM & 5S	LT & IR	-
Logistics services and Lean Six Sigma implementation: a case study	DMAIC	IF	ROC
Proposal the application of DMAIC tools and value stream mapping under the perspective of the lean philosophy for process improvement: A case study	DMAIC	LT & RLC	-

Table 4 shows the LSS Tools, expected benefits found and unexpected benefits found in each article analyzed in our research. According to the spider graph proposed in Figure 2, the LSS tool most commonly used in the articles reviewed in the systematic review was DMAIC. Next, as seen in Figure 5, the benefits obtained with the application of this tool will be presented; on 6 occasions a benefit was obtained in the reduction of the number of complaints, then in 4 occasions the Lead Time was reduced and the complete deliveries increased, in 3 occasions the operational costs were reduced, in 2 occasions the logistic cost was reduced and in 1 occasion the inventory was reduced.
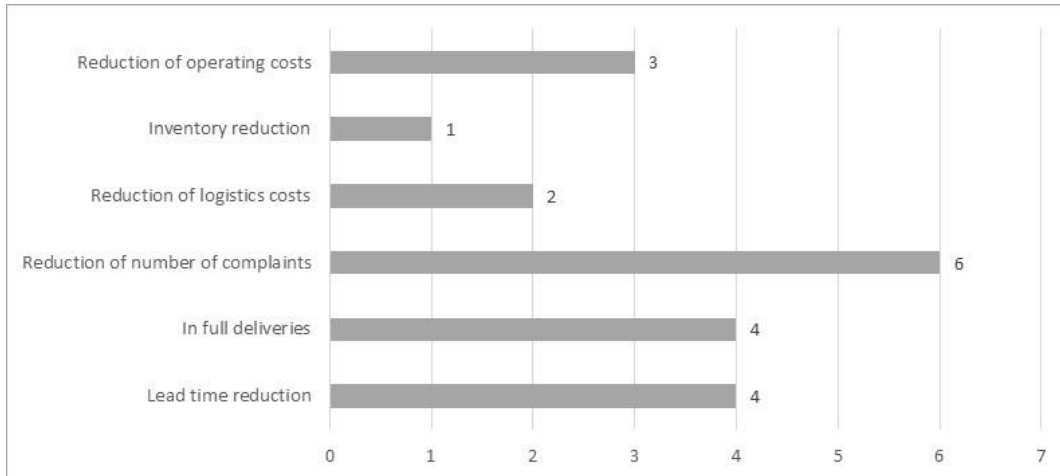
Figure 5. Benefits obtained with the DMAIC tool

4.10 Results Analysis

The academic articles show that there are indeed tools such as the DMAIC improvement cycle, 5S, VSM, among others, that can contribute to the solution of the problems of the logistics system of retail businesses.

It should be noted that without the involvement and commitment of top management and, in general, of the entire organizational structure, it would not be possible to obtain the expected benefits from the application of these continuous improvement tools and achieve the proposed objectives (Albliwi et al. 2014)

The LSS tool that was used the most among the 28 articles reviewed was DMAIC, which brought a large number of benefits to the retail logistics system. Among them, a reduction in the number of complaints by 30% (Nabhani and Shokri 2009), an increase in complete deliveries by 33% (Castle, Franzblau-Isaac, and Paulsen 2005), a reduction in lead time by 33% (De Souza Pinto et al. 2017b) and, finally a reduction in annual operational costs of six hundred thousand dollars (Shamsuzzaman et al. 2018).

It should also be added that, within the systematic literature review, the application of LSS tools predominated in internal logistics, characterized by the planning, control and execution of the company's internal flow (Pinheiro de Lima et al. 2017). The application of LSS tools within this part of the supply chain allowed for reducing the Lead Time of the process or inventory reduction, 88% of the times, as seen in Figure 6, where also 6% of the times there were a reduction of number of complaints and operational costs reductions respectively.
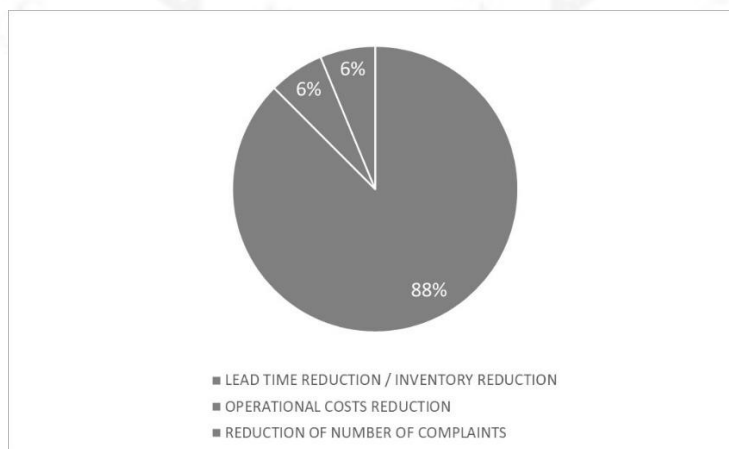

Figure 6. Benefits obtained with LSS tools in internal logistics

In addition, 31% of the articles analyzed where LSS tools were implemented in the internal logistics of retail, were supermarkets.

5. Conclusion

Based on our research objectives, it can be concluded that the LSS tool mostly used to try to solve the problems within the logistics system of retail businesses is DMAIC.

With the application of this tool in the logistics system, it was possible to obtain a 30% reduction in the number of complaints (Nabhani and Shokri 2009), a 33% increase in complete deliveries, a 33% reduction in lead time, and finally, a reduction in annual operating costs of $600,000.

It is important to mention that 86.7% of the academic articles studied in the systematic review applied their case studies in large companies in North America, Asia and Europe, which is why, when trying to apply the LSS tools addressed in this research in small companies, the results or indicators may not be as expected.

It is worth noting that not many researches were found that applied the VSM or Kaizen tools, the latter has only 3 appearances, which is the least found in the systematic review of the 28 academic articles. Both tools should be considered in future research to discover the benefits they could bring to retail logistics systems.

Finally, the main contribution of this research is that the application of the LSS methodology was mostly applied to the industrial sector. So our research demonstrated an original approach in the implementation of LSS to the retail sector in order to expose the benefits that this tools can provide.

References

Acero, Raquel., Torralba, Marta., Pérez-Moya, Roberto. and Pozo, José Antonio., Value Stream Analysis in Military Logistics: The Improvement in Order Processing Procedure, *Applied Sciences*, vol.10, no.1, 2020.

Albliwi, Saja., Antony, Jiju., Sarina Abdul Halim, Lim. and van der Wiele, Ton., Critical Failure Factors of Lean Six Sigma: A Systematic Literature Review, *International Journal of Quality and Reliability Management*, vol. 31, no.9, 2014.

Andersson, Roy. and Pardillo-Baez, Yinef., The Six Sigma Framework Improves the Awareness and Management of Supply-Chain Risk, *TQM Journal*, vol. 32, no. 5, 2020.

Awad, Mahmoud. and Shanshal, Yassir A., Utilizing Kaizen Process and DFSS Methodology for New Product Development, *International Journal of Quality and Reliability Management*, vol. 34, no. 3, 2017.

Campbell, Jorge Bullemore. and Fransi, Eduard Cristóbal., Sales in a Time of Pandemic: Impact of Covid-19 on Sales Management *Informacion Tecnologica*, vol. 32, no. 1, 2021.

Castle, Lon., Franzblau-Isaac, Ellen. and Paulsen, Jim., Using Six Sigma to Reduce Medication Errors in a Home-Delivery Pharmacy Service, *Joint Commission Journal on Quality and Patient Safety / Joint Commission Resources*, vol. 31, no. 6, 2005.

Celis, Olga Lucía Mantilla. and Sánchez García, José Manuel., A Technological Approach to the Development of Logistic Projects Using Lean Six Sigma, *Estudios Gerenciales*, vol. 28, no.124, 2012.

Chen, H., Wang, L., Mu, Y. and Wang, J., An Application Study of Lean Six Sigma in Logistic Service Quality Management, *International Asia Conference on Industrial Engineering and Management Innovation: Core Areas of Industrial Engineering, IEMI 2012 – Proceedings*, pp. 843-850, Taipei, Taiwan, 2013.

Dekimpe, Marnik G., Retailing and Retailing Research in the Age of Big Data Analytics, *International Journal of Research in Marketing* vol. 37, no. 1, 2020.

Denyer, David. and Tranfield, David., Producing a Systematic Review, *The SAGE Handbook of Organizational Research Methods,* 2009

Enid, Arelis., Davila, Girona. and Nieves, Rafael., Enhancing Training Strategies on a Retail Environment through Six Sigma, *Polytechnic University of Puerto Rico*, 2017.

Gauri, Dinesh K., Jindal, Rupinder P., Ratchford, Brian., Fox, Edward., Bhatnagar, Amit., Pandey, Aashish., Navallo, Jonathan R., Fogarty, Jhon., Carr, Stephen. and Howerton, Eric., Evolution of Retail Formats: Past, Present, and Future, *Journal of Retailing*, vol. 97, no. 1, 2021.

Ghosh, Sid. and Lever, Kaitlin., A Lean Proposal: Development of Value Stream Mapping for L'Oreal's Artwork Process, *Business Process Management Journal*, vol.26, no.7, 2020.

Gupta, Shaman. and Chandna, Pankaj., A Case Study Concerning the 5S Lean Technique in a Scientific Equipment Manufacturing Company, *Grey Systems*, vol. 10, no.3, 2020.

Gutierrez-Gutierrez, Leopoldo., de Leeuw, Sander. and Dubbers, Ruud., Logistics Services and Lean Six Sigma Implementation: A Case Study, *International Journal of Lean Six Sigma*, vol. 7, no.3, 2016.

Hernandez Sampieri, R., Fernandez Collado, C. and Baptista Lucio, M., *Metodología de la investigación*, 5th Edition, McGraw – Hill, 2010.

Horzela, Anna. and Semrau, Jakub., Using Tools to Improve Logistics and Production Processes in a Selected Construction Company, *European Research Studies Journal*, vol.24, no.1, 2021.

Madhani, Pankaj M., Lean Six Sigma Deployment in Finance and Financial Services: Enhancing Competitive Advantages, *IUP Journal of Operations Management*, vol.19, no.3, 2020.

Nabhani, Farhad. and Shokri, Alireza., Reducing the Delivery Lead Time in a Food Distribution SME through the Implementation of Six Sigma Methodology, *Journal of Manufacturing Technology Management*, vol. 20, no.7, 2009.

Nguyen, Dung H., de Leeuw, Sander., Dullaert, Wout. and Foubert, Bram P. J., What Is the Right Delivery Option for You? Consumer Preferences for Delivery Attributes in Online Retailing, *Journal of Business Logistics*, vol. 40, no. 4, 2019.

Noelle, H., Hypoproteinämie-Folge Oder Ursache von Krankheiten Besonders Bei Länger Hospitalisierten, *Transfusion Medicine and Hemotherapy*, vol. 3, no.6, 1976.

Olsson, Annika., Karla, Karla Marie., Johansson, Ulf., Olander Roese, Malin. and Ritzén, Sofia., Organizational Climate for Innovation and Creativity–a Study in Swedish Retail Organizations, *International Review of Retail, Distribution and Consumer Research*, vol. 29, no. 3, 2019.

Pinheiro de Lima, Orlem., Breval Santiago, Sandro., Rodríguez Taboada, Carlos Manuel. and Follmann, Neimar., A New Definition of Internal Logistics and How to Evaluate It, *Ingeniare*, vol. 25, no.2, 2017.

Quintero Arango, Luis Fernando., El Sector Retail, Los Puntos de Venta y El Comportamiento de Compra de Los Consumidores de La Base de La Pirámide En La Comuna 10 de La Ciudad de Medellín, *Revista Ciencias Estratégicas*, vol. 23, no.33, 2015.

Rahman, M. and Rahman, A., Integrating Lean, Six Sigma and Logistics Supports in a Supply Chain Model, *62nd IIE Annual Conference and Expo 2012*, pp. 3460-3466, Orlando, USA, May 19-23, 2012.

Resende de Carvalho, Edra., Elaje Azevedo Simões da Mota, Ana., Maués de Souza Martins, Gabriela., Dos Santos Lourenço Bastos, Leonardo. and Cristiano Silva Melo, André., The Current Context of Lean and Six Sigma Logistics Applications in Literature: A Systematic Review, *Brazilian Journal of Operations & Production Management*, vol. 14, no. 4, 2017.

Riley, Jason M. and Klein, Richard., How Logistics Capabilities Offered by Retailers Influence Millennials' Online Purchasing Attitudes and Intentions, *Young Consumers*, 2019.

Rosa, Ana Carolina Martins. and Broday, Evandro Eduardo., Comparative Analysis between the Industrial and Service Sectors: A Literature Review of the Improvements Obtained through the Application of Lean Six Sigma, *International Journal for Quality Research*, vol. 12, no.1, 2018.

Rossini, Matteo., Audino, Francesco., Costa, Federica., Cifone, Fabiana Dafne., Kundu, Kaustav. and Portioli-Staudacher, Alberto., Extending Lean Frontiers: A Kaizen Case Study in an Italian MTO Manufacturing Company, *International Journal of Advanced Manufacturing Technology*, vol. 104, no.5–8, 2019.

Sandberg, Erik. and Jafari, Hamid., Retail Supply Chain Responsiveness: Towards a Retail-Specific Framework and a Future Research Agenda, *International Journal of Productivity and Performance Management*, vol. 67, no. 9, 2018.

Shamsuzzaman, Mohammad., Alzeraif, Mariam., Alsyouf, Imad. and Khoo, Michael Boon Chong., Using Lean Six Sigma to Improve Mobile Order Fulfilment Process in a Telecom Service Sector, *Production Planning and Control*, vol. 29, no.4, 2018.

Singh, Deepinder., Singh, Virender., Singh, Harwinder. and Singh, Jagdeep., Six Sigma Methodology for Reducing Defects in Manufacturing Industry - a Case Study, *International Journal of Indian Culture and Business Management*, vol. 15, no.4, 2017.

De Souza Pinto, Jefferson., Aoki Schuwarten, Luan., Cassoli de Oliveira Júnior, Gilberto. and Novaski, Olívio., Proposal the Application of DMAIC Tools and Value Stream Mapping under the Perspective of the Lean Philosophy for Process Improvement: A Case Study, *Brazilian Journal of Operations & Production Management*, vol. 14, no.4, 2017.

Zhang, Abraham., Luo, Wen., Shi, Yangyan., Chia, Song Ting. and Sim, Zhi Hao Xavier., Lean and Six Sigma in Logistics: A Pilot Survey Study in Singapore, *International Journal of Operations and Production Management*, vol. 36, no.11, 2016.

Biographies

Renzo Melgar Torres graduated from Universidad de Lima with a Bachelor`s Degree in Industrial Engineering in 2021. He is currently a Logistics Programmer at Pluspetrol (Camisea Gas Project). His research interests include logistics, tools of improvement and data analysis.

Néstor Javier Plasencia Machuca graduated from Universidad de Lima with a Bachelor`s Degree in Industrial Engineering in 2021. He is currently a Customer Service Analyst at Kimberly Clark. His research interests include lean six sigma, logistics, and process improvements.

Rafael Mauricio Villanueva Flores, an Industrial Engineer from the Universidad de Lima and currently an Operations Manager of Anita Food and a Professor at the Faculty of Engineering and Architecture in the Industrial Engineering Career at the Universidad de Lima. Master of Science from Kansas State University. An executive with extensive experience in the management of industrial plants and author of various publications in the field of food.

Implementación de herramientas lean Six Sigma para mejorar la logística de los negocios retail. Una revisión de literatura

INFORME DE ORIGINALIDAD

1% EN
INDICE DE SIMILITUD

0%
FUENTES DE INTERNET

1%
PUBLICACIONES

0%
TRABAJOS DEL ESTUDIANTE

FUENTES PRIMARIAS

1 Matteo Rossini, Francesco Audino, Federica Costa, Fabiana Dafne Cifone, Kaustav Kundu, Alberto Portioli-Staudacher. "Extending lean frontiers: a kaizen case study in an Italian MTO manufacturing company", The International Journal of Advanced Manufacturing Technology, 2019
Publicación

<1%

2 Mohand Tuffaha. "Adoption Factors of Artificial intelligence in Human Resource Management", Universitat Politecnica de Valencia, 2022
Publicación

<1%

Excluir citas   Activo
Excluir bibliografia   Apagado

Excluir coincidencias   Apagado