A REVIEW OF THE LITERATURE ON THE COSTS OF QUALITY

Irina Daniela GAVRILUC[1],
Iuliana Eugenia GEORGESCU[2]

Abstract: *To highlight and monitor quality costs, a company should first adopt a cost classification framework. Basically, the cost of quality (CoQ) is composed of the costs of conforming to the customer's standards and the costs of not conforming to these standards. Our study aims to, starting from the studies identified in the specialized literature, offer a general vision of how the issue of determining and managing quality costs is addressed. For this purpose, a quantitative and qualitative analysis of a sample of 84 articles published in the last thirty years, articles that addressed the issue of quality costs, was carried out. In the quantitative analysis, a series of grouping criteria were considered, such as: year of publication, database, type of journal, authors' contribution, geographical area, method of determining the cost of quality and various performance indicators that are based on the cost of quality. The qualitative analysis mainly aimed at clarifying the concepts used in the field of quality and the cost of quality, as well as reviewing the ways of determining and valorization of information regarding costs of quality.*

Keywords : *Cost of Quality, Quality Costing , Cost Components , Quality Cost Methods*

JEL Classification : M

Introduction

Quality has proven to be one of the most important factors for every company, whether it has manufacturing or service activities. Quality improvement is therefore considered one of the most important approaches to customer loyalty in today's complex global competitive environment (Khaled Omar & Murgan, 2014).

Starting from the idea "if you can't measure, you can't fix", measurement is strictly necessary to get a picture of the overall performance, to be able to identify problems and opportunities for improvement. Author Cohen (Cohen, 2005) mentions that measurement is the only way to understand process performance, whether in terms of growth or decline and the need to act.

The cost of quality model is an internal cost model that is very useful in quality management. The high level of detail makes it easier to identify specific areas where costs are incurred due to the lack or low level of quality. In most standard costing systems, much of this information is incorporated into inventory variance accounts and expense accounts.

Why do we need a literature review on the cost of quality? In formulating the answer to this question, we started from the idea that in order to create new knowledge in the current literature, we need to connect past information with new scientific research (Maurizio Massaro, 2016).

[1] Ph. D. Student, , Faculty of Economics and Business Administration Iași, gavriluc.irina@gmail.com
[2] Ph. D. Univ. Prof. Dr., , Faculty of Economics and Business Administration Iași, iuliag@uaic.ro
DOI: 10.29302/oeconomica.2023.25.1.5

Research Methodology

Our work consists of a bibliometric study (meta-analysis) on the literature that addresses the topic of quality costs and the usefulness of information on these costs in establishing the strategy of entities with economic activity. In fact, meta-analysis is an objective process of literature review, by using objective procedures for selection and analysis of articles (Stanley, 2001). The review of the cost of quality literature involved reviewing various sources of information, namely: academic journals, industry publications and government reports. The purpose of the review was to identify a number of studies relevant to the area of interest and thereby gain an understanding of how quality issues have been approached and reflected in accounting, including the identification of key factors influencing cost quality.

For this purpose, the search was carried out in the Google Scholar database. The search terms used were: "costs of quality", "quality costing " and "quality management", and the time period targeted was 1993-2022. Given that the research topic falls within the field of accounting and management control, applicable to any entity, regardless of the field of activity and having no fiscal constraints specific to each country, it was decided to waive the application of a restriction in terms of belonging to a specific country or geographic region, considering that foreign specialized literature and good practices used in countries with a tradition in this field are very useful and relevant. The initial results of the search (594 articles) were then refined, following the analysis of the abstract of each article, eliminating those articles that have no relevance to our research, respectively 389 because the studies were based on the analysis of other fields such as medicine, tourism, environment, etc. Each of the 205 articles remaining in the analysis were then studied in its entirety to ensure its relevance to our analysis, eliminating at this stage 121 articles because they were not related to the field of accounting, thus arriving at a final number of 84 items in our sample.

The Atlas.ti platform was used, where the complete documents were uploaded in the form of a project and the coding lists created.

Results of the quantitative analysis of the sample items

Although the theoretical concept of quality costs appeared in the 1950s (Juran (1951) and Feigenbaum (1956)), only after the 1980s did this topic attract the attention of the scientific community. Thus, the seminal work of Crosby (1979) was one of the first attempts to bridge the gap between theory and practice and show the world how quality costs can bring positive results. Our research is spread in period of thirty years, to cover important research that, in a limitation of the time, could be omitted. Thus, the relevant articles are placed on the time axis in the following figure, from where an increase in the number of researches in the field of quality costs can be observed, with a preponderance in the 21st century, together with the 4th industrial revolution, the expansion of the Internet and of the digital age.

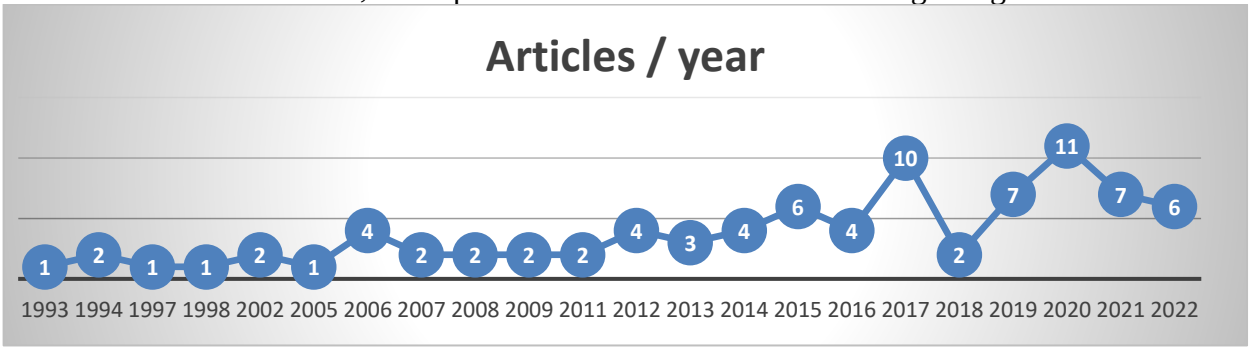

Fig. no. 1 The share of articles in the sample according to the year of publication

Geographical area was also included in the analysis of the 84 articles to highlight the distribution of research across the globe. This analysis highlights the interest in quality costs on all continents. The results show, however, that Europe and Asia are the continents with the

highest concentration of studies, respectively 36 and 29 articles followed by North America with 16 of the total analyzed articles.

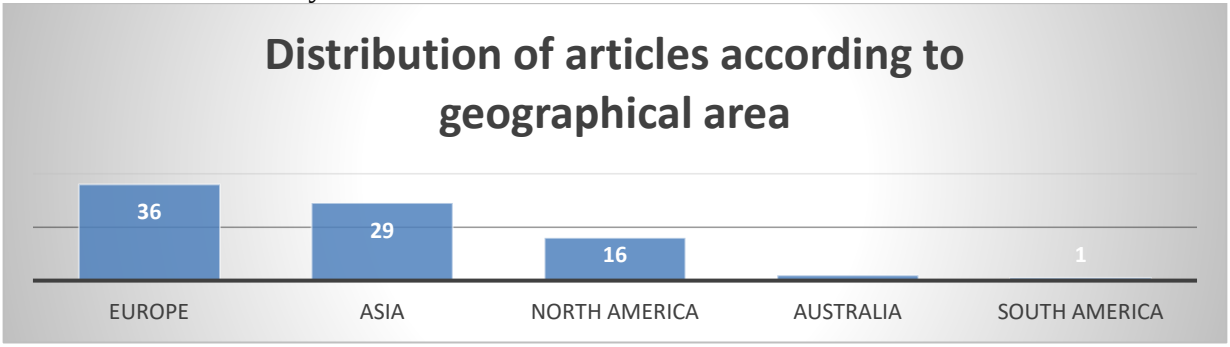

Fig. no. 2 The weight of the articles in the sample according to the geographical area

Of the 84 articles analyzed, only for 6 of the studies took place in several countries, which represents about 7%, and shows us a deficit in terms of multinational studies. Although the analysis indicates an increased interest in quality costs in Europe, where they are measured and analyzed in detail, at the opposite pole are Australia and South America, studies from these areas indicating that these quality costs are the least monitored and are sporadically reported.

An analysis of the relevance of the articles from the perspective of the quotation of the journal in which it was published allowed us to find that the topic of quality costs was addressed in journals, especially from the fields as Accounting, Economics and Econometrics, Finance, Strategy and Management. Their situation is shown in table no. 1.

Table 1 Share of articles in the most important journals

diary	No. ware	Weight	CiteScore	SRJ
International Journal of Quality & Reliability Management	9	12.68%	4.9	34
The TQM Journal	9	12.68%	4.3	39
Journal of Financial Economics	3	4.23%	9.7	3
Engineering Economics	2	2.82%	2.9	3.6
Production Engineering Archives	2	2.82%	2.8	3.5
Accounting, Auditing & Accountability Journal	2	2.82%	6	9
Other journals	57	67.86%		

In order to establish the type of articles, they were grouped into four major categories, respectively: theoretical, empirical studies, literature reviews and mixed. From figure no. 3 shows that the articles containing empirical studies are the most numerous (36 articles representing 43% of the total) followed by literature reviews (20 articles representing 24%) and conceptual ones (16 articles representing 19% of the total).

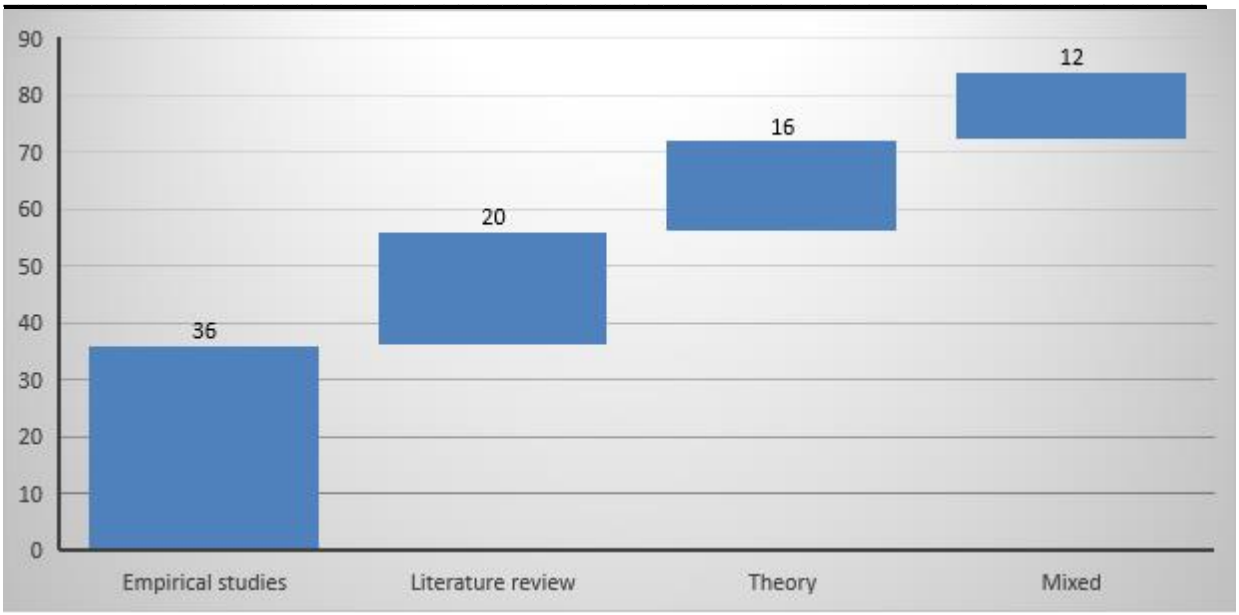

Fig. no. 3 The share of articles in the sample according to the type of article

Using the VOSviewer software tool, we have the representation in the form of a map of the most intensively discussed topics in the articles that address the subject of quality costs. You can see in the figure below the terms or concepts treated by several authors or that appear mainly in a larger number of scientific works.

Therefore, we can say that topics such as those related to cost, accounting, reporting, quality audit, forecasting, etc., are points of interest among researchers in the area of quality management and cost.

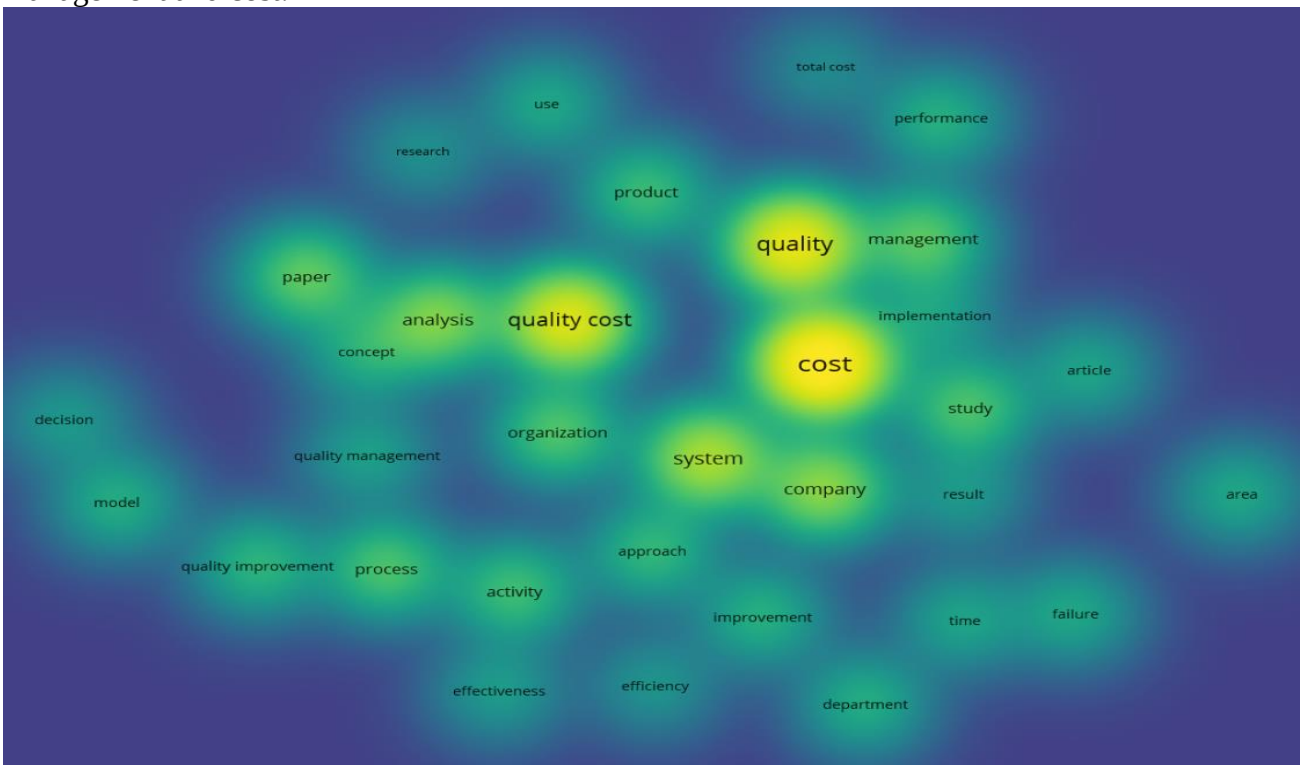

Fig. no. 4 Representation of research concepts and ideas in the field of quality cost and its management

Also, by processing bibliographic data with the help of the VOSviewer 1.6.18 software, it was possible to graphically represent the links between the terms covered in the literature. Thus, we can see the importance of the link between quality costs, on the one hand,

and quality management, models, processes, activities, decisions, performance measurement, on the other hand, directions that we have channeled our attention to in the qualitative analysis of articles.

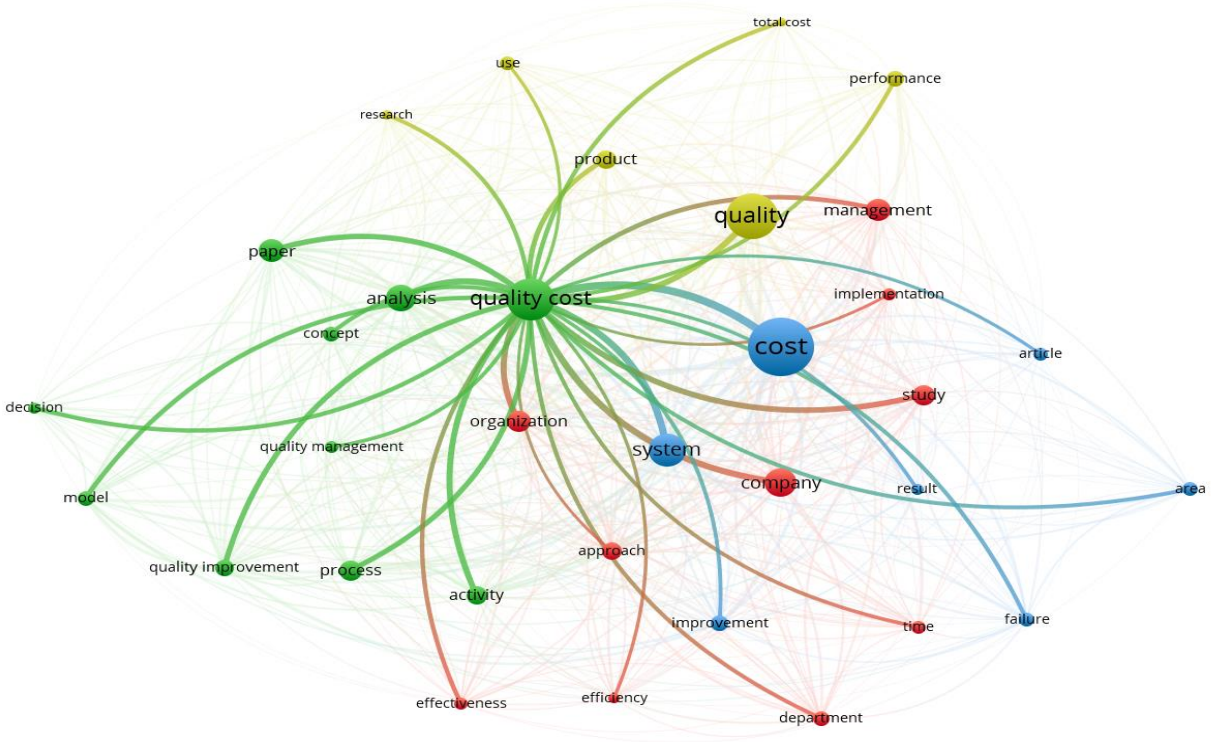

Fig. no. 5 Representation of the link between the terms used in quality cost research and its management

In the analyzed papers, we identified five generic groups of models that emphasize quality costs, namely: the PAF model (Prevention-appraisal-failure, prevention-evaluation-defects), the Crosby model, the opportunity cost model, the process cost model and the ABC model (Activity-based costing – costs allocated based on activities). A ranking of the items in the sample in terms of the frequency with which each of this model is used, is presented in figure no. 6.

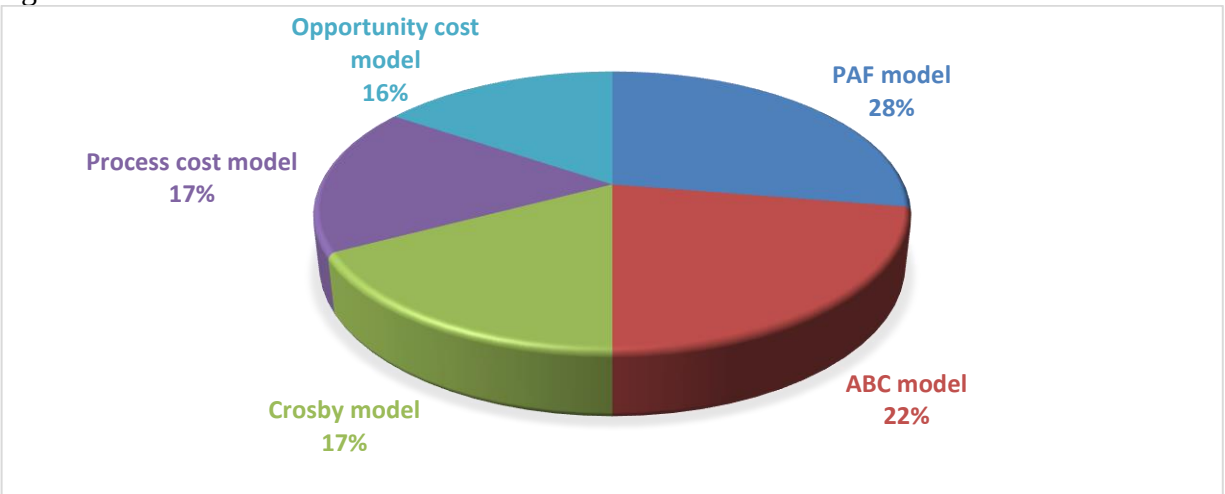

Fig. no. 6 The share of articles in the sample according to the quality cost model presented in the article

In each field of research, we find well-known authors and reference works. A scientific paper can enjoy a significant number of citations, which realistically gives it value, applicability or relevant to the research problem addressed. From another perspective, the idea of citation refers to both the work and its author. The following figure represents a map of researchers who have made a significant contribution to shaping the conceptual framework and empirical studies in the last 30 years.

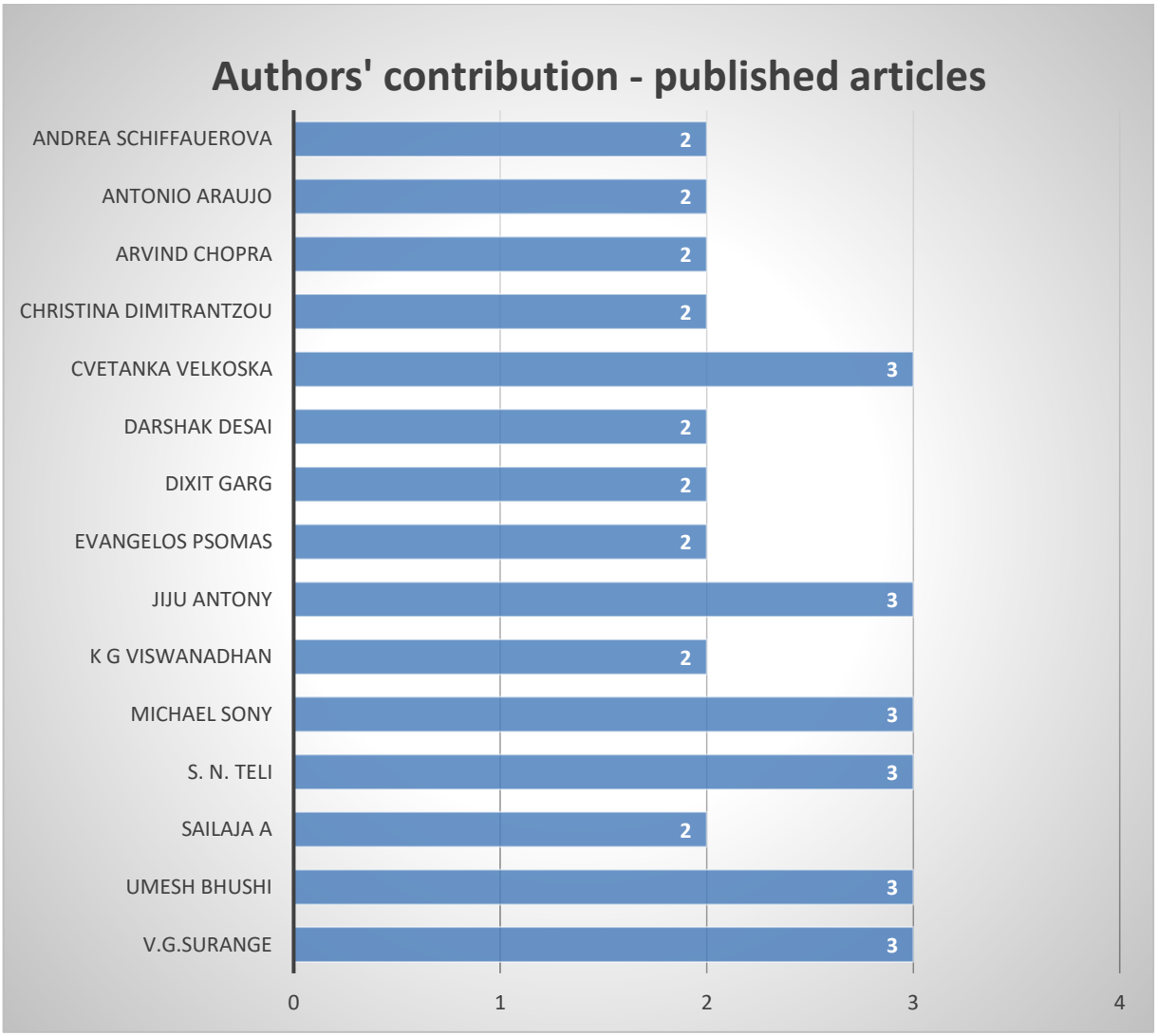

Fig. no. 7 Representative researchers in the cost of quality

Also we analyzed the articles from the perspective of the number of citations in order to highlight the works with particular relevance, considered milestones and representative for the targeted field.

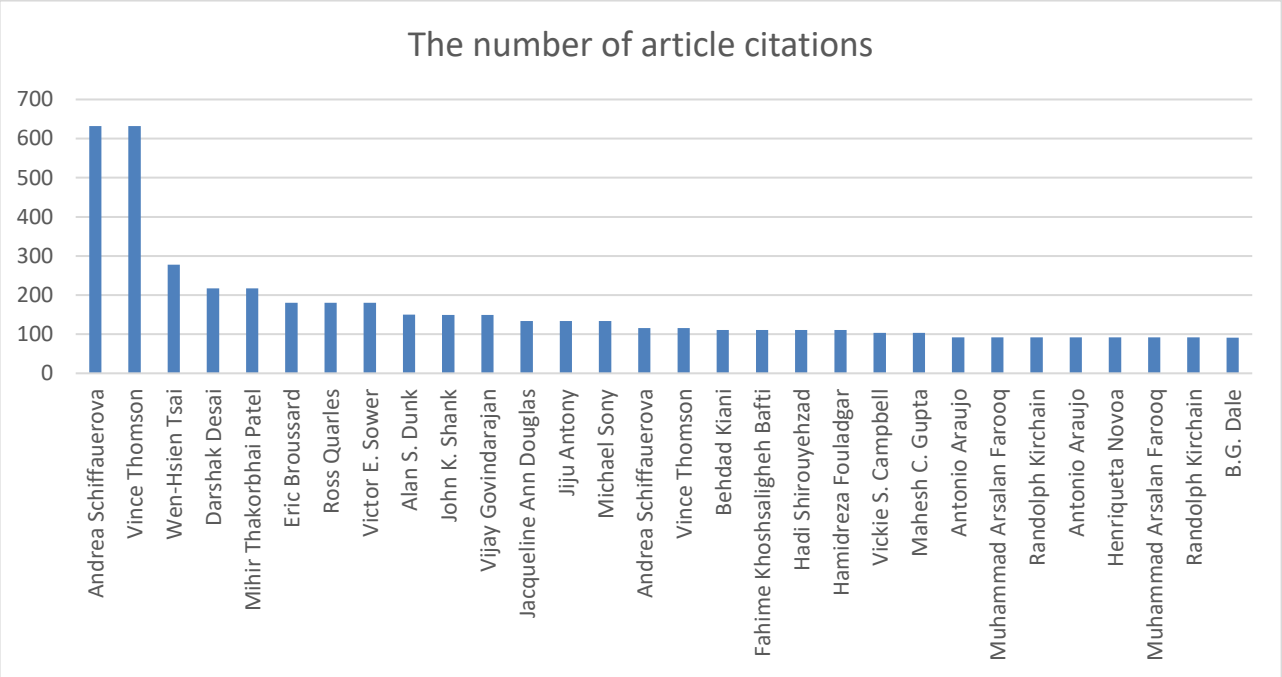

Figure 8Graphical representation of the most cited authors in the area of the cost of quality

After this brief presentation of the results of the quantitative analysis of the articles in the sample, we considered it extremely useful to also present some more relevant results of the qualitative analysis, highlighting a series of concepts and models, highlighted by the specialized literature.

SOME RESULTS OF THE QUALITATIVE ANALYSIS OF THE ARTICLES

Through the qualitative analysis, we tried to highlight some of the main topics and research directions addressed in the specialized literature regarding the definition of the concept of quality cost, the way to determine and use this type of cost in order to sustain some decisions.

The concept of quality has evolved from technical characteristics that presuppose compliance with manufacturing standards and is expanding under the influence of certification bodies such as the International Standard Organization (ISO org, 2022). Since 1982, the meaning of quality has been defined by the ability of a product or service to satisfy, at the lowest cost and in the shortest time, the needs of users (ISO 9000 – 1982).

Thus, quality is defined by a set of properties and characteristics of a product or service that give it the ability to respond to expressed or implied needs. (Alzarad & Separi, 2010). As early as 1951, Joseph M. Juran in his book entitled " *Quality Control Handbook* ", introduces three managerial processes necessary to implement a total quality program in an organization, a six-stage methodology and ten steps of quality improvement, concept of reference, represented graphically and in figure 9.

In his research, Crosby (1979) demonstrated a link between costs and poor product quality. In his view, the costs of quality are the costs of conformity and non-conformity, both of the product and of the process. He introduces the concept of "Zero defects", which can be achieved through preventive costs.

Armand V. Feigenbaum, in his work entitled "Total Quality Control", included in the quality costs the costs of prevention, the costs of evaluation and the costs of internal and external defects, and supports the idea of the concept of quality in all stages of a process and not only in the of production. (Charantimath, 2017)

The American Society for Quality Control published in 1967 the work entitled "Quality costs - what and how", paying attention to non-quality costs in the production phase. It also included the quality of materials and finished products in the cost structure, basically

defining costs of quality as the sum of prevention, evaluation, internal non-quality and external non-quality costs.

In 1979, Taguchi introduced the concept whereby that costs of quality can be associated with quality losses that occur as a result of non-compliance with quality requirements (“Quality Lost Function"), showing that the number of losses is indirect proportional to the quality of the product. Quality losses are defined by Taguchi as the sum of social losses, producer losses and consumer losses. His major contribution, highlighted in figure no. 9, consists of combining engineering techniques with those of mathematical statistics to achieve rapid improvement of quality costs, seeking optimization at the level of product design and manufacturing processes, with beneficial effects on product exploitation. It is also owed to him defining the signal-to-noise ratio, with important applications in cost reduction.

The British Standards Institution (BSI) in 1981 presents as quality cost models, the PAF model and the process cost model in response to economic trends and social conditions. The process cost model was first used in quality assessment by Marsh in 1989.

Schneidermann emphasizes the customer's quality requirements and aims to minimize total quality costs, consisting of compliance and non-compliance costs. The model, based on the "Zero defects" theory, covers the entire lifetime of the products, focusing on preventive actions. J. Bank (1996) includes three categories of costs in his model: compliance costs, non-compliance costs and lost profit due to quality deficiencies.Figure 9 briefly shows the most important approaches to quality costs and their evolution over time.

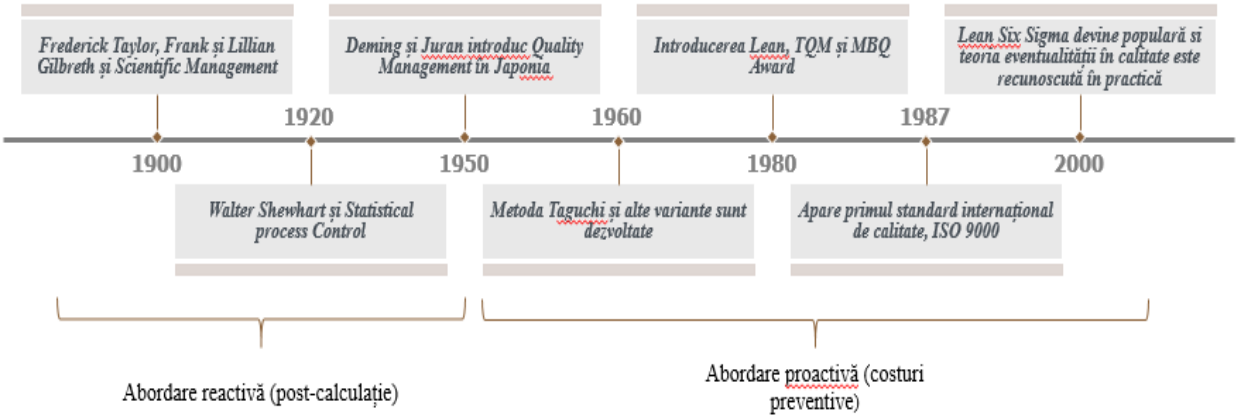

Fig. no. 9 Historical evolution of quality costs

TQM can be described as a philosophy, a particular doctrine of pro-quality activities, which is based on the idea of achieving success through continuous efforts to improve quality, involving all employees to achieve customer satisfaction. (Moges Belay, 2014). The greater the interest in TQM, the more actual the idea of implementing the total quality management system becomes and, implicitly, the interest in calculating the quality costs increases. A large part of researchers treat the concept in their works, such as Dale, Charantimath , Bugdol , Belay or Shank . Effective quality management involves collecting information on the level, structure and dynamics of quality -related costs. The definition, recording and systematic analysis of these costs are the basis of a possible decision regarding quality management and the existing system at the company. Controlling costs related to quality, that is, planning, regulating and controlling their value, aims to rationalize the activities that ensure quality in the process of creating products. (Kokot-Stępień, 2021)

An interesting and topical approach is the one according to which in the 21st century, with the emergence of the 4th industrial revolution (Industry 4.0) based on the development

of networks and the Internet, the development of cyber technologies has brought significant progress in automation and optimization of industrial processes, shaping the concept of IoQ Industry of Quality. This involves two major elements: technology and trust. The authors of this concept believe that the term Industry of Quality (IoQ) implies that the employees from the industry, the machines and other elements involved should be driven to make a quality product, along with the adoption of advanced technologies. (Kumar P., 2020).

Costs of quality are not precisely defined, neither in theory nor in business practice. This is undoubtedly due to the fact that there are many areas in enterprises where quality assurance activities and processes overlap. (Dale, 2007).

Costs of quality, which occur in every enterprise to achieve a certain level of quality, constitute an important element of total production costs and are the sum of all operational costs related to achieving quality. However, it is possible to quantify the effectiveness of systems designed to ensure an adequate level of quality in the enterprise, which is why they are sometimes also called quality assurance costs.

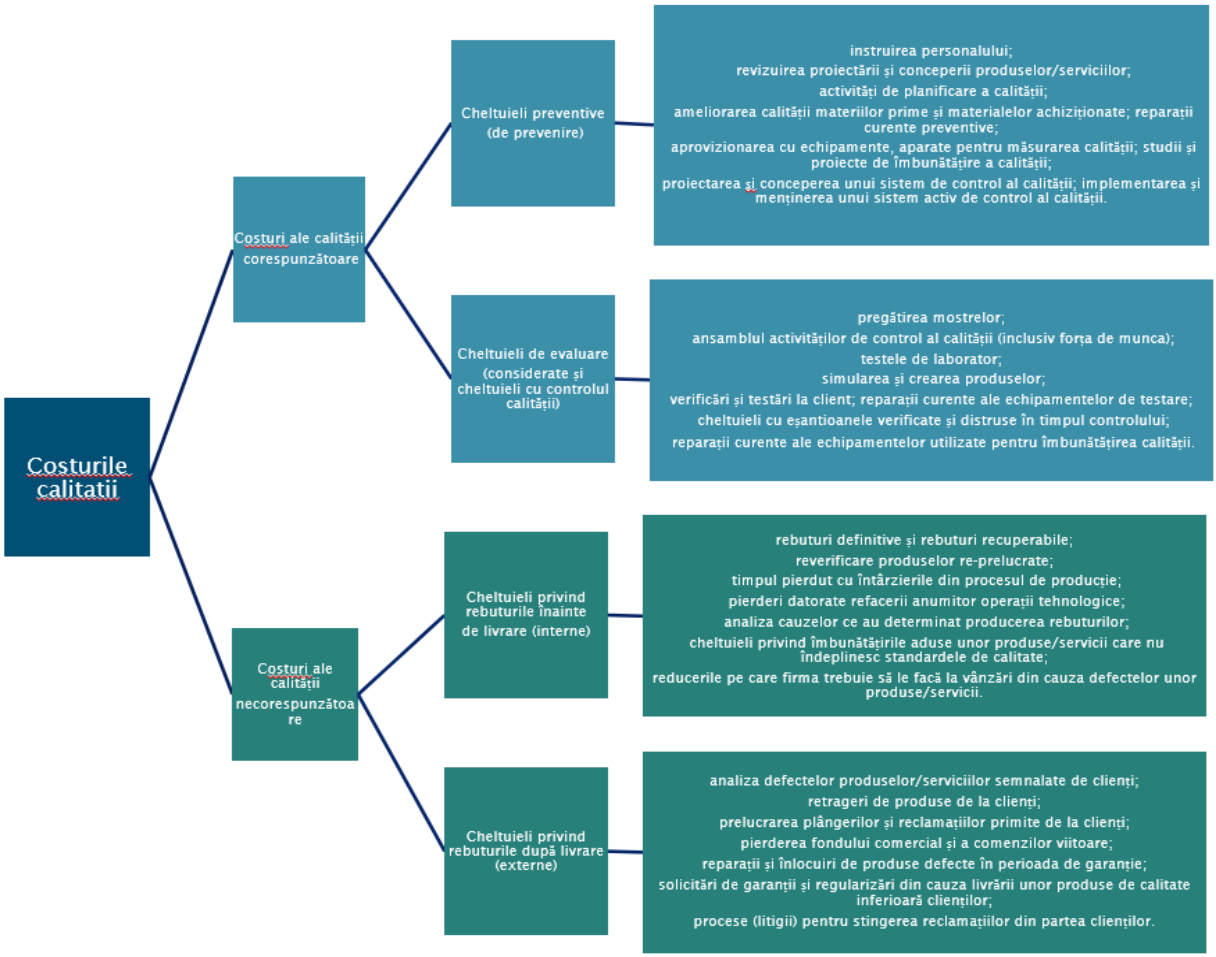

Fig. no. 10 Quality cost classification model

As can be seen in the previous classification, there are a multitude of intangible, or "hidden" costs that a number of authors have researched in detail, such as Murumkar , Sailaja, Basak, Swenson and Conbere.

To assess the total cost of quality, hidden costs must also be identified, quantified, measured and analyzed. To track hidden quality costs, it is necessary to go beyond the data produced by the traditional accounting system. This also provides insight into the huge impact of hidden quality costs on company profitability, the need and opportunity for improvements. (Sailaja, Basak, & Viswanadhan, 2015)

The term "hidden cost" is used to refer to costs that are recorded in the company's general ledger booking and/or scrap costs that are not easily discovered. Such "hidden" costs are additional production costs resulting from scrap or as additional costs for materials, processing time and storage space for scrap and reworked parts. Although they cannot be easily measured, they exist, and they can be significant, going as far as damaging the company's reputation, losing customers, project delays, and increasing overheads. (Amar Murumkar, 2017).

The hidden cost elements of quality are identified in the entities through extensive information gathering through interviews, logbooks, records and registers kept in various activity centers with time study entry, time sheets, machine logs, complaint logs, attendance sheets, minutes of meetings, etc.(Sailaja A. , Basak, G., & G., 2015)

There are several types of hidden costs of quality, including:

- Opportunity costs: These are costs associated with missed opportunities due to quality problems. For example, if a company has a poor reputation for quality, it may lose business to competitors who have a better reputation.
- Cultural-organizational costs: These are costs associated with a company's culture and how it affects quality. For example, if a company has an organizational culture that does not prioritize quality, it can lead to higher scrap costs and lower customer satisfaction.

These two categories of costs, however, can be difficult to quantify, as they refer to the future (Swenson & Conbere, 2021), and can also have a long-term impact on a company's reputation and harm image. A poor reputation for quality can lead to a loss of trust among customers and stakeholders that can take years to recover.

By categorizing quality-related costs from a company's general ledger, managers can evaluate quality investments based on cost and profit improvement. (Mehta & Acharya, 2012).

In the specialized literature there are a number of cost calculation procedures and methods that can be applied exactly, presented in table 2,or can be processed in a personalized manner to serve the manager's need for information necessary for decisions to develop the entity's strategy. Quality costing is a modern management tool that allows optimizing quality costs and identifying problematic activities and processes. (Sadkowski, 2019)

Table 2 *Cost calculation methods*

Generic model	**Costs / categories of activities**
PAF model	Prevention + evaluation + rejection
Crosby model	prevention + evaluation + rejection + opportunity PoC and PoNC
The opportunity cost model	COST of Compliance (CoC) and Cost of non-conformity (CoNC)
Process costing model	COST of Compliance (CoC) and Cost of non-conformity (CoNC)
A B C Model	Added value + activities without value added

Based on the analysis of the mutual relations between the cost categories, it is possible to evaluate the activity of an enterprise in the analyzed period. (Kokot-Stępień, 2021). The careful identification of the causes of the increase in inappropriate quality costs (losses) allows the making of decisions and the implementation of effective corrective actions that influence the quality improvement plans developed based on the results related to the quality costs obtained up to that moment in the entity. At the same time, efforts should be made to minimize the costs of internal and external non-conformity relative to the total cost of quality.

The value of the cost of quality (CoQ) can be expressed in different ways depending on the specific needs and objectives of an entity.

The expression of the CoQ indicator should be chosen based on the specific goals and objectives of the entity, as well as the data and resources available for the collection and analysis of quality-related costs. (Herzog & Grabowska, 2021)

"Orienting organizations towards quality is no longer a matter of choice, but rather one of professionalism. This must be a permanent feature that the organization benefits from, providing satisfaction to all stakeholders. Quality optimization and continuous improvement are the means by which this is achieved, if viewed in sequence and interdependence. Optimum quality must be achieved through continuous improvement and must represent the level from which improvement can continue to achieve permanent and long-term advantages. Therefore, any organization must implement methodologies for calculating and recording the costs and effects of quality, while measuring and analyzing the satisfaction of customers and all interested parties." (Maxim, 2005/2006)

Effective control over the utilization of resources of all categories in a manufacturing process is becoming the demand of the day primarily due to the high competition among today's market players. Human, material, machine and time resources must be utilized in the most cost-effective manner to ensure profitability of any business and at the same time no compromise on quality is allowed. This is the highly competitive globalized market scenario today. Therefore, management and managerial accounting have an important role in measuring and controlling the components of production costs. On the other hand, quality improvement programs have become essential for any organization to grow by expanding its customer base. Quality cost analysis is considered one of the most effective management tools that allows the collection and analysis of quality maintenance expenses in a manufacturing process and will also identify non-value-added expenses. (Sailaja, Basak, & Viswanadhan, 2015)

Regarding the general objective of our study, namely to carry out an analysis of the specialized literature on the topic of quality costs and their role in establishing a company's strategy, we believe that we have managed to identify a series of representative works on this topic so that establishing the current state of knowledge to open up new research perspectives in this field. Thus, we found that there are numerous studies that propose models, methods and techniques for calculating quality costs.

Conclusions

From the literature review we have drawn a number of conclusions regarding research in the field of quality costs, as following:

-there is an increase in research in the field of quality costs, with a preponderance in the XXI century, together with the 4th industrial revolution, the expansion of the Internet and digital data;

-Europe and Asia are the continents with the highest concentration of studies and seem to be sporadically reported in studies from Australia and South America;

-from the perspective of the journals in which they were published, most articles belong to TQM Journal, International Journal of Quality & Reliability Management, Journal of Financial Economics;

- articles with empirical studies are the most popular, 39% followed by conceptual ones, 24%;

- we determined important conceptual links between quality costs and quality management, models, processes, activities, decisions, performance measurement;

- most researchers mention the PAF model to obtain the CoQ cost parameters, followed by the ABC method;

- Andrea Schiffauerova, professor at the Concordia Institute for Information Systems Engineering Canada and McGill University professor Vince Thomson are the most cited authors, with an important contribution to the study of the cost of quality;

- there is no generalized model for determining the costs of quality that includes all related costs, to reduce costs or to improve the control of the quality activity for a specific problem or scenario.

References

1. ALNO Bhimani , CT (2015). Management and Cost Accounting. Harlow UK: Pearson Education Limited.
2. Alzarad , C., & Separi, S. (2010). Management control . _ Manual and applications . Paris: Dunod .
3. Amar Murumkar , DS (2017). Hidden Cost of Quality: A Review. Conference Paper .
4. Andrijašević , M. (2010). Total Quality Accounting.
5. Ayach , L., Anouar , A., & Bouzziri , M. (2019). Quality Cost Management in Moroccan Industrial Companies . Journal Of Industrial Engineering And Management.
6. Barber, DA (2006). Cost of Quality.
7. Biadacz , R. (2019). Pro-quality cost accounts in a time of sustainable development . International Journal Of Supply Chain Management.
8. Biadacz , R. (2020). Quality cost management in the SME. The Tqm Journal.
9. Blocher , EJ, Stout , DE, Juras , PE, & Cokins , G. (2016). Cost management: a strategic emphasis , 7th edition . New York USA: McGraw -Hill Education .
10. Briciu, S. (2006). Managerial accounting - Theoretical and practical aspects. Bucharest: Economic Publishing House.
11. Bris , P., Cermakova , M., & Molnar, V. (2022). Quality Cost Flows in Manufacturing Companies . International Scientific Journal About Logistics.
12. Bugdol , M. (2020). The problem of fear in TQM a literature review . The Tqm Journal.
13. Charantimath , PM (2017). Total quality management. Uttara Pradesh , India: Pearson India Education Services.
14. Chatzipetrou , E. (2016). A multidimensional longitudinal meta-analysis of Quality Costing Research . International Journal Of Quality & Reliability Management,.
15. Cho , W., Min, D.-J., & Dresner , M. (2022). The impact of predicted quality and customer cost on quality assurance behavior . International Journal Of Operations & Production Management.
16. Chopra , A. (2011). Behavior patterns of quality cost categories . The TQM Journal.
17. Chopra , A., & Garg , D. (2011). Introducing models for implementing cost of quality system . The Tqm Journal.
18. Cohen, S. &. (2005). Strategic supply chain management: the five disciplines for top performance. New York: McGraw Hill.
19. Dale, BW (2007). Managing quality. Oxford : Blackwell Publishing .
20. Diamandescu , A. (2013). Non-Quality Costs and Their Consequences In the organization.
21. Dimitrantzou , C. (2020). Future research avenues of cost of quality a systematic literature review . The TQM Journal.
22.Douglas C, W. (2007). The executive guide to Undersatnding and Implementing Quality Cost Programs -Reduce Operating Expenses and Increased Revenues . Milwaukee , USA: American Society for Quality - Quality Press.
23.Dunk , AS (2002). Product quality, environmental accounting and quality performance. Accounting, Auditing & Accountability Journal.
24.Elif Ocakci , JN (2021). Quality Cost and Economic Analysis.A Synthesis in the Manufacturing Systems . MATEC Web of Conferences 343, 05008. MATEC Web of Conferences 343, 05008.
25.Elsharif , TA (2018). The Application of Quality Costs Accounting in Industrial Companies in Benghazi Libya . Open Access Library Journal.
26. Fakhe , HB, Nourelfath , M., & Gendreau , M. (2016). A cost minimization model for joints production . International Journal Of Production Research .

27. Farooq , MA, Kirchain , R., Novoa , H., & Araujo , A. (2017). Cost of quality Evaluating cost quality. International Journal Of Production Economics .
28. Fons , LA (2012). Integration of quality cost and accounting practice _ The Tqm Journal.
29. Glogovac , M., Filipovic , J., Zivkovic , N., & Jeremic , V. (2019). A Model for Prioritization of Improvement Opportunities Based on Quality Costs in the Process . Engineering Economics .
30. Guinot , J., Sinn , JW, Badar , MA, & Ulmer , JM (2016). Cost consequence of failure in failure mode and effect analysis. International Journal Of Quality & Reliability Management.
31. Gupta, MC, & Campbell, VS (1995). The Cost of Quality. Production And Inventory Management Journal.
32. Herzog, I., & Grabowska , M. (2021). Quality Cost Account as a Framework of Continuous Improvement . Management And Production Engineering Review.
33. https://asq.org/quality-resources/cost-of-quality. (2022). American Society for Quality.
34.Isaksson , R., Ramanathan , S., & Rosvall , M. (2022). The sustainability opportunity study SOS. The Tqm Journal.
35. ISO org . (2022). https://www.iso.org/iso-9001-quality-management.html.
36. Jaju , SB, Mohanty , RP, & Lakhe , RR (2009). Towards Managing Quality Cost Case Study . Total Quality Management & Business Excellence.
37. Jeeves , A. (1993). Accounting for quality.
38. Jiju , A., Sony, M., Mcdermott , O., Pepper , M., & Furterer , S. (2021). Quality 4.0 and its impact on organizational performance. The Tqm Journal.
39. Khaled Omar, M., & Murgan, S. (2014). An improved model for the cost of quality. International Journal of Quality & Reliability Management.
40. Kokot-Stępień , P. (2021). The specificity of the functioning of the quality cost account . Production Engineering Archives .
41. Kumar , P. (2020). Industry of quality (IoQ) – An industry 4.0 perspective. International Journal Of Applied Research .
42. Kumar , SA, & Suresh , N. (2009). Operations management.
43. Kumar , V., & Sharma , R. (2017). Empirical year investigation of critical successful factors influencing the successful TQM implementation . International Journal Of Quality & Reliability Management,.
44. Letza , SR, & Gadd , K. (1994). ABC as the costing method of choice for total quality organization . The Tqm Magazine.
45.Lokkerbol , J., Molenaar , MF, & DoesQuality-Quandaries , RJ (2012). Quality Quandaries . Quality Engineering.
46. Maher , M. (1997). Solutions manual for cost accounting .
47. Mahmood , S., Ahmed, SM, & Kureshi , NI (2014). Determining the cost of poor quality and its impact on productivity and profitability . Built Environment Project And Asset Management.
48. Martínez , JM, & Selles , ME (2015). A fuzzy quality cost estimation method . sciencedirect .
49. Maurizio Massaro , KH (2016). Knowledge management in small and medium enterprises : a structured literature review . Journal of Knowledge Management.
50.Maxim, E. (2005/2006). Reconsidering quality strategies : from optimization to continuous improvement . Iasi: Scientific Annals of "Alexandru Ioan Cuza" University Volume LII/LIII.
52. Mehta, AV, & Acharya , U. t. (2012). Cost of Quality. Mumbai : Halo Technologies and Training Pvt . Ltd.
53. Michael W. Maher , CP (2010). Managerial Accounting: An Introduction to Concepts , Methods , and Uses , Tenth Edition . Mason OH USA: Thomson Higher Education .
54.Modhiya , S., & Desai , D. (2016). A review on cost of quality methodology and hidden costs in manufacturing industries .

55. Moges Belay , AM (2014). Adoption of quality management practices : An investigation of it relationship with laboratory productivity for labor -intensive manufacturing companies . Benchmarking : An International Journal, Vol. 21 No. 1, pp. 77-100.
56. Murumkar , A., Teli , SN, Bhushi , U., & Deshpande , A. (2017). Hidden Cost of Quality A Review.
57. Patel , AS, & Patel , KM (2020). objectionable review of literature on Lean Six Sigma methodology . International Journal Of Lean Six Sigma.
58. Patel , MT, & Desai , DA (2020). An exploratory year study on status of cost of quality in different industries .
59. Plewa , M., Kaiser , G., & Hartmann, E. (2015). Is quality still free ? empirically evidence on quality cost in modern manufacturing . International Journal Of Quality & Reliability Management,.
60. Psomas , E., Dimitrantzou , C., & Vouzas , F. (2021). Practically implications of cost of quality a systematic literature review . International Journal Of Productivity And Performance Management.
61. Purwanugraha , HA (2013). Mapping of Costs of Quality (CoQ) for Enhancing Competitiveness of Local Products to Global Market. Review Of Integrative Business And Economics Research .
62. Puttikunsakon , A., Boonlua , S., & Raksong , S. (2017). Success Factors on Strategic Quality Management.
63. Pyzdek , T., & Keller, P. (2013). The Handbook for Quality Management A Complete Guide to Operational Excellence. USA: McGraw -Hill.
64. R. Cooper, RK (1988). Measure costs right : make the right decisions . Harvard Business Review, pp. 96-103.
65.R.Vidya , Niavand , H., & Haghighat , F. (2014). What is calculation the Quality Costs Using the ABC Method . International Journal Of Scientific & Engineering Research .
66.Ramzan , MB, Akhter , MM, & Rehman , AU (2020). Estimation of Cost of Quality of a Garment Manufacturing Line to Reduce Cost of Failure . Conference .
67. Răboacă , G., & Ciucur, D. (2004). Methodology of economic scientific research . Bucharest: Romania de Maine Foundation Publishing House.
68. Rehacek , P. (2017). Quality Costs as an Instrument of verifying . Quality - Access To Success .
69. Rehacek , P. (2017). Quality Costs as an Instrument of verifying the Effectiveness of Quality Management System . International Journal Of Advanced And Applied Sciences .
70. SNTeli , Majal , V., Bhushi , U., & VGSurange . (2014). Impact of poor quality cost in automobile industry . International Journal Of Quality Engineering And Technology.
71. SNTeli , UMBhushi , D., & VGSurange . (2012). Assessment of Cost of Poor Quality. International Journal Of Engineering Research And Applications .
72. Sade, S., Husti , I., & Daróczi , M. (2019). Industry 4.0 as a Key Enabler toward Success. Periodica Polytechnica Social And Management Sciences .
73. Sadkowski , W. (2019). Models of Quality Costs Calculation and Their Classification . Scientific Quarterly " Organization And Management.
74. Sailaja, A., Basak, P., G., VK, & G., V. (2015). Hidden Costs of Quality: Measurement & Analysis. International Journal of Managing Value and Supply Chains , 13-25.
75. Schaltegger , S., & Christ , KL (2021). corporeal sustainability management accounting and multi-level links for sustainability . International Journal Of Management Reviews .
76. Schiffauerova , A. (2005). A review of research on cost of quality models and beast practice _ International Journal Of Quality & Reliability Management,.
77. Schiffauerova , A., & Thomson, V. (2006). Managing Cost of Quality: Insight into Industry Practice. The Tqm Magazine.
78. Shank , JK, & Govindarajan , V. (1994). Measuring the Cost of Quality a Strategic Cost Management Perspective. Journal Of Cost Management,.

79. Snieska , V., Daunorienė , A., & Zekeviciene , A. (2013). Hidden Costs in the Evaluation of Quality Failure Costs. Engineering Economics .
80. Sony, M., Antony, J., & Douglas, JA (2020). Essential ingredients for the implementation of Quality 4.0: A narrative review of literature . Emerald .
81. Sower, VE, & Quarles , R. (2007). Cost of quality usage . International Journal Of Quality & Reliability Management,.
82. Sower, VE, & Sower, CH (2015). Better business decision using cost modeling 2nd edition . New York: Business Expert Press.
83. Stanley, TD (2001). Wheat from Chaff : Meta-analysis as Quantitative Literature Review. Journal of Economic Perspectives , 15 (3): 131-150.
84. Swenson , D., & Conbere , JP (2021). Hidden Costs, Unintended Consequences , and Complex Organizational Problems . Organization Development Review.
85. Swenson , JP (2020). Hidden Costs, Unintended Consequences , and Complex Organizational Problems , and why Leaders Often Ignore Them . Organization Development review vol. 52 no . 4 .
86. Taidi , R. (2014). Cost of Poor quality: Quality management in Lean manufacturing and the effectiveness of the "Zero defects " goal . Abdelmalek Essaadi University-National School of Management, 10.
87. Teplická , K., & Hurná , S. (2021). New Approach of Costs of Quality According Their Trend During Long Period. Management Systems .
88. Tomov , M., & Velkoska , C. (2022). Contribution of the quality costs to sustainable development . Production Engineering Archives .
89. Tsai , W.-H. (1998). Quality cost measurement under activity-based costing _ International Journal Of Quality & Reliability Management,.
90. Vaxevanidis , NM (2008). Literature - Survey -of-Cost-of-Quality- Models . Annals Of Faculty Engineering Hunedoara – Journal Of Engineering.
91. Velkoska , C. (2022). Integration of Juran's Trilogy . Vision International Scientific Journal,.
92. Velkoska , C., & Tomov , M. (2022). Understanding and application of quality costs in automotive manufacturing companies in north-macedonia empirically study . International Journal Of Quality & Reliability Management .
93. Vk , K., Ragunath , L., & Emmanual , L. (2017). Quality Cost Analysis in an Industry.
94. Wood, DC (2007). Understanding Implementing Quality Cost Programs .
95. Yusuf, I. (2022). Modeling Cost of Quality for Defect Reduction . Sustainable Business And Society In Emerging Savings .