A Systematic Review of Literature about the Influence for Right Project Management Apply to the Good Practices of Lean Manufacture

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Abstract

Today companies have maintained their success derived from the adoption and the constant effort that is made in the activities to achieve a correct implementation of lean manufacturing. However, the misuse of these tools can significantly affect a considerable increase in the costs and resources of the company. Something similar happens with the application of good practices and guidelines that are directed under the management of projects that consists of exposing reliable and successful results under permanent effects of continuous improvement.

The purpose of the following article is to present a unified literature review that analyzes 53 English-language articles during the period 2011 to 2021. The following review was carried out with the support of four databases (Elsevier, SpringerLink, Emerald, Scopus), under a unified classification which presents the following: classification of article by source of publication, publication by year, area of knowledge, number of articles by area of knowledge, percentage of participation, percentage of use by type of article, number of articles by research methodology. This document will open and contribute at the academic level to implement future research gaps in the current state of the different industrial and/or manufacturing sectors.

Keywords
Lean Manufacturing, Management, Lean Tools, Project,

1. Introduction
The body of the acknowledgment about the project definition presented by the GUIE PMBOK® version (2017) is as follows: Projects are carried out to meet objectives through the production of deliverables. An objective is defined as a goal towards which work must be directed, a strategic position to be achieved, an end to be achieved, a result to be obtained, a product to be produced or a service to be provided. (PMBOK, 2017) It is said that the word "Project" in the modern sense only came into common use during the 20th century. Before that, it had several different meanings. The Oxford English Dictionary named the word used in the II century. In classical Latin, the verb to project means to throw away or discard. It was in the fifteenth century that the word was used to refer to the act of conceiving an idea, proposing a plan, putting something into action or venturing into the unknown (Davies Andrew, 2017). Over time, the evolution of correct project management has entered into situations in which the essence and the application of good practices to develop a project in accordance with the theories, come to cause confusion and decision making that can hardly be taken up again control over the current situation of the project, apply and develop the methodologies and tools that help achieve harmony and consistency between project management based on lean

manufacturing tools are ambitious challenges that industries do not want to run, however, the results are effective, which always seek to keep continuous improvement in mind to continue advancing towards the excellence of our production processes.

This article offers a review of the unified literature through an analysis that questions the techniques used during a period of 10 years. Likewise, it intends to identify areas of opportunity to analyze the results obtained through the investigations, thus generating a sequence of graphs to show the behavior and trends in a visual and clear way, in order to facilitate the reader's understanding of this work.

1.1 Objectives

Lean manufacturing has shown us that the benefits that are acquired in companies are those activities that are carried out day by day under the implementation of the tools that are part of this philosophy, in which one of its objectives is to seek the efficiency and performance of collaborators and stakeholders to achieve a common goal. However, the impact of these practices and on the performance of proper project management is still unclear due to the lack of understanding between the operational and administrative areas, which sometimes leads to conflicting results obtained by previous research. The purpose of this article is to carry out a systematic review of the literature to understand if companies that make use of manufacturing tools under correct project management have acquired an improvement in their productive performance or in the implementation of new projects. Likewise, this document has the task of tracing some future research in the literature and examining the period of time of research that has been considered to analyze both the areas of application, use of methodologies and implementation.

2. Literature Review

 Review The following bibliographical analysis delves into several points of view in developing the good practices that a correct project management offers based on the philosophy of lean manufacturing. The present review followed a qualitative analysis for the development of the research. The present methodology of review includes the selection of databases of relevant publications and the search using a wide range of keywords. After the invention of the mass production system by Ford and Crowther (1926), lean manufacturing is the next major evaluation in the process of creating efficient businesses, and one of its main goals is the elimination of manufacturing waste in the production. production line. For this review, it was revealed that only 1 article has been carried out to understand the interactions between the use of good project management practices under a correct application of the lean philosophy tools. The reduction of inventories and waste assumes that the customer is willing to pay only for activities that add value to the product or service, so the company must seek a manufacturing system that does not waste and that is, that is quick in the response, that is, that it is sensitive. Panizzolo (1998). On the other hand, the efficiency of manufacturing must also be sensible to allow the application of the production of traction by which the products are manufactured after the customer has placed his order, thus avoiding possible speculation and those resulting from the production of an ending stock of items. Shingo (2000). The development of alliances with suppliers is another important characteristic for the success of lean manufacturing. In which companies of all sizes should work in collaboration with their suppliers, sharing developments, dividing responsibilities to improve costs and demanding precise delivery and high-quality standards through just-in-time production Myerson (2012). However, the word "project" has many definitions, but for the purpose of this research, we will use the definition proposed by the Project Management Institute (PMI), which defines a project as a temporary endeavor designed to create a unique product or service PMI (2013). According to Liang and Guodong (2007) and Asad and Pinningtonb (2014), projects differ in size, uncertainty and complexity, and it is essential to study these characteristics to determine the critical factors that lead to their success. Projects can be understood as the application of knowledge, skills, tools and techniques to plan activities to achieve project requirements. This management can be facilitated by dividing the project into several constituent phases, thus defining its beginning and end, PMI (2013). Finally, it can be concluded that the use of good practices of correct project management to apply lean manufacturing tools are paths of opportunity because they have not been explored by many researchers in the world.

3. Methods

For the following literature review, the methodological processes analyzed from an analytical point of view were identified. The literature review seeks to identify, evaluate and interpret documents and differentiate between articles from unreliable sources, thus obtaining prestigious literature that helps to be clear and easy to understand for the reader.

For a more enriching literature review, papers were selected and categorized according to the most relevant criteria to provide accurate and concise information for future research, which were classified as follows: article classification by source of publication, publication by year, area of knowledge, number of articles by area of knowledge, percentage of participation, percentage of use by type of article, number of articles by research methodology. The following article is divided into three main phases: A) data collection, B) data analysis and C) synthesis and classification framework.

A. Data collection

In order to achieve the methodology proposed in this article, it was necessary to deploy the following points:

1. Research question. This question generally refers to the point of view, strategy and direction, what is the process of academic research based on the applications of lean manufacturing tools for the development of new projects?

2.
Participation and search. For this point the following databases were considered, such as: Scopus, SpringerLink, Emerald, and Elsevier, the databases mentioned above are the ones with the highest contribution of cited articles, availability of recent contributions and research directly related to the topic of interest. For the keyword search, the following proposals were entered: "Lean Manufacturing", "Lean tools", "Project" and "Management". The analysis of scientific articles published were only in English during the period from 2011 to 2021.

Classification and evaluation of results. For this step, each of the articles were classified and ordered according to the researcher's criteria, in which the collection of data or articles was formed, followed by an analysis of a classification proposal that mainly focuses on the research question presented in section C, which corresponds to a synthesis under the proposed classifications.

B. Data analysis

The collection of articles in the databases was performed by means of a structured form of reference with the help of a spreadsheet which facilitates the manipulation of the selection. Proposed as (Perez-Salazar et al., 2017)in which specific points were evaluated according to Mayring (2014) where publications that were made during 2011 to 2021, type of article, area of knowledge, journal that has more percentage of publication and percentage of participation (countries) were considered, also other perspectives were taken into account adding as the solution methodology, technique and/or validation tools, business turn or application areas, and level of implementation, in order to cover the research needs.

C. Synthesis and classification framework.

The classification of this document is divided into two important points in order to **dissuade (**disuadir?**)** relevant classifications, to start with the descriptive analysis first consisting of presenting the year of publication and the publication sources where these articles can be found, where the area of knowledge, country of publication and the type of data collection document is also applied. The second part shows the areas of descriptive analysis on the use of the most used lean manufacturing tools with application in project management, where the solution methodology and research methods are found. The following classification is shown below:

1. Publications during 2011 to 2021 and percentage of participation by country

The contributions in the data collection were established for a period from 2011 to 2021 and correspond to all the publications that were found in this timeline. also including the percentage of publication and/or journal where the article was registered, highlighting the country with the highest contribution in the proposed period. With the objective of visualizing the impact of scientific journals and trends in the publication of articles related to the topic of study.

2. Type of document

According to the descriptive analysis in the systematic literature review proposed by Crossan and Apaydin (2010) scientific articles can be classified according to their methodological perspective, obtaining theoretical articles,

literature review, articles with an empirical approach that build a theory and empirical approach that tests a theory. For the following work, theoretical articles are considered to be those that only present a discussion of specific topics without the conception of any frame of reference or model to follow and consequently have no validation of any kind. A literature review article is considered to be any article that specifies a number of articles reviewed to show a trend, a scientific contribution to address new research. In the case of articles that contain a frame of reference of experimentation, surveys or discussions, previous models and if it was validated or not with a case study or scientific technique, it is considered as an empirical contribution to the construction of theory. If only an application of an existing method or implementation of a technique in real problems is presented and no referential models are proposed, then the contribution is considered as an empirical application of the theory, because they are only applied to existing proposals, techniques or tools and are limited to only evaluating the application. The following research was based on the use of search engines or metadata for the development of the research.

3. Knowledge area

According to the proposal of (Anon., n.d.), he attributes that the contributions are classified according to the thematic content addressed in the research, where it can be classified in computer science, engineering, decision sciences, business and management, mathematics, multidisciplinary, social sciences, chemical engineering, arts and humanities, economics and finance, materials sciences, agriculture and biological sciences, astronomy, environmental sciences, psychology and planetary sciences.

4. Research method

This section identifies the research methods carried out by the authors to validate the proposals made in each of the articles detected. It is worth mentioning that the most used sections in the academic area are: simulation, case study, experimentation, as well as other research methodologies that the authors themselves did not specify exactly.

5. Area of application

The area of application is where the different business sectors are identified and classified. For each article analyzed, the following areas were identified as having the greatest impact: companies that offer different types of services, the automotive sector, the health sector and finally communications technology, construction, among others.

6. Level of implementation

In this last point, the objective for each article is to explore the scope of implementation to demonstrate what level of implementation the proposal or solution described in the article is at.

4. Data Collection

The results obtained under the search in the databases were obtained significant effects, which are conformed by SpringerLink where a total of forty-three (44) articles were obtained, from the Elsevier & Scopus database with a result of one article each and for the Emerald database a total of 8 articles, thus generating a total of fifty-three articles that make up the collection of data analysis.

It is important to highlight that there was no exclusion of any article by reviewing in detail that **it was incurred in duplicity** that there was no duplicity. it is worth mentioning that 1 article was discriminated for not having search criteria and it was basically by language. however, the grand total is evaluated and classified to 53 articles that figure the final collection of the analysis.

5. Results and Discussion

For this section the result of the classification of the collection of articles analyzed to show relevant descriptive information through the importance of the use of lean manufacturing tools with applications and use under a project management. The results obtained are presented below.

5.1 Public per year

According to the linear graph in Figure 1, it can be observed that in 2015, 2018, 2019 and 2020 the number of publications remains above the average, which corresponds to 4 articles per year. With respect to 2011,2012, and 2013 are the years in which a downward trend is observed, likewise it is observed that the years that more publications attributions per year were obtained was between 2014, 2016, 2017, with an average of 6 attributions per year.

Therefore, with a greater contribution, the year 2021 presents an increase that exceeds the previous years, surpassing the average that has been managed in previous periods, corresponding to a total of 9 articles.
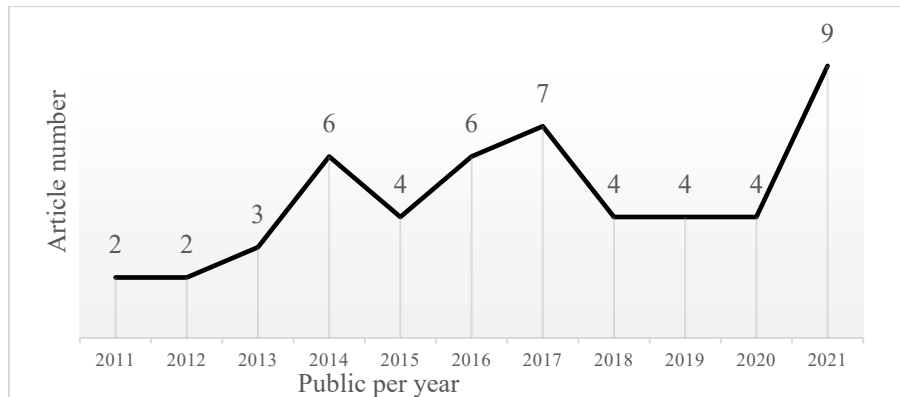

Figure 1. Lean manufacturing application trend under a management scheme of projects from 2011 to 2021.

The year 2021 with the highest number of contributions shows notoriously the support to the research on the use of lean manufacturing tools under the scheme of the use of good practices for a correct project management. However, it should be noted that the trends in previous years have not caused a significant impact, although for 2021 the greatest contribution is observed, which is undoubtedly a significant challenge for companies despite the fact that in 2020 there was a change that stalked humanity with strong economic impacts and border closures which constantly kept the world's population uncertain.

5.2 Source classification result

The distribution shown in Figure 2 represents the distribution of the selected papers by type of journal. the number of publications by source, The International Journal of Advanced Manufacturing Technology with 12% (24 articles) of the total number of lean manufacturing-project management publications has the largest share of published papers. In second place is BMC Health Services Research with a contribution of 1.5% (3 articles).

Figure 2. Classification of articles by source of publication

In third place, Annals of Operations Research, Global Journal of Flexible Systems Management, Journal of Industrial Engineering International, Journal of Manufacturing Technology Management and The TQM Journal contribute 1.6% with (2 published articles each), therefore, 7 journals of great relevance in the industrial sectors under a lean manufacturing scheme and different applications with the tools of this philosophy contribute with 1 publication each. It should be noted that the scientific journals in this literature review only represent 53 articles found, which shows only a part of the wide variety of topics and approaches that can be found on lean manufacturing applications for the use of good practices for proper project management.

5.3 Area of knowledge

The areas of knowledge shown in Figure 3, according to the literature review, where the area of knowledge with the highest number of analyzed articles was detected, are companies dedicated to offering different types of services with a total of 15 attributions to knowledge, followed by automotive companies with a total of 10 articles, out of the 53 articles collected for this document.
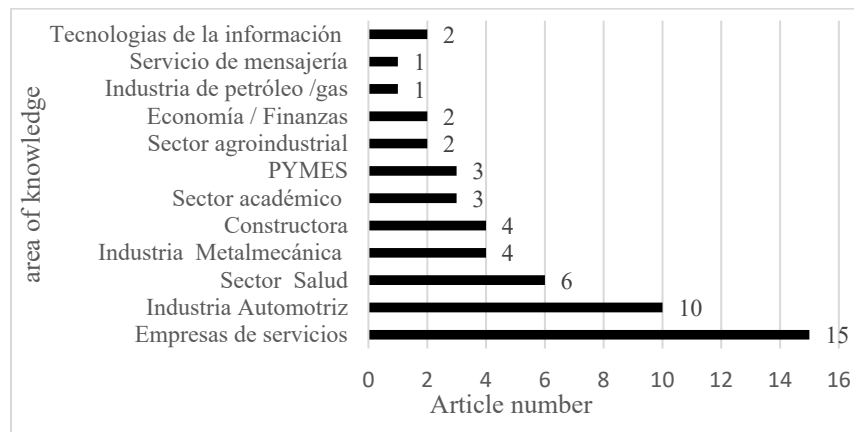

Figure 3. Number of articles by area of knowledge

A relevant data and is the area of knowledge that attributes in the health sector with a total of 6 articles thus occupying the third place in the bar chart, on the other hand, the sectors that have a similar trend are the metalworking industry and construction companies contributing a total of 4 articles focused on these areas. Likewise, the articles detected in the contribution of knowledge are the academic sectors, SMEs, information technologies among them manage to contribute a total of 12 articles and in last position are the different disciplines and areas of knowledge.

5.4 Ranking of results by country

It is important to highlight the origin of the contributions collected in order to detect which country has the greatest implementation of the lean manufacturing philosophy for proper project management. Figure 4 shows the percentage of participation by country.
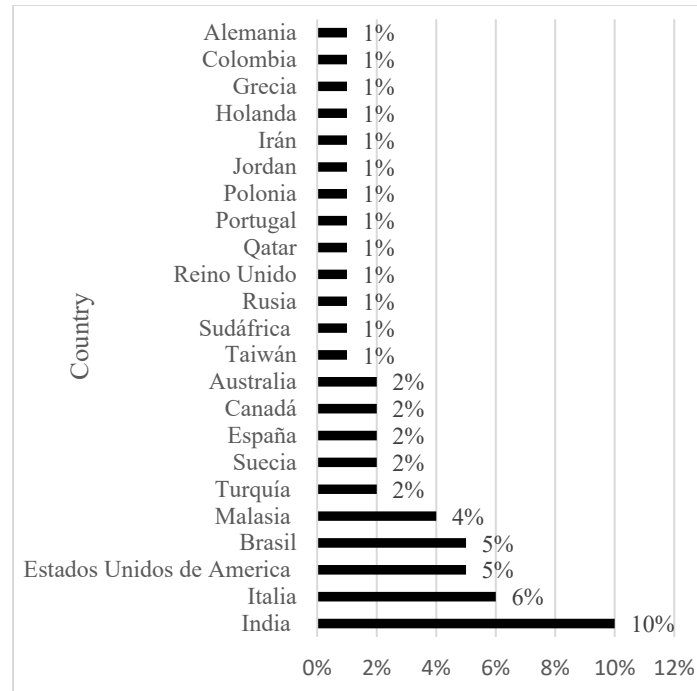
Figure 4. Percentage of participation by country

Where we can see that India has the largest contribution of published articles, which represents a total of 5.3%, represented by 10 contributions out of the 53 documents reviewed.

On the other hand, in second place is Italy with a total contribution of 6 articles, representing 3.1% of the total number of articles reviewed. In third place is the United States and Brazil with a contribution of 5 articles each country, representing 2.6%, we can also detect that several countries have the same number of contributions Turkey, Sweden, Spain, Canada and Australia with a total of 2 articles each country, representing 1.06%. The countries with less attributions and with the same number of articles are Taiwan, South Africa, Russia, United Kingdom, Qatar, Portugal, Poland, Jordan, Iran, Holland, Greece, Colombia and Germany representing 1% in attributions per country, being only a sample of the countries, which shows only the classification and position in which they are.

5.5. Classification results by document type
The following graph in Figure 5 shows the classification of the articles that had the greatest impact on data collection, leading with 39.6% the articles related to theory building with a contribution of 21 articles. For the construction of theory to classify these articles are what empirically seek to attribute to the creation of methodological proposals or proposals related to reference models which can be applied directly to characteristic problems.
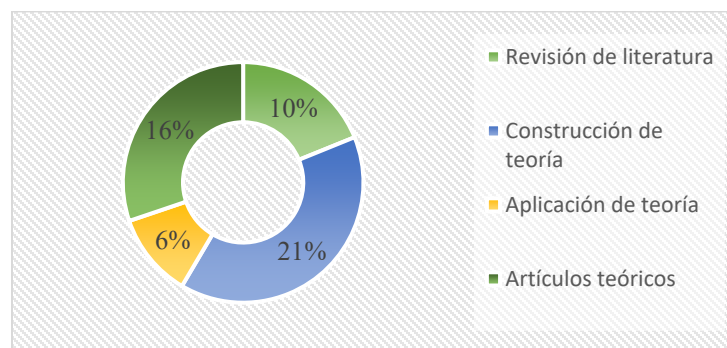

Figure 5. Percentage of use by item type

However, the need to contribute and give more weight to another application in the existing methods and seek to generate new proposals with new models according to the needs of the problems faced in the areas where they can be applied successfully, the interests of the scientific community in continuing to seek new gaps and contributions in the application of lean manufacturing tools under a scheme to apply good practices for proper project management are finally the authors whom define the course of their research.

5.6 Research method

The research method can be considered by authors and/or researchers where they show their procedures that they perform to test theories or next lines of research. Figure 6 shows 5 proposals that the author saw most present in the literature review in which the case study predominates with a participation of 12.1% with a total of 23 articles that are performed and tested with a case study methodology. In second place, a proposal/approach is observed in which it is based according to methodologies already proposed in other case studies but nevertheless these methodologies continue to cause significant changes in the productive processes. This attribution has an impact of 9.01% with a total of 17 articles that proposed this research methodology, distributor, retail agent and wholesale agent.
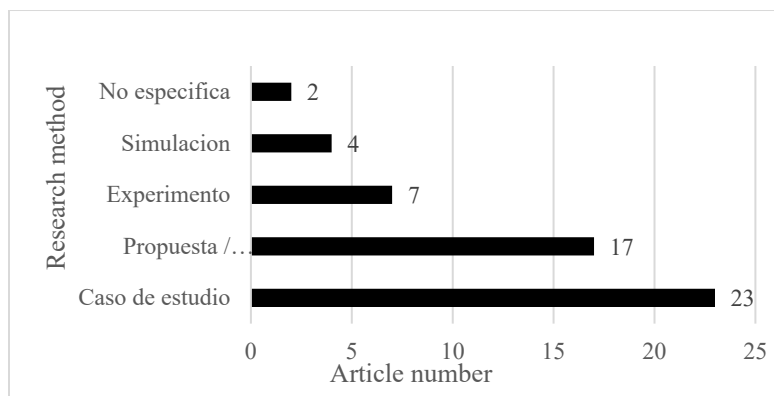

Figure 6. Number of articles by research methodology.

For the case of experiment, it has a contribution of 3.7% with a total of 7 articles, which have an attribution that usually seeks to create real scenarios or fictitious situations in which the researcher shows a panorama for decision making. Finally, for the methodology used for the articles that were based on simulation and a methodology that does not specify its contribution. It is important to highlight since it opens new gaps and proposals for researchers to make use of simulation software, which can be simple to understand, show possible scenarios that best fit future challenges and raise possible case studies.

5.7 Solution Methodology

Figure 7 shows that the technique that was most used in the selection of articles was the proposal, defining it as follows: for the solution process, researchers are invited to use lean manufacturing tools under a scheme of the use of good practices for project management. This type of proposal is present with 7 articles that use this type of technique, which is equivalent to 13.7% of attributions. The second tool with the highest participation was statistical testing which helps to visualize the current state of costs, functions and indicators, it is known that statistical tools are huge and at the same time kind that provide the opportunity to play and adapt the best tools for researchers with a participation of 8.8% with a total of 6 articles that decided to use this validation technique, the third incidence is the use of VSM and lean tools that contribute 10.6% between both articles with 5 contributions for each tool for solution. different methodologies.
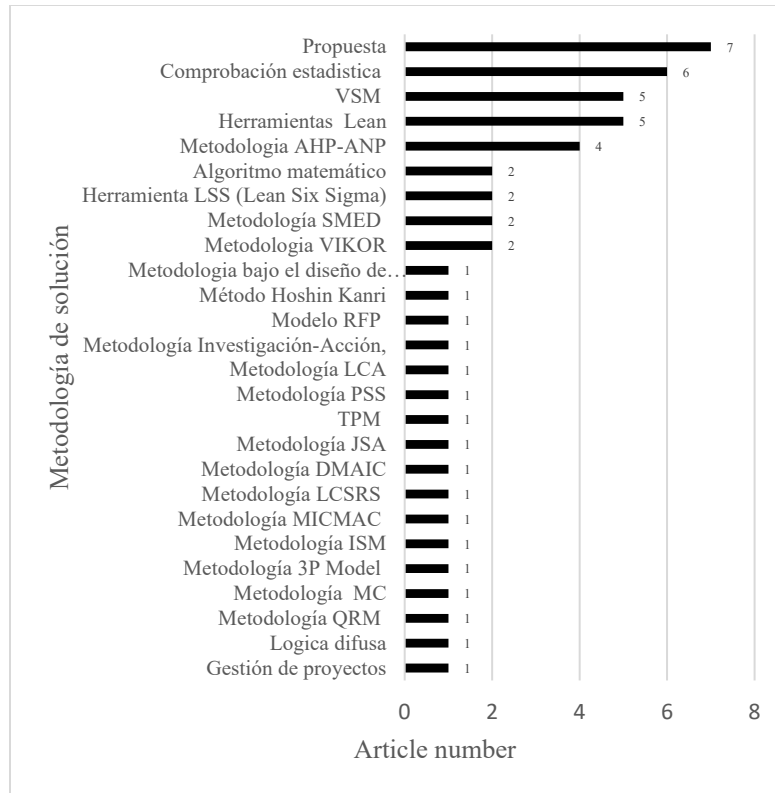
Figure.7 Number of articles by solution methodology.

The VSM consists of representing graphically to analyze process flows to present a product or service to the customer, with respect to lean tools, it encompasses all the tools that are part of lean manufacturing, to mention some 5s, Poka Yoke, TPM, among others. As it is observed in the graph, most of the solution techniques were based on already existing methodologies to validate under this scheme the use of lean manufacturing tools under a scheme of application of good practices for a correct project management, with these attributions in total equal to 16.9% of exclusive participation that was detected in each one of the articles which make a total of 32 contributions. Finally, we can say that most of the attributions were made under different methodologies.

5.7 Implementation level
Figure 8 shows the level of implementation reached by each of the contributions, where the number of articles with the implementation proposal is graphically represented. In first place is the implementation with a participation of 19.8% of these articles with significant attributions and opening new gaps for future researchers; the second place is headed by the articles that implemented proposals with a participation of 6.8%, indicating that the authors indicated their methodology without showing any type of practical result.
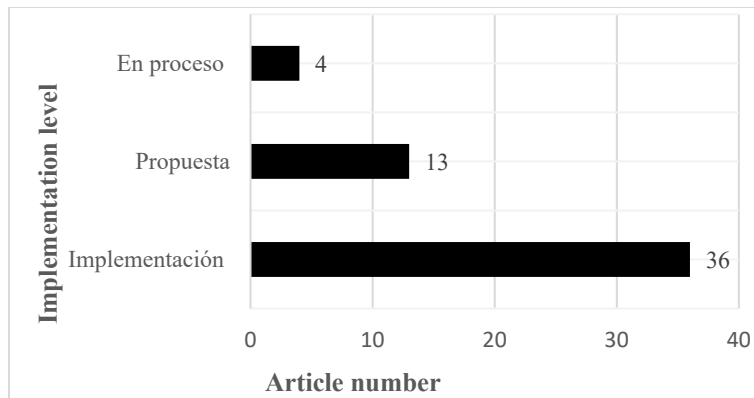
Figure 8 Level of implementation

The level of implementation is the graphic representation that shows us the number of articles that indicate the level at which the contribution or research reached. We can see that 44% of the articles reached a proposal level, that is, the author(s) indicated what their methodology or framework was, without reaching a practical result. Figure 8 shows the result of the research.

Finally, the level with the least attributions was those in process with a participation of 2.1%, which means that the authors who used this implementation are still creating or opening new lines of research, without yet having a satisfactory result or the use of the tools or methodologies employed are still under discussion.

6. Conclusión

The following literature review is directly related to the management and administration of projects to develop scientific and technological environments that serve as an overview of the attributions made in the last 10 years. It should be noted that identifying possible areas of opportunity for new fields of study and creating significant relevance on these topics, as well as possible behaviors under research techniques; the results obtained undoubtedly open new avenues for research, as well as the knowledge of new techniques to propose practical and efficient solutions to particular problems.

For this analysis a great variety of areas of knowledge and implementation on the management and administration of process flow were obtained, the annual period of search showed the different contributions published recently on topics in environmental impacts, information technologies, however for the attributions by countries shows that Mexico does not have significant advances in management and administration of projects that can be applicable in schemes under the needs and characteristics for projects of the Mexican industry, this is not bad on the contrary the margins so wide to expand new research and contribution of scientific articles allow day by day to offer a more standardized approach. Without mentioning that (India) has a greater means of validation in their proposals which attributes with more successful and relevant publications for researchers seeking to open new paths with the use of lean manufacturing tools under a scheme of the use of good practices for proper project management.

7. References

Adavert, J., Vidal, E., & Lorente, J. J. *5S Para la Mejora Continua. La base del Lean* (S. L. ALDA TALENT, Ed.; Tercera, abril 2017). (2017).

Asad Mir, F., & Pinningtonb, A. H. Exploring the value of project management: Linking Project Management Performance and Project Success. *International Journal of Project Management*, *32*(2), 202–217. (2014).

Bonham, S. S. *It Project Portfolio Management*. Artech House, Inc. (2005).

Crossan, M. M., & Apaydin, M. A Multi-Dimensional Framework of Organizational Innovation: A Systematic Review of the Literature. *Journal of Management Studies Journal of Management Studies*, *47*(6), 1154–1191. (2010).

Davies Andrew. *Projects: A Very Short Introduction* (1st ed.). Oxford University Press. (2017).

Deif, A. M., & ElMaraghy, H. Cost performance dynamics in lean production leveling. *Journal of Manufacturing Systems*, *33*(4), 613–623. (2014).

DeMarco, T., & Lister, T. *Peopleware Productive Projects and Teams* (2nd ed.). Dorset House Publishing Co. (1999).

Devi, T. R., & Reddy, S. v. Work Breakdown Structure of the Project. *International Journal of Engineering Research and Applications (IJERA), 2*(2), 683–686. (2012).

Dieste, M., Panizzolo, R., & Garza-Reyes, J. A. A systematic literature review regarding the influence of lean manufacturing on firms' financial performance. *Journal of Manufacturing Technology Management*, *32*(9), 101–121. (2021).

Ford, H., & Crowther, S. *Today and Tomorrow.* Page & Co., (1926).

Granillo, M. R. *Diseño de una estructura de desglose de trabajo (EDT) en base a la integración metodologica del diseño Axiomático y la administración de Proyectos* [Maestro en Ciencias con Especialidad en Ingenieria Industrial]. Instituto Tecnológico y de Estudio Superiores de Monterrey. (2009).

James, B. E., & Stephen, J. M. The Keys to Forecasting - # 2 Work Breakdown Structure. *Cost Engineering*, *46*(3). (2004).

Knoll, D., Reinhar, G., & Pruglmeier, M. Enabling value stream mapping for internal logistics using multidimensional process mining. *Expert Systems with Applications*, *124*, 130–142. (2019).

Liang, C., & Guodong, J. Project management of web-based product development teleservice. *The International Journal of Advanced Manufacturing Technology*, *32*, 162–168. (2007).

Mayring, P. Qualitative Content Analysis: Theoretical Background and Procedures. *Approaches to Qualitative Research in Mathematics Education*, 365–380. (2014).

Murray, W. R., & Simon, P. Making Sense of Stakeholder Mapping. *Connecting the World of Project Management*, *VIII* (11). (2006).

Myerson, P. *Lean Supply Chain and Logistics Management* (1st Edition). McGraw-Hill Education. (2012).

Pacana, A., & Woźny, A. Draft questions of 5S pre-audit with regard to health and safety standards for tires retreating plant. *PRODUCTION ENGINEERING ARCHIVES*, *13*(4), 26–30. (2016).

Panizzolo, R. Applying the lessons learned from 27 lean manufacturers.: The relevance of relationships management. *International Journal of Production Economics*, *55*(3), 223–240. (1998).

Pérez-Salazar, M. del R., Aguilar Lasserre, A. A., Cedillo-Campos, M. G., & Hernández González, J. C. The role of knowledge management in supply chain management: A literature review. *Journal of Industrial Engineering and Management*, *10*(4), 711–788. (2017).

Pinto, J. K. Understanding the role of politics in successful project management. *International Journal of Project Management*, *18*, 85–91. (2000).

PMBOK. *GUÍA DE LOS FUNDAMENTOS PARA LA DIRECCIÓN DE PROYECTOS GUÍA DEL PMBOK* (2017 Project Management Institute, Ed.; Sexta edición). Project Management Institute. (2017).

PMI. *Project management institute. A guide to the project management body of knowledge* (5th edn). PMI Publishing Division. (2013).

Randolph, A. W., & Poner, B. Z. What Every Manager Needs to Know about Project Management. *Sloan Management Review*, *29*(4). (1988).

Shenhar, A. J., & Dvir, D. Managing Technology Projects: A Contingent Exploratory Approach. *Proceedings of the 28th Annual Hawaii International Conference on System Sciences*, *3*, 1–10. (1995).

Shingo, S. *Sistema de Troca Rápida de FerramenUma Revolução nos Sistemas Produtivos (Em Portuguese do Brasil)*. Bookman. (2000).

Taiichi Ohno. *Toyota Production System Beyond Large-Scale Production* (Taylor & Francis Group, Ed.). Diamond, Inc., (1988).

Varajão, J., & Cruz, C. M. M. Using AHP and the IPMA Competence Baseline in the project managers selection process. *International Journal of Production Research*, *51*(11), 3342–3354. (2013).

Villacorta, P. M. (2014). *Gestión de Proyectos* (No. 1; EH14 4AS).

Wan, H., & Chen, F. F. A leanness measure of manufacturing systems for quantifying impacts of lean initiatives. *International Journal of Production Research*, *46*(23), 6567–6584. (2008).

Biographies

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I have participated in the development of quotations for different clients as well as the planning of steel purchases for new projects for companies such as Toyota, Nissan Mexicana and Honda. In 2020 i acquired the position of supervisor to coordinate activities related to time compliance and delegation of activities.

I am currently focused on continuing to acquire the necessary knowledge and skills to manage projects, while I continue studying for my Master's Degree in Engineering Project Management at CIATEC A.C. in Aguascalientes, Aguascalientes. Being part of the generation of students from 2020 to 2022.

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