COOPERATION IN CONSTRUCTION: THE ROLE OF VALUES

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The study presents a building project executed by a major Danish construction company, where cooperation and its staging were essential for achieving high productivity and competitiveness. The form of this cooperation is the main theme for the article. The contractor actively changed the communication and sociological values of the actors involved and saw it as essential for their way of cooperating. The cooperation included and combined elements of traditional industrial building production, with concepts and initiatives that had to be understood by means of sociological analysis. Tentatively the companies in the case can be understood as possessing a social capital which is enforced and united by initiatives of the main contractor. The social capital was built up and maintained through the actual constitution of cooperation already in the initial phase of bidding before the building process. The management logic of the main contractor is interpreted as based on a sociology-inspired understanding focusing on norms and social values rather than on contractual (law) and functional (engineering) logic, which had hitherto been prevalent in Danish construction management.

Keywords: mode of communication, shared value, cooperation, social capital, normativity

INTRODUCTION

For years it has been discussed how value-based production might stimulate the building process in terms of higher productivity, cheaper buildings and better health and safety on the work site. Winch (2012) connected the value concept with capital and discussed how value in construction could be viewed as different kinds of capital for actors. In a Danish context Kristiansen (2006), based on user perspectives, delivers an analysis of how the concept of value in construction has been used in recent years. As with Winch, Kristiansen mainly discussed in which way the result of construction, namely the buildings, could contribute to value for groups of users or for society as such. With a background in sociology, Kristiansen mentioned an alternative meaning of value, namely the social notion of values as a base of norm for social groups, norms which have intended or unintended regulating effects on social behaviour. It is such a sociologically rooted understanding of value that we refer to in our article.

Management of innovation and production in construction are increasingly subject to a number of complex challenges related to the staging of work and cooperation processes across companies and organisations (Bougarin *et al.*, 2014). In Denmark this development can partly be attributed to the last 10-20 years of increasing implementation and use of cooperative construction contracts and contract forms (Forman and Laustsen 2009), which has gained ground in the wake of fierce criticism of the construction price, quality and productivity development. In a UK context there has been a critique of

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"under-socialized" theories of the firm already in the '90'teens and social capital (Edelman *et al*., 2004) has been used as a framework for analyses with a more socialized perspective. Here it is important to note that it is a main challenge to develop a common social capital across team and firms especially in project based firms as is the case in Construction (Bresnan 2005, Edelman *et al*., 2004). It is one of aims to understand how the case company dealt with this problem.

The analytical focus in the paper will be on the construction industry´s cooperative problem in a social capital perspective, and further how the company establish a common platform between the cooperating parties for the development of a social capital which would stimulate cooperation and do it early in the building process, further our interest is on management of social norms and values.

We have done a dialog based single case study of a major Danish construction company which targets the role of values inhered in subcontractors in the construction projects already in bedding phase and consolidated later in the building process. In the paper we describe the cooperation in the tendering-bidding phase, and we look into how this cooperation apparently forms a development platform for enhancing the social capital between both the subcontractors themselves, and between them and the main contractor.

REVIEW OF LITERATURE

Danish housing construction firms have implemented a number of projects where cooperation in one way or another had a prominent role. Focus has varied both in theme (productivity, innovation, quality, health and safety etc.) and in actors (firms, managers, teams, persons etc.). From the 1990s and onwards, there was a strong focus on lean construction and on partnering (Gottlieb 2010). Further there was a strong focus on cooperation and the ability to increase productivity without compromising the working environment. This was similar to much of Scandinavian research and development work in productivity and work life (Hvid and Hasle 2003) with a focus on the work organisation of production combined with a basic assumption that employee involvement and participation can, at the same time, both give rise to new, more productive production processes as well as a better psychological and physical working condition. Seen as a representative of the Scandinavian industrial sociology this is opposed too much of the Anglo-Saxon Labour Process industrial sociology (Thompson 1989) seeing the two issues as an either or situation.

The Scandinavian research on cooperative production concepts has included an extensive series of empirical studies, (Sandberg 1987, Sandberg *et al*., 1992), renowned developmental tests at Volvo back in the 1980s and 1990s (Ellegård *et al*., 1992), and a number of other projects supported by the Swedish programme funds. Not least the Swedish governmental "Arbetslivsfonden" who supported 25,000 development projects in Swedish jobs between 1990 and 1995. In Denmark, there were corresponding activities. In the 1990s, the Danish Confederation of Trade Unions promoted (with inspiration from the Swedish sister organisation) "the stimulating work. However, it was characteristic that the construction industry was seldom represented in these empirical studies. The project based organisation with cooperation across the value chain separated the construction sector from other industries. A few development projects took place in the Danish construction sector, a major one was BYG-SOL (2003 - 2007), which included the establishment of an early cooperation between the parties with a focus on cultural factors, (language and mores), joint meetings, introduction to the construction site kick-off meetings, social events, common lunch locations and commitment to mutual plans (Hall-Andersen, H 2007 and Egebjerg 2006). Forman and Laustsen (2009) reviewed five

building projects, with elements of both partnering and lean construction. They found a large overlap between the specific initiatives and activities used whenever it was cooperation based on partnering, lean construction, strategic partnerships or the autonomous building site.

The interest in new cooperative construction contracts and contract forms has developed into instrumental regulations and tools, without focus and reflection on the relationship between these regulations and local practices. The concept of social capital can include some of the factors related to the rationality discussed above and throw light on some of the conditions important for social interaction. Social capital was introduced by Bourdieu (1986) who distinguished between economic, cultural and social capital. In principle, these forms of capital are exchangeable, but Bourdieu focused on the mechanisms that maintain social affiliation. Putnam (2000) and Woolcock (1998) changed the focus to an organisation level and developed the concept to deal with the traits of an organisation that promote coordination and cooperation for the common good. Networks, norms and trust are key parameters. In the Danish white paper on social capital and working environment, social capital was defined as the quality that enables an organisation' members to jointly address the organisation's core tasks (Olesen, KG, and *et al*., 2008).

The ability to cooperate is essential. Trust and the belief, that justice is done, favour cooperative ability (*ibid*. 8). There are thus at least three processes that are important: the ability to tie together a group (bonding), the ability to connect groups with each other (bridging) and the ability to connect across the hierarchies (linking). Social capital is unique in its form and strength from company to company. In this context, it means that companies who each possessed a solid social capital, would not necessarily have the ability to quickly establish a good and binding cooperation. For the construction industry, this might pose a problem because production is project-oriented (Gann and Salter, 2000) which imply that partners and cooperation often change from building site to building site. Due to change in context, attempts in Construction to exploit social capital become more problematic (Bresnen *et al*., 2005). Danish experience with the companies' social capital, has mainly been based on case studies from industry and government jobs. There is scarce knowledge about the relationships between social capital and the psychological work in project-based companies, which characterise the construction sector.

The Danish Construction Association (2011) conducted a study of social capital in eight Danish companies. The analysis identified a potential that focus on social capital could increase competitiveness in Danish construction, but it was reluctant to identify guidelines on how to achieve this With the concept of social capital we can describe the overall nature of relations as trust, justice, interpersonal skills, but the concept is difficult to connect to the practical coordination of workspaces. Gittell's (2004, 2009) theory on "relational coordination" gives a proposal of how in-depth relationships should be understood in companies. The key term "relational coordination" describes how the interaction between "quality of coordination" and "quality of communication" in the organisation's relationships affect the organisation's performance. Gittell is based primarily on Dutton and Heaphy (2003), who works with the quality element in social connections / relationships.

They rely on three psychological inspired descriptions of how individuals in high-quality relationships: that they feel "alive"/vital, valued and as a member of the mutual relation. In the case of construction projects, "relational coordination" will both cover the relationships in the individual construction company and the relations between the companies participating in the cooperation on the construction site (the primary partners

are here the building team and the construction management). Gittell and Weiss (2004) suggest that organisational practices influence the level of relational coordination, which includes central coordination mechanisms controlling the information flow within the company across functions.

On basis of other scholars Edelman *et al*., (2004, p.S60) divide social capital in a structural dimension, a cognitive and a relational dimension. The relational aspects of social capital, is concerned with "the underlying normative dimensions that guide exchange relationship behaviours". In project-based businesses, relational coordination represents an opportunity to operationalise social capital in terms of both integrative activities and coordination mechanisms. The coordination mechanisms are transversal sets of procedures and routines, interoperable information and meetings (formal and informal) as well as the tasks and operations that employees perform. Integrative activities are the company's use of incentive systems, control mechanisms, interdisciplinary performance measurements and supervision (Gittell 2009, Gittell and Weiss 2004).

Social capital may exploit a new type of rationality. It could be in the form of normativity, based on 'negotiated agreement' (Jessop, 2003) or 'communicative action' - inspired by both Weber and Habermas (Nørager 1985) - that challenges the tradition-bound procedural and goal-oriented normativity's (Sørensen and Vogelius, 1991) which have dominated in construction. This opening to a value-oriented rationality can also be seen as an establishment of a new social order through a 'removal' of traditional structures, rules and roles - and thus as an establishment of a new space for action, enabling new types of interaction and coordination between the parties.

METHOD

Empirically, the project is a single case study which was based on an ongoing discussion (in the period August 2009 to mid-2011) between the researchers and the project manager in a division of the Danish construction company MTH Construction (Division of Zealand and Copenhagen) concerning new management issues with an outset in experiences from specific projects. This dialogue process was followed by interviews of one of the major subcontractors (plumbing and HVAC) who had participated in the construction projects managed by MTH Construction. Finally, other data from the case were used, such as minutes of joint meetings between MTH and subcontractors as well as returned questionnaires sent by MTH Construction to the trade contractors about their perception/evaluation of the cooperation (Vogelius 2014). Our approach was a type of action research which in a Scandinavian context is named dialogue research. In dialogue research, input from the research directly/simultaneously affects the project being studied, but the research part has no responsibility for the process being researched and is financially independent from the project studied Storgaard (1991) Storgaard (1998).

THE CASE

In the period 2009 to early 2011, MTH Construction built the housing estates 'Magnet Dwellings" in Frederiksberg, part of Copenhagen, for a public housing client with 42 flats (MTH 2012). The total construction cost was approximately DKR 50 million, MTH Construction had the turnkey contract and also undertook the design. A number of firms were hired as sub- and trade contractors, the most important of which were heating / ventilation, roofing, painter works, carpentry works and electrician works. The building project, which was characterised by high good quality and a design based on a well-defined user profile, was a pilot for trying out new value-based forms of cooperation

conducted by MTH Construction. The new cooperation model was based on the establishment of a common understanding between subcontractors and main contractor, and besides the contractual economic agreements, there were some straightforward mutual decisions on how to act and cooperate on a daily basis (the case is described in detail in Vogelius 2014). Two value themes related to the construction process were central to the agreement, "Dialogue" (dialogue and cooperation rather than conflict) and "Interaction" (a civil tone at the workplace).It was decided to add two more themes, namely product (creating products you are proud to produce) and common explicit value and profit-sharing (agreed profit-sharing based on goals set in value areas such as health and safety and quality of the built). In other projects, common explicit value also refer to themes outside the building sphere, e.g. charitable purposes, e.g. to combat a certain type of disease.

Tendering

As early as during the preparation of a bid in the tendering phase, a model based on confidence and trust was used. At the main contractor's (MTH) request, the network of potential sub- and trade contractors worked through the tender documents in an open discussion, where considerations of quality, total contract sum and price for various subcontracts were estimated. On this basis, the first bid was developed for internal use. The pool of potential sub- and trade contractors was subject to competition in the process in order to get a competitive bid. If it turned out that someone outside the circle was cheaper, the subcontractors had in advance accepted that this party could be involved if a re-evaluation of prices did not reach a competitive level.

Compared with traditional procurement, the difference is that cooperation is already openly established in the tender process. It was an important feature in this phase that the logistics planning across the involved firms became part of the bidding process which opened up for significant cost reductions. The early planning also gave better opportunities for planning a better working environment and an effective use of the skills of the total workforce across the subcontractors at the site. The early joint logistics planning applied not only to labour, but also to an effective use of supplies across the parties with agreements on joint use of cranes, hoists etc. Hereby optimisation was obtained and overlap avoided. The overall planning already at the tender/bid phase ensured that readiness among the single parties was raised, with reduced starting-up time as a result.

Design

Client, consultants and contractors held meetings with the purpose to decide rules for the actual cooperation processes in the project. In particular, the focus was on:

- Formulating an objective for the project
- Establishing and formulating success criteria; Decisions on how the teams in the working process could meet and measure the criteria
- Establishing consensus about that "together we will construct a building to be proud of" and what this meant regarding quality standard (besides the specifications in the tender documents)
- Agreeing on an extra profit to the parties when the targeted goal was reached. This might involve an agreement for donations to charitable activities/institutions

The building process

Contracts were formed as an ordinary general contracting / total contract form, but had an added condition: all contractors had to accept to enter into a joint management across all trades on the building site. The joint leadership was realised through a mutual coordination planning directly between sub- and trade contractors. The main contractor did not in advance prepare a common detailed master plan. Instead various specific planning tools were established on site, e.g. manning tables and diagrams for progress. These tools were completed and negotiated directly between sub- and trade contractors and with the operative crews performing the functions. It was this common management of these tasks, which secured the responsibility for the internal coordination in relation to gangs and teams across firms and organisational affiliation. It was a basic rule at all levels, that there must be a civil tone at work - everybody had to "talk nicely with and to each other." Mutual agreement on what was labelled "Conflict-solving at source" instead of appealing up in the organisational system. Week-meetings for foremen and managers were established and five week plans were worked out at the site meetings. Corrections of tasks and design - as built - was ongoing and in dialogue with all levels (construction management, team/gang, design, consulting). The planning and management initiatives of the building process may be summarized to:

- Establish and enforce ownership by craftsmen and management of the already agreed targets
- Create new sub-targets with all subcontractors
- Create success criteria at the operative level in gangs and teams and their management in a common plenum in order to achieve the objective
- Establish rules for sharing a profit by compliance. A portion of the profits may be used for non-profit purposes
- All contractors (head, professional, and subcontracting) join in a common management team that is responsible for the overall management of the site (but with MTH as moderator).
- Establishment of norms for communication: a civil tone!

Delivery

A key instrument to achieve a good final product was the "master statement". A master statement was a demand from the head-contractor to the sub-contractors to document the process and partly to guarantee (by signature) the delivered quality. The review should be made by the master himself. Master statements were also agreed with suppliers. They had to take construction responsibility of the control of the installations. This ensured that guaranties for products were valid. Master examination took place the last 2-4 weeks before delivery. Deficiencies were corrected by special teams within 2 weeks.

ANALYSIS

An opening question for the analyses, can be formulated as a question of whether MTH Construction with the new concept had built a practice for establishing a social capital across the involved actors, which already before the project, namely in the phase of tender and bidding, had created the conditions for the "special cooperation" in the following project phases of design and production.

The new cooperation may be seen as an innovative development of partnering and lean where dialogue on values in product (high quality, to be proud of e.g.) and process (civil tone, conflict solving, e.g.) plays a crucial role in the consolidation of cooperation

between the actors (Gottlieb 2010). Many of these activities actually occurred in the MTH Constructions project. Seen in this light, elements of the MTH Constructions concepts were therefore seen before (as described in the Review section), but the combination and focus were changed, and they did not had the pronounced/ massive form, we saw in MTH projects. Instead of relying only on a legal and economic logic, the cooperation in equal degree also relied on a dimension of especially social values. This value concept may be seen as the axis around which the cooperation between the different actors and the related interests were moderated in the building process especially the establishment of an agreed code of communication - civil tone, conflict solving on location and common management across parties, was seen as effective. This may be seen as an establishment of a specific mode of social capital characterized by high potential for bonding in the teams, for cooperation between the groups and partners as well as across the hierarchies. The relational coordination involved integrative elements and coordination elements those are seen in terms of common managements across partners, high quality (to be proud of the delivered product), extra profit sharing and donation to charitable activities, civil tone in commutation etc.

Based on an overall evaluation of the performance of the delivered building etc., MTH Construction experienced that the approach worked and they profited from it. It is our interpretation that MTH Construction performed a new form of participatory collaboration between contractors and subcontractors, a form of relational coordination, which already started during work in the bidding phase and that the cooperation continues during the building process, where the realisation of all benefits for the construction project finally takes place.

The close coupling of a value-based coordination at the biding/tender stage and the insistence that the cooperation can be utilised and realised in the production process has proven to be a profit-giving business. Value-based cooperation seems to contain paradoxes in relation to the way cooperation between the parties has previously been perceived. How is it, for example, possible to get subcontractors to accept decreasing prices for their bid, increased productivity and better quality and close cooperation of all involved? It creates more competition - and increased cooperation, where one would otherwise expect increased competition at the expense of a good working relationship. The regulation between MTH Construction and sub-contractors was built on different fields of management, ranging from the management by contract over functional/operational management, to management by norms and values. The first two focus areas are inherently traditional in building projects and are a familiar part of the building management, whereas the latter is a new field attracting greater attention. Theoretically the case may be characterised as an example of how "co-operated and construction contracts and contract forms" represents a (new) emerging value rational normativity or action horizons in construction. A normativity that through "negotiated agreement" (Jessop, 2003) or "communicative action" (Nørager, 1985) challenges the tradition-bound, procedural and goal-oriented normativity.

The previous dominant form of cooperation has over time been naturalised in such a way that it seems as 'the' way to cooperate and has been installed as a traditional normativity which is not a subject for discussion, the (often limiting) rules, which also regulates the behaviour of players, (Sørensen and Vogelius 1991) is a normativity, based on contractual regulation and frequent conflict that often ends in court.

Habermas emphasises precisely the language and the wider communication as a coordinating factor - in fact, Habermas points out that normativity of modern creation lies

in and with the language (Nørager, 1985). Here it is worth to recall that one of the basic initiatives in the MTH Construction concept is precisely the requirement that players must change their linguistic game with each other - in brief, they are forced to speak nicely to each other. This work on the language is opening up to another rationality (value based) which at the same time is an opening up and changing of a time-honoured and vested social order, through a dismantling of the traditional structures, rules and roles - to an establishment of a new space for action, enabling new types of interaction and coordination partners in between. A new type of cooperation based on social values including mutual trust, low conflict and better coordination, and resulting in higher productivity, higher quality and better safety and health. As mentioned before, this is not a democratic and free dialogical situation, but a situation based on the structure of power between contractor and subcontractors. It is a process that is subject to and supported by the use of discourse based on shared values of cooperation and production, as well as traditional management tools o on many different levels.

CONCLUSIONS

With the implementation of the new concept, we initially raised the question whether MTH Construction has established a practice for creation of a special cooperation, which is rooted early in the phase of tendering/bidding. The ambition was to understand how, based on values, norms and a mode of communication, the establishment of binding cooperation between the participating actors already in the bidding process created cooperative relationships resulting in a more efficient cooperation later on in the project - in the designing/construction phase and - most important - in the executing/production process on the construction site itself.

What we can see is that apparently mechanisms of coordination were established through the establishment of the trust-based, transparent process early in the building process, which was used to increase and form social capital across the sub- and trade contractors as a means to improve collaboration and productivity on the construction site. The coordination mechanisms have the characteristic that they manage to incorporate the strengths of social capital as a mean for development of cooperation that creates high-quality solutions, higher productivity, and better economy for the involved contractors and a better working environment. In this way, cooperation in the tendering/bidding phase can be regarded as a way to create relational coordination already prior to the actual production taking place in the project. Literature tells that it complicated to enhance social capital in project bases organisations; the early initiatives observed in this case, is regarded as crucial for the good result. In light of the initiatives and measures used in the various phases of the participatory, value-based construction production, it seems likely that these local examples of management must be understood as (new) management rationality in construction. The blueprint combines two different (in the sociological sense) forms of governance, namely a technical rational management and a management by values and norms.

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