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The role of employee empowerment in the implementation of continuous improvement

Evidence from a case study of a financial services provider

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Abstract

Purpose – The purpose of this paper is to understand the role of increasing employees' level of continuous improvement (CI) empowerment, i.e. employees' knowledge and understanding of CI, the possibility of open communication and support from the work environment regarding CI, in the implementation of CI over time.

Design/methodology/approach – Based on the theory of structural empowerment, the authors test the research question using evidence from a case study in a European financial services provider. Data are gathered with questionnaires on a team level and cover a period of 2.5 years including 780 participants.

Findings – The findings show that after conducting a CI programme in the case, there is a significant increase in employees' CI empowerment over time, which has a positive but time-lagged relationship with the level of CI implementation.

Research limitations/implications – Implications are that CI empowerment can be created sustainably and is an important factor in establishing CI in a company, but that it takes time until empowerment leads to changes in behaviour. However, it has to be considered that these implications are solely derived from empirical results from a single company.

Practical implications – Financial service providers should invest in establishing CI empowerment and consider a delay in realising measurable benefits in terms of the level of CI implementation.

Originality/value – This paper is the first empirical study to examine the relationship between employee CI empowerment and the implementation of CI from a longitudinal perspective.

Keywords Service, Case study, Continuous improvement, Financial services, CI empowerment

Paper type Research paper

1. Introduction

Today, few companies can survive in their market environment by maintaining their status quo (Kofoed *et al.*, 2002; Swartling and Olausson, 2011). The ability of an organisation to stay flexible and responsive towards changing conditions requires continuous improvement (CI), leading to a dynamic company culture whose natural state is centred around incremental change and improvement (Hong *et al.*, 2014).

CI is defined as a bundle of principles, activities and tools within a company that aim to generate a planned and systematic improvement process of incremental and ongoing change (Lillrank *et al.*, 2001; Kofoed *et al.*, 2002). Through this ongoing change, CI aims to eliminate sources of imperfection within a company based on a high degree of employee participation to improve the quality of products and processes, and thus enhance the company's performance

Both authors contributed equally to this work and should be considered co-first authors.

(Imai, 1986; Kofoed *et al.*, 2002; Wynder, 2008; Singh and Singh, 2013). However, after great enthusiasm at the beginning of a CI initiative, most programmes lose momentum and management realises that few of the intended principles and behavioural patterns have become institutionalised within the company (Swartling and Olausson, 2011).

Among other potential reasons, studies by Kotter (1995), Lillrank *et al.* (2001), Angell and Corbett (2009) and Holtskog (2013) reveal that the successful institutionalisation of CI is closely linked to contributions made by individual employees. This contribution is not only dependent on one's interest in participating, but is also determined by one's personal abilities with regard to CI (e.g. Lok *et al.*, 2005; Lam *et al.*, 2015). While different terms can be found in relation to this phenomenon (e.g. "empowerment or engagement"; Rother, 2010, p. 176), we use the term "CI empowerment" as we adopt the concept of structural empowerment as the underlying theory (Kanter, 1993). CI empowerment covers the acquisition of required knowledge to undertake CI activities, as well as understanding of the CI goal to realise the impact of CI in one's daily work (Lillrank *et al.*, 2001). In addition, empowered employees feel supported by their management and colleagues to use their problem-solving skills actively, by openly talking about improvement opportunities and possible difficulties (Holtskog, 2013).

While there is acknowledgement that CI empowerment is relevant, how it contributes to establishing CI in companies over time is not well understood. Prior research focuses mainly on cross-sectional data, and shows positive effects (Lok *et al.*, 2005; Fernandez and Moldogaziev, 2013; Lam *et al.*, 2015; Jurburg *et al.*, 2016), but also negative or non-existent effects (Gibson and Vermeulen, 2003; Marquet, 2012). The only related long-term study is from Kofoed *et al.* (2002), who present longitudinal data from a case in which employees are not, in fact, directly empowered, but are supported by consultants who improve the processes. Hence, there is a research gap in terms of understanding the relationship between CI empowerment and CI implementation over time.

In contributing to closing this gap, we follow the understanding of Walker *et al.* (2015) with regard to the usefulness of importing theories from other disciplines if the underlying principle of an OM topic can be grounded in such a theory. Here, behavioural theories have been highlighted as useful to explain individual behaviour. We argue that in order to analyse the relationship between CI empowerment and CI behaviour of individuals, it is necessary to adopt a behavioural theory (Walker *et al.*, 2015). Thus, we make use of the theory of structural empowerment as a behavioural theory (Kanter, 1993) that explains a positive link between the training of employees in CI tools and principles and their CI behaviour as a foundation for CI implementation (Fernandez and Moldogaziev, 2013). As a consequence our understanding of CI empowerment is the empowerment of employees from the roots up, in the sense of providing structural elements to allow for self-determined improvement activities.

Our study aims to provide a better understanding of CI implementation using an example from the financial services industry. Financial service providers face particularly intensive competition as their services can easily be offered worldwide due to these offerings' digital nature, and because customer preferences change frequently in international markets (Staikouras and Koutsomanoli-Fillipaki, 2006; de Koning *et al.*, 2008). Most research on CI focuses solely on manufacturing (Kotter, 1995; Bessant and Caffyn, 1997; Lillrank *et al.*, 2001; Filho and Uzsoy, 2013; Glover *et al.*, 2015), while the characteristics of financial services provision differ from those of manufacturing in a number of ways (Hatzakis *et al.*, 2010; Leyer, 2016). Financial services are generally not visible as information is processed which makes it difficult to observe this process. In addition, operations are independent from a geographical location as information can be distributed digitally within seconds, which is not the case for tangible products. However, many aspects of financial service processing are regulated by authorities, and thus cannot be changed that easily or have to be changed due to regulations. Hence, results of studies on CI in manufacturing might be less applicable for service companies, creating a need for more empirical studies in the service sector.

We present empirical results from a case study conducted over a 2.5-year period in a major European financial services provider. We had access to a database containing internal data on a company-wide CI programme that was started with a roll-out but is an open ended journey to install CI sustainably. Such data are unique within the extant literature since they were collected during and after the initial CI journey of each team involved in the CI programme. This allows us to analyse the relationship between CI empowerment and CI implementation over a longer time period, even after the programme ended.

The paper is structured as follows. Section 2 provides the theoretical background on CI dimensions, while Section 3 highlights the importance of employee CI empowerment with regard to the implementation of CI programmes. Section 4 describes the methodology and data used, followed by the background of the case study in Section 5. Section 6 delivers the results of our investigation. We conclude with a discussion of our findings and the study's contributions and limitations, including suggesting potential avenues for future research.

2. Dimensions of CI

CI is associated with several organisational improvement methods, such as total quality management (TQM) (Kanji and Wallace, 2000; Lillrank *et al.*, 2001), lean management (Berger, 1997; Kofoed *et al.*, 2002; Singh and Singh, 2013; Glover *et al.*, 2015) and operational excellence (Kaye and Anderson, 1998; Angell and Corbett, 2009). Based on this diverse classification of the origin of CI, a number of characteristics of CI are provided in the literature. Berger (1997), de Leede and Looise (1999) and Filho and Uzsoy (2013) follow Imai (1986) and provide key characteristics of CI derived from the ideal Kaizen type: process orientation, improving and maintaining standards and people orientation. Kaye and Anderson (1998) expand this conceptualisation and present characteristics for a sustainable CI programme, including leadership, strategic focus, organisational culture and focus on employees, processes, standardisation and measurement and learning from results. In addition, Dahlgaard and Dahlgaard-Park (1999) provide a definition of CI in the context of business excellence. They suggest that CI is the result of building excellence in four dimensions: people, partnerships, processes of work and products.

While some characteristics overlap, there is no classification available that offers an holistic view of CI – i.e. that covers all dimensions suggested over years by academia and by practitioners. We argue that the characterisation of CI delivered by extant studies is not fully satisfactory with respect to representing the complexity and richness of CI within an organisation (Holtskog, 2013). Hence, motivated by the lack of an holistic concept of CI, we conceptualise the content of CI along five core characteristics by summarising prior work on this topic.

2.1 Process focus

Processes are the focal point of interest within CI programmes. Following Imai (1986), processes have to be sound in order to achieve improvements. Sound processes are based on a fundamental understanding of customer requirements, and aim to reduce process variability and waste (Piercy and Rich, 2015). To fulfil this requirement, the whole process must be known and understood by employees. This entails that the interdependence and outcome of different operational activities within the process have to be known and monitored by employees in order to identify improvement potential (Berger, 1997; Singh and Singh, 2013). In addition, sound processes involve standardisation as CI cannot happen if there is no standard (Imai, 1986; Ko *et al.*, 2009). Berger (1997) argues that process optimisation and standardisation in particular result in sustainable improvements of organisational performance.

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2.2 Customer focus
Following Kanji and Wallace (2000), as well as Lillrank *et al.* (2001), CI is closely linked to TQM, which aims at customer satisfaction (Kanji and Wallace, 2000). Since CI activities have to ensure that the improved procedures are aligned with customer requirements, we argue that customer focus is an essential characteristic of CI programmes. CI activities can help to identify and analyse customer needs in order to create transparency for both sides – company and customers. Ambiguous expectations between customers and company can lead to cumbersome coordination and feedback loops, as well as uneven distribution of work, resulting in overtime and work backlogs (Singh and Singh, 2012).

2.3 Work-based knowledge and skill acquisition
According to the extant literature, work-based training and learning are seen as an essential characteristic of CI. Successful improvement activities are based on sufficient knowledge and understanding by employees (Locke and Jain, 1995; Bessant and Caffyn, 1997; Oliver, 2009). Hence, CI is grounded in a constant learning process and creates an open learning environment to improve employees' problem-solving skills. By reducing isolated pools of knowledge and bottlenecks, the overall team performance is strengthened (Kofoed *et al.*, 2002).

2.4 Team management
In line with Kaizen, CI activities include involving team members in every step of the improvement process (Imai, 1986). Hence, team management can be seen as a key characteristic of CI. Through CI activities, the current level of communication and coordination within the team is improved, and information and reporting structures are strengthened. In addition, work and resources have to be distributed equally within the team to avoid work overload and bottlenecks, as well as idling. Identifying and implementing relevant assessment systems results in improved monitoring of CI implementation (Locke and Jain, 1995; Kaye and Anderson, 1998; Angell and Corbett, 2009). Furthermore, self-assessment forces managers to prioritise improvement opportunities, which ensures that improvement activities are strategically beneficial for the company (Samuelsson and Nilsson, 2002).

2.5 Mindset and behaviour
Several studies link CI to a change in mindset, and consequently behaviour (Kotter, 1995; Holtskog, 2013; Singh and Singh, 2013). Savolainen (1999, p. 1205) argues that CI involves "a new way of thinking" and innovative behaviour. CI behaviour and thinking has to be acquired over time, and can boost a company's competitive advantage since it cannot be easily copied by competitors (Savolainen, 1999). This is also acknowledged by Bessant and Francis (1999), who argue that training in problem-solving skills and the implementation of a system to receive and respond to ideas support employees to acquire the mindset and behaviour required for CI. In the context of lean management, Secchi and Camuffo (2016) show that understanding the underlying principles is important and limited template knowledge is not sufficient.

3. Importance of structural empowerment for the sustainability of CI implementation
Empowerment of individuals has been identified by many researchers and practitioners as a critical factor for change and improvement in the organisational context (Thomas and Velthouse, 1990; Kanter, 1993). Thomas and Velthouse (1990) describe empowerment broadly as an increase in intrinsic task motivation, and argue that empowerment cannot be described

with a single concept. The authors distinguish between two concepts of empowerment. First, empowerment through situational attributes, such as management practices, and second, empowerment through individual cognitions about situational attributes.

An extension with regard to the organisational perspective is made by Kanter's (1993) theory of structural empowerment, which focuses primarily on empowerment through organisational attributes, such as resource allocation towards employees. Such empowerment supports employees to achieve a high level of work performance, since empowered employees have the ability to control resources in order to accomplish their tasks. In line with this prior work, recent results have confirmed that if employees are not empowered in an organisation, their work becomes ineffective (Orgambídez-Ramos and Borrego-Alés, 2014). According to this theory, management should ensure individuals' structural empowerment by providing them access to the following sources (Kanter, 1993):

- an open learning environment to increase their level of knowledge and skills;

- relevant resources and support, i.e. receiving the financial support, time and supplies that are needed to accomplish the work;

- relevant information and knowledge, i.e. technical know-how, and understanding of policies and decisions within an organisation; and

- support in terms of guidance and feedback from colleagues or supervisors.

These critical sources are also confirmed by Lord and Hutchison (1993). These authors state a list of critical factors that support individuals in the transition process towards empowerment. Participants must be actively involved in the transition process in order to become critically aware of the current problems. Through active involvement, individuals have the chance to develop a new sense of awareness that leads to improvement potential. However, Lord and Hutchison (1993) argue that only individuals who have the necessary skills and knowledge, and who feel supported by their colleagues, can expand their awareness and act in transition processes. In addition, receiving new information is seen as a critical factor. In Lord and Hutchison's (1993) study, participants reported that relevant knowledge, ranging from information regarding an individual's own strengths to knowledge based on training and education, was especially critical for the transition process.

Prior research provides mainly positive evidence regarding the connection between structural empowerment and CI activities. Lok *et al.* (2005) show a significant correlation between employee empowerment and CI by questioning managers from a cross-industrial sample in Australia. Similarly, Lam *et al.* (2015) show (through evidence from the healthcare sector) that providing relevant resources and assistance for improvement increases the effectiveness of employee behaviour in CI, which contributes to a potential explanation for why many CI initiatives fail. In addition, empowerment is seen as an important factor to foster CI (Jurburg *et al.*, 2016), with structural empowerment in particular encouraging employees to engage in CI activities (Fernandez and Moldogaziev, 2013). The only long-term analysis is conducted by Kofoed *et al.* (2002), who present longitudinal results from a processing company of a CI programme based on consultants coming into the company and conducting projects to improve performance towards a defined goal. Thus, the focus is less on structural empowerment but more on employees being part of projects led by external consultants. The authors rely on qualitative interview data and provide a summary of these experiences. However, although the idea of structural empowerment is partly addressed (involvement of employees but not direct improvements), the results do not focus on the connection between empowerment and behaviour.

Empowerment is also in line with the idea of lean management in terms of self-awareness (e.g. Jolayemi, 2008; Radnor and Johnston, 2013), i.e. leaders act as coaches and employees

can make important decisions on all hierarchy levels (e.g. Robert *et al.*, 2000). This means that employees have to be supported in their self-awareness (of which empowerment is one part) in order to implement lean principles (of which CI is one part; Womack and Jones, 2003) in their daily work activities (Moyano-Fuentes and Sacristan-Diaz, 2012; Leyer and Moormann, 2014). Often, the term "engagement" (or also "employee involvement"; Mann, 2010) is used; however, this reflects the idea of structural empowerment as "people working on the process have the tools" (p. 8) to conduct CI (Liker and Morgan, 2006). Structural empowerment in that sense does not mean that teams should be autonomous and self-directed, but rather supported, with the aim of engaging them, in the same way as that documented in specific implementations of lean (e.g. within the Toyota Kata; Rother, 2010).

However, while there is strong evidence that empowered teams are more encouraged in reflecting their work activities and conduct improvements, there are potential drawbacks due to an increase in freedom not leading to improvement activities (Gibson and Vermeulen, 2003). Another negative aspect is highlighted with regard to the top-down approach to empowerment in hierarchical control environments (Marquet, 2012), though this is not in line with the understanding of structural empowerment or engagement in lean understanding.

Summing up, empowerment towards CI involves organisational attributes, as well as aspects with regard to the roles of employees and their direct links to other colleagues. Employees have to be equipped with relevant skills and information to execute the improvement activities and identify improvement potential. Furthermore, employees' understanding of the CI goals and the impact of the CI programme on their working routine is essential for CI programmes' success, since these aspects promote CI engagement and commitment (Lillrank *et al.*, 2001; Holtskog, 2013). Moreover, providing the opportunity to openly communicate problems and improvement potential within a team is also crucial to empower employees. Employees who feel supported by their fellow workers and their managers can actively participate and promote CI in their daily working routines (Angell and Corbett, 2009). Nevertheless, an analysis of the role of employee empowerment in the implementation of CI activities in the long-term is missing.

Thus, based on the reviewed literature on empowerment and CI, we conceptualise CI empowerment based on four criteria:

(1) Communication: open and structured communication is needed to promote CI in a sustainable way. Thus, employees should be given the opportunity to openly report and discuss potential problems or imperfections without experiencing a potential disadvantage at any time. As such, the reward system in a company should not punish employees reporting problems (Lee *et al.*, 2004). Open feedback gives rise to improvement plans, which can then lead to improvement actions. In the extant literature, feedback is seen as essential to promote CI (Samuelsson and Nilsson, 2002).

(2) Understanding: employees need to understand the CI goals and recognise the link between improvement activities and the impact of these on the employees' own working environment. Awareness of this link builds understanding, which in turn creates acceptance and supports ongoing engagement in the CI programme (Kotter, 1995).

(3) Knowledge: it is essential that employees feel as though they are equipped with all relevant information to perform their improvement work and to engage in CI activities. Equipped employees feel empowered and are more involved in improvement activities, which is crucial for CI programmes (Lillrank *et al.*, 2001; Swartling and Olausson, 2011).

(4) Support: teamwork is seen as an important feature of CI. Employees should feel supported by their colleagues, as well as their managers, to actively engage in improvement activities (Angell and Corbett, 2009).

Given the extant literature on employee empowerment, it is expected that there is a positive relationship between CI empowerment, as conceptualised above, and CI implementation. It is, however, unclear how this relationship is characterised over time.

4. Measures

According to the four criteria described and discussed in Section 3, we developed the questions shown in the list below to measure the perceived level of employees' CI empowerment. We used a survey to collect data on the individual and subjective perception of CI empowerment based on the theory of structural empowerment provided by Kanter (1993). Due to the fact that the sample company has a powerful work council, only selected questions were allowed to be asked and these had to be strictly agreed upon by the council before the survey was conducted.

Questions regarding employees' level of empowerment asked to participants are as follows:

(1) I am able to observe improvements in my direct working environment due to the CI activities.

(2) I have all tools and information required to perform my work.

(3) In our team it is possible to bring in suggested improvements and new ideas.

(4) In my immediate working environment, I am able to count on my co-workers' support.

The variable "perceived level of empowerment" was then calculated as the mean of the four questions.

The level of CI implementation per team was drawn from the dimensions of CI described in Section 2. To ensure measurement accuracy, the dimensions "process focus", "team management" and "mindset and behaviour" were measured with two items each (Table I).

The variable "level of CI implementation" was then calculated as the mean of the eight items.

Pre-tests were conducted with experts in the field to ensure that these questions were accurate. Both the level of CI empowerment and the level of CI implementation were measured on a scale from 1 to 5 to ensure comparability.

5. Case company description and data collection

Based on the selection criteria proposed by Yin (2009), a case study was chosen to examine the research question. The selection criteria adapted for our work were the size of the company, the long-term commitment of the top management towards CI and the high level of heterogenic cases within one organisation. Hence, the sample company can be seen as an exclusive case (Yin, 2009), in which CI was implemented in a standardised way in different teams based in different departments. The overall aim was to empower employees with regard to CI in the sense of training them, but not to create autonomous and self-directed teams (in the sense of the Toyota Kata as described in Rother, 2010). The standardisation of the programme roll-out allowed for testing of several factors that influence CI in several conditions to increase the generalisability of our case.

The case company is a large European financial services provider with more than 50,000 employees. The company aimed to implement CI stepwise, i.e. CI was implemented in teams successively, with a roll-out to 148 teams (more than 4,000 employees) at the end of the study period. A team of internal employees from different functional areas and levels were initially trained as CI experts to organise the CI implementation. The approach was bottom-up coaching of employees, i.e. teams, including the team leader, were coached by internal employees. These coaches visited the teams and empowered them in their work environment.

	Level 1	Level 2	Level 3	Level 4	Level 5
Standardising (process focus)	Development and understanding standard operating procedure (SOP)	L1 + first SOP generated, tested and new employee training with SOP	L2+systematic and regular use of SOPs	L3+SOPs continually updated and new SOPs created involving the whole team; employees comply with SOPs	L4+revision of SOPs at least half a year, SOPs are established in daily working routines
Process walkthrough (process focus)	Clarity regarding goals; support in executing processes	L1+frequency and regularity according to plan; no omissions or shortcuts	L2+monitoring of compliance with SOPs	L3+use of insights to identify problems; document and share experiences of SOPs	L4+process participants initiate process improvements and independently pursue them
Customer focus	Basic knowledge of customer expectation; first thoughts on measuring fulfilment of customer requirements	L1+identification of fields for actions; systematic identification of client requirements	L2+focus on improvements necessary in terms of quality and quantity to fulfil customers' requirements	L3+ongoing updating of structured and agreed customer requirements; permanent adjustment to changing client requirements; proactive dialogue	L4+full picture of customer requirements, continually measured, reported and improved; permanent emphasis on customer feedback
Individual development (work-based knowledge and skill acquisition)	Management shows interest in tasks, difficulties, success of employees; recognise moods/changes in performance of employees	L1+open questions leading to a dialogue format with employees; develop a sense of workload/work pressure	L2+dialogue; employees noticeably involved in planning and development	L3+regular discussion in an open and confidential atmosphere between management and employees	L4+proactive support is provided
Meeting structure (team management)	Schedule kept; all topics covered and discussed	L1+meeting well prepared; agenda and structure of meetings clearly defined	L2+balanced speaking and listening, clear tasks and responsibilities; employees involved in bringing problems up	L3+employees are increasingly included in dialogue; problems are discussed frequently	L4+employees systematically identify possibilities for improvement; employees actively introduce and take up topics
Control and measurement (team management)	Use and purpose of resource management understood; method explained and understood by employees	L1+basis for resource management established, time planning with resource management	L2+activities are controlled and prioritised with the help of resource management	L3+feedback loop to CI; daily goals are met or deviations clearly explained	L4+figures and goals are consistent
Problem identification and solving (mindset and behaviour)	Systematic identification of problems	L1+selection if problems are suited to problem-solving session; problem solving seen as necessary	L2+application of methods; employees more heavily involved	L3+problem solving part of daily work activities; problems seen as opportunities for improvement	L4+employees actively participate in identifying, analysing and solving problems
Tool Implementation (mindset and behaviour)	Use and purpose of implementation is understood; implementation plan is created and communicated	L1+implementation plan is discussed and updated regularly	L2+activities from implementation plan are carried out according to plan	L3+tasks from the implementation plan are regularly followed up on	L4+implementation plan contains initiatives to promote CI

Table I.
Description of CI levels

The idea was to identify their problems and give team members chances to solve these problems on their own. Tools were explained, moderated discussions were conducted within teams, prioritisation of problems was carried out and top-priority projects with accompanied supervision were conducted to achieve learning-by-doing. Following this, the team was to continue with CI on its own. Within each team, some members were then sent to other teams to spread the idea and to ensure structural empowerment. This idea differs from the description provided by Kofoed *et al.* (2002), in which consultants come in and team members provide input, but there is a project team and less general involvement from operational team members.

The programme roll-out was standardised for each team and divided into four phases – preparation, analysis, design and transfer – spanning a total of five months. During that time, 41 pre-defined improvement tools were implemented in cooperation with the target team in the dimensions of process focus (e.g. material and information flow analysis), customer focus (e.g. client requirement analysis), work-based knowledge and skill acquisition (e.g. skill matrix), team management (e.g. resource management) and mindset and behaviour (e.g. identification of team vision).

Responsibility for implementation of the tools shifted over the five months. Initially, the experts held responsibility for the CI implementation of identified improvement possibilities and the target team was guided through the improvement activities. During the roll-out, only those possibilities with the highest prioritisation were targeted. This procedure was motivated by the fact that knowledge and skills concerning the CI methodology were missing in the target team, and had to be established first. However, the programme aimed to empower each individual member of the target team and increasingly involve them over time. From the second month of this practice, members of the target team started to adopt increasing amounts of responsibility. After the five months, the CI experts left the target team, which was then expected to independently carry the CI methodology beyond the programme roll-out.

A non-random selection at team level was used due to the need to collect data across the teams within the organisation that had already implemented CI. However, since the procedure of CI implementation was standardised in each team, the validity and reliability of the results were taken as given and no further criteria for sampling selection was applied at the team level (Yin, 2009).

Following Chan (1998), more than three measurements were performed over time at the same unit of observation to ensure that the change path was captured correctly (Chan, 1998; Oud and Folmer, 2011). We chose two points in time during the programme roll-out and four points in time after the roll-out (immediately after, as well as three, six and 12 months later) to examine the change in employees' level of empowerment over time. Additionally, the CI implementation level was measured three times, starting after the transfer phase. This time frame is in line with previous studies on change implementation programmes (Doolen *et al.*, 2006; Glover *et al.*, 2015).

To measure the level of empowerment, the questionnaire was distributed in each team directly after the analysis, design and transfer phase, as well as three, six and 12 months after the roll-out. For each point in time, the scale was reliable, as tested using Cronbach's α (after analyse phase: 0.935; after design phase: 0.779; after transfer phase: 0.952; three months after roll-out: 0.963; six months after roll-out: 0.711; 12 months after roll-out: 0.762). Participation was anonymous and optional for each employee within the team. If fewer than four employees answered per team, the data for this team were not used due to anonymity reasons. Our sample consisted of 780 respondents to the questionnaire, who were organised in 58 teams.
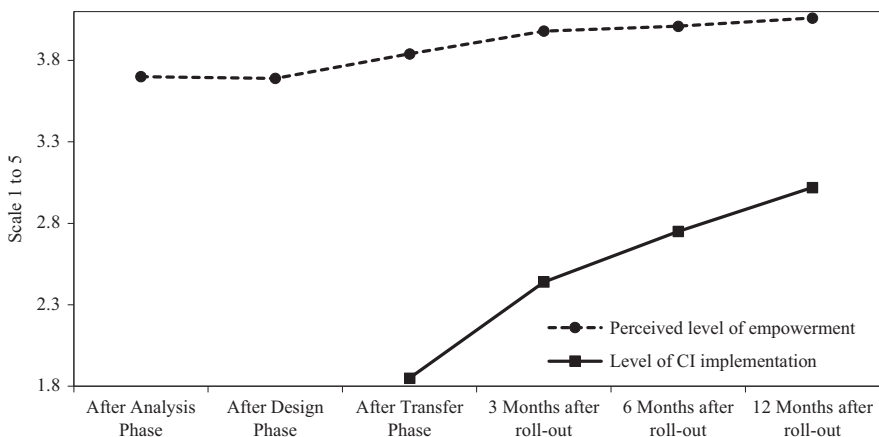
Data regarding the level of CI implementation per team were collected electronically via access to each of the teams' databases. A template with a task description, as well as the

review catalogue itself, was used in each team to ensure a standardised review procedure was followed. Since the review catalogue examined whether CI principles and tools were used within the daily work routine, the associated CI expert in each team conducted a first review after the roll-out and performed subsequent reviews three, six and 12 months later. At each review, the associated expert returned to the team for one day to observe the current situation and to fill out the review catalogue. The expert's review report was then discussed with the head of the target team to provide feedback on further improvement opportunities. Since the reviews were not reported to anyone other than the team members, we do not expect a bias due to dishonest answers. The measures regarding the level of CI implementation were also tested successfully with Cronbach's α for the three points in time (after transfer phase: 0.756; three months after roll-out: 0.730; six months after roll-out: 0.831; 12 months after roll-out: 0.769).

6. Results

The chosen method for the first part of the analysis is the repeated measurements analysis of variance (RMANOVA), as we want to compare similar measures at different points in time. The results of the RMANOVA regarding the level of employees' empowerment show a significant increase from periods 1 to 6, as displayed in Figure 1 ($F(5) = 13.96$, $p < 0.001$). The increase is 9.7 per cent from the beginning of the roll-out until 17 months later. Almost half of this increase (4.2 per cent) occurs during the roll-out period, i.e. within the five months. Thus, we can confirm a positive relationship between the programme roll-out and the level of CI empowerment. Figure 1 provides an overview.

In order to analyse the relationship between the level of empowerment and the level of CI implementation, we start with a second RMANOVA, taking both our independent and dependent variables into account. A comparison of the level of CI empowerment and the implementation level reveals that the former is significantly higher than the latter (between-subjects comparison, $F(1, 75) = 141.07$, $p < 0.001$). Both measures increase over the period of 12 months, but the implementation level does so significantly more than the level of empowerment (within-subjects comparison, $F(3) = 21.63$, $p < 0.001$). While the level of CI empowerment increases by 5.4 per cent over the time of comparison, an increase of 63.3 per cent can be observed regarding the implementation level. Accordingly, the distance between the level of CI empowerment and the implementation level is reduced from 2.01 after implementation to 1.06 – i.e. by almost half. Thus, both appear to converge.

Figure 1.
Comparison of employees' level of empowerment and level of CI implementation

Third, we focus on the relationship between the level of empowerment and the level of CI implementation using single points in time. We conduct regression analyses (one-sided tests) between the level of CI empowerment and the implementation level using the value regarding the level of CI empowerment from the point in time prior to the one of the implementation level. This ensures that the value of the implementation level covers the period in which the level of CI empowerment potentially influences the observed actions. The results show a weak positive relationship between the level of CI empowerment and the implementation level for period 2 – after design to after transfer ($t(1.595)$, $p < 0.10$; $\beta = 0.157$, Adj. $R^2 = 0.02$), a significant relationship for period 3 – after transfer to three months after ($t(2.309)$, $p < 0.05$; $\beta = 0.293$, Adj. $R^2 = 0.07$) as well as for period 4-3 months after to six months after ($t(2.011)$, $p < 0.05$; $\beta = 0.419$, Adj. $R^2 = 0.13$) but not for period 5-6 months after to 12 months after ($t(0.569)$, ns).

Several factors' impact on the level of empowerment and the implementation level are tested as control variables. Our results show that the size of the team ($F(1, 58) = 0.560$, ns), the type of team (market, IT, support; $F(1, 58) = 0.000$, ns), the penetration level (i.e. the number of teams trained per unit) ($F(1, 58) = 0.075$, ns) and the tools used according to the five dimensions of CI ($F(1, 58) = 0.000$, ns; $F(1, 58) = 1.181$, ns; $F(1, 58) = 1.864$, ns; $F(1, 58) = 0.473$, ns; $F(1, 58) = 0.038$, ns) do not have a statistically significant impact on either the level of empowerment or the implementation level.

7. Discussion and conclusion
7.1 Theoretical contributions
This paper is the first empirical study to examine the relationship between employee CI empowerment and the implementation of CI from a longitudinal perspective. Our results show that there exist a positive link between an increase in employee CI empowerment and a sustainable increase in the level of CI implementation over time, but that there is a time lag. This relationship allows us to derive several implications regarding the theory of CI.

First, we provide evidence of a significant increase in the level of CI empowerment of individual employees. Hence, the results of Kotter (1995), Lillrank *et al.* (2001), Angell and Corbett (2009) and Holtskog (2013) regarding the positive relationship between CI introduction and employees' understanding, communication and knowledge acquisition can be confirmed. Our results are descriptive in this regard as there might be other factors influencing the level of CI empowerment. However, given the absolute level measured it can be determined that employees have a high ability to unfreeze their existing principles and practices towards new behavioural patterns to implement CI within the organisation. In addition, our findings reveal that the level of CI empowerment is mostly increasing during the programme roll-out. This might be due to the fact that employees are confronted with new knowledge, methods and work practices in this part of the roll-out. Before implementing CI tools within a team, these tools are presented and discussed in special team sessions throughout the roll-out. Thus, relevant knowledge, as well as understanding of improvement tools and techniques, is transferred to individual employees during the roll-out. In addition, communication between colleagues seems to be improved in a long-lasting manner, due to frequent problem-solving sessions within the programme roll-out. Employees within the target teams are expected to use their experience, facts and knowledge obtained during the roll-out as a basis for debates and discussions with other colleagues. Moreover, employees have to work efficiently as a team and support each other to overcome the additional workload of the CI implementation activities besides their ordinary workload. As teams are trained in a decentralised way, there is a high degree of autonomy of teams but a high level of collective problem-solving within each team. Thus, our results support findings from Secchi and Camuffo (2016) regarding the positive effect of the introduction of lean management on autonomy and problem solving on a team level.

Second, there is evidence that the perceived level of CI empowerment is sustainable as the rate of increase remains significant and even increases after the programme roll-out in the target teams. Hence, employees are still able to promote CI after the roll-out autonomously and sustainably. An explanation for this lasting empowerment is that the implementation of CI does not stop after the programme roll-out. It rather becomes the full responsibility of each individual employee. At the beginning of the programme roll-out, a list of all improvement possibilities within the team is identified in a team session. As only the possibilities with the highest prioritisation are implemented together with the CI experts, while the others are implemented after the programme roll-out, overall implementation of CI starts after the roll-out, when the employees are empowered. Hence, employees can still enhance their CI skills and knowledge and improve their individual level of CI empowerment.

Third, and most important, we can observe a significant increase in the implementation level of CI over time. The results reveal that the implementation level increases after empowering employees within the CI programme. Both measures, CI empowerment and CI implementation increase significantly and converge over time. Additional analyses regarding a relationship between the level of CI empowerment and the implementation level of CI show positive and significant results for the three periods following the CI programme. Both results indicate that the increased implementation level of CI is positively related to employee CI empowerment.

The results can be interpreted in that way that employees' understanding of the CI goal leads to acceptance, which helps them to implement a number of CI principles and tools from the very beginning of the programme roll-out. In addition, correct usage of the tools is supported by the transferred CI knowledge. CI empowerment and CI activities mutually reinforce each other through a positive feedback loop. Employees' perceived level of support from their colleagues and managers, as well as their perception of initial improvement outcomes related to their efforts, helps them to promote CI actively in their daily working routines. The non-significant regression results observed in the last period can be interpreted as sustainability effect, i.e. that minor differences in the level of empowerment do not matter after a certain time. Hence, our results support the assumption of a positive relationship between CI empowerment and CI implementation within an organisation. As such we contribute to the discussion on managerial actions to be taken to achieve a sustainable acceptance and implementation of approaches in CI. Our results show that managerial actions as presented in the CI programme are connected to a long-term change in behaviour as proposed by the conceptual framework of Maalouf and Gammelgard (2016).

However, our results also confirm that employees' subjective perceptions are significantly higher than the objective level of implementation in reality, i.e. reality lags behind the subjective perception. This might be explained by the time it takes to reflect the idea of CI and look out for opportunities to use empowerment for conducting CI activities. As with many new concepts and ideas, employees have to start to experience positive effects in order to become more convinced to act in this regard. CI empowerment allows them to do so; however, it takes time to really change behaviour in this regard. Our results thus extend prior cross-sectional work (Gibson and Vermeulen, 2003; Lok et al., 2005; Marquet, 2012; Fernandez and Moldogaziev, 2013; Lam et al., 2015; Jurburg et al., 2016) by showing that there is a positive relationship between structural empowerment and CI implementation, but that this effect occurs with a time lag. As such, we also extend the results by Kofoed et al. (2002) by showing that empowering employees, rather than using external consultants, is a promising means by which to improve processes.

Fourth, our results show that specific tools within the CI programme do not influence employees' level of empowerment or the implementation level of CI. This result confirms the outcome found by Angell and Corbett (2009), who argue that the success of CI programmes

does not depend on the implementation of certain tools and techniques, but rather on the implementation of a range of general management practices. This is shown for example by Toussaint (2015) in the healthcare sector who argues that an overall improvement system, e.g. management-by-process system like the Toyota Production System, is more important for healthcare companies than a number of individual initiatives. Our results show, however, that top management support is required but there is no need to train managers first. It might be that such training is necessary for some organisations but it was not in the focus of our study, thus, further research should put an emphasis on the necessity of training upper management first.

In addition, our research does not show a significant impact of the size or type of target team on employee CI empowerment. This might be explained by the individual level of CI empowerment, i.e. every employee is targeted to be empowered and then has the possibility to contribute to CI activities within the team. Such activities can be performed in any size of team or any context an employee is working in.

7.2 Practical implications

The practical implications mainly pertain to the time horizon for implementing CI in an organisation. We can infer from our results that a CI programme that aims to implement CI sustainably within an organisation should focus on employees becoming CI empowered rather than expecting them to implement CI independently. Hence, organisations that aim for a behavioural change towards CI should allocate their resources to improve the level of CI empowerment, especially during the initial programme roll-out.

Furthermore, managers should not be deluded by the subjective euphoric feeling at the beginning of a CI programme. Rather, the findings suggest that managers should always plan and equip themselves for a long-term programme, since CI implementation clearly takes time.

Most companies fall into a trap whereby after great enthusiasm at the start of the CI programme, they have accomplished few of their intended objectives (Swartling and Olausson, 2011). To cope with this situation, managers should create a workable programme that uses the enthusiasm at the start, keeps it alive and uses it for the entire programme, and be obstinate about institutionalising CI with a long-term horizon. This also implies that managers must not stop after initial improvements have been achieved, since the overall goal is to establish a dynamic company culture whose natural state is based on incremental change and improvement (Hong *et al.*, 2014).

Finally, companies can focus on enhancing CI empowerment starting with any part of the business, without focusing on certain departments or team sizes. The idea should rather be to start somewhere, take a deep breath and foster the spread of CI empowerment from the starting team to other teams.

7.3 Limitations and future research

There are several limitations of this study to take into account. First, our data originated from one case in the financial service industry. It might be that specific characteristics of this company make it different to other financial service providers. We tried to mitigate this bias by incorporating a high number of teams throughout the organisation, so that at least the chosen case is reliable. Regarding the differences and similarities to other industries, one aspect should be considered when determining the impact of our results. The financial service industry is highly regulated, and thus it might be more difficult or impossible to change processes compared to a less regulated sector. In this case, the observed effect is expected to be seen faster in non-financial services, but we think that the main effect is still relevant according to the theoretical grounding. However, future research should address this limitation by conducting similar analyses in other financial service organisations, as well as other service industries, to increase the generalisability of our results.

Second, the time period covered in our analysis is limited to five months of implementation, with data collected up to 12 months after the roll-out. This time period cannot be considered as long-term in the CI context. Thus, further research could extent the time period of the overall CI implementation and collect post-data beyond the 18-month period to examine implementation of CI in the long term. Moreover, valuable insights into the necessary length of a CI programme to create employee empowerment could be generated by gathering evidence from programmes of different lengths.

Third, a selection bias could be present within the case company since the teams within our analysis were not selected randomly, but by the case company's management. It could be that only teams with employees who were open to CI were selected. We did not have access to data that would take this issue into account, but future research should focus on covering the opinion of employees towards CI as a control variable.

Fourth, we do not have a comparison with teams that were not part of the CI programme. As such, we are limited to a descriptive design with a limited analysis of the relationship between CI empowerment and implementation level. A design with non-trained teams would allow for more insights into causes and effects and to incorporate other influences which should be addressed in future work, but it was not possible due to restrictions of the work council in the company. Initial results of Gemmel et al. (2016) provide first qualitative insights in this regard (using quasi-experiments) by showing that non-trained nurses mainly report occurring problems but show little CI behaviour in terms of sharing improvement ideas or implementing them. Such work should be intensified with further experiments.

Fifth, another bias could arise based on the fact that participation in our surveys was voluntary. It might have been the case that employees who felt more empowered were more likely to participate in the survey. Thus, further research could expand the focus to other methodological approaches (such as personal interviews) to test our results from the survey for robustness. Studies could also explore the impact of employee empowerment on CI implementation over time by using observations of daily work practices in addition to surveys. This could generate a deeper understanding of the adoption of CI principles by individual employees.

Sixth, we focussed on team members without a separate analysis of the team leaders which, however, is presumably having an impact in lean management (van Dun and Wilderom, 2016). Their results show that the values of team leaders are an important factor on the adoption of lean practices and the resulting team effectiveness. Thus, the effect of team leaders' values as a moderating factor on changes in behaviour over time should be analysed by future studies as well.

References

Angell, L.C. and Corbett, L.M. (2009), "The quest for business excellence: evidence from New Zealand's award winners", *International Journal of Operations & Production Management*, Vol. 29 No. 2, pp. 170-199.

Berger, A. (1997), "Continuous improvement and kaizen: standardization and organizational design", *Integrated Manufacturing Systems*, Vol. 8 No. 2, pp. 110-117.

Bessant, J. and Caffyn, S. (1997), "High-involvement innovation through continuous improvement", *International Journal of Technology Management*, Vol. 14 No. 1, pp. 7-28.

Bessant, J. and Francis, D. (1999), "Developing strategic continuous improvement capability", *International Journal of Operations & Production Management*, Vol. 19 No. 11, pp. 1106-1119.

Chan, D. (1998), "The conceptualization and analysis of change over time: an integrative approach incorporating longitudinal mean and covariance structures analysis (LMCAS) and multiple indicator latent growth modeling (MLGM)", *Operational Research Methods*, Vol. 1 No. 4, pp. 421-483.

Dahlgaard, J.J. and Dahlgaard-Park, S.M. (1999), "Integrating business excellence and innovation management. Developing a culture for innovation, creativity and learning", *Total Quality Management*, Vol. 10 Nos 4-5, pp. 465-472.

de Koning, H., Does, R.J.M.M. and Bisgaard, S. (2008), "Lean Six Sigma in financial services", *International Journal of Six Sigma and Competitive Advantage*, Vol. 4 No. 1, pp. 1-17.

de Leede, J. and Looise, K. (1999), "Continuous improvement and the mini-company concept", *International Journal of Operations & Production Management*, Vol. 19 No. 11, pp. 1188-1202.

Doolen, T., Traxler, M. and McBride, K. (2006), "Using scorecards for supplier performance improvement: case application in a lean manufacturing organization", *Engineering Management Journal*, Vol. 18 No. 2, pp. 26-34.

Fernandez, S. and Moldogaziev, T. (2013), "Using employee empowerment to encourage innovative behavior in the public sector", *Journal of Public Administration Research and Theory*, Vol. 23 No. 1, pp. 155-187.

Filho, M.G. and Uzsoy, R. (2013), "The impact of simultaneous continuous improvement in setup time and repair time on manufacturing cycle times under uncertain conditions", *International Journal of Production Research*, Vol. 51 No. 2, pp. 447-464.

Gemmel, P., Meijboom, B. and van Beveren, S. (2016), "The impact of lean on the problem solving behavior of nurses. A quasi-experimental study", *Proceedings of the 23rd EurOMA Conference*, Trondheim, pp. 1-8.

Gibson, C. and Vermeulen, F. (2003), "A healthy divide. Subgroups as a stimulus for team learning behavior", *Administrative Science Quaterly*, Vol. 48 No. 2, pp. 202-239.

Glover, W.J., Farris, J.A. and van Aken, E.M. (2015), "The relationship between continuous improvement and rapid improvement sustainability", *International Journal of Production Research*, Vol. 53 No. 13, pp. 4068-4086.

Hatzakis, E.D., Nair, S.K. and Oinedo, M.L. (2010), "Operations in financial services. An Overview", *Production and Operations Management*, Vol. 19 No. 6, pp. 633-664.

Holtskog, H. (2013), "Continuous improvement beyond Lean understanding", *Procedia CIRP*, Vol. 7 No. 1, pp. 575-579.

Hong, P., Yang, M.G. and Dobrzykowski, D.D. (2014), "Strategic customer service orientation, lean manufacturing practices and performance outcomes", *Journal of Service Management*, Vol. 25 No. 5, pp. 699-723.

Imai, M. (1986), *Kaizen, the Key to Japan's Competitive Success*, Random House, New York, NY.

Jolayemi, J.K. (2008), "Hoshin kanri and hoshin process: a review and literature survey", *Total Quality Management*, Vol. 19 No. 3, pp. 295-320.

Jurburg, D., Viles, E., Tanco, M. and Mateo, R. (2016), "What motivates employees to participate in continuous improvement activities?", *Total Quality Management & Business Excellence*, available at: www.tandfonline.com/doi/full/10.1080/14783363.2016.1150170

Kanji, G.K. and Wallace, W. (2000), "Business excellence through customer satisfaction", *Total Quality Management*, Vol. 11 No. 7, pp. 979-998.

Kanter, R.M. (1993), *Men and Women of the Corporation*, Basic Books, New York, NY.

Kaye, M. and Anderson, R. (1998), "Continuous improvement: the ten essential criteria", *International Journal of Quality & Reliability Management*, Vol. 16 No. 5, pp. 485-509.

Ko, R.K.L., Lee, S.S.G. and Lee, E.W. (2009), "Business process management (BPM) standards: a survey", *Business Process Management Journal*, Vol. 15 No. 5, pp. 744-791.

Kofoed, L.B., Gertsen, F. and Jorgensen, F. (2002), "The role of CI and learning in an organisational change process: experiences from a longitudinal study of organisational change", *Integrated Manufacturing Systems*, Vol. 13 No. 3, pp. 165-175.

Kotter, J.P. (1995), "Leading change: why transformation efforts fail", *Harvard Business Review*, Vol. 46 Nos 3-4, pp. 59-67.

Lam, M., O'Donnell, M. and Robertson, D. (2015), "Achieving employee commitment for continuous improvement initiatives", *International Journal of Production and Operations Management*, Vol. 35 No. 2, pp. 201-215.

Lee, F., Edmondson, A.C., Thomke, S. and Worline, M. (2004), "The mixed effects of inconsistency on experimentation in organizations", *Organization Science*, Vol. 15 No. 3, pp. 310-326.

Leyer, M. (2016), "A framework for systemising services from an operations management perspective", *International Journal of Services and Operations Management*, Vol. 23 No. 4, pp. 486-509.

Leyer, M. and Moormann, J. (2014), "How lean are financial service companies really? Empirical evidence from a large scale study in Germany", *International Journal of Operations and Production Management*, Vol. 34 No. 11, pp. 1366-1388.

Liker, J.K. and Morgan, J.M. (2006), "The Toyota way in services: the case of lean product development", *The Academy of Management Perspectives*, Vol. 20 No. 2, pp. 5-20.

Lillrank, P., Shani, A.B. and Lindberg, P. (2001), "Continuous improvement: exploring alternative organizational designs", *Total Quality Management*, Vol. 12 No. 1, pp. 41-55.

Locke, E.A. and Jain, V.K. (1995), "Organizational learning and continuous improvement", *The International Journal of Organizational Analysis*, Vol. 3 No. 1, pp. 45-68.

Lok, P., Hung, R.Y., Walsh, P., Wang, P. and Crawford, J. (2005), "An integrative framework for measuring the extent to which organizational variables influence the success of process improvement programmes", *Journal of Management Studies*, Vol. 42 No. 7, pp. 1357-1381.

Lord, J. and Hutchison, P. (1993), "The process of empowerment: implications for theory and practice", *Canadian Journal of Community Mental Health*, Vol. 12 No. 1, pp. 5-22.

Maalouf, M. and Gammelgard, B. (2016), "Managing paradoxical tensions during the implementation of lean capabilities for improvement", *International Journal of Operations & Production Management*, Vol. 36 No. 6, pp. 687-709.

Mann, D. (2010), *Creating a Lean Culture. Tools to Sustain Lean Conversions*, Productivity Press, New York, NY.

Marquet, D. (2012), *Turn the Ship Around. How to Create Leadership at Every Level*, Greenleaf, Austin, TX.

Moyano-Fuentes, J. and Sacristan-Diaz, M. (2012), "Learning on lean: a review of thinking and research", *International Journal of Operations & Production Management*, Vol. 32 No. 5, pp. 551-582.

Oliver, J. (2009), "Continuous improvement: role of organisational learning mechanisms", *International Journal of Quality & Reliability Management*, Vol. 26 No. 6, pp. 546-563.

Orgambídez-Ramos, A. and Borrego-Alés, Y. (2014), "Empowering employees: structural empowerment as antecedent of job satisfaction in university settings", *Psychological Thought*, Vol. 7 No. 1, pp. 28-36.

Oud, J.H.L. and Folmer, H. (2011), "Reply to steele & ferrer: modeling oscillation, approximately or exactly?", *Multivariate Behavioral Research*, Vol. 46 No. 6, pp. 985-993.

Piercy, N. and Rich, N. (2015), "The relationship between lean operations and sustainable operations", *International Journal of Production & Operations Management*, Vol. 35 No. 2, pp. 282-315.

Radnor, Z. and Johnston, R. (2013), "Lean in UK Government: internal efficiency or customer service?", *Production Planning & Control*, Vol. 24 Nos 10-11, pp. 903-915.

Robert, C., Probst, T.M., Martocchio, J.J., Drasgow, F. and Lawler, J.J. (2000), "Empowerment and continuous improvement in the United States, Mexico, Poland, and India: predicting fit on the basis of the dimensions of power distance and individualism", *Journal of Applied Psychology*, Vol. 85 No. 5, pp. 643-658.

Rother, M. (2010), *Toyota Kata. Managing People for Improvement, Adaptiveness, and Superior Results*, McGraw-Hill, New York, NY.

Samuelsson, P. and Nilsson, L.-E. (2002), "Self-assessment practices in large organisations. Experiences from using the EFQM", *International Journal of Quality & Reliability Management*, Vol. 19 No. 1, pp. 10-23.

Savolainen, T.I. (1999), "Cycle of continuous improvement: realizing competitive advantages through quality", *International Journal of Operations & Production Management*, Vol. 19 No. 11, pp. 1203-1222.

Secchi, R. and Camuffo, A. (2016), "Rolling out lean production systems: a knowledge-based perspective", *International Journal of Operations & Production Management*, Vol. 36 No. 1, pp. 61-85.

Singh, J. and Singh, H. (2012), "Continuous improvement approach: state-of-art review and future implications", *International Journal of Six Sigma*, Vol. 3 No. 12, pp. 88-111.

Singh, J. and Singh, H. (2013), "Continuous improvement philosophy: literature review and direction", *Benchmarking. An International Journal*, Vol. 22 No. 1, pp. 75-119.

Staikouras, C.K. and Koutsomanoli-Fillipaki, A. (2006), "Competition and concentration in the new European banking landscape", *European Financial Management*, Vol. 12 No. 3, pp. 443-482.

Swartling, D. and Olausson, D. (2011), "Continuous improvement put into practice: alternative approaches to get a successful quality program", *International Journal of Quality and Service Sciences*, Vol. 3 No. 3, pp. 337-351.

Thomas, K.W. and Velthouse, B.A. (1990), "Cognitive elements of empowerment: an 'interpretive' model of intrinsic task motivation", *Academy of Management Review*, Vol. 15 No. 4, pp. 666-681.

Toussaint, J.S. (2015), "Hospitals can't improve without better management systems", *Harvard Business Review*, No. 4, pp. 2-5.

van Dun, D.H. and Wilderom, C.P.M. (2016), "Lean-team effectiveness through leader values and members' informing", *International Journal of Operations & Production Management*, Vol. 36 No. 11, pp. 1530-1550.

Walker, H., Chicksand, D., Radnor, Z. and Watson, G. (2015), "Theoretical perspectives in operations management: an analysis of the literature", *International Journal of Operations Management*, Vol. 35 No. 8, pp. 1182-1206.

Womack, J.P. and Jones, D.T. (2003), *Lean Thinking. Banish Waste and Create Wealth in Your Corporation*, Free Press, New York, NY.

Wynder, M. (2008), "Employee participation in continuous improvement programs: the interaction effects of accounting information and control", *Australian Journal of Management*, Vol. 33 No. 2, pp. 355-374.

Yin, R.K. (2009), *Case Study Research. Design and Methods*, Sage, Los Angeles, CA, London, New Delhi, Singapore and Washington DC.

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