



**Increasing employees' engagement in organizational citizenship behaviors within continuous improvement programs in manufacturing: the HR link?**

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## **Increasing employees' engagement in organizational citizenship behaviors within continuous improvement programs in manufacturing: the HR link?**

*Abstract-* The nature of Human Relationships (HR) within supply chains has received superficial attention in the drive for continuous improvement (CI). Persistent pressures impacting upon global engineering companies has limited the potential to address the HR element. Simply transferring mature western concepts and analytical tools does not capture the dynamics of the global production workforce. This paper proposes a new theoretical perspective, encompassing an evaluative tool, thus moving beyond formulaic implementations of initiatives that erroneously assume maturity of production practices and outcomes. The study helps advance organizations by adding contextualization to the human-centric perspectives of Organizational Citizenship Behavior (OCB) and discretionary effort (DE). Case-based data from engineering production workers in Thailand was factor analyzed to test the research hypotheses.

This research reports on an alternative operationalization of these core ideas, whilst significantly extending empirical-base through validating the propositions. Further, it contributes and responds to extant literature identifying HR as the missing link in enacting CI programs in practice. The paper addresses this gap and data collected provides support for theorizing that the HR concepts proposed positively impact organizational CI interventions. Findings have important implications for such interventions encompassing practical and theoretical relevance for global engineering managers with local engineering production workforce.

*Keywords-* Continuous improvement programs, human resources, employee engagement, organisational citizenship behaviour

### **I. INTRODUCTION**

The contemporary transformations of manufacturing articulated by the EU Factory of the Future 2030 vision provide the context of this study (FoF2020). The morphing of a traditional industry to a trending organizational entity affects such multi-societal contextual factors as: the Factory and nature; green/sustainable; Factory as a good neighbor; close to the worker and the customer; Factory and humans; human centered and factories in the value chain; collaborative practices (FoF2020). This implies that, even at European strategic level, the human aspects of manufacturing have been highlighted as key for future factories.

Globilization of production engineering continues to grow and, even though local workforce employment and financial growth are evidenced, so are many issues relating to different industrial exploitative practices in supply chains [1]. Indeed Cadden et al [2] state the importance of being cognisant of local cultural practices in parallel with transactional processes in supply chains for enhanced, sustained performance and workers satisfaction.

Even though many studies have looked at micro-activities and work-practices relating to employee empowerment and creativity from a psychological or HR perspective and their impact on performance improvement c.f. [3-5] the operations management literature seems lacking in detailed studies on the HR practices in local front line employees [6]. Thus, despite seminal studies amongst strategic and organizational scholars focusing on frontline workers and their importance in realising strategy [7, 8] engineering management research is somewhat lacking in empirical studies in this area. Given the increasing complexity, volatility and strategic importance in managing supply chain processes, operations management scholars have highlighted extensively the link between supply chain success in engineering industry and managers capabilities to lead and inspire [9-11]. However this monolithic, narrow and clearly insufficient focus on the managers leadership capabilities, has blinded us to the integral piece of the production puzzle; that of the global engineering frontline workers own role perceptions and preferences as well as their capability to engage. This paper addresses this gap by

consolidating the behavioral theory knowledge base from the perspective of outsourced organizational engagement and continuous improvement change, and identifies topics such as OCB and DE to direct future research.

Existing studies in engineering management literature are informative in identifying that human factors affect decision making [12],[13] from the perspectives of middle-managers practices [14] and self-leadership [15]. Nevertheless, they are limited in articulating the underlying mechanisms that rationalise how managerial interventions in global production environments can increase engagement of local production workforces through OCB and DE.

For this study, a unique focus is brought on non-managerial engineering workers in outsourced production locations and how their daily interactive work contributes to realising organizational strategy. Thus, the current work extends beyond looking at the role of top-management and large scale change initiatives by exploring and evaluating how frontline production workers can contribute to such organizational initiatives as CI. Consequently, the theoretical HR lens of human capital and organizational citizenship behavior is employed to analyze production shop-floor workers in a large global engineering manufacturing company in Thailand as a salient example of frontline workers. It is important to investigate the perspective of the shop-floor worker as they form the core of operations of manufacturing and services providers, by enabling intrinsic motivation factors ensures heightened employee performance and satisfaction Kreye [3]. This study posits the need for global manufacturing organizations to understand exactly how to improve buy-in of local frontline workforce [16].

Using three levels of analysis, ie individual, team and organizational leader, we observe micro- and organizational-level internal engagement. This study validates in action the evaluative tool [17] that global manufacturing companies can deploy to identify and support local frontline production workers to engage and contribute to strategic efforts such as CI.

CI is a function of management-directed action aimed at improving organizational performance and also occurs through employees undertaking tasks that go above and beyond the state of job requirements (i.e. discretionary effort (DE)). The research findings show the subtle and intricate nature of increasing engagement of frontline production local workforce and five tenets are identified as central to this engagement process: i) Empowerment and job positively impact OCB through the trust in individual relationships; ii) Empowerment, engagement, confidence and ability are positively correlated with progression through situational leadership; iii) Creative potential is positively impacted by the leader's ability to create trusting relationships; iv) Frontline-production floor employees are empowered with the leader's knowledge of their skills, abilities, confidence levels, personality and preferred working roles; and v) Supportive relationships between supervisors and shop-floor production workers are key to discretionary involvement.

The study is presented as follows: the theoretical framing is the next section, which defines the hypotheses model and relevant propositions. The methodology and case design section follows and the penultimate section gives the empirical findings and validation of the hypothesis model. The final section forms the discussion and contributions to theory and practice.

## **II. THEORETICAL FRAMING**

Human Capital theory has recognised that, as employees become more valued as assets, empowering them is key for organizational effectiveness [18]. Several definitions for empowerment exist in the literature and Wang and Lee [19] see empowerment as having the resources, information and authority to complete a task, and the ability to monitor and modify processes and procedures. For many, empowerment is intrinsically linked with the transference or sharing of power from those in a senior position to subordinates. Evident problems with the

concept of power transference are: a) the resistance it can incite in those who feel they are losing it; and b) the reluctance of disempowered employees who fear the added responsibility and accountability that empowerment brings [20]. Empowerment has two components; the psychological state of the subordinate and the attitudes and behaviors this leads to, together with the influencing empowerment behavior of the leader [21, 22]. It is this psychological empowerment (PE) aspect that has a positive impact on OCB when employees feel empowered to display it [18].

Empowerment is also dependent upon establishing trust between the leader and subordinate [20, 23, 24], which is enhanced by a belief in the leader's competence, reliability and dependability [18]. Having such trust leads to greater freedom for workers, allowing them more flexibility, the ability to begin to make their own decisions [20] and to feel that they can genuinely contribute to plans and decisions within the organization [24]. Benefits of empowerment have been observed as increased engagement [25]; job satisfaction [22, 26]; enthusiasm [18]; motivation; organizational loyalty [20] and commitment [22][20][27]; lowered dysfunctional resistance [28], as well as increased skills and innovative capabilities [24]. Empowerment also links into the construct of motivation, as tasks are seen as valued and motivation to take part leads to empowerment. Empowerment also relates to job satisfaction [19], through The Job Characteristics Model (JCM) [29]. JCM components of autonomy [29], significance [30], variety and feedback have also been directly linked to OCB outcomes [31]. Thus,

***Hypothesis 1: Empowerment and job satisfaction within manufacturing teams will positively impact OCB through the trust in individual relationships.***

The relationship that develops between the supervisor and team members is a special one. It affects the climate in the team, creating a collective identity that influences the quality and performance of its output [32]. It can impact on the task expectations and responsibilities of

members [33]. While all relationships mature over time, it is essential that the supervisor is able to persuade team members of their skills and capabilities from the beginning as this influences team members' evaluation of their supervisor; the more positive their approach, and the more receptive to suggestions that they are, improves the potential for team members to reflect the same values [34].

Leader-Member Exchange Theory (LMX), with its origins in Social Exchange Theory [35, 36], is founded on the notion of a two-way, dyadic relationship between an individual subordinate and their leader [37] which has a clear link to OCB [38]. For each dyad, the perceptions of both the leader and subordinate affect the measure of the multidimensional relationship [39] making it essential to view the relationship objectively from both sides [40]. Zhou and Schriesheim [41] acknowledge that supervisors value the task-oriented dimension most highly, while subordinates are likely to put more emphasis on the social aspects of the relationship. The quality of relationships are termed high or low LMX [37]. Employees that develop high LMX relationships with their leader display loyalty [39], increased organizational commitment [37, 42, 43], and are likely to stay [28]; a highly influential factor for newcomers to the organization [44]. This relationship also leads employees to engage in OCBs based on the desire to support both their leader and the organization [45]. High LMX personal benefits include increased job satisfaction [28] support [35] and respect [39] from their leader, along with rewards [35] and other benefits [34].

Building a relationship is dependent on the development of trust and the perception of fairness, which is crucial to establishing this trust and often leads the way to the engagement that is essential for DE [45]. Recently Srivastava and Dhar [46] identified a significant and direct effect of LMX on OCB, such that when individuals begin to experience the rewards of a high-level empowering relationship they begin to reciprocate in discretionary forms [33], increasing commitment [42] as they perceive their potential to make a difference increases. It

is important, therefore, that the perceptions of the supervisor and the team member are balanced as this establishes reciprocal behaviors, especially when both perceive the relationship as high, as LMX has been shown to be a significant antecedent of OCB in all levels of employee [32, 47].

Like LMX, Situational Leadership Theory (SLT) [48] involves a relationship between the team leader/supervisor and their team member, but it deals primarily with finding the leadership style that is most appropriate for a person in a particular situation. SLT recognises that determination of leadership behavior originates from the subordinate; leadership is not something that is *'done to'* subordinates but something that should be *'done with'* them and comes from behaving consistently, but not necessarily in the same way with all individuals. Thus some people need a lot of support and direction, while others can work with a minimum of interaction with their leader [49].

However, it is not just the individual that dictates the leadership style; it is also possible that the same person can require a different level of support when undertaking a task or role in which they have less or more experience [50]. Thus, Hersey and Blanchard [48] created a model that shows how the behavior of the leader should change based on the competence and confidence of the individual [51]. The model depicts leadership style moving along a path from directing to coaching, for those with little experience of the role; progressing to a supporting style; and ending at the delegating style, where the individual is motivated and able to work autonomously [49]. It is the responsibility of the leader: to make an accurate assessment of where an individual falls on the path in order to determine the leadership style that is right for the situation and to effectively respond to situational changes in the environment and individual disposition requirements [52], continually reassessing as progress is made. It is important, however, that this is done with the employee so that an agreement can be made on the level of leadership they need [53]. Fundamental to SLT, and the OCBs that can be displayed as a result,



is the fair treatment of team members; OCBs are often a direct result of the perception of fairness in the way they have been treated [31]. Leading in this way looks to build trust and a sense of ownership and responsibility in employees. This can only be achieved, however, by ensuring that a leader's actions meet the needs and fulfills the perceptions they wish the team to gain. It is important to work with individuals to increase their self-esteem, suggesting that workers who feel good about themselves are more productive. As SLT transitions take place, employees develop ownership and responsibility, and build trust with their leaders, as they are recognised as '*appreciating assets*' [53]. Empowerment also moves in stages and often depends on the criticality of the project and its due date, and is intrinsically linked to the experience of the workers [50]. Similar to situational leadership, as employees begin to take on more responsibilities, leaders become more like coaches than decision makers, as they observe and empower their team to fulfill these new roles and, more recently, that taking a situational contingency approach to leadership may promote OCB [54]. Hence:

***Hypothesis 2:** Manufacturing individual team members' levels of empowerment, engagement, confidence and ability are positively correlated with their progression through situational leadership styles.*

Individualising a relationship based on experience and competence has the potential to improve leadership. However, each person is not just a composite of their work-based characteristics but is also driven by personality and personal characteristics such as gender, age, background, values and ethics [55]. Few studies have yet considered the effects of work group exchange relationships (e.g. leader /member exchanges) and OCB [56]. Developing an understanding of these personal characteristics will enhance the leader-subordinate relationship and have the potential to influence OCB [57]. Extant research has shown that there is a significant link between OCB and personality, with agreeableness, conscientiousness; and, correlating most closely, openness [31, 57].

From a team perspective, team effectiveness could result in greater satisfaction, participation, willingness to collaborate [60], to innovate by proposing ideas, critically evaluating and then implementing them, all the while sustaining team harmony [61]. This suggests that members need to behave as a team instead of as individuals, although for this to take place a team needs to contain different core characteristics [58] each performing a role that fits their own personal characteristics [59]. Team roles are defined by a specific pattern or style of behavior made up of personality, mental ability, values and motivations, experience, field constraints and role learning, but it is the synergy of these complementary styles that builds truly effective teams [60].

Probably the most renowned theory on team roles preferred by many organizations is the Belbin Team Roles Model [61]. Developed over a nine year study of personality types and behaviors, Belbin's theory proposes that combining all roles offers the greatest potential to work effectively and comprises a classification of the roles each individual could exhibit in a team environment, detailing skills and behaviors each can offer the team dynamic. Yeh et al. [62] furthered a mathematical model to illustrate the advantages of a team role balance to achieve superior performance, although empirical evidence has been mixed [63]. Since its publication, some researchers have expressed doubt over the academic validity of Belbin's model. Notwithstanding such doubts, Belbin's model is widely recognized for its value in use to be more important than its psychometric validity and that to discard the work would be contra-indicative [64]. Revised from the original eight, Belbin's nine roles comprise: the leader roles of Coordinator (who manages) and Shaper (who motivates the team into action); the thinker roles of Monitor-Evaluator (who critically analyzes viability) and Plant (who initiates creative ideas); the company workers of Implementer (who carries out the work) and Completer-Finisher (who works methodically to completion); the negotiator roles of Resource

Investigator (who networks with outsiders) and Team Worker (who keeps harmony in the team); and finally the provider of task expertise, the Specialist [60].

A further factor that individualises workers is education. The effects of educational level on empowerment, contrary to the findings of earlier work, shows that those with a lower level of education have higher scores in the measurement of empowerment and meaning [65]. Ergeneli [18] and Koberg et al. [66] also reported that status and position within in an organization has a significant effect on empowerment, with those considering themselves to be of a higher status feeling more empowered, thereby linking in to the power ascribed to the roles they hold. This leads to the next proposition:

***Hypothesis 3: Personal demographics and characteristics positively correlate with empowerment levels of individual manufacturing team members.***

Creativity has been suggested to emerge from the problem solving activities of individuals on work that has no easy solution, forcing them to progressively modify their initial ideas to find a solution [67, 68]. CI itself relies on the generation of incremental ideas and, as a result, is intrinsically linked to the concept of creativity [65, 68, 69]. Amabile et al. [69] describe creativity as *'the seed of all innovation'* but warn that an individual's perception of the innovation process will impact on their personal motivation to contribute ideas, thus it is important that an individual feel they have a level of control over their working environment.

A leader wishing to develop and foster creativity in their team members is recommended to adopt an empowering type of leadership [51]. An additional benefit of considering creativity as a dimension of empowerment is that it has a significant effect on team performance [25]. This means that empowered employees experience greater autonomy, which leads them to positively interpret events as opportunities, and links to creativity [70].

However, even for the empowered individual employees to take the extra step and engage in ideas and knowledge sharing there needs to be an organizational culture of trust and innovation

[45] comprising of security, employability, management, fairness, supportiveness and rewards [45, 71, 72]. These antecedents of an organizational culture of trust mirror those required for creativity, thus establishing a link between the two constructs of creativity and trust. Recently, Chughtai [73] corroborated that leader–member exchanges influence creativity through the mediating mechanism of psychological empowerment. Thus:

***Hypothesis 4:*** *Effective empowerment of individual manufacturing team members to fulfill their creative potential is positively impacted by the leaders ability to create relationships based on trust.*

The relationship between the leader and subordinate is highly individualized and, according to the situational leadership model developed by Hersey [52] and Blanchard [50], the leader should base their actions primarily on the situation, whilst recognizing the worker skills and needs and adapting their behavior accordingly. The influence of leader-follower was tested in studies with supervisors-supervisees, confirming that individualised situational relationships and employee readiness alignment has a positive impact on OCB [55]. “Trust is actually built in the process of intersubjective cognition between trustee and truster” [74]. This leads to proposition 5:

***Hypothesis 5:*** *Effective empowerment of manufacturing team members positively correlates with the leaders knowledge of their skills, abilities and confidence levels.*

Dyadic supervisor-supervisee leadership relationships are undoubtedly affected by the characteristics and personalities of the individuals on both sides of the relationship [40]. Indeed, when the relationship between the leader and team member develops to be more social, OCB is more likely to occur [75]. It follows therefore that knowledge exchange and leader involvement are essential for successful individual knowledge and competency management linked to employee empowerment [82]. Thus:

**Hypothesis 6:** *Effecting empowerment of manufacturing team members positively correlates with the leader's knowledge of individual team member's personality, interests and working preferences.*

High quality exchanges evidenced in high LMX relationships between a leader and subordinate are important for creativity [83]. As high LMX leads to feelings of energy, this in turn leads to greater involvement in creative work [34, 76], and has a positive effect on less creative individuals [4]. The Componential Theory of Creativity [77] cited in [34], posits that through their supportive behaviors, leaders have a direct influence on the creativity of their team members and in turn high LMX relationships are essential for workers to become involved in creative work [30]. Creativity and innovative behaviors are also mediated through connectivity, trust and thriving [78] and supporting recent research has consistently identified that teams' proactivity, efficacy and creative performance is related to a leadership style, where leaders expressed "*individualized consideration for team members, the team members are likely to feel assured that their ideas and opinions are valued and that they can pursue creative ideas*" [79]. Thus:

**Hypothesis 7:** *Discretionary involvement by manufacturing team members in creative activities is positively impacted by supportive relationships with high quality exchanges.*

Although no formalised link has been found between situational leadership and personal factors related to the individual, it is proposed that one exists. The stages within situational leadership that progress from '*directing*' to '*coaching*' and '*supporting*' to '*delegating*' are structured with the situation and an assessment of skills and competence in mind. However, these do not take account of the social dynamics of the workplace nor an individual worker's personal factors/personality characteristics as evinced by favoured team role(s). For instance, in its early stages SLT calls for the leader to direct, but some individuals may find this intimidating and

may feel they are not forming a relationship with their leader, requiring the support and encouragement in this stage that only comes in later stages. Thus, it is proposed that:

***Hypothesis 8: Effective application of situational leadership positively correlates with Knowledge of manufacturing team member's preferred team role(s) and preferred leadership style.***

A link between situational leadership and creativity has yet to be established. It is again proposed that a link between the two constructs exists. By applying the correct style of leadership at the appropriate stage of development, one that is negotiated between the leader and team member, should lead to a good working relationship, which in itself has been shown to facilitate creativity [34]. It is also thought that providing the right level of support, direction, coaching or delegation, will allow the individual to thrive, in any task they become involved in, which would include creative pursuits. It is further proposed that:

***Hypothesis 9: Creative activities in manufacturing team members positively correlates with the apposite application of situational leadership style.***

Furnham and Bachtiar [80] identified an emerging consensus amongst recent studies that creativity and personality factors are interconnected as well as motivation and cognitive style. More specifically, the 'Big Five' personality traits of extraversion, openness and neuroticism were found to be positively related to creativity, whereas agreeableness and conscientiousness were negatively related [81]. The 'Big Five' conceptualisation derives from the 16 PF personality model that Belbin [61] based his research on to establish that personality characteristics lead to specific team roles, c.f. [82].

From the team perspective, teamwork has also been seen to contribute to creativity in the workplace, with distinct awareness of the resulting mix of workers who make up the team; Belbin's assessment of team roles feeds into this idea. An ideal team requires a mix of roles that support creativity and facilitate the transition from ideation to real solutions. The Plant role

is embedded into a team to improve creativity and inspire other team members [83]. However, Augsdorfer [84] found only 5-10% of people working in research and development can be considered to be truly creative in what would usually be considered as a creative role. This highlights an even greater need to recognise the contribution that the other team roles have in the creative process and to give them a chance to flourish and contribute both creatively and supportively in the team environment [84]. Thus, the final proposition is as follows:

***Hypothesis 10:** Successful creative CI outcomes within a manufacturing team positively correlates with leader knowledge of team role preferences and the contribution they can make.*

The relationships between the ten hypotheses (Figure 1) form the multi-perspective conceptual model and their applicability in new manufacturing localities

-----INSERT FIGURE 1 ABOUT HERE -----

### III. METHODOLOGY AND CASE DESIGN

Case selection is critical in case study research and the case organization was selected as a global exemplar in engineering manufacturing. The case organization, a multinational automotive manufacturing company, was ideal for testing the validity of the evaluative tool in a global arena given that a new site was being established in Thailand and another was part-way operational in Slovenia, demonstrating a rich environment for research of global workforce dynamics as the CI programs evolved in real time during this study. A longitudinal case study methodology approach was used [85]. Internal assessments from the engineering managerial and human resources teams ascertained that relationships between staff members were very poor, staff were disengaged and overall plant functioning needed improvement. Based on previous pilot intervention results, it was expected that, through the use of this evaluative tool for managers, insight and guidance to the management team on how to improve relationships and create a participatory and successful CI program would be derived. That is, a

program whereby staff are motivated to voluntarily contribute and to seek out innovation and development opportunities, thus validating the usefulness of this tool cross-culturally.

Research engagement adopted a behavioral perspective and started with extended visits, semi-structured interviews and observations at the Thailand plant, facilitated by professional interpreters, external to the organization. The themes discussed concurred with the survey organizational issues being measured and also focused on tool feedback.

A total of 87 employees participated: 73 members of shop floor teams and 14 supervisors; 69 male and 18 female; aged 25-to-45 years; the majority (60%) educated to high school level, followed by Technical College level (35%) and degree level (5%); length of tenure ranged from less than one year (36%) to 4-7 years (23%), with 31% of 1-year service and 10% 2-4 years. The majority had been in their present teams for less than 2 years (84%) and the remaining (16%) for 2-7 years. 81% of the participants were from the manufacturing plant, 11% quality inspection and 7% assembly line.

Participants were assured anonymity and confidentiality of the results. The survey was administered to all staff with a 100% response rate.

#### **IV. EMPIRICAL FINDINGS**

The questionnaire has six main sections, each containing a number of items relevant to each section theme, i.e. employee engagement; creativity; job motivation/empowerment; team roles; leadership style; and leader/subordinate relationships. All items were measured on a five-point Likert-type scale, anchored by “1—Not at all” to “5—A Great Deal.” Reliability measures (Cronbach alpha) are above the recommended value of 0.7 with the lowest value for ‘Employee Engagement’ only marginally below 0.8. These results indicate that the items within each section are measuring information cohesively. Descriptive and frequency based statistics were carried out to observe whether questions, scales, answers, means and standard deviations made



sense in relation to the data and what to observe. Pictures were drawn of the relationships the research aimed to measure (the hypotheses) and, due to sample size and the results of Cronbach alpha, two main analytical methods to look at association between the variables were chosen: factor analysis and Pearson correlations. Hypothesis 3 was further investigated by carrying out a multiple regression analysis.

To ensure construct validity of the survey instrument, all questionnaire items were submitted to factor analysis to ascertain whether the questions measured what they purported to measure (i.e. to group variables correlated with each other because of some common linkage: factor, theme and latent variable), to observe whether the items are grouped together in factors according to the theoretical themes identified from the literature review. Final factors were discussed and agreed upon by the researchers. Since one of the aims is to further develop and beta-test the survey instrument, this was followed by analysis of the data according to each hypothesis. This enabled the identification of which questions to combine into a summated score. Based on staff scores (means of the various items) correlations for each of the proposition links were calculated to see whether the concepts (e.g. empowerment and proposition 3) link together. However, since some of the summated scores were not deemed suitable as the propositions aimed to identify different aspects, it was considered necessary to correlate all the items here ascertained from the factor analysis (e.g. see hypothesis 8).

*Hypothesis 1* proposed that empowerment and job satisfaction within manufacturing teams will positively impact OCB through the trust in individual relationships. To examine the dimensionality of the measures (i.e. trust; OCB; empowerment; and job satisfaction) a confirmatory factor analysis was conducted. Factors were combined into summated scores and used to work out correlations for each of the predicted links proposed. In line with Dewettinck and Van Ameijde [22], job satisfaction has been used as a proxy to measure empowerment; hence, by using both measures, links between job satisfaction and empowerment may be

corroborated by the data. A significant positive correlation was found at the  $p < .01$  level between High Quality Exchanges and Empowerment (.508) Trust and Empowerment (.478); and Empowerment and OCB (.829). That is, there is a 99% certainty that individualized relationships characterized by high quality exchanges and displaying significant trust directly increase empowerment and job satisfaction leading to OCB. Therefore, Hypothesis 1 was supported. Questionnaire items measuring Job Satisfaction, derived from core job characteristics that foster psychological state [24], were submitted to factor analysis and transformed into a summated score; these also revealed a significant association between High Quality Exchange and Job Satisfaction (.417) at  $p < .01$ , corroborating the same relationship as with Empowerment and High Quality Exchanges relationships and strengthening the results.

The variables to measure leadership styles for *Hypothesis 2* were based on Hersey and Blanchard's four styles of directing, coaching, participating/supporting and delegating [48]. While four factors emerged from the factor analysis, not all items were congruent with the Hersey model which suggests a profile of characteristics (i.e. behaviors that contribute to the styles). Thus, for the effect of analysis only the items agreed by the research team that aligned with the theoretical model were used. These were weighted and averaged (or summated if multi-items) according to each of the 4 leadership types. For example, when the manager utilizes the directive style, item 3 (i.e. 'my leader directs how I undertake tasks') would score high and items 12, 6, 10 and 2 ('my leader provides me with sufficient feedback on how well I'm doing'; 'my leader discusses with me how we will work together'; 'I'm free to make my own decisions'; and 'my leader supports me in my tasks', respectively) would score low and thus be reverse coded. This procedure was used to code all different leadership styles. Items for the ability, confidence, empowerment and engagement constructs were also identified, factor analyzed and transformed into summated scores to look for associations between the different variables. First, 'leadership styles' and 'ability' and 'confidence' were correlated,

followed by 'leadership styles' and 'ability' and 'confidence' with 'empowerment'. Only the leadership styles of Coaching and Delegating were found to be associated with Ability (.493 and -.493, respectively) at the  $p < .01$  level of significance. No correlation was found between leadership styles and Confidence. Significant correlations for Empowerment was found at the  $p < .01$  level with the leadership style of Coaching (.425), whilst a significant negative relationship was found with both Delegating (-.425) and Directing (-.421). No significant association was found between Empowerment and the Supporting leadership style. Significant positive correlations were also found for Empowerment with Ability (.506) and with Confidence (.520) at the  $p < .01$  level of significance. Links between Engagement and leadership style were all significant and found to be positively correlated for Engagement with Coaching (.533) and for Engagement with Supporting (.358), while a significant negative correlation was found for Engagement with Directing (-.526) and with Delegating (-.533), as expected. Results of the correlations of Ability with Engagement, and Empowerment with Engagement showed 99% significance (.325 and .496, respectively), while Confidence with Engagement showed significance at the  $p < .05$  level (.264); i.e. with 95% certainty. Therefore, Hypothesis 2 is partially supported.

*Hypothesis 3* predicted that the personal factors of an individual, i.e. their demographic background and personality characteristics evinced by team roles, will affect their potential level of empowerment. Demographics were identified and used as the variables to operationalize the model's *personal factors*, i.e. 'Age', 'Gender', 'Level of education', 'Length of tenure', 'Type of job role', and 'Time in current team'. The characteristics of items representing the different Belbin team roles [61] were also identified and operationalized to see if questions linked together. One factor per team role was confirmed by the research team and items translated to summative scores for each type, before correlating individually with empowerment to measure for any associations and team role types identified were correlated

with empowerment. No significant correlations were found between the demographics examined i.e. Length of tenure; Level of education; Job role; Age group; Gender and Length of time in Team and Empowerment. To further confirm or challenge these results, the multiple regression analysis was carried out (Tables I, II ), which confirmed that, except for Gender (possibly due to the male predominance; 69 Males and only 18 females) personal factors overall appear not to affect the level of Empowerment.

---INSERT TABLE I ABOUT HERE---

---INSERT TABLE II ABOUT HERE ---

All team roles correlate positively with Empowerment at the  $p < .01$  level of significance. Unsurprisingly, Coordinator has the greatest correlation with Empowerment (.554), followed by Teamworker (.460) and Monitor-evaluator (.435). Thus results support the proposition that Team roles will affect team members' potential level of Empowerment and clarified that the personal demographics except for gender are not correlated with empowerment. Hypothesis 3 is thus partially supported.

*Hypothesis 4* proposed that a relationship based on trust will help leaders empower individuals to fulfill their creative potential in the team and organization. The variables to measure relationships based on Trust, Empowerment and Creative potential were factor analyzed. A significant positive correlation was found linking Creative potential with Empowerment (.480) and trust with empowerment (.478) at  $p < .01$ . A positive significant association was also found linking Trust with Creative Potential (.380). Thus Hypothesis 4 is supported.

*Hypothesis 5* proposed that knowledge of individual team members' Skills, Abilities and Confidence levels will allow the leader to Lead and Empower their subordinates more effectively. Variables were identified to operationalize measures for Knowledge of Skills; Knowledge of Abilities; Knowledge of confidence Levels; Lead; and Empower Subordinates

more Effectively. Highly significant positive correlations at  $p < 0.01$  were found between Knowledge of Abilities and Empower subordinates more effectively (.766); Knowledge of abilities and Lead more effectively (.702); Knowledge of Confidence Levels and Empower Subordinates more effectively (.666); Knowledge of Confidence Levels and Lead more effectively (.572); Knowledge of Skills and Empower subordinates more effectively (.492) and between Knowledge of Skills and Lead more effectively (.325). Thus Hypothesis 5 is also supported.

*Hypothesis 6* proposed that knowledge of an individual team member's personality, interests and working preferences will allow a leader to lead and empower team members more effectively. Variables to measure personality traits (that according to Belbin's theoretical framework lead to specific team role preferences and contributions they can make to lead and empower members more effectively), and were factor analyzed; ideally, contributions would also be ascertained and discussed qualitatively, but the relevant data is currently not available (see limitations section). Correlations were carried out to look at possible associations between Belbin personality types and leading and empowering staff effectively. A significant positive correlation at the  $p < .01$  level was found between the Belbin role of Monitor –evaluator and leads (.312). Lower association coefficients at the  $p < .05$  level were found for the roles Teamworker (.228); Plant (.265); Coordinator (.225) and Resource Investigator (.252). Shaper, Completer-finisher and Implementer roles were not associated with Lead more effectively. Congruently Monitor-evaluator (.306) and Teamworker (.335) were strongly associated at  $p < .01$  with empowering subordinates more effectively. To a lesser extent Completer-finisher; Implementer; and Coordinator were associated at the  $p < .05$  level, (.222; .242; and .261 respectively). Thus Hypothesis 6 is also upheld.

*Hypothesis 7* proposed that a supportive relationship with high quality exchanges leads to greater discretionary involvement in creative activities or CI programs. Variables were

identified to measure supportive relationships; high quality exchanges; and discretionary involvement in a CI program (CIP), which was factor analyzed and 1 factor for each was identified. Supportive relationships was correlated with high quality exchanges and subsequently correlated with greater discretionary involvement in the CIP. A significant positive correlation was found between supportive relationships and high quality exchanges at the  $p < .01$  level (.872), and between supportive relationships and discretionary power in the CIP (.306). Positive significant correlations at  $p < .01$  were also found between creative activities and high quality exchanges (.433) and supportive relationships and creative activities (.322). Thus hypothesis 7 is supported.

*Hypothesis 8* predicted that knowledge of individual team member's preferred team roles and preferred leadership style (i.e. Coaching, Supporting, Delegating and Directing [48]) will allow situational leadership to be applied appropriately and effectively. However, different to the other propositions since the items described a profile of situations, they were individually correlated with the leadership style variables. The team role of Teamworker correlated at  $p < .01$  with 'My leader directs how I undertake tasks' (.286). This situational variable correlates with Telling (.773), followed by Participating (.751), Coaching (.542), and Delegating (.365) styles at the  $p < .01$  level of significance. Suggesting that at different stages of readiness staff would respond to Supervisors. Teamworker also correlated with 'My leader supports me in my tasks' (.252) at  $p < .05$  lower level of significance. In terms of situational model it correlated with the Participating (.840), followed by Coaching (.658), Telling (.649) and Delegating (.437) at the  $p < .01$  level of significance.

Shaper correlated with 'I like my leader to lead me differently' (.242) at  $p < .05$ . In terms of the SLT model [48], it correlated with Delegating first (.754), then, Coaching (.334) at  $p < .001$  and Telling (.233) at  $p < .05$ . Shaper also correlated with 'My leader supports me in my tasks' (.229) at  $p < .05$ ; Participating (.840) was first, followed by Coaching (.658), Telling (.649) and

Delegating (.437) also at the  $p < .01$  level of significance. Shapers also correlated with 'My leader leads everyone in the same' (.213) at  $p > .05$  with Telling (.748), Coaching (.620), Participating (.532) and Delegating (.359) at  $p < 0.01$ .

Completer-finisher correlated only with 'My leader supports me in my tasks' (.297) at  $p < .01$ . In terms of SLT it correlated with Participating (.840), followed by Coaching (.658), Telling (.649) and Delegating (.437) also at the  $p < .01$  level of significance.

Coordinator correlated with 'My leader directs how I undertake tasks' (.245) at  $p < .05$  and correlated first with Telling (.773), followed by Participating (.751), Coaching (.542), and Delegating (.365) styles at the  $p < .01$  level of significance. Coordinators also correlated with 'My leader supports me in my tasks' (.239) at  $p < .05$ ; and with Participating (.840), followed by Coaching (.658), Telling (.649) and Delegating (.437) at  $p < .01$ .

Plant correlated with 'My leader discusses with me how we will work together' (.257) at  $p < .05$  and associated with Coaching first (.820); Telling (.613), Participating (.591) and Delegating (.359).

Monitor-evaluator correlated with 'My leader supports me in my tasks' (.428) at  $p < .01$  level of significance, and associated with Participating (.840), followed by Coaching (.658), Telling (.649) and Delegating (.437) at the  $p < .01$  level of significance. Monitor-evaluators associated with 'My leader discusses with me how we will work together' (.214) at  $p < .05$  and correlated first with Coaching first (.820); Telling (.613), Participating (.591) and Delegating (.359). Monitor-evaluators further associated with 'My leader directs how I undertake tasks' (.316) at  $p < .01$  and correlated with Telling (.773), Participating (.751), Coaching (.542), and Delegating (.365) styles at the  $p < .01$  level of significance.

Implementer correlates with 'I like my leader to lead me differently' (.293) at  $p < .01$ ; and by first Delegating (.754) then Coaching (.334) at  $p < .01$  and last Telling at  $p < .05$ . Implementers also correlated with 'The way my leader leads me has changed since I started the in the role'

(.231) at  $p < .05$  characteristic of the Coaching style first (.720), then Telling (.501), Participating (.434) and Delegating (.425) at  $p < .01$ .

Finally Resource-investigator correlates with 'My leader supports me in my tasks' (.305) at  $p < .01$  and with Participating (.840), followed by Coaching (.658), Telling (.649) and Delegating (.437) at the  $p < .01$  level of significance. Resource-investigators also associated with 'The way my leader leads me has changed since I started in the role' (.287) at  $p < .01$ , and associated with Coaching style first (.720), then Telling (.501), Participating (.434) and Delegating (.425) at  $p < .01$ . Resource-investigators further associated with 'My leader directs how I undertake tasks' (.260); hence, correlating with the Telling (.773), Participating (.751), Coaching (.542), and Delegating (.365) styles at the  $p < .01$  level of significance. Thus, overall results acknowledge differences but also similarities between job roles and preferred leadership styles; and work situations and experiences, and support hypothesis 8.

*Hypothesis 9* predicted that creative activities in team members will be facilitated by applying the apposite situational leadership style. The variables to operationalize creative activities and leadership styles were identified, factor analyzed and correlations carried out to identify whether leadership styles would facilitate creative activities. Factor analysis identified one factor for creative activities. A significant positive correlation was found between 'Creative activities and Coaching leadership style (.454), at  $p < .01$  level; a significant negative correlation for Creative activities with the Delegating style (-.454) at  $p < 0.01$  and with directing (-.236) at the  $p < .05$  level. No significant correlation was found for Creative activities with the Supporting style of leadership. Thus, hypothesis 9 is also upheld

*Hypothesis 10* proposed that leader knowledge of an individual's team role preferences and the contribution they can make will lead to more successful creative CI outcomes within a team. Factor analysis identified 1 factor for each of creative outcomes (eigenvalue 1.7) and CIP successful outcomes (eigenvalue 2.1); see also the results for hypothesis 3.



The variables to measure 'Personality traits' (i.e. team role preferences) creative and more successful CIP outcomes were identified and factor analyzed. Correlations were carried out to identify possible associations between the Belbin Team role preferences and perceived successful outcomes in the CIP, and between Creative and perceived successful CIP outcomes. A significant positive correlation was found for the team role of Coordinator with Creative outcomes (.232), at the  $p < .05$  level. For the Belbin team roles (indicative of Personality characteristics) and Successful CIP outcomes a significant positive correlation for Completer-finisher (.338) at  $p < .01$  level was found. Monitor-evaluator and Teamworker were also positively associated (.241 and .218) but at  $p < .05$  level of significance. Moreover, Creative outcomes and CIP successful outcomes positively correlated (.466) at  $p < .01$  level. Thus, Hypothesis 10 is also supported.

Additionally, to find further explanation for the correlation findings, individual correlations were also carried out, i.e. personality styles were correlated with the items that make both the factors of 'creative outcomes' and 'successful CIP outcomes'. Coordinator correlated highly with the variables 'My work function area is creative' and 'The work I do promotes creativity' (.368 and .341) at the  $p < .01$  level. Congruently Completer-finisher associated with the importance ascertained to the CI program and feeling a great deal of responsibility towards it (.281 and .297 respectively) at the  $p < .01$  level. Inconsistently, however, Monitor-evaluator correlates with 'the work I do promotes creativity' (.288) at  $p < .01$ . This analysis shows that, for Teamworker, the participants perceive the work they do as promoting creativity (.326) at  $p < .01$ , but this does not correlate with the output of their teams; this is consistent with the findings reported above. The variable 'I feel a lot of responsibility for improvement' (.287 and) at  $p < .01$  level two-tailed) and to a lesser extent the variable 'I think the CI programme is important' (.242) at  $p < .05$  were also significantly associated with Teamworker. Interesting to

note that, for Teamworker, the responsibility to contribute to CI was associated with the perception of being able to contribute many ideas to the program.

## **V. DISCUSSION AND CONTRIBUTIONS TO THEORY AND PRACTICE**

The primary aim of this paper is to propose an alternative operationalization of OCB focusing on the relationships between supervisors-supervisees to facilitate engagement in CI through supervisees offering DE. We have seen a growing body of engineering management literature calling for HR as the missing link in enacting continuous improvement programs (c.f. [12]). This paper responds to these calls by bringing together theoretically grounded concepts into one holistic evaluative tool for use by engineering managers to employ in global production facilities with local engineering production workforce. In being theory-led and working with qualitative data, this paper has been consistent with this goal.

A number of impacts manifest from this study for both research and practice. In terms of management practice relevance, this study asserts the significance of involving HR practices when implementing continuous improvement processes in international manufacturing/engineering companies with global production facilities and local production/engineering workforce. Thus, our insights on the HR mechanisms for enacting CI programmes in global production environments provide engineering managers with a possible blueprint for enhancing DE of local workforce.

Further, it increases understanding of OCB and DE mediating people management and highlights the influence of managers' leadership style, thus providing practical direction for engineering organizations and the managers within them. Hence, bringing in behavioural theory, in terms of motivation due to the supervisee perceived team role in addition to the quality of the power relationships on the production-line, represents a new contribution on previous studies on leadership.

This study has further developed and empirically tested the evaluative tool [17] theoretically linking the constructs of empowerment (motivation, trust); creativity; Leadership style (situational leadership); personality type (evinced through preferred Belbin team roles); and Leader-Member Exchange (evinced through Leader-subordinate relationships). In line with hypotheses 1, 4, 5, 6, 7, 8, 9 and 10 the results consistently indicate that a focus on the quality of relationships between supervisors and supervisees result in greater discretionary involvement by supervisees in OCB and CI. Specifically, the results show that Supervisors' ability to engender trust by applying situational leadership to followers' willingness and ability with flexibility, will contribute to engage motivate and empower supervisees to offer DE and creative abilities to CI; in turn increasing their job satisfaction.

However hypotheses 2, 3 and 10 were only partially supported. No association was found between the Leadership styles of Hersey and Blanchard [48] and an increase in confidence levels by supervisees (i.e. H2). No significant association was found for personal factors such as age; level of education; length of tenure; job role; time in current team; and personality characteristics measured through the different Belbin team roles, e.g. challenging the findings of Koberg et al. [66] (i.e. H3). Further, gender was found to have only a tenuous relationship in the regression analysis results (H3), although the high predominance of the male gender in the current study may have influenced this result. Thus, there is a need for this research to be repeated with a more gender balanced group. In the next section the results' main patterns are examined in greater detail, the contributions to theory development on OCB are highlighted and the areas for development are identified.

#### *A. Contributions to theory development and implications for further research*

Our study contributes to the OCB and CI literature in five key ways. **First**, it further develops and refines the theoretical model by bringing to light how the constructs link together within the manufacturing industry and in Supervisors' and Supervisees' job roles, such that:

a) it points to the importance of examining the quality of relationships between Supervisors and Supervisees in order to increase job satisfaction, in line with Dewettinck et al. [22] and OCB (H1);

b) it shows how situational leadership styles may be associated with employees' ability; level of empowerment; and engagement (H2). That is, Coaching and Directing leadership styles seem appropriate with Supervisees at a lower ability level, with the Coaching leadership style perceived by Supervisees as empowering, while the Delegating and Directing styles are viewed as disempowering. The former is possibly due to Supervisees being at different levels of development within the manufacturing industry, thus adding to the literature on the implications of the employees' levels of readiness [48]. Interestingly, the use of the different situational leadership styles did not correlate with improving Supervisees' confidence levels as expected. A possible explanation may be that it is the level of ability and the support required at each stage that needs to be the main focus for Managers, in line with Blanchard [53]. Congruently, levels of Supervisee empowerment are also associated with ability and confidence (the results of Sims et al. [50] also concur); c) it suggests that Supervisors being aware of Supervisees preferred Belbin team roles is useful [86], since different team roles correlate at different level of significance with empowerment (i.e. the Coordinator displays the highest level of being empowerment (see H3). However, personal variables such as age; level of education; and length of tenure did not correlate with levels of empowerment, which challenges other findings [66, 87] and [18]. Thus, results suggest that, to lead and empower subordinates more effectively, it is more important to have an awareness of individuals' skills, abilities and confidence levels [49] (see H5).

**Second**, it highlights a promising new line of research for the OCB literature of focusing on the quality of relationships between Supervisors-Supervisees; and on the appropriateness of using leadership styles tailored to employee level of ability to foster or hinder engagement in

CI (e.g. see H1; H2 results). Thus, this work provides a theoretically-informed framework for engineering managers to apply to organizations in order to attain engagement in CI by motivating Supervisees to offer DE and OCB.

**Third**, it clearly shows that developing trust between the Supervisor and Supervisee is the antecedent to forming empowering relationships which enable fulfilment of creative potential and engagement in CI. Importantly, the results recognized that supportive relationships with high quality exchanges lead to greater discretionary involvement in innovation within CI, adding a new focus to the literature on OCB and innovation.

Further, results have reinforced the suggestion by Atwater and Carmeli [34] of a link between situational leaderships and creativity (H8). Results have suggested that providing Supervisees with the adequate level of support, direction, or delegation would lead individuals to be predisposed to engaging in creative activities. Congruent with this thesis, Coaching was the leadership style that emerged as being more conducive to engage Supervisees in creative activities (H9). Conversely, it has confirmed Supporting, Delegating and Directing styles would inhibit involvement in creative pursuits. A possible explanation here may be that this could be indicative of staff needing to be at a state of empowerment and readiness before enabling their creative endeavors.

The results of H10 are both interesting and challenging as they demonstrate that recognizing an individual's team role preferences and the contribution that they can make will lead to more creative CI outcomes within a team. Indeed, these results suggest a link between team roles indicative of personality traits by Belbin and creative outcomes for the role of Coordinator; and CIP creative outcomes and successful CIP. In turn, furthering the literature on creativity (e.g. [80, 84]). Moreover, the thesis that an ideal team to be creative requires a Plant to improve creativity and inspire others [83], is also challenged in these results; Plant correlated with neither creative outcomes, nor successful CIP outcomes. Additionally, while expectations were

for the role of Monitor-evaluator to contribute least to creativity, this role correlated at  $p < .01$  with the variable 'the work I do promotes creativity'. A possible interpretation is that the participants did not fully understand the questions or that, in line with Fisher [82], this finding could add to extant theory that raises questions on the validity of the Belbin model.

**Fourth**, results clearly suggest that different team roles are associated with situational leadership styles, thereby enabling a more effective management of human capital and establishing a new link in research. Knowledge of Supervisees' preferred team roles may be useful indicators of their behaviors and Supervisory style needs e.g. Teamworkers at an earlier stage require their supervisors to use a Telling leadership style, before adopting Coaching, Participating and finally Delegating styles, depending on situations (see H8). Further, this reinforces previous results that it is beneficial for Supervisors to know their Supervisees well and to know what leadership style to use according to situation and staff level of ability (H8 and H3).

**Fifth**, differing constellations of team member personality characteristics, as related with team roles that may enable Supervisors to lead and empower staff more effectively, were brought to light (e.g. Monitor-evaluators were perceived as the subordinates to be most effectively empowered, whilst Shapers, Implementers and Completer Finishers emerged as the least). Importantly, no extant publications were found in this field of research. Moreover, it may be argued that this study adds to the behavioral theory literature on the impact of personality impinging on OCB (e.g. [88]).

#### *B. Implications for research and practice*

This study has some methodological constraints. First, relationship exchanges can be mediated by mood, which needs to be carefully managed and contained by the Manager [89]. Thus, to increase the reliability and validity of this tool the need to control for this variable should be addressed in future research. Second, the personality traits of altruism leading to

greater levels of agreeableness in organizations could also moderate the quality of relationships and staff engagement in CI, thus impacting on DE and OCB delivered. Third, environmental factors such as culture, nature of work and work-life balance can also influence individuals' decisions to engage with additional tasks. Fourth, for pragmatic reasons, the rich qualitative data from this research have yet to be fully transcribed and analyzed. Finally, further research should refine and update the evaluative tool in line with the findings before use and apply it in other organizational settings, alongside qualitative research on the views and behaviors of supervisors and supervisees undertaking CI programs.

For production and engineering management, by boosting supervisors' leadership awareness to be cognizant of the local workforce needs and how they perceive their role, better outcomes would be evident. So, use of the evaluative tool proposed here on increasing staff engagement in CI programs would enable managers to gain valuable insight into the relationships at work within their organizations, identify issues that may be impeding successful implementation of CI and apply agreed interventions to resolve such issues. Moreover, it would extend management attention from looking solely at supervisors leadership styles but also – and uniquely here – to include the workers own perceived role in the team. To conclude, this study builds on a new emphasis for research on OCB by providing new insights and empirical evidence within a global manufacturing context, focusing on the relationships between Supervisors and Supervisees and linking DE to engage employees in CI. This research found that a narrower number of constructs than those in the original CI evaluative tool [17] can be used with an updated version in future research investigations. Overall, the findings contained herein suggest innovative directions for future research.

## VI. REFERENCES

1. Scarbrough, H. and C. Carter, *Investigating knowledge management*. 2000: Chartered Institute of Personnel and Development.
2. Cadden, T., et al., *Old habits die hard: exploring the effect of supply chain dependency and culture on performance outcomes and relationship satisfaction*. *Production Planning & Control*, 2015. 26(1): p. 53-77.
3. Kreye, M.E., *Employee motivation in product-service system providers*. *Production Planning & Control*, 2016. 27(15): p. 1249-1259.
4. Tierney, P. and S.M. Farmer, *Creative self-efficacy development and creative performance over time*. *Journal of Applied Psychology*, 2011. 96(2): p. 277.
5. Lopez-Cabrales, A., A. Pérez-Luño, and R.V. Cabrera, *Knowledge as a mediator between HRM practices and innovative activity*. *H. Res. Mgt*, 2009. 48(4): p. 485-503.
6. Yang, Y., P.K.C. Lee, and T.C.E. Cheng, *Continuous improvement competence, employee creativity, and new service development performance: A frontline employee perspective*. *Int. Journal of Production Economics*, 2016. 171, Part 2: p. 275-288.
7. Balogun, J., K. Best, and J. Lê, *Selling the Object of Strategy: How frontline workers realize strategy through their daily work*. *Orgn. Studies*, 2015. 36(10): p. 1285-1313.
8. Ambrosini, V., C. Bowman, and S. Burton-Taylor, *Inter-team coordination activities as a source of customer satisfaction*. *Human relations*, 2007. 60(1): p. 59-98.
9. Essex, A., N. Subramanian, and A. Gunasekaran, *The relationship between supply chain manager capabilities and performance: empirical evidence*. *Production Planning & Control*, 2016. 27(3): p. 198-211.
10. Ermilova, E. and H. Afsarmanesh, *Competency modelling targeted on boosting configuration of virtual organisations*. *Prod. Planning and Ctrl*, 2010. 21(2): p. 103-118.



11. Maura Sheehan, P., A. E. Ellinger, and A. D. Ellinger, *Leveraging human resource development expertise to improve supply chain managers' skills and competencies*. European Journal of Training and Development, 2013. 38(1/2): p. 118-135.
12. Giannoccaro, I. and A. Nair, *Examining the Roles of Product Complexity and Manager Behavior on Product Design Decisions: An Agent-Based Study Using NK Simulation*. . IEEE Transactions on Engineering Management, 2016. 63(2, MAY 2016).
13. Elkosantini, S. and D. Gien, *Integration of human behavioural aspects in a dynamic model for a manufacturing system*. Int. J.of Prod. Research, 2009. 47(10): p. 2601-2623.
14. Linder, S. and S.S. Torp, *Middle Managers' Engagement in Autonomous Strategic Actions: Does It Really Matter How Top Managers Use Budgets?* IEEE Transactions on Engineering Management, 2017. 64(4, November 2017).
15. Marvel, M.R. and P.C. Patel, *Self-Leadership and Overcoming the Time Resource Constraint: Accelerating Innovation for New Products* , Vol. 64, No 2, 1-12 · April 2017. IEEE Trans. on Eng. Mgt., 2017. 64(2, April 2017): p. 1-12.
16. Johnstone, S., A. Wilkinson, and A. Dainty, *Reconceptualizing the Service Paradox in Engineering Companies: Is HR a Missing Link?*IEEE Trans.on Eng. Mgt., 2014.61(2):p.9
17. Wagner, H.T., et al., *Building a Model of the Synergistic Effects of Constructs Affecting Organizational Citizenship Behavior Leading to Team Engagement in Continuous Improvement Programs*. Journal of Business Leadership, 2012. 8(Spring 2012 ): 7-28.
18. Ergeneli, A., G.S. Arı, and S. Metin, *Psychological empowerment and its relationship to trust in immediate managers*. Journal of Business Research, 2007. 60: p. 41–49.
19. Wang, G. and P.D. Lee, *Psychological empowerment and job satisfaction: An analysis of interactive effects*. Group and Organization Management, 2009. 34(3): p. 271-296.
20. Greasley, K., et al., *Employee perceptions of empowerment*. 27, 2005. 4(354-368).

21. Lee, M. and J. Koh, *Is empowerment really a new concept?* International Journal of Human Resource Management, 2001. 12(4): p. 684-95.
22. Dewettinck, K. and M. Van Ameijde, *Linking Leadership empowerment behaviour to employee attitudes and behavioural intentions.* Personnel Rev, 2011. 40(3): p. 284 - 305.
23. Kim, B.P., E. Losekoot, and S. Milne, *Consequences of empowerment among restaurant servers: helping behaviors and average check size.* Mgt. Dec., 2013. 51(4): p. 781-794.
24. Dainty, A.R.J., A. Bryman, and A.D.F. Price, *Empowerment within the UK construction sector.* Leadership and Organization Development Journal, 2002. 26(3): p. 333-342.
25. Albrecht, S.L. and M. Andreetta, *The influence of empowering leadership, empowerment and engagement on affective commitment and turnover intentions in community health service workers: Test of a model.* Leadership In Health Services, 2011.24(3): p.228-237.
26. Farzaneh, J., F. Dehghanpour, and K.M. Ali, *The impact of person-job fit and person-organization fit on OCB: The mediating and moderating effects of organizational commitment and psychological empowerment.* Personnel Rev., 2014. 43(5): p. 691-672.
27. Kuo, T.-H., et al., *Employee empowerment in a technology advanced work environment.* Industrial Management and Data Systems, 2010. 110(1): p. 24-42.
28. Vecchio, R.P., J.E. Justin, and C.L. Pearce, *Empowering leadership: An examination of mediating mechanisms in a hierarchical structure.* L.ship Qrtly, 2010. 21: p. 530–542.
29. Yang, S.-B. and S.O. Choi, *Employee empowerment and team performance: Autonomy, responsibility, information, and creativity.* Team Perf. Mgt, 2009. 15(5/6): p. 289-301.
30. Katsikea, E., et al., *The effects of organizational structure and job characteristics on export sales managers' job satisfaction and organizational commitment.* Journal of World Business, 2011. 46: p. 221–233.
31. Organ, D.W., *Personality and Organizational Citizenship Behavior.* Journal of Management, 1994. 20(2): p. 465-487.

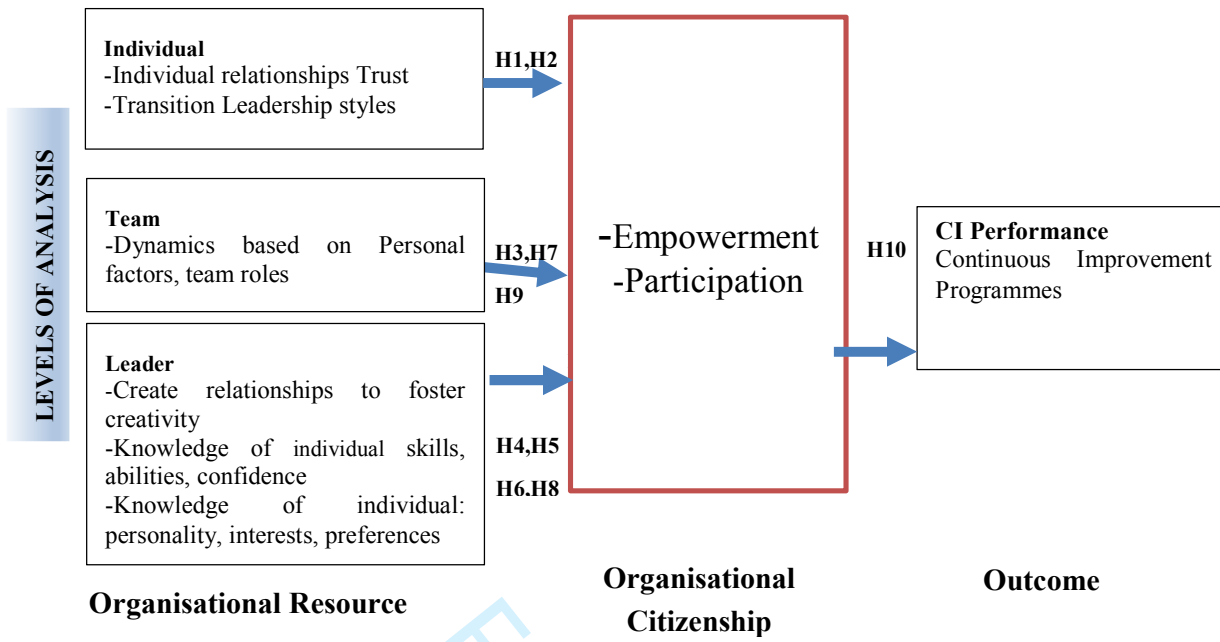
32. Chang, C.-H. and R.E. Johnson, *Not all leader–member exchanges are created equal: Importance of leader relational identity*. *Leadership Quarterly*, 2010. 21: p. 796–808.
33. Klieman, R.S., J.A. Quinn, and K.L. Harris, *The influence of employee-supervisor interactions upon job breadth*. *J. of Managerial Psychology*, 2000. 15(6): p. 587-605.
34. Atwater, L. and A. Carmeli, *Leader-member exchange, feelings of energy and involvement in creative work*. *The Leadership Quarterly*, 2009. 20: p. 264-275.
35. Harris, K.J., A.R. Wheeler, and K.M. Kacmar, *Leader-member exchange and empowerment: Direct and interactive effects on job satisfaction, turnover intentions and performance*. *The Leadership Quarterly*, 2009. 20: p. 371-382.
36. Cropanzano, R. and M.S. Mitchell, *Social Exchange Theory: An Interdisciplinary Review*. *Journal of Management*, 2005. 31(6): p. 874-900.
37. Northouse, P.G., *Leadership: Theory and Practice*. 2007, London: Sage Publications.
38. Kim, S., J.W. O'Neill, and H.-M. Cho, *When does an employee not help coworkers? The effect of leader–member exchange on employee envy and organizational citizenship behavior*. *International Journal of Hospitality Management*, 2010. 29: p. 530–537.
39. Scandura, T.A. and E.K. Pellegrini, *Trust and leader-member exchange: A closer look at relational vulnerability*. *J. of Leadership and Orgn. Studies*, 2008. 15(2): p. 101-110.
40. Nahrgang, J.D., F.P. Morgeson, and R. Ilies, *The development of Leader-member exchanges: Exploring how personality and performance influence leader and member relationships over time*. *Org. Behaviour and Human Dec. Proc.*, 2009. 108: p. 256-266.
41. Zhou, X. and C.A. Schriesheim, *Quantitative and qualitative examination of propositions concerning supervisor–subordinate convergence in descriptions of leader–member exchange (LMX) quality*. *The Leadership Quarterly*, 2010. 21: p. 826–843.
42. Cogliser, C.C., et al., *Balance in leader and follower perceptions of leader-member exch.: Relationships with performance and work att.* *L.ship Qrtly*, 2009. 20: p. 452-465.

43. Abu Bakar, H., K.E. Dilbeck, and M. J.C., *Mediating role of supervisory communication practices on relations between leader-member exchange and perceived employee commitment to workgroup*. Communication Monographs, 2010. 77(4): p. 637-656.
44. Chen, J. and D. Eldridge, *The missing link in newcomer adjustment: The role of perceived organizational support and leader-member exchange*. International Journal of Organizational Analysis, 2011. 19(1): p. 71-88.
45. Sharkie, R., *Trust in leadership is vital for employee performance*. Management Research News, 2009. 32(5): p. 491-498.
46. Srivastava, A.P. and R.L. Dhar, *Impact of leader member exchange, human resource management practices and psychological empowerment on extra role performances*. International Journal of Productivity and Performance Management, 2016. 65(3):351-377.
47. Bettencourt, L.A., *Change-oriented organizational citizenship behaviors: the direct and moderating influence of goal orientation*. Journal of Retailing, 2004. 80: p. 165-180.
48. Hersey, P. and K.H. Blanchard, *Management of Organizational Behavior – Utilizing Human Resources*. 1977, New Jersey: : Prentice Hall.
49. Blanchard, K., *Situational Leadership: Adapt your style to their development level*. Leadership Excellence, 2008. 19.
50. Sims Jr., H.P., S. Faraj, and S. Yun, *When should a leader be directive or empowering? How to develop your own situational theory of leadership*. Bus.Hns, 2009. 52:p.149-158.
51. Hersey, P., *Situational Leaders: Use the model in your work*. L.ship Excel., 2009. 12.
52. Zhang, Z.-X., et al., *Business leadership in the Chinese context: Trends, findings, and implications*. Management and Organization Review, 2014. 10(2): p. 199-221.
53. Blanchard, K., *The changing face of management*. Manager, 2009: p. 22-23.
54. Luo, H. and S. Liu, *Effect of Situational Leadership and Employee Readiness Match on Organizational Citizenship Behavior in China*. Soc. Beh. & Pers, 2014.42(10):p.1725-1732.

55. Li, A. and S.M.B. Thatcher, *Understanding the Effects of Self and Teammate OCB Congruence and Incongruence*. J. of business and psychology, 2015. 30(4): p. 641-6555.
56. Cohen, A., E. Ben-Tura, and D.R. Vashdi, *The relationship between social exchange variables, OCB, and performance*. Personnel Review, 2012. 41(6): p. 705-731.
57. Mahdiun, R., M. Ghahramani, and A.R. Sharif, *Explanation of organizational citizenship behavior with personality*. Proc. Soc. & Beh. Sciences, 2010. 5: p. 178–184.
58. Holtzman, Y. and J. Anderberg, *Diversify your teams and collaborate: Because great minds don't think alike*. Journal of Management Development, 2011. 30(1): p. 75-92.
59. Davies, M.F. and E. Kanaki, *Interpersonal characteristics associated with different team roles in work groups*. Journal of Managerial Psychology, 2006. 21(7): p. 638-650.
60. van de Water, H., K. Ahaus, and R. Rozier, *Team roles, team balance and performance*. Journal of Management Development, 2008. 27(5): p. 499-512.
61. Belbin, R.M., *Management Teams: Why they succeed or fail*. 2006, Oxford: Butt.-Hein.
62. Yeh, J.Y., et al., *The impact of team personality balance on project performance*. African Journal of Business Management, 2012. 6: p. 1674-1684.
63. Mathieu, J.E., et al., *A Review and Integration of Team Composition Models: Moving Toward a Dynamic and Temporal Framework*. J. of Mgement, 2014. 40(1): p. 130-160.
64. Fisher, S.G., W.D.K. Macrosson, and G. Sharp, *Further evidence concerning Belbin team role Self-Perception Inventory*. Personnel Review, 1996. 25(2): p. 61-67.
65. Hewett, T.T., *Informing the design of computer-based environments to support creativity*. International Journal of Human-Computer Studies, 2005. 63(4-5): p. 383-409.
66. Koberg, C.S., et al., *Antecedents and outcomes of empowerment: Empirical evidence from the health care industry*. Group and Organization Management, 1999. 24: p. 71-91.
67. Weisberg, R.W., *Creativity: Genius and Other Myths*. 1986, New York: W. H. Freeman.

68. Morton, S.C. and N.D. Burns, *Understanding and Overcoming Resistance to Innovation*, in *Creating Wealth from Knowledge: Meeting the innovation challenge*, J. Bessant and T. Venables, Editors. 2008, Edward Elgar: Cheltenham.
69. Amabile, T.M., et al., *Assessing the work environment for creativity*. *Academy of Management Journal*, 1996. 39(5): p. 1154-1184.
70. King, L. and S.T. Gurland, *Creativity and experience of a creative task: Person and environment effects*. *Journal of Research in Personality*, 2007. 41(1252-1259).
71. Reychav, I. and R. Sharkie, *Trust: an antecedent to employee extra-role behaviour*. *Journal of Intellectual Capital*, 2010. 11(2): p. 227-247.
72. Sangar, R. and S. Rangnekar, *Psychological Empowerment and Role Satisfaction as Determinants of Creativity*. *Asia Pac. J. of Mgt Res. and Innov.*, 2014. 10(2):p. 119 - 127
73. Chughtai, A.A., *Can ethical leaders enhance their followers creativity*. *Leadership and Organization Development Journal*, 2016. 12(2): p. 230-249.
74. Fukuhara, Y., *A critical interpretation of bottom-up management & leadership styles in Japanese companies: a focus on empowerment & trust*. *AI & Society*, 2015.31:p. 85-93.
75. Rubin, R.S., W.H. Bommer, and D.G. Bachrach, *Operant leadership and employee citizenship: A question of trust?* *The Leadership Quarterly*, 2010. 21: p. 400–408.
76. Hammond, M.M., et al., *Predictors of individual level innovation at work: a meta-analysis*. *Psychology of Aesthetics, Creativity, and the Arts*, 2011. 5 (1): p. 90-105.
77. Amabile, T.M., *How to Kill Creativity*. *HBR*, 1998. Sep-Oct (Reprint 98501): p. 77-87.
78. Carmeli, A. and G.M. Spreitzer, *Trust, connectivity, and thriving: Implications for innovative behaviors at work*. *Journal of Creative Behavior*, 2009. 43(3): p. 169-191.
79. Shin, Y. and C. Eom, *Team Proactivity as a Linking Mechanism between Team Creative Efficacy, Transformational Leadership, and Risk-Taking Norms and Team Creative Performance*. *The Journal of Creative Behavior*, 2014. 48: p. 89-114.

80. Furnham, A. and V. Bachtiar, *Personality and intelligence as predictors of creativity*. *Personality and Individual Differences*, 2008. 45: p. 613–617.
81. Costa, S.D., et al., *Personal factors of creativity: A second order meta-analysis* *Revista de Psicología del Trabajo y de las Organizaciones*, 2015. 31(3).
82. Fisher, S.G., T.A. Hunter, and W.D.K. Macrosson, *Belbin's team role theory: For non-managers also?* *Journal of Managerial Psychology*, 2002. 17(1): p. 14-20.
83. Titterington, D. *Build better teams: All team members play key roles*. 2010; Available from: [Manufacturing-today.com](http://Manufacturing-today.com), pp. 22-23.
84. Augsdorfer, P., *Managing the unmanageable*. *Res.-Tech. Mgt*, 2008. 1(4): p. 41-47.
85. Yin, R.K., *Case study research: design and methods*. *Applied Social Research Methods Series*, v5, 4th edition. 2009, Thousand Oaks, Calif.; London: Sage.
86. Balderson, S.J. and A.J. Broderick, *Behavior in teams: Exploring occupational and gender differences*. *Journal of Managerial Psychology*, 1996. 11(5): p. 33-42.
87. Hancer, M. and R.T. George, *Psychological empowerment of non-supervisory employees working in full-service restaurants*. *Hospitality Management*, 2003. 22: p. 3–16.
88. Organ, D.W., *The Motivational basis of Organizational Citizenship Behavior*. *Research on Organizational Behaviour*, 1990. 12: p. 43-72.
89. Glomb, T.M., et al., *Doing good, feeling good: Examining the role of organizational citizenship behaviors in changing mood*. *Personnel Psychology*, 2011. 64(1): p. 191-223.



**Figure 1.** Schematic inter-relationship of the research hypotheses and constructs



TABLE I. MODEL SUMMARY

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.309 <sup>a</sup>	.095	.027	.43900

a. Predictors: (Constant)

How long have you been in your current team?

What is the highest level of education you have completed?

How would you describe your primary job role?

What is your age group?

Are you male or female?

How long have you worked at the organization?

b. Dependent Variable: Empowerment

TABLE II. COEFFICIENTS<sup>a</sup>

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	3.234	.258		12.515	.000
	Are you male or female?	<b>-.242</b>	<b>.119</b>	<b>-.221</b>	<b>-2.037</b>	<b>.045</b>
	What is your age group?	.140	.108	.143	1.301	.197
	How long have you worked at the organisation?	-.031	.055	-.082	-.574	.567
	How would you describe your primary job role?	.074	.068	.117	1.091	.278
	How long have you been in your current team?	.033	.075	.062	.439	.662

a. Dependent Variable: Empowerment

view

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Editor of IEEE Transactions on Engineering Management,

**17 April 2018**

Dear Editor,

Please find attached the revised manuscript entitled, **Increasing employees' engagement in organizational citizenship behaviors within continuous improvement programs in manufacturing: the HR link?** for consideration in publication in **IEEE Transactions on Engineering Management**. The paper submitted has been prepared following the journal's guidelines and has been thoroughly proof-read to ensure that there are no spelling and grammar errors.

The main contribution of this paper is the development of a theoretical evaluation framework, using a formal methodology and rich case-research to ascertain the local frontline production-workers capabilities to engage in strategic organisational continuous improvement efforts. In addition, this paper defines salient HR concepts such as Organisational Citizenship Behaviour (OCB) and Discretionary Effort (DE) and tests these by utilising rich case-based data collected from frontline production workers in Thailand thus extending OCB and DE scope and dimensionality.

On behalf of the authors of this paper I would like to thank you for your help and clear editorial direction for this submission. Your support is gratefully appreciated. We hope that the paper will be of interest and would fit in with the scope of the journal.

I look forward to hearing from you in due course.

Yours faithfully,

Dr Roula Michaelides

For Peer Review

Managerial relevance statement - A number of impacts manifest from this study for both research and practice. In terms of management practice relevance, this study asserts the significance of involving HR practices when implementing continuous improvement processes in international manufacturing/engineering companies with global production facilities and local production/engineering workforce. The study supports the view that HR is the missing link in enacting continuous improvement programmes in global production practices.

It also increases understanding of Organizational Citizenship Behavior (OCB) and discretionary effort (DE) mediating people management and highlights the influence of managers' leadership style, thus providing practical direction for organisations. For management this means that, by boosting supervisors' leadership awareness to be cognizant of the local workforce needs and how they perceive their role, better outcomes would be evident. So, if there were a prescribed equation on increasing staff engagement in CI programmes, not only would we include supervisors leadership styles but also – and uniquely here – the workers own perceived role in the team. Thus, bringing in behavioural theory, in terms of motivation due to the supervisee perceived team role in addition to the quality of the power relationships on the production-line, represents a new contribution on previous studies on leadership.