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The Relationship Between Quality Management and Marketing – Study of the Current Situation

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Abstract

Theoretical background: This paper considers the interdisciplinarity of quality science. In the first part of the work, a set of important disciplines supporting qualitative research was defined, focussing on management science and marketing. It is noticed that the studies have been conducted to examine the relationships among quality management and marketing performance. However, the literature is short of studies relating to the ordering, classification and categorization of current research results, which integrates the concepts of Total Quality Management (TQM) with the basics of marketing management.
Purpose of the article: The study used the method of systematic literature review in order to recognize the relationship between the selected area of quality science, i.e. quality management, and the selected discipline supporting quality science, i.e. marketing management.
Research methods: A four-stage research process was applied, defining the purpose of the research as the ordering (classification) of the research, in which the issues of TQM and marketing management were referred to. A collection of literature (n = 1,649) was selected using the Web of Science database. Bibliometric analysis was used, indicating the distribution of the number of publications and the analysis of

the number of citations. Content related analysis referring to the recognition of occurrences, here working with keywords, was conducted.
Main findings: As a result, four clusters were distinguished and taking into account the significance expressed in terms of the number of repetitions of individual words in a given cluster, four thematic areas of research were specified in which the integration of knowledge in the field of marketing with quality management is visible, i.e. (1) customer driven quality management, (2) the quality of design, (3) quality of conformance, and (4) the cost of quality management. The last part of the paper focuses on significant changes in the quality management strategy related to the ongoing Fourth Industrial Revolution and the importance of managing quality in a global, interdisciplinary approach.

Introduction

In Polish literature of the subject, the concept of introducing an interdisciplinary domain of knowledge dealing with any issues regarding quality, called *qualitology*, is being developed (Kolman, 1973, 2009). Qualitology is interpreted as quality science on the basis of the existing achievements of sciences and knowledge derived from practice – the theory of a specific concept, i.e. the theory of quality, the general subject of which is the nature of objects (Borys, 1984, p. 17). There are several concepts of shaping quality science and the diverse approaches to the most important tasks of qualitology and the general subject of research and specific research objectives as well as the concepts of the division of science on quality (Azgaldov & Kostin, 2011; Azgaldov et al., 2018; Borys, 1984; Kolman, 1973, 2009; Mantura, 2020). Referring to the current state of the development of quality science indicates the dominance of pragmatism and disproportionate utilitarianism in the quality science development process. Thus, in this paper the reference is made to the list of specific research objectives of science of quality include, referred to Borys (2012), among others: (1) Semantic, methodological and historical issues of quality knowledge, including the definition of laws, principles and research objectives; (2) The theory of qualitative features; (3) Issues of recognizing the nature of objects, ordering, classification and categorization of objects due to the similarity of their nature, including the problems of qualitative homogeneity, gradation of the significance of features and determining quality (this is the purpose of non-hierarchical qualitative research); (4) Qualitative comparative issues (comparative and axiological, evaluative) related to the hierarchical ordering, classification and categorization of objects and their sets; (5) Informative, prognostic and systemic problems of quality theory and issues of controlling qualitative changes. The general subject of qualitative research is the qualitative nature of objects, and the scope and subject of qualitative research covering all reality with all its components. In this paper the issue related to systematic problems of quality are considered, i.e. the complex problems whose solution requires knowledge from various areas beyond the field of quality management. Therefore, the subject of interest considered in this work is the place of quality theory in the system of scientific disciplines. Assuming that the nature of objects is the general subject of qualitology, the following list of specified

disciplines, indicating their contribution to the development of the theory of quality, are included (see: Kolman, 2009; Mantura, 2020): (1) Mathematics (providing methods for formalizing, transforming and mathematical modelling in qualitology); (2) Theory and engineering of systems (enabling systemic recognition of the quality of objects and their surroundings); (3) Sociology (research into the quality of life of various social groups and sociological quality criteria); (4) Psychology (enabling the recognition of systems of needs, preferences, requirements, goals, behaviours and motivations of a person in connection with the quality of the surrounding reality); (5) Metrology (supporting qualitology in the scope of quantitative determination of quality, in particular quantitative determination of the characteristics of objects and requirements of entities); (6) Information theory (principles of optimal information flow in quality management systems and IT quality criteria); (7) Technical sciences (ensuring field specificity in operating the quality of technical objects); (8) Marketing (enabling market consideration of quality); (9) Organization and management sciences (scientific principles of organization of quality systems and management of these systems). The above summary indicates the potential for the development of a specific area of quality theory by creating interdisciplinary research teams. The aim of this work is to study and identify the relationship between: Organization and management sciences (referring to the concept of Total Quality Management, TQM) and marketing management (particularly referring to the analysis of current and significant publications related to considerations on problems, directions of development and the future of marketing).

Literature review

The American Society for Quality includes marketing functions within the creation of Customer Experience (CX). The CX is defined as the short- and long-term interactions and relationship between a company and its customers (ASQ, 2024). It is indicated that the customer experience journey can include how a customer interacts with a company's employees, facilities, and marketing, in both the real and digital worlds. Another association to marketing is indicated when the common voice of the customer (VOC) is analysed. Here, the branches of well-known marketing research methods are applied, e.g. surveys and focus groups for validating what an organization already presumes to know about customer needs. A number of studies have been conducted to further examine the relationships among quality management and marketing, considering issues such as, e.g.: (1) customer, consumer and user involvement in product quality development, i.e. seven different methods for customer involvement in product development (Kaulio, 1998; Kahraman et al., 2006; Franco et al., 2020); (2) relation between quality orientation, market orientation, and organizational performance, analysing whether quality management and marketing are complementary business approaches in organizations and, if so, the extent of

their performance impact (Lai & Cheng, 2005; Ali et al., 2020); (3) impact of quality management, particularly TQM on operating performance, based on empirical evidence from firms that have won quality awards (Forza & Filippini, 1998; Zhang et al., 2022); (4) the relevance of quality strategies in a highly competitive environment, i.e. the impact of intensity of market competition on the relationship between the use of TQM practices and organizational performance, especially, the TQM practices of customer focus, product design (Chong & Rundus, 2004; Gajewska et al., 2020); (5) the impact of quality practices, including also quality conformance, on customer satisfaction and business result (Hendricks & Singhal, 1997; Nilsson et al., 2001); (6) the investigation how key internal quality practices of product versus service organizations (employee management, process orientation, and customer orientation) influence customer satisfaction and business results (Mongeon & Paul-Hus, 2015).

However, the literature is short of studies relating to the ordering, classification and categorization of current research results, which integrates the concepts of TQM with the basics of marketing management.

Research methods

To achieve the formulated goal of research, i.e. to recognize the relationship between the selected area of quality science, i.e. quality management, and the selected discipline supporting quality science, i.e. marketing management, a systematic literature review (SLR) procedure was used (van Dinter et al., 2021). Four phases of research activities were specified (Czakon, 2011, 2016):

1. Determining the purpose of the study, i.e. ordering (classification) research that refers to the issues of TQM and marketing management.

2. Identifying primary literature using the Web of Science database; selection of publications by using a set of keywords appearing in the title of the work, abstract or in keywords specified by the authors; developing a database of publications, i.e. the so-called "database clean up".

3. Bibliometric analysis, i.e. analysis of the number of publications in subsequent years; Content analysis, i.e. occurrences study, here working with keywords. The VOSviewer software tool for constructing and visualizing bibliometric networks was applied. The occurrences attribute indicates the number of documents in which a keyword occurs (van Eck & Waltman, 2010).

4. Development of a report.

In the first stage of the research work, an analysis of current and significant publications related to considerations on problems, directions of development and the future of marketing was carried out (Syam & Sharma, 2018; Davenport, 2020; Dwivedi et al., 2021; Huang & Rust, 2021; Saura, 2021; Ameen et al., 2022). As the result of the above-mentioned analysis of the current state of new technologies (in particular, Data Science, Machine Learning and Artificial Intelligence) application

in the field of marketing management, the list of search terms was selected. At the next stage of the research, a set of key-words identifying critical factors of TQM was defined (Black & Porter, 1996). The results of the above research activities, i.e. the set of Search terms used at the publication selection stage, are summarized in Table 1.

Table 1. Search terms used at the publication selection stage

Search terms related to marketing management
"Digital Marketing" OR "Online Marketing*" OR "Internet Marketing*" OR "Advertise*" OR "Sale*" OR "Search Engine Marketing" OR "Programming Advertising" OR "Social Media Marketing" OR "Digital Content Marketing" OR "Customers' Preferences*" OR "Customer Online Behavior*" OR "Customer's Online Experience" OR "User Behavior" OR "User Experience" OR "Marketing Research" OR "Customer Understanding" OR "Market* Strategy" OR "Market Segmentation" OR "Customer Needs" OR "Customer Wants" OR "Personalize Product" OR "Customer Preferences" OR "Customer Emotional Needs" OR "Communication with Customers" OR "Customer Preferences" OR "Customer Reactions" OR "New Product Design"
Search terms related to TQM
"TQM" OR "Total Quality Management" OR "Quality management" OR "Quality planning" OR "Quality control" OR "Quality improvement" OR "Quality assurance" OR "ISO 9001:2015" OR "Quality of design" OR "Quality of conformance" OR "Quality of use" OR "Quality policies" OR "Quality enhancement" OR "Market-Driven Quality"

Source: Author's own study based on (Black & Porter, 1996; Syam & Sharma, 2018; Davenport, 2020; Huang & Rust, 2021; Saura, 2021; Ameen et al., 2022).

This study took into account articles published and indexed in Web of Science data-base. The search terms were searched for in the Title, Abstract and Keywords. As a result, n = 1,745 publications were identified. In the next stage, the so-called database cleaning was carried out, consisting in the application of the exclusion and deletion criteria of publications classified into groups, i.e. Book Review, News Item, Meeting Abstract, Retracted Publication. In addition, a collection of works written only in English has been identified. Therefore, in further analysis n = 1,649 publications are taken into account.

Results

The VOSviewer, visualizing scientific software, was applied for scientometric analysis. This method is based on mathematical and statistical bibliometric analysis (Mongeon & Paul-Hus, 2015). The main premise of this type of analysis is the use of content and data contained in publications (Diodato & Gellaty, 2013). Figure 1 shows the distribution of the number of publications and the analysis of the number of citations. This allows us to assess the changing size of the collection of publications and its importance on the map of science. The analysis of publications in the following years allows to assess the stage of development of a given research area. Assuming that the number of publications is subject to lifecycle regularities: after birth there is a slow growth that accelerates, then stabilizes at a given level to finally decrease.

Referring to the results obtained, it can be noted that the research area in the scope of research activities in which the concepts of quality management and marketing management are integrated is still in the end of the second phase of growth. This means that the first results of research in this area have already been implemented and their results constitute a prerequisite for further research work. The analysis of the number of citations reflects, relatively to the number of publications, the significant impact of the obtained results, measured by the number of works that use them.

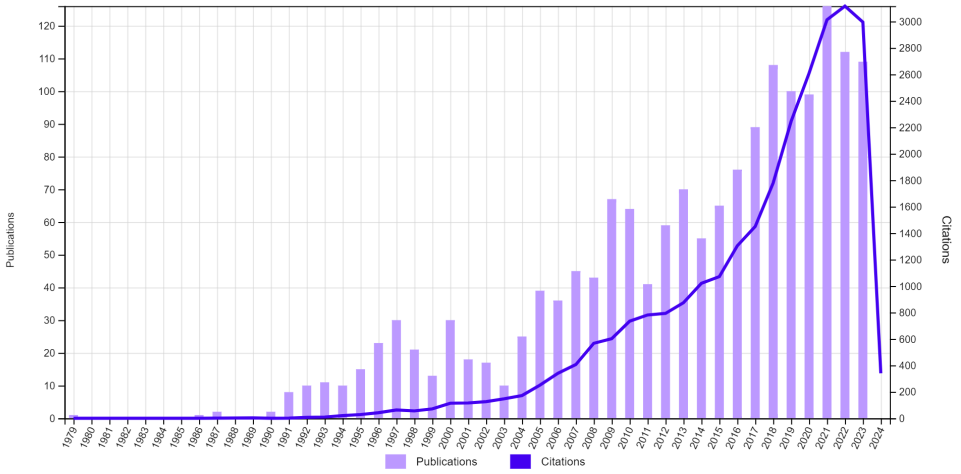

Figure 1. Analysis of the number of publications and citations over the years

Source: (Web of Science, Citation Report).

At the next stage, the analysis of content, to get an overview on the topics discussed in the publications, was conducted. The term co-occurrence analysis based on text data was conducted with the application of VOSviewer software. The minimum number of occurrences of term was defined as 12. For each of the 704 terms identified by the software algorithm, a relevance score was calculated. Based on this score, the most relevant terms were selected. The default choice was to select the 60% most relevant terms, which was equal to 422 terms. The resulting term map is presented in Figure 2. Each circle represents the term form, the title or abstract of the publications in selected dataset. The terms are located based on the co-occurrence in the Titles and Abstracts. The higher the number of co-occurrences of the two terms, the closer they are located in the map.

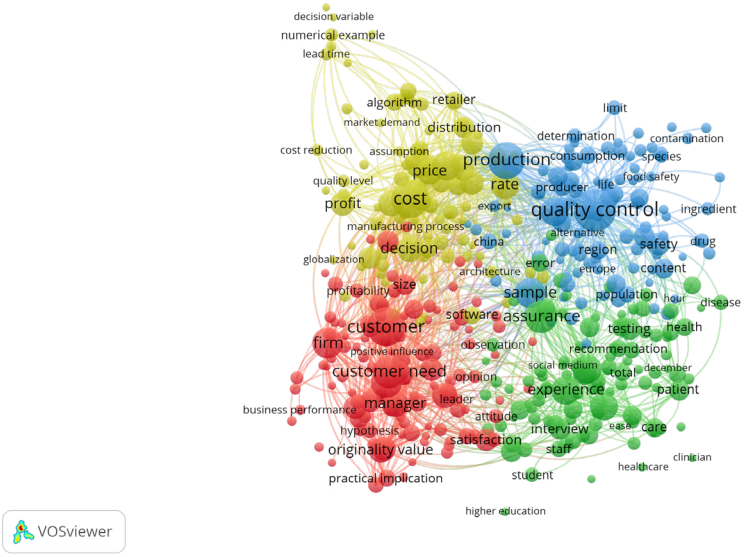

Figure 2. Map of four clusters of the keywords related to the domain

Source: Author's own study with an application of VOSviewer software.

Based on the results of the analysis, four clusters were distinguished. Taking into ac-count the significance expressed in terms of the number of repetitions of individual words (n_i) in a given cluster, four thematic areas of research defining the relationship between quality management and marketing management were specified, i.e.:

Cluster I. The area of **customer driven quality management**, expressed by such a cluster of keywords as: {n_1 – Customer, 274; n_2 – Customer need, 196; n_3 – Relationship, 177; n_4 – Firm, 171; n_5 – Manager, 124; n_6 – Literature, 119; n_7 – Originality value, 108; n_8 – Design methodology approach, 102; n_9 – Customer satisfaction, 101; n_{10} – Implication, 94; …; n_{117} – Latter, 12}.

Cluster II. The area of research referring to **the quality of design** (the excellence of design), expressed by such a cluster of keywords as: {n_1 – Occurrence, 190; n_2 – Experience, 147; n_3 – User, 146; n_4 – User experience, 143; n_5 – Evidence, 101; n_6 – Testing, 89; n_7 – Interview, 81; n_8 – Questionnaire, 81; n_9 – Person, 72; n_{10} – Communication, 69; …; n_{108} – System review, 12}.

Cluster III. The area of research referring to **quality of conformance** expressed by such a cluster of keywords as: {n_1 – Amount, 69; n_2 – Chain, 73; n_3 – Concern, 68; n_4 – Consumer, 151; n_5 – Content, 74; n_6 – Production, 240; n_7 – Quality Control, 321; n_8 – Regulation, 84; n_9 – Safety, 96; n_{10} – Sample, 163; …; n_{101} – Conjunction, 12}.

Cluster IV. The area of research referring to **cost of quality**, expressed by such a cluster of keywords as: {n_1 – Cost, 261; n_2 – Decision, 125; n_3 – Demand, 151; n_4 – Distribution, 83; n_5 – Function, 124; n_6 – Investment, 82; n_7 – Manufacturing, 86; n_8 – Manufacturer, 111; n_9 – Parameter, 90; n_{10} – Policy, 107, …; n_{96} – Quality Characteristic, 13}.

Referring to the results of research conducted at the first stage of the research process, i.e. an analysis of current and significant publications related to considerations on problems, directions of development and the future of marketing it is indicated that a particular role in solving problems related to customer driven quality management (Cluster I) and the issues of the quality of design (Cluster II) might be played by marketing management methods, i.e. (1) methods used in shaping such as New Product Design, Logo Design, Social Media Trends analysis; (2) a set of activities connected with Product Reviews Analysis, Measuring Clicks Online, Predicting Clicks Online; (3) a collection of tools supporting research and evaluation Customer Online Experience, Customer Online Behavior, User Behavior, User Experience, Customer Understanding, Customer Needs, Customer Wants, Customer Preferences; Customer Emotional Needs, Customer Reactions and User Generated Content; (4) Social Media Interactions, Social Media Commentary. However, marketing areas that may be useful in supporting of the shaping of conformance quality (Cluster III) are, among others, Sales Forecasting, Recommender Systems and Personalized Recommendations Systems, Customer Service Management, and Customer Relationship Management. While managing the cost of quality (Cluster IV) it seems important to refer to such elements of marketing management as, e.g. Online Sales Data analysis, Price Management, Place Management, Advertisements, Communication with Customers, Promotional Content, Personal Communication.

At the final stage of the research, the set of publications with the highest number of citations was identified. From the total set of publications (n = 1,649), a set of publications classified under the Web of Science category "Management" has been extracted (n = 314). Table 2 summarizes the selected fifteen most frequently cited publications that integrate elements of quality management with marketing management issues. The table presents the sorted research results in descending order of how they have been most frequently cited using the Citation Class sort, i.e. basis: highest first (here, sorts records in descending order based on the Times Cited number). For each publication, following an analysis of its content, it is assigned to which area of research defining the relationship between quality management and marketing management it belongs. It is also indicated which concepts, methods or tools supporting quality management were applied to the considered research studies.

When analysing the research focus of the listed works, it can be seen that research most often refers to issues related to customer-driven quality management, for product quality improvement or at the stage of product development. These works most often use such quality management tools as Quality Function Deployment (QFD), surveys (including those examining customer satisfaction), and Kano's model. The research results presented above indicate an exemplary body of work defining the specifics of the research carried out within the four research areas identified in these studies, concerning: Cluster I (the area of customer driven quality management), Cluster II (the area of research referring to the quality of design), Cluster III (the area of research referring to quality of conformance), Cluster IV (the area of research referring to cost of quality).

Table 2. Collection of the most cited publications

Selected publication	Citations/ References	Relation between marketing and quality management	Applied methods and tools of quality management
"Quality function deployment: A literature review" (Chan & Wu, 2002)	593/632	Cluster II: the quality of design	Quality Function Deployment (QFD)
"Customer perceptions of e-service quality in online shopping" (Lee & Lin, 2005)	536/50	Cluster I: customer driven quality management	Customer satisfaction survey
"A fuzzy optimization model for QFD planning process using analytic network approach" (Kahraman et al., 2006)	444/60	Cluster II: the quality of design	Quality Function Deployment (QFD)
"Does implementing an effective TQM program actually improve operating performance? Empirical evidence from firms that have won quality awards" (Hendricks & Singhal, 1997)	430/37	Cluster III: quality of conformance	Total Quality Management (TQM) programs
"Twenty years on: The state of contemporary ecotourism research" (Weaver & Lawton, 2007)	367/159	Cluster I: customer driven quality management	Ecotourism sector schemata and analysis
"A systematic approach to quality function deployment with a full illustrative example" (Chan & Wu, 2005)	234/32	Cluster I: customer driven quality management	Quality Function Deployment (QFD)
"Quality management and job quality: How the ISO 9001 Standard for quality management systems affects employees and employers" (Levine & Toffel, 2010)	150/59	Cluster IV: cost of quality	ISO 9001 quality management systems
"Six Sigma adoption: Operating performance impacts and contextual drivers of success" (Swink & Jacobs, 2012)	128/79	Cluster IV: cost of quality	Six Sigma program
"Understanding customer needs through quantitative analysis of Kano's model" (Wang & Ji, 2010)	103/16	Cluster I: customer driven quality management	Kano's model
"A methodology for analyzing web-based qualitative data" (Romano et al., 2003)	60/68	Cluster III: quality of conformance	Qualitative Data Analysis (QDA)
"Product configuration, ambidexterity and firm performance in the context of industrial equipment manufacturing" (Salvador et al., 2014)	45/168	Cluster IV: cost of quality	Industrial equipment manufacturing firms survey
"A model of competition between perpetual software and software as a service" (Guo & Ma, 2018)	32/39	Cluster I: customer driven quality management	Analytical model to study the competitive pricing strategies
"Quality function deployment: more than a design tool" (Erdil & Arani, 2019)	26/129	Cluster I: customer driven quality management	Quality Function Deployment (QFD)
"Design of extended warranty service in a dual supply channel" (He et al., 2018)	18/36	Cluster I: customer driven quality management	Analytical methods and numerical experiments
"Quality management as a driver of innovation in the service industry" (Gonzalez-Cruz et al., 2018)	20/89	Cluster III: quality of conformance	Service organizations survey

Source: Author's own study based on the Web of Science database.

Discussions

In this paper the issue related to interdisciplinary character of quality science, i.e. the relationship between the quality management and marketing management, were considered. The four clusters representing specific types of problems which requires the reference to both management and marketing science were identified.

In the area of customer driven quality management (Cluster I) quality could be defined as follows: Quality is the degree to which a specific object (thing, service) corresponds to a specific user-consumer or meets the requirements of a specific user-consumer. If the user is highly satisfied with the object, the quality of the object is very high, if the user's satisfaction with the object is low, the quality of the object is low. Therefore, in this approach, the user-consumer decides arbitrarily what the quality of the object is. Here, quality is defined in an evaluative sense and is sometimes called "market place quality" (Kiliński, 1979). The quality improvement and the engineering characteristics affecting product performance are primarily identified and improved to optimize customer needs. Limited resources and increased market competition and product complexity require a customer-driven quality management in product development and in achieving higher customer satisfaction (Hyun Park et al., 2017).

In the area of studies referring to the quality of design (the excellence of design, Cluster II), quality could be defined as the degree of accuracy of predictions in relation to the actual requirements of interested parties. The quality of a project is determined not only by producers and customers, but also by many other factors, and above all, social interest (Kiliński, 1979). This area of research takes into account Quality Planning, i.e. as defined by the American Society for Quality (ASQ, 2024), creation of plans for quality, reliability, operations, production, and inspection. When considering the current situation, i.e. during the Fourth Industrial Revolution, one wonders what will the future meaning of quality be and what might the new culture of quality management be. Hyun Park et al. (2017) noticed that there, instead of product quality, more emphasis will be given to design, safety, and service quality. In particular, design quality will become more important than manufacturing quality, since the design influences customers' happiness and there will be no difference in manufacturing quality, because of intelligent manufacturing, robotization, and 3D printing.

In the third area of studies (Cluster III) quality is assessed by the degree of compliance of the workmanship with the design or pattern. In order to determine the quality of compliance, the ratio of, for example, the quantity of a product produced in accordance with the design, norms, standards or pattern to the total quantity of the product manufactured is determined (Kiliński, 1979). This area also takes into account quality control, i.e. the activities and techniques employed to achieve and maintain the quality of a product, process, or service, and quality assurance, i.e. the prevention of quality problems through planned and systematic activities (Oakland, 1996). Currently, in this area, a particularly important role is played by the speed of design, production, and delivery. As human beings are becoming *phono sapiens*, the

speed of identifying customers' demand, speedy production with accuracy of quality assurance and quality control techniques will become an increasingly important factor in quality (Hendricks & Singhal, 1997).

The area of research referring to cost of quality (Cluster IV) is related with as a methodology that allows an organization to determine the extent to which its resources are used for activities that prevent poor quality, that appraise the quality of the organization's products or services, and that result from internal and external failures (ASQ, 2024). Having such information allows an organization to determine the potential savings to be gained by implementing process improvements.

Conclusions

While answering the question whether TQM applies to marketing, Oakland (1996) writes "the answer to the question is not remarkable – it starts there!". Quality starts with marketing. Since the times of Oakland, the approach to quality management, as well as the set of marketing methods and tools have significantly changed. The dynamic development of new technologies, such as Data Science, Machine Learning and Artificial Intelligence, is of particular importance here. Hyun Park et al. (2017) indicated that the industrial revolutions have resulted in strategic changes in production strategy, quality goals, quality strategies and advanced key achievements in human benefits. They proposed the multi-way flow approach to quality management (QM) suitable for the challenges of the Fourth Industrial Revolution. In their view the five QM stages, i.e. Plan, Design, Production, Marketing and Sales stages are connected by Big Data–AI–IoT platform. Here, it is noticed that in the Intelligent Digital Transformation society of the Fourth Industrial Revolution, the concepts of quality and QM would evolve expanding from product quality to design quality, service quality, and brand quality. In 1996 (Oakland, 1996) it was indicated that quality starts with marketing. New quality management concepts adopt the "Open Quality" strategy shaped by the use of Big Data, AI, and IoT technologies. In this approach to quality, knowledge from the field of quality management and marketing is integrated. Marketing management is responsible for important elements related to quality improvement, including: establishing the true requirements for the product, communication between customers and suppliers, finding the nature and timing of the demand, establishing systems for feedback of customer information and reaction. Hyun Park et al. (2017) noticed that the utilization of a business platform will become an important issue in QM. Based on the results achieved in this paper, it is noticed that for the accurate utilization of the business platform based on Big Data, AI, and IoT, it is important to carry out further research activities integrating knowledge in the area of marketing management with quality management. Recognizing how to shape Creative Teams capable of managing quality in a global, interdisciplinary approach responding to the needs of a specific community as a whole, is also essential here.

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