

Total quality service in digital era

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Abstract

Purpose – Total quality management is a valuable approach to continuously improve the quality of organizations; however, scholars debate its applicability to services, which require specific best practices that are different from those related to manufacturing. Moreover, digitization is pervading all kinds of services, but little has been written about total quality service practices in digital-based companies. For this purpose, the authors provide a holistic model of total quality service that reflects the peculiarities of such companies, guided by the question: how do total quality service practices change in digital-based service organizations?

Design/methodology/approach – The authors conduct an illustrative case study on Healthware Group, a global integrated digital health organization, to evaluate theoretical assumptions about total quality service practices in the digital environment.

Findings – The findings allow to validate the model provided. In addition, the study enables them to observe the changes the authors are witnessing in service provision in the digital era and the consequent transformation of best practices. To be accurate, the authors cannot refer to a full transformation in digital-based companies but rather to the enrichment and extension of TQS practices. The best illustration of these conclusions has been summarized in a set of propositions corresponding to seven of the key levers of a TQS model.

Originality/value – The paper represents the first attempt to discuss the relationship between total quality service and digitalization, offering a set of propositions for academics and insights for practitioners. The model can be used as a tool to visualize the different levers that successful implementation of TQS in digital-based services companies can rely on.

Keywords Total quality service, Total quality management, Digitalization

Paper type Conceptual paper

1. Introduction

The literature on total quality management (henceforth TQM) is particularly extensive, replete with empirical studies and critical discussions of the dimensions of TQM or their impact on performance or innovation. In fact, TQM is an approach to continuously improving the quality of organizations that involves management, employees, customers and the business process (Kanji and Asher, 1993). The TQM approach has focused primarily on manufacturing firms (Mahmood *et al.*, 2015; Singh and Ahuja, 2014). However, this literature tends to encompass many discussions that also incorporate topics unrelated to manufacturing or product logic, such as service (Arasli, 2012; Psomas and Jaca, 2016). Some scholars argue that the dimensions of manufacturing quality management should naturally apply to service organizations. Other scholars, on the contrary, argue that services differ from manufactured goods in terms of the



intangibility of the service, the simultaneity of production, delivery, and consumption, perishability, the variability of customer expectations, and the participatory role of customers in service delivery (Sureshchandar *et al.*, 2001a). Thus, the complex implementation issues surrounding total quality service (henceforth TQS) require separate discussion. While the purpose of TQS is similar to TQM—delivering superior value to one's customer to increase revenue (Miguel *et al.*, 2016; Jyoti *et al.*, 2017) – the implementation of total quality practices in service environments may be different.

This study focuses on the TQS literature that lacks sufficient research in this area compared to the product industry (Jyoti *et al.*, 2017; Miguel *et al.*, 2016; Stamatis, 2018; Bouranta *et al.*, 2019). We fill this gap by paying attention to TQS practices and discussing TQS in digital-based service firms. This article aims to provide an up-to-date view of TQS practices as digitization pervades services and is an area of particular interest to quality professionals (Lock and Seele, 2017; Seele and Lock, 2017). Taking a cue from Sureshchandar *et al.* (2001a, b) who offer a holistic model of TQS, we reflect on the relevance of some elements of TQS by proposing an appropriate TQS model that is useful for interpreting quality practices in digitization-based enterprises. The focus on digitization further contributes to the TQS literature, and more extensively to the TQM literature. In fact, quality management scholars have not adequately included digitization in their discussions (Carnerud *et al.*, 2020).

Therefore, the research question is as follows: How do TQS practices change in digital-based service organizations?

To address this issue, we follow a deductive approach. We start from the literature on TQS and digital services to derive a conceptual model from theoretical speculations (Doty and Glick, 1994; Jabareen, 2009). The conceptual approach provides an update of the holistic TQS model (Sureshchandar *et al.*, 2001a, b) by discussing changes in at least four major areas of quality management: servicescapes, union relations, impetus and HRM systems.

Afterwards, we support the model with an illustrative case study to explore the adoption of TQS practices in a digital environment. Specifically, to explain and illustrate TQS practices in digital-based service firms more in depth, we select the digital health services firm Healthware. The illustrative case study tests the consistency of the proposed conceptual model. What emerges is that changes have occurred in four main areas: union intervention, servicescapes, HRM system and impetus. In addition, social responsibility acquires a very important role in the renewed configuration of TQS practices. These new “weights” are illustrated by the provided model.

The article is organized as follows. The theoretical background reviews the literature on TQS and TQS in digitization. After that, we illustrate a conceptual model evaluated in Section 3 through an illustrative case study. Finally, we present discussion and conclusion.

2. Theoretical background

2.1 Total quality service

Service quality has been an important field of study in marketing and organization for decades. The concept of quality is related to customer satisfaction or organizational practices that contribute to providing a quality offering. More specifically, evidence on service quality appeared in the early 1990s addressing the following issues: customer perceptions of service quality (Parasuraman *et al.*, 1985); total quality in public services (Choppin, 1994); the role of the personnel and human resource management function (Berry, 1999); operational, organizational, and human resource factors for improving service (Waldman and Gopalakrishnan, 1996); the concept of service culture (Schneider and Bowen, 2010); and service encounters, critical incidents, and recovery (Keaveney, 1995). These critical issues have been addressed independently and in different ways by scholars, sometimes integrating them into the TQM literature.

A number of scholars, in fact, adopt TQM practices indiscriminately for product and services, discussing total quality practices in service industries, such as in hospitality (Daghfous and Barkhi, 2009), banking (Helms *et al.*, 2001), health care (Duggirala *et al.*, 2008) and so on.

Only later, Sureshchandar *et al.* (2001a, b) feel the need to provide an all-encompassing holistic model of TQS (from the management perspective). The authors define TQS as a socio-technical approach that is useful for revolutionary and effective management in service organizations. To define TQS, Sureshchandar, Rajendran and Anantharaman inevitably draw on TQM theories. Specifically, the authors address all facets of TQM in service organizations (such as human and non-human aspects of service production and delivery, service design and operations, aesthetics of the physical environment, information technology, industrial relations and corporate citizenship behavior) in an effort to find the peculiarities of quality practices for services.

To be more specific, the authors conducted a review of the quality management literature deriving 12 critical dimensions of TQS, ten of which are closely related to TQM practices. They classified quality management practices into three groups that we label as follows: editable, both suitable and unique to services (Figure 1).

Editable practices address the dimensions of TQM that can be effectively used in service organizations, but with modifications: top management commitment and visionary leadership, human resource management, process design and management, information and analysis, benchmarking, continuous improvement, employee satisfaction, and customer focus. For instance, top management commitment and visionary leadership in service organizations rather than manufacturing organizations have an immediate impact on customer satisfaction because in service, the production and delivery phases are simultaneous. Human resource management in service can be eligible as crucial resources for competitive advantage. In fact, employee recruitment is a relevant indicator of service quality from a customer perspective, just as employee satisfaction is reflected in customer reviews. Designing and managing service systems means dealing with service delivery and then architecting the customer experience. Like manufacturing organizations, service organizations need information and analytics systems to foster communication and,

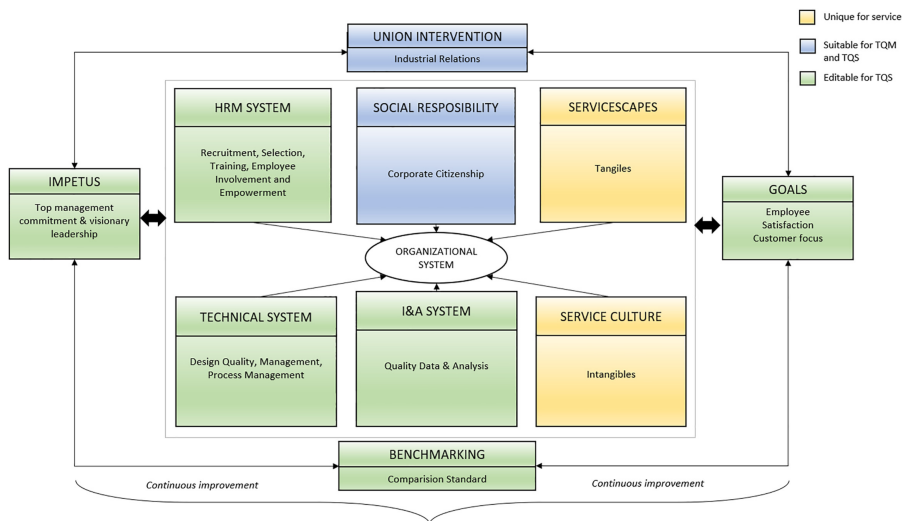


Figure 1.
Total quality system

Source(s): Sureshchandar *et al.* (2001a, b)

consequently, process improvement. However, service organizations should duplicate the communication effort across organizational functions and across the organizational environment and customers. Benchmarking for services is a more nuanced discipline that consists of hard data (service characteristics) and soft data (behavioral customer characteristics).

Continuous improvement follows the customer journey rather than the manufacturing process; High customer involvement in the service organization gives greater importance to customer centricity than manufacturing companies, where quality is equally dependent on product and customers.

Both suitable practices address common dimensions of TQM and TQS, such as union intervention and social responsibility. These dimensions of total quality are not distinctive to service organizations. As is the case in the manufacturing organization, unions in the workplace leverage employee involvement and thus indirectly influence the quality effort. Social responsibility in manufacturing and service environments contributes to brand image and quality perception formation.

Unique to services are servicescapes and service culture. Servicescapes refer to the tangible elements of the service experience (e.g. employee attire, sounds, location of service delivery) that play a key role in determining customer impressions of service quality. Service culture is a proxy for the diffusion of the common vision in the service organization; it is a distinctive dimension to service because it acts on employee–customer interactions.

To put it plainly, Sureshchandar, Rajendran and Anantharaman accept that the TQM philosophy can be applied to services as well. However, they point out that studies done in the manufacturing sector cannot be applied directly to the service sector because of the specific characteristics of services that require some peculiar organizational principles. Services require different production and marketing systems.

In the aftermath of the holistic model, TQS has become increasingly relevant in service firms because it focuses on rigorous analysis and continuous improvement of customer-oriented service processes. Gupta *et al.* (2005) focused on three quality management constructs—leadership, organizational culture and employee commitment – that are considered to be very important in achieving TQS goals, e.g. business process quality, service quality and customer satisfaction. Yang (2006) presented an innovative and comprehensive quality management system for service industries and demonstrated its theoretical and practical application in several service industries. The authors provided a benchmarking for those service organizations with lower levels of implementation in some quality management practices in front of virtuous companies (e.g. HP and IBM). Subsequently, the focus on TQS practices proved useful not only for scholars who paid more attention to quality practices in service organizations but also for scholars who considered TQS adoption in industries influenced by services.

For instance, while Duggirala *et al.* (2008) adopted TQS to measure patient satisfaction, Jyoti *et al.* (2017) studied TQS in the automotive service industry. In the automotive industry, service quality practices ensure that the vehicles produced are rightly delivered or that the vehicle company provides excellent after-sales service. In other words, TQS practices are employed to pay more attention to customer satisfaction by activating a feedback loop that leads to product/service improvement to performance.

According to Stamatis (2018), TQS occurs at the organizational level and corresponds to the commitment of the entire organization in operationalizing customer focus.

2.2 Total quality service and digitalization

Digital technologies are reshaping and renewing organizational and production systems, business models, and the way companies create and capture value. Digital transformation

leads to socio-technical change, which suggests that routines and practices also need to be revised in favor of broader transformation (Dąbrowska *et al.*, 2022).

Nonetheless, digitization in quality management is an ambiguous topic. Although digitization is identified as an area of particular interest to quality professionals, Carnerud *et al.* (2020) failed to demonstrate academic attention on the connection to quality management studies. The authors observed indirect references to digitization in studies discussing information technology (IT) or information systems (IS). However, they found that these researches addressed only part of digitization, omitting several interesting dimensions. For example, IT and IS are considered by quality management scholars to be only pieces of technology that affect an organization, without considering these technologies as tools for digitizing quality practices (Kobus *et al.*, 2018; Brunetti *et al.*, 2020).

Other studies focus on the link between quality management and digitization but investigate the opposite relationship to the one we are exploring through this paper. In fact, as pointed out by Carvalho *et al.* (2020), what emerges from the current literature is that many companies do not have specific quality-based strategies or models to deal with the digital transition; thus, it does not concentrate on quality management, and quality practices, in digital-based companies. In this vein, current research has yet to identify, comprehend and define such quality practices and “distinguish between those that lead to digital immersion and those that lead to resistance or avoidance (Dąbrowska *et al.*, 2022, p. 10).”

What is certain is that by instituting quality practices, companies can save a lot of money; in fact, having a highly established quality culture allows them to spend less than all those companies that do not look at quality management as a strategy. All of this is even more true thanks to the exploitation of new technologies (Gunasekaran *et al.*, 2019). However, this field has not yet been deepened.

A great deal of attention is, in fact, only recently provided by Sony *et al.* (2020) and Brunetti *et al.* (2020), stating that quality management is one of the areas that will be significantly affected by digitization. Indeed, digitization changes the way people (obviously consumers) communicate, consume and create value in a service environment and triggers new market and sourcing strategies and shorter life cycles of product and manufacturing technologies. According to the insight of Behmer *et al.* (2016), digitization adds additional factors that result in a significant increase in QM flexibility requirements, creating unique opportunities for managing the quality of products and services delivered by organizations.

Sony *et al.* (2020) offer an interesting discussion of the concept of “Quality 4.0.” The authors focused on Industry 4.0, illustrating which digital tools – particularly prescriptive analytics and big data – are being used to improve an organization’s ability to reliably deliver high-quality products to customers. They highlight the key ingredients for the successful implementation of Quality 4.0: big data management; prescriptive analytics; vertical, horizontal, and end-to-end integration; quality practices for strategic advantage; leadership 4.0; training 4.0; organization 4.0; and top management 4.0.

In this regard, Sampaio *et al.* (2022) discuss the growing importance of technologies for the rapid production of products and services that exhibit very high levels of quality. To date, many companies build their success, added value and competitive advantage on high quality standards, and faster, more efficient, and less expensive technologies facilitate the achievement of this objective.

The concept of “supercare”, exposed by Carvalho *et al.* (2020), refers precisely to achieving ever higher levels of quality in service delivery or product development. Continuous improvement is possible thanks to technologies, such as artificial intelligence and machine learning, that are not only capable of processing huge amounts of data and monitoring and hyperconnecting but also make it much easier to prevent and predict errors.

Whereas, Jamkhaneh *et al.* (2021) identify human resource empowerment as a driver for understanding the new concept of Quality 4.0 in the digital age. This aspect is also

highlighted by [Gunasekaran et al. \(2019\)](#) who, in a special issue aimed at exploring quality management in the twenty-first century, collect a number of contributions that can be placed into five main categories: (1) Economic aspects of quality in the era of Industry 4.0, (2) Decision-making models in quality in the era of Industry 4.0, (3) Business models in quality in the era of Industry 4.0, (4) Human aspects in quality in the era of Industry 4.0 and (5) Technological aspects in quality in the era of Industry 4.0.

However, all these authors embrace the product logic, neglecting the peculiar aspect of service. [Cavallone and Palumbo \(2020\)](#) provide a contribution that better fits the service logic. They identify how digital technologies, such as artificial intelligence and Industry 4.0 approaches, blend technological improvements with patient-centeredness to achieve two divergent strategic goals of healthcare organizations: (1) improving the quality of healthcare services and (2) containing healthcare-related costs. This discussion of quality practices and digitization still neglects some aspects, particularly the distinctiveness of services. Only one study addresses digitization in services. Specifically, [Palumbo et al. \(2021\)](#) address the exploitation of digital tools in ecomuseums. The authors show that TQM soft practices, in particular managerialization and professionalization, stimulate greater people-centeredness and promote the adoption of a focus on the visitor experience in the construction of the cultural service offering ([Rossato and Castellani, 2020](#)). These soft practices play a role in recontextualizing museums' presence in the digital environment, using digital tools to enhance service offerings.

2.3 The conceptual model

The investigated literature suffers from a gap in fully illustrating what practices change for the service industry in a digital environment. Building on the model of [Sureshchandar et al. \(2001a, b\)](#) and drawing on recent literature on total quality in digitized organizations ([Sony et al., 2020](#); [Palumbo et al., 2021](#)), we elaborate a theoretical model for digital TQS ([Figure 2](#)).

The model shows four main areas of change from the traditional TQS model: servicescapes, union relations, impetus and the HR system. However, we do not overlook the impact of digitization on other dimensions of TQS.

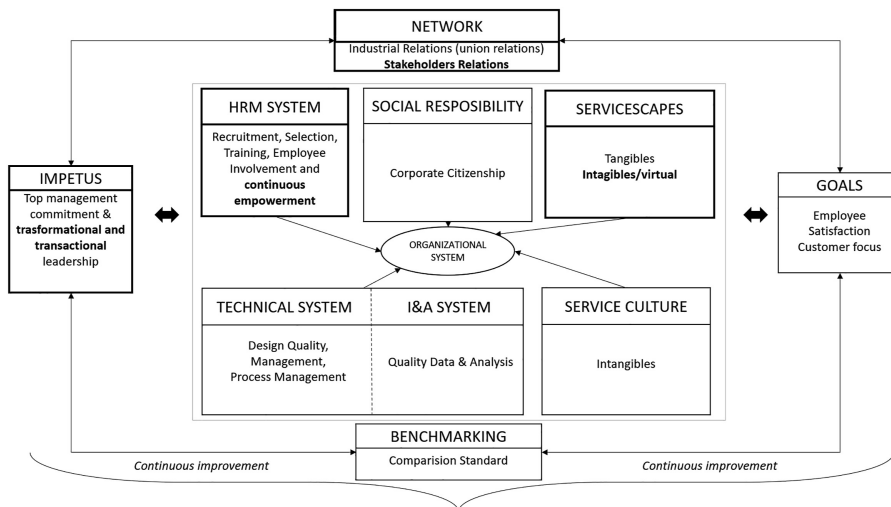


Figure 2. A conceptual model of TQS in the digital era

Source(s): Our elaboration on [Sureshchandar et al. \(2001a, b\)](#)

The goals of TQS remain the same, but digitization has changed the way we improve the quality of service delivery through the pervasiveness of digital tools that follow customers along the service journey (Palumbo *et al.*, 2021). In addition, digitization has made it easier to achieve employee satisfaction (Sony *et al.*, 2020) by influencing the organizational leverage of service quality. At the same time, digitization brings out the diversity of customer needs and multiplies the moments to satisfy consumers by complicating the achievement of high levels of service quality (Jamkhaneh *et al.*, 2021). Therefore, the use of digital technology contributes to achieving new levels of excellence in operations, performance and innovation (Gunasekaran *et al.*, 2019) by enriching the quality journey of service firms.

According to Sony *et al.* (2020), the quality of process design and management depends on understanding customer needs that are tracked through big data in a digital environment. This means that technical and I&A systems are closely related as the quality of the data collected and the accuracy of the analysis provide key elements for continuous improvement of service processes. In addition, big data enables a holistic or all-encompassing understanding of customer needs. Customer preferences and feedback could be mapped to different stages of service consumption, pursuing customer focus at different levels of decision making. For this reason, in Figure 2 the boundary between the two dimensions of TQS, i.e. technical systems and I&A systems, appears blurred.

The quality of services depends on digital tools and human resources (Palumbo *et al.*, 2021). However, in a digital environment, they are better engaged in strategic and innovation tasks, better and continuously trained, and better selected (Sony *et al.*, 2020). Particularly for service, human resources are supported by many technologies that reduce wasted time on repetitive tasks by focusing more on training activities that increase their professionalism toward non-repetitive tasks. We label these digital changes for the HRM dimension by adding the property “continuous empowerment”.

The service culture is also partially affected by digitalization, which does not change the essence of the quality dimension but the way this dimension is realized. Integrated technologies better connect different departments, functions and tasks, quickly spreading intangible values such as the vision of the service company. In addition, digitization facilitates the training of employees in adopting an open-minded spirit and integrating external insights from the market or stakeholder network. Top management commitment is crucial to ensure service quality during digital transformation (Sony *et al.*, 2020). Top management must make a committed effort in reducing resistance against organizational transformation from various organizational stakeholders by leading and encouraging digitization of traditional practices. Consequently, a transformational and transactional leadership style is needed. The leader should be knowledge-oriented, triggering a virtuous cycle between innovation and learning.

The reference to union intervention is reductive considering all the actors involved in the service process. We propose to call quality practices “networking”, referring to all types of stakeholder relationships. Activities such as planning, control and quality improvement should focus on all organizations that cooperate within the value creation process. These organizations constitute the service ecosystems.

The environment for service is no longer tied to a physical location, so it is obsolete to consider only tangible servicescapes in a TQS model. New forms of virtual atmospheres should be designed as the customer experience is shifted from the physical context to a new digital media context, such as websites or social media (Ballantyne and Nilsson, 2017).

Regarding benchmarking, accountability and goals the literature does not reveal changes while considering the concept of continuous improvement appears as facilitated by digitalization that offers tools to monitor customer and employee satisfaction in real time (Cavallone and Palumbo, 2020).

3. Illustrative case study in the healthcare sector: the case of Healthware

3.1 Methodological notes

To answer our research question, we felt the case study was a suitable methodology. It is particularly appropriate when the investigation involves contemporary events and seeks an answer to the “how” question (Yin, 1994), or when relatively little is known about a phenomenon to generate theoretical insights (Eisenhardt, 1989; Feagin *et al.*, 1991).

In particular, we conducted an illustrative case study, widely used in the social sciences and international relations (Levy, 2008), as well as in medicine and management (Mariotto *et al.*, 2014), where is particularly used to illustrate innovative practices of particular companies (Kaplan, 1986; Scapens, 2004). This particular type of case study provides illustrations of how particular theoretical categorizations can be observed in practice; it mainly describes what happens and why in one or two cases (Shukla and Adil, 2021).

In other words, they allow for the illustration of empirical examples of particular theories (Scapens, 2004), especially in the construction of new theories involving technological change, as Schiavone (2013) and Faulkner and Runde (2009) demonstrate.

The purpose of applying this methodology, as Levy (2008) illustrates, “*is to give the reader a ‘feel’ for a theoretical argument by providing a concrete example of its application or to demonstrate the empirical relevance of a theoretical proposition by identifying at least one relevant case*” (Eckstein, 2000). Illustrative case studies illustrate what has been accomplished in practice (Scapens, 2004), implying the superiority of some organizations’ practices over others. Alternatively, they may provide Weber-like ideal-types that give “shape” to theories through observation of practice (Eckstein, 2000; Scapens, 2004; Levy, 2008). The first intent is exactly in line with the purpose of our work.

We believe that our illustrative case study can allow us to develop inferences, as Siggelkow (2007) and Breidbach *et al.* (2014) argue. Through such inferences, in our view, it will be possible to generate a prerequisite for further theory building and, consequently, theory testing (Siggelkow, 2007; Eisenhardt and Graebner, 2007). We are aware that our single case study is not about a “talking pig”, to quote Siggelkow (2007), but that at the same time, it can be the basis for illustrating the connection between theorizing and practice. A single case study can be “a very powerful example”; Siggelkow (2007) argues that there are at least three important uses of case studies: motivation, inspiration and illustration. He further asserts that this last use may seem trivial, but it is not at all.

In addition, our case study is based on data of a secondary nature, thus according to Reddy and Agrawal (2012) it is a type II case study. This type of case study fits very well with notions and management models.

Scholars have debated the validity and generalizability of case study findings derived from secondary sources; to date, it is well known that interviews and direct observations are not indispensable to illustrate a good case study; rather, the exclusive use of secondary data sources in case-based qualitative research generates equally rich and valuable insights (Bowen, 2009; Yin, 2011). This argument is supported by the work of Merriam (1988), for example, who points out that “*Documents of all kinds can help the researcher discover meaning, develop understanding, and uncover insights relevant to the research problem*” (p. 118). Many qualitative studies use document analysis that allows for rich descriptions of an event, phenomenon and so forth (Stake, 1995; Yin, 1994; Bowen, 2009).

Through a qualitative research approach based on secondary data, we used multiple sources of evidence for the triangulation of data (Yin, 2017), and we organized the case study analysis on the study of the following types of documents: (1) Archival documents and websites, (2) newspaper articles, (3) audio materials, (4) videos of events (5) other documents (see the table below) and (6) direct observation, where the connection between the use of quality practices and the digitization of the company emerged.

The analysis consists of an iterative approach. The combination of different and independent multiple sources of evidence can be crucial for producing complementary perspectives of a specific phenomenon.

We screened the emerging elements and synthesized the findings by dividing them into the different practices that constitute the conceptual model of TQS in the digital era, provided by [Figure 2](#).

The following table ([Table 1](#)) shows how this material was employed in the data analysis, indicating the use of the different sources.

3.2 Case selection

Our case study is about a global integrated digital health organization that offers services and expertise in strategic consulting, communications, technology and innovation to healthcare companies. The goal is to improve the patient experience by acting on a digital transformation of all businesses involved in health systems. For instance, Healthware intends to transform business outcomes in life sciences, medical devices and health insurance with the aim of offering integrated services for patients.

The selected case emphasizes the service dimension and digital influence that strongly characterizes the healthcare industry, which is demonstrating a strong propensity to include digital technologies in its service value proposition. Therefore, it is perfectly consistent with the analysis we intend to perform. The company is located at the intersection of digital transformation and digital health, it was already born with a digital and continuous improvement vocation that leads it to scale rapidly in different markets with exponential success.

Therefore, we chose this company because it can be a starting point to explore total quality relationships in the digital environment.

The company was founded in 1997 in Salerno, South of Italy.

Healthware Group has multiple specialties and operates under different brands for each. These include marketing and communications agency Healthware International, media consultancy Healthware Engage, innovation consultancy Healthware Labs and virtual events specialist SWM.

In addition, it has a national and international presence with its subsidiaries around the world (15 offices in Europe, the United States and Asia). It is an active participant in many industry events that address the intersection of healthcare and technology; in this regard, it is also the co-host of the world's leading digital health conference *Frontiers Health*. It also invests in digital health startups through its corporate venture capital fund *Healthware Ventures*.

4. Findings

The purpose of the article is to explore how TQS practices change in a digital environment. Drawing from the TQS literature ([Sureshchandar et al., 2001a, b](#)) and digitization in services, we proposed a conceptual model that we attempted to evaluate with an illustrative case study. Therefore, our results are organized according to the sixth section of the model ([Figure 2](#)).

4.1 Top management commitment and visionary leadership

The commitment and long-term vision for the development of the Healthware organization are certainly one of the Company's critical success factors. Healthware proposes to build the future of health and thus needs a clear vision to make it. From archival documents, the Company appears guided, in fact, since the beginning, by a well-defined vision: humanizing healthcare by democratizing access with spirit, purpose scale and empathy. The top management has fixed a set of practice guidelines for addressing Healthware teamers and Healthware stakeholders to embrace the vision of the challenge: be part of and capitalize on

Source	Type of data	Number/type of documents	Use in the analysis
Official publicly available documents	Archival documents & websites:		
	Official data from annual reports	2	
	Certifications	2 documents stating they have European certification - such as ISO - and the code of ethics (1) Facebook, Instagram and LinkedIn	• Gather more information
	Official social media pages		
	Newspaper articles:		
Many articles in specialized magazines in the fields of technology, startups and healthcare were analyzed	17	• Understand the impact of different application in the provision of services	
Direct observations	Audio material:		
	Interviews in the context of specialized conferences (such as RipartItalia and Sanità Next)	4	• Understand the use of digital technologies for each TQS practice
	Videos:		
	Videos from the company's YouTube channel	40	
	Videos of events; Healthcare Group participates in many events (this feature is already a best practice) such as PartnersHealth, Salute Web Fest, Digital Italy Summit, The Future of Health-Live chat, TEDx etc	17	• Gather information about the relationship between the best practices and value creation mechanisms through technologies
Other documents:			
Research article	1		
The websites of the companies acquired by the Group to improve the digitalization process of each area in which they provide services (SWM; Make Helsinki; <i>pharmaphorum</i> ; <i>Argon Global Healthcare</i>)			
Chatbot test on the website			• Test the actual link between the use of digital technologies and the best practices related to the <i>Customer Focus</i>

Table 1.
Number, types and sources of data

industry transformation; build a solid and diverse career foundation strengthen leadership capabilities; create opportunities and manage change. The change that Healthware proposes to manage concerns the digitalization of the healthcare ecosystem. Being a born-digital company in a traditional healthcare industry, it can blend elements that merge different branches and skills and competencies, giving rise to innovation diffusion. Healthware Labs managing director Kristin Milburn says, “*Music as medicine? Video games as a treatment modality? These are the things that inspire me about digital health and the future of healthcare*”.

Moreover, the digital vocation was further underscored by Covid-19, and the push for digitization highlighted the transformational leadership style. The Company launched many virtual initiatives to involve employees at all levels while gaining stakeholder engagement. The common goal was to engage all stakeholders in the ecosystem to create a single force that would be useful to everyday people (patients/citizens), employees and stakeholders in general. In addition to the extraordinary circumstances of Covid-19, it has established an internal digital academy, which takes place only on the web, the Digital Health Academy. The academy has the aim to spread the digital culture in healthcare. The topics covered are leadership, change management, permission to fail, managing the startup ecosystem and educating customers.

As stated by the CEO and founder Roberto Ascione “*to have a well-constructed and clear vision, the company rests on a type of leadership that makes the management highly flexible and ready for new challenges*”.

Moreover, in this regard, many awards attest to the spread of these values within the Company. Roberto Ascione has been awarded important titles over time, such as Decade’s Best Industry Leader by Health 2.0 Conference – 10 Year Global Retrospective Award in 2016, nominated Transformational Leader at the 2017 PM360 ELITE Awards and named among the 100 Most Inspiring People by PharmaVOICE in 2017.

As evidence that the Group strongly believes in these pillars, the Company is committed to promoting women’s leadership in healthcare through a partnership with the Healthcare Businesswomen’s Association Europe (HBA EU).

4.2 Human resource management

Roberto Ascione states that the whole history of Healthware is based on “*anomalies*”. From the fact that it was born from the idea of a person with a bizarre path – according to most people – to the fact that the Company’s growth path occurred against the traditional strategies. Furthermore, even the selection of people within the Company occurs based on an anomaly. What comes out most often from articles, videos of events and interviews is that people working at Healthware are selected more for soft skills than technical skills.

Roberto, during a TedTalk affirmed: “*We started by looking for people who were as they needed to be, i.e. structured for exactly what they needed to do, and we had several failures. Then we realized that we had to look for aptitudes and not look at what was not normal in the paths. So, we found economists who are passionate about design, people who have studied philosophy or anthropology but want to do economics, etc. This has created a team that may not be perfect but, I assure you, is one of the best in the world*”. He continues: “*Technical skills, the things that people know how to do, are essentially increasingly a non-durable asset, subject to continual change and evolution. If that does not happen, they can become obsolete. I have prioritized everything else . . .*”. Healthware’s teams are multidisciplinary, and the Company pushes for a continuous exchange between talented global digital innovators that, in turn, dialogue with life-science professionals, aiming at a common goal. Furthermore, Healthware is committed to offering inspiring workplaces where people feel comfortable bringing out innovative solutions.

4.3 Technical system and information and analysis system

The design of the service offering at Healthware is built on an integrated system of competencies. The different divisions into which the Company is divided work individually

but simultaneously in synergy to ensure that the end customer has the best possible solution. Healthware staff in each division are trained to manage projects for clients spread across the globe using a combination of tools and processes.

The company's employees are connected in a global network through virtual meeting tools, mobile devices and centralized documents. The Company can share project data internally and with clients through a web-based tool. Employees share goals, calendars, tasks and responsibilities, and project news. The Company also uses a centralized workflow management system to define changes to applications and content.

Furthermore, Healthware service process is a co-creative process. Through a dense program of events, the sharing and meeting are stimulated, encouraging new ways of thinking about business and healthcare delivery by leveraging many new digital technologies. The Company invites consumers, startupper, financial supporters and all involved stakeholders to create new solutions by immersing themselves in virtual and augmented reality problems. Co-creative processes are supported by a valid information and analysis system that ensures the efficiency of the process and the automation of many procedures. Ascione states: *"There is a need for few but solid certainties: efficient processes, automation/self-certification of as many procedures as possible and an economic fabric that takes on its responsibilities, or rather injects industrial and financial energy into new companies, with greater courage and intensity"*.

4.4 Service culture

The services offered by Healthware are based on customer-centricity. The culture of service permeates several branches of the Company. The Company's health services group is Healthware International, which focuses on designing a transformative healthcare experience that engages, simplifies and empowers people's lives. However, the Company established Healthware Engage to track consumer needs, targeting digital marketing and media strategies with a data-driven, results-driven approach. Healthware Labs was created with an ongoing exchange between the Company and its customers to build and grow innovation practices by looking at old problems in new ways and generating innovative ideas through an Open Innovation process.

4.5 Servicescapes

In the case of Healthware, the concept of servicescapes deprives itself of the tangible, physical elements of the place where the service is provided because the service is intangible and does not have an exclusive place where one can go to use it.

The Company provides its services to companies that need its advice in a non-physical place. At the same time, they use the location to network, create events and stimulate an ecosystem – in which they believe so much – to involve customers and stakeholders, for example, through the Life Hub. Healthware's headquarters is a place that inspires innovation; it starts from the symbol of enlightenment of the past to turn, through cutting-edge technology and design elements, to the future. The Salerno headquarters is part of an evocative monumental complex next to the headquarters of the ancient Salerno medical school, the first medical institution in the world, dating back to the eleventh century.

A magical space, deeply rooted in history, equipped with the latest technology and filled with smart people, startups and teams visiting from around the world, it has become home to patients, physicians and health innovators united by the mission to reinvent healthcare.

The mixture of such diverse elements does not clash in this location because it is from history – witnessing the insights of enlightened people from the past – that Healthwarriors want to lead into the future.

4.6 Social and environmental responsibility

Depending on the type of activities carried out, Healthware has a high potential in terms of social impact, contributing significantly to the development of companies in the world of health and, in general, in the health and medical sector, improving efficiency and accessibility. In addition to this aspect, rooted in the core business, Healthware Group is equipped with a series of controls and management systems that improve its sustainability profile. In fact, in addition to having obtained certifications such as ISO 27001 and ISO 9001, relating respectively to the information security management system and the quality management system, the Company has adopted a Code of Ethics and an Organizational Model 231, through which it pays attention to social and environmental issues. Moreover, the Group has also adopted an employee entry policy to complement these safeguards regarding personnel management.

Environmental sustainability is an important value for the Company, which celebrates it and creates food for thought through an event called GreenBlueDays during which issues linked to technology, healthcare and sustainability are addressed.

As a service company, Healthware's environmental responsibility translates into actions to curb consumption related to office activities, emissions from business travel and the use of materials with the least environmental impact. The electricity consumption determines Healthware's energy consumption, heating systems within the premises and company cars, which are intended for mixed-use, are supplied to some employees.

The share of electricity from renewable sources in the total electricity purchased has increased. Concerning the waste produced, 100% of this was recovered, as it is a recyclable material and in favor of circular consumption models.

Technologies, in this case, are leveraged to demonstrate the tangibility of the environmental problem.

In addition, Healthware has received several awards for its contribution during health emergencies and for the services made available to counteract their effects, including the telemedicine services provided by Paginemediche to enable remote and large-scale visits and communications between patients and doctors.

Healthware Group has recently agreed with the Institute of Tumors of Naples, aimed at research activities and the development of digital therapies. Thanks to the mutual areas of expertise, with this memorandum of understanding, Healthware and Pascale will promote and implement innovative solutions in digital technologies applied to oncology, oriented to facilitate clinical practice and, therefore, improve patients' lives. The latter will enjoy numerous benefits starting from the fact that, being of a software nature and often exploiting widespread platforms such as smartphones, digital health solutions and digital therapies present characteristics of great accessibility for patients and physicians.

Furthermore, the Group adopts a data security management system compliant with ISO 27001 standards. It guarantees adequate treatment of information, thanks to which no cases of data breaches occurred during the year.

4.7 Network

Behind Healthware's choices, from space and employee management to international relationships and headquarters, to creating and sharing moments, there is a very heartfelt concept of the ecosystem. In this regard, Ascione says, *"The scaling of digital health is important. It is a business, and that is the obvious part, but being able to scale means making these solutions sustainable and widespread. Digital should become the norm for health, which is not possible without scaling. It takes a lot because it needs the alignment of many players and it will not happen in isolation. Partnerships will be essential along with an open mindset and a true ecosystem culture; all are critical to moving forward"*.

The headquarter in Salerno is also home to the Digital Health Factory, focused on creating digital solutions for health and wellness and bringing together companies, investors and

talent who can access the Hub's co-working space, geared to the needs of today's digital nomads.

In addition, they have partnerships with players as diverse as research institutes, pharmaceutical companies, software companies, business accelerators and startups. Moreover, every year they bring together all those involved in the healthcare ecosystem (in an expansive view) through a conference of global importance: Frontiers Health Global Conference. The Frontiers Health Conference is designed to provide a unique experiential platform to learn, exchange and be inspired.

According to Ascione, relationships are at the heart of success: *“successful innovative projects must integrate technology with three other determining factors—spaces, relationships and processes—to effectively and quickly ‘ground’ the digital transformation”*.

The key aspect is that the entry of new players in the health ecosystem (e.g. big tech, food, wellness, finance and other players coming from different industries but strategically converging on health) will create an “enlarged” hyper-competition, putting more and more at the center the patient and his experience, making the most of marketing technologies, such as CRM and social media, and emphasizing the Value-Based Healthcare approach.

4.8 Continuous improvement

The Company's code of ethics clearly states the intention of continuous improvement. The continuous improvement of the Company's performance, always inspired by the highest quality criteria, is one of the primary objectives of Healthware, which has also obtained the Quality Management System Certification following ISO 9001:2008. In addition, Healthware can continuously improve through continuous feedback that leverages AI and big data analytics to improve service delivery based on extreme customization. Roberto Ascione's goal has always been to create an environment aimed at continuous improvement that embodies encouragement, participation, inclusiveness and cultures. The Company incorporates all these values through initiatives, seminars, internal and external meeting moments.

4.9 Customer focus and employee satisfaction

The site covers many key areas: customer engagement, digital health, digital transformation, trends and perspectives on future industry scenarios, and more. The customer Healthware addresses and whose needs it seeks to best intercept is twofold: healthcare companies that implement innovative solutions thanks to Healthware's capabilities and patients for whom the services offered are custom-designed.

Moreover, this is not limited only to the offer of service but also to new business models, new products and commercial processes, and new ways of communication able to increase efficiency and offer attention to the patient and the person that is difficult to find in past experiences. Healthcare Group wants to make the customer experience something unique. To this end, it acquired the Finnish agency Make Helsinki Ltd, founded in 2015, specializing in communication services ranging from Virtual Reality to Customer Experience, from design to augmented reality and recruitment for clinical studies. Healthware Group acquired SWM in 2021 to gain established consumer engagement expertise to enhance customer-centricity further. Maximizing the value of virtual and hybrid events relies on disrupting the way we interact with healthcare providers. Using learning science with creative storytelling and technology allows for the ongoing needs assessment. To stay on top of consumer needs, they leverage data science, gaining real-world information to provide unprecedented experiential value.

In addition, several times, Roberto Ascione reiterates humanizing healthcare systems. He strongly argues that technologies – it seems a paradox – will make the system more human: *“I believe that digital health will profoundly change the management of health. We are used to medicine being the same for everyone or reasoning for large groups of*

individuals. The advent of digital health offers a great opportunity for personalization: the great availability of data offers the possibility of adopting a series of solutions to the needs of the individual. Because our health is individually variable, we expect this personalization of medicine, treatments, and care will yield great results". Ascione says, "The medicine of the future is patient-centered, and digital will be the tool that connects the hospital with the territory and the patient; all of these digital systems will interact to give the best kind of care to the specific patient".

"People at the center" is also a mantra within the organization when it comes to employees. In addition, all divisions are continuously linked thanks to integrated technologies; they better connect different departments, functions and tasks, requiring greater collaboration among employees and an open mind in integrating external insights from the market or stakeholder network.

In addition, the Group promotes continuous exchange among employees around the world, believing that different backgrounds and perspectives can create fertile ground for innovation and continuous improvement. The Digital Health Academy involves employees and external stakeholders to this end. Technology facilitates proximity, exchange and aligns goals.

5. Discussion and propositions

A large portion of the existing literature reports TQS as a peculiarity of TQM practices. This study provides further evidence of the need to revise existing models to develop one that is entirely dedicated to service distinctiveness. More specifically, we believe that due to the pervasiveness of digitization, academics cannot overlook the effect of digital tools in service and total quality practices. Although we developed the concept of TQS in the digital age through theoretical speculation, the selected case study provides illustrations and extends the understanding of critical aspects of TQS. Indeed, the results lead to developing a set of research propositions that represent the main evolutions of the TQS concept in digital-based service companies. A new TQS should rise to the business challenges of the digital age. Digitization offers real opportunities for businesses to get closer with consumers and employees, so it can be understood as a driver for consolidating and routinizing TQS practices. Digitization supports companies in operationalizing customer focus, engagement and continuous improvement. However, the consumer-business proximity induced by digitization must be managed to avoid falling into organizational chaos.

Theoretical speculations, as well as the illustrative case study, reveals that TQS goals do not undergo any change in the digital era; they are only enriched with tools that support companies in maintaining the process of quality service delivery (Stamatis, 2018). For example, the case of Healthware illustrates that customers and employees of a digital company are better tracked in terms of their commitment to quality. Through digital tools, they help maintain and update the continuous co-design of the health service through a cohesive journey into the future of health care.

In addition, Healthware simultaneously takes a consumer and employee-centric perspective to ensure continuous improvement in healthcare services. Continuous improvement is an established practice within the company. Through this practice, it is possible, strategically (Bessant *et al.*, 2001; Audretsch *et al.*, 2011) to incorporate sustainable small-step improvements through active participation of people (Anand *et al.*, 2009; Berger, 1996) and to fix a culture of organizational learning in which new knowledge is created, acquired and applied (Martinez-Costa and Jimenez-Jimenez, 2008; Bessant *et al.*, 2001).

However, while the goals of TQS are validated and reinforced by evidence from digitally based service firms, intriguing propositions emerge that look at specific elements of the TQS model. The propositions address seven of the key levers of a TQS model: impetus, HRM

system, service culture, technical system and I&A system, servicescapes, social responsibility and networking.

The first proposition concerns impetus understood as the leadership and commitment of top management. Theory (Sony *et al.*, 2020) and practices suggest that leadership goes beyond the transactional leadership style (which focuses on supervision, organization and team performance) and emphasizes that people work more effectively if they have a sense of mission. To date, digital services companies require a transformational leadership style, perfectly embodied by Roberto Ascione. This type of leadership trait has a collective purpose, a vision that encompasses everyone's aspirations. Ascione is a manager who has a vision and is committed to pursuing it; this can empower others and motivate performance beyond expectations.

Furthermore, this style is also typical of healthcare professionals, as Al-Sawai (2013) points out. Abundant evidence from Healthware and HBA EU suggests that women are more likely to be transformational leaders. A critical mass of women in leadership roles positively influences organizational excellence and profitability. In fact, Healthware is offering a dedicated course for women to ensure transformational leadership in the future for healthcare and other service client companies.

P1. Transformational and transactional leadership fosters TQS practices in digital environments.

Another source of success in achieving high service quality is human resource management, specifically empowerment (Jamkhaneh *et al.*, 2021) or continuous empowerment of employees and workers. Healthware empowers its employees by adopting an inclusive approach, investing in activities and routines based on capacity building, organizational learning, community knowledge and community ownership. These practices impact the quality of healthcare service mostly dependent on human resources. In addition, continuous empowerment may affect service culture. Healthware shows how continuous empowerment should represent a state of mind or attitude shared by all organization members instead of a set of rigid rules, policies, procedures or practices. The advantage of the continuous empowerment approach is that it becomes a piece of corporate culture, so empowerment becomes a state of mind for the organization. In service organizations, empowerment should be based on creating a sense of ownership of the service culture. In fact, Healthware plans a monthly meeting where employees come together, during which roles are explained in detail, best practices are shared and success stories are told to enhance this sense of attachment. Therefore, we develop the following propositions:

P2. Continuous empowerment is a condition for stimulating TQS in digital environments.

P2.1. Continuous empowerment affects service culture.

At the same time, the focus on service quality, in this case, creates empowerment. As a result, the service environment is more stimulated toward quality practices, transforming total quality as a basic condition for continuous empowerment. Thus, the proposition is:

P2.2. TQS is a condition for continuous empowerment.

Effective quality management relies on the appropriate dissemination of general information. Information dissemination in the digital enterprise depends on the structure of technical systems. Specialized information systems support the dissemination of information within Healthware in different areas and across different Healthware subsidiaries. The company leverages digital tools and organizational structure to ensure quality of service and process design for all customers and stakeholders involved in its network.

In a TQS environment, people must communicate across organizational levels, functions, product lines, and locations to solve current problems, avoid new ones, and implement change. In a digital TQS, communication is aided by technical systems that provide tools to collect and analyze information from different areas. This keeps the company constantly connected with customers and stakeholders, and employees.

P3. Technical systems and information and analysis systems are closely related to ensure a TQS.

The digital enterprise necessarily extends the servicescape into a virtual and digital world. In some cases, companies move their product and services entirely into the digital environment; in other cases, they adopt a hybrid place. Since the servicescape is an essential factor in customers' perception of value (Tankovic and Benazic, 2018; Ballantyne and Nilsson, 2017), total quality should also be pursued in digital environments. Healthware provides a clear example of careful digital, physical space management.

P4. The intangible and virtual elements of servicescape affect TQS, as well as the tangible element.

Customer focus, accountability, commitment and continuous improvement analysis system are deeply imbued with social responsibility. In a hyperconnected services company, the concept of social responsibility related to transparency, data ethics and social innovation is inevitably included. Healthware bases its service on adopting digital health solutions and tools such as sensors, apps and wearable devices to monitor biometric parameters continuously. Also, virtual assistants equipped with artificial intelligence that communicate with the patient, digital platforms and services for remote medical assistance, algorithms that generates physiological and behavioral biomarkers. Therefore, the quality of services is measured by data transparency and ethics in the use and treatment of data.

In addition, Healthware offers an example of how the digitization of some services, such as health services, can achieve social innovation. Through digitalization Healthware aspires to offer health services to everyone or for large groups of individuals. Digitalization increases the number of people accessing health services. For instance, Digital Health Solutions also allow patients to be involved in prevention before treatment. Such solutions will reduce patient visits to the hospital, and enable targeted and personalized care, but above contribute to social innovation by decreasing the cost of treatment and allowing the health system to be more humane and accessible to all.

P5. Social responsibility for TQS includes social innovation and data transparency and ethics.

P5.1. Public digital services companies improve TQS by leveraging social innovation.

Quality practices, according to Healthware, are rooted in the power of relationships, of connections between actors working from different perspectives to achieve common goals. Therefore industry relations are only a piece of a wide network of actors that contribute to improving the quality of healthcare services. Networks are effective strategic devices that support firms in managing the opportunity exploitation process (Foss *et al.*, 2013) and innovation (Demirkan and Demirkan, 2012). However, to reach a consistent quality of service, the network needs accurate management and accurate comprehension of competitive dynamics that the network might open. According to Dagnino *et al.* (2021), the entry of new players transforms the firms' environment into a hypercompetitive environment with a dynamic and interactive rivalry that may induce negative consequences in terms of volatility of performance, market share erosion and industry leader dethronement. Since the healthcare industry has become increasingly hypercompetitive, healthcare firms should be more aware

about network risk and opportunity. The network should be intended as a dynamic and heterogeneous configuration of partners that might lead company to gain or lost advantages, as well as quality levels.

P6. Networking rather than industry relations is a component of TQS for digital services companies.

6. Conclusions

Digitization creates unique circumstances for managing the quality of products and services (Sony *et al.*, 2020; Gunasekaran *et al.*, 2019); however, the literature on TQS, and TQM more generally, lacks contributions in exploring the effects of digitization on quality practices. We fill this gap by paying attention to TQS practices and discussing TQS in digital-based service firms. The paper contributes by providing an update of the holistic TQS model (Sureshchandar *et al.*, 2001a, b) by envisioning the application of quality practices in a digital environment. More specifically, our conceptual approach discusses changes in five primary areas of quality management: servicescapes, labor relations, impetus, HRM systems and union intervention.

For these reasons, the configuration of TQS practices varies, enriching itself with additional elements, not transforming itself completely. In fact, these elements acquire greater value precisely because they reflect the peculiarities of a service business in the digital age. Therefore, we provide a model that brings out these elements. In five main areas, changes have occurred: *union intervention* becomes *network relations*; *servicescapes* that is enriched with *intangible* and *virtual* elements; *HRM system* that is now strictly linked to *service culture*; *impetus* that requires a new form of leadership. In addition, *social responsibility* acquires a very important role in the renewed configuration of TQS practices. These new “weights” are illustrated in Figure 3.

Due to digitization, the servicescapes is enriched with intangible/virtual elements that characterize service environments. These elements should be considered in total quality

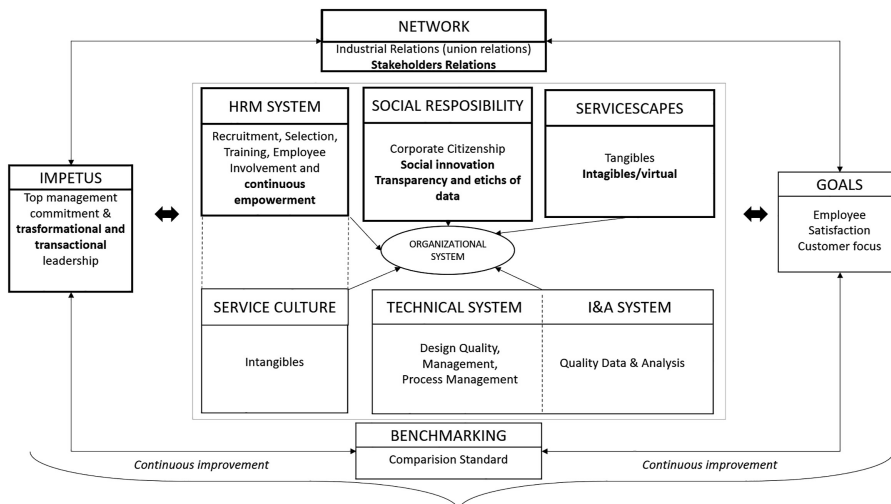


Figure 3. The empirical model of TQS in digital era

Source(s): Our elaboration

practices. The union relationship is replaced by a network dimension that considers the network of stakeholders and the ecosystem of services. Thus, quality can be measured against the entire network and not just a specific relationship such as the union relationship. The discussion about the impetus reflects a new style of leadership that is more transformational and transactional. HRM systems emphasize continuous employee empowerment that characterizes training practices in digital organizations. It is tightly linked to service culture through continuous empowerment that becomes a state of mind for the organization, creating a sense of ownership of the service culture. Moreover, in a digitized environment (as it acquires more and more intangible characteristics), creating a more empowered service culture is even more critical. In fact, a change in organizational culture is the primary motivation through which total quality practices become a norm and are successful (Schein, 2010).

Technical systems are embedded in the organization with information and analytics (the line between the two is blurred) that are prerequisites for digital service innovation. In addition, the case study evidence shows an interesting contribution in social responsibility. The literature did not provide theoretical assumptions of these elements.

However, the illustrative case study presents insights into the practices of data ethics, transparency and focus on leveraging digitization to deploy services and innovation in a social context. In addition, the findings also suggest that (1) a digitized environment implies and encompasses some of the total quality practices that are already understood as routine for the organization and (2) service innovation is closely linked to TQS practices.

The article has some limitations regarding the approach of a single case study with secondary data and the field investigated. Indeed, although the single case delves into some aspects, it is not exhaustive to fully explore our research question. At the same time, Healthware's specialization in the healthcare industry may overlook other discussions of TQS in the digital age. However, the article represents the first attempt to model the practice of TQS in the digital age.

Non-trivial theoretical and managerial implications indeed flow from the article. We broaden the body of knowledge on TQS and open a discussion on an integrated topic: digitization and total quality. At the same time, we offer managers of digital companies tools to guide their quality practices, inviting them to make an effort to identify more appropriate metrics. This model can be used effectively to visualize the different levers that successful implementation of TQS in digital-based service companies can rely on. This is even more true because many companies today are born digital and lose all tangible characteristics over time. This tool can be used by management as an exercise in reflection and exchange between all levels of the organization, as when to "unearth" the value of a business model, you practice and experiment through the business model canvas.

Policymakers can pay attention to the new challenges and opportunities that digitization offers by adapting and updating quality protocols.

6.1 Future research

Scholars may extend the proposed model or validate the propositions in other service industries. Future research could develop a system that quantitatively analyzes the weight of each of the TQS levers in order to provide the company with a measure of the levels of implementation of each. In this way, the organization could keep track of how to continuously improve quality by taking action through targeted actions.

The model can also be extended into a servitization environment, where TQS and TQM must be blended to provide a clear view of a total quality process. The theoretical and illustrative interpretations of this leverage lead us to develop hypotheses that must be tested to validate our conceptual model.

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