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A Systematic Literature Review of Quality Seven Tools

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Basic quality seven tools help any organizations to improve their capability and process to fit into update situation and condition base on optimum choice they can select, in first step data need to be collected over the time upon agreed to get baseline data, as a visually how often data will emerge is a important also to compile it into some interactive graph of variations, if there any analysis can made and resulted as a listed problem occur from process have been finished, we can grade it as well to see which one impactful to our process and will be the top priority to improve, and this paper is targetted to see is the seven tools of quality is the comprehensive tools that can figured out any result that bridge us to varius group of result and easy to determine any conclution to make improvement for future plan tahat create continuous significant optimization to sustainability process to help any industry acheive a good analysis to growth over the years to come.

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1. INTRODUCTION

A quality product or service is one that is free of flaws—that is, free of mistakes that require redoing work (rework) or result in field failures, customer discontent, customer claims, and so forth (Deshpande, 2013). This interpretation of quality is based on the notion of "cost," with greater quality being associated with "costing less." The industrial sector is quickly growing in today's world. Every day, new thoughts and ideas are introduced that have application in the industrial sector, and the issues connected with industrial production, quality, and consumers continue to increase in complexity. Maintaining product quality in order to stay competitive in the market and preserve the company's or firm's brand name is very tough, but it is also essential. Quality control (QC) is a more conventional technique of managing quality that is being utilized by companies today (Chauhan, Shah, & Bhatagalikar, 2013). Control and quality assurance (QC) are involved with inspecting and evaluating finished work. Following World War II, Japan was the first country to introduce the idea of quality control. In later years, the quality-control idea expanded to the United States, the United Kingdom, and other nations, where it was first used in the industrial sector. Since then, the idea of quality control (QC) has gained in prominence. Simple statistical techniques are utilized to address issues in the seventh Quality Control Tool (QC Tool). Some of these tools were created in Japan, while

others were introduced to Japan by Quality Gurus such as Deming and Juran (Muhammad, 2015). Research by Mislan and Purba (2020), showed that the SQC method through the application of seven tools and utilization of FMEA to reduce the percentage of product defects.

2. LITERATURE REVIEW

The process stages were identified using the improvement strategy, which monitored the processes. To map processes and discover inter-process connections, the SIPOC tool was used (Stîngă, Severin, Mitrache, & Lascu, 2020). Notably, the frequency of all defects decreased. When it comes to inverted cables, for example, the frequency has dropped from 35 to 2. There was a drop in the frequency of motor disfigurement from 10 to 3, as well as a decrease in the frequency of loud motor from 9 to 3 (Realyvásquez-Vargas, Arredondo-Soto, García-Alcaraz, & Macías, 2020). The failure to grasp the concept of Lean Management, as well as unhappiness with the offered remedies, stems from a failure to adhere to the premise that the most significant signal about the problem originates from the source of the problem (Orynycz, Tucki, & Prystasz, 2020). The findings of the scatter tools diagram analysis revealed that top FFA grades as well as high levels of contaminants had a significant beneficial impact on the number of faults in the sample. Consequently, using a causal diagram, an investigation into the reasons of defect is carried out, and it is discovered that the predominant cause of defect is excessive grades of FFA in material requirement (Rosnani Ginting, Wanli, & Fauzi Malik, 2020).

The outcome, in the end, demonstrates that the New concept of Seven tools quality may be used to tackle a more scope range of excellent quality product product control challenges in production or services (R. Ginting & Fattah, 2020). It is critical to comprehend the significance of the chain of problems, which comprises the first eight things in this research, and to find the most appropriate ways to address those difficulties in the first place. To a significant extent, obtaining solutions in the following order of importance will save community as well as time, money, and source of materials in the long run (Akyildiz & Ekmekci, 2020). The operational sector contributes the most to project delays (26.3%). This category adds 25.56 percent to project delay (Sweis, Moarefi, Amiri, Moarefi, & Saleh, 2019). The relevant data that has been reviewed, the technique to systematically identify data flows, and the key data streams that have been proposed may all be utilized as a foundation for the deployment of quality tools in a cyber-physical system in an industrial setting (SchÖtz, Rosemann, & Reiser, 2019). The cause and effect diagram was especially useful for identifying the underlying cause and its effects (Memon et al., 2019). The findings revealed that PDCA cycle and DELTA techniques in evaluating machine damage was extremely successful and that the best implementation was achieved (Ihsan, Hasanah, & Purba, 2019).

There was a reduction in green tire faults due by under cure from 2088 pieces to 1585 pieces. This study can be carried on in order to make improvements to the Topring Problem in order to solve it (Hardono, Pratama, & Friyatna, 2019). The Second Grade Deffect Panel is the most common form of defect that may be found in the field. With the use of a fishbone diagram, it has been shown that there are numerous variables that contribute to Second Grade Panel faults in Polyurethane Sandwich Panel products. These aspects include human factors as well as techniques, equipment, materials and the environment (Febrianti & Tools, 2019). It is possible to reduce losses by converting defective products into other products with a high selling value. It is also possible to reduce losses by cutting defective products if a defect occurs on the side so that they can be sold again to consumers at prices comparable to new products in order to reduce losses incurred (Artikel, 2019). With incomplete fish scale flaws in 34 fish / seed while using the first process for getting milkfish, Gresik Mud should use the second procedure for capturing milkfish, according to the analysis and discussion with the seven tools method (Rosyidi & Hermanto, 2018).

3. RESEARCH METHOD

This paper review technique was used in this investigation 98 articles / journals based on the application of QC seven tools in various

companies. This literature review is the best method to study and analyze from basic theory, tools, experience and lesson learnt for either academic or practical exercise. Accordingly, this paper study starts with initial collection as step no. 1 of total 5 steps. The application of QC seven tools analysis in this article is shown in the following Fig. 1.

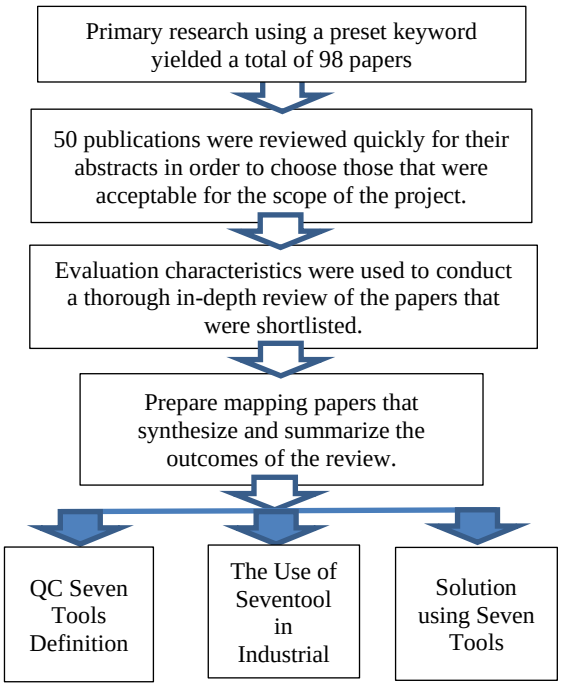

Fig. 1. Study Framework

4. RESULT AND DISCUSSION

Because the result was 19.72 percent, with a difference of 0.28 percent, which is deemed non-significant, it is determined that the goal of boosting capacity in three double manufacturing lines of electronic boards by at least 20% was reached (Realyvásquez-Vargas, Arredondo-Soto, Carrillo-Gutiérrez, & Ravelo, 2018). It is evident from the practical example provided in this article that the use of quality management tools and methods is beneficial. The quality management technique: the new seven instruments may be used to decrease the number of Triocid stripping rejects at PT. Zenith Pharmaceuticals, which is a pharmaceutical company (Pramono et al., 2018). Recommended to the business that they utilize seven quality control tools to regulate the quality so that quality can be managed and the causes that cause defects can be identified (Helia & Suyoto, 2018). The root cause identification technique was used in this research to identify the reasons behind the failure of the Iraqi construction project's design and construction. A variety of issues relating to building projects and project management process groups are encountered by the Iraqi construction industry. Among them are (Al-Zwainy, Mohammed, & Varouqa, 2018). Without a doubt, all of the quality tools listed above should be evaluated and used by management in the process of detecting and resolving quality issues throughout the manufacturing of goods and services (Neyestani, 2017). The correlation as well as coefficient between total production and total production faults is 0.4923, which shows that the two variables are related since r>0 indicates a positive connection (Suryoputro, Sugarindra, & Erfaisalsyah, 2017).

The estimations based on Pareto charts were verified in almost all of the cases studied. Aside from that, the diagram shows other information that is helpful, such as growth, extreme values, and even changes in the locations of certain areas (Zdrazil & Applova, 2017). This method is less complex and less expensive than total control of all variables. This approach is expected to be incorporated into the HSE process control system to improve the current expensive inspection techniques (Azadeh, Ameli, Alisoltani, & Motevali Haghighi, 2016). Complete repair attention is required according to the Pareto diagram, where there are only three types of categories: broken, porous, and thin side. The factors that cause the product to reject this is that the machine is not a standard spinning machine, the molding used is bent, and the drill bit used is blunt (Diniaty, 2016). Maintaining the quality of the goods produced and ensuring that they meet market requirements necessitates the use of quality control procedures throughout the manufacturing process. When quality control is carried out using a control chart (control chart), it may be used to produce a controlled state or to ensure that the process is within control boundaries, demonstrating that the process is consistent (Idris, Sari, Wulandari, & U, 2016).

Table 1. Existing literature review of the Quality Seven Tools

No	Paper Identity	Research object	Result
1	(Stîngă et al., 2020)	Tire manufacturing redesign.	Root cause analysis was done using Ishikawa and Pareto diagrams. When problems were identified, steps were made to simplify processes and improve production times.
2	(Realyvásquez-Vargas et al., 2020)	Improving a manufacturing process.	The manufacturing business reduced the number of assembly errors in component A from 67 to 16, result of 76.12% reduction.
3	(Orynycz et al., 2020)	Fast food restaurant.	The study techniques provided allow checking and improving work organization at the outlet. The study performed offered quantifiable and tangible advantages.
4	(Rosnani Ginting et al., 2020)	Crude palm oil product quality control.	Pareto objective 80/20 principle, the final result proportion of both faults reached 74.7 percent in CPO.
5	(R. Ginting & Fattah, 2020)	Production quality control .	Based on the findings, Seven Tools may determine the failure problem.
6	(Akyildiz & Ekmekci, 2020)	Occupational health and safety.	These changes will address all migrant workers' OHS issues.
7	(Sweis et al., 2019)	Oil and gas project.	According to Pareto analysis, the top 8 root lines causes account for 84.7% of delays.
8	(SchÖtz et al., 2019)	Cyber physical systems.	Cyber-physical systems may be discovered methodically.
9	(Memon et al., 2019)	Defect of paint shop.	Total faults decreased by 70% from 155 to 47 in the fourth month (February 2016).
10	(Ihsan et al., 2019)	CNC machine damage analysis.	To overcome engine damage, use the PDCA cycle to the techniques DELTA done carefully, once the root cause is identified and given remedies his best.
11	(Hardono et al., 2019)	Defect product green tire.	Using the outcomes of the modifications, the pneumatic issue reduced by 48% from 891 pcs in month two to 463 pcs in month five.
12	(Febrianti & Tools, 2019)	Plyurethane manufacture.	Among three kinds of defects, 130 Panel Stock Defects, 201 Second Grade Panel Defects, and 196 Panel Reject Defects, QC 7 tools reveal that Second Grade Panel Defects account for the majority of 201 units.
13	(Artikel, 2019)	Steel manufacture.	Tool of Pareto diagram is used to make sure the percentage value of the defect level at PT. Jaya Pari Steel Tbk, which includes 41% lamination, 32% reject plate, and 24% missroll plate.
14	(Rosyidi & Hermanto, 2018)	Gresik mud fish auction place.	The fishbone diagram resulting in the human component (man) requiring direction or training to keep the fish fresh. TPI Lumpur Gresik's lack of SOP for milkfish producers has created issues.

Table 1. Existing literature review of the Quality Seven Tools (cont.)

No	Paper Identity	Research object	Result
15	(Realyvásquez-Vargas et al., 2018)	Manufacturing industry.	It was determined that the project's goal of decreasing wave welding faults by at least 20% in the most popular Manual-Finish models was accomplished, as defects on the three studied models reduced by 66%, 79%, and 77%.
16	(Pramono et al., 2018)	Business performance in Pharmaceuticals company.	The new seven instruments may be used to minimize Triocid stripping rejects at PT Zenith Pharmaceuticals.
17	(Helia & Suyoto, 2018)	Cement bag production.	Data are beyond the control boundaries on the P control chart, and the variables that create dominating handicap may be determined using a fishbone diagram.
18	(Al-Zwainy et al., 2018)	Construction project.	To enhance project management technique, identify the underlying cause of issues.
19	(Neyestani, 2017)	Tools for resolving quality issues in businesses.	It is critical to use all seven QC tools while addressing manufacturing process problems.
20	(Suryoputro et al., 2017)	Batik textile manufacturing.	The study shows that using seven tools to execute and analyze quality control is beneficial.
21	(Zdrazil & Applova, 2017)	Regional growth and disparities.	An study of regional inequalities using - convergence access showed that a Pareto chart may be used to assess regional disparities.
22	(Azadeh et al., 2016)	Quality improvement in radio therapy department.	A fuzzy control zone is required to keep patients safe from out-of-control features. Any industry may benefit from this, particularly delicate ones.
23	(Diniaty, 2016)	Concrete manufacture.	Cleaning up the workplace utilizing 5S concepts and educating workers.
24	(Idris et al., 2016)	Quality control in food manufacturing.	The research showed that data on the kind of mismatch of faulty goods were collected up to 120 samples with 20 times taken, thus the number of defective items may be tallied up to 242.
25	(Karimi, Pallagi, Szabó-Révész, Csóka, & Ambrus, 2016)	Pharmaceutical drug research.	An Ishikawa diagram used to investigate all variables affecting the intended DPI product including CIP.
26	(Morales, Adán Valles, Torres-Argüelles, Erwin Martínez, & Andrés Hernández, 2016)	Concrete block plant.	Overall, the procedure achieved 97.53 percent downtime reduction, exceeding the original target of 50%, and the time available increased to 98.8 percent.
27	(Ratnadi & Suprianto, 2016)	Polyester staple fiber.	The runability of the drawing process is the most significant source of waste drawing as determined by a Cause and Effect Diagram (Fishbone Diagram).

Table 1. Existing literature review of the Quality Seven Tools (cont.)

No	Paper Identity	Research object	Result
28	(Sharma, 2016)	Iron manufacture.	7 QC tools assist enhance an organization's performance and efficiency, thereby increasing production.
29	(Aryanto & Auliandri, 2015)	Fillet skin on red mullet product.	According to the Pareto diagram, the most human category accounts for 54% of faults in Skin on Red Mullet Fillet. The following step's equipment category was 22%, temperature condition was 13%, material was 9%, and technique was 3%. So that each category causes product faults may be viewed in sequence.
30	(Desai, Kotadiya, Makwana, & Patel, 2015)	Large scale food processing industry.	The issue of weight differences in 1 kilo gram milk in powder pouches was successfully solved, lowering the reject rate to 50%.
31	(Gadre, Jadhav, Gaikwad, & Jadhav, 2015)	Seven quality tools review.	Seven QC tools may assist resolve quality problems. The use of seven Quality techniques increased the company's performance by 95%.
32	(Joshi, 2015)	Workplace organization.	7S is 5S plus 2S, i.e. Safety and Spirit (Team Spirit). Safety measures and training assist reduce accidents in the business.
33	(Muhammad, 2015)	Fan manufacturing industry.	Conclusion: The fundamental quality tools are extremely successful in detecting and eliminating faults from the production process. These tools are useful at all stages of fault elimination.
34	(Sanny & Amalia, 2015)	Food field company.	These are the variables that create faults in confectionery manufacturing.
35	(Stadnicka, 2015)	Setup time analysis.	The analysis persuaded management to use SMED. The SMED study showed a 38% setup time reduction.
36	(Ivančić, 2014)	Decision making process.	It is extremely important to use the Pareto principle 80:20 in the decision-making process.
37	(Assareh et al., 2013)	Clinical databases using statistical quality control.	Statistical quality control should be included in current clinical data quality improvement initiatives.
38	(Baskar & Pragadeeswaran, 2013)	Electronics industry.	Filling the edge AB of PCB takes 0.05 hours each piece. 250 sets take 12.5 hours, which may be saved by using this approach during PCB manufacturing.
39	(Chauhan et al., 2013)	Quality improvement in process industry.	Using 7QC tools consistently can help improve quality.
40	(Deshpande, 2013)	Tyres manufacture.	Cost analysis and comparison with prior data yielded yearly savings of Rs. 3,06,020.

Table 1. Existing literature review of the Quality Seven Tools (cont.)

No	Paper Identity	Research object	Result
41	(Shih et al., 2013)	Value stream mapping supply chain development.	Lean businesses are built on capability, with each value stream member striving to eliminate unnecessary activities both inside and across their firms.
42	(Cloete & Bester, 2012)	Biochemistry laboratory.	Adequately built and planned research may provide measurable benefits, with a clear and continuous emphasis on the intended study goals.
43	(Prajapati, 2012)	Automotive Industry analysis using SPC	Significant improvement after implementation by 400 times check with good result.
44	(Tarhan & Demirors, 2011)	Safety critical system.	Test development process execution charts showed that the mean values of measurement data may be utilized to compare the results of various test development processes.
45	(Isac, 2010)	Quality manageemnt in automotive industry.	Using innovative quality methods and working smarter, Total Quality Management aims to satisfy both external and internal customers, as well as external and internal suppliers, while also striving to continuously improve business operations.
46	(Shahin, Mazaher, & Arabzad, 2010)	Business roadmap.	New framework may be used to any quality improvement scenario, independent of service, product, process, or company. This is due to the resources on quality control tools.
47	(Drake, Sutterfield, & Ngassam, 2008)	Analysis and revolution of six sigma.	Six-approach sigma's and tools may address issues ranging from product/service design through compliance.
48	(Stephenson, 2001)	Supply chain of a maintenence enviroment.	Periodic process performance evaluation requires identifying and formulating metrics using lean technologies.
49	(Karapetrovic & Rajamani, 1998)	Statistical quality control techniques.	SQC is not the sole answer, but it is a viable one and possibly a step in the right direction.
50	(Plsek, 1995)	Techniques for managing quality.	Healthcare companies that fully grasp and effectively use quality tools are on the cutting edge of contemporary quality.

Companies can take preventive and corrective actions to reduce waste levels and improve product quality as a result of this understanding of quality seven tools (Ratnadi & Suprianto, 2016). As a result, 7 quality control tools are generally recognized as being critical in enabling organizations to create cost-effective products with the required degree of quality and efficiency (Sharma, 2016). It can be observed from the findings of the FMEA table that the priority corrective action begins with the categories of people, equipment, temperature conditions, materials, and procedures and progresses from there. When it comes to the human category, improvement design can be accomplished by increasing the number of supervisors assigned to error-prone process activities, conducting training for newly hired employees, and instilling the importance of maintaining quality in the minds of all those

involved in manufacturing activities (Aryanto & Auliandri, 2015). Three variables have impacted the choice of a quality control method: the simplicity with which the technique may be used, the capacity to assess product specification fulfillment, and the potential to address key quality and productivity issues. Quality tools play an essential role in data collection, analysis, visualization, and the creation of a solid foundation for data-driven decision making (Gadre et al., 2015).

When utilizing a questionnaire survey, the 7S activities should be constantly evaluated and modified if they deteriorate. The 7S enhances the performance of companies in terms of greater productivity, better quality, fewer accidents as well as a clean, safe, and healthier working environment (Joshi, 2015).

Table 2. Comprehensive tools for problem solving

No	Tools	Definitions
1	Statistics graph	Data is represented as a graph to allow for easy comparison of quantities or changes in numbers; this graph may be used for organizing data, displaying it to others, making decisions, or storing data.
2	Check sheet	This check sheet, which is a table used to organize data by type for ease of checking, is used to determine if tasks have been performed without issues or to avoid missing checks or incorrect inspections.
3	Pareto chart	A chart that categorizes issues and defects by kind in the order of numbers and displays the cumulative total; it is also used for examining a problem or defect item to see whether it should be highlighted for solution, i.e., to determine the location of the problem.
4	Cause and effect diagram	It is a diagram that organizes the outcomes of jobs (effects) and the variables that affect them (causes), and it is also used to explain causes and their influence on results (effect).
5	Scatter diagram	In addition to displaying related data to examine the correlation between variables, a correlation graph may also be used to examine the connection between two variables.
6	Histogram	It is also used to produce quality value variance or data group distribution, a columnar section chart obtained by counting the frequency of data in each zone divided across the existing data region.
7	Control chart	A tool for evaluating the situation of quality values in relation to control limits in order to determine the stability of a process. It is also used for checking the daily control status in order to determine if a process is in good condition or if there are any anomalies.

The findings indicate that the company's manufacturing processes are operating outside of its control boundaries. As a result, it is recommended that the business use rapid quality control measures by monitoring the productivity of the two primary elements that

produce fault, which are machines and people. If everything goes according to plan, the business will be able to reduce the amount of manufacturing errors that occur (Sanny & Amalia, 2015). During the data analysis, it was found that the frequency with which the setup occurs has an effect on the time required for the setup. While neither the source of an operator's knowledge about the setup process nor industry standards have a major impact on the setup time, there is a substantial impact on the setup time (Stadnicka, 2015). The Pareto principle is used to simplify the buying process and guarantee higher long-term sales margins in order to increase profitability (Ivančić, 2014). In order to improve the accuracy and completeness of databases, several approaches such as quality assurance frameworks, systematic audits, and repair processes have been suggested (Assareh et al., 2013). Containerization is supported. Transportation, consignment and container handling, storage, and information control are just a few of the critical decision areas that fall under the logistics umbrella (Baskar & Pragadeeswaran, 2013). In the context of a company's entire quality management system, there is the potential of systematic use of all seven quality control instruments (Chauhan et al., 2013).

We can see that there were four significant issues out of a total of 15 problems. Using the Pareto principle, we were able to identify the most pressing issue. The study's overall goal is to minimize cure tyre scrap as a result of an awling needle being inserted into a green tyre (Deshpande, 2013). In order to determine waste, practical references are made to the DMAIC and PDCA methods, as well as the usage of spaghetti diagrams and Fishbone analysis (Shih et al., 2013). It is essential to conduct empirical research in order to evaluate the suggested approach and identify any changes that need be made to the framework (Shahin et al., 2010). The advantages that flow from using the various six-sigma methods to diverse production scenarios are incalculable for a business that is genuinely committed to quality improvement, market longevity, and global competitiveness (Drake et al., 2008). Most companies will never be able to completely avoid the consequences of this kind of waste since the solutions are sometimes too easy to see and embrace, as well as being somewhat counter-intuitive (Stephenson, 2001). It is recommended to use a SQC strategy for engineering courses and their common components, which include lectures, labs, and tutorials. Four case examples from undergraduate mechanical and industrial engineering courses are given to illustrate the points made (Karapetrovic & Rajamani, 1998).

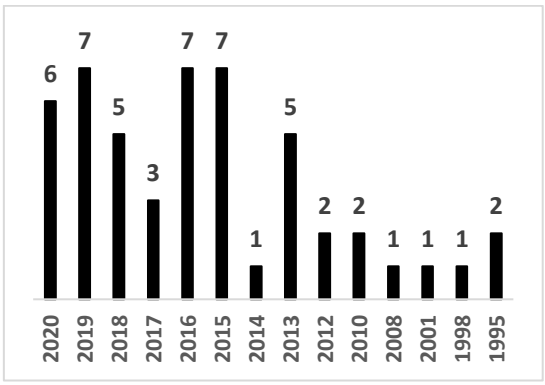

Fig. 2. Paper by year published

From year of publications the highest of seven published paper at year 2019, 2016, 2015, from total 50 paper.

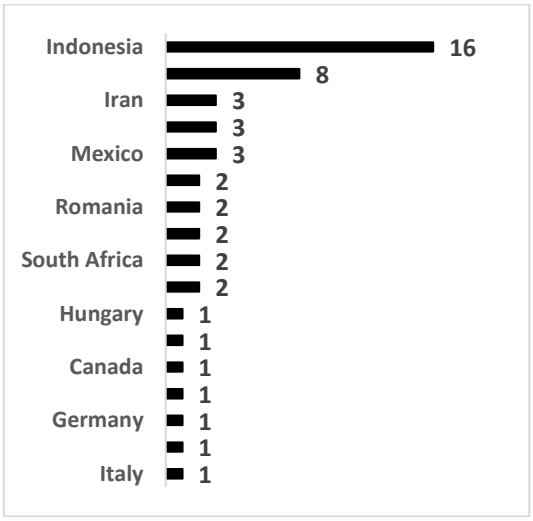

Fig. 3. Paper by year published

From country of publications Indonesia is the highest with 16 pulications.

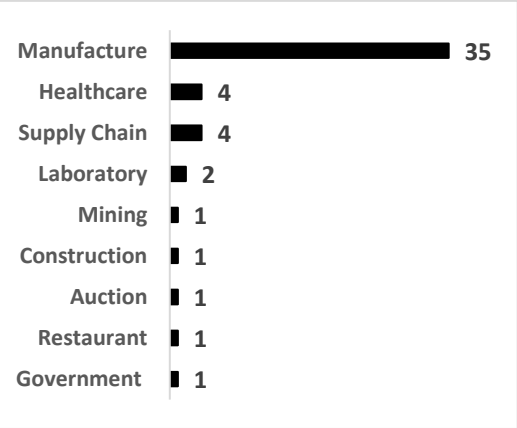

Fig. 4. Paper by year published

Manufacture industry is the highest with total 35 paper.

5. CONCLUSION

Industrial enviroment running on any plan that make it the first time before that process started, any process have been passed will create amount of data that very interested to review, and seven tools of quality is the comprehensive tools can figured out any result that bridge us to varius group of result and easy to determine any conclution to make improvement for future plan tahat create continuous significant optimization to sustainability process ahead.

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