

COLLABORATIVE IMPROVEMENT: WHAT DO WE KNOW? WHERE DO WE NEED TO GO?

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ABSTRACT

Although especially through research performed across the CINet community, a lot of theoretical and practical knowledge has been developed on intra-firm continuous improvement, there is still a substantial lack of empirically grounded contributions and theories on collaborative improvement (CoI), that is, CI in an inter-organizational setting. The so-called CO-IMPROVE project investigated whether and how the concept of CI can be extended and transferred to inter-organizational processes. The objective of the paper is to evaluate the research findings in view of existing theories on CI. Thus, the paper actually presents an attempt to find out about the similarities and differences of extant CI theory to CoI settings by assessing what is specific for CoI, what for CI, and where theories on the two areas of application meet and overlap.

1. INTRODUCTION

Incremental improvement, especially in manufacturing, has been widely discussed in the literature on Continuous Improvement (CI) (see e.g. Imai, 1986; Bessant and Caffyn, 1997, Boer *et al.*, 2000). CI is the “planned, organised and systematic process of ongoing, incremental and company-wide change of existing work practices aimed at improving company performance” (Boer *et al.*, 2000). CI has its early accounts going back to before the industrial revolution even started and scientific management was developed (Boer and Gieskes, 1999). The export of the concept from the USA to Japan and its development there, the influence of many other concepts, such as Quality Circles, Total Quality Management and Lean Production, the explicit attention of many authors to CI (Imai, 1986; Robinson, 1991; Bessant, 1997; De Lange-Ros, 1999), and the work of the CINet resulted in the development, exchange and dissemination of practical and theoretical research in the field of CI. By now CI is a consolidated concept in managerial theory and practice and is seen as vital in today’s business environments.

Due to external dynamics, competition is moving towards the level of networks of organisations. Nowadays companies have to increasingly link their internal processes

with external customers and suppliers (Ford *et al.*, 2003) in order to stay competitive. This includes not only operational processes like new product development and production, but also continuous improvement (Boer *et al.*, 2000; Rijnders, 2002). In capturing the 'state of the CI-concept', Boer *et al.* (2000) expected that one of the key characteristics of CI is that it is no longer restricted to intra-firm processes but increasingly applies to inter-firm processes as well.

This notion provided the start of a three years EU-funded research project, called CO-IMPROVE (Collaborative Improvement Tool for the Extended Manufacturing Enterprise, GIRD – CT2000 – 00299). The overall purpose of the project was to develop a tool supporting the implementation and operation of collaborative improvement within the Extended Manufacturing Enterprise (EME). Collaborative Improvement (CoI) was defined as “a purposeful inter-company interactive process that focuses on continuous incremental innovation aimed at enhancing the EME overall performance” (Cagliano, 2004). There is still a substantial lack of empirically grounded contributions and theories on the concept of CI in an inter-organizational setting (Chapman and Corso, 2005). Consequently, it is a major challenge for practitioners as well as researchers to gain insight into and develop an understanding of the organization and management of the process of CoI is (Boer and Gertsen, 2003). In CO-IMPROVE, an action research approach was adopted to address the companies' improvement needs while creating knowledge and in-depth understanding of the process itself at the same time (Middel *et al.*, forthcoming). The part of the CO-IMPROVE project reported here took place in an inter-organizational setting involving a System Integrator in the automotive industry and three of its suppliers in the Netherlands. The System Integrator (SI) specializes in 'Motion Control'-systems for different markets, such as the automotive, truck, marine, medical and agriculture market. Supplier 1 is an assembly company of plastic precision parts for the automotive, medical and pharmaceutical industry. Supplier 2000 produces fine-mechanical parts for the high-tech industry. Supplier 3 produces cylinder-tubes for the automotive industry.

The research questions addressed in this paper is:

How and to what extent do the lessons learned from the Dutch part of the CO-IMPROVE project confirm, add to or conflict with extant CI theory?

The objective of the paper is to evaluate, especially with regard to the Dutch setting, the research findings in view of existing theories on CI. Thus, the paper actually presents an attempt to find out about the similarities and differences of extant CI theory to CoI settings by assessing what is specific for CoI, what for CI, and where theories on the two areas of application meet and overlap. On the basis of this we will present ideas on further steps in the development of CoI theory.

2. CONTINUOUS IMPROVEMENT AND COLLABORATIVE IMPROVEMENT

2.1 THE NEED TO HAVE A CLEAR STRATEGIC FRAMEWORK

It is widely agreed that one of the prerequisites for CI success is a clear strategic framework including long-term and short-term targets and milestones related to that, which is clearly communicated throughout the organization (Imai, 1986, Bessant *et al.*, 1994, Caffyn, 1998; Gieskes *et al.*, 1999). The CI Capability Model describes CI in terms of key behaviours, which appear to be essential for long-term success with CI (Bessant *et al.*, 1994; Bessant and Caffyn, 1997). Two of the key behaviours are the

awareness and understanding of the organization's aims and objectives and the use of the organization's strategic goals and objectives to focus and prioritize improvement activities (Bessant *et al.*, 1994; Bessant and Caffyn, 1997, Caffyn, 1999). Further key components of CI in the area of strategy, as identified by Caffyn (1998), are top management commitment and a long-term, company wide perspective.

The question is what the commonalities and differences are between CI and CoI with regard to the role of strategy. For a company in the automotive industry today the main challenge is to constantly monitor and adjust its cost-structure to the standard in the industry. Continuous improvement and continuous cost reduction are integrated and explicit in the System Integrator's (SI) policy and practices. The aim is to establish close co-operation and long-term agreements with a limited number of suppliers. As such, the SI looks for highly involved and dedicated partners that fully support the company in assembling and delivering to customers systems of top quality to agreed competitive prices at the promised delivery date. However, within the process of CoI companies should not only be motivated to attain their own goals, but also through improvement and collaboration within a network, to improve and enhance the performance of the whole EME. As such, a shared and mutually understood vision is an important prerequisite for participating companies to fully exploit the opportunities within the relationship.

In the Dutch EME this worked out as follows. Prior to the project, the companies lacked a shared vision on CoI and a sense of direction. The direction given for improvement activities between the SI and the suppliers were initiated and started based on a performance measurement tool, which is used by the SI to assess their suppliers with regard to cost, quality and delivery performance. The findings from a case study, as part of this research (see Middel *et al.*, 2005), indicated that many improvement activities actually were ad-hoc, problem driven improvement projects, rather than collaborative, structural and pro-active improvement processes. The activities were centred around product and process problems and driven by the supplier-assessment of the SI with regard to cost, quality and delivery. This led the suppliers of the SI to suspect that the CoI approach was a new way of imposing cost reduction and quality and delivery improvements. In order to resolve this, the SI put a lot of effort into introducing and explaining the concept and benefits of CoI. They presented and discussed in a workshop setting their vision and sense of direction with regard to the CO-IMPROVE project, allowed the suppliers to reflect and comment on this, and provided the opportunity for the suppliers to give their goals and aims. This resulted in a common understanding of and a shared vision with regard to CoI in order to focus and prioritize improvement activities in an inter-organizational perspective. An approach towards CoI was selected where companies would jointly initiate improvement activities and explicit attention was given to diffusing knowledge, experiences and lessons learned as part of the CoI initiative (Kaltoft *et al.*, 2003; Middel *et al.*, 2004).

So one important result is that not only do companies need to understand and share the vision and goals, they also have to be committed to CoI. Firstly, intra-organizational commitment is needed, i.e. top management support, to facilitate and support the CoI process. A lack of commitment within a company has negative effects on the process and progress of improvement initiatives, such as lack of activity within a project or no selection of new CoI projects. Secondly, the companies within the EME need to be committed towards each other to fully explore and exploit the possibilities and opportunities in the relationship and to diffuse learning throughout the EME.

We conclude that for both CI and CoI a clear strategic framework is an important prerequisite. In both CI and CoI there should be a shared vision and goals, which should be clearly communicated and mutual understood and accepted by the members involved. The main difference with regard to these components between CI and CoI lies in the unit of analysis (CI is the intra-organizational setting, CoI is the inter-organizational setting). Further the (top management) commitment towards the process of CI and CoI plays an important role. Within CI and CoI the internal commitment of all employees towards the improvement process is prerequisite for the success or failure of the initiative. However, within the CoI process companies need also be externally committed towards the CoI process, the relationship and the EME.

2.2 THE IMPACT OF A SHORT-TERM ORIENTATION INSTEAD OF LONG-TERM OPTIMISATION

CI is the ongoing process of small improvements to existing work practices and processes. It is not a one-off improvement initiative to yield short-term results, but a planned, organised and systematic process to increase performance on the short-term as well as the long-term. If a company is designing, organizing and implementing CI activities to focus solely on short-term improvements, an effective CI system will never take root within the organization (see also Bessant, 1998). Organizations should balance between top-down (planned, strategy driven) and bottom-up (emergent, contributing to strategy development) improvement activities with a short-term and long-term orientation. CI appears to be at first sight a very simple and attractive concept but evidence shows that it is very difficult to design, implement and develop it successfully (Bessant, 1998; Boer *et al.*, 2000).

Within the CO-IMPROVE setting an Action Learning approach was used through a cycle of workshops and face-to-face meetings. The workshops were aimed at engaging companies in collaborative improvement activities, involving processes of diagnosing, fact-finding, implementation and evaluation of improvement actions. Moreover, the process of action learning emphasized the importance of a structured questioning and reflective process within the Dutch learning network (Middel *et al.*, 2005).

The CO-IMPROVE project in the Dutch setting progressed from idea conception, through targeting improvement actions to solving problems in a systematic way. In the beginning, collaborative improvement initiatives started based on the supplier assessment by the SI. The initiatives had the characteristics of a planned and systematic process with a short-term orientation trying to solve immediate operational problems on cost, quality and delivery within a relationship. However, mainly due to the common understanding of the concept and benefits of CoI and the learning experiences of the companies throughout the process, they started to consider improvement activities not only as a response to practical problem but also as way to focus on emerging, “creative” improvement activities and the opportunity to develop a closer and long-term relationship. As a result, through an increase in the openness of communication and knowledge/information exchange, a setting was been created where the companies in the Dutch EME were better able to balance between short-term, planned and assessment driven improvement initiatives and long-term, emerging, creative and relational improvement initiatives.

In the Dutch setting, CoI was designed and implemented based on the notion that collaboration and improvement in the EME is characterized by interdependence, shared vision and goals, trust, commitment and joint work and activities. In order to overcome the situation in which the suppliers believed that the CO-IMPROVE project was another way of imposing improvement initiatives, the SI selected and adopted a non-directed

approach based on a shared vision and goals, trust and commitment. The Dutch EME thought this approach would be the best way for the partners to discover and become aware of the concept and the possible benefits of CoI.

We conclude that for CoI, just as for CI, a formal CI/problem solving cycle is required to fully exploit the improvement potential within the EME. Within the improvement cycle specific attention has to be paid to capturing and disseminating learning within and between the organization that are involved in order to stimulate and trigger reactive solutions and creative opportunities. Therefore, an effective and open communication channel needs to be developed, both intra-organizationally as well as inter-organizationally, in order to share and transfer information, learning and knowledge between and within the companies in the EME. Another similarity is that companies do need to balance between a short-term and long-term improvement perspective and between planned (top-down) and emerging (bottom-up) improvement initiatives.

2.3 THE BELIEF IN THE VALUE OF SMALL IMPROVEMENTS

One of the prerequisites of CI is that an underlying belief/assumption system is needed that contains the core CI values (Bessant, 1995; Bessant and Caffyn, 1997; De Lange-Ros, 1999). According to Bessant (1995), the belief in the value of small step incremental innovation is a core enabler of CI.

As explained before in this paper, the suppliers were initially hesitating to fully collaborate in the CoI process. In order to overcome this situation and increase the belief in the concept of CoI, next to trying to develop a shared vision and goals, improvement initiatives were chosen between the SI and the suppliers, which could be solved fairly easily to achieve both operational and learning outcomes. Important in the process was that the results and benefits of the CoI project needed be shared among the companies in order for the companies to believe in the benefits of, and continue to collaborate in, CoI. Another important influence was that the companies frequently presented, discussed and reflected upon the different improvement projects within the EME. This led to a situation where companies actually started to learn from and with each other, which affected the belief in CoI processes positively.

We conclude that the belief in the value of small improvements is just as important in CoI. The difference however between CI and CoI is that within CoI the companies should believe in the value of small improvements through extensive collaboration with other companies. As companies are working together, they should systematically link and relate their internal processes with the processes of other companies to increase internal and external efficiency. Through collaboration and improvement, companies can improve the performance of intra- and inter-organizational processes, maintain and develop relationships, and learn and build CoI competences.

2.4 TRUST IN THE PROCESS OF COI

Specific research on trust in CI has not been reported, although we have found some references to trust. For example in Japan where life-time employment was used to create trust among the employees that they will not lose their job because of improvement initiatives in product, process and organization.

However, from the CO-IMPROVE research trust emerged as an important factor affecting the CoI (Kaltoft et al., 2003). Trust can be defined as the belief of one party of the relationship that the other party will act in the firm's best interest in circumstances where that other party could take advantage or act opportunistically to gain at the firm's expense (McCutcheon and Stuart, 2000). Trust in CoI processes can be an enabling

factor, whereas a lack of trust can be a disabling factor in the process and progress of CoI initiatives. However, trust between organizations is built upon trust between employees, just as organizational learning is built upon individual learning. Trust comes in various forms, namely cognitive trust (based on success of past experiences), affective trust (based on emotional bonds between individuals) and calculative trust (based on future perception or expectation) (McAllister, 1995; Morrow et al., 2004; Vieira, 2005).

Within the Dutch situation all three forms of trust were present. The relationship with the SI and supplier 1 can be classified as cognitive trust between the companies. The relationship was perceived as trustworthy from both sides. In the past, several CoI initiatives already had led to some results. The relationship between the SI and supplier 2 can be classified as affective trust. The sales representative had a very good personal relationship with the purchaser of the SI. This relationship was perceived as very good from both sides, both from an operational and a relational point of view. However, when the purchaser left the SI, this affected the level of trust of the supplier towards the SI negatively in terms of openness and willingness to share information in the CoI process. This showed that trust between companies is built upon the people working in the companies, but also that trust is an enabling factor and a lack of trust a disabling factor in CoI processes. The relationship between supplier 3 and the SI was fairly new as business between the two companies was about to start up. In this respect, the two companies “trusted” each other for the time being in order to develop business, which could be beneficial for both of them. This can be classified as calculative trust.

As we have seen from this, that trust has different forms in CoI processes. We can conclude that this is an important prerequisite and enabler in CoI processes. As soon as there is a lack of trust the CoI process is negatively influenced. However, what seems to be particularly interesting is that organizational trust is built upon trust between people working together in CoI initiatives.

2.5 DECISION MAKING, POWER AND POLITICAL BEHAVIOUR IN THE PROCESS OF COI

In the CI literature, a flattened hierarchy and the devolution of decision making are important components of the CI process (Caffyn, 1998). These two components enable, amongst others, an (infra)structure in which CI can thrive. The hierarchy within an organization determines the decision making power people do have. From this perspective, power is embedded in the position of an actor within the organization structure (Fehse, 2002). Power also has a relational aspect, such as, the enactment of power to influence the behaviour of others and/or to attain certain goals (Frost, 1987). However, in order to increase the commitment and contribution of all employees a flattened hierarchy and the decentralization within the decision making process are required.

The main difference between CI and CoI is that within CoI processes there is no hierarchy. The balancing of power in the EME actually takes place in the market. In the Dutch EME the power, from a structural power perspective, was not balanced due to the fact that the suppliers depended on the sales volume of the SI. The representative of the SI knew he could use his power position to influence others and/or to attain certain goals, but deliberately did not, because he believed that power would negatively influence the process and progress of CoI. He rather believed that the decision making process was a responsibility of the EME and/or the CoI project team in which all the participants should have the opportunity to present and discuss the process and objectives of the CoI project.

An example in which both uncertainty in the decision making process and the power balance led to political behaviour was shown in the case of the dyad between the SI and supplier 2. As the purchaser of the SI left, trust between the companies dropped, leading to an uncertain situation with regard to the decision making process and the power in the relationship. As such the supplier did show political behaviour in terms of Behaving reactively towards the SI and less open in communication and information sharing/exchange.

We can conclude that the decentralization of the decision making process is as important in CI as in CoI. Whereas a flattened hierarchy is indicated as an important component for CI, a hierarchy does not exist within CoI processes. In the Dutch setting SI had more power than the suppliers, because the suppliers depended on the SI. Nevertheless, the use of power has a negative influence on the process and progress of CoI, leading to political behaviour of the suppliers. It is therefore important within CoI processes to seek and maintain an appropriate power balance.

2.6 THE INFLUENCE OF COI CAPABILITY – OR LACK THEREOF

Between 1992 and 1997, the CIRCA team carried out practical, action-oriented research with a set of industrial collaborators drawn from the manufacturing sector (Caffyn, 1999). A major outcome from this work was the CI Capability Maturity Model. This model describes CI in terms of a set of key behaviours or behavioural routines which appear to be essential for the long-term success with CI, and how these behaviours (should) develop over time (Bessant and Caffyn, 1997). Individuals and groups display the behaviours, and they are closely linked to core abilities belonging to the organization (Caffyn, 1999). The core CI abilities are (Caffyn, 1999):

1. The ability to link CI activities to the strategic goals of the company.
2. The ability to strategically manage the development of CI.
3. The ability to generate sustained involvement in CI.
4. The ability to move CI across organizational boundaries.
5. The ability to learn through CI activity.
6. The ability to articulate and demonstrate CI values.

Within the CO-IMPROVE project collaborative improvement assessments were used as interventions into the collaborative improvement process and to measure the maturity of collaborative improvement behaviours at the same time. The interventions were expected to affect the level of maturity to the extent that they would trigger a dialogue between the people involved, and help develop a deeper understanding of the fundamental principles of CoI and an increased motivation to participate in subsequent improvement activities. In the assessment instrument, the following behaviours were listed:

1. The EME-members are guided by a shared improvement and collaboration values.
2. Companies within the EME use long-term goals and objectives to focus, prioritize and organize improvement activities.
3. People/companies within the EME participate proactively in incremental improvement and their learning is captured and deployed.

4. People/companies within the EME participate in implementing and facilitating improvement projects across the boundaries of the inter-company operations.
5. People/companies within the EME constantly evaluate improvement projects and ensure that the outcomes are used to improve and monitor the collaborative improvement system on an EME level.

At the start of the CO-IMPROVE project, the Dutch companies scored particularly low on capturing and deploying learning from the CoI process by constantly evaluating improvement projects. Prior to the research project, reflection on learning was not performed due to operational priorities within the Dutch setting. Through the Action Learning approach the situation improved gradually over time, because explicit attention was given in the workshops to reflect upon the CoI process and identifying lessons learned, experiences and present them in plenum for the whole EME. As such, the companies within the EME developed an increased awareness of the concept and benefits of collaborative improvement, recognized the importance of a structured process towards improvement and learning, and provided a setting of reflection and evaluation with a high degree of openness and trust. Over time, the companies matured with regard to the CoI process, showing an increase in the score of the CoI maturity assessment on all five behaviours.

We can conclude that just as within CI processes a set of behaviours appear to be important in CoI processes as well. The maturity level of CoI does increase over time through successful collaboration and improvement. Nevertheless, what appeared to be particularly difficult for the companies in the Dutch EME was behaviour 5, due to operational priorities and a lack of emphasis and facilitation.

2.7 THE ROLES WITHIN THE IMPROVEMENT PROCESS

CI is depending on the contribution of both individuals as well as teams, which are involved in and committed to continuous improvement (Boer *et al.*, 2000; Caffyn, 1997). Each actor plays one or more roles as part of the process. One of the important roles that have been mentioned by Caffyn (1997) and included in the CIRCA-model is the CI facilitator.

Within the CO-IMPROVE project various roles were identified, which appeared to influence the progress and process of the collaborative improvement. Roles particularly important in the Dutch setting were:

- Instigator: Starts activities, generates discussions and encourages participation.
- Facilitator: Facilitates communication, moderates discussion, encourages interaction and reflection.
- Expert: Provides information, evaluates feasibility, anticipates constraints.
- Gatekeeper: Provides contacts, identifies and liaises with key sources of information.
- Actor: Does the work, participates in activities and discussions, reflects on experience and progress.

The initial approach that was chosen by the companies is based on the notion that collaboration and improvement in a network of companies is characterized by interdependence, shared goals and vision, trust, commitment, joint work and activities. Collaborative improvement initiatives should be initiated and selected by the whole group, based on immediate practical problems or improvement opportunities.

However, after a few months, hardly any collaborative improvement project had been started. Although the companies supported the adopted approach, this did not lead to the required results with regard to collaborative improvement. The companies were not able to hold on to the enthusiasm and translate this into joint activities. Therefore the SI decided to change approach and become more active and directive, by starting activities, generating discussion and encouraging participation of all companies. The more active and directive role appeared to be important for the process and progress of the CoI initiatives in the Dutch setting. More improvement initiatives were identified and selected, more CoI meetings took place, and all companies participated more actively (see also Kalsoft *et al.*, 2004). The leaders role that the SI fulfilled was necessary in terms of creating momentum and speeding up the CoI initiatives.

With regard to the different roles that need to be played, what appeared to be particularly important in (implementing) collaborative improvement processes is:

- Some roles frequently need to be fulfilled by more than one person in order for the project to be successful.
- Individuals/companies occasionally fulfill more than one critical function.
- The roles that individuals/companies play change over time.

Roberts and Fusfeld (1981) concluded essentially the same for roles in radical innovation processes.

If we compare the literature of CI with the findings of this research, we can conclude that the facilitator role plays an important role both within CI and CoI. However, within the process of CoI different roles need to be fulfilled due to the characteristics and dynamics within the EME. Important roles then become the instigator and the gatekeeper as was described in the above-mentioned example of the CO-IMPROVE. Also these roles do change more frequently over time in order to maintain and develop the CoI process and the relationships within the EME.

3. DISCUSSION

As companies increasingly link their internal processes with external customers and suppliers, new approaches must be developed to enhance the business performance and, in particular, the continuous improvement of their performance between the partners within a network of organizations (Kalsoft *et al.*, 2003). Therefore the concept of continuous improvement (CI) must be applied and used in inter-organizational settings as well (Boer *et al.*, 2000 and Rijnders, 2002). In this paper we presented and discussed whether and how the concept of CoI and CI meet and overlap by identifying differences and similarities of extant theory of CI and CoI. Table 1 gives an overview of the similarities and differences of CI and CoI, as presented and discussed in this paper.

Table 1: Similarities of and differences between CI and CoI

Plays a role in CI and CoI:	Plays a role in CI, not CoI:
<ul style="list-style-type: none"> • Clear strategic framework/ shared vision and goals • Communication and understanding of strategy to all participants • Intra-organizational commitment 	<ul style="list-style-type: none"> • Flattened hierarchy • Empowerment • Commitment to training and personnel development

<ul style="list-style-type: none"> • Balance between long-term and short-term improvement perspective • Formal problem solving cycle • Capturing and transfer the learning • Effective and open communication and information sharing • Balance between top-down and bottom-up improvement initiatives • Shared belief in prosperity through improvement and collaboration • Trust • Decentralization of decision making • Facilitator • Wide range of tools that can be used and applied in the process • Treating learning as part of the improvement process • Set of key behaviours or behavioural routines 	
<p>Plays a role in CoI, not CI:</p> <ul style="list-style-type: none"> • Benefit sharing • CoI roles (instigator, expert, gatekeeper) • Inter-organizational commitment to exploit and explore improvement potential inside the collaborative relationships • Political power • Power distance based on market and dependency • Implementation process based on shared vision and goals, trust and commitment 	<p>Plays not a role in CI and CoI:</p>

As we can see from Table 1 some of the components of CoI, identified within this research, such as shared vision and goals and trust, actually appear to be additional, but in some of the cases the unit of analysis was the explaining factor. Whereas CI is applied to intra-organizational processes, CoI is applied and used in inter-organizational processes. CI is a company-wide process of improving the existing practices within a company, which requires the contribution and commitment of all employees. CoI, on the other hand, is applied and used in inter-organizational settings in which companies work together to affect process, progress and outcomes of the relationship. People or groups of people of the different companies interact with each other, both internally as well as externally, as part of the improvement process and, consequently, integrate their processes and work practices in a more efficient and effective way.

Another notable point in Table 1 is that the decision making power of people within CI processes is determined by the hierarchy of the organization. A flattened hierarchy is mentioned as an important component of CI (Caffyn, 1998) and is listed in Table 1. However, the main difference between CI and CoI is that within CoI processes there is

no hierarchy. Consequently, the balancing of decision making power takes place in the market and is dependent on the relative dependency towards each other and the (characteristics of the) market.

Another explaining factor, as discussed above, might be the specific industry in which this research was performed or even the country. The list may not be complete; it is based on the empirical findings of one case study of a Dutch EME active in the automotive industry. Research of collaborative improvement in EMEs in other countries and/or industries may produce additional similarities and differences between CI and CoI.

4. CONCLUSION

The objective of this paper was to evaluate the research findings in view of existing theories on CI. An SI in the automotive industry with three suppliers provided the empirical setting for this research. The result of the assessment on what is specific for CI, what for CoI, and where theories on the two areas meet and overlap is presented in Table 1.

As we can see from Table 1 a lot of similarities do exist between CI and CoI. However, some of the components do differ because of their specific intra-organizational, such as flattened hierarchy, and inter-organizational characteristics, such as benefit sharing, political power and power distance based on market and dependency. One defining feature that is not specifically discussed in CI and CoI, but very important in the relationships between individuals and companies is time. However this feature is (in)directly related to the issues of trust, behaviours and capabilities in CI and CoI, commitment and power.

Additional challenges and suggestions for future research include:

- CI requires capabilities belonging to the organization and they can mature over time, but does a specific maturity in CI positively influence the CoI maturity. In other words, do companies with a high maturity on CI perform better in and achieve a higher level of maturity with regard to CoI than companies with a lower maturity on CI? Is there a relationship between CI and the CoI maturity and what are its effects?
- In answering the question what are the commonalities and differences between CI and CoI, we found additional components of CoI to CI. The unit of analysis is an explanation, however there might be more explanations for the differences between CI and CoI, such as the influence of contingencies/contextual factors, industry specific characteristics or even national characteristics. As such more research is required on the influence of the factors outside the collaborative relationship on the process and outcomes of CoI.
- There are different forms of trust within collaboration. But, does one dimension of trust lead to better performance in CoI processes than the others? Are more forms of trust required in CoI in order to influence the process positively? The trust issue in CoI is an important line of research which needs to be explored to a larger extent within the research community.

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