
A bibliometric view on the use of Total Quality Management in Services

Chen Zhang

Dissertation

Master in Management

Supervised by

Professor Maria do Rosário Mota de Oliveira Alves Moreira

Professor Paulo Sérgio Amaral de Sousa

June, 2018

Biographical Notes

Chen Zhang was born in China. She obtained Bachelor's Degree in Arts (English Language and Literature) at School of International Studies, Sun Yat-sen University in 2016.

Currently, she is pursuing Master in Management at Faculty of Economics, University of Porto, to be completed in 2018 with the present dissertation.

She is also doing a curricular internship in Li & Fung (Portugal) Lda., which will end along with the concluding of her Master.

Acknowledgements

I would like to express my deepest gratitude to those who have offered me great help during this study.

To Professor Maria do Rosário Mota de Oliveira Alves Moreira, for her teaching, encouragement and countless advice.

To Professor Paulo Sérgio Amaral de Sousa, for his talent in data processing and programming that is indispensable to this study.

To my parents, who always give me intimate care and selfless love.

To Beto Jiang, thank you for being the source of happiness in my life.

Abstract

Purpose – This research aims to highlight the major domains of and address the most prominent topics in the Total Quality Management (TQM) area in the services sector. Although there are numerous studies related to TQM and the number of researches in literature is still increasing rapidly, systematic quantitative reviews on these topics are in shortage. The aim of this paper is to present a thorough analysis in terms of time and geographical location of the current issues mostly discussed related to the use of TQM in services, shedding some lights about trends, gaps and patterns.

Design/methodology/approach – This paper fills this gap by conducting a bibliometric analysis on the extant literature of TQM collected from Web of Science and Scopus databases. The bibliometric techniques employed in this study are publication counting and abstract analysis, co-citation analysis and co-word analysis.

Results – The findings of this study indicate that TQM implementation is not a fading topic. The studies in the field of “TQM use in services” are growing and becoming more intensive. TQM-related practices are gaining more and more attention while the TQM implementation framework is still under development. Healthcare is the most researched industry but the concentration on it has spread to other industries over time. Top management commitment/leadership is a critical construct for TQM implementation and managers should be aware of the obstacle caused by lacking it.

Theoretical and Practical implications – This paper sheds some light on the most significant topics in TQM, the popular trends of recent TQM research and the potential drawbacks. TQM professionals and managers in service sectors can benefit from this paper by having a sketch of the latest and most prominent academic findings and thus gaining some insights or techniques that fit into the practical implementation.

Originality/value –There is growing concern about the practical implementation of Total Quality Management. Many empirical studies have realized the gap between the TQM techniques discussed in the academic scope and their practical applications to industrial problems. Therefore, it is significant to know what has been done and what should be pursued in the future. This paper made its effort to fill this gap by conducting a bibliometric analysis on the extant literature of TQM collected from databases like Web of Science and Scopus.

JEL-codes: L80, M19

Keywords: Total Quality Management (TQM), Bibliometric, Co-citation, Co-word

Index of Contents

Biographical Notes.....	ii
Acknowledgements.....	iii
Abstract	iv
Index of Tables.....	viii
Index of Figures	ix
1. Introduction.....	1
2. Literature Review	3
2.1 Total Quality Management	3
2.1.1 Origins and Background.....	3
2.1.2 Principles, Practices and Techniques	5
2.1.3 Implementation Issues	6
2.2 Services: Classification and Characteristics	7
2.2.1 Classification.....	7
2.2.2 Characteristics	8
2.2.3 Differences between Manufacturing Sectors and Service Sectors.....	8
2.3 Similar Studies.....	9
2.3.1 Bibliometric Analysis on Quality-related Topics (not TQM)	10
2.3.2 Non-bibliometric Analysis on TQM Implementation in Services	11
3. Methodology.....	14
3.1 The Bibliometric Study.....	14
3.2 Key Techniques of Bibliometric Analysis	15
3.3 Application of Bibliometric Techniques.....	16
3.3.1 Building Bibliographic Database	16
3.3.2 Publication Counting and Abstract Analysis	18
3.3.3 Co-citation Analysis.....	19
3.3.4 Co-word Analysis.....	20
4. Results	21
4.1 General Overview of the Database	21
4.1.1 Chronological Evolution of the Articles	21
4.1.2 Researched Geographical Area of the Database.....	22
4.1.3 Researched Industries of the Database	24
4.1.4 Journal Characterization	24
4.2 Article characterization.....	27

4.3 Co-citation Network.....	30
4.4 Co-word Network.....	34
4.4.1 Co-word Network of 1990 to 2003	37
4.4.2 Co-word Network of 2004 to 2017	37
4.4.3 Evolution in two sub-periods	38
5. Conclusion	41
5.1 Main results of the Study	41
5.2 Limitation	42
5.3 Suggestion for Future Researches.....	42
References	43
Appendix 1	47
Appendix 2.....	50
Appendix 3.....	61
Appendix 4.....	62
Appendix 5.....	63

Index of Tables

Table 1 Definition of TQM (Source: Own Elaboration)

Table 2 Principles, Practices and Techniques of TQM

Table 3 Principles and practices of TQM

Table 4 Difference between Manufacturing and Services

Table 5 Similar Studies (Bibliometric Analysis on Other Quality-related Topic)

Table 6 Similar Studies (Non-bibliometric Analysis on TQM Implementation in Services)

Table 7 Steps of Doing a Bibliometric Analysis

Table 8 Key Bibliometric Techniques

Table 9 Keywords Combined within Search

Table 10 Number of Articles per Specific Researched Industry

Table 11 Number of Articles per Journal

Table 12 Top Journals with More Articles Published on “Use of TQM in Services”

Table 13 Co-citation Clusters and Representative Documents

Table 14 Co-word Clusters and Representative Words, 1990-2003

Table 15 Co-word Clusters and Representative Words, 2004-2017

Table 16 Co-word Evolution of “Use of TQM in Services”

Index of Figures

Figure 1 The service process matrix

Figure 2 Chronological Evolution of the Articles on “Use of TQM in services”, 1990-2017

Figure 3 Number of Articles Analyzing Specific Country(s)/Region(s) Distributed per Continent

Figure 4 Chronological Evolution of the Articles Analyzing Specific Country(s)/Region(s) by Country Type, 1990-2017

Figure 5 Number of Articles per Topic

Figure 6 Number of Articles per TQM Implementation Issue/Challenge Discussed

Figure 7 Visualized Co-citation Network

Figure 8 Visualized Co-word Network for Articles Published in 1990-2003

Figure 9 Visualized Co-word Network for Articles Published in 2004-2017

1. Introduction

Quality has been the concern of manufacturers for a long time (Aquilani, Silvestri, Ruggieri, & Gatti, 2017). After the success of Japanese companies in global competition, U.S manufacturers recognized the need of improving quality (Cusumano & Takeishi, 1991). Some pioneers, such as W. Edwards Deming, Joseph Juran and Philip Crosby, developed philosophies, practices and tools to overcome the obstacles caused by quality problems (Suarez, 1992). The emergence of TQM extended the scope of quality and provided the direction of current trend of quality management. The quality improvement require participation of all members of the organization (Sadikoglu & Zehir, 2010). By definition, it is a people-orientated management system that aims at continual improvement in customer satisfaction at continually lower real cost (TQL Steering Committee, 1992).

For businesses and companies, it is a common sense that quality is crucial for survival and success. However, many organizations simply do not realize the root of some management approaches is quality-related principles, or they seldom apply those approaches. Thus, there are significant gaps between executives' understanding of quality improvement and implementation of it (Talib & Rahman, 2015).

Modern quality management began in the manufacturing sector. Service sector began to recognize the important role of quality after manufacturing sector, and the maturity of TQM in services is lower than manufacturing (Dale, Barber, Williams, & Van Der Wiele, 1997). The principles of quality that apply to manufactured products apply equally to service products. But due to the different natures of the two sectors, there are differences in total quality management of service sector and of manufacturing sector (Huq & Stolen, 1998).

The practical implementation of quality management is gaining more and more concern. There are numerous studies related to TQM (Aquilani et al., 2017). It is valuable to identify the hot topics in TQM. Consequently, the main aim of this work is to conduct a systematic review on the TQM use in services with a bibliometric view. Bibliometric analysis enables an objective investigation of current literature to identify the knowledge structure and research front (Okubo, 1997). This systematic review will also identify the trends, gaps and weaknesses in this field and provide TQM professionals and managers in service industries with some insights or techniques that fit into the practical implementation.

At the same time this research being conducted, an internship at Li & Fung (Portugal) Lda., the branch in Porto of the multinational group, was performed to fulfil the requirement for curricular internship from the QTEM Master's program. All details about the company and activities developed are included in Appendix 1.

To achieve the main aim of this research, this scientific work is organized as follows. In Chapter 2, it is made a literature review regarding quality management, service and similar studies. The methodological considerations are presented in Chapter 3. In Chapter 4 a presentation and discussion of results is depicted. Finally, Chapter 5 includes conclusion of this study, discussion of limitation and suggestion for future research.

2. Literature Review

In this chapter, it is presented the fundamentals of TQM and services. Total quality management is introduced in Section 2.1, including the theoretical background; principles and practices; and implementation issues. Section 2.2 focuses on services. Then, in Section 2.3, some similar studies are discussed in order to present the similarities and differences regarding the topic. The next section focuses on the framework of this research and the hypotheses to be analysed.

2.1 Total Quality Management

2.1.1 Origins and Background

During 1970s, Japanese products of high quality quickly penetrated the Western market and gave a shock to the American companies (Yong & Wilkinson, 2002). Under the increasing pressure from both the competitors and customers with higher expectations, managers began to take quality seriously related to the survival of their business. Corporate-wide extensive quality improvement was conducted and commitment of top management to quality was renewed (Yong & Wilkinson, 2002). From the 1980s and through the mid-1990s, manufacturing companies conducted significant investment in improving quality, and later, quality practices expanded into service sectors and non-profit organizations (Prajogo, 2005).

It is noticeable that during the last thirty years of twentieth century, the trend of shifting focus from product quality to Total Quality Management played important role in the development of quality management (Boaden, 1997). The contemporary TQM literature are originated from those educational works of quality management pioneers like Deming, Juran and Crosby, but there are many different definitions of TQM (Sila & Ebrahimpour, 2003). In the literature, TQM is classified as a philosophy, an approach or a concept, or in another way. Most definitions contain customer focus and continuous improvement. Some examples of TQM definition in literature are presented in Table 1.

Author(s)	Defined as	Definition
Sashkin and Kiser (1993, p.39)	A base of an organizational culture	TQM means the organization's culture is defined and supports the consistent attainment of customer satisfaction through an integrated system of tools, techniques, and training. This involves the continuous improvement of organizational processes, resulting in high quality products and services.
Chang and Lu (1995, p.15)	A management philosophy	TQM is seen as an effective management philosophy which seeks continuous improvement in the quality of performance of all processes, products/services of a company.
Mohrman, Tenkasa, Lawler and Iedford (1995, p.26)	An approach	TQM is an approach to managing organizations which emphasizes the continuous improvement of quality and customer satisfaction, entails the application of systematic tools and approaches for managing organizational processes with these ends in mind, and involves the establishment of structures such as quality improvement teams and councils for maintaining focus on these ends and enacting organizational improvement processes.
Plenert (1996, p.67)	A system	TQM is an over-all planning system that systematically implements changes. It uses other tools, like CIM (Computer Integrated Manufacturing), JIT (Just in Time Manufacturing), TOC (Theory of Constraints), and MRP II (Manufacturing Resources Planning) to effectively implement change.
Ho (1997, p.276)	A concept	Total: everyone associated with the company is involved in continuous improvement (including its customers and suppliers if feasible); Quality: customers' expressed and implied requirements are met fully; Management: executives are fully committed.
Vasconcellos (2003, p.19)	An integration (process)	TQM is the integration of all functions and processes within an organization in order to achieve continuous improvement of the quality of goods and services. The goal is customer satisfaction.

Table 1 Definition of TQM (Source: Own Elaboration)

From 1990s, popular press and academic journals have published a mass of studies investigating both successful and unsuccessful implementation of TQM (Kaynak, 2003). According to Yong and Wilkinson (2002), there was a growing concern on the field of TQM and its influence on organizational effectiveness.

TQM was originally developed mainly in manufacturing industries, but it has also been implemented in administrative processes, and then many services have begun to apply some TQM practices (Mohrman et al., 1995). Business has realized that quality must not be viewed solely as a technical discipline, but as a discipline in management. That is, quality issues permeate all aspects of business enterprise that the "quality of management" is as important as "management of quality" (Evans & Lindsay, 2013).

2.1.2 Principles, Practices and Techniques

TQM requires specific tools and techniques to improve products, services, and business processes (Partlow, 1996). However, like there is a lack of a widely accepted definition, a standard widespread implementation framework for TQM does not exist (Sila & Ebrahimpour, 2003).

Hackman and Wageman (1995) summarize that TQM authorities (Juran, Ishikawa and Deming) propose four principles that should be instruction for organizations to conduct quality improvement: (1) focus on work processes, (2) analysis of variability, (3) management by fact and (4) learning and continuous improvement. Meanwhile, there are similar philosophical orientation and common core values about people, organizations, and change processes in TQM literature. The interventions prescribed by authorities to realize those values are summarized by Hackman and Wageman (1995) as five practices. This set of principles, practices and techniques is shown in Table 2.

Principles		
Focus on work processes Analysis of variability Management by fact Learning and continuous improvement		
Practices	Function	Techniques
Explicit identification and measurement of customer requirements	Provide a test for evaluation of process changes	None
Creation of supplier partnerships	Ensure the acceptable quality of materials that enter the organization	None
Use of cross-functional teams to identify and solve quality problems	Bring the full spectrum of necessary information and expertise to bear on decisions about system-wide problems	None
Use of scientific methods to monitor performance and to figure out points of high leverage for performance	Provide teams with trustworthy data to use in their decision making	Control chart Pareto analysis Cost-of-quality analysis
Use of process-management heuristics to enhance team effectiveness	Improve the quality of the decision-making process itself	Flowchart Brainstorming Cause-and-effect diagram

Table 2 Principles, Practices and Techniques of TQM (Adapted from Hackman and Wageman (1995))

An alternative approach to principles and practices is proposed by Boaden (1997). According to Boaden (1997), difference between principles (beliefs or tenets) and practices (actions that reflect and embody the beliefs) is critical when discussing the elements of TQM, but most authors appear to mix the beliefs and activities with “principles”, which may cause confusion because some principles can only be applied with the introduction of certain practices. By examining a variety of sources from individuals through institutions to surveys, Boaden (1997) develops a set of TQM principles and practices, shown in Table 3. This version of principles and practices emphasize the driver and rationale of a practice, rather than the activities themselves, which are more suitable for the changing environment.

Principles of TQM	Practices
Customer focus, with emphasis on the customer-supplier relationship, internally and externally	Considering education and training as an investment
The commitment of everyone to quality improvement, especially managers	The use of teams and team work
The involvement of everyone within the organization in quality improvement	The use of appropriate tools and techniques, reviewed regularly
A focus on processes	Goal-setting, measurement and feedback for all aspects of the business
Continuous improvement as a philosophy	None

Table 3 Principles and practices of TQM (Boaden, 1997)

2.1.3 Implementation Issues

The research and application of TQM were conducted in manufacturing first (Dooley & Flor, 1998). Nevertheless, in the last decades, service industries have attracted attention of TQM researchers and implementers (Lam, Lee, Ooi, & Lin, 2011). The effectiveness of TQM principles hinges on the successful implementation in the organization. In practice, however, the outcome of TQM is not achieved easily because the implementation is a complicated and tough process (Rad, 2006).

Many reasons have been given for the failure of TQM with cited reasons in the literature. According to Talib and Rahman (2015), barriers often hindered the proper implementation of TQM and have negatively affected the desired outcomes. As a result, many TQM initiatives have been abandoned, ignored or declared a failure. Aquilani et al. (2017) point out that a widely accepted or shared model for TQM implementation does not yet exist.

According to Calabrese and Corbò (2015), in general, there are five critical factors that hinder TQM implementation. The first one is lack of leadership and top management support for quality (Sebastianelli & Tamimi, 2003). It is because the strategic plans for quality are not suitable, leadership development is lagging, control systems which enable the implementation of TQM programs is absent and the attention to processes and employee involvement is insufficient (Huq, 2005). The second one is human resource management being inconsistent with TQM principles. It is caused by lack of employee empowerment, lack of communication and cooperation and lack of employees' training of TQM. The third one is short of customer focus, the fourth is inadequate planning for quality and the fifth is lack of systems or resources for supporting TQM programs (Sebastianelli & Tamimi, 2003).

Furthermore, the difficulties of implementing TQM are even higher in the service industries because of its singular characteristics (Ennis & Harrington, 1999), as we are going to see next section. The barriers can also be classified into three categories in terms of based on people-oriented issues, managerial issues and organizational issues (Talib & Rahman, 2015) .

2.2 Services: Classification and Characteristics

Many people today work in services. According to World Bank (2017), the percentage of employment in services-related jobs is 51% worldwide. In developed countries, the percentage is even higher, for example, 79% of workforce in the U.S. is employed in service industry. The service industries can be divided into trade, transportation and utilities; information; finance; professional and business services; education and health services; leisure and hospitality; and other services (U.S. Bureau of Labour Statistics, 2017).

2.2.1 Classification

In order to classify these industries, Schmenner (1986) proposes the service process matrix (Figure 1), in which two key elements are used to classify service delivery processes, labour intensity, and customer interaction. Then, those service industries can be classified into four categories in this two-by-two matrix: service factory (e.g. airlines, trucking and hotels),

service shop (e.g. hospitals and auto repair), mass service (e.g. retailing, wholesaling and schools) and professional service (doctors, lawyers and accountants).

		Degree of Interaction & Customization	
		Low	High
Degree of Labor Intensity	Low	Service Factory: Airlines, Trucking, Hotels, etc.	Service Shop: Hospitals, Auto repair, etc.
	High	Mass Service: Retailing, Wholesaling, Schools, etc.	Professional Service: Doctors, Lawyers, Accountants, etc.

Figure 1 The service process matrix (Schmenner, 1986)

2.2.2 Characteristics

Marketing theorists generally proposed distinct features of services. The most frequently cited characteristics were intangibility, inseparability (of production and consumption), heterogeneity (or non-standardization), and perishability (or exclusion from the inventory) (Zeithaml, Parasuraman, & Berry, 1985). Among them, most services exhibit at least two of the features (Burton, Cross, & Chapman, 1999).

Intangibility refers to the fact that services, unlike goods, do not always have physical attributes which allow users to judge it by sense organ (Berry, 1980). *Inseparability* indicates to production and consumption happening at the same time (Cowell, 1988). *Heterogeneity* refers that the performance of service cannot be standardized and changes with times, employee, and customer perceptions (Cowell, 1988; Zeithaml et al., 1985). Onkvisit and Shaw (1991) consider *heterogeneity* as a reflection of customization and flexibility of the service. According to Zeithaml et al. (1985), *perishability* means that it is impossible to store services and preserve it to the future.

2.2.3 Differences between Manufacturing Sectors and Service Sectors

Although there are some similar processes in services and manufacturing and they both aim to achieve operational and financial success (Zhou, Park, & Yi, 2009), the differences

of production of services and manufacturing are obvious, and these differences have important implication on quality management (Huq & Stolen, 1998).

Generally speaking, services are more labour intensive while manufacturing is more capital intensive (Sengupta, Heiser, & Cook, 2006). The production of services typically requires a higher degree of customization than manufacturing and customers often participate in the service process. Meanwhile, customer needs and performance standards are often different since customers are different (Ellram, Tate, & Billington, 2004; Huq & Stolen, 1998). The service firm, with its highly customized output, must approach quality differently, which results in the difficulties of achieving consistently high quality and measuring and monitoring service quality (Huq & Stolen, 1998; Zeithaml, Berry, & Parasuraman, 1996). Because of these difficulties, employees in service companies have to do judgment at individual-level more than in manufacturing companies (Huq & Stolen, 1998). These differences are listed in Table 4.

Difference	Authors
<ul style="list-style-type: none"> Labour intensiveness 	Sengupta, Heiser, and Cook (2006)
<ul style="list-style-type: none"> Customer involvement and higher degree of customization Service/customer heterogeneity 	Ellram, Tate, and Billington (2004), Huq & Stolen (1998), Dale et al. (1997)
<ul style="list-style-type: none"> Difficulty of maintaining high quality Difficulty of measuring and monitoring service quality 	Huq & Stolen (1998), Zeithaml et al. (1996)
<ul style="list-style-type: none"> Service company employees must exercise greater individual judgment 	Huq & Stolen (1998)

Table 4 Difference between Manufacturing and Services (Source: Own Elaboration)

2.3 Similar Studies

This research is the first attempt to perform a bibliometric analysis on the topic of TQM implementation in the general service sector. The current similar studies are either bibliometric analysis on quality-related topic but not TQM neither in services, or non-bibliometric analysis on TQM implementation in services (general service sector or a specific service sector). In this section, both kinds of similar studies are discussed.

2.3.1 Bibliometric Analysis on Quality-related Topics (not TQM)

The first group of similar studies is bibliometric analysis on quality-related topic but not TQM neither in services. Their topics are other fields in quality, such as statistical process control and continuous improvement projects, but they still share similarities with this study on bibliometric databases, analysis methods and process, and possible used software.

There are three studies in this group. Lizarelli, Bessi, Oprime, Do Amaral, and Chakraborti (2016) propose a bibliometric analysis of the international publications about statistical process control (SPC) from 1956 to 2013. Veiga, Mendes, and Lourenço (2016) conduct a bibliometric study on fundamental contributions on applications of statistical methods in the area of quality and process control. Gonzalez Aleu and Van Aken (2017) perform a bibliometric approach to describe the current research on hospital continuous improvement projects (CIPs) from an author characteristics' perspective. This is the only one that focus in services, but a specific one (healthcare).

It is noticeable that all of these three studies defined Web of Science (WoS) as (one of) the bibliographic database(s). They all indicated that the choice was made because WoS is one of the well-known bibliographic databases in the academic field, and it includes access to thousands of journals.

Regarding the bibliometric methods, on the one hand, both Lizarelli et al. (2016) and Veiga et al. (2016) conduct publication counting and abstract analysis and citation analysis, which enable them to reach the conclusion of the growing importance of their topics and growth of publications in the corresponding fields. On the other hand, both Lizarelli et al. (2016) and Gonzalez Aleu and Van Aken (2017) perform co-author analysis to investigate the issues of institution-level and country-level collaboration. Lizarelli et al. (2016) conclude that the most productive authors' publications in the various areas of SPC research publish in the same group of journals and have a strong research network, while one key finding of Gonzalez Aleu and Van Aken (2017) is that authors publishing in the area of CIPs can be described as a relatively new international community given the countries represented.

A synthesis of the aforementioned studies is presented below in Table 5.

Authors	Quality-related Topic	Bibliometric Data	Bibliometric Methods	Analysis Software	Key Findings
Lizarelli et al. (2016)	Statistical process control	<ul style="list-style-type: none"> Web of Science 3,683 articles published from 1956 to 2013 	<ul style="list-style-type: none"> Publication counting and abstract analysis Citation analysis Co-author analysis 	<ul style="list-style-type: none"> Vantage Point Statistica 11.0 	<ul style="list-style-type: none"> There are leading countries in this type of publication, e.g. United States The most productive authors publish in the same sources thus there is a strong research network Identification of the growth of publications in the various fields of SPC research and the main sources of publications in English
Veiga et al. (2016)	Statistical quality Control	<ul style="list-style-type: none"> Web of Science, science citation index expanded (SCI-Expanded), social science citation index (SSCI), social science citation index (A&H CI), and Thomson ISI 3,040 articles published from 1943 to 2013 	<ul style="list-style-type: none"> Publication counting and abstract analysis Citation analysis Co-word analysis 	<ul style="list-style-type: none"> Microsoft Excel 2010 IBM SPSS version 21.0 IBM SPSS Text Analytics for Surveys 4.0 	<ul style="list-style-type: none"> The continuous growth of importance of statistical applications in process and quality control The contributions with greatest influences are related to principal component and multivariate analysis in the area of clinical assessment Besides multivariate analysis, the dominant techniques are control charts, use of data-mining tools and autocorrelation/time series
Gonzalez Aleu and Van Aken (2017)	Continuous improvement projects	<ul style="list-style-type: none"> ProQuest, EBSCO, Engineering Village, and Web of Science 302 publications 	<ul style="list-style-type: none"> Co-author analysis 	<ul style="list-style-type: none"> Microsoft Excel 2010 	<ul style="list-style-type: none"> Hospital CIPs are increasingly attracting new scholars each year Authors publishing in this area can be described as a relatively new international community given the countries represented

Table 5 Similar Studies (Bibliometric Analysis on Other Quality-related Topic)

2.3.2 Non-bibliometric Analysis on TQM Implementation in Services

The author found no studies of bibliometric reviews of implementation of TQM in services, but there are some studies conducting non-bibliometric analysis on the TQM implementation-related topics. They use systematic literature review or meta-analysis to investigate critical success factors (CSFs) of TQM implementation or TQM practices, and share similarities of the general topic, literature review scope and databases with the author's study. However, due to the different methodology, this group of similar studies all has smaller sample size of data compared to the first group which conduct bibliometric analysis.

Aquilani et al. (2017) perform a systematic literature review contained in the three databases EBSCO, JSTOR, and Springerlink and on the search engine Google Scholar to identify new avenues of research in line with the ongoing changes in quality and

management required to firms, especially regarding customers. Hietschold, Reinhardt, and Gurtner (2014) also conduct a systematic literature review on the CSFs of TQM implementation. They both indicate the gaps and weaknesses in the TQM implementation field. Aquilani et al. (2017) indicate that the relationships between TQM CSFs, TQM and management and/or marketing have been little studied, which is a gap in the existing research, while Hietschold et al. (2014) focus on the measurement of CSFs and point out that present emphasis on hard factors is more than on soft, human and behavioural factors, and this causes wrong results and incentives.

Essentials and practices of TQM in healthcare sector is another direction of similar studies. In the study of Mosadeghrad (2014) and study of Faisal, Rahman, and Azam (2011), the aim is to review and quantitatively and qualitatively analyse the application of TQM in order to identify a set of elements needed for a successful implementation of TQM. They both propose top-management commitment, education and training, employee involvement/participation, process management, continuous improvement and customer focus as the critical practices of TQM. Moreover, based on a systematic literature review, Aquilani et al. (2017) emphasize that there is a common focus in the customers, and one of the key CSFs is customer focus/satisfaction.

A synthesis of the aforementioned studies is presented below in Table 6.

Authors	TQM related topic	Research scope	Analysis method	Type of Data	Key Findings
Aquilani et al. (2017)	TQM critical success factors (CSFs)	Services in general	Systematic literature review	<ul style="list-style-type: none"> Ebsco, JSTOR, and Springerlink 103 papers published before September 7, 2016 	<ul style="list-style-type: none"> Customer focus has gained importance in recent times A general or shared model to successfully TQM does not yet exist Few studies have investigated the relationship between TQM and the issues of both marketing and performance – a research gap
Hietschold et al. (2014)				<ul style="list-style-type: none"> ScienceDirect, Business Source Complete and Emerald Management 145 studies 	<ul style="list-style-type: none"> CSFs can be classified into 11 distinct dimensions Proposition of a three-level framework and a holistic set of measurement instruments Indication of deficiencies of current measurements and suggestion of ways to reduce those deficiencies Current focus on measuring hard factors more often than soft, behavioural and human factors creates false results and incentives
Faisal Talib, Rahman, and Azam (2011)	TQM practices	Healthcare sector		<ul style="list-style-type: none"> ProQuest Advanced Search Database 15 peer-reviewed research papers published between 1995 and 2009 	<ul style="list-style-type: none"> Eight supporting TQM practices were identified as best practices for TQM implementation in healthcare setting: top-management commitment, teamwork and participation, process management, customer focus and satisfaction, resource management, organization behaviour and culture, continuous improvement, and education and training
Mosadeghrad (2014)	Essentials of TQM implementation		Meta-analysis	<ul style="list-style-type: none"> PubMed, Ebsco, Elsevier science, Emerald, JSTOR, etc. 37 empirical studies published between 1980 and 2012 	<ul style="list-style-type: none"> A successful TQM implementation needs seven elements: sufficient education and training, supportive leadership, consistent support of top management, customer focus, employee involvement, process management and continuous improvement of processes

Table 6 Similar Studies (Non-bibliometric Analysis on TQM Implementation in Services)

3. Methodology

In this chapter, it is presented the considerations for the adopted methodology. As such, Section 3.1 introduces the methodology that will be used, Section 3.2 contains a description of the techniques of bibliometric analysis to be performed and Section 3.3 is to explain the application of the bibliometric techniques.

3.1 The Bibliometric Study

There are different definitions of bibliometrics, but different contexts contain the same purpose of conducting a bibliometric analysis. Pritchard (1969) indicate that bibliometrics can be defined as the mathematical and statistical analysis of bibliographic records. And according to Okubo (1997), bibliometrics is an analysis tool which contains specific measurements aiming to quantify the scientific and technological production data through article and/or patent publications. By conducting quantitative analysis of academic research output, the major purpose of bibliometrics is to improve scientific documentation, information and communication activities (Osareh, 1996).

Compared to narrative systematic literature review which is subjected to bias by the authors (Minkman, Ahaus, & Huijsman, 2007; Tranfield, Denyer, & Smart, 2003), bibliometric approaches has a main advantage in introducing quantitative rigor into the subjective analysis of literature (Zupic & Cater, 2015). By employing a quantitative approach for the description, evaluation, and monitoring of publications, a clear, systematic, and reproducible review process is possible to conduct thus improving the quality of reviews. Thus, bibliometric methods can be regarded as a helpful assistant to literature reviews since it can guide the researchers to the most influential works and mapping the research field while avoiding subjective bias (Zupic & Cater, 2015).

According to Cobo, López-Herrera, Herrera-Viedma, and Herrera (2011), there are two main uses of bibliometric methods. The first one is performance analysis (evaluative bibliometrics), which aims to assess the research and publication performance of individuals and institutions; and the second one is science mapping (relational bibliometrics), which attempts to reveal the structure and evolution of a scientific field (Thelwall, 2008; Zupic & Cater, 2015). In the present study, it will be developed a science mapping. It would allow understanding of the conceptual, social and intellectual structure

of the research field of TQM implementation in services permitting the assessment of the trends, gaps and weaknesses of the existing academic outputs (Thelwall, 2008).

This study follows closely the bibliometric approach of Zupic and Cater (2015). There are five steps of conducting a bibliometric approach, as shown in Table 7 and will be discussed in detail in Section 3.3.

Steps		Tasks
1	Research Design	a. Define the research question b. Choose the appropriate bibliometric method for the research question
2	Compiling the Bibliometric Data	a. Select the appropriate database b. Filter and export the document bibliographic data (search criteria, journal selection, manual filtering, citation threshold value filtering)
3	Analysis	a. Choose the appropriate bibliometric software (BibExcel, Sitkis, SciMat, Microsoft Excel, etc.) b. Clean the data c. If necessary, produce similarity matrix for statistical software d. Identify subgroups with chosen method (MDS, PCA, cluster analysis, network analysis)
4	Visualization	a. Choose the preferred visualization method (MDS, Network Analysis) b. Select the appropriate software to implement visualization (UCINET, Pajek, Gephi, R iGraph, Citespace II, etc.)
5	Interpretation	Describe and interpret the findings

Table 7 Steps of Doing a Bibliometric Analysis (Source: Zupic & Cater, 2015)

3.2 Key Techniques of Bibliometric Analysis

In this paper we use bibliometric methods, analysing bibliographic data from publication databases to construct structural landscape of scientific fields. The first step (research design) is to define the research questions and choose appropriate bibliometric methods.

The research questions are as follows:

- 1) What are the most salient themes in applying Total Quality Management in major service sectors?
- 2) What are the trends, gaps and weaknesses in this field?

There are three techniques chosen in this study. The first is Publication counting and abstract analysis. It can answer the research question 1 - the most salient themes in applying TQM in service sectors. The second one is co-citation analysis. It can answer research question 2 by identifying intellectual structure and the research front of the research field. The last one, co-word analysis can answer both research question 1 and 2

because it can find the network of themes and track the evolution of a concept. The three techniques are explained in Table 8.

The detailed presentation of aforementioned techniques will take place in Section 3.3 and Section 4, including the discussion of the selected bibliographic databases, keywords used, and description of the full process of research, data export and treatment, classification of academic output and presentation of results.

Techniques	Description	Research Question(s) Can Be Answered	Function	Author(s)
Publication counting and abstract analysis	A quantitative and qualitative indicator of the productivity of a field of study in terms of the output delivered in academic publications	RQ 1: What are the most salient themes in applying Total Quality Management in service sectors?	<ul style="list-style-type: none"> Evaluate and compare the research performance of individual researchers, departments, and research institutions and nations 	
Co-citation analysis	Connecting documents, authors, or journals based on the joint appearances in reference list	RQ 2: What are the trends, gaps and weaknesses in this field?	<ul style="list-style-type: none"> Represent a link between documents Identify the knowledge base of a research field and its intellectual structure 	Cobo et al., 2011
				Zupic & Čater, 2015
Co-word analysis	Using the words in documents to establish relationships and build a conceptual structure of the domain.	RQ 1: What are the most salient themes in applying Total Quality Management in service sectors?	<ul style="list-style-type: none"> Find the network of themes and their connections that represent the conceptual space of a field. Track the evolution of concept X 	Cobo et al., 2011
		RQ 2: What are the trends, gaps and weaknesses in this field?		Zupic & Čater, 2015

Table 8 Key Bibliometric Techniques (Source: Own elaboration)

3.3 Application of Bibliometric Techniques

3.3.1 Building Bibliographic Database

After the literature review and research design was finished, the next step was to compile the bibliographic data, including selecting appropriate database, and filtering and exporting the document bibliographic data. The databases chosen by this study are Elsevier's Scopus and Thompson Reuters' Web of Science. These two databases are good tools for bibliometric studies and evaluations of scientific productions.

Scopus is a premier research platform. It is recommended by some researchers as having a wider coverage than the WoS (Zupic & Cater, 2015). Moreover, as the largest abstract and citation database of peer-reviewed literature (Elsevier, 2017), Scopus provides data for all authors in cited references, improving the precision of author-based citation and co-citation analysis (Zupic & Cater, 2015).

As one of the world’s largest citation indexes, WoS is another popular tool for searching extensive citation and conducting bibliometric analysis. It has general, cited reference and advanced search features, with an extensive range of tools with which to manipulate search results (ClarivateAnalytics, 2017). However, the study of Meho and Yang (2007) demonstrates that though WoS remains an important citation database, it may be necessary to additionally use Scopus for locating citations to an author or title, and, by extension, journals, departments, and countries. The two databases complement rather than replace each other.

The search was performed by using a combination of defined keywords. The main keywords were always combined with a secondary keywords and tertiary keywords, as shown in Table 9. The keywords were searched on “Title, authors, abstracts and keywords” in WoS and Scopus. In WoS, the database of searching was set as “All databases”.

Main Keywords	Secondary Keywords	Tertiary Keywords
<ul style="list-style-type: none"> • Total Quality Management • TQM 	<ul style="list-style-type: none"> • Services • Service Sectors • Service Industries • Service Firms • Service Companies 	<ul style="list-style-type: none"> • Implementation • Application • Introduction

Table 9 Keywords Combined within Search (Source: Own Elaboration)

The searching procedure resulted in 2,736 records from Scopus and 1,539 records from WoS. After eliminating the duplications, the author obtained 3,774 articles, retrieved on January 10th, 2018.

The next step was Abstract analysis and publication counting. The first task was to screen the records by reading the title and abstract and clarifying the articles into four categories:

- “Yes” – the topic of the journal article is related to TQM implementation in services

- “Not sure” – the topic of the journal article is probably related to TQM implementation in services
- “No” – it is not a journal article or the topic of the journal article is surely not in the scope of this study
- “Not applicable” – the language of the text is not English

The 3450 articles in “No” and 17 articles in “Not applicable” were removed from the list. The reasons for excluding such large amount of articles in “No” are “not analyzing TQM implementation” and “analyzing TQM implementation in non-service sectors, e.g. manufacturing”. The remaining was 258 articles in “Yes” and 52 articles in “Not sure”. After analysing the introduction and conclusion or full text, 16 articles in “Not sure” were recategorized as “Yes” and the others were removed from the list. It is notable that despite the effort made, it was impossible to access the full text of 6 articles whose abstracts are not enlightening to summarize the topic. Thus, they were excluded from the list. After the screening process, the author obtained the final database of 268 articles (Appendix 2).

3.3.2 Publication Counting and Abstract Analysis

After obtaining the database, it was the time to export the publication information and analyse the topic of each article. Careful reading of abstract or full text of each article was needed in order to fill in the table which contains the following dimensions: topic, researched geographic area, researched industry, discussed TQM principles, discussed TQM Practices, discussed TQM CSFs (critical success factors), and discussed TQM implementation issues/challenges. The publication information of article title, author(s), journal name and publication year was exported from Endnote to MS Excel.

Talib, Rahman, and Qureshi (2012) conduct a literature review on studies about TQM in services sector and summarizes them in 14 topics. Based on that, a list of primary topics was developed and afterwards adjusted during the abstract/full text analysis. The adjusted list of 18 topics of “use of TQM in services” contains:

- Application of TQM in a specific activity
- Application of TQM in a specific organization
- Assessing a model/framework for TQM implementation
- Developing a model/framework for TQM implementation

- Evaluation of TQM implementation results in (a) country(ies)/region(s)
- Evaluation of TQM implementation results in (an) industry(ies)
- Evaluation of TQM implementation results in (an) organization(s)
- Extent of TQM implementation in (a) country(ies)/region(s)
- Extent of TQM implementation in (an) industry(ies)
- Factors influencing TQM implementation
- Improving TQM implementation process by other approach(es)
- Key success factors (CSFs) of TQM implementation
- Relationship between TQM and customer satisfaction
- Relationship between TQM and job satisfaction
- Relationship between TQM and overall performance
- TQM implementation issues/challenges
- TQM practices
- TQM techniques/tools

Besides identifying the topic of articles, it is also valuable to identify in details which items are discussed under a certain topic. “TQM practices”, “critical success factors (CSFs) of TQM implementation” and “TQM implementation issues/challenges” were specially investigated because they are closely related to practical implementation. Practitioners will benefit from knowing which TQM practices are most popular, which CSFs are most important and what kind of challenges need more attention during TQM implementation.

3.3.3 Co-citation Analysis

The purpose of co-citation analysis is to find the linkage between two references by counting the times they were jointly cited by another article, thus forming a network of all the references within a research area, which is called “intellectual structure” (Zupic & Cater, 2015). It is based on the assumption that the more two publications are cited together, the closer is their relationship, and also the higher is their importance individually (McCain, 1990). To conduct co-citation analysis, the author first extracted all references of the 268 articles, and then used a data cleanup program to do data cleaning and format transformation. There were references that might be alternative representations of the

same thing. For example, name of the same author can be different in different references and need to be corrected, such like “De Silva, W.” and “Silva, W. D.” Using the clustering function in the program, it was possible to figure out these references and unify them. To better refine the records, we also used Microsoft Excel to do the unifying work. The refined list contained 9474 references.

The next step was to calculate the frequency of co-occurrence of a pair of references in an article in Microsoft Access. This process generated a list of network of co-citation. Then the list was imported into VOSviewer, a software which can generate maps based on network data, to construct and visualize the network (van Eck & Waltman, 2011).

3.3.4 Co-word Analysis

The logic behind co-word analysis was similar with co-citation analysis. Co-word analysis can be conducted based on article title, author keywords, abstract or full text. Using only titles or author keywords will generate the problem of indexer effect, while using abstract or full text will introduce noise due to the existence of irrelevant words (Zupic & Cater, 2015). In this study, we chose the abstract part of the 268 articles to do the co-word analysis, considering that abstract is a summarized version of full text which contains critical words and less irrelevant words in terms of quantity.

To analyse the evolution of the researches, the study period was separated the 26 years (1990-2017) into two sub-periods: 1990-2003 and 2004-2017. Abstracts from articles published in different sub-periods were extracted into two MS Excel spreadsheets. Words that represent the same thing were unified, for example, “TQM” and “total quality management”, “health care” and “healthcare”.

The next step was to define the list of words used in co-word analysis. These words were selected in two pools: author keywords and abstracts. In Microsoft Excel, it was possible to calculate the most frequent words. Based on the literature review, 100 most frequent words which were relevant to the topic were selected from 436 author keywords from 268 articles (Appendix 3). Then, the appearance of these 100 words could be shown in Microsoft Excel. Again, Microsoft Access and VOSviewer were used to do the network mapping for co-words.

4. Results

4.1 General Overview of the Database

In this section, a general overview of the bibliometric database will be presented.

4.1.1 Chronological Evolution of the Articles

The chronological evolution of the articles on “use of TQM in services” (Figure 2) shows that it is a path with irregular fluctuations.

The two peak values are in 1996 and 2011, with 21 articles and 17 articles respectively. There was a continuous increase of research interests from 1990 to 1996, which means the researches on “use of TQM in services” were developed and gradually gained attention in the academic field. However, this trend was followed by a decrease for 3 years and then irregular ups and downs in the following years. The total number of articles published in period 1990 to 2003 and 2004 to 2017 is 137 and 131 respectively. Meanwhile, after the peak in 1996, the average number of articles in period 1997 to 2006 and period 2007 to 2017 is 9.7 and 9.2 respectively, which shows that the “use of TQM in services” is not a faded topic in academic world.

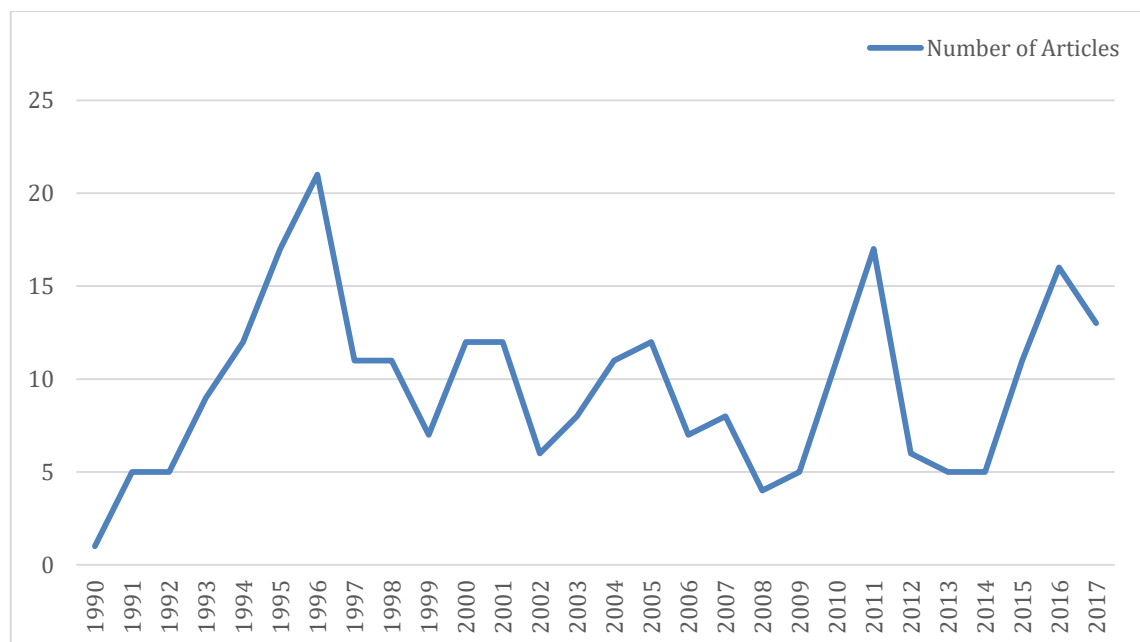


Figure 2 Chronological Evolution of the Articles on “Use of TQM in services”, 1990-2017

(Source: Own Elaboration)

4.1.2 Researched Geographical Area of the Database

Concerning the geographical area of researches in the bibliometric database, 190 out of 268 articles have specific geographic area of research, and the remaining 78 articles do not mention a specific research country/region. The country which has been analyzed most is USA (47 articles), followed by UK (18 articles) and India (18 articles). Asia, Europe and North America are the top three continents studied most; together represent 88.4% of all researched countries/regions (Figure 3).

Among the 47 articles that studied USA, 74.4% were published between 1991 and 1999, and among the 18 articles that studied UK, 61.1% were also published between 1991 and 1999. The 18 articles that focus on India were all published after 2000, and 91.7% of the articles that studied Malaysia were also published after 2000. The expected result is that the use of TQM in services were first studied in countries such as USA (the earliest article was published in 1991) and UK, and then in countries such as India and Malaysia.

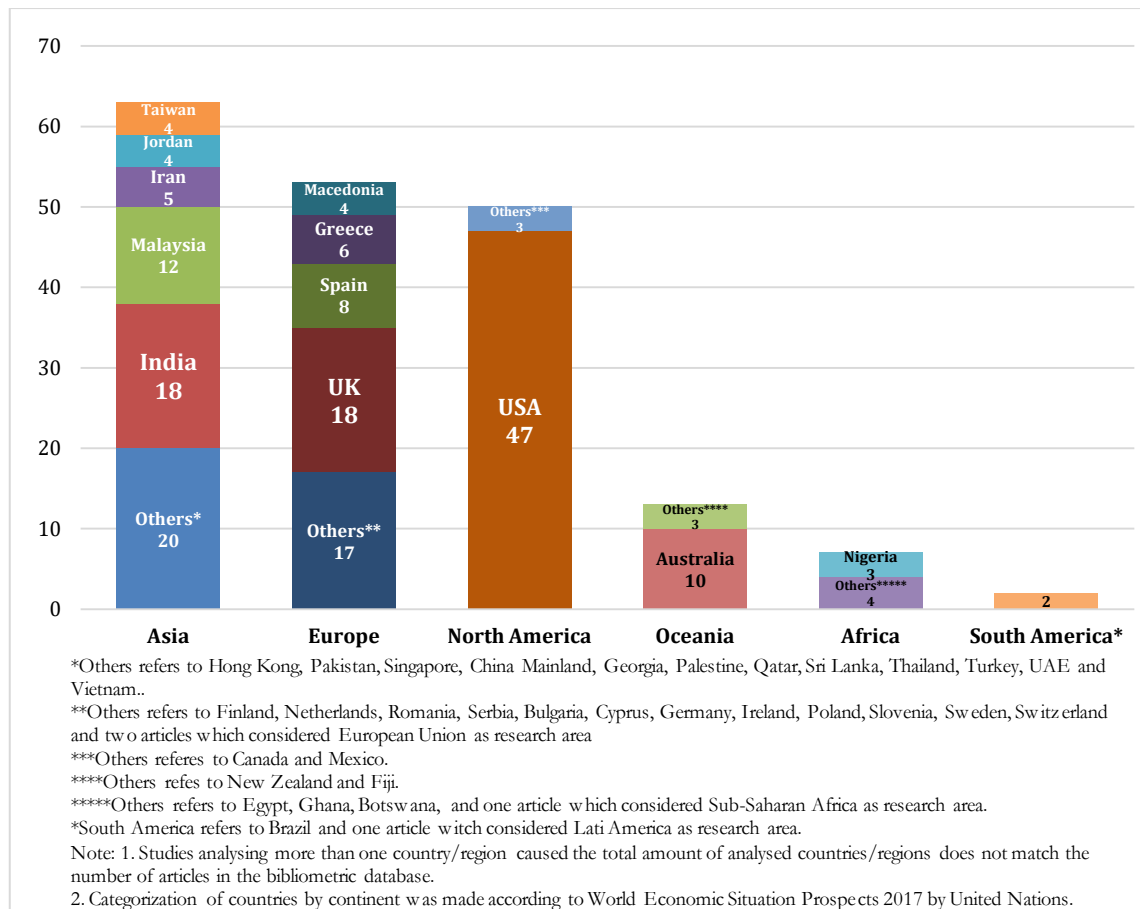


Figure 3 Number of Articles Analyzing Specific Country(s)/Region(s) Distributed per Continent (Source: Own Elaboration)

After classifying the countries/regions in developed area and developing area, it is possible to obtain another result regarding the chronological evolution of the articles (Figure 4). The total number of articles focusing developed areas and developing areas is 105 (39.2%) and 75 (28.0%) respectively. The “use of TQM in services” was analyzed in developed countries/regions first and the number of articles per year reached the peak of 15 in 1996. After 1996, this number never exceeded 6. However, there has been a growing effort from authors to study developing areas after 2000. Between 2000 and 2017, there are only 5 years that the number of articles on developed areas per year surpasses the number of articles on developing areas. There are irregular fluctuations on both numbers, thus it is hard to conclude a prediction for the trend of research geographic areas.

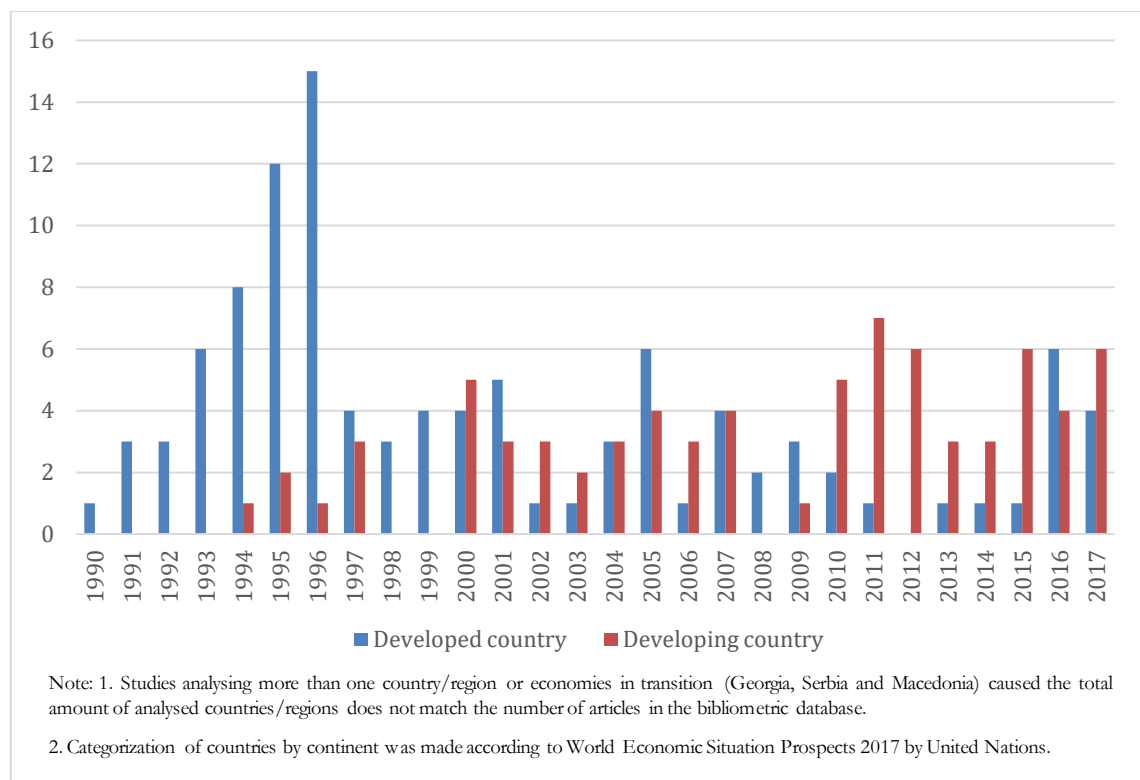


Figure 4 Chronological Evolution of the Articles Analyzing Specific Country(s)/Region(s) by Country Type, 1990-2017 (Source: Own Elaboration)

4.1.3 Researched Industries of the Database

In the database, 95 articles analyze the use of TQM in general services, without a focus on a certain service industry (35.4% of the total amount). Other 173 articles study the application of TQM in specific service industries. As shown in Table 10, there are 14 specific service industries researched in the database. Healthcare is the most studied industry: 31.7% of the articles chose to investigate TQM implementation in this industry, followed by higher education (7.5%), financial services (6.3%) and public sector (6.0%). The above four industries include the majority of the articles in the database (51.5%). It is interesting that during the period between 1990 and 2003, 44.5% focused on the use of TQM in healthcare industry, but this focus was dispersed to other industry and general service industry during the period between 2004 and 2017. Healthcare is the only one that the aggregated value of publication quantity decreases comparing the sub-period of 1990-2003 and 2004-2017.

Industry	Number of Articles	Percentage	1990-2003	Change	2004-2017
General service sectors	95	35.4%	40	↑	55
Healthcare	85	31.7%	61	↓	24
Higher education	20	7.5%	6	↑	10
Financial services (including banking and insurance)	17	6.3%	7	↑	10
Public sector	16	6.0%	7	↑	9
Hospitality (including hotel and tourism)	10	3.7%	4	↑	6
Transportation (including aviation)	8	3.0%	2	↑	6
IT and softer ware	7	2.6%	2	↑	5
Library	6	2.2%	2	↑	4
Telecommunication and automobile service	5	1.9%	0	↑	5
Courier	4	1.5%	0	↑	4
Others (Logistics, Engineering services, Consulting services and Marketing services)	4	1.5%	1	↑	3

Table 10 Number of Articles per Specific Researched Industry (Source: Own Elaboration)

Note: Studies analysing more than one industry caused the total amount of articles per researched industry does not match the number of articles in the bibliometric database.

4.1.4 Journal Characterization

In the bibliometric database, there are 149 journals and 32 of them contain more than one article. As shown in Table 11, the 32 journals contain 147 articles in total, which count for

54.9% of the database. *Total Quality Management & Business Excellence* contains 47 articles, which means that 25% of the articles on “use of TQM in services” was published on this journal. The other journals with greater number of articles published are *TQM Journal* (15 articles), *International Journal of Quality & Reliability Management* (12 articles), *Managing Service Quality* (7 articles) and *International Journal of Health Care Quality Assurance* (7 articles).

Journal	No. of Articles
Total Quality Management & Business Excellence*	47
TQM Journal**	15
International Journal of Quality & Reliability Management	12
International Journal of Health Care Quality Assurance	7
Managing Service Quality	7
Health Marketing Quarterly	3
International Journal of Production Research	3
International Journal of Productivity and Performance Management	3
International Journal of Productivity and Quality Management	3
Journal of nursing care quality	3
Accreditation and Quality Assurance	2
African Journal of Business Management	2
Amfiteatru Economic	2
Australian Health Review	2
Health Services Research	2
Industrial Management & Data Systems	2
International Journal for Quality Research	2
International journal of health care quality assurance	2
International Journal of Service Industry Management	2
Journal of Operations Management	2
Journal of the American Dietetic Association	2
Library Management	2
Military Medicine	2
Production Planning & Control	2
Psychiatric Services	2
Quality & Safety in Health Care	2
Quality Assurance	2
Quality Assurance in Education	2
Quality-Access to Success	2
Service Industries Journal	2
Tem Journal-Technology Education Management Informatics	2
Tourism Management	2

Table 11 Number of Articles per Journal (Source: Own Elaboration)

Note: Only journals containing more than one article are shown in the table.

**Total Quality Management & Business Excellence* refers to *Total Quality Management & Business Excellence* and *Total Quality Management* (continued as *Total Quality Management & Business Excellence* in 2002).

***TQM Journal* refers to *TQM Journal* and *TQM Magazine* (continued as *TQM Journal* in 2007).

In order to assess the scientific domains of the journals in the database, the author chose to compare their SJR indicator (SCImago Journal Rank), a metric developed by Scopus Database which is calculated based on the number of citations a journal receives from other journals during a certain year and the importance of the later ones (Butler, 2008). In this work, the indicator used (SJR 2016) means the weighted citations received in year 2016 to documents published in the journal in years 2015, 2014 and 2013. Higher SJR values means the journal has higher prestige (Butler, 2008). We also included Clarivate Impact Factor, a categorization tool for journals on the Web of Science Database (Clarivate, 2018). Table 12 shows the SJR indicator and Clarivate Impact Factor of journals with 3 or more than 3 articles in the database. *International Journal of Production Research* (1.463 SJR and 2.325 JIF) is the journal with highest impact factor, followed by *Managing Service Quality* (0.858 SJR and 3.100 JIF) and *Total Quality Management & Business Excellence* (0.652 SJR and 1.368 JIF).

Journal	SJR*	JIF**	NO. of Articles***
International Journal of Production Research	1.463	2.325	3
Managing Service Quality****	0.858	3.100	7
Total Quality Management & Business Excellence	0.652	1.368	47
International Journal of Productivity and Performance Management	0.607	/	3
Journal of nursing care quality	0.602	1.224	3
International Journal of Quality & Reliability Management	0.477	/	12
International Journal of Productivity and Quality Management	0.38	/	3
TQM Journal	0.362	/	15
International Journal of Health Care Quality Assurance	0.278	/	7
Health Marketing Quarterly	0.197	/	3

Table 12 Top Journals with More Articles Published on “Use of TQM in Services”

(Source: SJR — SCImago Journal & Country Rank 2016 and Clarivate Impact Factor 2016)

Note: Only journals containing 3 or more than 5 articles (Table 11) are shown in the table. The order is based on the SJR value.

*SJR refers to SCImago Rank Indicator 2016

** JIF refers to Clarivate Impact Factor 2016 and the JIF for some journals are not available

***NO. of Articles refers to number of articles on “use of TQM in services” in the database published in the journal

****Managing Service Quality continued as Journal of Service Theory and Practice in 2014

4.2 Article characterization

In this section, it is presented the analysis result of the topics of the articles and most cited articles. After careful reading and analysis of the abstract or full text of each article, we obtained the number of articles on each topic. As shown in Figure 5, the most salient topics are “evaluation of TQM implementation results in (an) industry(ies)”, studied by 55 articles and it counts for 20.5% in the database.

The next most popular topics are “CSFs of TQM implementation” (12.7%), “developing a model/framework for TQM implementation” (12.3%) and “evaluation of TQM implementation results in (an) organization(s)” (11.2%). There are three topics on “evaluation of TQM implementation results”, representing 92 articles (34.3%) in total. The two topics on “application of TQM” represent 43 articles (16.0%) in total. The large number of articles that focus on “evaluation of TQM implementation results” reveals that the effectiveness of TQM is at the core of research. As indicated in literature review, there is indeed great effort to propose TQM implementation model/framework for TQM implementation since it is the third most salient topic.

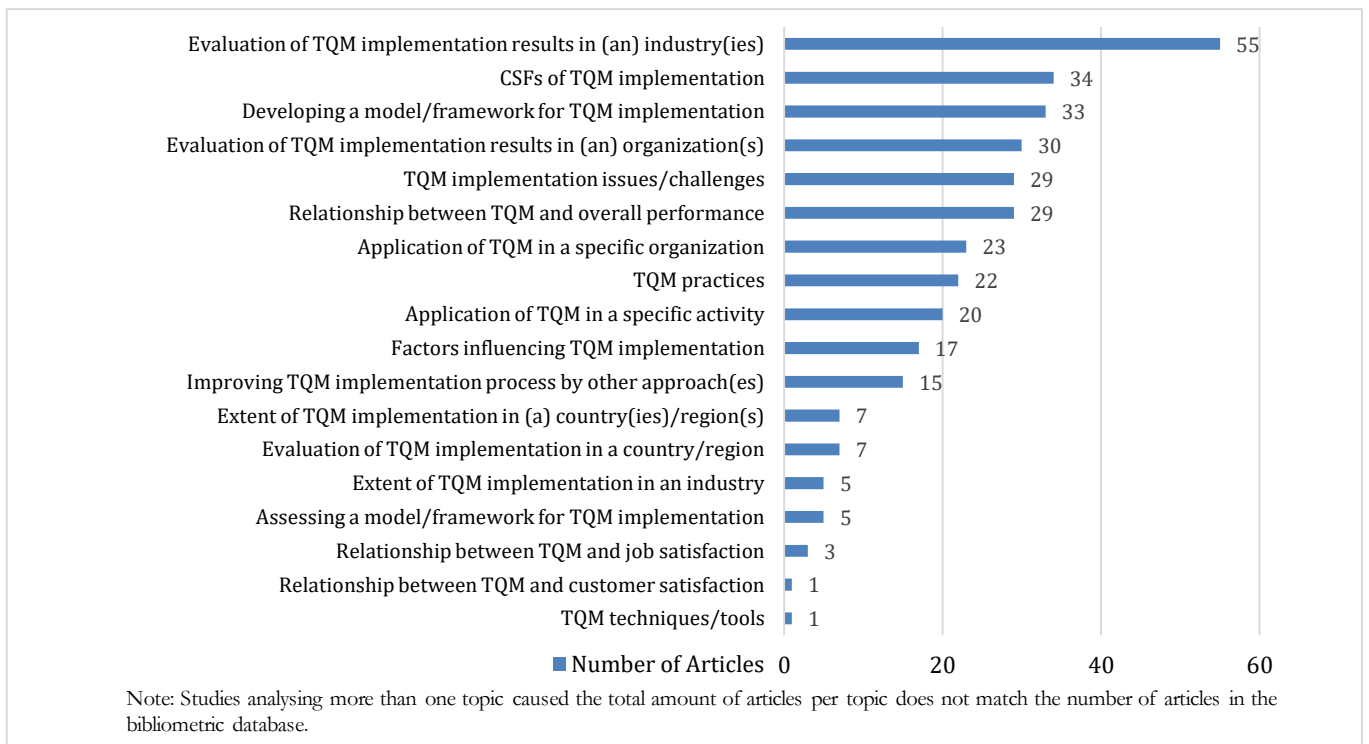


Figure 5 Number of Articles per Topic (Source: Own Elaboration)

Apart from identifying the topics of the articles, it was also identified what exact practices, CSFs and implementation issues are discussed in those articles, in order to provide suggestion and alert for TQM professionals and managers.

“TQM practices” is the eighth salient topic (Figure 5), and some articles which discuss other topics also mention at least one specific TQM practices. To sum up, there are 63 different TQM practices proposed in the database, and 28 practices are analysed by more than one article (Appendix 4). The most important TQM practices are top management commitment/leadership, customer focus and education and training.

As the second investigated topic (Figure 5), CSFs of TQM implementation is mentioned by 60 articles (some articles mention it but do not discuss it as the main topic). In total, there are 65 discussed CSFs and 38 of them are analysed by more than one article (Appendix 5). The most emphasized CSF for TQM implementation is top management commitment/leadership (50 articles mention it), followed by customer focus (29 articles) and education and training.

“TQM implementation issues/challenges” is ranked as the fifth most analysed topic in the database (Figure 5). 51 out of 237 articles mention at least one issue/challenge and 27 articles investigate it as the main topic. As shown in Figure 6, there are 33 issues/challenges discussed by more than one articles. 22 articles point out that lack of top management commitment is the barrier of TQM implementation. This is consistent with the result of Sebastianelli and Tamimi (2003). Moreover, resistance to change and lack of clear mission and TQM strategic plan are highlighted by 14 articles respectively, and are tied for the second most analyzed issue/challenge of TQM implementation.

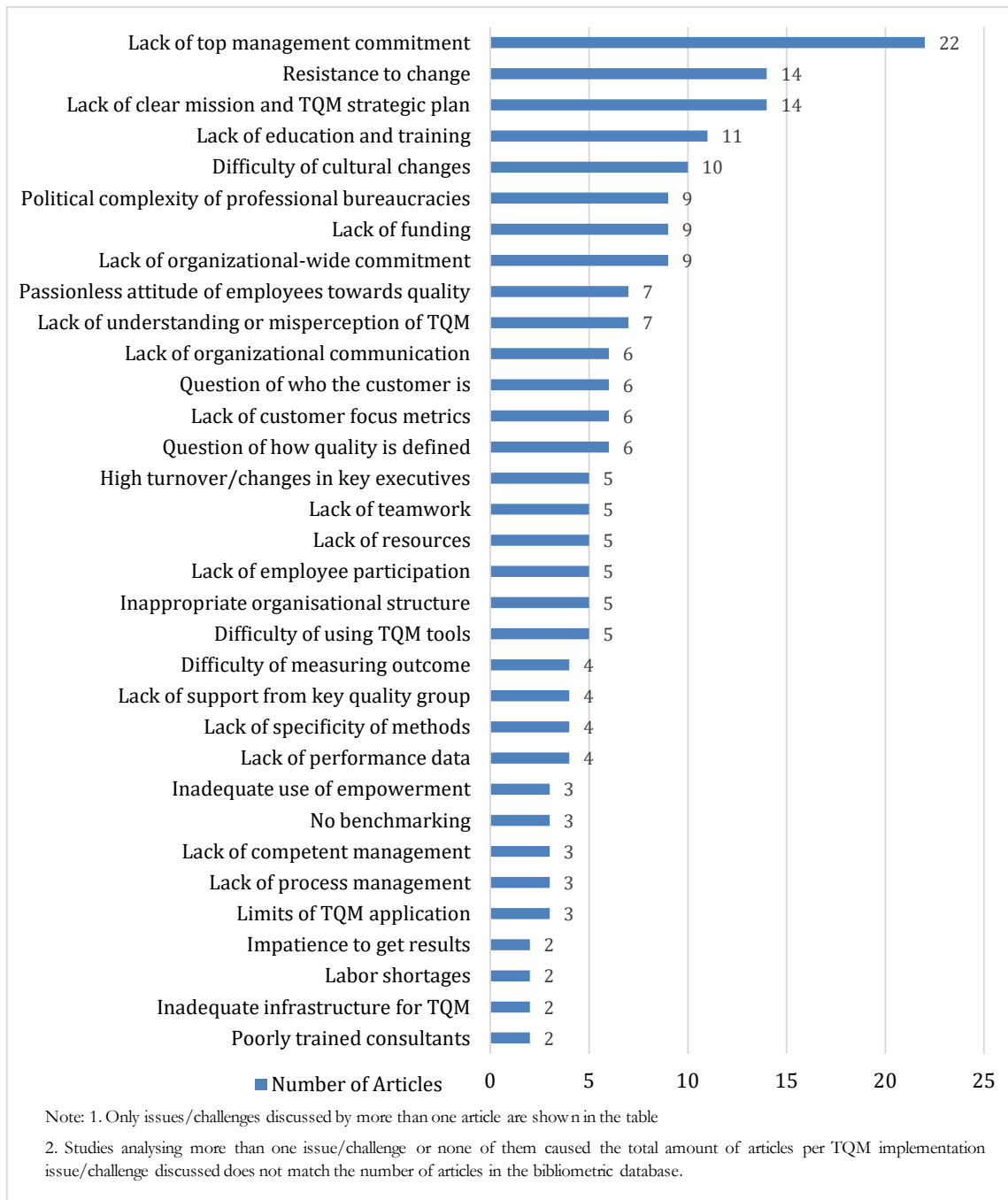


Figure 6 Number of Articles per TQM Implementation Issue/Challenge Discussed
(Source: Own Elaboration)

Viewing Appendix 4 and 5 together, the top three most notable items are be “top management commitment/leadership”, “customer focus” and “education and training”. Combined with the results in Figure 6, that “lack of top management commitment/leadership” is ranked as the most emphasized obstacle, it can be concluded

that “top management commitment” is very critical for TQM implementation, however, the often failure of ensuring “top management commitment” hinders the success of TQM application in services. This is an alert for TQM professionals and managers in service industries. At the same time, attention should also be paid to “education and training” since “lack of education and training” ranks also high among the challenges. In contrast, the other critical item—customer focus—is generally executed better, since it ranked only as the 13th most discussed challenge of TQM implementation.

4.3 Co-citation Network

Based on the 9474 records extracted from 268 articles, there are 287,820 pairs of co-occurrences of citations and it is impractical to employ a co-citation analysis on it. The suggested solution is to choose the co-occurrences above a certain number to just include the most influential documents (McCain, 1990). In this study, only co-occurrences equal or above 7 times were imported to VOSviewer, generating a map of network of 74 most influential references. In order to define the clusters based on the closeness of connections, we chose *Association strength* option as the method of normalization. *Minimum cluster size* was set as 5 to eliminate insignificant and uninteresting clusters (van Eck & Waltman, 2011).

The co-citation network mapping is shown in Figure 7. Documents were displayed by the first author and publication year. The larger size of label and bubble represents the higher weight of that item, while the shorter line represents the stronger connection of two documents. The documents belong to one cluster have the same color. Being in the same cluster represents that the two items are connected or they both have connection with other item(s).

There are six clusters containing 74 items (Figure 7). The cluster names in Table 13 were defined based on the majority or documents in that cluster.

Cluster Name	Representative Documents
C1: Measuring Key Dimensions of TQM	Ahire, Golhar, and Waller (1996); Saraph, Benson, and Schroeder (1989); Flynn, Schroeder, and Sakakibara (1994); Black and Porter (1996)
C2: TQM and Organizational Performance	Powell (1995); Samson and Terziovski (1999); Flynn, Schroeder, and Sakakibara (1995)
C3: Quality Gurus' Philosophies and TQM	Deming (1986); Crosby (1979); Feigenbaum (1983); Juran and Gryna (1993)
C4: TQM Practices	Samat, Ramayah, and Mat Saad (2006); Prajogo (2005); Sila

	and Ebrahimpour (2002)
C5: Data Analysis Methods	Hair, Black, Babin, Anderson, and Tatham (1995)
C6: Profile of Service Sectors	Zemke and Schaaf (1990)

Table 13 Co-citation Clusters and Representative Documents (Source: Own Elaboration)

Cluster 1: Measuring Key Dimensions of TQM

This cluster is at the centre of the map, which means that the included documents have the most connections with the ones in other clusters. With the aim of finding a valid and reliable way to measure the TQM implementation, the four representative documents all investigated on the key dimensions/CSFs of TQM and proposed the measurements for them. The citations of these documents are mainly from those articles with topic “evaluation of TQM implementation results”.

Cluster 2: TQM and Organizational Performance

The second cluster discussed the relationship between TQM and its influence on organizational performance, which provided references on effectiveness of TQM. The documents also indicated the predictors of organizational performance during TQM implementation. For example, Powell (1995) conclude that certain tacit such as organizational culture, employee empowerment, and top management commitment drive successful TQM implementation and generate competitive advantage. This cluster contributed to the casual relationship between TQM, quality performance and organizational performance at the perspective of strategic management.

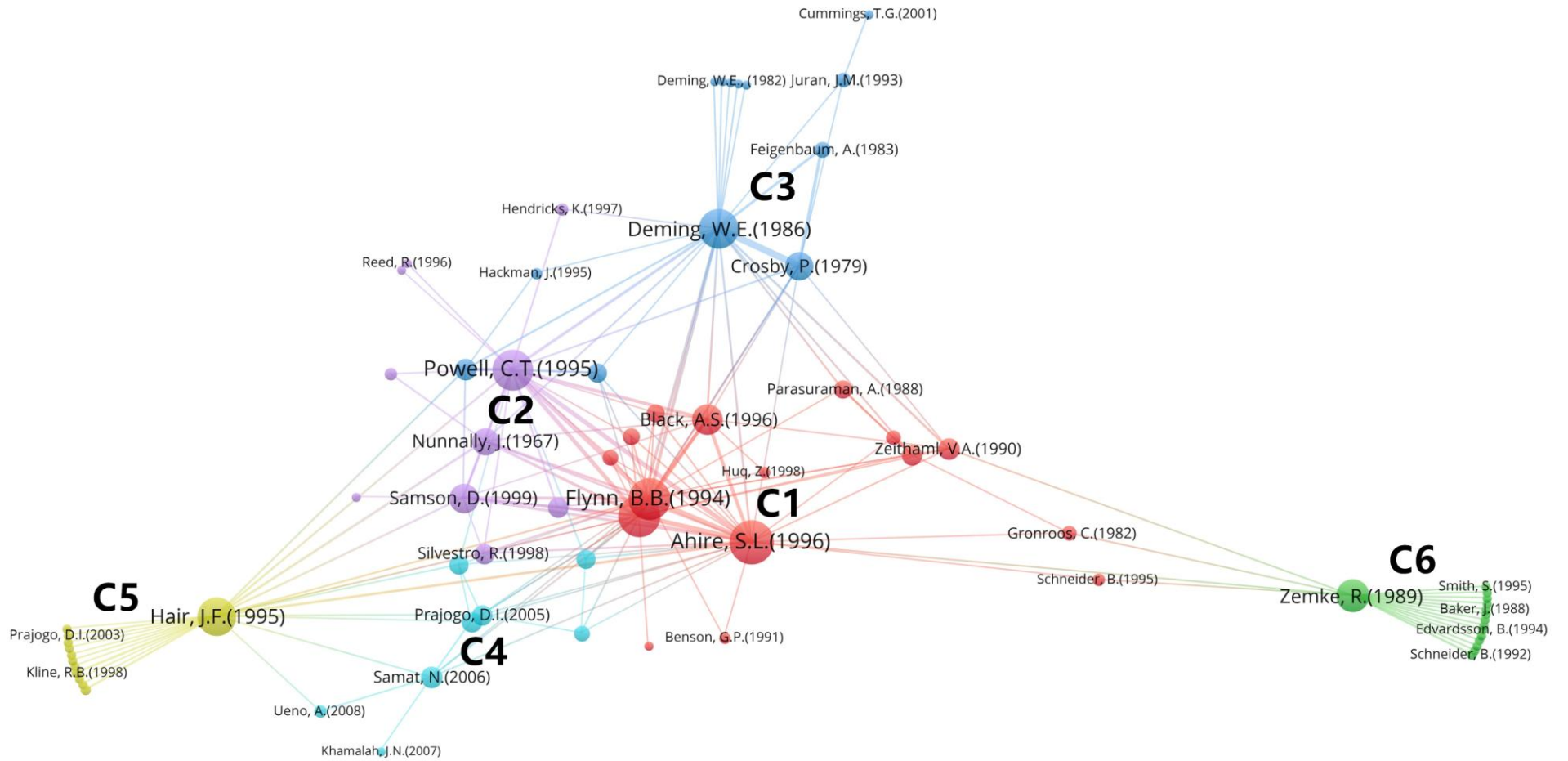


Figure 7 Visualized Co-citation Network (Source: Own Elaboration)

Cluster 3: Quality Gurus' Philosophies and TQM

The representative documents in this cluster are works from quality gurus, such as Deming, Crosby, Feigenbaum and Juran. Deming (1986) proposes a theory of quality management developed from his famous 14 Points for Management. Crosby (1979) teaches managers to avoid quality problem at each stage of production. Feigenbaum (1983) addresses company's quality development to ensure customer satisfaction. Juran and Gryna (1993) provide a comprehensive and balanced reflection on the impact of quality on all aspects of organizations.

Cluster 4: TQM Practices

This cluster investigated the applicability and effectiveness of certain TQM practices, such as employee empowerment, customer focus and continuous improvement (Samat et al., 2006). The empirical data of the major documents was all collected by surveys and interviews in service firms. These studies were commonly cited because they provide affirmation for the validity of TQM practices.

Cluster 5: Data Analysis Methods

The visualization of this cluster is different than the previous four. The book *Multivariate Data Analysis* written by Hair, J.F. (1995) is at the center with small bubbles scattered around it as satellites. The small bubbles are not connected with each other, but only with the centre. Hair's book taught multivariate data analysis and provided data analysis method for other literatures.

Cluster 6: Profile of Service Sectors

The map of this cluster is similar with the cluster 5. It is represented by Zemke and Schaaf's book (1990) which introduces the best service organizations and their management choices. The profiles of service leaders provide information for articles which analyzed TQM related topics in the range of service sectors.

The first four clusters are closely related to TQM. Cluster 1 and Cluster 2 aims at identifying the effectiveness of TQM implementation. Cluster 1 is answering the question of “What is key to TQM success?” and “How can organization know the degree it has achieved?” Cluster 2 is answering the question of “What is the impact of TQM implementation on organizational performance?” Cluster 3 is connecting quality philosophies with TQM. Cluster 4 is discussing the components of TQM implementation – the practices. There is no cluster focusing on the framework of TQM implementation, which is the gap in the research field. This result is consistent with Sila and Ebrahimpour (2003).

4.4 Co-word Network

Similar with co-citation analysis, the author also set a threshold of 5 times for co-occurrence of a pair of words, in order to see the most significant words in this research field. As shown in Figure 8 and Figure 9, the co-word network of 1990 to 2003 and 2004 to 2017 contains 35 items and 47 items respectively. The first map contains 4 clusters and the second map contains 5 clusters (Table 14 and 15). The clusters are named based on the representative words. The following results were concluded by analyzing the two networks and comparing them.

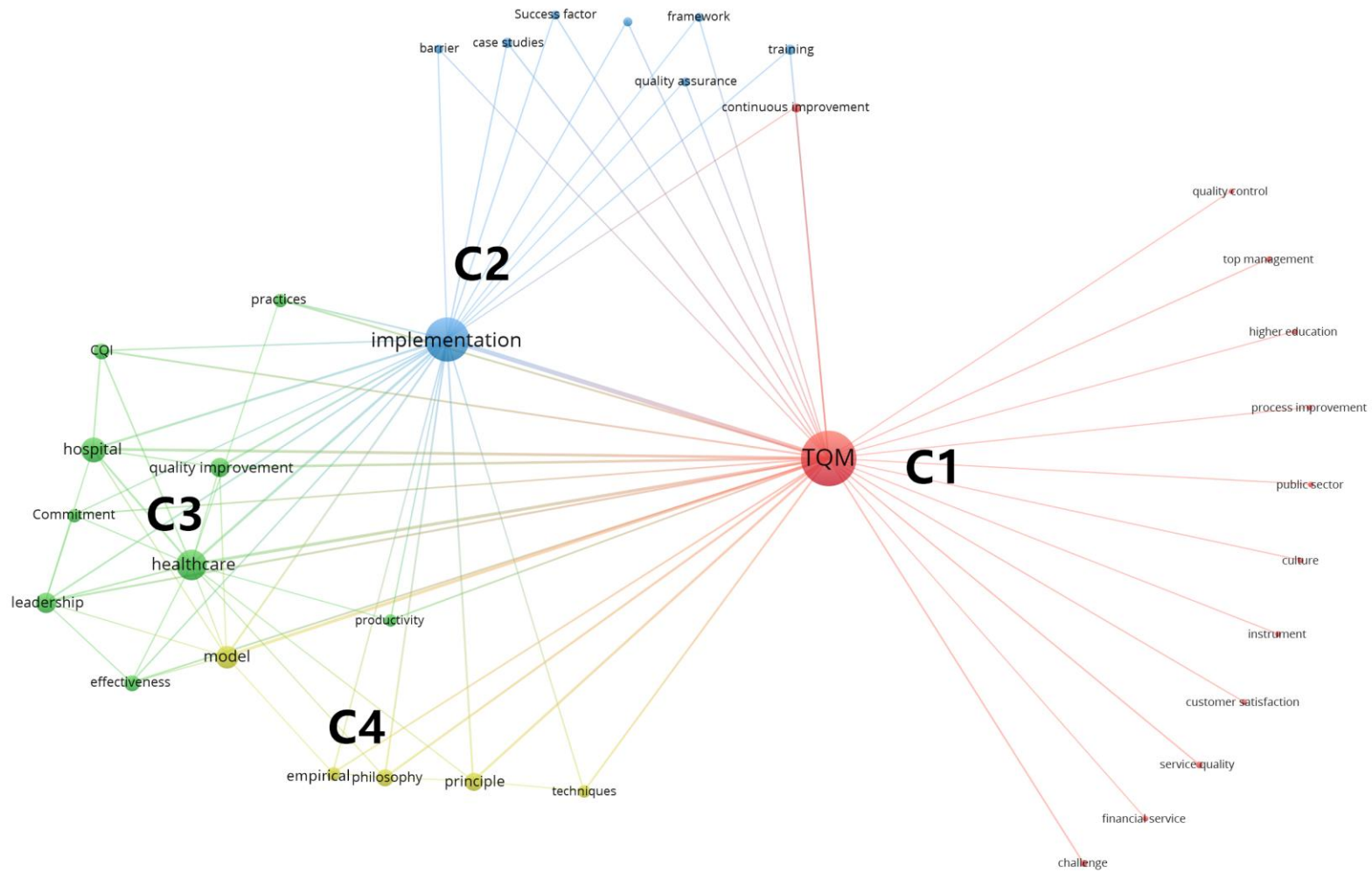


Figure 8 Visualized Co-word Network for Articles Published in 1990-2003 (Source: Own Elaboration)

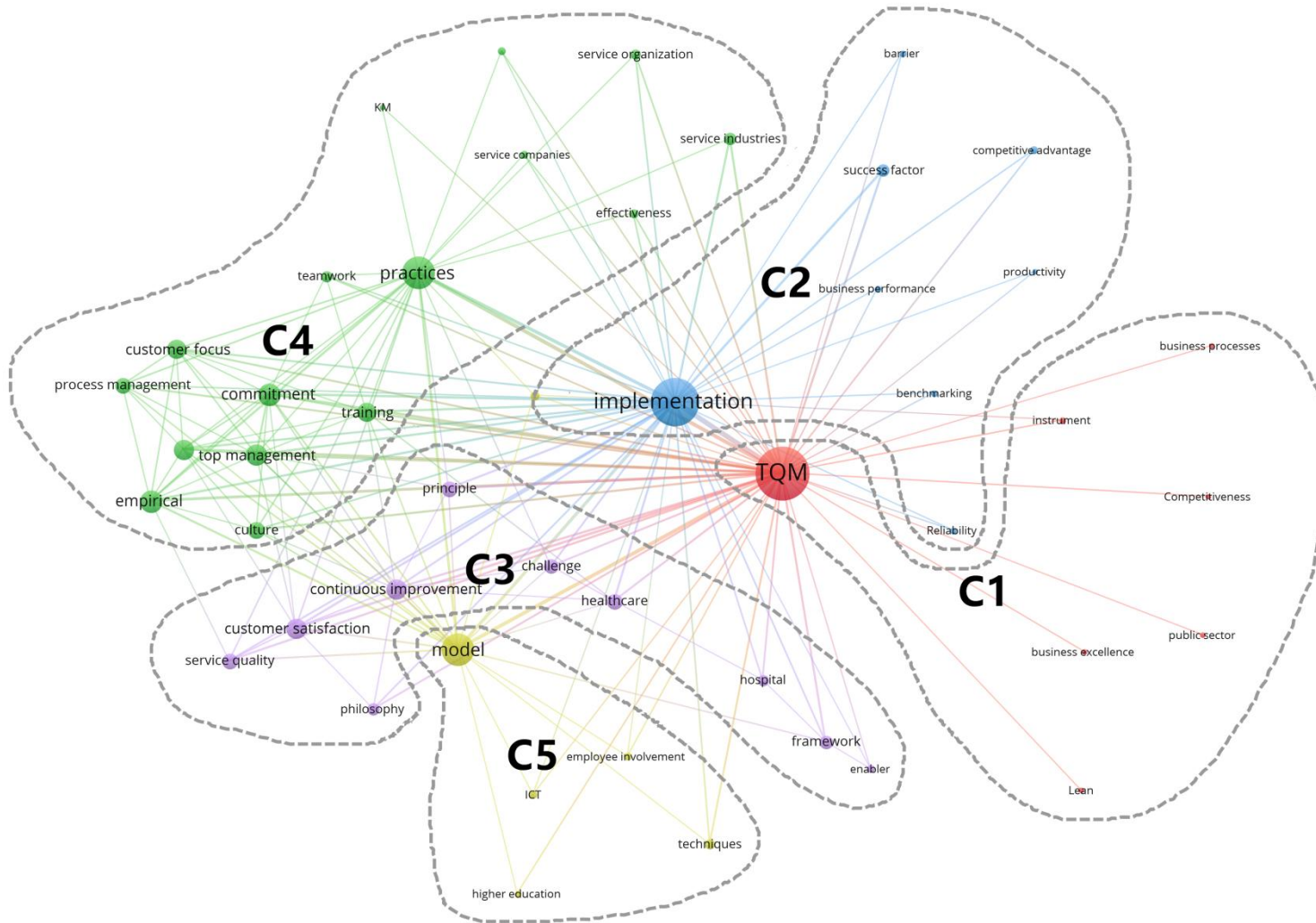


Figure 9 Visualized Co-word Network for Articles Published in 2004-2017 (Source: Own Elaboration)

4.4.1 Co-word Network of 1990 to 2003

“TQM” and “implementation” have the biggest bubble and are mapped at the center, and they represent the Cluster 1 and 2 respectively. The rest words in Cluster 1 only have connection with “TQM”. The words in Cluster 2, such as “barrier”, “case study”, “framework” and “success factor”, connect with “TQM” and “implementation” both. In Cluster 3, “healthcare” and “hospital” are the most obvious words in terms of industry, connecting with “model”, “leadership”, “commitment”, “effectiveness”, “quality improvement” and “productivity”. It is consistent with the previous result that healthcare is the most analyzed industry in “use of TQM in services”. The words in Cluster 4 are related to empirical adoption of TQM. “Principle” has strong relatedness with “philosophy” and “techniques”, indicating that they were usually studied simultaneously.

Cluster	No. of items	Representative Items
C1: TQM	13	TQM
C2: TQM Implementation	8	barrier, case studies, framework, implementation, success factor
C3: TQM in Healthcare	9	commitment, effectiveness, healthcare, hospital, leadership, practices, productivity, quality improvement
C4: Empirical Adoption	5	empirical, model, philosophy, principle, techniques

Table 14 Co-word Clusters and Representative Words, 1990-2003 (Source: Own Elaboration)

4.4.2 Co-word Network of 2004 to 2017

Similar with the previous sub-period, “TQM” (representative word of Cluster 1) and “implementation” are the most used words. In Cluster 2, the words with smaller bubbles, such as “success factor” and “business performance” do not have connection with each other, but they all connected with “TQM” and “implementation”. “Healthcare” and “hospital” in Cluster 3 are still representing the most notable researched industry. In Cluster 4, “practices” is connecting with “service companies”, “service industries” and “service organizations” at the one direction, and with “commitment”, “leadership”, “process management”, “customer focus” and “teamwork” at the other direction. Unlike the previous map, “principle” do not have connection with “techniques”, which shows that

the number of researches studied them together are decreasing thus the co-occurrence of them is below 5 times in this co-word study. Cluster 5 is mainly representative by “model”, which is an important topic in this field.

Cluster	No. of items	Items
C1: TQM	7	TQM
C2: TQM Implementation	8	barrier, business performance, competitive advantage, implementation, productivity, reliability, success factor
C3: TQM in Healthcare	10	challenge, continuous improvement, customer satisfaction, enabler, framework, healthcare, hospital, philosophy, principle, service quality
C4: TQM Practices	16	commitment, culture, customer focus, empirical, leadership, process management, teamwork, top management, training, practices
C5: TQM Model	6	model, structural equation model, techniques

Table 15 Co-word Clusters and Representative Words, 2004-2017 (Source: Own Elaboration)

4.4.3 Evolution in two sub-periods

To better trace the trend and changes of these words, the author separated the words according to their existence in the map and classified them into five categories: Research direction, Research industry, Research methodology, TQM dimension/practice and TQM outcome (Table 16). The classification was based on the understanding in the abstract analysis of the database.

Word Theme	Only in first map	In both maps	Only in second map
Research Direction	/	barrier, challenge, effectiveness, framework, instrument, model, philosophy, practices, principle, techniques, success factor	critical factor, CSF, enabler, reliability,
Research Industry	financial service	healthcare, higher education, hospital, public sector, service organization	ICT, service companies, service industries
Research Methodology	case studies	empirical	structural equation model
TQM Dimension /practice	CQI, quality assurance, quality control, quality improvement	commitment, continuous improvement, culture, leadership, process management, top management, training	benchmarking, customer focus, employee involvement, KM, Lean, teamwork

TQM Outcome	/	customer satisfaction, productivity, service quality	business excellence, business performance, competitive advantage, competitiveness, organizational performance
--------------------	---	--	---

Table 16 Co-word Evolution of “Use of TQM in Services” (Source: Own Elaboration)

First, the second sub-period contains 12 words more, and the connections between words are more complicated, as shown in the map. This indicates that the research field of “use of TQM in services” has been expanding over time. Moreover, the words that didn’t have connection (the co-occurrence was below 5 times) in the first sub-period were connected in the second sub-period. For example, “practices” and “model” established strong connection in the second sub-period, showing that researchers were using (TQM) practices to build (TQM) model or using (TQM) model to improving (TQM) practices.

Second, there are words appearing only in the map of first sub-period (the least co-occurrence times of the word and any other word was below 5). For example, “CQI” (continuous quality improvement), “quality assurance”, “quality control” and “process improvement” do not appear in the second map because their popularity in this research field has been decreasing over time. The word “case studies” only exist in the first map, indicating that the percentage of researches based on case study is decreasing. However, by comparing the co-occurrence data, the author found that the absence of “financial service” in the second map does not indicate that the researchers didn’t study it during 2004 to 2017, but because the highest number of co-occurrence of “financial service” and another word in 1990-2003 is 4, below the threshold of 5 times set by the author.; while highest number in 2004-2017 is 5, equal to the threshold.

Third, the words that appear in both maps have prominent meaning in the research field. They are popular research focus throughout history. It is notable that the bubble size of some words becomes bigger in the second sub-period, such as “practice”. “Top management”, “commitment”, “continuous improvement” and “training” are also in this trend. This is because on the one hand, the practices related to them were applied in the TQM implementation more than before thus they were discussed more when evaluating the TQM results, on the other hand, they were more emphasized by the academic world than before due to effectiveness of the practices. Consequently, the word “empirical” also

appears more frequently because of the increasing number of studies using empirical data to verify the effectiveness of TQM practices.

Among the words appearing on both sub-periods, the size of some bubbles shrinks, such as “healthcare” and “hospital”. It is because that there was a decreasing trend of interests studying TQM use in healthcare industry. The total number of publications in the first and second sub-periods didn’t decrease too much, counted as 137 and 131 respectively. However, according to abstract analysis, there are 85 articles investigating healthcare industry, among which 61 articles were published in the first sub-period and only 24 articles were published in the second sub-period.

Fourth, the words which only appear in the second sub-period suggest that they were not as prevalent in studies before 2004. “ICT” (information and computer technology) is one of the examples in terms of researched industry. The words related to TQM practices are “benchmarking”, “customer focus”, “employee involvement”, “lean” and “teamwork”, showing that the discussion of them were growing. The appearance of “KM” (knowledge management) indicates that researchers started to analyze the interaction effects between KM and TQM. The word “business performance”, “business excellence”, “competitive advantage” and “competitiveness” also gained more attention in the second sub-period. This is consistent with the abstract analysis. Among the 29 articles studying “relationship between TQM and overall performance”, only 4 of them were published in the first sub-period while the remaining 25 articles were published after 2004. The emergence of “structural equation model” indicates that more and more researchers are using it to propose TQM implementation model.

5. Conclusion

The practical application of TQM in service sectors is an important topic in the quality management field. It is worthy to conduct a bibliometric analysis based on the journal articles to identify the most salient themes, the trend, gaps and weakness in this research field. This Chapter contains a summary of main results of the study, a discussion of limitation and suggestions for future researches.

5.1 Main results of the Study

The bibliometric database contains 268 articles published between 1990 and 2017. They were extracted from SCOPUS and WoS. Regarding the chronological evolution, 1996 and 2011 are the two peaks in terms of publication quantity, while the rest years are in irregular fluctuation. However, the average publication quantity per ten years is stable, which indicates that the topic of “use of TQM in services” didn’t fade in the academic world.

39.2% of the articles focus on the developed areas and 20.8% of them investigate developing areas. The rest articles do not have a certain geographic research area. USA is the most studied country, followed by UK and India. The 1990s were boom years for researches on developed areas. In contrast, the studies on developing areas were most conducted after 2000.

Healthcare is the most researched industry but the interests in analyzing TQM implementation in the extent of healthcare is dropping.

Among the 149 journals in the database, *Total Quality Management & Business Excellence* ranks at the first in terms of number of published articles, and *International Journal of Production Research* is the journal with the highest prestige based on the rank of SJR indicator.

According to abstract analysis, the top three most salient topics are “evaluation of TQM implementation results in (an) industry(ies)”, “CSFs of TQM implementation” and “developing a model/framework for TQM implementation”. “Top management commitment/leadership” is one of the most critical dimensions in TQM implementation. But the difficulty of ensuring top management commitment is the biggest challenge for TQM success, which should be a highlighted point for TQM professionals and managers.

Co-citation analysis was conducted based on the 9474 records cited by the 268 articles. The analysis generates six clusters: C1-Measuring Key Dimensions of TQM, C2-TQM and Organizational Performance, C3-Quality Gurus' Philosophies and TQM, C4-TQM Practices, C5-Data Analysis Methods and C6-Profile of Service Sectors. There is not a cluster of TQM implementation frameworks, indicating that the researches on it is still under development, which is a gap in the conceptual structure.

Co-word analysis was performed for the period 1990-2003 and 2004-2017 separately, on the abstract of the 268 articles. The evolution shows that the researches in the second sub-period is growing and becoming more intensive. The words related to TQM practices are gaining more and more attention, for example, "continuous improvement" and "culture". The emerging practices are "benchmarking", "employee involvement", and "lean" etc. Consistent with abstract analysis, healthcare is the industry studied by most articles. The other important industries are higher education and public sectors.

5.2 Limitation

This study contains limitations. On the one hand, the chosen databases for bibliometric analysis only contain Scopus and WoS which do not include books. Thus, it is possible that the sample does not perfectly represent the whole picture of this research field. On the other hand, there are 6 articles excluded from the database since it is impossible to access the full text.

5.3 Suggestion for Future Researches

The future researches may choose other databases which include books and other type of documents. Moreover, it is also worthy to analyze the chronological evolution of each topic to identify the trends and developments of this research field. Investigation of TQM techniques or research nature (for example, empirical or not, quantitative or qualitative) can be other alternative directions for future studies.

References

- Ahire, S. L., Golhar, D. Y., & Waller, M. A. (1996). Development and validation of TQM implementation constructs. *Decision Sciences*, 27(1), 23-53.
- Aquilani, B., Silvestri, C., Ruggieri, A., & Gatti, C. (2017). A systematic literature review on total quality management critical success factors and the identification of new avenues of research. *TQM Journal*, 29(1), 184-213. doi:10.1108/TQM-01-2016-0003
- Berry, L. L. (1980). Services marketing is different. *Business*, 30(3), 24-29.
- Black, S. A., & Porter, L. J. (1996). Identification of the critical factors of TQM. *Decision Sciences*, 27(1), 1-21.
- Boaden, R. J. (1997). What is total quality management ... and does it matter? *Total Quality Management*, 8(4), 153-171. doi:10.1080/0954412979596
- Burton, F., Cross, A., & Chapman, M. (1999). *International business organization: subsidiary management, entry strategies and emerging markets*: Springer.
- Butler, D. (2008). Free journal-ranking tool enters citation market. *Nature*, 451(7174), 6. doi:10.1038/451006a
- Calabrese, A., & Corbò, M. (2015). Design and blueprinting for total quality management implementation in service organisations. *Total Quality Management and Business Excellence*, 26(7-8), 719-732. doi:10.1080/14783363.2014.881970
- Chang, P.-L., & Lu, K.-H. (1995). Current status of total quality management implementation in Taiwan companies. *The TQM Magazine*, 7(1), 14-19.
- Clarivate. (2018). InCites Journal Citation Reports Overview. Retrieved from <http://ipscience-help.thomsonreuters.com/incitesLiveJCR/overviewGroup/overviewJCR.html>
- ClarivateAnalytics. (2017). Web of Science. Retrieved from <https://clarivate.com/products/web-of-science>
- Cobo, M. J., López-Herrera, A. G., Herrera-Viedma, E., & Herrera, F. (2011). Science mapping software tools: Review, analysis, and cooperative study among tools. *Journal of the American Society for Information Science and Technology*, 62(7), 1382-1402. doi:10.1002/asi.21525
- Cowell, D. W. (1988). New service development. *Journal of Marketing Management*, 3(3), 296-312.
- Crosby, P. B. (1979). *Quality is free: The art of making quality certain*. McGraw-Hill, New York, NY.
- Cusumano, M. A., & Takeishi, A. (1991). Supplier relations and management: A survey of Japanese, Japanese-transplant, and US auto plants. *Strategic Management Journal*, 12(8), 563-588.
- Dale, B. G., Barber, K. D., Williams, R. T., & Van Der Wiele, T. (1997). Managing quality in manufacturing versus services: A comparative analysis. *Managing Service Quality: An International Journal*, 7(5), 242-247. doi:10.1108/09604529710172881
- Deming, W. E. (1986). *Out of the crisis*. Cambridge, MA: Cambridge University Press.
- Dooley, K. J., & Flor, R. F. (1998). Perceptions of success and failure in TQM initiatives. *Journal of Quality Management*, 3(2), 157-174.
- Ellram, L. M., Tate, W. L., & Billington, C. (2004). Understanding and managing the services supply chain. *Journal of Supply Chain Management*, 40(3), 17-32.
- Elsevier. (2017). About Scopus. Retrieved from <https://www.elsevier.com/solutions/scopus>

- Ennis, K., & Harrington, D. (1999). Quality management in Irish health care. *International Journal of Health Care Quality Assurance*, 12(6), 232-243.
- Evans, J. R., & Lindsay, W. M. (2013). *Managing for quality and performance excellence*: Cengage Learning.
- Faisal, T., Rahman, Z., & Azam, M. (2011). Best practices of total quality management implementation in health care settings. *Health Marketing Quarterly*, 28(3), 232-252. doi:10.1080/07359683.2011.595643
- Feigenbaum, A. V. (1983). *Total quality control*: McGraw-Hill, New York.
- Flynn, B. B., Schroeder, R. G., & Sakakibara, S. (1994). A framework for quality management research and an associated measurement instrument. *Journal of Operations Management*, 11(4), 339-366.
- Flynn, B. B., Schroeder, R. G., & Sakakibara, S. (1995). The impact of quality management practices on performance and competitive advantage. *Decision Sciences*, 26(5), 659-691.
- Gonzalez Aleu, F., & Van Aken, E. M. (2017). Continuous improvement projects: an authorship bibliometric analysis. *International Journal of Health Care Quality Assurance*, 30(5), 467-476. doi:10.1108/IJHCQA-07-2016-0105
- Hackman, J. R., & Wageman, R. (1995). Total quality management: Empirical, conceptual, and practical issues. *Administrative science quarterly*, 309-342.
- Hair, J. F., Black, W. C., Babin, B. J., Anderson, R. E., & Tatham, R. L. (1995). *Multivariate data analysis* (Vol. 5): Prentice hall Upper Saddle River, NJ.
- Hietschold, N., Reinhardt, R., & Gurtner, S. (2014). Measuring critical success factors of TQM implementation successfully—a systematic literature review. *International Journal of Production Research*, 52(21), 6254-6272. doi:10.1080/00207543.2014.918288
- Ho, S. K. (1997). Are ISO 9000 and TQM routes for logistics excellence? *Logistics Information Management*, 10(6), 275-283.
- Huq, Z., & Stolen, J. D. (1998). Total quality management contrasts in manufacturing and service industries. *International Journal of Quality & Reliability Management*, 15(2), 138-161. doi:10.1108/02656719810204757
- Juran, J. M., & Gryna, F. M. (1993). *Quality planning and analysis: from product development through use*: McGraw-Hill New York.
- Kaynak, H. (2003). The relationship between total quality management practices and their effects on firm performance. *Journal of Operations Management*, 21(4), 405-435. doi:10.1016/s0272-6963(03)00004-4
- Lam, S. Y., Lee, V. H., Ooi, K. B., & Lin, B. (2011). The relationship between TQM, learning orientation and market performance in service organisations: An empirical analysis. *Total Quality Management and Business Excellence*, 22(12), 1277-1297.
- Lizarelli, F. L., Bessi, N. C., Oprime, P. C., Do Amaral, R. M., & Chakraborti, S. (2016). A bibliometric analysis of 50 years of worldwide research on statistical process control. *Gestao e Producao*, 23(4), 853-870. doi:10.1590/0104-530X1649-15
- McCain, K. W. (1990). Mapping authors in intellectual space: A technical overview. *Journal of the American society for information science*, 41(6), 433.
- Meho, L. I., & Yang, K. (2007). Impact of data sources on citation counts and rankings of LIS faculty: Web of science versus scopus and google scholar. *Journal of the American Society for Information Science and Technology*, 58(13), 2105-2125. doi:10.1002/asi.20677
- Minkman, M., Ahaus, K., & Huijsman, R. (2007). Performance improvement based on integrated quality management models: What evidence do we have? A systematic literature review. *International Journal for Quality in Health Care*, 19(2), 90-104. doi:10.1093/intqhc/mzl071

- Mohrman, S. A., Tenkasi, R. V., Lawler, E. E., & Ledford, G. E., Jr. (1995). Total quality management: Practice and outcomes in the largest US firms. *Employee Relations*, 17(3), 26-41. doi:10.1108/01425459510086866
- Mosadeghrad, A. M. (2014). Essentials of total quality management: A meta-analysis. *International Journal of Health Care Quality Assurance*, 27(6), 544-558. doi:10.1108/IJHCQA-07-2013-0082
- Okubo, Y. (1997). Bibliometric indicators and analysis of research systems.
- Onkvisit, S., & Shaw, J. J. (1991). MARKETING THEORIES, MODELS AND GENERAL ISSUES: Is Services Marketing "Really" Different? *Journal of Professional Services Marketing*, 7(2), 3-17.
- Osareh, F. (1996). Bibliometrics, citation analysis and co-citation analysis: A review of literature I. *Libri*, 46(3), 149-158.
- Partlow, C. G. (1996). Human-resources practices of TQM hotels. *Cornell Hotel and Restaurant Administration Quarterly*, 37(5), 67-77. doi:10.1016/0010-8804(96)88977-4
- Plenert, G. (1996). Total Quality Management (TQM)—putting structure behind the philosophy. *International Business Review*, 5(1), 67-78.
- Powell, T. C. (1995). Total quality management as competitive advantage: a review and empirical study. *Strategic management journal*, 16(1), 15-37.
- Prajogo, D. I. (2005). The comparative analysis of TQM practices and quality performance between manufacturing and service firms. *International Journal of Service Industry Management*, 16(3), 217-228.
- Pritchard, A. (1969). Statistical bibliography or bibliometrics. *Journal of Documentation*, 25(4), 348-349.
- Rad, A. M. M. (2006). The impact of organizational culture on the successful implementation of total quality management. *TQM Magazine*, 18(6), 606-625. doi:10.1108/09544780610707101
- Sadikoglu, E., & Zehir, C. (2010). Investigating the effects of innovation and employee performance on the relationship between total quality management practices and firm performance: An empirical study of Turkish firms. *International Journal of Production Economics*, 127(1), 13-26. doi:10.1016/j.ijpe.2010.02.013
- Samat, N., Ramayah, T., & Mat Saad, N. (2006). TQM practices, service quality, and market orientation: Some empirical evidence from a developing country. *Management Research News*, 29(11), 713-728.
- Samson, D., & Terziovski, M. (1999). The relationship between total quality management practices and operational performance. *Journal of Operations Management*, 17(4), 393-409.
- Saraph, J. V., Benson, P. G., & Schroeder, R. G. (1989). An instrument for measuring the critical factors of quality management. *Decision Sciences*, 20(4), 810-829.
- Sashkin, M., & Kiser, K. J. (1993). *Putting total quality management to work: what TQM means, how to use it, & how to sustain it over the long run*. Berrett-Koehler Publishers.
- Schmenner, R. W. (1986). How can service businesses survive and prosper? *Sloan management review*, 27(3), 21-32.
- SCImago, n. d. SJR — SCImago Journal & Country Rank [Portal]. Retrieved from <http://www.scimagojr.com>
- Sebastianelli, R., & Tamimi, N. (2003). Understanding the obstacles to TQM success. *The Quality Management Journal*, 10(3), 45.
- Sengupta, K., Heiser, D. R., & Cook, L. S. (2006). Manufacturing and service supply chain performance: a comparative analysis. *Journal of Supply Chain Management*, 42(4), 4-15.

- Sila, I., & Ebrahimpour, M. (2002). An investigation of the total quality management survey based research published between 1989 and 2000: A literature review. *International Journal of Quality & Reliability Management*, 19(7), 902-970.
- Sila, I., & Ebrahimpour, M. (2003). Examination and comparison of the critical factors of total quality management (TQM) across countries. *International Journal of Production Research*, 41(2), 235-268. doi:10.1080/0020754021000022212
- Suarez, J. G. (1992). *Three Experts on Quality Management: Philip B. Crosby, W. Edwards Deming, Joseph M. Juran*. Retrieved from
- Talib, F., & Rahman, Z. (2015). Identification and prioritization of barriers to total quality management implementation in service industry: An analytic hierarchy process approach. *TQM Journal*, 27(5), 591-615. doi:10.1108/TQM-11-2013-0122
- Talib, F., Rahman, Z., & Azam, M. (2011). Best practices of total quality management implementation in health care settings. *Health marketing quarterly*, 28(3), 232-252. doi:10.1080/07359683.2011.595643
- Talib, F., Rahman, Z., & Qureshi, M. N. (2012). Total quality management in service sector: A literature review. *International Journal of Business Innovation and Research*, 6(3), 259-301. doi:10.1504/IJBIR.2012.046628
- Thelwall, M. (2008). Bibliometrics to webometrics. *Journal of Information Science*, 34(4), 605-621. doi:10.1177/0165551507087238
- Tranfield, D., Denyer, D., & Smart, P. (2003). Towards a Methodology for Developing Evidence-Informed Management Knowledge by Means of Systematic Review. *British Journal of Management*, 14(3), 207-222.
- van Eck, N. J., & Waltman, L. (2011). VOSviewer manual. *Manual for VOSviewer version 1.3*.
- Vasconcellos, J. A. (2003). *Quality assurance for the food industry: a practical approach*: CRC Press.
- Veiga, P., Mendes, L., & Lourenço, L. (2016). A retrospective view of statistical quality control research and identification of emerging trends: a bibliometric analysis. *Quality and Quantity*, 50(2), 673-692. doi:10.1007/s11135-015-0170-8
- WorldBank. (2017). Employment in services (% of total employment) (modeled ILO estimate). Retrieved from <https://data.worldbank.org/indicator/SL.SRV.EMPL.ZS>
- Yong, J., & Wilkinson, A. (2002). The long and winding road: The evolution of quality management. *Total Quality Management*, 13(1), 101-121. doi:10.1080/09544120120098591
- Zeithaml, V. A., Berry, L. L., & Parasuraman, A. (1996). The behavioral consequences of service quality. *The Journal of Marketing*, 31-46.
- Zeithaml, V. A., Parasuraman, A., & Berry, L. L. (1985). Problems and strategies in services marketing. *The Journal of Marketing*, 33-46.
- Zemke, R., & Schaaf, D. (1990). *The service edge: 101 companies that profit from customer care*. Plume Books.
- Zhou, M., Park, T., & Yi, J. (2009). Commonalities and differences between service and manufacturing supply chains: Combining operations management studies with supply chain management. *California Journal of Operations Management*, 7(1), 136.
- Zupic, I., & Cater, T. (2015). Bibliometric Methods in Management and Organization. *Organizational Research Methods*, 18(3), 429-472. doi:10.1177/1094428114562629

Appendix 1

Internship Report

In this report, the author will discuss her curricular internship at Li & Fung (Portugal) Lda.. It includes a description of internship objectives and the company profile, followed by the reflection of this work experience.

The Objectives of the Internship

The curricular internship was executed from March 2018 to June 2018, containing 600 working hours, at the branding department of Li & Fung (Portugal) Lda.. As an intern, the author's expectations were to (1) understand how the company and the department operate, (2) get training in the real business world and (3) improve the analytical ability of dealing with quantitative tasks.

Introduction of the Company

Li & Fung is a global supply chain & trading company headquartered in Hong Kong. It has more than 250 offices in 40 markets and employs over 25,000 people worldwide. Li & Fung creates customized, end-to-end supply chain and logistics solutions for brands and retailers. The clients are brands mainly from U.S. and Europe, department stores, hypermarkets, specialty stores, and e-commerce sites¹.

Li & Fung (Portugal) Lda. is a branch of the multinational corporate, located in Porto, Portugal. The product category includes apparel, home textiles, home furnishing and ceramics. The department of branding is responsible for licensed brands such as *Orla Kiely*, *Donna Wilson*, *Emily Bond* and *Hackett London*. On the one hand, the team needs to communicate with factories to track the production and quality; on the other hand, the

¹ Li & Fung Ltd. (2018) Creating the Supply Chain of the Future: Annual Report 2017

team is in close contact with the distributors and brand holders who license the brand to Li & Fung and purchase the finished goods from the company.

Job Description and Contribution

The internship was divided into two periods. In the first two months, the author worked with the front end sales team. The daily job included product catalogue management, order management and potential clients searching, etc. In order to get familiar with the business and products, the author started with the product catalogue management for four brands, *DaTerra*, *Donna Wilson*, *Emily Bond* and *Hackett London*. The task was to organize photos of hundreds of products and their code number. The master file of organized photos and code number could help the team to improve the efficiency when communicating with customers. The author also learned to use the internal system of Li & Fung to handle the orders, inputting data of new orders, calculating the percentage of margin and tracking the status and shipment situation of the previous orders. It required patience and carefulness to ensure every detail correct.

In order to expand the business, the sales team needed to develop new customers. It could be done in two ways, promoting other licensed brands to the current or previous customers or contacting new clients who would be potentially interested with the products. The author learned how to promote products to current customers by email. She also searched and selected a list of potential customers by analyzing if their business scope and business model was compatible with the company. Necessary information of potential customers was organized and transferred to sales & marketing people.

In the later two months, the author also worked with the back end sales team. The daily job included sales report analysis and daily inventory tracking. The author first analyzed the sales of 2017 and first quarter of 2018 of the whole branch to understand the business scale. The report was written based on sales by team, sales by brand and sales by quarter. The abnormal variations were highlighted and analyzed. Then she learned to do weekly sales analysis for different distributors in Microsoft Excel. By comparing the sales volume, commission amount and percentage of margin, the team could monitor the sales situation and identify the market changes in order to adjust the strategy better and in time.

Another important task was tracking the inventory at the distributors' warehouses. This is part of providing supply chain solutions to clients. The aim was to minimize the inventory at the safe bottom line and forecast the trend. Considering the recent sales, actual inventory and incoming shipment, the author identified the products whose weeks-cover of inventory was or would be soon less than the normal lead time. Then according to the projection of consuming speed of inventory, the team would communicate with the distributors and provide them suggestion of making new order in terms of time and quantity.

During work, the author developed the understanding of the importance of TQM in a sourcing-trading service company, especially on the dimension of "customer focus" and "supplier management". On the customer side, all the value-added activities are based on customer-focus metrics. To deliver satisfactory customized goods, the company need to understand customers' needs, design the wanted pattern, quote the right price and shorten the delivery cycles. On the supplier side, Li & Fung has a coordinated network with more than 15,000 suppliers to ensure it can always find the adequate supplier (Li & Fung, 2018). Also, as a coordinator involves in all parts of the supply chain, it can help the suppliers better manage the factories in terms of capacity, efficiency and quality. The joint development with suppliers will in return better address customer needs and improve customer satisfaction.

During the internship, the author improved the ability of handling multi-task and data analysis skills. Working in the company which acted as middleman between supplier and customer, she also had a better understanding of the supply chain. This educational experience in the dynamic organization would make the author more ready for the career.

Appendix 2

Author	Year	Title
Singh, R. Khanduja, D.	2010	Customer requirements grouping – a prerequisite for successful implementation of TQM in Technical Education
Cappell, E. Leggat, S.	1994	The implementation of theory-based nursing practice: laying the groundwork for total quality management within a nursing department
Boerstler, H. Foster, R. W. O'Connor, E. J. O'Brien, J. L. Shortell, S. M. Carman, J. M. Hughes, E. F. X.	1996	Implementation of total quality management: Conventional wisdom versus reality
Nwabueze, U.	2016	Organisational improvement: One hospital's experience of implementing TQM
Hoskins, E. J. Abdul al-Hamid Noor, F. Ghasib, S. H.	1994	Implementing TQM in a military hospital in Saudi Arabia
Cassidy, B. S.	1991	Total quality management: An implementation strategy for excellence in the medical record department
Al-Swidi, A. K. Mahmood, R.	2011	Fostering the performance of banks through total quality management (TQM) practices: A bank branches perspective
Alzahrani, A. I. Alzahrani, A. Alfarraj, O.	2016	An integrated model of technology and total quality management for public health sector organizations
Bayter, M. Oznacar, B.	2016	Total quality management in university libraries of Turkey
Bringelson, L. S. Basappa, L. S.	1998	TQM implementation strategies in hospitals: an empirical perspective
Burnett, L.	1993	Introduction of total quality management into a clinical chemistry laboratory
Camison, C.	1998	Total quality management and cultural change: a model of organizational development
Creps, L. B. Oxford, A. Vegoda, P. R.	1993	Performance improvement review: implementation of total quality in medical information services
Dwore, R. B. Murray, B. P. Parsons, R. J. Smith, P. M. Vorderer, L. H.	1995	Revenue enhancement through total quality management/continuous quality improvement (TQM/CQI) in outpatient coding and billing
Ghahramani, B.	2000	Total quality management applications in the healthcare industry: a systems engineering approach
Goldman, R. L.	1996	Customer service: Beyond TQM/CQI
Isouard, G.	1996	A TQM approach to test usage in AMI
Isouard, G.	1999	A quality management intervention to improve clinical laboratory use in acute myocardial infarction
McLaughlin, C. P. Kaluzny, A. D.	1997	Total quality management issues in managed care
Motwani, J. G. Harper, E. Subramanian, R.	1995	The need for implementing TQM in the healthcare industry: an empirical investigation
Pearson, J. M. Crosby, L. Orwig, R. A.	1996	A framework for the introduction of total quality management into the is department
Sahney, V. K. Warden, G. L.	1991	The quest for quality and productivity in health services
Standridge, C. R. Brown-Standridge, M. D.	1995	Combining total quality management and simulation with application to family therapy process design

- Tesfayohannes, M. Temtime, Z. T. Nyakudya, M. 2013 Towards customized TQM practices for SMEs in emerging African economies: Evidence from Botswana
- Townes, C. Petit, B. Young, B. 1995 Implementing total quality management in an academic surgery setting: lessons learned
- Weech-Maldonado, R. Zinn, J. S. Brannon, D. 1999 Managerial implications of corporate board involvement and perceived market competition for quality improvement in nursing homes
- White, S. 1994 Total quality management in the public sector--issues for implementation
- Bilen, C. 2010 Total quality management in higher education institutions: Challenges and future directions
- Filion, L. J. 1994 Visionary Systems Thinking (VST) as a Support to Creativity in the Quality Management (TQM) Process
- Emison, G. A. 2004 Pragmatism, adaptation, and total quality management: Philosophy and science in the service of managing continuous improvement
- Grol, R. 2000 Between evidence-based practice and total quality management: the implementation of cost-effective care
- Chung Woon, K. 2000 TQM implementation: Comparing Singapore's service and manufacturing leaders
- Knights, D. McCabe, D. 1999 Are there no limits to authority?: TQM and organizational power
- Smith, A. D. Offodile, O. F. 2008 Data collection automation and total quality management: case studies in the health-service industry
- Ajmal, Mian M. Tuomi, Ville Helo, Petri T. Sandhu, Maqsood Ahmad 2016 TQM practices in public sector: Case of Finnish healthcare organizations
- Ahmad, M. F. Nee, P. S. Nor, N. H. M. Wei, C. S. Hassan, M. F. Hamid, N. A. A. 2017 Total quality management practices in malaysia healthcare industry: A survey result
- Sakthivel, P. B. Raju, R. 2006 Conceptualizing total quality management in engineering education and developing a TQM educational excellence model
- Franco, G. Bisio, S. 1999 Total quality strategy in the formative process of the occupational physician
- El Masry, R. B. Hamido, R. Y. Hilaly, H. N. 2015 Assessing the implementation of TQM in the hospitality industry in Alexandria
- Silvestro, R. 2001 Towards a contingency theory of TQM in services: How implementation varies on the basis of volume and variety
- Smith, A. D. 2009 Leveraging concepts of Knowledge Management with Total Quality Management: Case studies in the service sector
- Al-Shdaifat, E. A. 2015 Implementation of total quality management in hospitals
- Shortell, S. M. O'Brien, J. L. Carman, J. M. Foster, R. W. Hughes, E. F. X. Boerstler, H. O'Connor, E. J. 1995 Assessing the Impact of Continuous Quality Improvement/Total Quality Management: Concept versus Implementation
- Issac, G. Rajendran, C. Anantharaman, R. N. 2004 A conceptual framework for Total Quality Management in software organizations
- Carmona-Marquez, Francisco J. Leal-Millan, Antonio G. Vazquez-Sanchez, Adolfo E. Leal-Rodriguez, Antonio L. Eldridge, Stephen 2016 TQM and business success Do all the TQM drivers have the same relevance? An empirical study in Spanish firms
- Talib, F. Rahman, Z. 2010 Critical success factors of TQM in service organizations: A proposed model

- Douglas, T. J. Fredendall, L. D.
Sakthivel, P. B. Rajendran, G. Raju, R.
Keys, P.
Dubois, Hans F. W.
Mahmutaj, L. R. Jusufi, G. Zylfijaj, K.
Grubi, A. K.
Talib, Faisal Rahman, Zillur Azam,
Mohammed
Yang, C. C.
Cheng Lim, P. Tang, N. K. H.
Swinehart, K. Smith, A. E.
Bou, J. C. Beltran, I.
Aly, N. Akpovi, J.
Lindberg, E. Rosenqvist, U.
Abu-Doleh, J. D.
Houston, K. L. Clute, C. Kille, R. Kimball,
M. Matthews, R.
Mitreva, E. Nikolov, E. Nikolova, B.
Ehigie, B. O. McAndrew, E. B.
Saravanan, R. Rao, K. S. P.
Aboyassin, N. A. Alnsour, M. Alkloub, M.
Singh, A. K. Sushil.
Kuo, T. Chang, T. J. Hung, K. C. Lin, M.
Y.
Ehigie, B. O. Akpan, R. C.
Fung, M.
Lam, S. Y. Lee, V. H. Ooi, K. B. Phusavat,
K.
Alolayyan, M. N. F. Ali, K. A. M. Idris, F.
Ibrehem, A. S.
Stock, G. N. McFadden, K. L. Gowen, C.
R., III.
Zakuan, N. M. Yusof, S. M.
- 2004 Evaluating the deming management model of total quality in services
2005 TQM implementation and students' satisfaction of academic performance
1998 The Betrayal of the Total Quality Movement in Western Management: Managed healthcare and Provider Stress
2002 The synergistic role TQM and reengineering could play in standardizing the European vaccination policy
2015 The role of quality management practices in improving the efficiency and effectiveness of financial services
2011 Best practices of total quality management implementation in healthcare settings
2003 The establishment of a TQM system for the healthcare industry
2000 The development of a model for total quality healthcare
2005 Internal supply chain performance measurement: a healthcare continuous improvement implementation
2005 Total quality management, high-commitment human resource strategy and firm performance: An empirical study
2001 Total quality management in California public higher education
2005 Implementing TQM in the healthcare service: A four-year following-up of production,organisational climate and staff wellbeing
2012 Human resource management and total quality management linkage - rhetoric and reality: Evidence from an empirical study
1994 TQM brings collaboration to patient transport process
2016 Application of Total Quality Management (TQM) in the Macedonian Railways Transport in the Republic of Macedonia
2005 Innovation, diffusion and adoption of total quality management (TQM)
2016 Development and validation of an instrument for measuring total quality service
2011 Achieving total quality management using knowledge management practices: A field study at the jordanian insurance sector
2013 Modeling enablers of TQM to improve airline performance
2009 Employees' perspective on the effectiveness of ISO 9000 certification: A total quality management framework
2005 Psycho-social factors influencing practice of total quality management in some Nigerian organizations
1998 A learning team approach for service organizations to achieve TQM and beat the competition
2012 A structural equation model of TQM, market orientation and service quality Evidence from a developing nation
2011 Advance mathematical model to study and analyse the effects of total quality management (TQM) and operational flexibility on hospital performance
2007 Organizational culture, critical success factors, and the reduction of hospital errors
2010 Proposed relationship of TQM and organisational performance using structured equation modelling

- Laosirihongthong, T. Shahrour, A. M. El-Kafafi, S. Qasrawi, B. T. Almahamid, S. M. Qasrawi, S. T. Yue, J.-W. Ooi, K.-B. Keong, C. C. Sabella, A. Kashou, R. Omran, O. Ehrmeyer, S. S. Laessig, R. H. Bosch, V. G. Enríquez, F. T. Goldschmidt, H. M. J. Brandslund, I. Vogt, W. Westgard, J. O. Voipio-Pulkki, L. M. Pequeriaux, N. De Bievre, P. Ehrmeyer, S. Libeer, J. C. Fields, D. Roman, P. M. Eiro, N. Y. Torres-Junior, A. S. Sila, I. Mitreva, E. Pancev, D. Gjorshevski, H. Filiposki, O. Metodijeski, D. Singh, G. Khin, E. W. S. Zolfaghari, F. Saravanan, R. Rao, K. S. P. Gorji, M. York, K. M. Miree, C. E. Yasin, M. M. Kunt, M. Alavi, J. Zimmerer, T. W. Agus, A. Witt, C. A. Muhlemann, A. P. Sureshchandar, G. S. Rajendran, C. Anantharaman, R. N. Sureshchandar, G. S. Rajendran, C. Anantharaman, R. N. Furterer, S. Elshennawy, A. K. Schatzberg, D. R.
- 2006 TQM models and their effectiveness in New Zealand water utilities services
- 2017 The impact of TQM practices and KM processes on organisational performance An empirical investigation
- 2011 The relationship between people-related total quality management (TQM) practices, job satisfaction and turnover intention: A literature review and proposed conceptual model
- 2014 Quality management practices and their relationship to organizational performance
- 1999 Point-of-care testing: Implementation and practice of cost-effective total quality management
- 2005 TQM and QFD: Exploiting a customer complaint management system
- 2001 The EFQM management model for TQM applied to laboratory medicine
- 2010 Total Quality Management and Performance in Substance Abuse Treatment Centers
- 2015 Comparative study: TQ and Lean Production ownership models in health services
- 2007 Examining the effects of contextual factors on TQM and performance through the lens of organizational theories: An empirical study
- 2017 The implementation of the Quality Costs Methodology in the Public Transport Enterprise in Macedonia
- 2010 Total Quality Management in the stock exchange: A case study
- 2007 The impact of total quality service age on quality and operational performance: An empirical study
- 2011 The Study of the Relationship between Total Quality Management and Service Quality Improvement Leading to an Optimal Model Presentation
- 2004 Causation or covariation: an empirical re-examination of the link between TQM and financial performance
- 2004 TQM practices in service organizations: An exploratory study into the implementation, outcome and effectiveness
- 2004 TQM as a focus for improving overall service performance and customer satisfaction: an empirical study on a public service sector in Malaysia
- 1994 The implementation of total quality management in tourism: some guidelines
- 2002 Management's perception of total quality service in the banking sector of a developing economy – a critical analysis
- 2001 A holistic model for total quality service
- 2005 Implementation of TQM and lean six sigma tools in local government: a framework and a case study
- 1993 Total quality management for maintenance process improvement

- Mitreva, E. Taskov, N. Srebrenkoska, V. Filiposki, O. Lazarevski, I. Malinovska, J. R. 2017 Analysis of the Current Conditions in the Macedonian Companies concerning the Quality of Products, Services and Processes
- Daghfous, A. Barkhi, R. 2009 The strategic management of information technology in UAE hotels: An exploratory study of TQM, SCM, and CRM implementations
- Withanachchi, N. Handa, Y. Karandagoda, K. K. W. Pathirage, P. P. Tennakoon, N. C. K. Pullaperuma, D. S. P. 2007 TQM emphasizing 5-S principles: A breakthrough for chronic managerial constraints at public hospitals in developing countries
- Pantouvakis, A. Karakasnaki, M. 2017 Role of the human talent in total quality management-performance relationship: an investigation in the transport sector
- Nwabueze, U. 2001 Chief executives – hear thyself: Leadership requirements for 5-S/TQM implementation in healthcare
- Chang, Hsin Hsin 2006 An empirical evaluation of performance measurement systems for total quality management
- Al-Assaf, A. F. Harris, L. A. Gentling, S. J. Curtis, K. Trimble, J. 1994 Total quality improvement according to hospital nursing executives
- Siddiqui, J. Rahman, Z. 2006 TQM for Information Systems: Are Indian organizations ready?
- Mitreva, E. Angelovski, G. Filiposki, O. Taskov, N. Gjorshevski, H. 2016 Optimization of Business processes in Airport Services Company in Macedonia using the TQM Philosophy
- Irfan, S. M. Kee, D. M. H. 2013 Critical success factors of TQM and its impact on increased service quality: A case from service sector of Pakistan
- Tomazevic, N. Seljak, J. Aristovnik, A. 2016 TQM in public administration organisations: an application of data envelopment analysis in the police service
- Psychogios, A. G. Wilkinson, A. Szamosi, L. T. 2009 Getting to the heart of the debate: TQM and middle manager autonomy
- Sadeh, E. Garkaz, M. 2015 Explaining the mediating role of service quality between quality management enablers and students' satisfaction in higher education institutes: the perception of managers
- Talib, F. Rahman, Z. Qureshi, M. N. 2011 Prioritising the practices of total quality management: An analytic hierarchy process analysis for the service industries
- Wang, H. 2006 From "user" to "customer": TQM in academic libraries?
- Mavi, R. K. Madanshekaf, S. Hafshejani, K. F. Gharakhani, D. 2012 Identifying and prioritization effective factors in TQM implementation using AHP and DEMATEL methods
- Khan, M. A. 2012 An Empirical Study of Barriers in Implementing Total Quality Management in Service Organizations in Pakistan
- Robson, A. Mitchell, E. 2007 CSR performance: Driven by TQM implementation, size, sector?
- Androniceanu, A. 2017 The three-dimensional approach of total quality management, an essential strategic option for business excellence
- Huq, Z. 2005 Managing change: A barrier to TQM implementation in service industries
- Franchet, Y. 2004 Introduction of TQM in Eurostat, a supranational statistical service
- Mosadeghrad, A. M. 2013 Obstacles to TQM success in healthcare systems
- Bouranta, N. Psomas, E. L. Pantouvakis, A. 2017 Identifying the critical determinants of TQM and their impact on company performance: Evidence from the hotel industry of Greece
- Psomas, E. Antony, J. 2017 Total quality management elements and results in higher education institutions The Greek case
- Talib, Faisal Rahman, Zillur Akhtar, Asif 2012 An instrument for measuring the key practices of total quality management in ICT industry: an empirical study in India

- Mosadeghrad, A. M.
Siddiqui, J. Rahman, Z.
Tam, C. M. Hui, M. Y. T.
Talib, F. Rahman, Z. Qureshi, M.
Al-Khalifa, K. N. Aspinwall, E. M.
Knezevic, M. Cerovic, S., Dzamic, V.
Radojevic, T.
Ooi, K.B.
Lam, S.Y. Lee, V.H. Ooi, K.B. Lin, B.
Moghaddam, G. G. Moballeghi, M.
Claver-Cortes, E. Pereira-Moliner, J. Tari,
J. J. Molina-Azorin, J. F.
Prajogo, D. I.
Kumar, V. Choisne, F. De Grosbois, D.
Kumar, U.
Baird, K. Hu, K. J. Reeve, R.
Au, G. Choi, I.
Benjamin, O. E. Regina, C. A. Sylvester, A.
O.
Camison, C.
Shahin, A. Dabestani, R.
Talib, F. Rahman, Z. Qureshi, M. N.
McDonald, I. Zairi, M. Ashari Idris, M.
Kini, R. B. Hobson, C. J.
Sila, I. Walczak, S.
Lawrence, M. Packwood, T.
Manolessos, Y. I. Prezerakos, G. N.
Meliones, A. Theologou, M. E.
Dinh Thai, H. Igel, B. Laosirihongthong,
T.
Suárez-Barraza, M. F. Ablanedo-Rosas, J.
H.
- 2014 Essentials of total quality management: A meta-analysis
2007 TQM principles' application on information systems for empirical goals: A study of Indian organizations
1996 Total quality management in a public transport organisation in Hong Kong
2011 Analysis of interaction among the barriers to total quality management implementation using interpretive structural modeling approach
2000 The development of total quality management in Qatar
2017 Total Quality Management Implementation and Guest Satisfaction in Hospitality
2014 TQM: A facilitator to enhance knowledge management? A structural analysis
2011 The relationship between TQM, learning orientation and market performance in service organisations: an empirical analysis
2008 Total quality management in library and information sectors
2008 TQM, managerial factors and performance in the Spanish hotel industry
2005 The comparative analysis of TQM practices and quality performance between manufacturing and service firms
2009 Impact of TQM on company's performance
2011 The relationships between organizational culture, total quality management practices and operational performance
1999 Facilitating implementation of total quality management through information technology
2006 Individual differences in TQM change compliance: A study of service organizations in Nigeria
1996 Total quality management in hospitality: An application of the EFQM model
2011 A feasibility study of the implementation of total quality management based on soft factor
2011 A study of total quality management and supply chain management practices
Sustaining and transferring excellence: A framework of best practice of TQM transformation based on winners of Baldrige and European Quality Awards
2002
2004 Making total quality initiatives successful in thailand—the motivation theory effect
2017 Universal versus contextual effects on TQM: a triangulation study using neural networks
1996 Adapting total quality management for general practice: Evaluation of a programme
2000 TQM-based approach to QoS management
2010 Total quality management (TQM) strategy and organisational characteristics: Evidence from a recent WTO member
2014 Total quality management principles: Implementation experience from Mexican organisations

- Pantouvakis, A. Psomas, E. 2016 Exploring total quality management applications under uncertainty: A research agenda for the shipping industry
- Rahimi, M. 1995 Merging Strategic Safety, Health and Environment into Quality Management
- Bruyere, S. M. Brown, D. S. Mank, D. M. 1997 Quality through equality: Total quality management applied to the implementation of Title I of the Americans with Disabilities Act of 1990
- Tuomi, V. Ajmal, M. M. Helo, P. T. 2013 Implementing TQM initiatives in public service organisations: Case of academic libraries
- Talib, F. Rahman, Z. Qureshi, M. N. 2011 Total quality management and service quality: An exploratory study of quality management practices and barriers in service industry
- Siddiqui, J. 2010 Studying the impact of total quality management in service industries
- Talib, F. Rahman, Z. 2014 TQM in the British National Health Service: Nine reasons for failure
- Nwabueze, U. 2011 TQM success factors in North Indian manufacturing and service industries
- Kumar, R. Garg, D. Garg, T. K. 2005 The importance of market orientation, learning orientation, and quality orientation capabilities in TQM: an example from Taiwanese software industry
- Wang, E. T. G. Wei, H. L. 2011 Total quality management (TQM) factors: An empirical study of Kwara State Government Hospitals
- Adeoti, J. O. 2005 Assessing the need of tqm in the banking sector of the northern cyprus
- Şafakli, O. 2003 Critical success factors of TQM: a select study of Indian organizations
- Wali, A. A. Deshmukh, S. G. Gupta, A. D. 2004 Implementing total quality management in the classroom by means of student satisfaction guarantees
- Lawrence, J. J. McCollough, M. A. 2010 Testing the criticality of HR-TQM factors in the Malaysian higher education context
- Ali, N. A. Mahat, F. Zairi, M. 2007 Implementation of TQM in China and organisation performance: An empirical investigation
- Yusuf, Y. Gunasekaran, A. Dan, G. 2017 The Impact of TQM Philosophy for the Improvement of Logistics Processes in the Supply Chain
- Zimon, D. 2010 A four-fold regional-specific approach to TQM: The case of South Eastern Europe
- Psychogios, A. G. 2000 TQM and business performance in the service sector: a Singapore study
- Brah, S. A. Wong, J. L. Rao, B. M. 1999 Gaining perspectives: The future of TQM in public sectors
- Sinha, M. N. 2012 A structural approach to intergrating total quality management and knowledge management with supply chain learning
- Loke, S. P. Downe, A. G. Sambasivan, M. Khalid, K. 2002 Critical success factors of TQM implementation in Hong Kong industries
- Antony, J. Leung, K. Knowles, G. Gosh, S. 2007 TQM in the Service Sector: A Survey of Small Businesses
- Khamalah, J. N. Lingaraj, B. P. 2017 A review of the quality evolution in various organisations
- Sreedharan, V. R. Raju, R. Srinivas, S. S. 2015 Role of total quality management in service innovations: An empirical study of Pakistan's financial services firms
- Arshad, A. M. Su, Q. 2011 The impact of TQM practices on learning organisation and customer orientation: a survey of small service organisations in Malaysia
- Ang, Y. S. Lee, V. H. Tan, B. I. Yee-Loong Chong, A. 2008 TQM in a virtual organisation: Issues and strategies
- Ahmed, N. U. Sharma, S. K. 1994 Quality 1st - A model for TQM implementation and planning
- Adams, M. L. 2016 Adopting total quality management to enhance service delivery in medical records: Exploring the case of the Korle-Bu Teaching Hospital in Ghana
- Adjei, E. Mensah, M.

- Ahire, S. L. 1997 Management science total quality management interfaces: An integrative framework
- Alkire, T. S. 1995 A total quality management approach to patient menu system development
- Aly, N. A. Mack, R. 1993 TQM implementation in hospitals
- Anderson, E. 1995 High tech v. high touch: A case study of TQM implementation in higher education
- Anderson, L. K. 1994 Total quality management approach improves medication replacement
- Ang, C. L. Davies, M. Finlay, P. N. 2001 An empirical study of the use of information technology to support total quality management
- Apsan, H. N. 1993 Applying tqm to environmental site assessments under the astm standard
- Arikian, V. L. 1991 Total quality management - applications to nursing service
- Arndt, M. Bigelow, B. 1995 The implementation of total quality management in hospitals - How good is the fit?
- Askarian, M. Heidarpoor, P. Assadian, O. 2010 A total quality management approach to healthcare waste management in Namazi Hospital, Iran
- Badiru, A. B. 1990 A systems approach to total quality management
- Badrick, T. Preston, A. 2001 Influences on the implementation of TQM in healthcare organizations: Professional bureaucracies, ownership and complexity
- Berman, E. M. 1995 Implementing TQM in state welfare agencies
- Calabrese, A. Corbo, M. 2015 Design and blueprinting for total quality management implementation in service organisations
- Chakravarty, A. Parmar, N. K. Ranyal, R. K. 2001 Total quality management / The new paradigm in healthcare management
- Chang, P. L. Lu, K. H. 1995 Current status of total quality management implementation in Taiwan companies
- Chong, Y. Y. Unklesbay, N. Dowdy, R. 2000 Clinical nutrition and foodservice personnel in teaching hospitals have different perceptions of total quality management performance
- Chowanec, G. D. 1996 The fall and rise of TQM at a public mental health hospital
- Coker, M. Sharp, J. Powell, H. Cinelli, P. 1997 Implementation of total quality management after reconfiguration of services on a general hospital unit
- French, M. Colley-Ogden Sr, T. 1995 Banking on people - TQM, service quality, and human-resources
- Cowling, A. Newman, K. 1993 Total quality management and servicing users through remote access technology
- DiMattia, E. A., Jr. 2000 Implementation of quality programmes in developing countries: a Fiji Islands case study
- Djerdjour, M. Patel, R. 1993 Introduction of total quality management (TQM) into an internal-medicine residency
- Ellrodt, A. G. 1994 Total quality management in the hospital setting
- Ernst, D. F. 1996 Putting the customer first: Total Quality and customer service at the British Library Document Supply Centre
- Filling, S. 1992 Utilizing a knowledge-based decision-support system as total quality management consultant
- Franz, L. S. Foster, S. T. 1995 Quality of service for people with learning disabilities
- Goddard, A. Ingham, R. Spackman, A. Williams, J. 2004 A digraph approach to TQM evaluation of an industry
- Grover, S. Agrawal, V. P. Khan, I. A.

- Hart, M. 1996 Improving the quality of NHS out-patient clinics: the applications and misapplications of TQM
- Ho, S. K. 1996 A TQM Model for Enabling Student Learning
- Ho, S. K. M. Cicmil, S. 1995 Total quality management transfer to small and medium industries in Malaysia by SIRIM
- Hsieh, A. T. Chou, C. H. Chen, C. M. 2002 Job standardization and service quality: a closer look at the application of total quality management to the public sector
- Hunter, M. E. Love, C. C. 1996 Total quality management and the reduction of inpatient violence and costs in a forensic psychiatric hospital
- Jaca, C. Psomas, E. 2015 Total quality management practices and performance outcomes in Spanish service companies
- Jakkala, L. Miraj, M. 2015 On the role of clinical total quality management in clinical research and healthcare
- Joss, R. 1994 Converging implementation strategies in commercial TQM initiatives: implications for the NHS
- Kaminski, G. Glorius, N. S. McGrath, M. S. Gibbons, M. Silbert, G. Weinstein, S. McGrath, M. S. Fleming, D. Reifenberger, J. 1992 Total quality management at Bethesda, Inc
- Kanji, G. K. 1996 Implementation and pitfalls of total quality management
- Kanji, G. K. Sa, P. M. E. 2003 Sustaining healthcare excellence through performance measurement
- Karthikeyan, G. Thenmozhi, M. 2000 TQM Practices in Travel Services -- A Case Study
- Khurshid, Z. 1997 The application of TQM in cataloguing
- Kim, P. S. Johnson, D. D. 1994 Implementing total quality management in the healthcare industry
- Klein, D., Motwani, J. Cole, B. 1998 Continuous quality improvement, total quality management, and reengineering: one hospital's continuous quality improvement journey
- Kralovec III, O. J. Huttner, C. A. Dixon, M. D. 1991 The application of total quality management concepts in a service-line cardiovascular program
- Kunst, P. Lemmink, J. 2000 Quality management and business performance in hospitals: A search for success parameters
- Lau, H. C. Idris, M. A. 2001 The soft foundation of the critical success factors on TQM implementation in Malaysia
- Locock, L. 2003 Healthcare redesign: meaning, origins and application
- Longbottom, D. Zairi, M. 1996 Total quality management in financial services: An empirical study of best practice
- Love, P. E. D. Gunasekaran, A. Li, H. 1998 Putting an engine into re-engineering: toward a process-oriented organisation
- Lu, E. Sohal, A. 1993 Success factors, weaknesses and myths concerning TQM implementation in Australia
- Mani, B. G. 1995 Old wine in new bottles tastes better - A case-study of TQM implementation in the IRS
- Mani, B. G. 1996 Measuring productivity in federal agencies: Does total quality management make a difference?
- Mani, T. P. Murugan, N. Rajendran, C. 2003 Classical approach to contemporary TQM: an integrated conceptual TQM model as perceived in Tamil classical literature
- Matta, K. Chen, H. G. Tama, J. 1998 The information requirements of total quality management
- Matthews, B. L. 1992 Case-study: The implementation of total quality management at the Charleston VA Medical Center's dental service
- Mersha, T. 1997 TQM implementation in LDCs: Driving and restraining forces

- Mezher, T. 2000 The transformation of Lebanese firms from ISO 9000 certified to TQM
- Miller, J. B. Milakovich, M. E. 1991 Improving access to healthcare through total quality management
- Montes, F. J. L. Jover, A. J. V. 2004 Total quality management, institutional isomorphism and performance: The case of financial services
- Morris, D. S. Haigh, R. H. 1996 Introducing total quality management into the Student Service Department of a college of further education in the UK
- Ngai, E. W. T. Cheng, T. C. E. 1997 Identifying potential barriers to total quality management using principal component analysis and correspondence analysis
- Parent, J. B. 1993 The Implementation of the Composite healthcare System into Total Quality Management in Military Medical Treatment Facilities
- Pattanayak, D. Koilakuntla, M. Punyatoya, P. 2017 Investigating the influence of TQM, service quality and market orientation on customer satisfaction and loyalty in the Indian banking sector
- Psomas, E. L. Jaca, C. 2016 The impact of total quality management on service company performance: evidence from Spain
- Quazi, H. A. Padibjo, S. R. 1997 A journey towards total quality management through ISO 9000 certification - a Singapore experience
- Ross, P. Clear, M. Dixon, K. Bartlett, M. Johnson, A. Wheldon, B. Hatcher, D. 1996 Total quality management practices in the NSW hospital system--an overview
- Sahney, S. 2016 Use of multiple methodologies for developing a customer-oriented model of total quality management in higher education
- San Miguel, E. Heras-Saizarbitoria, I. Jose Tari, J. 2016 TQM and market orientation in care home services
- Saunders, I. W. 1992 Total quality management in the hospitality industry
- Scheuermann, L. Zhu, Z. W. Scheuermann, S. B. 1997 TQM success efforts: use more quantitative or qualitative tools?
- Seetharaman, A. Sreenivasan, J. Boon, L. P. 2006 Critical success factors of total quality management
- Sila, I. Ebrahimpour, M. 2003 Examination and comparison of the critical factors of total quality management (TQM) across countries
- Sluyter, G. V. Barnette, J. E. 1995 Application of total quality management to mental-health: A benchmark case-study
- Sullivan-Taylor, B. Wilson, M. 1996 TQM implementation in New Zealand service organizations
- Sunder, V. M. 2016 Constructs of quality in higher education services
- Sureshchandar, G. S. Rajendran, C. Anantharaman, R. N. 2001 A conceptual model for total quality management in service organizations
- Sureshchandar, G. S. Rajendran, C. Anantharaman, R. N. 2002 The relationship between management's perception of total quality service and customer perceptions of service quality
- Sutha, A. I. Robert, S. J. 2016 A tqm approach to implementation of Handling and management of hospital waste in hospital
- Talib, F. Rahman, Z. 2015 Identification and prioritization of barriers to total quality management implementation in service industry: An analytic hierarchy process approach
- Tan, J. K. 1998 A model for achieving total quality-management information technology infrastructure within an integrated delivery system
- Tang, K. H. Zairi, M. 1998 Benchmarking quality implementation in a service context: A comparative analysis of financial services and institutions of higher education. Part I: Financial services sector

- Tang, K. H. Zairi, M. 1998 Benchmarking quality implementation in a service context: A comparative analysis of financial services and institutions of higher education: Part II
- Tang, K. H. Zairi, M. 1998 Benchmarking quality implementation in a service context: A comparative analysis of financial services and institutions of higher education. Part III
- Tena, A. B. E., Llusar, J. C. B. Puig, V. R. 2001 Measuring the relationship between total quality management and sustainable competitive advantage: A resource-based view
- Terziovski, M. Sohal, A. Samson, D. 1996 Best practice implementation of total quality management: Multiple cross-case analysis of manufacturing and service organizations
- Thomas, E. A. 2011 Implementation of occupational health service improvements through application of total quality management processes
- Warwood, S. Antony, J. 2003 A simple, semi-prescriptive self-assessment model for TQM
- Watkins, T. 1997 Total quality management in higher education: Myths and realities
- Weech-Maldonado, R. Zinn, J. E. Hamilton, R. D., 3rd. 2001 The performance impact of context in TQM implementation: the nursing facility industry
- Wild, R. H. Hope, B. 2003 DATQUAL: a prototype e-learning application to support quality management practices in service industries
- Wilshaw, G. Dale, B. G. 1996 Developing a continuous improvement philosophy in a marketing organisation: An examination of key events
- Yasin, M. M. Meacham, K. A. Alavi, J. 1998 The status of TQM in healthcare
- Younis, T. Bailey, S. J. Davidson, C. 1996 The application of total quality management to the public sector
- Zairi, M. Matthew, A. 1995 An evaluation of TQM in primary care: in search of best practice
- Zinn, J. S. Brannon, D. Weech, R. 1997 Quality Improvement in Nursing Care Facilities: Extent, Impetus, and Impact

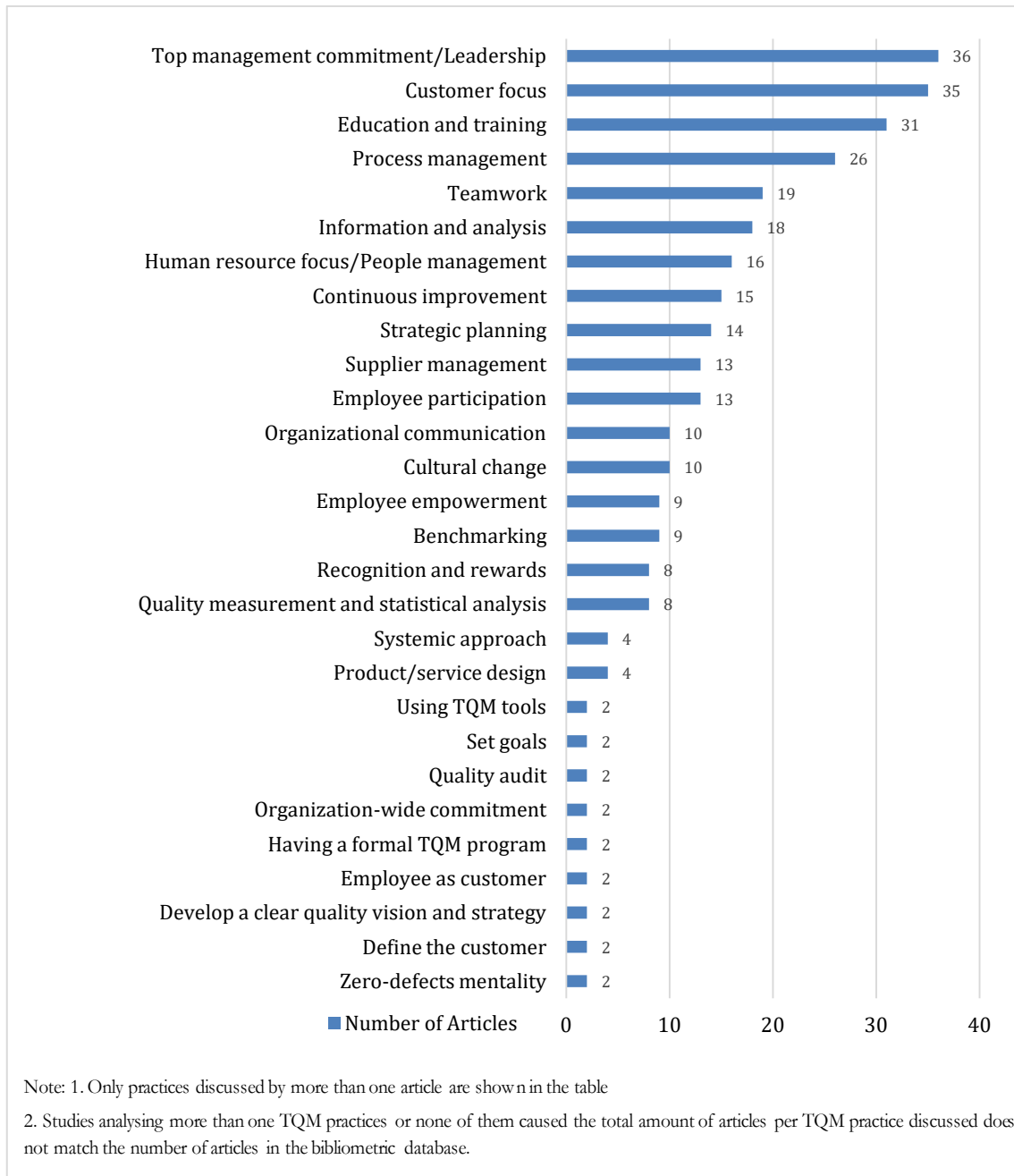
Appendix 3

Selected Words for Co-word Analysis

analytic hierarchy process	financial performance	process improvement
banking	financial service	process management
barrier	framework	productivity
benchmarking	healthcare (health care)	public sector
BPR (Business Process Reengineer)	HEI (Higher Education Institution)	quality assurance
business excellence	higher education	quality control
business performance	hospital	quality function deployment
business processes	hotel	quality improvement
case studies (case study)	HRM (Human resource management)	quality management systems
challenge	ICT (Information and Computer Technology)	quality systems
commitment	implementation	reliability
company performance	instrument	SCM
competitive advantage	ISO 9000	service companies
competitiveness	Kaizen	service industries
continuous improvement	KM (Knowledge Management)	service industry
CQI (continuous quality improvement)	leadership	service organization
critical factor	Lean	service quality
CRM (Customer Relationship Management)	learning orientation	Servqual
CSF (Critical Success Factor)	libraries	Six Sigma
culture	library management	statistics
customer focus	market orientation	structural equation modelling
customer satisfaction	methodology	success factor
developing countries	model	supply chain management
education	organizational change	teamwork
effectiveness	organizational development	techniques
empirical	organizational performance	top management
employee involvement	performance management	Total quality management
employee satisfaction	performance measurement	TQM (Total quality management)
empowerment	philosophy	TQS
enabler	practices	training
external customer	principle	waste management

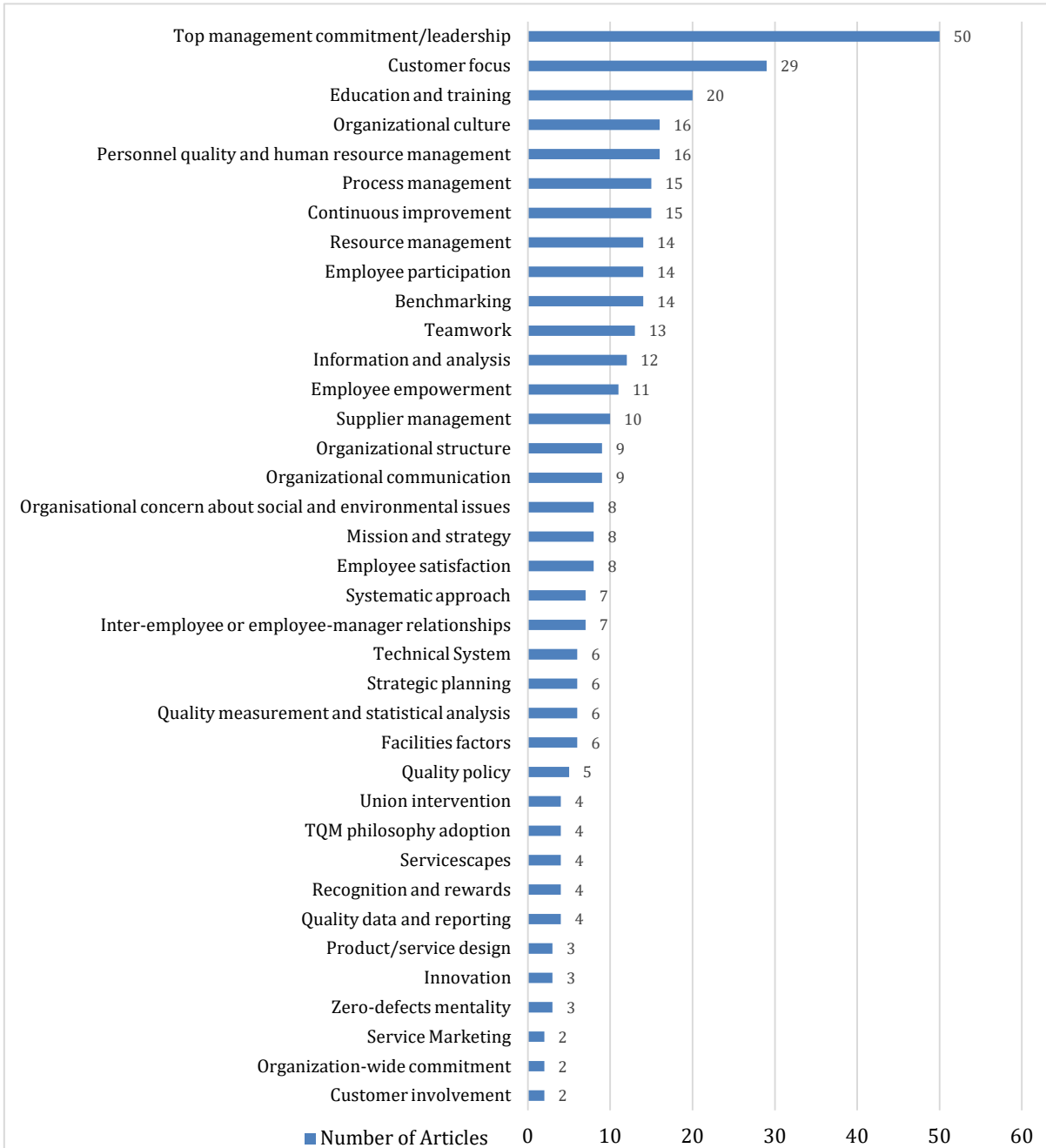
Appendix 4

Number of Articles per TQM Practice Discussed (Source: Own Elaboration)



Appendix 5

Number of Articles per CSF of TQM Implementation Discussed (Source: Own Elaboration)



Note: 1. Only KSFs discussed by more than one article are shown in the table

2. Studies analysing more than one KSFs or none of them caused the total amount of articles per KSF of TQM implementation discussed does not match the number of articles in the bibliometric database.