*Article*

# Sustainability, TQM and Value Co-Creation Processes: The Role of Critical Success Factors

**Barbara Aquilani \*, Cecilia Silvestri and Alessandro Ruggieri**

Department of Economics and Management, University of "Tuscia" of Viterbo, Viterbo 01100, Italy;
c.silvestri@unitus.it (C.S.); ruggieri@unitus.it (A.R.)
\* Correspondence: b.aquilani@unitus.it; Tel.: +39-761-357-729

**Abstract:** Sustainability views firm success and the welfare-wellbeing of societies in which they develop as closely inter-related. Value co-creation assumes that firms create value not only for themselves, but also for all actors willing to participate in co-creation processes, as well as for the whole ecosystem in which they operate. Thus, co-creation can sustain social development and sustainability. However, to ensure sustainability through value co-creation processes, TQM principles must be followed and Critical Success Factors (CSFs) reinterpreted following this perspective. In this important, but understudied context, the aim of the paper is to focus on value co-creation processes fostering sustainability, identifying which CSFs are most suitable to best support each phase of these processes. The paper is based on a review of the literature and bridges sustainability, value co-creation, TQM, EM and IMS literature for the first time, proposing a new model of value co-creation processes, which considers it a never ending cycle. The proposed model presents and discusses, for the first time, the most important CSFs to foster sustainability and opens the discussion on how to re-interpret quality principles, which must also be followed in value co-creation processes.

**Keywords:** sustainability; value co-creation; Critical Success Factors (CSFs); Total Quality Management (TQM); Environmental Management (EM); Integrated Management Systems (IMS); co-creation process

## 1. Introduction

"Sustainability may [...] be defined as maintaining well-being over a long, perhaps even an indefinite period" [1] (p. 3441) and is widely considered one of the most important factors in determining firm growth and development [2].

Co-creation has been studied following different perspectives as one of the most "ill-defined and elusively used" terms as stated by Grönroos [3] (p. 1521); [4], and scholars have already focused on similarities and differences among the various perspectives proposed [5–7].

Among them, the most suited approach, in light of the present study, is the value co-creation approach [8] following a strategic perspective, in that it proposes as TQM and sustainability a full new philosophy of doing business and not just a different way of collaboratively creating new product offerings, as for example the service-dominant logic developed in the marketing domain (see, for example, [9–11]).

Co-creation, following this approach, can be defined as the "joint creation and evolution of value with stakeholding individuals" and is the most wide-spread and recently discussed approach to firm value creation, assuming that value can no longer be created only within firms, but must be generated with partners and, especially in the long run, with customers [8] (p. 14).

Value co-creation as intended above and sustainability share a new view of the key role of the firm in its operating context, towards a lasting expansion of wealth-welfare-wellbeing within the society in

which it operates, which is really important when assuming that social and economic aspects cannot be separated because they "in reality are one and the same" [1] (p. 3436).

In fact, the co-creation approach assumes that "co-creatively leveraging all stakeholder capabilities in meshworks of social, business, civic, and natural communities can lead to better states of governance, infrastructure, development, and sustainability, with 'win more-win more' outcomes and expansion of wealth-welfare-wellbeing all around" [8] (p. 31).

Nonetheless, the link between sustainability and value co-creation following a strategic perspective has been completely ignored until now in the literature as the question about how value co-creation processes could foster sustainability.

In fact, value co-creation process studies are at an early stage [12], and in the literature, no study has considered that to fully understand how to build and run co-creation processes, "traditional quality management principles" must be considered because they "do not go away" in firms willing to adopt co-creation, they just need to be reinterpreted to ensure "the quality of fulfilled experiences" [8] (pp. 161–162).

Indeed, this paper aims at taking a first step towards the reinterpretation of traditional quality management principles, bridging the sustainability, value co-creation and TQM literature, identifying which Critical Success Factors (CSFs) are more likely to ensure the quality of experiences made in each phase of the value co-creation process to foster sustainability.

In particular, the paper will build the first value co-creation process model able to foster sustainability, identifying which CFSs are necessary in each of its steps.

Indeed, in previous literature, none of the value co-creation process models proposed encompassed CSFs, in particular, or TQM issues, in general, nor were these same models linked in any way to sustainability and its requirements. Therefore, this can be recognized as the main contribution of this paper, grounded on the fact that this issue deserves some more attention in that it is important not only in the value co-creation approach, as claimed by Ramaswamy and Ozcan [8], but also in the sustainability domain where scholars recently suggested that "an increase of appropriate sustainability efforts often requires expanding beyond conventional thinking" [13]. The present study will follow this suggestion while considering, together with sustainability and value co-creation, the literature pertaining to CSFs of the TQM, Environmental Management (EM) and Integrated Management System (IMS) research domains.

This has been performed thanks to two main methodological steps. The first one, encompassed in the literature review section, made it possible to conduct a literature review divided into three subsections regarding: (a) the CSFs of the TQM literature, retrieving and discussing the four literature reviews already published [14–17]; (b) the CSFs of EM, common to EM and TQM and, finally, those important for IMS implementation, retrieving papers from two databases; (c) value co-creation and its relationship with sustainability, replicating the same methodology of Point b.

The second step, considering that CSFs in value co-creation processes have not yet been studied [8] and also that the co-creation process literature is at an early stage [12], explains how the value co-creation process proposed has been built, starting from an already existing process model issued in another context and adapted through the previous literature review, following both the theoretical approach embraced and the paper aim.

Therefore, the paper starts with the literature review, followed by the methodology section, and encompasses first the discussion of the proposed model and then the conclusion, which highlights the major contributions of the paper, as well as its theoretical and managerial implications. The concluding remarks also encompass both limitations and future avenues of research.

## 2. CSFs of TQM

CSFs can be understood as "those circumstances or practices which already exist, or those that need to be developed in ensuring the success of TQM implementation" [18] (p. 805). Wali, Deshmukh and Gupta [19] (p. 4) described them as "the select few overarching requirements that must be

present for an organization to be able to attain its vision, and to be guided towards its vision". More recently, CSFs have been defined as "best practices, enablers or keys, which drive a company's success" [17] (p. 6255).

Over time, quite a number of papers have been published analyzing CSFs of TQM under different aspects (i.e., [18–24]), and also, four different literature reviews have been issued with the aim of mapping the state-of-the-art of this subject. Looking at the latter, Karuppusami and Gandhinathan [14] identify 56 CSFs, but through the "Pareto analysis", they find that only 14 CSFs are really important for the implementation of TQM. Sila and Ebrahimpour [15] initially identify 25 CSFs, which have then been revised as only 11 [16], and Hietschold et al. [17], through a systematic literature review, identify 11 CSFs, which are considered the only really important ones in the implementation of TQM. The aim of this paper is not that of a new literature review, and it will consider, as a starting point for its development, the CSFs common to at least two of the four literature reviews considered to identify the most important CSFs of TQM, which are briefly described in Table 1.

**Table 1.** Common CSFs of TQM in literature reviews.

| CSF | Definition |
| --- | --- |
| 1. Top Management commitment and leadership | "Top management leadership is the degree of which top management sets up QM objectives and strategies, provides and allocates necessary resources, contributes in quality improvement efforts, and assesses QM implementation and performance" [25]; [26] (p. 11029). |
| 2. Process management | Process-oriented instead of result-oriented management approach [17]. |
| 3. Customer focus and satisfaction | The goal is to identify and meet current and emerging customer needs [17]. |
| 4. Supplier partnership | Entails working together toward a common aim and is based on the premise that each party can gain more through cooperation [27]. |
| 5. Human resource management | This CSF includes factors such as training, employee involvement and teamwork [16]. |
| 6. Information/analysis/data | Enables the evaluation of the product/service quality through measurement tools and methods before and after improvement activities [17]. |
| 7. Culture and communication | "Strong quality orientation accelerated the spread of the quality philosophy through the organisation". Communication between employees, suppliers and customers is very important for the success of TQM [17] (p. 6263). |
| 8. Strategic quality planning | "Companies have to integrate quality in the organisational strategy to achieve consistent and lasting excellence" [17] (p. 6263); [28]. |
| 9. Just-in-time (JIT) | "JIT is a management philosophy that strives to eliminate sources of manufacturing waste by producing the right parts in the right place at the right time" [29] (p. 396). |
| 10. Role of quality department | This CSF refers to quality assurance, quality continuous improvement and quality system improvement [14]. |
| 11. Benchmarking | "Benchmarking describes the analysis of best practices of leading competitors in the same branch in which the organization operates or in other branches using similar processes" [17] (p. 6263). |
| 12. Continuous improvement | Continuous improvement is a management philosophy based on "continuous improvement in performance, cost and quality. Kaizen (or continuous improvement) strives to empower the workers, increase worker satisfaction, facilitates a sense of accomplishment, thereby creating a pride of work" [30] (p. 51). |
| 13. Design and conformance | Is the ability to make new products compliant with client expectations [14]. |
| 14. Social and environmental responsibility or environmental focus | "Includes the organisation's responsibility for good public citizenship and the protection of the environment and people's health as well as resource conservation" [17] (p. 6264). |
| 15. QFD | QFD is a quality tool that translates customer needs into technical characteristics [31]. |

Source: our elaboration.

CSFs have been studied not only in TQM as a whole, but have also been analyzed in the sustainability domain and, in more detail, in EM, at the interface of EM and TQM, as well as in IMS.

## 3. Sustainability, TQM, EM, IMS and Their CSFs

### 3.1. Sustainability and Its Relationship with TQM

Sustainability has gained momentum over the last fifteen years and is still a prominent issue in the management literature. The importance of removing all trade-offs between business and society is widely recognized and shared by scholars and practitioners, as well as their inseparable interplay. Sustainability can be loosely defined "as a state of affairs where the sum of natural and man-made resources remains at least constant for the foreseeable future, in order that the well-being of future generations does not decline" [1] (p. 3442). In this domain, it has been clarified that "corporate sustainability is achieved at the intersection of economic development, environmental protection and social responsibility" [32] (p. 2834); [33,34]. In this context, it is clear that firms have the "ability to produce" within the whole economy, and sustainability must be integrated in business management to achieve sustainable development within society [33] (p. 124).

In other words, the firm's competitive advantage and the health of communities in which it operates are closely inter-related [35,36]. Obviously, this possible integration is challenging and requires not only firm willingness to embrace sustainability, but also some firm paradigms, management philosophy, processes and tools able to effectively support firms in implementing this new approach.

Obviously, among these, we find TQM with its CSFs.

In order to study more in-depth this issue not covered by previous literature reviews as for the CSFs of TQM presented above, the authors used two databases (Scopus and ScienceDirect) and a combination of keywords. The results of this research are presented in Appendix A, Table A1. Starting from these identified papers, also a check of the references provided in them has been done to make sure all relevant papers were considered.

Indeed, important similarities affect sustainability and TQM, above all regarding philosophies and applied practices as highlighted by some authors [37–40]. Both sustainability and TQM are based on preventive and proactive approaches that aim to achieve long-term goals and maintain performance achievements.

At an operational level, in order to guarantee the real governing of their processes, both these philosophies have developed technical and organizational tools to be implemented, such as: (1) continuous improvement; (2) zero defects; (3) life cycle assessment; (4) waste reduction; and (5) employee involvement and training [41–44].

Apart from the common traits just mentioned, a tight relationship exists between sustainability and TQM. According to Isaksson [45] "TQM as a management system could be expanded to include components of Sustainability Development" (p. 633), identifying "process management" as the most suitable tool, not only for improving the economic firm performance, but also its environmental and social performance. Sharing this view, Todorut [46] has proposed a conceptual model of sustainable development that combines TQM and "Strategic Management principles", stating that a complex management system based on TQM principles would favor firm excellence in embracing the sustainable development approach. This author also states that, in this knowledge-based age, a sustainable organization "is an always learning organization that constantly adapts to environmental changes, which adopts a modern leadership and tends to be a priority for present and future" (p. 930).

In this same vein, Zink [47] suggests that "old" quality-oriented approaches, like the TQM and European Excellence Model, could play an important role in the firm's change towards corporate sustainability because they help create congruent goals and remove conflicts concerning objectives of economic, environmental and social issues. In particular, according to Edgeman's [48] theory, where excellence for sustainable development can be built on the triangle "person-organisation-society", Zink [47] highlighted TQM principles (i.e., leadership, continuous improvement) that can easily be

declined in this theoretical framework, stating that excellence models are valuable tools to transfer the concept of corporate sustainability into practice.

Garware and Isaksson [49], also building on Edgeman's [48] theory, asserted that the TQM approach, integrated with EM, can contribute to strong sustainability through the principles of customer satisfaction, typical of TQM philosophy, and continuous improvement, characterizing EM.

Indeed, over fifteen years ago, Mehra, Hoffman and Sirias [50], envisaging future TQM as a management strategy, had clearly identified, besides "process focus", the "innovation focus" in terms of perpetual growth and knowledge creation at various levels, the future importance of both partnership with customers and information, which would lead to "managing change with quality" in the domain of "customer focus" (p. 868) and "environmental focus", to be intended as "a three-dimensional focus comprising government regulations, social/ethical issues, and market dynamics" (p. 870).

Clearly, apart from some CSFs of TQM already mentioned and "naturally" linked to sustainability (see Appendix A, Table A2), the literature often refers to environmental sustainability as a key antecedent of sustainability.

Indeed, in the environmental domain, CFSs have already been studied focusing, on the one hand, on EM and, on the other, on the connection with TQM. Unfortunately only a few papers focus on the CSFs of IMS able to support sustainability as a whole. These studies will be reviewed briefly below, in order to create a list of the most important CSFs that foster sustainability.

### 3.2. CSFs of Environmental Management

Environmental sustainability in firms is achieved through EM, in that it implicates a series of significant events in the sustainability arena [51], and it "could provide an overall system perspective to deal with environmental issues" [52] (p. 15344); [53]. EM practices could be defined as a combination of organizational activities aimed at "improving environmental performance, including improving efficiency, shortening response time, cutting down energy consumption, reducing waste and toxic material usage" [52] (p. 15344–15345); [54].

To study this issue, the authors followed the same methodology explained in the above sub-section, and the search results are presented in Appendix B, Table B1.

Looking to the retrieved paper, it is clear that some authors have studied CSFs for the adoption and maintenance of EM systems. Indeed, Soo Wee and Quazi [55] developed and validated a set of critical EM factors to support managers, in order to audit and improve their practices in this domain. Identified CSFs were: top management commitment to EM, total involvement of employees, training, green product/process design, supplier management, measurement and information management. Zutshi and Sohal [56] discuss CSFs for the successful implementation and maintenance of EM systems, identifying "four broad headings" (p. 401), namely management leadership and support, learning and training, internal analysis and sustainability, arguing that they are general in nature and therefore able to be implemented in any organization, regardless of its size, sector or the nature of the business. Sambasivan and Fei [57] identified four CSFs for the successful implementation of ISO 14001 and EM systems, developing the study in Malaysia among electrical and electronics sector companies. The results of their study demonstrated that the CSFs in order of importance were: (1) management approach (top management commitment and support, environmental policies and objectives, management reviews); (2) organizational change (training and awareness, documentation and control, emergency response and preparedness, communication); (3) technical aspects (production process enhancement, monitoring and measuring equipment, environmental specialist assistance); and (4) external and social aspects (market pressure, government policies and legislation, customer requirements, employee relations). Tung et al. [58] proposed a model to examine the relationship between some CSFs, namely top management support, training and "Link of Performance to Rewards" and EM effectiveness, demonstrating that "organizations need to provide higher levels of top management support, training and align rewards with environmental performance to achieve the effectiveness of environmental management processes, and in turn improve environmental

performance" (p.193). Finally, Yang et al. [52] suggest that EM practices could also have a positive effect on technological innovation performance, through the moderating effect of supply chain integration.

Looking to the CSFs studied in the EM domain (see Appendix B, Table B2), it appears clear that top management and employee training are the most considered factors able to support EM implementation.

*3.3. CSFs Common to EM and TQM*

Environment sustainability and TQM are linked two-fold. EM practices to support environment sustainability include, among others, TQM as stated by Garrod and Chadwick [59], Theyel [60] and Yang et al. [52]. Besides this, Pipatprapa et al. [61] more recently showed that quality management has a significantly positive effect on environmental performance. Therefore, in order to become effective, the EM system should be part of an IMS and must belong to a wider strategy, which should include TQM [62,63].

When TQM is integrated into EM, some benefits like: "an improvement in the efficiency and effectiveness of the organization [...], a reduction in bureaucracy [...], the alignment of goals, processes and resources; a reduction in the costs of internal and external audits; and the availability of joint training and improved communication between all organizational levels" emerge [63] (p. 212), as already highlighted in the literature (i.e., [56,64,65]). According to Klassen and McLaughlin [66], firms that have adopted a TQM approach achieve higher performances in EM than those that implement EM without TQM. For this reason, some authors have suggested that TQM should be a pre-requisite for the successful implementation of EM [40–42].

The link between TQM and EM has also lead to the TQEM (Total Quality Environmental Management) literature from the seminal work of Borri and Boccaletti [37], which identified customer satisfaction/customer focus (internal/external), employee empowerment, management commitment, fact-based decision making, continuous improvement, prevention, audit, supplier partnership as common between quality and EM. In this same domain, Curkovic et al. [38,42] studying manufacturing systems identified seven CSFs, namely: leadership, strategic planning, customer and market focus, information and analysis, human resource management, process management, business result. Molina-Azorín et al. [67], focusing on issues of integration between TQM and EM, identified in the following CSFs the key dimensions for successful implementation of QEM (Quality Environmental Management): people management, information and analysis, customer focus, leadership, process management, supplier management, planning, product design. More recently, Saad et al. [44] have developed a study in the Libyan food industry in order to identify the CSFs able to support firms in improving the efficiency level of an integrated system developed considering both TQM and EM. They suggest focusing on customer satisfaction/customer focus, human resource management, culture and communication, to develop modern managerial techniques. In this same vein, Francis [68], focusing on Quality Function Deployment (QFD) suggested it as being at the very core "of a new model and framework for Environmentally Conscious TQM (ECTQM) where TQM is within design for environmental" (p. 351). de Bakker [69] assumes a different perspective from the above-mentioned one and focuses on the environmental sustainability of firm products, using insights from TQM. In developing POEM (Product-Oriented Environmental Management), the author creates a TQM matrix placing customer focus, continuous improvement and teamwork at its core, following Dean and Bowen's [70] view based on the assumption that these are the three core principles to the successful implementation of TQM.

Appendix C presents both the steps of the methodology used for the literature review concerning this sub-section (see Table C1) and the retrieved papers with the CSFs identified in each of them (see Table C2). Looking to the CSFs identified in this stream of literature, it is interesting to note that customer focus represents the CSF most discussed between TQM and EM. This could be linked to the relevance of satisfying the customer for TQM successful implementation and to the importance customers give even more today to environmental concerns.

*3.4. CSFs of Integrated Management Systems*

Based on the assumption that over time, firms have implemented different management systems increasing complexity and duplicating costs, some authors have highlighted how also integrating "managing the interdependence of quality, environmental and occupational health and safety management" could be a good solution [71] (p. 396). IMS have been defined as "a single integrated system used by an organisation to manage the totality of its processes, in order to meet the organisation's objectives and equitably satisfy the stakeholders" [72] (p. 3). Moreover, it has been pointed out that "the integration of various elements produces maximization of the qualities of each element with a score higher than that which is derived from the simple sum of the elements" [73] (p. 261). Benefits of such an integration are really relevant and range from reduction in documentation, reduction in time required for implementation, customer satisfaction to, for example, improvement of the company image and competitiveness, as highlighted in Khanna et al.'s [74] literature review, which also examines the motivation to adopt IMS.

Coming to CSFs, Zeng et al. [75], in analyzing how to effectively implement IMS, focus on some internal and external organizational factors, namely human resource, organizational structure, company culture, understanding and perception (internal), technical guidance, certification bodies, stakeholders and customers and the institutional environment (external). Following this approach, Samy et al. [76], focusing on the integration of management systems to enhance environmental performance and sustainable development, suggest focusing only on two key factors, namely culture (internal (organizational culture and climate) and external (culture of the society and country)) and process, intended as "a set of interdependent activities that has to be performed in light of achieving the objectives/goals of an organization" [76] (p. 989).

Looking at implementation experiences in the IMS domain, Mohammad et al. [77] and Khanna et al. [74] identified key factors as top management commitment, provision of resources, training, process control, documentation structure, continual improvement and focus on stakeholders.

Mohamad et al. [78] studying management system integration for organizational sustainability, identifies the following CSFs: "management commitment and leadership, resources management, focuses on stakeholders, education and training, performance measurement, systems and processes and continual improvement" (p. 1158). Almeida et al. [79] in exploring CSFs of the IMS, also focusing on both difficulties faced by firms in their implementation and resulting benefits, found that the key CSFs in this domain are top management involvement, human and financial resources availability and employee training.

Finally, Domingues et al. [80] review IMS from various perspectives and end up identifying only the audit function as fundamental for the effective implementation of IMS. Both the methodology used to perform the literature review of this subsection and the retrieved papers with the discussed CSFs in each of them can be found in Appendix D, respectively Tables D1 and D2.

Looking to the CSFs identified in the literature for IMS, it is clear that continuous improvement seems to play a crucial role in this domain. This can be due to the fact that an IMS greatly simplifies firm management, but needs continuous maintenance and improvement in order to successfully perform a set of interpedent activities, which change over time.

Figure 1 shows the results of the above literature review, performed at the intersection of TQM and the sustainability literature concerning CSFs.
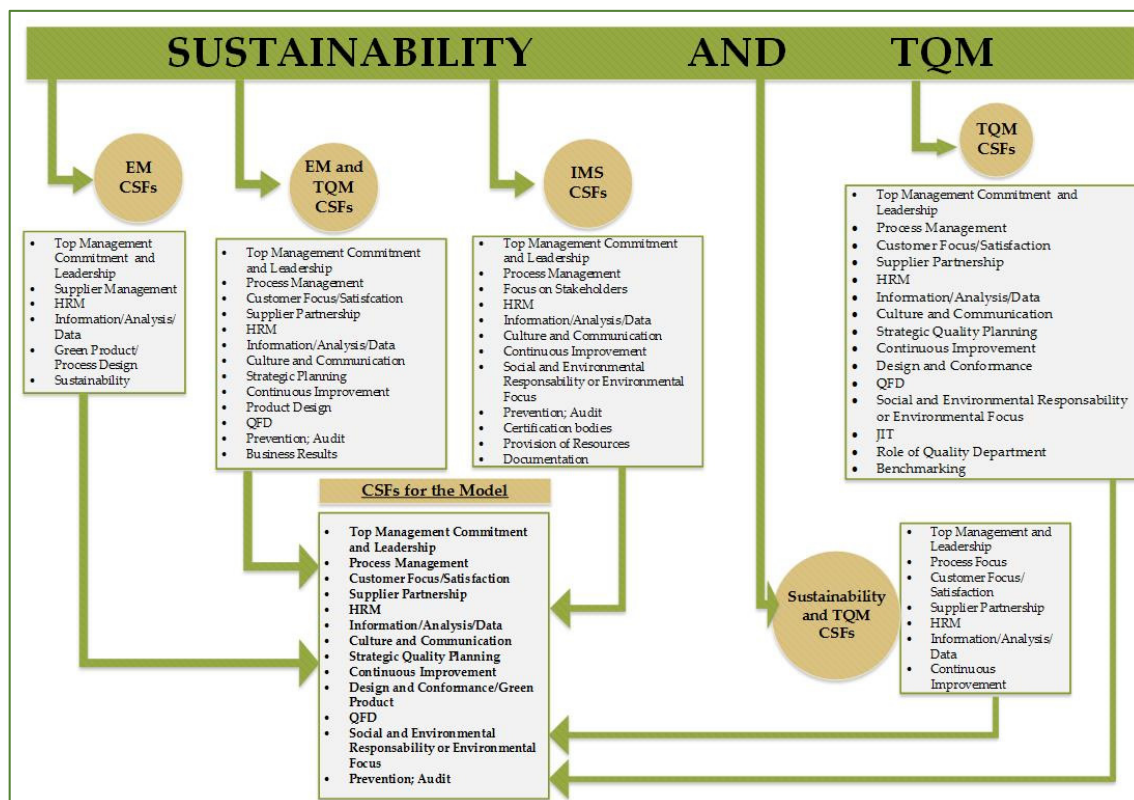
**Figure 1.** Most important CSFs at the interface between sustainability and TQM.

## 4. Value Co-Creation and Sustainability

The value co-creation approach can be summarized as follows: "the co-creation view starts with interactions as the locus of value and platforms of engagements with individuals are the locus of value creation, and co-creative enterprises follow a single principle: they focus their entire organization on the engagements with individuals" [81] (p. 11). This must to be understood as a "win more—win more" approach able to expand "wealth-welfare-wellbeing all around" in that "co-creatively leveraging all stakeholder capabilities in meshworks of social, business, civic, and natural communities can lead to better states of governance, infrastructure, development, and sustainability" [8] (p. 31).

In fact, co-creation, following a strategic perspective, can be understood in a lasting way as "the process by which mutual value is expanded together [...]" [82] (p. 195). Therefore, the value co-creation approach no longer applies to just new product development, but could concern managerial practices or even new goals to be achieved by the firm [8].

The relationship between value co-creation and sustainability as intended above is clear and, from another point of view, has recently also been highlighted by Arnold [83], whose paper aims at investigating the to-do combination between co-creation, following the user innovation [84–86] and the service-dominant logic [9] perspectives, and relationship management to foster sustainability. In the present study, only the value co-creation approach will be considered, while sharing with Arnold [83] two beliefs: (i) "co-creation can be a possible way to develop new sustainability innovations and introduce into the market successfully" (p. 2) or rather, "interactions among people inside and outside the firm became the connective tissue where new insights, learning, and innovation were generated" [87] (p. 5); (ii) co-creation changes firm perspectives on value creation, considering that value can no longer be created only by firms, but should be shared between partners participating in its creation and with society in general [88]. These two basic aspects are able to bridge value co-creation and sustainability studies, in that the first enables the co-creation of value, or rather, of values to be shared among different stakeholders/actors, also on their behalf, and that of the entire society.

According to Denning [89], these values would be able to enhance firm growth, as well as that of the ecosystems in which it operates through "radical transparency, continuous improvement and sustainability" (p. 4), to be introduced in the value co-creation processes.

Unfortunately, value co-creation process studies are at an early stage [12] even though they are the necessary tools to co-create value and also the ones that must encompass the sustainable requirements necessary to co-create value and enhance values. As highlighted by Durugbo and Pawar [12], scholars have not concentrated on building and implementing co-creation processes able to provide radical transparency, continuous improvement and sustainability, even if their need is clear, and as highlighted by Ramaswamy and Ozcan [8] (pp. 161–162) by stating that: "traditional quality management principles do not go away"; they just need reinterpretation.

However, none of the co-creation models proposed in literature include TQM in general or CSFs of TQM, EM or IMS in any form, and the link between sustainability and value co-creation has been rather ignored.

With the aim of beginning to fill this gap in the literature, this paper considers the Durugbo and Pawar [12] model as a starting point to build a value co-creation process model and then discusses the CSFs to be introduced in it, as will be explained in the following section.

## 5. Method

The first step to build the proposed model is to recognize which are the most important CSFs to be included in it.

This has been achieved thanks to the literature review performed in Section 3 and identifying where sustainability, TQM, EM and IMS intersect, selecting those CSFs retrieved in at least two different streams of literature (see Figure 1).

The second step is to identify a process model already proposed to use as a starting point to build a new model. Unfortunately, a value co-creation process model in the value co-creation approach following a strategic perspective has not yet been created. Therefore, the Durugbo and Pawar [12] model has been used as a starting point, even if it is a co-creation model not considering the theoretical approach embraced in this paper. However, this model has been selected because it encompasses the so-called "existing value", the value already created by the firm, which plays a role in the following co-creation processes, which are long lasting, and because it focuses on the technique of co-creation and, thus, the tools used to involve customers. As a descriptive process model, it shows a high level of abstraction able to capture the basic logic of co-creation [12] in the customer-supplier-encounter relationship domain. Moreover, it is developed in a service context, which traditionally sees direct contact between employee and customer and is a basic assumption of the value co-creation approach following a strategic perspective that states "Employees First, Customers Second (EFCS)" [8] (p. 207).

The model used considers three building blocks ("co-creation involvement strategy", "co-creation technique selection" and "co-creation dialogue"), which the authors will combine with the individual experience space of the value co-creation approach and the role of engagement platforms which are the locus of value co-creation. The proposed model, unlike that of Durugbo and Pawar [12], also considers that "co-creation is both the means and the end, in a continuous cycle" [87] (p. 29), and therefore, the value captured by participating individuals would nurture the following co-creation processes in a never ending cycle.

## 6. Results and Discussion

### 6.1. A Process Model of Value Co-Creation

The proposed model (see Figure 2) starts by considering the three building blocks proposed by Durugbo and Pawar [12], but adds the insights peculiar to the value co-creation approach, like individuals, and not only suppliers and encounters or engagement platforms, where the "co-creation

dialogue" takes place and value co-creation among partners is achieved. Value co-created within a process is the starting point of the following process and becomes a never ending cycle.
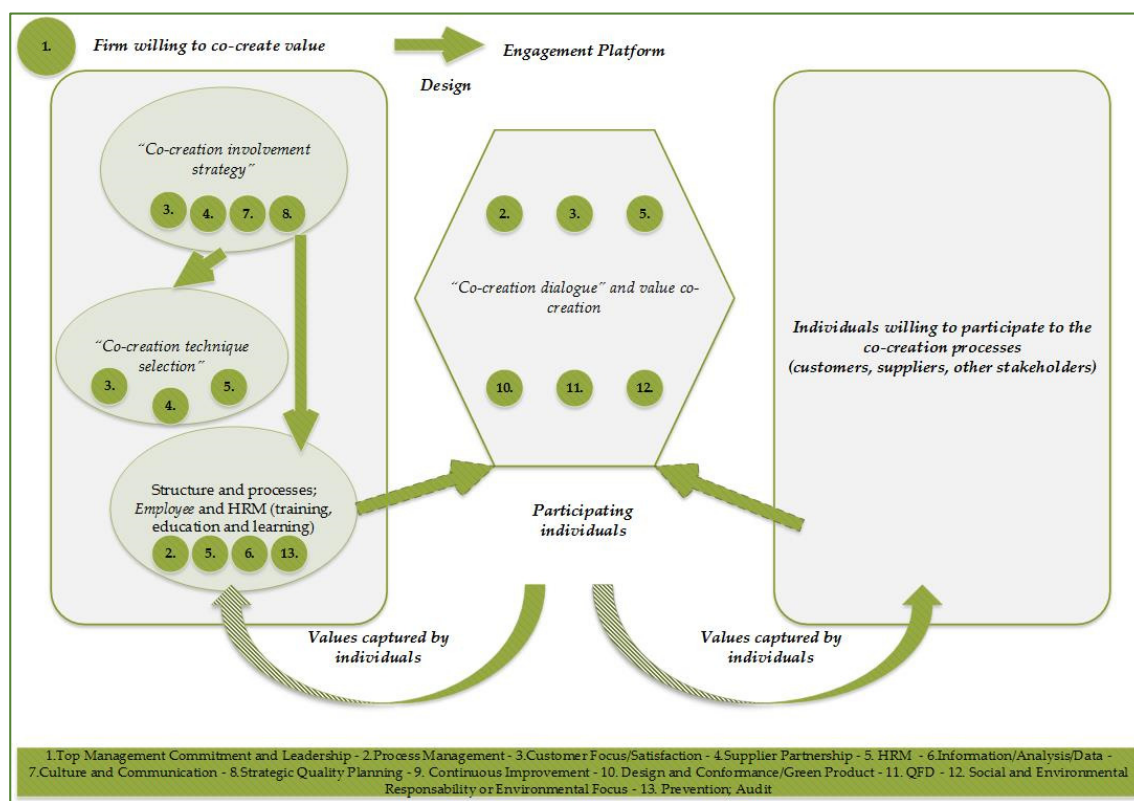


**Figure 2.** An integrated value co-creation process model.

The model is divided into three columns: the first one is dedicated to firms willing to embrace the value co-creation approach in which both the "co-creation involvement strategy" and "co-creation technique selection" building blocks of the Durugbo and Pawar [12] model have been included, together with the "structure and process, employee and HRM" block.

In point of fact, "co-creation involvement strategy" concerns the strategy to involve the right individuals who, for their part, are willing to collaborate in firm value co-creation activities. Obviously, it must be set as part of the whole firm strategy and fundamentally at its core, given that the firm's willingness to open its boundaries is a pre-requisite to embrace value co-creation. In this sense, the role of top management is really important in stating that the value co-creation approach will drive the entire activity (i.e., [8]). Nonetheless, it is clear that the "co-creation involvement strategy" could also be suggested and/or shaped by employees who directly collaborate with individuals outside the firm, in that the mind-set required to implement value co-creation throughout the entire organization is individual experience centric (i.e., [90,91]). In this domain, it is also important to point out that collaboration can lead to value co-creation, following the homonym approach, only if individuals outside the firm play active roles (i.e., [92,93]) since human experiences are the heart of value creation processes (i.e., [82,88,94,95]) and benefit from their collaboration in the value co-creation process carried out with the firm [5].

Linked two-fold with the "co-creation involvement strategy", in the left-hand part of Figure 1, the "co-creation technique selection" can also be found. This block considers that the most suitable co-creation technique must be chosen each time to achieve value co-creation with selected partners, bearing in mind that they must not only play active roles, but also obtain the expected benefits from their collaboration. In addition, in this context, employees directly involved in co-creation activities

with individuals outside the firm could play a role in suggesting what partners desire/expect/ would like to develop/have suggested, etc., to help top management co-create with them, adopting the most suitable technique on each occasion.

"Structure and processes, employee and HRM" is a new block, with respect to the building blocks proposed in the Durugbo and Pawar model. It considers that also the most suitable organizational structures, roles and processes must be put in place to allow the co-creation of value with individuals outside the firm. Just think about the new skills employees should have, or new employee roles created inside the organization, or at the intersection with the engagement platform, or the management of co-creation within the latter. Bearing in mind that co-creation can also involve shared norms and rules to co-create, employees should also be fully and effectively involved in these activities and skilled to do so.

The engagement platform has been placed in the central part of Figure 1, as it supports valuable and effective interactions among individuals [8]. Engagement platforms include persons, processes, interfaces and artifacts, which represent the infrastructure necessary for individuals to interact: they are "purposely designed as a system of engagements" [16] (p. 284). Clearly, "co-creation dialogue" can only develop and value co-creation can only be achieved within them; for this reason, they are also considered the "*locus* of value creation", as interactions are the "*locus* of value" [81] (p. 11). Engagement platforms are almost always created by firms, even though they can be modified through continuously developing interactions with individuals outside the firm, as value co-creation can also focus on these firm activities.

Value co-created within the engagement platform must be shared among participants, a concept made clear by the two curved arrows below the whole model, which, in the authors' view, can illustrate how this already co-created value is just a factor to be added to the next value co-creation process in "a continuous cycle" [87] (p. 29).

*6.2. CSFs in a Value Co-Creation Process Model towards Sustainability*

The discussion of the most important CSFs to be included in the co-creation model begins with the strategy and activities firms willing to co-create value must put in place.

As value co-creation is a new approach, it requires a new mind-set (i.e., [8,96,97]), embracing the new perspective of the human experience domain [8] as stated above. This requires a direct and strong commitment by top management, which should impress and communicate its willingness to shift to a new management approach. Therefore, top management must be fully committed towards these aims whilst showing a coherent leadership style [8], which will shape not only the "co-creation involvement strategy," but also firm "structures and processes" to effectively implement the new approach (CSF No. 1 in the model). Top management will also be involved in the "co-creation technique selection" in that it should allocate the most suitable resources to enable these processes and check their correspondence to its value co-creation goals. The role of top management and its leadership style is the most cited CSF and is recognized as essential in the sustainability, TQM and value co-creation literature.

Initially analyzing "co-creation involvement strategy", it must be said that, according to Durugbo and Pawar [12] (p. 4373), "products, services and experiences are developed jointly by companies and their customers through collaboration" and participation. The value co-creation approach considers that collaboration should be at an individual level, focusing on individual/human experiences [82], thus between peers. Indeed, it is essential that firms and their employees focus on customers/individuals. However "customer focus" is one of the key factors in implementing TQM and should be considered a strategic firm choice, in order to maintain competitive advantage over time. "Customer focus" (sometimes combined by some TQM authors with customer satisfaction (i.e., [98,99]; see below for the discussion on customer satisfaction) has therefore a meaningful impact on the "co-creation involvement strategy" to be designed and implemented by the firm, as well as on the "co-creation technique section" and in the "co-creation dialogue" blocks of the model (CSF No. 3

in the model). Indeed, the selection technique should be part of co-creation activities and therefore be designed by individuals participating in the process from both within the firm and outside it; as value co-creation is an activity among peers, also norms, rules and techniques should be shared. "Co-creation dialogue" is also shaped by the customer/individual focus of employees participating in the value co-creation process, in that individuals participating outside firm boundaries must have the opportunity to actively participate and receive the expected benefits for their collaboration; the basic assumption of the value co-creation approach.

These same thoughts, obviously, also apply to supplier partnership (CSF No. 4 in the model). The choice of partners in the supplier domain shapes the "co-creation involvement strategy", as well as the "co-creation technique selection", all participants being aware that collaborating will generate gains for both parties.

Culture and communication are really important for firms willing to implement value co-creation. Schein [100] defined organizational culture as a "pattern of shared basic assumptions that the group learned as it solved its problems of external adaptation and internal integration, that has worked well enough to be considered valid and, therefore, to be taught to new members as the correct way to perceive, think, and feel in relation to those problems" (p. 12). Several studies, in the literature on quality management have analyzed the concept of organizational culture, and Kanji and Yui [101] claim that "total quality management is the culture of an organization committed to customer satisfaction through continuous improvement" (p. 417). Company/internal culture has been recognized as one of the most important CSFs for the implementation of IMS to enhance environmental performance and sustainable development [76]. Cultural aspects are also really important in shaping "co-creation involvement strategy", as well as "co-creation dialogue"; openness for example, in the value co-creation domain, is responsible for enabling effective collaboration with partners [102] (CSF No. 7 in the model).

Communication tools allow the diffusion of organizational culture; therefore, this factor should also be considered among factors able to support effective co-creation participation and dialogue. In this domain, also the tools considered most useful for communication should be chosen by the firm to create the best "co-creation technique".

According to Juran [103] "strategic quality planning" is a systematic approach to set and achieve quality objectives throughout the company (p. 128). Quality should be understood as related to customer/individual needs and therefore encompass employees, customers and other individuals participating in the value co-creation process, given that they must work side-by-side continuously and is a focal point in the value co-creation approach, which can shape a more effective "co-creation involvement strategy" (CSF No. 8 in the model).

The willingness of individuals to co-create with firms surely depends on employee involvement, but only where continuous improvement impetus exists and is nurtured. Indeed, continuous improvement (CSF No. 9 in the model) enables involvement by everyone, managers and workers alike, in a cycle of continuous knowledge in order to generate excellence in firm activities and, as a consequence, also in value co-creation processes, not forgetting the "environmental focus" [50] (CSF No. 12 in the model). Moreover, according to Mehra et al. [50], firms "will have to plan perpetual growth processes based upon innovation, improvements, and knowledge creation" if they want to provide customer satisfaction (p. 870); a key issue in management and sustainability. Value co-creation participating customer/individual satisfaction is also a key factor in maintaining involvement nurtured by performing active roles and gaining some benefits, as well as enhancing "co-creation dialogue". Indeed, value co-creation generates customer satisfaction [104], or individual satisfaction, and is one of the key CSFs to generate firm competitive advantage, in that firm success depends on the ability to understand and satisfy the needs of customers and consumers [105,106], as well as all the other stakeholders as suggested by the literature on IMS [74,77]. Therefore, in the value co-creation approach, satisfaction should be reinterpreted so that firms nurture an "active and ongoing dialog [which] is about engaging customers[/individuals] on their terms and allowing them to co-construct the experience to suit their own context" [96] (p. 32).

For the "co-creation technique selection", apart from the CSFs already cited above, also Human Resource Management (HRM) must be considered relevant in that it is one of the few CSFs that is studied in all streams of the literature at the intersection of sustainability and TQM. In point of fact, HRM, as a whole, has been recognized as "vital for successful IMS implementation" (i.e., [74,77] (p. 1393)), even if it also encompasses some other CSFs, and from the literature review section above, it is clear how different authors have made a deeper analysis of some aspects of it instead of others (see Figure 1 and Appendixs A–D). For the paper aim, especially training, learning and education are of particular value. Indeed, the ability of employees to interact shapes co-creation activity and outcomes; therefore, firms must develop programs to train their employees to make interaction easy and effective for both customers/individuals and themselves. "Employee training and learning", following Kassicieh and Yourstone [107], should be considered as "a key to successful implementation of TQM along the dimensions of cost reduction and profit increase" (p. 36) (CSF No. 5 in the model). Moreover, having trained and therefore skilled employees enables effective communication, which is essential to carry on the "co-creation dialogue", as well as enhance "co-creation participation" between individuals internal/external to the firm. In point of fact, training and education, as well as communication must be considered jointly with the employee involvement strategy the firm must put in place to foster willingness to participate and co-create with customers. Employee involvement is critical to success in TQM implementation, in EM and at the interface between the two [108]. Indeed, it is necessary to ensure excellence for all quality dimensions, such as design, production, sale, delivery, after-the-sale, safety and security, as well as perceived quality [109]. According to Mehra et al. [50] "quality must become the responsibility of everyone in the organization in order to succeed in the marketplace" (p. 861) and, it can be added, in co-creating value. Therefore, employee involvement has a meaningful impact on helping top management select and shape the most suitable co-creation technique on each occasion and is essential for an effective "co-creation dialogue" to co-create value/values.

HRM has been mentioned in the "co-creation technique selection", but must also be considered part of the internal features of the organization in which only firm structures and processes must be put in place to implement its strategy and have not as yet been discussed.

Coming to "structure and processes", the first important CSF is "process management". Process management can be defined as a set of behavioral and systematic principles essential for quality management itself. This CSF is more about processes than results [110,111] and encompasses tools through which firms can promote and encourage innovation and creativity, giving rise to continuous improvement [112]. The process management approach allows easy communication inside and outside firms and helps to run effective "co-creation dialogue" and co-create value (CSF No. 2 in the model).

"Information/analysis/data" CSF are critical because firms must monitor their activities, measuring quality before and after improvement activities. In the value co-creation domain, the measurement issue is at an early stage, and few papers have created and validated DART (Dialogue, Access, Risk, Transparency) measurement scales either partially or as a whole (i.e., [113,114]). This is an interesting avenue for future research in re-interpreting CSFs of TQM, above all because the value co-creation approach can also be understood as "a new information and communications productivity standard" [115] (p. 17) (CSF No. 6 in this model).

The last CSF considered of particular value in the "structure and process" block of the model is prevention/audit. Prevention comes from audit, which can be defined as "a systematic, independent and documented process aiming at the collection of evidence and assessment of an MS concerning the fulfillment, and to the extension of that fulfillment, on the criteria defined by the standard" [80] (p. 1326). Many processes could be covered by audits also in IMS, among them: provision of adequate resources, employee training, definition and review of customer requirements, control of design and development, identification of environmental aspects and impacts, measurement of customer satisfaction, etc. [80]. Clearly, the above list indicates that audits could be really effective in improving the quality of value

co-creation processes and, therefore, are essential in the "structure and process" domain (CSF No. 13 in the model).

It must be remembered that "co-creation dialogue" develops over time on engagement platforms and among important CSFs to co-create value where both design conformance and QFD (Quality Function Deployment) should be considered. The design and conformance CSF is important to implement TQM and essential to create and maintain an effective "co-creation dialogue" (CSF No. 10 in the model). In fact, understanding customer needs and nurturing an effective and lasting dialogue with consumers, firms should also design and develop new products/services to satisfy their expectations, able to enhance customer satisfaction and customer value, also because of their participation in that innovation process. In other words, the last missing link for integration between selected co-creation models and TQM CSFs, looking at customer needs, is QFD, able to translate customer needs into products/services with technical characteristics. According to Govers [116], "QFD encompasses some activities that people did before but it replaces erratic, intuitive decision making processes with a structured methodology that establishes all relevant information and experiences that are available throughout the organization" (p. 576). In particular, QFD is essential towards effective "co-creation dialogue" and to co-create value sharing individuals/information/ideas/experiences, the latter being the basis of value (CSF No. 11 in the model).

## 7. Conclusions

The paper makes some important contributions. It: (1) bridges the sustainability, value co-creation, TQM, EM and IMS literature for the first time; (2) proposes a new model of value co-creation processes, considering this as a never ending cycle; (3) creates the first value co-creation model that encompasses the most important CSFs to foster sustainability through quality processes; (4) opens the discussion and leads the way to the re-interpretation of quality principles in the value co-creation process literature.

From a theoretical point of view, linking the sustainability and value co-creation literature opens new avenues of research, but also sheds light on the new role firms can play, not only with their partners, but at a broader level, further underlining why economy and society cannot be separated, but need to be integrated even more successfully within the firm to foster sustainability on behalf of the entire society. Moreover, having considered the role of the identified CSFs and also considering the EM and IMS literature in value co-creation processes represent a first attempt at including TQM principles in value co-creation processes towards sustainability. Therefore, this paper contributes to the value co-creation approach following the strategic perspective in that the proposed model includes the quality principles as suggested by Ramaswamy and Ozcan [8]. It also contributes to the sustainability literature in that it opens new perspectives to understand how sustainability can relate to other managerial philosophies and can share with them the firm's key drivers and activities. In this domain, Lozano et al [117] have recently suggested to focus future studies on corporate sustainability developing an integrative theory able to holistically include it in firm theories; this paper moves in this direction. Moreover, the literature review on CSFs performed in this study highlighted the common traits among different managerial approaches, the analysis of which has not yet been completely performed and which can also represent a future step of this research. On this point, it is worth remembering that a recent study invites us to focus on "Quality Management practices and tools [that] must be developed and adapted in order to support sustainability considerations" [118] (p. 1); this paper also welcomes this suggestion, contributing to the TQM literature, without forgetting about the strategic perspective proposed by the value co-creation approach.

From a managerial point of view, the paper could give guidance to firms in understanding how their TQM, EM and even IMS implementation knowledge and experience helps create and run effective value co-creation processes towards sustainability and can also suggest how to reinterpret CSFs through operationalization using the value co-creation lens. In fact, the paper initiates the creation of a sole framework for firm activities, which encompasses quality, value co-creation and sustainability that are closely linked to each other and should be achieved together. Being aware of

the common key drivers and activities that could be run simultaneously to achieve value co-creation and sustainability would also help managers in realizing cost saving and make more effective their management of integrated systems towards a better performance under different profiles.

This paper, having made an initial attempt to bridge the sustainability, value co-creation and TQM, EM and IMS literature and to identify important CSFs in realizing value co-creation processes able to foster sustainability, also has some limitations: above all, the discussion of CSFs is not exhaustive in that only some CSFs have been considered. The background of the paper could also be enhanced performing an extensive literature review, using other methodologies and/or databases and/or search engines and/or other keywords. Moreover, the model is the first one proposed at the intersection of sustainability, value co-creation following a strategic perspective and CSFs, and therefore, future research should encompass other issues not fully considered in this first attempt to bridge these streams of literature. Indeed, this research paper only encompasses a theoretical approach, which should be tested through an empirical study. This could certainly be a future avenue of research, even if perhaps a more in-depth discussion of the identified CSFs should be put in place, also considering DART insights. Moreover, after having reinterpreted the CSFs, it would be well worth seeking to better understand how they relate to each other, using the value co-creation approach lens. When performing the empirical studies already envisaged, it would be also worth considering new and relevant CSFs in this domain and also to try to measure their importance in the effective implementation of the model proposed.

**Author Contributions:** All authors conceived of the paper research questions and aim and contributed substantially to it. Cecilia Silvestri concentrated on the CSFs literature review, and Barbara Aquilani concentrated more on the value co-creation literature review and conceived of the value co-creation process model. Barbara Aquilani and Cecilia Silvestri contributed methods, as well as the integrated process model and wrote the paper.

**Conflicts of Interest:** The authors declare no conflict of interest.

## Appendix A

**Table A1.** Summary of the literature review steps for the CSFs of sustainability and TQM section.

| Phase | Description | Scopus | ScienceDirect |
|---|---|---|---|
| 1 | All those articles containing at least one of the following combination of keywords in their title: | 69 | 5 |
| | *TQM AND Sustainability* | *9* | *0* |
| | *TQM AND Sustainable Development* | *4* | *1* |
| | *Quality Management And Sustainability* | *33* | *1* |
| | *Quality Management AND Sustainable Development* | *23* | *3* |
| 2 | All those articles containing in their abstract or title: Critical Success Factors (CSFs) | 8 | 0 |
| 3 | All those articles containing at least one of additional keywords in their abstract or title: firm; company*; corporation; enterprise*; organization. | 3 | 0 |
| 4 | Papers retrieved checking the references provided in the above selected papers | 1 | 0 |
| | **Total papers** | **4** | |

Source: our elaboration; note: when the same article was found both in Scopus and ScienceDirect, it was counted just once in Scopus.

**Table A2.** CSFs of sustainability and TQM.

| Authors | CSFs TQM and SD |
|---|---|
| Garvare and Isaksson (2001) [49] | Customer focus/satisfaction |
| Rusinko (2005) [41] | Long-run focus; continuous improvement; employee empowerment; integrated prospective; multi-functional approach and participation by the whole value chain |
| Isaksson (2006) [45] | Process focus |
| Zink (2007) [47] | Leadership; continuous measurement and improvement; people dimension |

Source: our elaboration.

## Appendix B

**Table B1.** Summary of the literature review steps for the CSFs of EM section.

| Phase | Description | Scopus | ScienceDirect |
|---|---|---|---|
| 1 | All those articles containing at least one of the following combination of keywords in their title: | 8 | 1 |
| | *Environmental Management system AND Critical Success Factor* | *1* | *0* |
| | *Environmental management system AND Critical Factors* | *2* | *1* |
| | *Iso 14001 AND Critical Success Factors* | *1* | *0* |
| | *Iso 14001 AND Critical Factor* | *1* | *2* |
| | *Environmental Management AND Organizational Factors* | *3* | *0* |
| 2 | All those articles containing at least one of additional keywords in their abstract or title: firm; company; corporation; enterprise; organization. | 4 | 0 |
| 3 | Papers retrieved checking the references provided in the selected papers above | 1 | 0 |
| | **Total Papers** | **5** | |

Source: our elaboration; note: when the same article was found both in Scopus and ScienceDirect, it was counted just once in Scopus.

**Table B2.** CSFs of EM.

| Authors | CSFs |
|---|---|
| Zutshi and Sohal (2004) [56] | Management leadership and support, learning and training, internal analysis and sustainability |
| Soo Wee and Quazi (2005) [55] | Top management commitment, total involvement of employees, training, green product/process design, supplier management, measurement and information management |
| Sambasivan and Fei (2008) [57] | Management approach (top management commitment and support, environmental policies and objectives, management reviews), organizational change (training and awareness, documentation and control, emergency response and preparedness, communication), technical aspects (production process enhancement, monitoring and measuring equipment, environmental specialist assistance), external and social aspects (market pressure, government policies and legislation, customer requirements, employee relations) |
| Tung et al (2014) [58] | Top management support, training and "link of performance to rewards" |
| Yang et al. (2015) [52] | Supply chain integration |

Source: our elaboration.

## Appendix C

**Table C1.** Summary of the literature review steps for the CSFs as common points between TQM and the EM system.

| Phase | Description | Scopus | ScienceDirect |
|---|---|---|---|
| 1 | All those articles containing at least one of the following combination of keywords in their title: | 81 | 3 |
| | *Total Quality Management AND Environmental Management* | *19* | *2* |
| | *Total Quality Management AND Environment* | *26* | *1* |
| | *Total Quality Environmental Management (TQEM)* | *29* | *0* |
| | *Quality Management AND Business Environment* | *7* | *0* |
| 2 | All those articles containing in their abstract or title: Critical Success Factors (CSFs) | 9 | 0 |
| 3 | All those articles containing at least one of additional keywords in their abstract or title: firm; company; corporation; enterprise; organization. | 7 | 0 |
| | **Total papers** | **7** | |

Source: our elaboration; note: when the same article was found both in Scopus and ScienceDirect, it was counted just once in Scopus.

**Table C2.** CSFs as common points between TQM and the EM system.

| Authors | CSFs TQM and EM |
|---|---|
| Borri and Boccaletti (1995) [37] | Customer satisfaction/customer focus (internal/external); employee empowerment; management commitment; fact-based decision making; continuous improvement; prevention; audit; supplier partnership |
| de Bakker (2002) [69] | Customer focus; continuous improvement; teamwork |
| Molina-Azorín et al. (2009) [67] | People management, information and analysis, customer focus, leadership, process management, supplier management, planning, product design |
| Curkovic et al. (2000, 2008) [38,42] | Leadership; strategic planning; customer and market focus; information and analysis; human resource management; process management; business results |
| Yan and Zhang (2011) [109] | Customer focus, process measurement, leadership, employee involvement, continuous improvement |
| Francis (2009) [68] | Quality Function Deployment (QFD) |
| Saad et al. (2015) [44] | Customer satisfaction/customer focus; human resource management, culture and communication |

Source: our elaboration.

## Appendix D

**Table D1.** Summary of the literature review steps for the CSFs of IMS section.

| Phase | Description | Scopus | ScienceDirect |
|---|---|---|---|
| 1 | All those articles containing at least one of the combination of keywords in their title: | 1 | 0 |
| | *Integrated Management Systems AND Critical Success Factors* | *1* | *0* |
| | *Integrated Management Standard AND Critical Success Factors* | *0* | *0* |
| | *Management Systems Integration AND Critical Success Factors* | *0* | *0* |
| | *Integrated Management System AND Implementation Factors* | *0* | *0* |
| 2 | All those articles containing at least one of additional keywords in their abstract or title: firm; company; corporation; enterprise; organization. | 1 | 0 |
| 3 | Papers retrieved checking the references provided in the above selected papers | 5 | 0 |
| | **Total papers** | **6** | |

Source: our elaboration; note: when the same article was found both in Scopus and ScienceDirect, it was counted just once in Scopus.

**Table D2.** CSFs of IMS.

| Authors | CSFs of IMS |
|---|---|
| Mohammad et al. (2006) [77] | Management commitment and leadership, resource management, focus on stakeholders, education and training, performance measurement, system and process, continual improvement. |
| Zeng et al. (2007) [75] | Internal factors: human resources, organizational structure, company culture, understanding and perception; external factors: technical guidance, certification bodies, stakeholders and consumer, institutional environmental |
| Khanna et al. (2009) [74] | Top management commitment, provision of resources, training, process control, documentation, continual improvement |
| Almeida et al. (2014) [79] | Top management involvement; human and financial resource, employee training |
| Mohamad et al. (2014) [78] | Management commitment and leadership, resource management, focus on stakeholders, education and training, performance measurement, system and process and continual improvement. |
| Domingues et al. (2015) [80] | Audit function |
| Samy et al. (2015) [76] | Cultural factors (internal: organizational culture/climate; external: culture of the society and country), process management |

Source: our elaboration.

## Abbreviations

The following abbreviations are used in this manuscript:

| | |
|---|---|
| CSFs | Critical Success Factors |
| TQM | Total Quality Management |
| EM | Environmental Management |
| IMS | Integrated Management System |
| POEM | Product-Oriented Environmental Management |
| TQEM | Total Quality Environmental Management |
| HRM | Human Resource Management |
| QFD | Quality Function Deployment |

## References

1. Kuhlman, T.; Farrington, J. What is sustainability? *Sustainability* **2010**, *2*, 3436–3448. [CrossRef]
2. Bateh, J.; Heaton, C.; Arbogast, G.W.; Broadbent, A. Defining Sustainability in the Business Setting. *Am. J. Bus. Educ.* **2013**, *6*, 397. [CrossRef]
3. Grönroos, C. Conceptualizing value co-creation: A journey to the 1970s and back to the future. *J. Mark. Manag.* **2012**, *28*, 1520–1534. [CrossRef]

4. Grönroos, C.; Voima, P. Critical service logic: Making sense of value creation and co-creation. *J. Acad. Mark. Sci.* **2013**, *41*, 133–150. [CrossRef]

5. Saarijärvi, H.; Kannan, P.K.; Kuusela, H. Value co-creation: Theoretical approaches and practical implications. *Eur. Bus. Rev.* **2013**, *25*, 6–19. [CrossRef]

6. Galvagno, M.; Dalli, D. Theory of value co-creation: A systematic literature review. *Manag. Serv. Qual. Int. J.* **2014**, *24*, 643–683.

7. Alves, H.; Fernandes, C.; Raposo, M. Value Co-Creation: Concept and Contexts of Application and Study. *J. Bus. Res.* **2016**, *69*, 1626–1633. [CrossRef]

8. Ramaswamy, V.; Ozcan, K. *The Co-Creation Paradigm*; Stanford University Press: Stanford, CA, USA, 2014.

9. Vargo, S.L.; Maglio, P.P.; Akaka, M.A. On value and value co-creation: A service systems and service logic perspective. *Eur. Manag. J.* **2008**, *26*, 145–152. [CrossRef]

10. Vargo, S.L.; Lusch, R.F.; Akaka, M.A.; He, Y. Service-dominant logic: A review and assessment. *Rev. Mark. Res.* **2010**, *6*, 125–167.

11. Vargo, S.L.; Lusch, R.F. Institutions and axioms: An extension and update of service-dominant logic. *J. Acad. Mark. Sci.* **2016**, *44*, 5–23. [CrossRef]

12. Durugbo, C.; Pawar, K. A Unified Model of the Co-Creation Process. *Expert. Syst. Appl.* **2014**, *41*, 4373–4387. [CrossRef]

13. Bateh, J.; Horner, D.H., Jr.; Broadbent, A.; Fish, D. Sustainability: A Literature Review and Suggested Way Forward. *J. Sustain. Manag.* **2014**, *2*, 35–42.

14. Karuppusami, G.; Gandhinathan, R. Pareto analysis of critical success factors of total quality management: A literature review and analysis. *TQM Mag.* **2006**, *18*, 372–385. [CrossRef]

15. Sila, I.; Ebrahimpour, M. An investigation of the total quality management survey based research published between 1989 and 2000: A literature review. *Int. J. Qual. Reliab. Manag.* **2002**, *19*, 902–970. [CrossRef]

16. Sila, I.; Ebrahimpour, M. Examination and comparison of the critical factors of total quality management TQM) across countries. *Int. J. Prod. Res.* **2003**, *41*, 235–268. [CrossRef]

17. Hietschold, N.; Reinhardt, R.; Gurtner, S. Measuring critical success factors of TQM implementation successfully—A systematic literature review. *Int. J. Prod. Res.* **2014**, *52*, 6254–6272. [CrossRef]

18. Yusof, S.R.M.; Aspinwall, E. Critical success factors for total quality management implementation in small and medium enterprises. *Total Qual. Manag.* **1999**, *10*, 803–809. [CrossRef]

19. Wali, A.A.; Deshmukh, S.G.; Gupta, A.D. Critical Success Factors of TQM: A Select Study of Indian Organizations. *Prod. Plan. Control* **2003**, *14*, 3–14. [CrossRef]

20. Claver, E.; Tari, J.J.; Molina, J.F. Critical factors and results of quality management: An empirical study. *Total Qual. Manag. Bus. Excell.* **2003**, *14*, 91–118. [CrossRef]

21. Seetharaman, A.; Sreenivasan, J.; Boon, L.P. Critical success factors of total quality management. *Qual. Quant.* **2006**, *40*, 675–695. [CrossRef]

22. Sen, B.A.; Taylor, R. Determining the information needs of small and medium-sized enterprises: A critical success factor analysis. *Inf. Res.* **2007**, *12*, 329.

23. Ismail Salaheldin, S. Critical success factors for TQM implementation and their impact on performance of SMEs. *Int. J. Product. Perform. Manag.* **2009**, *58*, 215–237. [CrossRef]

24. Arumugam, V.C.; Mojtahedzadeh, R.; Malarvizhi, C.A. Critical success factors of total quality management and their impact on performance of Iranian Automotive Industry. *Int. Conf. Innov. Manag. Serv. IPEDR* **2011**, *14*, 312–316.

25. Saraph, J.V.; George Benson, P.; Schroeder, R.G. An instrument for measuring the critical factors of quality management. *Decis. Sci.* **1989**, *20*, 810–829. [CrossRef]

26. Mustafa, E.; Talib Bon, A. Role of top management leadership and commitment in total quality management in service organization in Malaysia: A review and conceptual framework. *Elixir Hum. Res. Manag.* **2012**, *51*, 11029–11033.

27. Began, J. What is co-makership? *Int. J. Qual. Reliab. Manag.* **1987**, *4*, 47–57.

28. Lee, S.M.; Rho, B.-H.; Lee, S.-G. Impact of Malcolm Baldrige National Quality Award Criteria on Organizational Quality Performance. *Int. J. Prod. Res.* **2003**, *41*, 2003–2020. [CrossRef]

29. Sijo, M.T. Implementation of JIT in industries-A Case Study. *Int. J. Sci. Eng. Technol. Res.* **2013**, *2*, 396–399.

30. Singh, J.; Singh, H. Kaizen philosophy: A review of literature. *IUP J. Oper. Manag.* **2009**, *8*, 51.

31. Govers, C.P.M. QFD not just a tool but a way of quality management. *Int. J. Prod. Econ.* **2001**, *69*, 151–159. [CrossRef]

32. Engert, S.; Rauter, R.; Baumgartner, R.J. Exploring the integration of corporate sustainability into strategic management: A literature review. *J. Clean. Prod.* **2016**, *112*, 2833–2850. [CrossRef]

33. Bansal, P. The Corporate Challenges of Sustainable Development. *Acad. Manag. Executive* **2002**, *16*, 122–131. [CrossRef]

34. White, P. Building a sustainability strategy into the business. *Corp. Gov. Int. J. Bus. Soc.* **2009**, *9*, 386–394. [CrossRef]

35. Porter, M.E.; Kramer, M.R. Strategy & Society: The Link between Competitive Advantage and Corporate Social Responsibility. *Harv. Bus. Rev.* **2006**, *84*, 78–92. [PubMed]

36. Porter, M.E.; Kramer, M.R. Creating Shared Value. *Harv. Bus. Rev.* **2011**, *89*, 62–77.

37. Borri, F.; Boccaletti, G. From total quality management to total quality environmental management. *TQM Mag.* **1995**, *7*, 38–42. [CrossRef]

38. Curkovic, S.; Melnyk, S.A.; Handfield, R.B.; Calantone, R. Investigating the linkage between total quality management and environmentally responsible manufacturing. *IEEE Trans. Eng. Manag.* **2000**, *47*, 444–464. [CrossRef]

39. Narasimhan, R.; Schoenherr, T. The effects of integrated supply management practices and environmental management practices on relative competitive quality advantage. *Int. J. Prod. Res.* **2012**, *50*, 1185–1201. [CrossRef]

40. Wiengarten, F.; Pagell, M. The importance of quality management for the success of environmental management initiatives. *Int. J. Prod. Econ.* **2012**, *140*, 407–415. [CrossRef]

41. Rusinko, C.A. Using quality management as a bridge to environmental sustainability in organizations. *SAM Adv. Manag. J.* **2005**, *70*, 54–60.

42. Curkovic, S.; Sroufe, R.; Landeros, R. Measuring TQEM returns from the application of quality frameworks. *Bus. Strategy Environ.* **2008**, *17*, 93–106. [CrossRef]

43. De Sousa Jabbour, A.B.L.; Jabbour, C.J.C.; Latan, H.; Teixeira, A.A.; de Oliveira, J.H.C. Quality management, environmental management maturity, green supply chain practices and green performance of Brazilian companies with ISO 14001 certification: Direct and indirect effects. *Transp. Res. Part. E Logist. Transp. Rev.* **2014**, *67*, 39–51. [CrossRef]

44. Saad, A.; Su, D.; Marsh, P.; Wu, Z. Investigating Environmental Management and Quality Management Issues in the Libyan Food Industry. *Br. J. Econ. Manag. Trade* **2015**, *9*, 1–16. [CrossRef]

45. Isaksson, R. Total quality management for sustainable development: Process based system models. *Bus. Process Manag. J.* **2006**, *12*, 632–645. [CrossRef]

46. Todorut, A.V. Sustainable development of organizations through total quality management. *Proc. Soc. Behav. Sci.* **2012**, *62*, 927–931. [CrossRef]

47. Zink, K.J. From total quality management to corporate sustainability based on a stakeholder management. *J. Manag. Hist.* **2007**, *13*, 394–401.

48. Edgeman, R.L. BEST business excellence:: an expanded view. *Meas. Bus. Excell.* **2000**, *4*, 15–17. [CrossRef]

49. Garvare, R.; Isaksson, R. Sustainable development: Extending the scope of business excellence models. *Meas. Bus. Excell.* **2001**, *5*, 11–15. [CrossRef]

50. Mehra, S.; Hoffman, J.M.; Sirias, D. TQM as a management strategy for the next millennia. *Int. J. Prod. Oper. Manag.* **2001**, *21*, 855–876. [CrossRef]

51. Nyirenda, G.; Ngwakwe, C.C. Environmental management practices for sustainable development: Agenda for harmonization. *Ecol. Econ.* **2014**, *5*, 76–85.

52. Yang, J.; Han, Q.; Zhou, J.; Yuan, C. The Influence of Environmental Management Practices and Supply Chain Integration on Technological Innovation Performance—Evidence from China's Manufacturing Industry. *Sustainability* **2015**, *7*, 15342–15361. [CrossRef]

53. Shrivastava, P.; Hart, S. Creating sustainable corporations. *Bus. Strategy Environ.* **1995**, *4*, 154–165. [CrossRef]

54. Bergmiller, G.G.; McCright, P.R. Parallel Models for Lean and Green Operations. Available online: http://zworc.com/site/publications_assets/ParallelModels.pdf (accessed on 18 December 2015).

55. Soo Wee, Y.; Quazi, H.A. Development and validation of critical factors of environmental management. *Ind. Manag. Data Syst.* **2005**, *105*, 96–114. [CrossRef]

56. Zutshi, A.; Sohal, A.S. Adoption and maintenance of environmental management systems: Critical success factors. *Manag. Environ. Qual. Int. J.* **2004**, *15*, 399–419. [CrossRef]

57. Sambasivan, M.; Fei, N.Y. Evaluation of critical success factors of implementation of ISO 14001 using analytic hierarchy process (AHP): A case study from Malaysia. *J. Clean. Prod.* **2008**, *16*, 1424–1433. [CrossRef]

58. Tung, A.; Baird, K.; Schoch, H. The relationship between organisational factors and the effectiveness of environmental management. *J. Environ. Manag.* **2014**, *144*, 186–196. [CrossRef] [PubMed]

59. Garrod, B.; Chadwick, P. Environmental management and business strategy: Towards a new strategic paradigm. *Futures* **1996**, *28*, 37–50. [CrossRef]

60. Theyel, G. Management practices for environmental innovation and performance. *Int. J. Oper. Prod. Manag.* **2000**, *20*, 249–266. [CrossRef]

61. Pipatprapa, A.; Huang, H.H.; Huang, C.H. A Novel Environmental Performance Evaluation of Thailand's Food Industry Using Structural Equation Modeling and Fuzzy Analytic Hierarchy Techniques. *Sustainability* **2016**, *8*, 246. [CrossRef]

62. Labodová, A. Implementing integrated management systems using a risk analysis based approach. *J. Clean. Prod.* **2004**, *12*, 571–580. [CrossRef]

63. Ferenhof, H.A.; Vignochi, L.; Selig, P.M.; Lezana, Á.G.R.; Campos, L.M. Environmental management systems in small and medium-sized enterprises: An analysis and systematic review. *J. Clean. Prod.* **2014**, *74*, 44–53. [CrossRef]

64. Zeng, S.; Tian, P.; Shi, J. Implementing integration of ISO 9001 and ISO 14001. *Manag. Audit. J.* **2005**, *20*, 394–407. [CrossRef]

65. Bernardo, M.; Casadesus, M.; Karapetrovic, S.; Heras, I. How integrated are environmental, quality and other standardized management systems? An empirical study. *J. Clean. Prod.* **2009**, *17*, 742–750. [CrossRef]

66. Klassen, R.D.; McLaughlin, C.P. TQM and environmental excellence in manufacturing. *Ind. Manag. Data Syst.* **1993**, *93*, 14–22. [CrossRef]

67. Molina-Azorín, J.F.; Tarí, J.J.; Claver-Cortés, E.; López-Gamero, M.D. Quality management, environmental management and firm performance: A review of empirical studies and issues of integration. *Int. J. Manag. Rev.* **2009**, *11*, 197–222. [CrossRef]

68. Francis, F. Total Quality Management—A Tool for Design for Environment. In Proceedings of the International Conference on Advances in Computational Tools for Engineering Applications, 2009. ACTEA '09, Beirut, Lebanon, 15–17 July 2009; pp. 351–354.

69. De Bakker, F.G. Product-Oriented Environmental Management: Lessons from Total Quality Management. *J. Ind. Ecol.* **2001**, *5*, 55–69. [CrossRef]

70. Dean, J.W.D.; Bowen, E. Management theory and total quality: Improving research and practice through theory development. *Acad. Manag. Rev.* **1994**, *19*, 392–418.

71. Von Ahsen, A. The Integration of Quality, Environmental and Health and Safety Management by Car Manufacturers—A Long-Term Empirical Study. *Bus. Strategy Environ.* **2014**, *23*, 395–416. [CrossRef]

72. Dalling, I. Integrated Management Definition. Available online: https://iso9001mgtsystem.files.wordpress.com/2015/02/cqi-imsig-integrated-management-definition-issue-2-1.pdf (accessed on 1 October 2016).

73. Bernardo, M.; Simon, A.; Tarí, J.J.; Molina-Azorín, J.F. Benefits of management systems integration: A literature review. *J. Clean. Prod.* **2015**, *94*, 260–267. [CrossRef]

74. Khanna, H.; Laroyia, S.C.; Sharma, D.D. A survey on Indian experience on integrated management standards (IMS). *Int. J. Qual. Res.* **2009**, *3*, 1–11.

75. Zeng, S.X.; Shi, J.J.; Lou, G.X. A synergetic model for implementing an integrated management system: An empirical study in China. *J. Clean. Prod.* **2007**, *15*, 1760–1767. [CrossRef]

76. Samy, G.M.; Samy, C.P.; Ammasaiappan, M. Integrated management systems for better environmental performance and sustainable development-a review. *Environ. Eng. Manag. J.* **2015**, *14*, 985–1000.

77. Mohammad, M.; Osman, M.R.; Yusuff, R.M.; Ismail, N. Strategies and Critical Success Factors for Integrated Management Systems Implementation. *Int. Conf. Comp. Ind. Eng. CCIE* **2006**, *35*, 1391–1396.

78. Mohamad, F.; Abdullah, N.H.; Mohammad, M.; Kamaruddin, N.K. Management systems integration for organizational sustainability: Quality, environmental, occupational health and safety, and energy. *Appl. Mech. Mater.* **2014**, *465–466*, 1155–1159. [CrossRef]

79. Almeida, J.; Domingues, P.; Sampaio, P. Different perspectives on management systems integration. *Total Qual. Manag. Bus. Excell.* **2014**, *25*, 338–351. [CrossRef]

80. Domingues, J.P.T.; Sampaio, P.; Arezes, P.M. Analysis of integrated management systems from various perspectives. *Total Qual. Manag. Bus. Excell.* **2015**, *26*, 1311–1334. [CrossRef]

81. Leavy, B. Venkat Ramaswamy—How value co-creation with stakeholders is transformative for producers, consumers and society. *Strategy Leadersh.* **2014**, *42*, 9–16. [CrossRef]

82. Ramaswamy, V. It's about Human Experiences... and Beyond, to Co-Creation. *Ind. Mark. Manag.* **2011**, *40*, 195–196. [CrossRef]

83. Arnold, M. Fostering Sustainability by Linking Co-Creation and Relationship Management Concepts. *J. Clean. Prod.* **2015**. [CrossRef]

84. Von Hippel, E. *Democratizing Innovation*; MIT Press: Cambridge, MA, USA, 2005.

85. Baldwin, C.; von Hippel, E. Modeling a Paradigm Shift: From Producer Innovation to User and Open Collaborative Innovation. *Organ. Sci.* **2011**, *22*, 1399–1417. [CrossRef]

86. Von Hippel, E.; Euchner, J. User Innovation: An Interview with Eric von Hippel. *Res. Technol. Manag.* **2013**, *56*, 15–20. [CrossRef]

87. Ramaswamy, V.; Gouillart, F. Building the co-creative enterprise. *Harv. Bus. Rev.* **2010**, *88*, 100–109. [PubMed]

88. Ramaswamy, V.; Gouillart, F. *The Power of Co-Creation*; Free Press: New York, NY, USA, 2010.

89. Denning, S. Navigating the Phase Change to the Creative Economy. *Strategy Leadersh.* **2014**, *42*, 3–11. [CrossRef]

90. Reay, P.; Seddighi, H.R. An empirical evaluation of management and operational capabilities for innovation via co-creation. *Eur. J. Int. Manag.* **2012**, *15*, 259–275. [CrossRef]

91. Ramaswamy, V.; Ozcan, K. Strategy and co-creation thinking. *Strategy Leadersh.* **2013**, *41*, 5–10.

92. Prahalad, C.K.; Ramaswamy, V. The new frontier of experience innovation. *MIT Sloan Manag. Rev.* **2003**, *44*, 12–18.

93. Prahalad, C.K.; Ramaswamy, V. *The Future of Competition: Co-Creating Unique Value with Customers*; Harvard Business School Publishing: Boston, MA, USA, 2004.

94. Prahalad, C.K.; Ramaswamy, V. Co-creation experiences: The next practice in value creation. *J. Interact. Mark.* **2004**, *18*, 5–14. [CrossRef]

95. Ramaswamy, V.; Ozcan, K. CEOs must engage all stakeholders. Available online: https://hbr.org/2011/10/ceos-must-engage-all-stakehold (accessed on 1 October 2016).

96. Ramaswamy, V. Co-creation of value: Toward an expanded paradigm of value creation. *Mark. Rev. St. Gallen* **2009**, *26*, 11–17. [CrossRef]

97. Bhalla, G. *Collaboration and Co-Creation—New Platforms for Marketing and Innovation*; Springer Science+Business Media: New York, NY, USA, 2011.

98. Porter, L.J.; Parker, A.J. Total quality management—the critical success factors. *Total Qual. Manag.* **1993**, *4*, 13–22. [CrossRef]

99. Black, S.A.; Porter, L.J. Identification of the Critical Factors of TQM. *Decis. Sci.* **1996**, *27*, 1–21. [CrossRef]

100. Schein, E.H. On dialogue, culture, and organizational learning. *Organ. Dyn.* **1993**, *22*, 40–51. [CrossRef]

101. Kanji, G.K.; Yui, H. Total quality culture. *Total Qual. Manag.* **1997**, *8*, 417–428. [CrossRef]

102. Berman, S.; Korsten, P. Leading in the Connected Era. *Strategy Leadersh.* **2014**, *42*, 37–46.

103. Juran, J.M. *Suprematia Prin Calitate*; Editura Teora: Bucuresti, Romania, 2002.

104. Navarro, S.; Llinares, C.; Garzon, D. Exploring the relationship between co-creation and satisfaction using QCA. *J. Bus. Res.* **2016**, *69*, 1136–1139. [CrossRef]

105. Brah, S.A.; Wong, J.L.; Rao, B.M. TQM and business performance in the service sector: A Singapore study. *Int. J. Oper. Prod. Manag.* **2000**, *20*, 1293–1312. [CrossRef]

106. Sila, I. Examining the effects of contextual factors on TQM and performance through the lens of organizational theories: An empirical study. *J. Oper. Manag.* **2007**, *25*, 83–109. [CrossRef]

107. Kassicieh, S.K.; Yourstone, S.A. Training, performance evaluation, rewards, and TQM implementation success. *J. Qual. Manag.* **1998**, *3*, 25–38. [CrossRef]

108. Yan, B.; Zhang, L. An Approach of Quality Management in the Small Business Environment of South Africa. In Proceedings of the 2011 IEEE International Conference on Industrial Engineering and Engineering Management (IEEM), Singapore, 6–9 December 2011; pp. 684–688.

109. Sparks, R.E.; Legault, R.D. A definition of quality for total customer satisfaction: The bridge between manufacturer and customer. *SAM Adv. Manag. J.* **1993**, *58*, 16.

110. Anderson, E.W.; Fornell, C.; Lehmann, D.R. Customer satisfaction, market share, and profitability: Findings from Sweden. *J. Mark.* **1994**, *58*, 53–66. [CrossRef]

111. Teh, P.L.; Ooi, K.B.; Yong, C.C. Does TQM impact on role stressors? A conceptual model. *Ind. Manag. Data Syst.* **2008**, *108*, 1029–1044. [CrossRef]

112. Zairi, M. Business Process Management: A boundaryless approach to modern Competitiveness. *Bus. Process Manag. J.* **1997**, *3*, 64–80. [CrossRef]

113. Yi, Y.; Gong, T. Customer Value Co-Creation Behavior: Scale Development and Validation. *J. Bus. Res.* **2013**, *66*, 1279–1284. [CrossRef]

114. Albinsson, P.A.; Yasanthi, P.B.; Sautter, P.T. DART Scale Development: Diagnosing a Firm's Readiness for Strategic Value Co-Creation. *J. Mark. Theory Pract.* **2016**, *24*, 42–58. [CrossRef]

115. Ramaswamy, V. Leading the transformation to co-creation of value. *Strategy Leadersh.* **2009**, *37*, 32–37. [CrossRef]

116. Govers, C.P. What and how about quality function deployment (QFD). *Int. J. Prod. Econ.* **1996**, *46*, 575–585. [CrossRef]

117. Lozano, R.; Carpenter, A.; Huisingh, D. A review of "theories of the firm" and their contributions to Corporate Sustainability. *J. Clean. Prod.* **2015**, *106*, 430–442. [CrossRef]

118. Siva, V.; Gremyr, I.; Bergquist, B.; Garvare, R.; Zobel, T.; Isaksson, R. The support of Quality Management to sustainable development: A literature review. *J. Clean. Prod.* **2016**, in press. [CrossRef]