

ENGAGING THE CONSTRUCTION SUPPLY CHAIN: A PLURALISTIC PERSPECTIVE

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Construction Supply Chain Management (CSCM) has recently gained momentum as a means of improving the construction industry's productivity. However, it has been difficult to create a dominant paradigm that translates CSCM into effective and value-added practices. Drawing on a critical literature review combining insights from Neo-Institutional Theory and Engaged Scholarship principles, the paper presents an alternative practice oriented framework for advancing CSCM. The contribution is a supplement to the macro-oriented agenda typically associated with industrial change, which often neglects to consider the relationship between micro-practices and institutional logics in the effort of progress. In particular, the proposed framework acknowledges pluralism and contextual sensitivity as a prerequisite for providing greater insight into the problematic and messy nature of industry change. In conclusion, the role of micro-level agency is argued to be instrumental for the further progress of CSCM. Thus, the paper attempts to re-orientate CSCM by presenting a framework based on participatory analysis and critical discussions combining field and individual-level perspectives. The research limitations are affected by the CSCM research conducted in non-positivistic paradigms, which involves a certain amount of subjectivity as some of the arguments depends on the authors' perceptions.

Keywords: CSCM, engaged scholarship, pluralism, research methods, sensitivity

INTRODUCTION

In Denmark, the construction sector is one of the largest industries with approximately DKK 200 billion turnover per year. Danish authorities have pointed out that there is a need to increase productivity in construction to maintain economic development and competitiveness. One way to reach the goal of increased productivity is to address the potentials of Construction Supply Chain Management (CSCM) since as much as 90 percent of the turnover can be related to external costs (Karim *et al.*, 2006). Previous efforts have focused on implementing Supply Chain Management (SCM) principles from other industries without tangible results. A contributing explanation might be that other industries are typified by integrated structures, standardized processes and long-term relationships, whereas the construction industry is identified by structural features like temporary locations, fragmentation and adversarial relationships that hinder the adoption of SCM practices (Burgess *et al.*, 2006). Thus, considering the potentials in addressing these costs, one of Denmark's major contractors has initiated a CSCM research project to increase productivity in the Danish construction industry.

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Linking into the debate on 'rigour and relevance', the aim is to unfold a practical development agenda while also contributing to the burgeoning interest in contributing to theory-building in construction management research (CMR). We develop our argument around a discussion of the need for contextual sensitivity in the progress of CSCM, which is related to new philosophical understandings involving academia and practitioners in the process. Accordingly, we differ from the dominant positivistic paradigm normally used within operations management and the macro-oriented agenda that is often associated with institutional change in the construction industry.

First, we review some of the main discussions and reflections of the CSCM literature to reveal the unresolved tensions it creates. Then, Neo-Institutional Theory (NIT) is discussed as an opportunity to explore the role of micro-practices in the development of CSCM. With this in mind, we present Engaged Scholarship (ES) as an approach for advancing CSCM that is sensitive to the plurality of institutional factors of the construction industry. Finally, operationalisations and implications for further CSCM research are presented by proposing a novel analytical framework.

A Review of Discussions and Reflections on CSCM

To justify a new thinking of the CSCM enquiry, we will review some of the overall implications in the generic SCM research. To begin with, we critically illuminate learnings from other industries and point to macro-contextual sensitivity as a remedy to unlock inexpedient path-dependencies of CSCM research. Next, we focus on the micro-level and ask what can be learned from the implementation process of other managerial logics in construction to avoid repeated failures. Finally, we present a pluralistic micro-to-macro approach to progress the rigour and relevance of CSCM.

Macro Contextual Conditions of CSCM

Reading the terrain of the construction industry, strategies for maturing CSCM have often been pragmatically legitimised by the promise of better performance enabling cost reductions and innovations (Schiele, 2007). In particular, focus has been on developing integrated approaches to the implementation of CSCM by mirroring the development of other industries (Lith *et al.*, 2015). However, supply chain models established for other industrial contexts are problematic to use in construction, as they are often characterized by the integration of sequential interdependencies and activities. In contrast, the pattern of interdependence in construction is fragmented and non-sequential (Bankvall *et al.*, 2010). For this reason, novel reflections of how problems are linked in construction supply-chains have often been debated in CMR when discussing how to mature and advance CSCM principles (Schiele, 2007).

In general, high maturity is associated with organisational harmony where purchasing professionals work together across tactical and strategic levels. Moreover, maturity is often linked to an organisation's capacity to translate the price based ordering role to shared understandings across the entire chain creating trust and long-term relations. In contrast, a low degree of maturity is associated with purchasing professionals remaining on the operational level (Voordijk *et al.*, 2015). According to Meng *et al.*, (2011), the maturity level of supply chain relationships in construction is highly related to the ability of managing aspects as risk-sharing, transparency, trust, common objectives and strong communication across the entire supply chain. Thus, CSCM maturity is ideally progressed by interactions stimulating compliant behaviour beyond solitary levels of organizational reality.

In this macro-perspective, the construction industry is often theorized as the least integrated of all industries, typified by adversarial supply relations and lack of trust between parties as some of the main barriers to maturing CSCM. Notwithstanding, some suggestions to maturing CSCM have assumed that solutions from other industries can be followed, instead of recognizing the complexity and uncertainty of project-based organisations (Fearne and Fowler, 2006). The key difference between adaptations of managerial logics across industries is, however, that construction cannot be compared to an integrated organisational environment. Integration therefore represents no easy answer to the complications of the construction industry, and it may be the case that the fragmented landscapes of construction may never grasp the full potential of supply chain integration, as we know it from other industries (Briscoe and Dainty, 2005). Moreover, we argue that a continuous mirroring of construction in the experiences of others might entail an uncritical reproduction and theorization of the idea that change should be based on the policies of other industries instead of developing solutions that are sensitive to local needs and practices of the construction industry. This inexpedient path-dependency can be challenged through a criticism of what we can learn from others, and previous experiences with managerial logics in construction might be a remedy to this.

Micro Contextual Conditions of CSCM

Sensitivity towards the local conditions of construction, also embraces the experiences gained from other managerial efforts in the construction industry to understand the potentials and pitfalls of developing CSCM. As such, we gesture that the lack of generalizations across different problem-domains is indicative of an inability to learn from experiences that describe practical development efforts in the industry.

As such, we claim that some managerial logics in the construction industry have resulted in noncompliance and sub-efficiency due to insensitivity to the industry's considerable levels of complexity and uncertainty. For example, as stated by Fearne and Fowler (2006), previous attempts to extend partnering logics throughout the supply network of construction has been unsuccessful due to absence of long-term interest, conflicting cultures and lack of trust among chain partners. Comparatively, lean logics concerned with supply chains have often been legitimized in other industries by their ability to optimize and produce continuous improvements in the supply network. Thus, where others have made significant progress towards more efficient and integrated supply chains through the systemic adoption of lean logics, the adaption in construction has resulted in the sub-optimizing of individual resource-domains, which has negatively affected the overall efficiency of the building project.

According to Meng *et al.*, (2011), construction supply chain relations are fragmented and deviate from organisation to organisation and from project to project. These local circumstances are possibly the main reason as to why successful managerial logics from integrated industries are ill-performing in the context of construction. Thus, construction has tried to adopt the potentials of CSCM since the 1980s, however, the adaption has been incomplete and novel approaches have to be developed to solve the puzzle of CSCM (Vrijhoef and Koskela, 2000). As research indicates (Frödell, 2010; Thunberg *et al.*, 2015), supply chain decisions are affecting the overall efficiency of the entire building process, which stresses the relevance of engaging with stakeholders across the supply chain. This is, however, an often-overlooked aspect in CMR. Correspondingly, as claimed by Papadopoulos *et al.*, (2016), there is a lack of enquiry

into how companies can launch frameworks for advancing CSCM by orchestrating these in ensemble with practitioners to advance operationalization.

Subsequently, failing to understand the relationship between new change recipes at the specific contextual macro-level influences the desired development process at the micro-level of practice. If we are to avoid repeated failures or hegemonic change recipes, we suggest that an alternative roadmap for progressing CSCM must at least acknowledge the past experiences of managerial efforts in the construction industry, and engage locally with practitioners to create novelty through contextual sensitivity.

The Micro-to-Macro Approach of CSCM Research

Reviewing some of the SCM enquiries across industries reveals that the main research paradigm is positivist and related to manufacturing and transaction cost economics (Burgess *et al.*, 2006), and that questions of how to conduct empirical research are rarely addressed (Kotzab *et al.*, 2005). In other words, there is a lacuna of research conducted in an interpretivist paradigm, which is otherwise relevant when exploring the complex and unpredictable nature of the construction industry. Consequently, positivist accounts could fruitfully be supplemented with more pluralistic approaches using multiple method paradigms to evolve and progress the research area of CSCM.

A critical review across industries by Soni and Kodali (2011) highlighted that a practice-oriented research design may well result in cross-method synergies and improved approaches for future studies of SCM. Moreover, the review stated that 'action research' principles and triangulation of stakeholder knowledge would advance SCM research. Thus, the development of CSCM may progress faster if there is greater plurality of research, which in turn would require a wider engagement with non-positivist methods. Overall, the justification for challenging the dominant positivist paradigm is that methodological uniformity only does little to enable us to "understand the complex network of relationships, which shape industry practice" (Dainty, 2007, p. 9), and ultimately leave construction in status quo.

Consequently, interpretivist approaches might provide us with richer understandings of the conditions that govern the progress of CSCM and how these shape local practices. Justifying a practice-oriented research approach is, however, a challenge that will include convincing others that it is a valid method of creating scientific truth. This will depend on the ability to create legitimacy for a variety of performance improvements that might not be rationalised, in a positivistic sense, as benefits across the entire supply chain, but nevertheless are perceived as meaningful in a localised or situated practice. As such, we argue that to release the potential of CSCM more sensitivity should be paid to understanding the nature of construction through a micro-to-macro approach, and thus the limits of what we can learn and apply from the generic SCM literature and other industries.

Methodological Concerns in the Study of CSCM

Regardless of a growing interest in CSCM, it has been difficult for both practitioners and academics to educate themselves based on current literature and the idiosyncratic nature of the industry. This calls for new philosophical positions that challenge the paradigmatic inflexibility and path-dependencies, which are so prevalent within the built environment (Dainty, 2007). To the extent of our knowledge, is there no single definition of CSCM, nor is there a dominant paradigm that has successfully translated SCM practices into the construction industry.

Thus, the CSCM puzzle, in all its simplicity, is how to shape a shared endeavour moving from a price-based negotiation regime to a collaborative trust regime based on long-term relations, transparency, shared risks and common objectives (Kotzab *et al.*, 2005). Such a shared endeavour is often associated with industry convergence across field-embedded organisations to create supply chain integration, which is a recipe that has proven successful in other industries. The project-based construction industry can be seen as a divergent and fragmented system (Bankvall *et al.*, 2010) and the assumption is that alternative theoretical and methodological conceptualizations are needed to develop an effective framework as suggested by Papadopoulos *et al.*, (2016), which can advance both academia and practice of CSCM. Building on the arguments set out in the review section, we next present Neo-Institutional Theory (NIT) and Engaged Scholarship (ES) as elements in an analytical and pluralistic framework for conducting ‘action by research’.

Institutional Theory and Institutional Pluralism

In general, researchers have tended to study the outcomes of institutional influences on organizations (Suddaby, 2010), but recently there has been a reorientation focusing on the micro-level to explain how actors can mobilise others to gain legitimacy for an alternative logic in a highly structured context, industry or field at the macro-level. A ‘field’ can be seen as an arena of actors sharing sociocultural productions and the dynamic relationship among them (Scott, 2014).

Fields are identified by the process of isomorphism, which forces one part in a settlement to mirror other parts that confront the same set of environmental conditions (DiMaggio, 1983). Isomorphism arises from regulations, professionalization or uncertainty in the institutional environment and affects structures as companies are seeking to adopt legitimate solutions or legitimize their practices towards others (Dainty *et al.*, 2013). Isomorphism can lead to both path-dependency and lock-in if organizations are trying to mimic each other regardless of efficiency. Additionally, path-dependency is typified by past field experiences, and radical change can only emerge if a new path is construed a strategic moment in time. Nevertheless, fields are not entirely stable and change never fully path-dependent or deterministic.

A contemporary perspective in NIT deals with the notion of pluralism (Lounsbury *et al.*, 2012; Greenwood *et al.*, 2016). Here the argument is that any institutional field is identified by the coexistence of multiple demands, pressures or institutional logics from the environment that prescribe what constitutes legitimate behaviour, what goals are suitable, and what instrumentality is legitimate to accomplish these goals (Santos and Pache, 2013). Viewing the construction industry as a field it can be argued that it is populated by several competing logics that each nurtures a form of isomorphic pressure. Following Jensen *et al.*, (2011) there is a tendency to treat such logics as unambiguous and complementary when discussed as reform strategies at the field level. However, as demonstrated by Koch and Urup, (2017), constellations of multiple institutions and logics at the local level are often practised as contradictory leading to internal fragmentation in companies, which affects the performance and potentially constitutes a barrier towards achieving a more coherent and desired result.

Empirical studies at the micro-level have stressed the challenge of competing logics within or across institutional fields, which calls for new hybrid perceptions to create contextual sensitivity by the desired outcome of higher productivity (Höllner *et al.*, 2017). As such, pluralistic researchers and practitioners must focus on the mediating capacity of the co-existence of competing logics while also exploiting the benefits of

their interdependence (Reay and Hinings, 2009). Returning to the rigour and relevance debate, our argument is that we must study how managerial logics occur in practical interactions in the process of changing the rules of organizing time and space in social reality (Thornton and Ocasio, 1999). Thus, the combination of NIT and ES, which is discussed below, is proposed as analytical ingredients for conducting a framework of progressing the rigour and relevance of CSCM research.

Engaged Scholarship as Approach

ES is an approach for confronting real tangible problems by undertaking a process that engages with both stakeholders and academia to an associated problem-domain, which is too complex for any parties to solve alone. ES grasps the interpretivist paradigm using principles of inductive research methods like 'action research' to collaboratively construct a meaningful reality of the studied environment where the scholar becomes a participant in the change process of others (Voordijk and Adriaanse, 2016).

In the competition of methodological primacy in CMR, we present the combination of NIT and ES as an analytical framework and a contribution to the inquiry of CSCM. The approach dissociates from social engineering and aims at a reflective analysis of how managerial mechanism affects different focus groups and cultures that coexist in project-based organizations typically and unfairly studied as others or sub-culture (Terjesen *et al.*, 2012). Theorizing practice, the engaged research is problem-driven in relation to specific focus groups making sense of their social interaction. The inquiry differs from distinctive macro-explanations and explicates the micro foundations of institutional logics to explain micro-to-macro mechanisms involved in the progress of CSCM. Thus, scholars can engage in organizations by building case studies and using multi-methodology to identify practices, competing logics, cognitive and structural aspects. As such, it is an exploration of the micro-agency that arises in the friction between logics that otherwise appears incompatible (Johansen and Waldorff, 2017). Hence, ES is stressed as a concept that can help integrate relevant industry representatives and scholars to explore how actors are linked in supply networks and thereby understand the institutional mechanisms of these networks.

The criticism of ES is the challenges of merging different mind-sets generated by the triangulation of stakeholder knowledge. This process can be unpredictable and the trial is to balance the level of dimensions needed to reveal key features of a problem (Van de Ven, 2007). Another criticism is the risk of decisions made by organisational power by settling for the lowest common sum of stakeholder knowledge. Thus, the research becomes average by resolutions, which disconnect the process of creating substantial scientific truth (Bresnen, 2017; Mckelvey, 2006). ES has been criticised for lack of scientific rigour and CMR has been criticised for lack of more practitioner influenced problem definitions set aside by concerns of scientific rigour. Thus, the argument to emphasize ES is to act on and avoid the danger of academic isomorphism that follows with dominant ways of exploring organizational phenomena (Bresnen, 2017). In other words, CSCM have strong requirements for 'action by research' when handling practical problems across the supply chain (Kotzab *et al.*, 2005). This contrasts with the majority of SCM research, which have followed the positivistic paradigm, which is possibly the reason why ES is not institutionalized.

We argue that an interpretivist paradigm, acknowledging the idiosyncratic nature of construction, can provide new insights into the causal relationship of science, actions, and consequences across the supply chain. ES can play the proactive role of helping one of Denmark's largest contractor groups solve a productivity issue by challenging

the quest for scientific rigour in managerial studies, which has disoriented from the initial balance of favouring practical relevance (Bresnen, 2017). Hence, the contractor becomes an ‘idea factory’ where practitioners and researchers can co-produce valid knowledge together (Van de Ven, 2007).

Research Operationalisation and Development of CSCM

As an empirical contribution, we now present a series of analytical questions and related research approaches that form an operational basis for a conceptual research framework of progressing CSCM. The framework is limited by the scale of research done in the non-positivistic paradigm and must be acknowledged as a primary roadmap for a new thinking in CMR. As such, the framework draws on pluralism by combining different epistemological views to the advancement of CSCM (Mingers and Brocklesby, 1997). Thus, the criticism of combining views is often based on a polarity between research paradigms instead of seeing the potential of overcoming the weaknesses of a single research paradigm. Nevertheless, it will be hard to develop any research area if all researchers belong to the same paradigm and culture conducting the same type of research (Dainty, 2007; Näslund, 2002; Pearce, 2015).

For this reason, the framework is trying to explore the potential of reorienting NIT in ensemble with ES methodologies. Hence, analytical questions and approaches to operationalize the development of the CSCM inquiry are emphasized in Table 1. In addition, main themes from the literature review are related to the framework, which we find essential for framing the future roadmap of CSCM. In particular, we focus on understanding the recursive relationship between macro-structuring forces and the micro-practices of CSCM to advance a framework capable of bridging the micro-to-macro divide in studies and practices of change. As such, the framework is assumed rigorously enough to embrace academic requisites and relevant enough to explore existing project-activities significant to the construction industry.

Table 1: Analytical Questions and Approaches to the Operationalisation of CSCM

Main Review Themes	Analytical Questions (NIT)	Analytical Approach (ES)
Understand the role of industry context as a prerequisite for maturing and progressing CSCM	What institutional mechanisms are required to mature CSCM in project-based organizations?	Coproduction of stakeholder knowledge to define maturing implications of CSCM
Advance micro-practices and organisational strategies to mobilize agency in the ‘messy’ implementation game of CSCM	How can CSCM logics be implemented within project-based organisations and be legitimated as a field-practice?	Orchestrating an interventionist learning strategy for creating actionable knowledge for the implementation of CSCM
Create legitimacy for local improvements that do not necessarily apply for the entire supply chain	To what extent can CSCM be integrated and legitimized within projects and what is its impact on performance?	Conducting practical research designs and strategies relevant to evaluate and measure the impact of CSCM logics

We claim that a theoretical appeal of multi-methodology focusing on the above question and approaches can provide a deeper sensitivity to the understanding of complex supply networks. The analytical considerations are based on how CSCM logics can interact with and give rise to new organizational forms by identifying existing conflicting logics across the chain. Furthermore, the theoretical argument behind this is that NIT needs to ‘get dirty’ and revitalize its relations to organizations and individuals ‘in-situ’ to reboot its theoretical development and its relevance to practice (Dover and Lawrence, 2010; Johansen and Waldorff, 2017).

The framework proposal is, in other words, a response to ‘the tyranny of best practice’ (Fernie and Thorpe, 2007) that endorses one dominant way to typify buyer and seller relationships across industries. Instead, we suggest that construction practitioners

must challenge past development efforts often established on instrumental rationality and unreflective experiences from other industries, and reflect upon to the fact that no one explicit relational form is suitable for all. Consequently, the advancing of CSCM requires that scholars, policy makers, clients and industry bodies reflect upon and engage with the knowledgeable practitioners of the construction industry (Fernie and Thorpe, 2007). As such, we claim, that the further proliferation of CSCM depend on research that engages with and rethinks social issues theoretically to change both the way actors think and how they act in the world (Dover and Lawrence, 2010).

CONCLUSIONS

We have discussed and reflected on the potentials and challenges of addressing the rigour and relevance gap in CSCM research. Accordingly, we have not chased ideal models or dualistic oppositions between related issues of CSCM. In contrast, we have tried to unfold selected considerations in the current CSCM literature to build up our main argument about the important role of contextual sensitivity. As such, we have stressed industry insensitivity as the main barrier to the proliferation of CSCM by illuminating unsuitable lessons of other industries, leading to sub-efficiency and inexpedient path dependencies in the construction industry.

At the same time, we argue that the fragmented nature of the industry for too long has been an excuse to justify a passive prohibitive barrier to build trust, long-term relations and process adaptations beyond individual projects. Consequently, this leaves actors of construction in a status quo or worse, and calls for new practical and academic understandings to orchestrate institutional change in construction. Thus, we have analysed alternative mechanisms and dynamics in the process of contributing with a novel framework for the further proliferation of CSCM that focuses on both micro and macro-level aspects. Above all, we stressed that change is not entirely programmable or foreseeable, but a messy and iterative process where actors must engage themselves in practical settings and have the capacity to manipulate organisational strategies to advance CSCM.

Finally, we conclude, that the nature and challenges of the industry has been theorized beyond recognition and what (and how) to do about it, should be the next research outlook of CSCM releasing the capacity of action. With this in mind, the limitations of the research presented is affected by the partial research conducted in non-positivistic paradigms, which involves a certain amount of subjectivity as the arguments to a higher extent depends on the authors' perceptions. Thus, to consolidate the statements put forward in this research, future attempts must be directed to validate the proposed framework and the new thinking of CSCM research. As such, rethinking pluralism could provide an important foundation for future research frameworks that advances a richer conceptualisation of CSCM.

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