XXVI. International RESER Conference: The Core Task Approach to modelling the dynamics of value co-creation and innovation activity

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The purpose of this paper is to contribute to the topical managerial challenge and the need for alternative methodological approaches to understanding complex and dynamic value creation and innovation activity in daily business practice among actors. We share the epistemological intent of making explicit the social construction of value co-creation and innovation by applying practice-based approaches. Specifically, the relevance of the Core Task Analysis (CTA) approach is examined theoretically and demonstrated empirically by structuring the emerging shared activity system in terms of new value creation activities of actors in the manufacturing industry. Finally, both the scientific and practical contributions are critically discussed.

1. Introduction

While seeking ways to understand and support complex value creation and renewal, both service and innovation research have shared a growing interest in collaborative, systemic and practice-based approaches (Russo Spena et al., 2012; Kallio et al., 2016; Mele et al., 2016). In innovation research, paradigmatic transitions have been approached as shifts 1) from a closed to a more open innovation logic, combining inbound and outbound resources, and 2) from a narrow view of innovations as product- and technology-based to seeing them as more systemic and multidimensional, requiring different innovation logics with strategies and activities, whether incremental or radical in nature (e.g. Francis & Bessant, 2005; Chesbrough, 2011).

Furthermore, Mele and colleagues, (2016) and Kallio and colleagues (2016) have examined these ongoing changes from a philosophic viewpoint, highlighting transitions from economic, technological, and positivistic views towards collectivistic, process-oriented and interpretive paradigms (e.g. Tronvoll et al., 2011; Greer and Lei, 2012; Lusch & Nambisan, 2015). The experimental, co-constructive, uncertain and iterative nature of innovation activity is thus highlighted (Ellström, 2010; Edvardsson et al., 2011; Sorensen et al., 2013; Vargo et al., 2015).

In daily business in order to sustain competitiveness, the imbalance between the requirements for change and daily work become critical in service encounters among

actors. In these situations, the change in activity should be co-constructed and actualized as a new type of collaboration in terms of speech, interaction and emerging novel practices. Essential to this is how novel situated-awareness and action are utilised as a source of mutual value creation and renewal in a sustainable and competitive manner.

The purpose of this paper is to contribute to that topical managerial challenge and the need for alternative methodological approaches to understand complex and dynamic value creation and innovation activity in *daily business practice* among actors (e.g. Elström, 2010; Lusch & Nambisan, 2015). Here, we share the epistemological intent of making explicit the social construction of value co-creation and innovation by applying practice-based methods (cf. Corradi et al., 2010; Edvardsson et al., 2011; Mele et al., 2016). Practice-based studies have attracted growing interest in service innovation research by providing relevant approaches to challenge traditional ontological and epistemological premises (cf. Corradi et al., 2010; Russo Spena et al., 2014; Lappalainen et al., 2014; Mele et al., 2016).

By applying the practice-based Core Task Analysis (CTA) approach developed by Norros with her colleagues (e.g. Norros, 2004; Norros & Nuutinen, 2002; Reiman, 2007), we offer a new insight for the theoretical discussion by structuring the emerging *shared activity system* in terms of the new value creation activities of actors in the manufacturing industry. Thereby, we aim to *demonstrate* how this theoretical and methodological approach elucidates the situated and socially constructed general logic of action, and provides ways for capturing value co-creation that overcomes organizational boundaries. This shared activity system is studied as a source as well as a realization of renewal.

In that way we not only contribute methodologically and empirically to the acknowledged need for applying multi-method practice-based approaches, but also claim that we should pay more attention to the epistemological and ontological assumptions of our research, as well as making them more explicit. The paper has been structured as follows; in section two we present the theoretical grounds for the CTA approach with linkages to practice-based studies. In the third section, the empirical design is described and in the fourth section, the chosen empirical findings are summarized in order to illustrate the relevancy of the CTA approach. Finally concluding remarks are presented in section five.

2. Theoretical background

Recently, an ambitious theoretical and conceptual examination has been made in order to build linkages between the economic, business and social aspects of value creation and innovation in different levels of an ecosystem (e.g. Edvardsson et al., 2011; Russo Spena et al., 2014; Vargo et al., 2015; Mele et al., 2016). Increasingly, innovations are understood to be created in social and working activities embedded in everyday business practice in and between organizations. The experimental, emergent, uncertain and iterative nature of innovation activity is highlighted. Thus innovation activity is seen more or less as a continuous practice embedded in dynamic and interactive value co-creation processes with customers, end users and other value network parties. (e.g. Ellström, 2010; Sorensen et al., 2013; Lusch and Nambisan, 2014; Russo Spena et al., 2015.)

However, there are still topical needs for a specifically *methodological exploration* and for *empirical studies* that more deeply elaborate on the complex and multifaceted nature, structure and activity of value co-creation and innovation (e.g. Calborg et al., 2013; Kallio et al., 2016).

To narrow the research gap, we see that the practice-based approach developed by Norros with her colleagues (e.g. Norros, 2004; Norros & Nuutinen, 2002; Reiman, 2007) has much to offer in studying the dynamics of complex value creation and renewal. The approach provides conceptual and methodological tools to understand the co-construction of situated activity and knowledge, and thus the development of work practices. In the following we briefly review the related and recently extended practiced-based theoretical debate and give an overview of the roots of the CTA approach.

2.1. Practice-based views on value creation and innovation

Schultze and Orlikowski (2004: 87) argue that the practice approach 'highlights how macro-level phenomena such as inter-firm relations are created and recreated through the micro-level actions taken by firm members'. Manifold practice-based studies in organizational research (PBS) have again attracted growing interest, with a move towards a more explicit acknowledgement of practice as epistemology, as reviewed by Corradi and colleagues (2010).

They summarized the following three dimensions built into a concept of practice:

1) the set of interconnected activities to stabilize collective action and a common orientation.
2) the sense-making process that supports the accountability of a shared way of doing things and allows the continuous negotiation of the meanings of practice by practitioners.
3) the social effects generated by a practice in connection with other social practices. This is the dimension of the reproduction of practice. (Corradi et al., 2010: 247.)

In their recent article, Mele and colleagues (2016) examined the extended multidisciplinary interest in the practice-based school of thought by identifying three different research streams that contribute to a practice-based view of innovation or renewal. When comparing our application of the Core Task Analysis approach against these three main streams, we see linkages with the first two. First, Mele and colleagues (2016) present the studies based on *"classical works of human knowledge and learning"* such as the "communities-of-practice" literature (Lave and Wenger, 1991), the theory of practice and reflective practice (Argyris & Schön, 1974), pragmatic philosophers (e.g. Dewey, 1910), cultural historical theories of activity (Leontjev, 1978, Vygotsky, 1978, Engeström, 1999), as well as more recent work on organisational change and organisational culture (Tsoukas & Chia 2002). The core of scholars come from social sciences, focusing on social, contextual and the situated nature of human knowing and acting as their starting point for the innovation approaches or criticism against mainstream innovation research (Mele et al., 2016; Kallio et al., 2016). As the CTA approach has roots in cultural historical theories of

activity and pragmatic philosophy, it shares the same kind of foundation but has been developed in the other direction described in the next section.

Second, Mele and colleagues (2016) identify researchers who represent *"the service innovation research and managerial tradition of iterative and interactive scholars"* but are recently supplementing their argumentation with practice-based approaches regarding the logics of innovation. Among these scholars the widely adopted theoretical argumentation has been focused on a Service-dominant logic (S-D logic). According to S-D logic, value is always reciprocally co-created, and thus contextually interpreted and experienced by the beneficiaries, such as providers, customers and end-users (e.g. Vargo and Lusch, 2008). Recently, in the S-D logic debate an increasing interest in the social construction of value co-creation processes has emerged, stressing social interaction as the basis of the service exchange and service innovation shaped by values, competences, knowledge and related expectations modified by the cultural history of all the parties involved (e.g. Edvardsson et al., 2011; Lusch & Nabisan, 2015). When highlighting the role of relationships, knowledge and the dynamic nature of the resources, we can see the linkages between the S-D logic and the CTA approach. Furthermore, as in the CTA approach, renewal is seen in the S-D logic debate as a co-creational and continuous process taking place in complex and interdependent systems (cf. Norros, 2004; Vargo et al., 2015).

2.2. The Core Task Approach - combining systemic and situated views

The practice-based approach developed by Norros and her colleagues (e.g. Norros, 2004; Norros & Nuutinen, 2002; Reiman, 2007) has much to offer in studying societal meaning and the dynamics of value co-creation as a source of renewal. The CTA approach (Core Task Analysis) is based on a systemic notion of human activity. Situated actions are conceived from an ecological, human-environment interaction perspective. (Norros, 2004; Norros & Nuutinen, 2002.)

The approach has its roots in the cultural-historical theory of activity (Engeström, 1999; Leont'ev, 1978; Vygotsky, 1978) and the pragmatist conception of habit (e.g. Kestenbaum, 1977; Norros, 2004). They both share the premise that contradictions and disturbances in situational activity function as drivers of change, and thus of innovation. When sensing contradictions in their habits of action in situational interaction, actors constantly adapt their behaviour accordingly. In keeping with pragmatist philosophy, habits are not perceived narrowly as repetitive and retaining function; rather they are seen as enabling a constant evaluation of environmental conditions against set targets. Accordingly, the human–environment interaction is characterised by affordances and habits. *Affordances* are interpretations from the environment, thus contextual features for the attainment of useful results. *Habits* are learned ways of acting, and reflect the logical–general nature of human thinking, creating a continuity of activity and thus a basis for the concept of practice. Both affordances and habits express the meaning of the interaction. Furthermore, the concept of habit allows for extracting the habitual meanings as formative principles that both *explain and predict* the specific course of action. (Norros, 2004; Norros & Nuutinen, 2002.) In that way the habits are seen as the basis of contextual and purposeful activity.

However, to accomplish behavioural change (operationally and conceptually), both individual and shared reciprocal experiencing, reflective thinking and experimenting are called for as the main mechanisms (Engeström et al., 1999; Miettinen, 2000). In particular, the activity theory of Engeström highlights conscious, object-oriented activity; when the actors are able to re-conceptualize the activity with a wider horizon of possibilities and collaboratively change their way of acting accordingly, the comprehensive change takes place (Engeström et al., 1999).

We follow the argumentation of Norros (2004) that the cultural-historical theory of activity provides concepts for systemic analysis on the development of activity. Actions are analysed through a socio-technical activity system with six inter-related elements. The first three elements describe: actor(s) who work(s) with certain tools and mediating artefacts around the object of an activity. The activity takes place in activity systems with certain rules, community and division of labour. A change in the activity is derived from either internal or external tensions that call for changes in some or all of the elements in the activity system, as described in Figure 1.

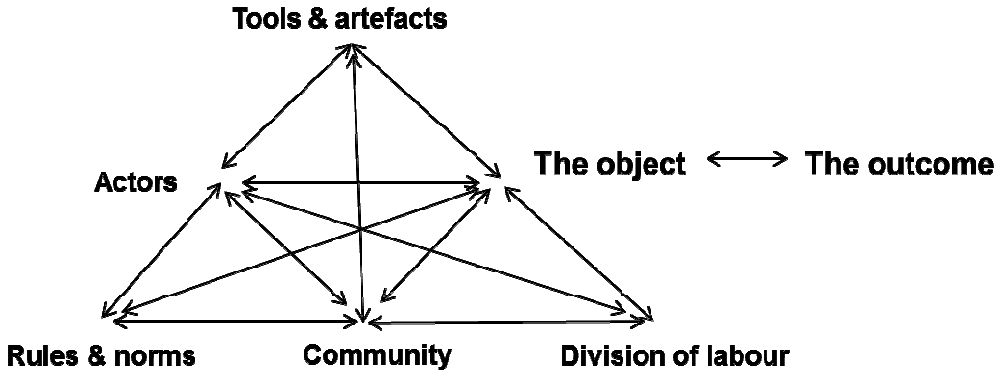

Figure 1. Inter-related elements of the activity system (Engeström et al., 1999).

Furthermore, the systemic analysis helps to define critical functions in terms of environmental dynamism, complexity and uncertainty and finally the core task demands of the target studied. *Dynamism* refers to the temporal dimension and related demands, while *complexity* relates to multiple, reciprocally connected influencing elements and systemic relationships. *Uncertainty* refers to characteristics of the available knowledge for situated decision-making, which is always somehow limited or insufficient (in unexpected events of activity). (Norros, 2004; Nuutinen, 2006; Reiman, 2007.) The core task is defined as "such a content of work, characterized through the objective and outcome-critical intrinsic constrains of activity that actors should take into account in all situations when determining the relevance of situated goals and conditions for the attainment of aimed objectives" (Norros, 2004: 146).

Finally, by studying situational and social activity, we are able to elaborate on the societal meaning and dynamics in terms of how actors interpret, co-construct and manifest in their action the expanded object of activity, and renewed tools or management practices both at an individual and system level. Thus findings related to the core-task demands represent both the enacted capability (i.e., as expressed in the interviews or observed by the researchers) and potential capability (i.e., as

inferred or suggested by the researchers or interviewees) inherent in peoples' situational acting (Norros, 2004; Norros, 2014). Due to the interactive nature of value creation as our research focus, collaborative structures are essential as the basis for value creation and renewal in daily operations.

Both the model of activity system and the CTA approach have been applied in a variety of contextual settings (e.g. Hasu & Engeström, 2000; Kerosuo, 2006; Kallio & Lappalainen, 2014). The latter has its roots in examining safety critical organizations such as nuclear power plants, but the strength of comprehensive and systemic analysis frames has been acknowledged, further developed and applied across industries (e.g. Norros, 2004; Nuutinen, 2006; Reiman, 2007; Norros & Nuutinen, 2009; Norros et al., 2013; Savioja, 2014). The empirical and methodological novelty of this paper is to extend the scope of the analysis from an organizational or professional activity to networked activity across organizational boundaries by modelling *renewed networked value creation of actors as a shared activity system* (see Figure 1).

3. Empirical Design

3.1. Empirical context of the case study

Our empirical study focused on elaborating on complex Lean change in the manufacturing company facilitated by their long-term (equipment) supplier in order to integrate their resources in a more competitive and innovative manner in their value network in the industrial ecosystem. Nowadays the widely adopted and studied Lean approach has again increasingly aroused interest across industries. According to recent literature reviews (Stone, 2012; Samuel et al., 2015), the approach has inspired various academics and practitioners, but it has also faced strong critiques focus particularly on the applicability of operative shop-floor level methods in different industries and particularly outside of mass production. However, the main premises that look to understand the dynamic mutual value creation in a systemic manner, and not just the strategic and operative aspects but also the value chain and network aspects, seem to be still relevant, and thus topical for our research context too (e.g. Hines et al., 2004). Furthermore, the Lean approach reflects the two fundamental balancing drivers: standardization and renewal in value creation, as well as the related tensions and obstacles.

A long-term, multimethod case study was conducted between February 2014 and June 2016 that included annual in-depth interviews of key actors and focused observations with mini interviews in order to model the *emerging new, general logic of activity as well as a shared activity system of three actors in the value network*, and the related tensions and interpretations.

Actor A is a family-owned SME company, providing high quality solutions for the machine, metal and plastics industry, specializing in flexibility and time-critical approaches to enhance the competitiveness of customers. The solutions range from components, complete tooling solutions, design service, and technical solutions for whole supply chain management. The company is known for its pioneering attitude in

traditional industrial sectors and for having strong competence in different business sectors, with international expertise too.

Actor A has been collaborating with **Actor B** for over ten years. The privately owned SME company operates as a contract manufacturer in the plastics industry. They provide design and technical support, production of injection moulded plastic parts and assembly for the needs of electronic, medical and manufacturing industries. The relationship between Actors A and B started with moulds and has progressed to a deeper collaboration by combining strong knowhow and negotiation power with a shared value proposition for end customers. Furthermore, Actor A has facilitated Actor B in the change towards Lean management in order to promote their competitiveness in the value networks of the plastics industry. This latest phase of collaboration will be our research focus. In the Lean change their mutual goal was to boost the performance of Actor B by co-constructing and adopting the lean-based operation model step by step within two and a half years.

Actor C is a global player in welding in various and demanding application areas and industries. The family-own company has built their competitiveness on user-experience-based innovation and operation excellence of high-tech welding solutions with lifecycle service. The company has a long history of collaboration with both Actors. Over time Actor A has become as an important partner in designing injection moulds and managing complex mould projects in regard to the plastics components of welding equipment. Actor B has been a trusted contract manufacturer in plastic products and thus played the role of networked integrator of both material and mould suppliers, such as for Actor A. In order to respond to tightening global competition Actor C has boosted co-development activities throughout the value chains with a number of chosen actors. One of the current networked projects focused on logistics practices involving also Actor B, with mutual synergies due to ongoing Lean change.

3.2. The research process followed by CTA methodology

Empirical data were gathered by applying CTA methodology, which provides a framework for interdisciplinary studies of technologically, in highly mediated operational environments characterized by complexity, dynamics and uncertainty (Norros, 2004). Firstly, in-depth interviews were conducted with Actor A and B in two different timelines during their collaboration in the Lean change process from September 2013 to December 2015. The purpose of the interviews was to understand co-construction of core tasks of parties with new demands and possibilities as well as to elaborate on the shared activity system operating among Actors A, B and C. Interviewees represented all organizational levels and key roles, such as owners, development/operation managers, sales as well as production workers. Altogether, eleven interviews were conducted between January 2014 and November 2015. Interviews took approximately one and half hours. In addition to notes, they were tape-recorded and later transcribed.

In keeping with the main principles of the CTA methodology, the qualitative analysis was based on modelling *iteratively* Actor A and Actor B as the two interrelated activity systems in terms of renewed core task demands taking into account constrains and possibilities. As a starting point, the framework of the main elements of the activity system, as shown in Figure 1, was applied in order to identify roughly the expanded object of both Actors and related changes in each element of their interrelated activity

systems. More specifically, the analysis of Actor A was targeted to the extended expert and consultative service as an integrative characteristic of their diverse business activities. The analysis of Actor B was focused on adopting the Lean approach as the paradigmatic and systemic change. The results of the analysis were deepened in order to define critical functions in terms of environmental dynamism, complexity and uncertainty, and finally the renewed core task demands of both Actors.

In the next phase, situated (episodic) encounters were selected for deeper analysis and participatory observation (Norros, 2004). In our cases, such relevant and interesting research targets concern the ongoing Lean-based change process and related business dynamics among the Actors. The situated co-construction was observed in the actual work situations of actors from the viewpoint of several work roles. More specifically, we conducted participatory observations targeted at assembly workers and the production manager in the site of Actor B in one afternoon June 2015. The observation protocol was derived from the previous analysis phase, focusing particularly on *indicators of new practice*, which functioned as a rough hypothesis. During the observation, researchers asked some questions related to the object of the work at hand, with consideration of critical conditions as well as the changes towards the Lean approach. In addition to the notes of two researchers, the episodes, of approximately half an hour each, were tape recorded and later transcribed. The aim of using participatory observations was to elaborate on *how the actors communicate, co-construct and manifest in their action the expanding object* of their work and the required changes in the core tasks from an individual and activity system perspective. Thus the observation episodes provided us with *illustrative examples* in order to iteratively structure, test and elaborate further in our analysis.

Finally, as a synthesis we structured the *shared activity system* in terms of an extended object between Actors A, B and C. For that purpose, in June 2016 we conducted complimentary interviews with Actor C who was selected to our case study as the common (end) customer of the companies A and B. In addition, to test our interpretations, we arranged evaluative workshops for the interviewees, who we have identified as key actors in companies A and B.

4. Results

Based on theoretically grounded empirical illustration we demonstrate the methodological relevance of the Core Task Analysis approach to making sense of the complex and dynamic social construction of mutual value creation and renewal. For that purpose, we chose *empirical examples* from the two main different phases of the analysis for the current study.

4.1. The model for the renewed Core Task with emerging indicators

In the following we present briefly the essence of the Core Task model of Actor B in order to demonstrate with the conceptualization of CTA approach of how Lean

principles have been co-constructed and gradually manifested in the different levels of activity system.

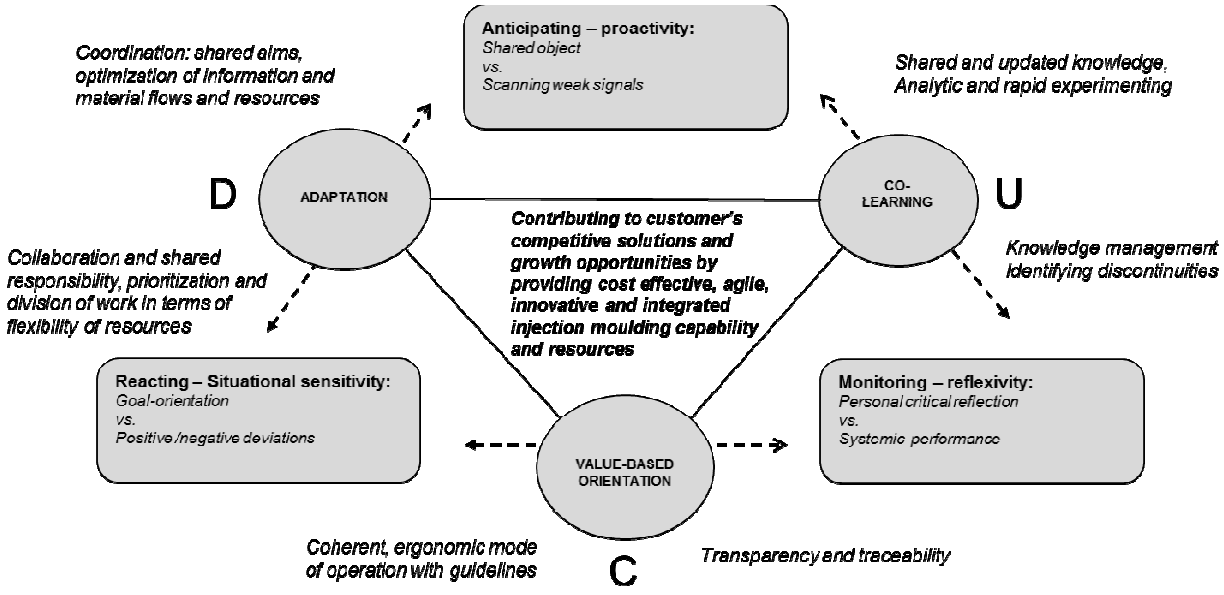

Figure 2. The model of the renewed Core Task for Actor B (cf. Reiman, 2007; Norros et al., 2013; Norros, 2014).

As summarized in Figure 2, the object of Actor B has been defined so as to contribute to customers' competitive solutions and growth opportunities by providing cost effective, agile, innovative and integrated injection moulding capabilities and resources with networked partners. This enables them to achieve increased flexibility and effectiveness in their chosen value networks and growth opportunities with global pioneers.

Critical core-task demands are elaborated on as follows. First, *Anticipating – proactivity*: shared understanding of value creation based on injection moulding capabilities, related resources and a Lean-based operation model in a manner conducive to productivity, safety and well-being. In addition, continuous proactive foresight unto changes and related impacts in operating conditions are called for to enable dynamic and purposeful resource and action planning. Second, *Reacting - situational sensitivity*: situational activity and related decision-making that are driven on the one hand by a shared object and goals, and, on the other hand, by a situational sensitivity to positive and negative deviations or discontinuities. Third, *Monitoring - reflexivity*: dynamics of the environmental complexity together with related uncertain, the multiform and typically mediated information call for continuous monitoring, critical assessment and reflection of the performance in relation to pursued goals, outcomes and effectiveness individually and collectively.

Further, we identified so-called *indicators* of the emerging and renewing core-task demands in work practices, with so-called instrumental or balanced demands (see Figure 2). From a value creation perspective, it is a question of co-constructing a new logic of action. In Table 1 we have demonstrated the multilevel interrelated demands of the Core Task model of Actor B as emerging change in the value creation logic based on Lean approach.

"Instrumental" demands	Work practice demands	Examples of indicators of Lean approach (as indicators of renewed core task)
DYNAMISM: Systemic and self-organized ADAPTATION in the short and long term	Coordination: shared aims, optimization of information and material flows and resources	Focusing on **visual** operating mechanisms, such as production layout enabling pull control, tables for fine-tuning human resource allocation and Kanban system.
	Collaboration and shared responsibility, prioritization and division of work in terms of flexibility of resources	Renewed **committed** steering board, extend work roles enhancing multi-skillness and flexibility, 5S procedures to ensure tidiness and minimize loss and ineffectiveness.
COMPLEXITY: VALUE-BASED ORIENTATION as main driving mechanism	Coherent, ergonomic mode of operation with guidelines	Processes enabling effective information and material flows and standardized procedures to ensure real time quality and inventory management **throughout the value streams.**
	Transparency and traceability	Visual material handling and **digitalized** information flows as well as documentation of activities and deviations
UNCERTAINTY: CO-LEARNING embedded in systemic practice	Knowledge management (analysis/synthesis), Identifying discontinuities	Continuous visual management and **real-time monitoring** enabled by advanced and optimally utilised ERP-system and other communication platforms
	Shared and updated knowledge, Analytic and rapid experimenting	Collaborative **experimenting** of alternative solutions to enhance renewal such as value stream mapping, targeted analysis, practical experiments and agile adoption of renewed practice

Table 1. Structure of Core Task model demonstrated empirically considering Actor B.

As Table 1 shows, there are emerging manifestations of a more value-based, agile and transparent operation model that characterizes Lean principles, but has been co-constructed in situational activity and related decision-making, taking gradually form of actor (i.e. company) specific, dynamic and multidimensional practice. On that basis, current strengths and development targets were also defined to guide the ongoing change process.

When analysing the Lean change process as a comprehensive change in the Core Task of the organizational actor we aim to highlight the following issues. *First, the expansion of the object from a systemic perspective.* Based on interviews the key persons seem to share the expanded object characterized by a proactive, systemic and value-based Lean approach. Essential to it is how it is communicated to all staff as a kind of frame of reference for reflection and guidance in the dynamic and complex change. The systemic change is characterized by two fundamental balancing drivers, standardization and renewal in value creation, as well as the related individually and collectively experienced opportunities and threats. When the main confusion and resistance was overcome, the extended work roles and flexibility in terms of human resources were gradually taken into practice in different forms. One of the interviewees represented a kind of the role model for shop floor employees regarding multi-skilled and flexibility between value creation activities. Furthermore, she took an active part in co-constructing new practices with management tools and facilitating others in adopting the change demands at hand. Her orientation reflects the renewal potential of an individual employee in dynamic resource integration, rather than the anticipated threat of an impersonalised and monotonous work role. Thus the example highlights the self-directing and systemic nature of the emerging value-creation logic with related demands in all work roles and activities.

Second, changes in the value creation logic related to the operation model and critical demands. The co-constructive nature of the renewed core task with demands

and particularly those practical indicators (as guiding principles) were understood by key persons. A continuous reflective and experimental development orientation was gradually built in daily practice, while systemic monitoring called for more consideration. Tools were developed to enable visual and real-time information and material flows, but the operation model still needs further development regarding flexibility and purposeful reaction to deviations. Strong internal tensions and several layout changes restrained the identification and co-construction of emerging indicators of the Lean-based value creation model and practice at the individual and activity system levels. It is essential to a comprehensive change that the emerging indicators of the renewed generic logic of action as shared representatives of the meaningful and pursued object of action are elaborated on so as to facilitate staff to interpret situational actions and make purposeful decisions. In that way individual and mutual learning and thus commitment to collaborative change, or innovation in daily practice is enhanced.

Third, deepening relationship between Actor A and B in value network as shared activity system. Based on the interviews, it was seen that Actor A has played an important role in the renewal process of Actor B. We summarized the role as strong contextual insight into the Lean approach, framing the pursued operation model and facilitating co-development. These dimensions actually characterize the core task of the extended expert and consultative service of Actor A as an integrative characteristic of their diverse business activities. In the collaboration between Actor A and B, the core task manifested in challenging the current underlying assumptions and related practice as well as communicating Lean principles in order to reframe collaboratively the renewed operation logic, and thus also the core task demands. Furthermore, Actor A facilitated practical experiments focusing on adopting Lean principles and the co-development of concepts and tools to manage the renewed value creation logic. Challenges were faced in co-defining the indicators of the emerging Lean model and mutual roles during the change process. While it was a question of radical change in value creation models (and related demands both within Actor B and between Actors), learning and facilitative methods seemed to be experienced as radical too, causing mutual tensions and resistance. In spite of this, as indicated in Table 2, the renewed practices have been gradually taken into use on a daily basis. The contribution of Actor A covered from key-person sparring to systemic support for the complex and dynamic change, aiming to enhance the mutual competitiveness in the shared activity system and in the overall ecosystem.

4.2. Dynamics of the shared activity system of Actors A, B and C

Based on the perspectives of all three actors in Figure 3 we have tentatively drafted the ongoing dynamics of the shared activity system of Actors A, B and C.

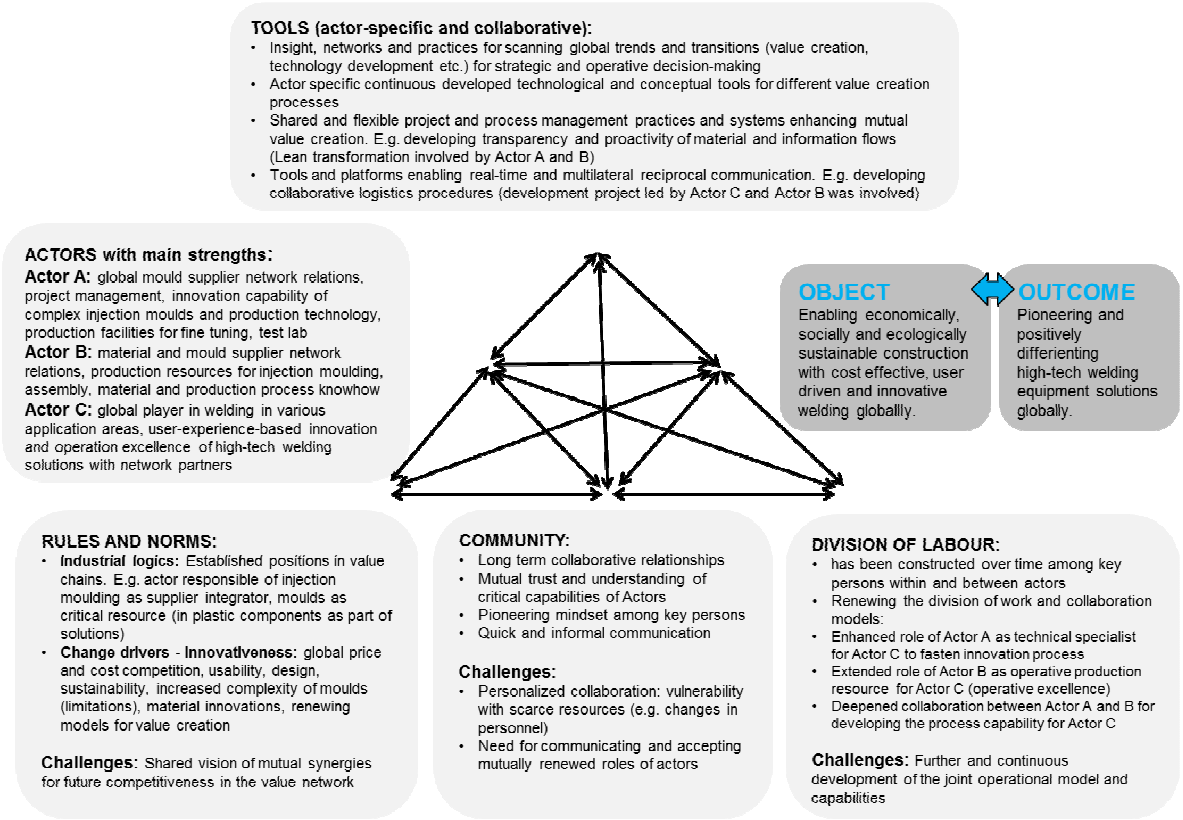

Figure 3. Summary of the dynamics of the shared activity system.

As modelled in Figure 3, in order to sustain competitiveness in the midst of tightening global competition, there seems to be a continuous search for new value creation opportunities with collaboration modes among Actors (with their value networks). Consequently, traditional mechanisms with their established rules in the industrial ecosystem have been challenged. Actor C seems to develop the division of labour and collaboration practices in the direction of direct multilateral collaboration among chosen actors to enhance cost effectiveness, transparency and optimal resource integration throughout the innovation and value creation activities. Here the innovation and global project management capability of Actor A appears to be highlighted, while the production and process capability of Actor B is emphasized. In addition to the critical actor-specific resources, adaptation and proactive insight, personal relationships with strong know-how and mutually flexible practice are seen as crucial in a complex, dynamic and fast cycled business environment.

5. Concluding remarks

Based on the theoretically grounded empirical illustration, we have demonstrated the methodological relevance of the Core Task Analysis (CTA) approach for making sense of the complex and dynamic social construction of mutual value creation and renewal. The CTA approach can be summarized as having three main purposes; First, to *understand the object of activity* by examining the intentions and related critical demands. This is done by framing or modelling the core task with its multilevel

demands for dynamic assessment and reflection in relation to situational conditions and in terms of potentials and restrictions. Second, the aim is to i*nterpret the shared meanings and intentions* among actors so as to elucidate the motivations and reasons for the actions taken. Those conceptions of actors reveal the way of thinking behind the realized and observable actions. Thus by combining the two we are able to draw conclusions on the current or emerging practices. Third, that the *general logic of human action* can only be understood and elaborated in its situational and cultural historical settings (Norros, 2004; Norros & Nuutinen, 2002; Reiman, 2007).

Having roots in the cultural historical theory of activity and the pragmatism paradigm the CTA approach seems to share the same kind of epistemological and ontological assumptions with two practice-based schools of thoughts and their approach to innovation as follows. First, focusing on the social, contextual and the situated nature of human knowing and acting as a starting point for renewal and learning as collective practice with mediated (and also renewed) tools and artefacts (Mele et al., 2016; Kallio et al., 2016). Second, it highlighted the complex value creation and innovation as a dynamic co-construction process between actors as active resource integrators (e.g. Edvardsson et al., 2011; Lusch & Nabisan, 2015; Vargo et al., 2015). Furthermore, they all refer to the *interpretive* (or dialogical) approach to innovating and renewing in the systemic sense. Thus in order to capture and change the general logic of action, the underlying contextual institutional logics must be understood (cf. Norros, 2004; Tronvoll et al., 2011; Chandler & Vargo, 2011; Vargo et al., 2015).

In addition to examining the theoretical roots and linkages of the Core Task Analysis approach, we *demonstrated empirically* the application of the approach in a Lean change process as the context for modelling the renewing of actor-specific core tasks based on changes in value creation within and between focused Actors. Furthermore, we elaborated on the ongoing dynamics within value network of Actors as the shared activity system.

Various applications of both the activity system model and a further developed CTA approach have already indicated a strong theoretical and empirical basis (e.g. Hasu & Engeström, 2000; Norros, 2004; Nuutinen, 2006; Kerosuo, 2006; Reiman, 2007; Norros & Nuutinen, 2009; Norros et al., 2013; Savioja, 2014; Kallio & Lappalainen, 2014). The novelty of our paper was to build linkages between the CTA approach and topical debate on whether practice-based approaches have something to offer in building bridges between the economic, business and social aspects of value creation and innovation in different levels of the ecosystem. Thus the empirical and methodological novelty of this paper is to model *renewed networked value creation of actors as a shared activity system.*

Based on our theoretical and empirical examination, we conclude that the CTA methodology appears to provide a relevant approach to understanding and elaborating on the complex and dynamic social construction of value creation and innovation activity across organizational boundaries. Furthermore, the approach enables a comprehensive analysis of two fundamental balancing drivers, standardization and renewal in the contextual setting of value creation.

Thus from a *managerial perspective*, the CTA approach with the empirical illustration provides *evaluation frameworks* to support complex renewal processes within and between companies. More specifically, the empirical study, by elaborating on change

dynamics and the implications of the topical Lean approach from the perspective of the systemic and social re-construction of human activity, provides a *practical example and a frame for reflection*. Basically, due to the comprehensive nature of the analysis, the approach may appear time and resource consuming. However, when familiar with the idea of the analysis, the conceptual frames can be applied in alternative ways, such as critical /complimenting perspectives to support collaborative innovation and renewal across organizational borders.

In terms of validity assessment of qualitative empirical case studies, the *credibility* of the methodology and empirical illustrations has been ensured by opening up the research process with theoretical grounds phase by phase. The role of the researchers has been more interpretive than emancipative. *Dependability* of the analysis and empirical findings has been tested via critical discussions and feedback loops with interviewed key persons. While having a main aim of narrowing the identified methodological gap in (service) innovation research, the *transferability* is seen rather in a methodological than empirical sense. (cf. Guba & Lincoln, 1994.) This opens up possibilities for researchers to apply the approach in different contextual settings.

Finally, in the paper we not only contribute methodologically and empirically to the acknowledged need for applying multi-method practice-based approaches, but also claim that we should pay more attention to the epistemological and ontological assumptions of our research, as well as making them more explicit. In that way we enable better their critical assessment and thus both scientific and practical impact (cf. Mele et al., 2016).

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