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Kaizen and Continuous Improvement – Trends and Patterns over 30 years

Purpose

The primary purpose of the paper is to depict how Kaizen and Continuous Improvement (CI) are represented in scientific journals focussing on Quality Management (QM) from the 1980s until 2017. Additionally, the study aims to examine how Kaizen is studied and described and how the relationship between Kaizen and CI is portrayed.

Design/methodology/approach

The study applies a mixed methods approach to search for tendencies and outlines concerning Kaizen and CI in four scientific journals focussing on QM and two focussing on OM. The dataset contains entries from 1980 until 2017, which makes it possible to depict how Kaizen has evolved over more than 30 years.

Findings

The findings show that Kaizen and CI attained special interest in the mid-1990s, after which interest appears to have decreased. However, the findings imply that a regenerated interest for the areas spiked post 2010. In addition, the results indicate that Kaizen is on the one hand accepted by one part of the management community but on the other hand completely ignored by the rest. Finally, the data illuminate a need to strengthen and clarify Kaizen's theoretical basis and its relationship to CI.

Practical implications

If an aspiration exists to increase the success rate of Kaizen implementation, the results from the study highlight the need to address and clarify epistemological, terminological and theoretical issues.

Originality/value

Prior data mining studies pinpointing how Kaizen and CI have evolved over the last 30 years appear not to exist.

Introduction

Thirty years have passed since Imai (1986) proposed Kaizen as the nucleus of Japan's competitive success. The message has been repeated ever since, adding to the Kaizen success story that has become an accepted key concept of modern management in the 21st century (Imai, 2012; Miller *et al.*, 2014). Kaizen has also been presented as a fundamental factor in Japanese management and is often considered an underlying element of Lean production and TQM (Brunet and New, 2003). The concept of Kaizen is often used as a synonym for continuous improvement (CI), but essential disagreements exist in academia and practice concerning the definition and (in)compatibility of the two terms (*ibid*). Nevertheless, companies around the world have adopted Kaizen and CI systems in the second half of the twentieth century, and many benefits have been observed (Cooney and Sohal, 2004; Irani *et al.*, 2004). The CI concept was introduced in Western industry in the early 20th century as a development of tools and techniques derived from scientific management (Bhuiyan and Bagel, 2005; Ellis *et al.*, 2017). Later, CI programmes were introduced in Japan by management experts such as Deming, Juran, and Gilbreth, and by the US forces present there after the end of the Second World War (Robinson, 1990). At some time, the tools and concepts evolved, incorporating quality control and people participation, into the Kaizen term as a management tool for ongoing improvement (Imai, 1986).

Although the benefits of working with Kaizen and CI have been broadly reported in the literature, implementing Kaizen and CI is complex and not always successful (Jurburg *et al.*, 2017). Without disputing the positive effect of Kaizen and CI in Japan and throughout the world, Brunet and New (2003) and Suárez-Barraza *et al.* (2011) note important issues concerning terminology, implementation and epistemology. Both Brunet and New (2003) and Suárez-Barraza *et al.* (2011) stress that clarifying the nature and scope of Kaizen is imperative for improving its success rate in real world application. In the same vein, both Bhuiyan and Baghel (2005) and Singh and Singh (2015) establish that a more critical analysis and a more rigorous theoretical basis for conducting research in the field are required. With the aim of adding new viewpoints on the evolution of Kaizen, this study adopts a longitudinal and comparative perspective, researching how Kaizen and CI have been used by scholars in six academic management journals over more than 30 years.

Background

Kaizen is often examined in relation to different quality initiatives, strategies and perspectives, such as Quality Control (QC), Total Quality Control (TQC), Quality Management (QM) and Total Quality Management (TQM) (Imai, 1986; 2012; Maurer, 2012; Sanchez and Blanco, 2014). However, no study appears to have specifically attempted to explore how Kaizen has been documented and has evolved in QM research. As a bond between Kaizen and QM has been proposed, a better understanding of how Kaizen has been represented in QM research might lead to a better understanding of the Kaizen concept itself. Furthermore, Brunet and New (2003) note that Kaizen on the one hand appears to be recognized by a large community of management scholars and practitioners, but on the other hand appears to be essentially ignored by others. Therefore, the digital archives of four academic QM journals have been reviewed in a search for patterns and trends concerning Kaizen. The four journals are *International Journal of Quality & Reliability Management (IJQRM)*, *The TQM Journal (TQMJ)*, *Total Quality Management & Business Excellence (TQMBE)* and *Quality and Reliability Engineering International (QREI)*.

One of the principal objectives of the implementation of Kaizen and CI is the improvement of quality and productivity in targeted activities and processes (Al Smadi, 2009). Hence, with the

purpose of adding two complementary perspectives on Kaizen vis-a-vis the QM journals, the digital archives of two scientific journals focussing on Operations Management (OM) have been included in the dataset. The two journals are *International Journal of Operations & Production Management (IJOPM)* and *Journal of Operations Management (JOM)*.

Moreover, different standpoints exist concerning whether to treat Kaizen as synonymous with CI or a closely related but nevertheless separate concept (Berger, 1997; Bhuiyan and Baghel, 2005; Martin, 1993; Brunet and New, 2003; Singh and Singh, 2015; Suárez-Barraza *et al.*, 2011). Hence, the study aspires to focus the spotlight on this relationship from a QM, OM, and Kaizen perspective. Finally, qualitative studies on the evolutionary patterns of Kaizen and CI have been performed by researchers such as Bhuiyan and Baghel (2005), Singh and Singh (2015) and Suárez-Barraza *et al.* (2011). However, with the exception of Sanchez and Blanco (2014), quantitative studies on Kaizen are not easily found. Consequently, the study has attempted to bridge this gap by applying a mixed method approach. Thus, the primary purpose of the paper is to depict how Kaizen and CI are represented in scientific journals focussing on QM from the 1980s until 2017. Additionally, the study aims to examine how Kaizen is studied and described and how the relationship between Kaizen and CI is portrayed.

Kaizen

Kaizen is a Japanese term and was initially used and spread by Masaaki Imai (Imai 1986) as a concept used in business management and in everyday life (Singh and Singh, 2015). In the management arena, Imai defines Kaizen as continuing improvement involving everyone, managers and workers alike (Suárez-Barraza *et al.*, 2011). According to Brooks (1993), Kaizen means ‘change for the good’ and is a school of thought focussed on continual improvement. To the management field, Kaizen has occasionally been presented as the missing link when organizations in the West do not reap the expected benefits from Japanese management philosophies (Berger, 1997). Ma *et al.* (2017) view Kaizen as an improvement method that is process-oriented and that the goal with Kaizen is improvements. This view is shared by Aoki (2008), because he states, “Kaizen in Toyota is a process of activities that are implemented continuously”. Based on a literature review, Iwao (2017) identifies Kaizen as a roughly sketched notion that can be defined as consisting of small, incremental, mutually independent process innovations generated repeatedly by workers. Nonetheless, he equals CI with Kaizen when summarizing research on the topic(s) (*ibid*). Brunet and New (2003) find the generality and simplicity of the Kaizen idea to be both its weakness and its strength, rendering analytical deconstruction and empirical research extremely challenging. Moreover, because Kaizen has remained free from controlling influences and proponents, researchers and practitioners have been able to cherry pick the best elements of other systems and methodologies, which has resulted in a wide variety of interpretations (*ibid*). With this history in mind, Brunet and New (2003) define Kaizen as consisting of pervasive and continual activities, outside the contributor’s explicit contractual roles, to identify and achieve outcomes he believes will contribute to the organizational goals. Furthermore, they decompose the concept by proposing two axes: the degree to which the processes of Kaizen are systematized and organised, and the degree to which senior managers specify or influence the themes of Kaizen activities (*ibid*). Based on empirical results, Brunet and New (2003) outline that Kaizen activities appeared at three different levels within the organization – at the management, group, and individual levels. They also conclude that Kaizen has been adjusted to different conditions in different organizations and is thus far from standardized (*ibid*). At the same time, Kaizen appears to be a vital part of a general operation and planning system (*ibid*). A main outcome from Kaizen is that it helps generate a mind-set in which essential change and new tools become more simply accepted by co-workers (Brunet and New, 2003).

According to Suárez-Barraza *et al.* (2011), Kaizen can be viewed as a set of managerial principles that manage improvement and learning. From the perspective of TQM, Kaizen can be considered a management philosophy consisting of principles, methodologies and techniques for which the cornerstones are a) Teamwork, b) Elimination of Muda and gemba management, c) Education and Training, d) Commitment from Top Management, e) Proposing and applying improvements, and f) Focus on processes and standards (ibid). Berger (1997) indicates that the characteristics of Kaizen are its focus on work standards in small improvements as an effect of the continuous movement. Kaizen cannot be separated from the base; keeping standards such as CI will aggregate to an overall contribution to the organizations (ibid). Brooks (1993) states that organizations that have adopted the cornerstones of Kaizen have reached these five objectives: 1. *Empowerment to define and improve processes*; 2. *Definition of process steps to an intimate level across departments, functions and teams*; 3. *Subliminal detailed process orientation to all levels within the organization*; 4. *The generation of a large quantity of improvement ideas*; and 5. *Enhancement of compliance with the best method at all levels*.

Imai (2013) acknowledges that Kaizen is often interpreted as and has come to mean CI. However, he questions this translation because in his opinion, it does not carry forward the tremendous amount of self-discipline and commitment that is needed by everyone when conducting Kaizen (Imai, 2013). Hence, with the ambition of emphasizing that Kaizen is not simply CI but rather *grand-scale, companywide improvement*, a new interpretation is proposed: everyday improvement, everybody (everyone) improvement and everywhere improvement (Imai, 2013). Miller *et al.* (2014) also note that Kaizen is often defined as *change for the better* or *improvement* but state that it is necessary to examine more deeply the meaning of the word to better understand Kaizen's underlying assumptions. According to Miller *et al.* (2014), the ideogram for *kai* definitely means "to change, to remove the old with new". However, the ideogram of *zen* is more troublesome because *good* is not sufficiently precise; the opposite of *zen* is not only bad – it is evil (ibid). Accordingly, true Kaizen incorporates a built-in compass that guides individuals and organizations towards doing greater good in the long term (ibid). Schmidt (2010) agrees with Miller *et al.* (2014) that *kai*, according to the ideogram, is accomplished by driving out the bad. However, he emphasizes that *kai* relates to oneself and that the good in *zen* stems from sacrificing to the gods – which is good for everyone (Schmidt, 2010). Consequently, taken together, Kaizen implies self-sacrifice for the betterment of everyone (ibid). Furthermore, Schmidt (2010) emphasizes that *kai* relates to large changes because it is also used in reference to revolutions. Maurer (2012) states that the Asian origins of the words are misleading because they imply that Kaizen at its core is a uniquely Japanese philosophy that is difficult to translate into Western culture. In contrast, Maurer (2012) states that Kaizen was born in the United States during World War II (WWII) through the wartime industrial management programme Training Within Industries (TWI). TWI-experts offered and taught US corporations the philosophy of CI, which boiled down to *focus attention on employees, seek small improvements and make do with what you have* (ibid). TWI ended with the war; however, Deming who had been instrumental in aiding US business during WWII, took his ideas concerning *CI, small steps towards progress, reduction of waste, respect for workers and service to the customers*, to the Japanese leaders (ibid). Japanese leaders called this small-step philosophy Kaizen, and it became the backbone of Japanese business dominance in the second half of the twentieth century (ibid). Faced with Japanese business dominance in the 1980s, US corporations once again turned to Deming and his suggestions of CI (ibid). In parallel, Kaizen was embraced by many US businesses and lives on today through lean production, just-in-time (JIT) delivery, and statistical control of processes (ibid). Similarly, Singh and Singh (2015) find that with the exception of the two

decades following WWII, which denoted US industrial dominance and business complacency, CI has been continuously adopted and developed in the USA. CI was especially popular in the USA during WWII and in the TWI programme, which was imported into Japan by the US military occupation authorities (ibid). Subsequently, according to Singh and Singh (2015), CI – called Kaizen in Japan – gained popularity in Japan as a low investment, proven method of raising quality and productivity. Singh and Singh (2015) also note a revival of CI-programmes in US industry since the early 1980s. However, they explain this resurgence as being due to direct Japanese investment in the USA, and the efforts of US companies to complete successfully with their Japanese counterparts (ibid). Schroeder and Robinson (1991) and Robinson and Stern (1998) have elaborated this line of thought and identify the first modern CI programme (CIP) to have been initiated in 1984 at the National Cash Register Company in Dayton, Ohio, USA; such programmes have thereafter been implemented and developed continuously in the US. They also find that the surge in popularity of employee suggestion systems and CIPs in Japan was primarily because they were an inexpensive means to improve production and reduce costs in a time of severe resource shortages (ibid). Second, they credit the US military occupation authorities who quickly contracted TWI, Inc. to run programmes in Japan using former instructors from the wartime US TWI service (ibid). According to Robinson and Stern (1998), these arrangements were the foundations for what they label *Kaizen teian*. However, both Schroeder and Robinson (1991) and Robinson and Stern (1998) note that early forms of suggestion systems existed in Japanese society and industry. For example, the eighth shogun, Yoshimune Tokugawa, introduced a suggestion box for citizens in 1721, and in 1905, inspired by a visit to NCR's operations in the USA, the textile firm Kanebuchi Boseki applied a suggestion box system (ibid). Schroeder and Robinson (1991) note that direct Japanese investments coupled with the desire to imitate successful Japanese businesses resulted in the introduction (or reintroduction) of CIPs to US industry in the 1980s and onwards. As a means of combining but delimiting the historical evolution and the Kaizen and CI concepts, Suárez-Barraza *et al.* (2011) suggest that two variants of Kaizen exist – Japanese and Western. The Japanese variant of Kaizen is less researched but can be deduced from the writings of scholars such as Imai (1986; 2012) and Brunet and New (2003), accounted for above (ibid). The Western variant of Kaizen is most commonly referred to as CI, and publications on the topics are available in abundance (ibid). However, the Western variant of Kaizen (CI) possesses an inherent paradox. Whereas CI on the one hand is conceived as a general element of other management approaches (i.e., TQM), it is on the other hand occasionally presented as a practical managerial perspective in the form of methodology, techniques and tools with the purpose of identifying and eliminating non-value adding activities (ibid). Hence, the Western variant of Kaizen (CI) can be considered both generic and specific at the same time.

Evidently, different views exist concerning the historical evolution of Kaizen and CI. Nonetheless, many authors, including gurus such as Masaki Imai, Taiichi Ohno, Shigeo Shingo, Hiroyuki Hirano and Edward Deming indicate that one of the shared aspects between Kaizen and CI is that they both are keys to productivity in any organization because they address improvement both in business processes and in co-workers (Imai 1986, Ohno 1988, Shingo 1989, Hirano 1989, Deming 2000, Womack & Jones 1996).

Continuous improvement (CI)

Bhuiyan and Baghel (2005) state that no theoretical basis exists for CI and assert that CI tends to be used as a general term that has acquired many of its attributes from other quality initiatives such as TQM and lean manufacturing. Nevertheless, Bhuiyan and Baghel (2005) find that CI is often defined as a culture of continued improvements of any size that includes

all different levels of an organization. Therefore, it can arise through evolutionary improvements, through improvements that are incremental or through essential changes (ibid). Anand *et al.* (2009) find that CI is often defined as a systematic struggle to seek and apply new ways to actively and constantly achieve process improvements. Zollo *et al.* (2002) conclude that CI is an active ability that can be defined as “a learned and stable pattern of collective activity through which the organization systematically generates and modifies its operating routines in pursuit of improved effectiveness”. Prajogo (2000) indicates that CI is a process in the whole organization focussed on continued gradual improvements of any size. Singh and Singh (2015) view CI as a generic term that has been at the centre of discussion since the beginning of the industrial revolution. However, a definition of CI is proposed: a culture of sustained improvement aimed at eliminating waste in all organizational systems and processes, involving all organizational participants (ibid). Other authors have defined the CI process as a group of planned, organized and systematic processes of constant change that are inter-related across the whole organization, in which the focus is on engaging all people in the organization to achieve more productivity, quality, well-being, ergonomics and effectiveness (Jurburg *et al.*, 2017).

Numerous researchers have tried to understand the CI process and how it can be successfully achieved through a set of facilitating factors (Bessant *et al.*, 2001; Corso *et al.*, 2007; Dahlgaard-Park *et al.*, 2013; Geralis and Terziovski, 2003; Prajogo and Sohal, 2004; Readman, 2007). These factors appear with divers names and approaches throughout the CI literature. However, some of the most common are “top management support and commitment, strategic focus on CI through the definition of an appropriate set of goals and objectives, using the right methodology to implement CI throughout the whole organization, creating and sustaining a CI culture, employee support and commitment, good information, communication and knowledge-transfer systems, and having a CI management and follow-up system to track the CI efforts and progress made” (Jurburg *et al.*, 2017). These facilitators should be merged into the organization’s culture to have successful and sustainable CI systems (ibid).

CI is viewed by many authors as a frequent TQM factor (Sila and Ebrahimpour, 2002) and is one of the core values in the base of TQM (Bergman and Klefsjö 2003). Furthermore, different frameworks guide CI activities such as Six Sigma, Lean Production, Balanced Scorecard and Lean Six Sigma (Anand *et al.*, 2009; Bhuiyan *et al.*, 2006; Eaidgah *et al.*, 2016).

Materials and methods

The study applied a mixed methods approach to seek trends and patterns on Kaizen in research journals from the 1980s up to 2017. The process and its sub-steps are described in the *Data Mining* section.

Data Mining

Within the field of text- and data mining, a *Cross Industry Standard Process for Data Mining (CRISP-DM)* has been developed consisting of six phases: *Business Understanding, Data Understanding, Data Preparation, Modeling, Evaluation and Deployment* (Wirth and Hipp, 2000). This study has been conducted according to the *CRISP-DM* standard and is visualized in Figure 1.

Figure 1 Summary of the CRISP-DM process (Wirth and Hipp, 2000) applied in the study

Business understanding includes defining the study objectives, problem formulation and formation of the strategy to address the problem (Wirth and Hipp, 2000). The primary purpose of this study was to depict how Kaizen and CI are represented in scientific journals focussing on Quality Management (QM) from the 1980s until 2017. Additionally, the study aimed to research how Kaizen is studied and described and how the relationship between Kaizen and CI is portrayed. As a means of clarifying the QM perspective, it was also decided to include journals with a broader focus on Operations Management (OM) so that a comparison was possible.

Understanding data refers to the collection and initial exploration and evaluation of the data, allowing for possible changes in scope and strategy (Marbán *et al.*, 2009). The following points guided the search for scientific journals from which data could be collected:

- QM, TQM or OM had to be in the title.
- The purpose of the journal should be to publish theoretical and practical research on QM or OM research.
- Journals with a long publication history were prioritized.
- The journals had to be peer-reviewed.
- Source Normalized Impact per Paper (SNIP), Impact per Publication (IPP) and SCImago Journal Rank (SJR) had to be available and acceptable for each journal.
- The database structure had to allow large-scale data collection.
- The journals should, if possible, be distributed by different publishing houses.

Assessment of scientific journals according to the above-stated guidelines singled out IJQRM, TQMJ, TQMBE, QREI, JOM and IJOPM as suitable objects for the study. Together, the six

journals were judged to represent a broad base covering both theoretical and practical issues on QM and OM. Furthermore, IJQRM, TQMJ and IJOPM were published by the Emerald Group, whereas TQMBE was published by the Taylor & Francis Group, QREI by John Wiley & Sons and JOM by Elsevier (RELX group). In addition, testing showed that it was possible to collect data from the three scientific journals (the rendered dataset is described in more detail under Data source). Data available from each journal were year of publication, author(s), title, abstract, keywords and type of publication (i.e., research paper, book review, or editorial). Collecting and studying journal abstracts is common in text mining (Feldman and Sanger, 2007). The purpose of abstracts is to summarize the main points of a research paper, and they are generally accessible online free of charge. Hence, database creation consisting of research paper abstracts offers a cost-efficient approach for researchers interested in the specific type of studies (Delen and Crossland, 2008). Usage of keywords is an alternative approach; however, it is considered a less reliable data source because researchers are relatively free to choose keywords. Consequently, there is a risk of adding keywords that help index the research paper rather than give it an accurate classification (Miner, 2012). To attain as many entries on Kaizen and CI as possible, both research paper abstracts and keywords were selected as variables for data collection together with year of publication and scientific journal.

Preparing data includes cleansing the data of distorting information and values and narrowing down the elements and variables to be included and processed (Kurgan and Musilek, 2006). A subsequent step was to isolate the research paper abstracts and keywords from other journal content such as book reviews, editorials and errata and to single out entries on Kaizen and CI. The data were only screened for entries containing the term(s) Kaizen, Continuous Improvement and CI. In the process of profiling the data, it became evident that keywords had not been satisfactory collected. The reason for the many erroneous entries appeared to be inconsistencies in the occurrence and placement (database structure) of the keywords. The only remedy for correcting the missing values appeared to be manual processing. As stated above, keywords are not judged as reliable as research paper abstracts. Hence, it was decided to exclude keywords from the data.

The modeling phase concerns the choice and calibration of methods to analyse the data (Reinartz, 2002). Time series analysis offered a means of depicting how Kaizen and CI have evolved over the years. Hence, trend analysis using moving average was performed. The intention was to perform standard text mining procedures, such as cluster- and sentiment analysis, to attain insights on the content. However, only 27 entries on Kaizen were identified, which is too small a number for text mining procedures to be relevant. Hence, it was decided to explore the entries qualitatively by reviewing the complete research papers. Entries on CI were much more frequent (n=348), which could legitimize text-mining processing. However, results from quantitative processing of abstracts on CI were judged incompatible with results from qualitative analysis of the complete papers on Kaizen, which is why no text-mining activities were performed on the CI entries. In the process of qualitatively analysing papers on Kaizen, additional metadata were collected and compiled, such as title, author(s), manuscript origin (country/countries) and type of paper (i.e., research paper or case study). When reviewing the papers, an answer to whether the study was theoretical or practical (focussing on implementation) was sought. Furthermore, with the aim of clarifying the theoretical foundations of Kaizen and how it was described, each paper's theoretical base for Kaizen was scrutinized. Similarly, practical papers focussing on implementation were examined with respect to the tools, techniques and/or methods implemented and described. Finally, with the

objective of exploring the relationship between Kaizen and CI, the association between the two concepts in each paper was assessed.

Evaluation of the modeling means that results are secured and compared with the objectives of the study (Mariscal *et al.*, 2010). In this phase, results from time series analysis, metadata compilation and qualitative analysis of the complete papers were reviewed for trends and patterns concerning Kaizen and CI and how the relationship between Kaizen and CI is described in the research papers.

Deployment relates to the objectives of the study and ensures that the results are applied accordingly (Ibid). The results presented in this study are considered to correspond to the deployment phase of CRISP-DM.

Data source

The data source for the data mining process consisted of abstracts from six academic journals. Four of the journals have a focus on QM, whereas two adopt a broader perspective on OM. The four QM journals that are included in the study are

- International Journal of Quality & Reliability Management (IJQRM)
- The TQM Journal (TQMJ)
- Total Quality Management & Business Excellence (TQMBE)
- Quality and Reliability Engineering International (QREI)

The two OM journals that are included in the study are

- International Journal of Operations & Production Management (IJOPM)
- Journal of Operations Management (JOM)

The online catalogue of IJQRM starts in 1984. In 1998, the International Journal of Quality Science merged into IJQRM. TQMJ has been online since 2008, but its predecessor, The TQM Magazine, started publishing online in 1988. In 1998, Training for Quality merged into The TQM Magazine. TQMBE was established in 1990 under the name Total Quality Management and has been online from the start. In 2003, Business Excellence was added to the title, rendering its current name. QREI published its first issue in 1985. Both IJOPM and JOM started publishing in 1980. In 1980–2017, 10,573 research papers with corresponding abstracts were published: IJQRM 1691 papers, TQMJ 1271 papers, TQMBE 1620 papers, QREI 2228, IJOPM 1691 and JOM 1157.

Kaizen and Continuous Improvement over 30 years

The result of how Kaizen and CI are represented in scientific journals focussing on QM from the 1980s until 2017 is presented in Table 1, which reveals that Kaizen appears in 27 abstracts and CI appears in 348. This summary demonstrates that Kaizen entries are very rare because they represent only approximately 0.3% of the 10.573 abstracts included in the study, whereas CI represents approximately 3%. The results also show that TQMJ have a lead in publications on Kaizen (9), with TQMBE close behind (8), followed by IJQRM and IJOPM with 5 publications each. Furthermore, the results disclose that JOM and QREI have no entries on Kaizen, which imply that they have not published a single paper on the subject. Hence, if compared with the total amount of abstracts available, entries on Kaizen do not represent a significant part of any of the journals' content. Concerning publications on CI, TQMBE has the most entries (113), confirming the observations of Sanchez and Blanco (2014), who also place it on top with respect to number of publications. This last categorization is why Sanchez and Blanco (2014) label TQMBE a worldwide reference journal on CI. However, if judged by the number of total abstracts, TQMJ actually scores higher (7%) in the current study. Thus, in the words of Sanchez and Blanco (2014), it could perhaps also be classified as a reference journal on CI. IJQRM comes in third place with 67 published abstracts, followed by IJOPM (39), QREI (15) and JOM (9). Consequently, albeit in varying degree, all journals appear to have published papers related to CI. Viewed as a different concept, the results validate previous findings from Brunet and New (2003) and Suárez-Barraza *et al.* (2011) that research on Kaizen is scarce, even non-existent, within parts of the QM and OM research community. The results also confirm the statement of Suárez-Barraza *et al.* (2011) that research publications on CI (the Western variant of Kaizen) are abundant with reference to the Japanese version of Kaizen. Furthermore, research on CI is well represented in QM research, albeit less notable in OM research. This point supports the notions of scholars such as Bergman and Klefsjö (2003) and Sila and Ebrahimpour (2002), who suggest that CI is a unique perspective and cornerstone of QM.

Table 1 Overview of the occurrence of Kaizen and CI entries in the examined journals

	Kaizen	Journal %	CI	Journal %	n (Abstracts)
TQMJ	9	1%	105	7%	1476
TQMBE	8	< 1%	113	6%	1880
IJQRM	5	< 1%	67	4%	1691
IJOPM	5	< 1%	39	2%	2141
QREI	0	< 1%	15	1%	2228
JOM	0	< 1%	9	1%	1157
Total	27		348		10573

Figure 2 Kaizen entries per journal 1988-2017

Examining the results chronologically, the first entry on Kaizen appears in 1988 in TQMJ, followed by a five-year gap, after which relative stability is established with 1 publication annually on average. The first entry for CI manifests itself in 1989 in QREI, after which

Figure 3 Kaizen entries 1988-2017

Figure 4 CI entries 1988-2017

publications on the topic have been made on a yearly basis, with an average of 12 publications per year. Figure 2 exhibits the distribution over time for Kaizen entries for each journal. Figure 2 shows that Kaizen entries from all journals (except for JOM and QREI) were published in each of the three past decades, with no specific concentration in time for any journal. From trend analysis with sliding average on the Kaizen and CI entries displayed in Figures 3 and 4, two trends in the data appear. First, a peak for both Kaizen and CI in the mid-1990s exists. Second, the results indicate a novel interest in the subjects from 2010 onwards. However, concerning Kaizen, the last trend should be taken lightly due to the small number of entries ($n=9$). Note that one author stands as head author for 45% of these publications. In their review of CI research papers from 1986–2011, Sanchez and Blanco (2014) distinguish two periods. The first was between 1986 and 2007, when the publications follow a flat trend with continual up and down variations (ibid). The second period starts in 2007 with a dramatic rise of publications that peaks in 2011 (ibid). Consequently, the results from this study confirm the latter observation that a new interest in Kaizen and CI appears to have been sparked around 2010. However, the results from this study reject the notion of a flat trend from the 1980s to 2007. Instead, the results could be said to confirm the historical depictions by Bhuiyan and Baghel (2005), Maurer (2012), Singh and Singh (2015) and Suárez-Barraza *et al.* (2011), which state that Kaizen and CI attained a new interest from US industry in the 1980s because of Japanese business superiority. The results could be said to acknowledge that this renewed interest was from not only US industry but also UK industry. Perceiving, studying and then publishing findings on new management trends are associated with a substantial time delay. Hence, it is natural that an increased managerial interest in Kaizen and CI in the 1980s is noticeable a few years later in the 1990s.

In Figure 5, the manuscript origin for each paper has been charted based on each author's university affiliation. When no university affiliation was stated, the company or correspondence address was used as national classifiers. Because it is the manuscripts that have been classified, a paper with several authors can originate from several countries or generate several entries from the same nation-state. In the same vein, an author that has co-

Figure 5 Kaizen manuscript origin based on author affiliation

authored more than one paper will generate as many entries as he or she has co-authored. Figure 5 shows that Kaizen manuscripts originating from the UK have the lead position, followed by manuscripts from the USA, India and Mexico. In their study of CI research papers, Sanchez and Blanco (2014) found a dominance of contributors from the USA and the UK. Taken together, the results could indicate a greater interest for Kaizen and CI from authors in these countries. However, they

could also be interpreted as due to journal selection, because all journals

in the current study published in English, as did a majority of those studied by Sanchez and Blanco (2014). Additionally, IJQRM, TQMJ and TQMBE could be suspected of incorporating a European bias, and IJOPM a USA-bias. Concerning authorship, there are 40

co-authors, and only three have co-authored more than one paper – one author has co-authored four papers and two have co-authored two papers. These numbers point towards Kaizen attracting attention from a broad spectrum of scholars.

All identified papers on Kaizen are presented in Table 2. Of the 27 reviewed articles, 23 elaborated on the subject. Because Jørgensen *et al.* (2003), Kanji (1998), Patel *et al.* (2001) and Schattenkirk (2012) only mention Kaizen in the abstract without any further relevance to the study or paper, they were excluded from further analysis. A majority of the papers (61%) are case studies, followed by research papers (30%) and general reviews (9%). Regardless of whether a document was a case study or research paper, all papers except one were practically oriented, focussing on implementation, tools and techniques. These findings parallel those of Sanchez and Blanco (2014), who found CI research to be dominantly empirical, with the two most common topics, representing 76% of all research on CI, being implementation and methodologies. Most studies described success stories of how a Kaizen activity had been adapted and implemented for a specific purpose and/or context. A further common denominator for the reviewed Kaizen studies is a weak theoretical base. Kaizen is seldom thoroughly defined, if defined at all, or theoretically underpinned. The most dominant approach to defining Kaizen is by reference to Imai (1986). However, it appears that this reference is used more as a means to legitimize the theoretical base than to actually define and employ the definition in the study. Similarly, another approach to defining or explaining Kaizen is by linkage to Japan (language, culture or philosophy) and CI, i.e., Kaizen is Japanese for CI, or it is “the Japanese CI”. In most cases, these references are shallow and cannot be said to rise to the standards of a useful definition. Furthermore, when Kaizen theory is elaborated, it is quite scattered and linked to everything from quality gurus such as Deming, Juran and Ishikawa to broader management concepts such as QM, TQM, Lean and six-sigma. The results are comparable with those of Sanchez and Blanco (2014), who found that the theory and concept of CI was among the less developed topics, and Suárez-Barraza and Rodríguez-González (2015), who note that the term CI is seldom defined. Furthermore, the relationship between Kaizen and CI is seldom elaborated in the reviewed papers. Some authors treat them as synonyms, whereas others view them as different concepts; however, others view them as associated without precise clarification.

Table 2 Identified papers on Kaizen arranged by year of publication

Paper	Journal	Country	Type of study/paper
Parsons, J. (1988).	TQMJ	USA	General review
Brooks, R. (1993)	TQMJ	UK	Research paper
Creelman, J. (1993)	TQMJ	NA	Case study
Chen, F. (1994)	IJQRM	USA	Case study
Gondhalekar, S., & Karamchandani, V. (1994)	TQMJ	India	Case study
Clayton, M. (1995)	TQMBE	UK	Case study

Gondhalekar, S., Subash Babu, A., & Godrej, N. (1995)	IJQRM	India	Case study
Krüger, V. (1996)	TQMJ	Germany	General review
Webley, P. (1996)	TQMBE	UK	Research paper
Kanji, G. (1998)	TQMBE	UK	Literature review/ Statement
Bond, T. (1999)	IJOPM	UK	Case study
Patel, S., Dale, B., & Shaw, P. (2001)	TQMJ	UK	Case study
Brunet, A. P., & New, S. (2003)	IJOPM	UK	Research paper/ Case study
Jørgensen, F., Boer, H., & Gertsen, F. (2003)	IJOPM	Denmark	Case study
Visawan, D., & Tannock, J. (2004)	IJQRM	Thailand and UK	Case study
Montabon, F. (2005)	TQMBE	USA	Case study
Aoki, K. (2008)	IJOPM	Japan/UK	Research paper
Suarez Barraza, M., Smith, T., & Mi Dahlgaard-Park, S. (2009)	TQMJ	Mexico, Spain & Sweden	Case study
Schattenkirk, D. (2012)	TQMJ	Canada	Research paper
Di Pietro, L., Mugion, R., & Renzi, M. (2013)	TQMBE	Italy	Case study
Glover, W. J., Liu, W. H., Farris, J. A., & Van Aken, E. M. (2013)	IJOPM	USA	Research paper
Suárez-Barraza, M., & Smith, T. (2014)	TQMBE	Mexico & Spain	Case study
Suárez-Barraza, M., & Ablanedo-Rosas, J. (2014)	TQMBE	Mexico & USA	Case study
Prashar, A. (2014)	TQMJ	India	Case study
Suárez-Barraza, M., & Rodríguez-González, F. (2015)	TQMBE	Mexico	Case study
Ma, J., Lin, Z., & Chi Keung Lau, C. K., (2017)	IJQRM	UK	Research paper
Awad, M., & Shanshal, Y. A. (2017)	IJQRM	United Arab Emirates & USA	Research paper/ Case study

Conclusions and Discussion

The study validates the observations of Bhuiyan and Baghel (2005), Brunet and New (2003), Sanchez and Blanco (2014), Singh and Singh (2015) and Suárez-Barraza *et al.* (2011) concerning the theoretical deficit of Kaizen and CI. This shortcoming is not only an issue for the academic community. Clarifying the theoretical foundations of both Kaizen and CI is necessary to ensure successful implementation. Support is also found for the claim from Brunet and New (2003) and Suárez-Barraza *et al.* (2011) that Kaizen is on the one hand accepted by one part of the management community and on the other hand completely ignored by the rest because one QM journal and one OM journal each appear not to have published a single scientific paper related to Kaizen since the 1980s. Furthermore, the study confirms claims from scholars such as Bergman and Klefsjö (2003) and Sila and Ebrahimpour (2002), who find that CI, and Kaizen if the concepts are considered synonyms, is a distinguishing research area for QM in comparison with other management research areas such as OM. Moreover, that 23 out of 27 abstracts (85%) treated Kaizen is in line with results from Delen and Crossland (2008), Feldman and Sanger (2007) and Miner (2012), who declare abstracts to be a reliable and relevant data source when conducting text mining.

In a large number of the analysed papers related to Kaizen, the concept of participation is a key issue for a definition of Kaizen. For example, Gondhalekar *et al.* (1994) state that Kaizen requires all employees to participate continuously in making improvements. Volker Krüger (1996) defines Kaizen as the opposite of innovation, because Kaizen activities are incremental and small improvements that involve everyone in the company. The same idea is gathered by other authors (Bond, 1999; Suárez-Barraza & Smith, 2009; Suárez-Barraza & Rodríguez-González, 2015). They also give importance to the idea that all of the employees should participate in the Kaizen process, and that Kaizen is a bottom-up change (Bond, 1999). The management literature has generally recognized the participation of the workforce in process improvement as a key element in Kaizen (Elgar and Smith, 1994; Senge, 1990; Utterback, 1995). The participation in Kaizen implies that all employees from top management to front-line workers are committed to the recognition of the existence of problems and work in teams and as peers in identifying possible improvement areas (Magnier-Watanabe, R., 2011). In Japan, Kaizen is a means of encouraging worker participation that is promoted through different types of Kaizen activities: suggestions, Kaizen teams, and Kaizen events (Jaca *et al.*, 2014). The participation of people in such activities is usually considered a means of developing key skills in the employees. In Japanese companies, Kaizen is applied to make employees feel comfortable in the company because their managers consider Kaizen activities a means to increase communication among employees and consequently improve the well-being and motivation of the people working there. Another benefit area relates to the idea that Kaizen encourages workers to think positively, convincing them that everyone in the company can contribute by thinking of and giving ideas for improvement (*ibid.*). As Imai (1986) states, “Kaizen means ongoing improvement involving everyone – top management, managers and workers”.

Additionally, Kaizen appears to have become more a practical tool or an event rather than a profound management philosophy that, in the words of Miller *et al.* (2014), must incorporate a built-in ethical compass that guides individuals and organizations to do greater good in the long term. This point is similar to results from Lean research showing that many managers attempt to implement Lean without comprehending its underlying principles, which in turn delimits Lean as a set of tools and techniques rather than a management philosophy (Radnor and Boaden, 2010). Moreover, because the results from this study show that Kaizen is seldom

defined, the concept might appeal to practically oriented studies, in which emphasis is placed on implementation rather than theory. This possibility is in line with the thoughts of Brunet and New (2003), who state that researchers and practitioners have been able to cherry-pick what to include in their idea of Kaizen, which has resulted in a wide variety of interpretations. Extending this line of thought, the weak theoretical base coupled with a high focus on implementation might be one reason for Kaizen attracting little interest from the academic community, i.e., Kaizen is considered a set of disparate tools, techniques and methods based on a weak theoretical underpinning rather than an extensive theoretical (and philosophical) entity worth exploring.

Moreover, the results point towards Kaizen being closely related to Masaaki Imai, which might not be particularly surprising because Imai (1986) launched the first management book on the topic. Nor is this relationship necessarily a negative aspect; management gurus are prominent in many fields. However, according to Imai (1986; 2012), Kaizen and Gemba Kaizen are trademarks of Kaizen Institute Ltd., and copyrighting comprehensive management concepts is not commonplace. As far as the authors are aware, no similar claim exists on CI. Hence, it is possible that this condition might have influenced the evolution of terminologies – favouring CI. After all, why as a researcher or practitioner risk a lawsuit when conducting work that generates intellectual property for the benefit of a private company?

Likewise, it is worth reflecting on why a special focus on Kaizen is needed. On the one hand, Kaizen appears quite uninteresting to the academic community because it evidently has not attracted much researcher attention over the last 30 years. On the other hand, it appears that Kaizen is quite well known both within and outside academia. A comparison in Google Trends between Kaizen and *continuous improvement* (CI intendedly not used because the abbreviation has other meanings outside academia) reveals that Kaizen is, on average from 2004, six times more often searched on the web than is continuous improvement. Hence, a discrepancy appears to exist between the scholarly and non-scholarly world. The general interest appears to lean towards Kaizen, whereas management research has largely focussed on CI. It is not clear how or why this difference has developed. Possibly a sceptical research community has viewed Kaizen as only another faddish buzzword advocated by certain campaigners and consultancy firms. From this point of view, Kaizen only serves the purpose of selling more books or consultancy services but in fact does not bring any new knowledge to the table. Nevertheless, by adopting such a stance, researchers might have failed to recognize important management insights that have taken root and spread outside academia. Thus, the issue is perhaps not why research on Kaizen is called for but rather why it has not been called for earlier.

From the study, it is not possible to assess whether the theoretical and practical deficiencies and discrepancies in the explored studies arise due to flaws in the research process or due to unskilled implementation. If a researcher does not understand what he/she sees and hears during data collection, there is an apparent risk that a case with poor implementation and weak theoretical foundation is presented in the paper. This risk would therefore imply that the academic community is describing and thus creating greater theoretical and practical confusion than actually is true on the ground; i.e., the study object knows what they are doing and why, but the researcher misunderstands. In the second case, the researcher portrays an honest picture that shows that the managerial actions on the ground are neither thoroughly thought through nor well-grounded in theory. Consequently, the organization does not really know what they are doing or what to call their activities, which is why they are using several different terms and concepts without clear definitions. The “truth” most likely lies somewhere

in-between these two scenarios, but if the ambition is to resolve critical epistemological, theoretical and practical issues concerning Kaizen, it might be wise to extrapolate antipoles.

Finally, it is worth reflecting upon to what extent a historiography that assigns Western management philosophies and teachings on CI as the foundations of Kaizen favours a Western world-view, i.e., Kaizen only being “the Japanese CI”. This point also applies to the current study because all included journals could be suspected of incorporating a Western bias and thus could be supposed to favour a Western historiography. Similarly, the dominance of CI might have arisen partly because it is an English term. English is a more common language in academic environments than Japanese and CI is; thus, most likely more straightforward to translate into other languages than Kaizen is. Alternatively, the dominance of CI could be the effect of self-preservation on behalf of the researcher, i.e., it is easier to have papers on CI accepted and published than those on Kaizen. In any case, a more thorough historical, theoretical and epistemological discussion would deepen our understanding and knowledge concerning both Kaizen and its relationship to CI. In such a process, it could be fruitful to contrast a Western historiography against the delineation by Suárez-Barraza *et al.* (2011), who recognize two different variants of Kaizen –Japanese and Western.

Research limitations and future research

The data source for quantitative modeling consists of abstracts from four scientific journals focussing on QM and two focussing on OM. Hence, trends and patterns that could be shown by inclusion of other entries such as headings and complete papers are omitted. The part of the study concerning CI focusses exclusively on the entries Continuous Improvement and CI. Consequently, formulations such as *continuous ongoing improvement* and *continuous incremental improvement* have not been classified as CI accounts. This process might have excluded records of CI that a qualitative assessment might have categorized as such.

A future area of research that is found to be missing is to define Kaizen thoroughly with a solid theoretical underpinning. The relationship between Kaizen and CI also must be researched more to establish the similarities and / or the differences between the two concepts. If theoretical consolidation and harmonization is not achieved, the risk of fashions and fads increases as new concepts are launched instead of epistemological and theoretical contradictions and incompatibilities being fruitfully resolved. Hence, if Kaizen and CI are to take advantage of what appears to be an increasing interest in this topic, increased theorization is required.

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