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Seven Tools Analysis of the Green Tea Industry: Systematic Literature Review

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Abstract

Green tea is a drink that is quite familiar in the community, this drink has many benefits for both health and beauty. In addition to Indonesia, this drink is also well known to foreign countries and has even become the top three in the category of drinks that are often consumed by the world community. The reason why green tea is widely consumed by the public is because green tea is good for dieting. The high antioxidant and anti-cancer content contained in it is also good for health for both men and women. In addition, the easy way of serving this tea is also the reason people consume this drink. Green tea can be served hot or cold. With research using this systematic Literature Review method, we can find out in more detail about the efficacy of green tea. In addition, research with this method is also real with 99% correct results because the researcher uses several journals as comparison material. In the establishment of an industry, of course, many problems are found in its implementation. Seven tools or 7QC can be used to help solve existing problems because it provides several menus that can be used to research problems. Besides being used to solve problems, this tool can also be used to control unwanted things. From these seven tools we can also see the problem so we can fix it faster before this problem gets more complicated.

Keywords

Green tea, Seven tools, Benefits of green tea, Problems, Systematic Literature Review.

1. Introduction

Green tea or green tea is one of the drinks that is quite well known among the public Indonesia. According to research, green tea is one of the most frequently consumed beverages in the world (Erastus Mosha and Ruíz, 2010) In recent years, scientists have learned that the green tea plant has potential health benefits. This research has shown that the main component that is very beneficial is catechins (Reygaert, 2017) Besides being known as a drink that many enjoy, green tea is also famous for drinks that have many benefits that are important for health. Green tea or green tea can also increase antioxidant capacity (Chopra, 2016). In addition to containing high antioxidants so it is good for health, green tea also contains many antitumor and antimicrobial properties (Xu, Xu, and Zheng, 2017).

Seven tools or better known as 7QC is a tool used to analyze cause and effect, solve problems, seek to improve results and work processes. In simple terms this tool can be used to control statistical processes using various tools such as graphs, histograms, as well as a control chart (Pramono et al., 2018). 7QC can be applied to reduce problems at every stage of production and can improve the performance of the production process (Memon et al., 2019). Seven tools are presented in addition to solving some problems as well as controlling unwanted things. This tool can also be applied to find out things that affect production in an industry (Doctoral, 2019).

1.1 Research Questions

1) How is the process of implementing the seven tools in the green tea industry?
2) How is the impact of the seven tools on the production of the Green tea industry?

1.2 Research purposes

Based on the formulation of the problem that has been described previously, the purpose of this study is to determine the application of the seven tools to the green tea industry and to find out how much influence it has on the production process.

2. Theoretical Foundation

Many articles discuss the seven tools for the supporting sector that the industry must pay attention to. Now training is needed so that workers and entrepreneurs are able to face the onslaught in this modern industrial era. An approach is needed in order for education to modernize the teaching process and bring it closer to dynamic industrial practices (Mavrikios et al., 2018). This paper will focus on the process of implementing the seven tools or 7QC. With this proposal, it is hoped that it can help the green tea industry in solving problems and losses using the seven tools or 7QC system.

Since the opening of the free market, competition between companies is also getting tougher. Industry is also required to always meet increasingly diverse consumer demands with good quality (Suryoputro et al., 2017) With such problems, 7QC can be a mainstay for the industry to help solve them. Seven tools are designed with various variants so that entrepreneurs can go out to provide services as expected by consumers. These seven basic quality control tools, introduced by Dr. Ishikawa, are: 1) Check sheet; 2) Graph (Trend Analysis); 3) Histogram; 4) Pareto chart; 5) Cause-and-effect diagrams; 6) Spread the diagram; 7) Control chart (Ishikawa, 2017).

Seven tools is a graphical method used to solve problems in the production sector, especially those related to quality (Susilawati, 2022) . The seven tools consist of: Check Sheet is a tool that is often used in the Manufacturing Industry for data collection in the production process which is then processed into useful information and results in decision making (Amartya & Mahbubah, 2022) . Pareto diagrams are bar graphs that show problems in order of number of occurrences. The order starts from the number of problems that occur the most to the problems with the least frequency of occurrence. In the Graph, it is shown by the highest bar graph (far left) to the lowest graph (far right). Cause and Effect Diagram (Fishbone Diagram) is a QC tool that is used to identify and show the relationship between cause and effect in order to find the root cause of a problem. Cause and Effect Diagrams are used to show the causal factors and quality effects caused by these causal factors. Because they are shaped like Fishbones, Cause and Effect Diagrams are also known as Fishbone Diagrams. Histogram is a graphical display to show the distribution of data visually or how often a different value occurs in a data set (Prabaswari & Susilo, 2020) . The benefit of using histograms is to provide information about variations in the process and assist management in making decisions for continuous process improvement. Control Chart (Map of Control) is one of the tools from QC 7 tools in the form of a graph and is used to monitor/monitor the stability of a process and study process changes from time to time (Suryoputro et al., 2017) . This Control Chart has Upper Line (top line) for Upper Control Limit (highest control limit), Lower Line (bottom line) for Lower control limit (lowest control limit) and Central Line (middle line) for Average (Average). The scatter diagram is a tool that serves to test how strong the relationship between 2 variables is and determine the type of relationship (Zamrodah, 2016) . The relationship can be a positive relationship, a negative relationship or no relationship at all. The shape of the Scatter Diagram is a graphical representation consisting of a set of points from the value of a pair of variables (Variable X and Variable Y). In Indonesian, Scatter Diagrams are also known as Scatter Diagrams. Stratification What is meant by Stratification in Quality Management is the division and grouping of data into smaller categories with the same characteristics. The purpose of using Stratification is to identify the causal factors in a problem (Mizuno, 2020).

3. Method

In conducting this research, the author uses the A Systematic Literature Review (SLR) method. Systematic review is a review that is used to answer a question listed in the paper with a predetermined method. SLR is a method for identifying, selecting, and critically evaluating relevant research, and collecting and analyzing data from the studies included in the review (Mahyoub et al., 2019). SLR uses a fair and impartial method in evaluating all available techniques (Hassan et al., 2022) .

In practice, errors in the application of SLR are very few because the data is processed in such a way with comparisons of several journals as a reference. That way, we can minimize an error in data processing (Guo et al., 2021). This study follows directions that are in accordance with the rules that have been set in Slr so that the data

used are unusual and real (Adnan et al., 2021) . The data that will be included in the research can also be accounted for for its authenticity because it is through real sources as well as with the author. Comparison from several journals can also be used as a reference so that this slr is data with the least errors (Adamu et al., 2022).
The preparation of this paper includes the following steps:

1) Searching/identifying data sources
   a. Identify data search string
   b. Searching for data sources and web addresses
   c. Determination of the desired data
2) Data extraction and synthesis
   a. Filtering data sources from almost 2000 data to 1000 data
   b. Add text for development
   c. The final selection is based on the criteria of 1000 data, only 150 data remain
3) Data analysis
   a. Reanalyzing data from 150 data, 50 data were taken according to the criteria
   b. Determine the result of some data
   c. Carry out development of existing data (Figure 1)

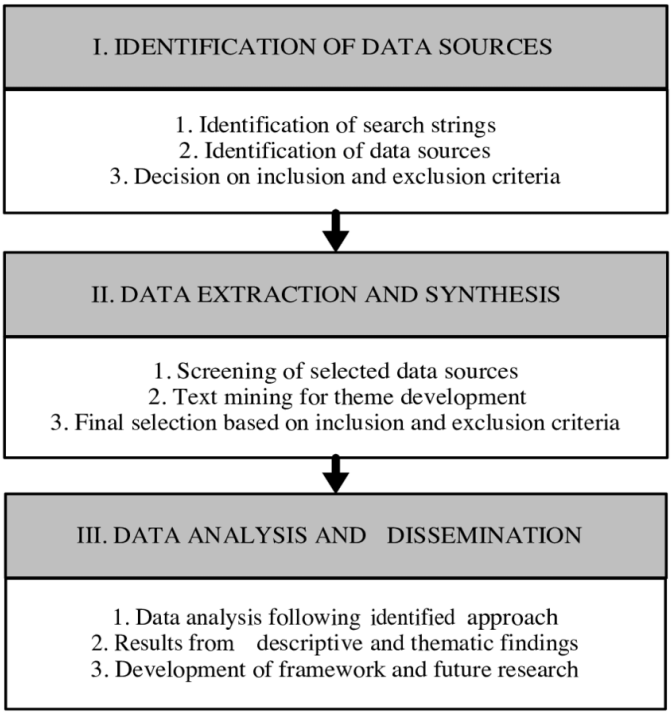

Figure 1. Methodology Systematic Literature River
Source: (Ghadge et al., 2020)

4. Data Collection

When conducting research in "Analysis of the seven tools on the management of the green tea industry", researchers can obtain the required journals, literature and articles through various research platforms such as Google Scholar, Research Gate, and harzing publish or perish. The reason researchers use the database is because researchers can easily find and access the required literature and on this platform researchers get 150 journals for research titles. From the 150 journals, the authors chose again so that there were 42 journals with topics related to the theory of choice.

This platform is indeed very helpful in maintaining the scope of the research to be limited with keywords, authors, and time published to develop a systematic literature review. So that the author can easily take and draw conclusions from the selected journal. These journals will then be reprocessed so that they become useful papers for the

community and writers. From the journals that have been collected, the authors have used 21 of the 40 journals that will be used. The author groups them into seven year intervals based on the year of publication from 2015 to 2022 (Figure 2).

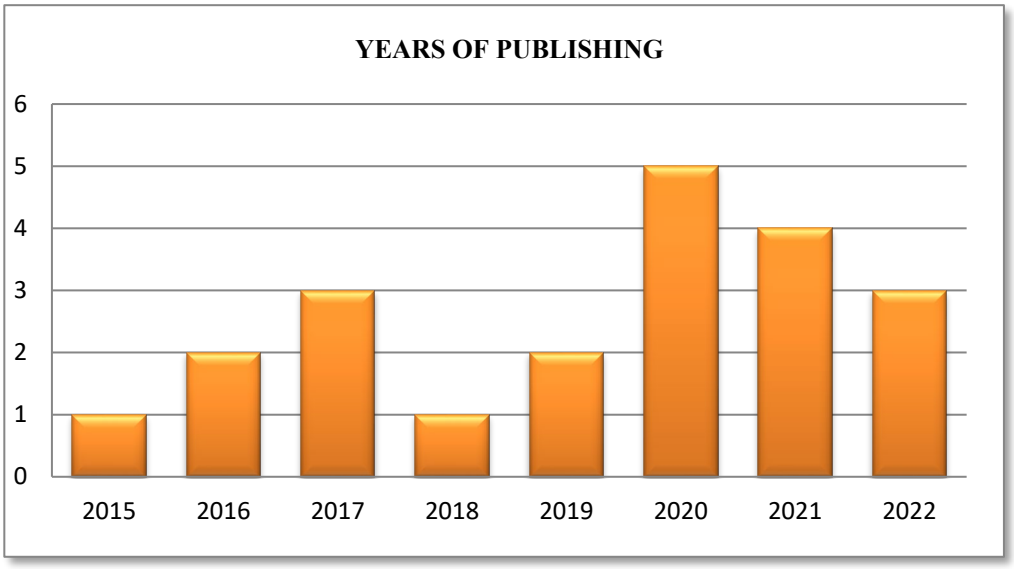

Figure 2. Classification of Journals by year of publication.
Source: Self-managed (2022)

Based on Figure 2 above, it can be seen the number of journals published from 2015-2022. The main objective of the year-by-year division is to realize the number of publications selected and meet the standard of articles in a given year (Mustapha et al., 2021) . The following is a diagram for the literature according to the literature database source.

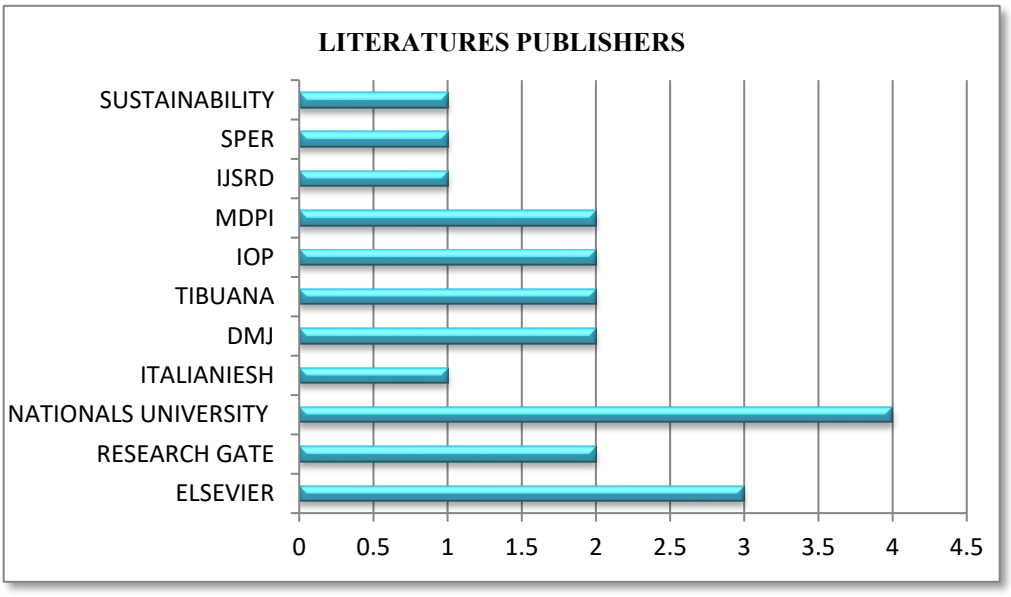

Figure 3. Classification of Journals by publishing platform.
Source: Google Scholar, Research Gate, harzing publish or perish and self-managed (2022)

From Figure 3 above, it can be seen that many journals are published in other international places such as Indonesia, Korea and others. The authors took the data from several sources such as Google Scholar, Research Gate, and Harzing Publish or Perish. Thus, it can be concluded that the journals used in this SLR are credible and can be accounted for for their validity.

5. Results and Discussion

5.1 Application of seven tools in industry

The accuracy in solving using these seven tools reaches 95% of all problems. Therefore, many companies use the seven tools to identify errors in data management (M & Siahaan, 2016). The menu that is often used is the check sheet, which is a data collection sheet. In this menu, data is collected and then selected according to the needs and listed so that the results of the recording are real (Nurcahyanie & Koesdijati, 2020). The goods in the production process are recorded in the check sheet menu in both quantitative and qualitative forms (Pearl, 2019). The method of collecting data to analyze an error is also not easy because the data taken must be in accordance with the constraints experienced. Sampling cannot only be done randomly but must be appropriate and thorough so that the errors detected are not wrong which cause errors in handling (Wardhani et al., 2021).

After going through the check sheet menu, the data obtained is then identified to find out the causes and effects of why the problem occurs. The identified errors are then drawn to a conclusion to correct the location of the most errors (Tools & Process, 2022). Here is an overview of the fishbone in Figure 4.

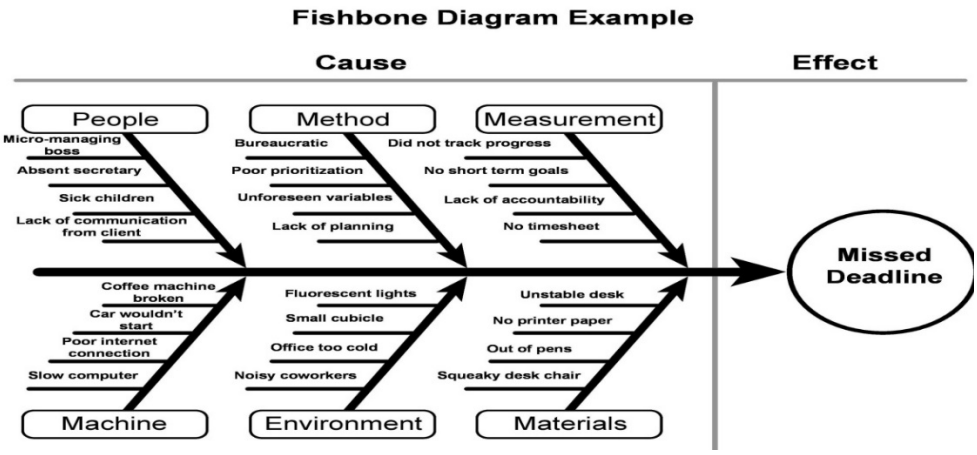

Figure 4. Cause & effect diagram
Source (Gadre et al., 2015)

From the diagram it can be seen that the problem is looking for the cause after the cause is known, the next step is to look for the consequences of the problem for both output and input. As a result of this problem, it will be further developed so that solutions can be found for future improvements (Erdhianto, 2021). From the data that has been taken above the average problem that occurs is the harvest process so that the quality of the leaves produced is not good. The second factor is the management process, most of which still use simple methods and the location of the factory is far from the garden, resulting in less fresh leaves. These problems need special attention from the manager so that the impact can be reduced which results in quite large losses (Pal, 2021)

5.2 Impact of seven tools on green tea production

It's no secret that green tea has many benefits for beauty, medicine and nutritious drinks. Green contains high anti-cancer and anti-oxidants so it is good for curing various diseases (Yu et al., 2017). The high content of catechins is also very good which is often found in grapes, blueberries, nuts and chocolate (Lakshmi et al., 2017) With these various benefits, many green tea management industries have been established, especially in Indonesia. Now many green tea companies have been founded because of the great demand in the market (Reygaert, 2017) With so many companies that have been established, of course, there are also many competitors and obstacles that must be faced

(Chen & Reniers, 2020). For more details, the authors include the journal in the form of a diagram so that the accuracy of this data is very high (Atanasova, M., Georgiev & Chapanov, 2018) (Table 1).

Table 1. Findings of seven tools in the green tea industry
Source: from several journals, processed by researchers (2022)

No	The articles' titles	Author name and year	Findings/Outcomes
1	Design of Finished Goods Inspection Acceleration With Qcc Method and Seven Tools To Increase Productivity .	Aprina, B. (2021)	The manufacturing industry in the current era of globalization is very strict. Speed to produce products is important now, not only in terms of process. Developing a new product at PT. Surya Toto Indonesia has been running well, only in the process there are still found the exceeded of time or schedule of work plans that have been made. The preparation process for carrying out this test will take more time
2	Global tectonic plate motions from slr data processing	Atanasova, M., Georgiev, I., & Chapanov, Y. (2018)	Various global and arc-dependent parameters are estimated by analyzing Satellite Laser Ranging (SLR) data of the geodynamic satellites Lageos 1 for the period April 1984 – December 2011 and Lageos 2 for the period January 1993 – December 2011.
3	Analysis of Maintenance of Light Fire Extinguishers at PT Indorama Synthetics Using the Seven Tools Method	Nirwana, NR, Irawan, MA, Diadi, FA, Al-fauzi, MR, & Saefullah, A. (2022).	The research method used in this research is observation with literature study as a support. The analytical method used is to use the Seven Tools method which aims to solve a problem at work to improve results and processes at work
4	Data extraction and management Data were extracted independently by two reviewers (JY and ARC) and confirmed by a third reviewer (PS) using a form adapted from Cochrane Data Extraction Form for Intervention Review	Yu, J., Song, P., Perry, R., Penfold, C., & Cooper, AR (2017)	Green tea or green tea extract (GT/GTE) has been demonstrated to reduce insulin resistance and improve glycemic control. However, the evidence for this health beneficial effect is inconsistent. This systematic review evaluated the effect of GT/GTE on insulin resistance and glycemic control in people with pre-diabetes/type 2 diabetes mellitus (T2DM). Ovid MEDLINE, Embase, AMED, Web of Science, and the Cochrane Library were searched up to April 2017 for randomized controlled trials of participants with pre-diabetes or T2DM, where the intervention was GT/GTE
5	An Update on the Health Benefits of Green Tea	Reygaert, WC (2017)	Green tea, which is produced from the leaves of the Camellia sinensis plant, is one of the most popular beverages worldwide. Over the past 30 years or more, scientists have studied this plant in respect to potential health benefits. Research has shown that the main components of green tea that are associated with health benefits are the catechins.
6	Chemical industry in China: The current status, safety problems, and pathways for future sustainable development	Chen, C., & Reniers, G. (2020).	Safety risks have become an obstacle to the sustainability of the chemical industry in China since many chemical companies were forced to close down by China's government in the past three years. This study investigates chemical safety in China in order to identify the causes of the major accidents and accompanying casualties, formulating the safety management needs to develop a sustainable chemical industry in China. First, we analyze the evolution and current status of China's chemical industry to identify

			possible safety issues rooted in the industry.
7	A review on green tea catechins in oral health management	Lakshmi, T., Balusamy, SR, & Parameswari, R. (2017)	Tea is one of the common beverages used worldwide. Green tea is a commonly used beverage in the Asian countries. Tea contains constituents such as flavonoids and catechins which have wide use in several health-related problems. Green tea extract catechins have four main derivatives: Epicatechin, epigallocatechin (EGC), epicatechin gallate, and EGC gallate
8	Problems with the implementation of industry 4.0 in enterprises from the SME sector	Ingaldi, M., & Ulewicz, R. (2020)	Industry is currently undergoing a revolution (called Revolution 4.0) related to the far-reaching integration of all production areas through the digitization and the creation of new communication channels. The Polish economy generated a GDP of USD 524.5 billion in 2017, of which small and medium enterprises generated about 50% of revenue and in which microenterprises accounted for the largest share in generating.
9	Production quality control with new seven tools for defect minimization on PT. Indonesian Aerospace.	Ginting, R., & Fattah, MG (2020).	PT. Dirgantara Indonesia has a high production complexity by producing components for aircraft and aerospace products. The company report from 2016 until 2018 noted that the higher the number of defective products is delayed delivery to the main contractor. this is very detrimental to the company because in addition to getting fined also has to pay shipping costs. To analyze the problem, Seven New Tools are used.
10	Proposed Improvement of Flour Quality by using New Seven Tools Method	Ginting, Rosnani, & Wibowo, C. (2020)	The quality of flour is a matter that must be considered as the main output in the production process, in this case each type of flour has a different standard specification, the quality of the flour is determined by 3 main factors contained in the flour, namely moisture, protein and Ash content. The specifications of the three main factors must be achieved in order to produce quality flour and suitable for use according to the type of flour.
11	Evaluation of seven different rna-seq alignment tools based on experimental data from the model plant arabidopsis thaliana	Schaarschmidt, S., Fischer, A., Zuther, E., & Hincha, DK (2020)	Quantification of gene expression is crucial to connect genome sequences with phenotypic and physiological data. RNA-Sequencing (RNA-Seq) has taken a prominent role in the study of transcriptomic reactions of plants to various environmental and genetic perturbations. However, comparative tests of different tools for RNA-Seq read mapping and quantification have been mainly performed on data from animals or humans, which inevitably neglects, for example, the large genetic variability among natural accessions within plant species.
12	Disabled Analysis of Ceramic Products on the Glass Process Using the Seven Tools Method (Case Study: Pt. Njmx Surabaya	Nurcahyanie, YD, & Koesdijati, T. (2020)	In the production process of quality is very off at PT. NJMX, a company engaged in the manufacture of ceramics where the quality of a good ceramic surface does not have any disability is expected by consumers. This study aims to identify the disability of ceramic products by using the seven tools method on the glaze process, applying the seven tools method as an effective tool to improve productivity and product quality in the process of making ceramic in the glaze unit.
13	The seven tools of causal inference, with reflections on	(Pearl, 2019)	The Dramatic Success In machine learning has led to an explosion of artificial intelligence (AI) applications and

	machine learning		increasing expectations for autonomous systems that exhibit human-level intelligence. These expectations have, however, met with fundamental obstacles that cut across many application areas. One such obstacle is adaptability, or robustness.
14	Seven Tools As the Problem Solving Ways T0 Improve Quality Control	(Wardhani et al., 2021)	There are many ways for the company to reach a good standard for their goods and services. Standard is essential to achieve a level of customer trust. The company must be maintaining the quality of their services and products, including in this case the quality of goods beside the services. To ensure its achievement, a directed management system and processes are needed to achieve the level of customer trust.
15	Analysis And Quality Improvement Of Public Health Center And Drug Information System Using Quality Function Deployment And Seven Qc Tools Method	(M & Siahaan, 2016)	The implementation of information system in the Jember Regency Health Office operation area still encountered many problems that frequently experienced by users. The obstacles faced by users include low speed system, duplication of patient index number, patients miplacemenet in clinic, inconsistencies of drug data during transaction, report and reality.
16	A Study on Seven Quality Control Tools & Its Effects On Productivity, Quality & Cost	Zamrodah, Y. (2016)	The 7 QC tools is a designation given to a fixed set of graphical techniques which helps in troubleshooting the issues related to quality. These tools are basic because they are suitable for people with little formal training in statistics and used to solve the majority of quality related issues.
17	Problems of introduction of digital technologies in the transport industry	Duganova, E., Novikov, I., Novikov, A., & Zagorodnii, N. (2022)	In the context of global digitalization, the service and repair of vehicles will have to undergo major transformations. Digital transformation provides for the restructuring of all business processes, which will lead to the improvement and, in some cases, complete replacement of existing systems for the organization of transport and service enterprises.
18	Journal of E-Komtek Integrating Seven Tools and Kaizen Approach in Evaluating Defects on Tofu Production Process	Tools, IS, & Process, P. (2022)	UKM Tofu ADA is a tofu producer that makes an effort to develop the quality standardization of the tofu production process. Managing tofu quality through maintaining the production process is challenging, resulting in no good tofu
19	IJSRD-International Journal for Scientific Research & Development|	Gadre, PK, Jadhav, DP, Gaikwad, SG, & Jadhav, AV (2015)	The main aim of this paper is to provide the use of 7-Quality Tools (QC) to improve the quality of products in any industry. It includes different methods and tools by which some organization can keep check on quality.
20	Quality control analysis to reduce the number of defects in the packaging of pg kremmboong sugar products using seven tools method	Erdhianto, Y. (2021)	Quality control is an activity that must be carried out by a company so that the products produced are in accordance with the standards set by the company in order to meet customer satisfaction.
21	Reviving Pottery Industry by Solving Problems: A Study in a Developing Reviving Pottery Industry by Solving Problems: A Study in a Developing Economy	Pal, SK (2021)	The pottery industry is a traditional handicraft in human civilization with historical and archaeological values, covering small and cottage industries, having remarkable contributions to the economy. The research aims to pursue the problems of Bangladesh's pottery industry and find out some ways to solve these constraints. Data were collected through a closed-ended

			questionnaire from males (87%) and females (13%) of 55 members of potter's families from 14 villages under 6 Upazila of Rajshahi district having various ages, 58% were 15 to 24 years

The obstacles in establishing an industry are very diverse, both from within and outside the company (Ingaldi & Ulewicz, 2020). The current industry competition is very tight, not only about the speed of production and meeting targets but also high quality (Aprina, 2021). With this competition, businessmen are required to have up-to-date ideas so they don't fall behind and go out of business. But the innovation also must not eliminate the characteristics of a product (R. Ginting & Fattah, 2020). Seven tools are the main factors that must be considered to prevent unwanted things from happening. The seven tools method is a very simple method to solve problems (Nirwana et al., 2022). There are seven steps that must be considered in dealing with problems that occur in the industry using the seven tools method (Rosnani Ginting & Wibowo, 2020). There are seven menu options offered in the seventools menu. The menu does not have to be used in its entirety, because of its simplicity, the seven tools are widely used by industry managers (Schaarschmidt et al., 2020).

Defects in the management of goods must also be avoided so that the goods to be marketed have good quality. Defects of these goods can be avoided by rigorous research and sorting of goods before they are marketed (Zamrodah, 2016). Goods that pass the next selection go to the packing stage and items that do not pass the selection go into damaged goods. But before the defective item is destroyed, the item is collected for data collection and research so that errors can be identified in which part of the item must be repaired (Duganova et al., 2022).

6. Conclusion

Green tea has many benefits for health, beauty and fitness. Green tea drinks are in great demand by the public, both from within and outside the country and become the number 3 drink that is widely consumed. But with these many benefits, green tea also has many problems, both in terms of planting and selling. These obstacles can be overcome by using the seven tools menu. Seven tools is a very simple menu so that someone who uses it does not require special training. The data that is processed in this menu is very simple and also very detailed so that it is very helpful for users. The accuracy of this menu reaches 95% in solving problems.

Seven tools provide seven menus that can be processed in such a way, the frequently used data are Check Sheets, Graphs (Trend Analysis), Histograms, Pareto charts, Cause-and-effect diagrams, Spread diagrams, Control charts. The chart does not need to be used all of it, only part of it is used according to user needs. Data collection for samples must also be considered because this also requires a high level of accuracy. Most industries use the seven tools menu only up to the cause-and-effect diagram.

7. Suggestion

Solving problems using seventools is indeed very simple, but much attention must be paid to data collection so that more fatal errors do not occur. The biggest problems must also be addressed immediately so that the industry does not experience many losses resulting in more losses. In collecting data for samples, it is better to use several teams to minimize errors. The data taken must also be in accordance with what is needed and do not just take it because it will affect the results obtained later.

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