
Developing new knowledge in collaborative relationships in megaproject alliances: organising reflection in the Dutch construction sector

Marcel Veenswijk*, Alfons van Marrewijk and
Kees Boersma

Faculty of Social Sciences,
Department of Culture, Organization and Management (COM),
Vrije Universiteit Amsterdam,
De Boelelaan 1081,
1081 HV Amsterdam,
The Netherlands
Email: m.veenswijk@fsw.vu.nl Email: a.van.marrewijk@fsw.vu.nl
Email: fk.boersma@fsw.vu.nl
*Corresponding author

Abstract: This paper describes the development of new forms of public–private collaboration by members of a project-based organisation as a Community of Practice (CoP) in the Dutch construction sector. Cost overruns, time delays and corruption have put pressure on the relationship between the government and the construction sector. Political and public actors are forcing the construction industry to develop new cultural practices of collaboration in public–private partnerships. The paper incorporates power relations and shows how public and private partners, together with the researchers, develop an innovative tendering process. Based upon the literature on project-based organisations functioning as CoPs, we show how temporal organisational settings can enable new forms of learning. The specific development of a CoP in the Dutch construction sector has resulted in a 3-D virtual simulation programme which can be used to experience new behaviour and to train people in new approaches.

Keywords: megaprojects; project-based learning; CoP; communities of practice; innovation; organisational culture; anthropology; virtual simulation.

Reference to this paper should be made as follows: Veenswijk, M., van Marrewijk, A. and Boersma, K. (2010) ‘Developing new knowledge in collaborative relationships in megaproject alliances: organising reflection in the Dutch construction sector’, *Int. J. Knowledge Management Studies*, Vol. 4, No. 2, pp.216–232.

Biographical notes: Marcel Veenswijk is Professor in Management of Cultural Change at the Department of Culture, Organization and Management, VU University Amsterdam. He publishes on organisational culture, change processes and intervention strategies, especially in the context of public sector organisations and has a wide experience as researcher as consultant. He is Editor in Chief of *Intervention Research: International Journal on Culture, Organization and Management*. In 2005, he published *Organizing Innovation, New Approaches to Cultural Change and Intervention in Public Sector Organisations*, IOS Press, Amsterdam/Berlin/Oxford.

Alfons van Marrewijk (1960) is Professor of Business Anthropology at the Department of Culture, Organization, and Management, VU University Amsterdam, where he received his PhD degree in Organization Anthropology. Earlier he graduated in Electronics at the Dutch Technology College and worked in various organisations as telecom engineer and project manager. His academic work centred on cultural change in technology-driven organisations and project-based alliances. He is co-author of *The Culture of Project Management: Understanding Daily Life in Complex Megaprojects*. He has published in several journals including *Journal of Managerial Psychology*, *International Journal of Project Management*, *Culture and Organization* and *Telematics and Informatics*. Van Marrewijk combines his academic interest in Business Anthropology with international consultancy work.

Kees Boersma is an Associate Professor at the VU University Amsterdam in the group of Culture, Organization and Management. His research interest is in 'science and technology studies', 'business history' and in 'organisational culture and power'. He published widely on R&D history, organisational learning, enterprise-wide systems and organisational safety culture. His publications appeared amongst others in journals as *Enterprise and Society*, *Human Relations*, *Business Process Management Journal* and *Journal of Strategic Information Systems*. He is teacher in the courses organisational politics, organisational and management theory and technology and culture (for detailed information, see: www.keesboersma.com).

1 Introduction – problematic cooperation between public and private partners in megaprojects

In many countries, institutional 'top down' interventions, such as public inquiries, legal penalties and performance-control regulations, have been undertaken in an attempt to radically change collusion and corruption practices in the construction sector (Boersma et al., 2007). Although these planned change interventions have shifted the attention towards cultural change in the sector (Nijhof et al., 2008; Pries, 2008), many of the cultural characteristics are still emergent. Characteristics appear to be: structural cost overruns of public sector budgets, problematic public-private collaboration, technical failures and practices in the construction industry which have been subject to collusion and corruption (e.g. Flyvbjerg et al., 2003; Van Marrewijk and Veenswijk, 2006). The Singaporean report on 'Reinventing Construction' (Construction Industry Steering Committee, 1999) and the Hong Kong report 'Construct for Excellence' (Construction Industry Review Committee, 2001) criticise the current performance and (lack of) transparency in the industry. These reports highlight a wide range of irregularities in the different stages of megaprojects as well as deficiencies in the control mechanisms due to a fragmented construction industry, a dysfunctional segregation of design and construction activities, and a lack of cooperation and innovation between the fragmented elements (Dulaimi et al., 2002). More recent European evaluations of megaprojects identify similar difficulties and failures. In the UK, government-supported reviews of the UK construction sector depict a fragmented industry characterised by adversarial relationships, confrontational attitudes, poor tendering practices, a blame culture, and a lack of trust and cooperation, based on fundamental differences in interest between clients, contractors and others (Marshall, 2000; Adamson and Pollington, 2006; Bresnen

and Macmillan, 2006). In the Netherlands, the reputation of the Dutch construction industry was seriously damaged when the 2002 report of a Royal Commission concerning 'Irregularities in the Dutch Construction Industry' confirmed the 'shocking picture that the media had presented in the beginning of the year, that the entire sector was in on the fraud and other illegal practices' and that 'management knew about it and authorities helped to perpetuate the system' (Van den Heuvel, 2005, p.34). As Dorée (2004) points out, there were remarkable similarities between the system exposed in the Netherlands and that of the 'dango' price-fixing system in the Japanese construction industry described in the early 1990s by McMillan (1991).

Large-scale interventions by the Dutch government in the 1990s have not been successful in changing corruption practices in the construction sector (van Marrewijk and Veenswijk, 2006). These experiences have stimulated alternative types of interventions in which the construction sector itself is made responsible for improvements and abolishment of dysfunctional practices. In the Netherlands, several taskforces such as 'PSI-Bouw' and the 'Regieraad Bouw' were established to support innovative project-based organisations that take the shape of Communities of Practice (CoP; Sydow et al., 2004) around megaprojects. Wenger (1998) describes CoPs as joint enterprises which are understood and continually renegotiated by its members. The central characteristics of a CoP are the mutual engagement that binds members together into a single social entity and the shared repertoire of communal resources that members have developed over time. A CoP is explicitly distinct from formal groups because membership is based on participation rather than on official status and membership is not bound by organisational affiliations (Wenger, 1998, p.3). A CoP is related to issues of identity, meaning, and organisational artefacts CoPs act as drivers for innovation and experimentation. The innovative capacity is supposed to be the outcome of a dynamic 'bottom-up' process; despite the bottom-up process. The government holds a specific position within the CoP because it has control over financial and legislative incentives.

Developments in Dutch megaprojects that encourage new ways of working in project-based organisations echo an international trend. Project-based organisations, as temporary, short-lived entities, can 'circumvent traditional barriers to organise change and innovation' (Sydow et al., 2004, p.1475). Project-based organisations can consist of members of a single organisation, but are increasingly based upon alliances between members of different, heterogeneous organisations. Project-based organisational settings open up new possibilities and ways of learning (Scarbrough et al., 2004a) since the various members of the project-based organisations can express and share their specific knowledge during meetings and collectively articulate tasks and goals (Enberg et al., 2006). However, the negative effects of project-based organisations and project-based learning have, to some extent, tempered expectations of the success of such arrangements. One of the major problems is that the learning which only takes place within the project-based organisation is not captured for the next project and dissolves with the project's cessation so that every project-based organisation has to start its learning process from scratch (Prencipe and Tell, 2001; Scarbrough et al., 2004a; Scarbrough et al., 2004b). In this paper, we will shed light on the learning of a single project-based organisation conceived as a CoP while simultaneously focusing on how this organisation is embedded within wider institutional practices. The project-based organisation researched for this paper was a CoP oriented to the dynamic innovative contexts of megaprojects.

Although the process of community building has been described extensively in current project-based organisations and CoP literature, power dynamics seem to be an underdeveloped field in CoP theory. This paper aims to fill in some of the theoretical blind spots and concentrates on the question of how power dynamics relate to the development of public-private learning CoPs within the changing organisational context of megaprojects. The paper first theoretically evaluates project-based organisations and/or CoPs and then presents the case of a Dutch CoP in 'Partners in Business' (PIB). In this community, actors from four leading Dutch construction firms and the Department of Public Works and Water Management participated in an informal and unofficial setting. The community was established in 2005 and remains active as an innovative platform in the infrastructural field. The researchers acted as catalysts and project learning reflectors during the different stages of community building. After the presentation and analysis of the case, we discuss the results of the case study while reflecting back on theory and illustrate the advantages of considering the blind spots in CoP theory.

2 Learning practices in a project-based organisation like a CoP

The centrality of notions of community as a learning entity for new organisational practices is widespread in theories of culture, identity and knowledge accumulation (see Veenswijk and Chisalita, 2007). CoPs facilitate iterative and situated learning, a process through which individuals are engaged in a temporal organisational setting. Situated learning implies and presupposes social interaction, implying not so much the individual acquisition of knowledge but social participation that enables collective forms of learning (see also Berends et al., 2003). Learning, in this respect, is an 'evolving, continuously renewed set of relations' (Lave and Wenger, 1991). In addition to their capacity for iterative and situated learning, Lave and Wenger (1991) identify three main aspects that characterise CoPs: meaning, identity and practice.

Meaning, in the first place, refers to the fact that community experiences and learning processes are linked to the praxis and sense-making processes of community members. Objects and events are useful to community actors only if they can ascribe meaning to them and can place them within their own frames of reference. Webs of significance impart a certain order to reality, and this system subsequently achieves a certain legitimacy. Sense-making can be described as the number of assumptions concerning reality that are held by an actor and valued in a certain way (Veenswijk, 2001, p.55). For Weick, sense-making is about the 'placement of items into frameworks, comprehending, redressing surprise, constructing meaning, interacting in pursuit of mutual understanding and patterning' (1995, p.6). We see sense-making as an ongoing process, which is grounded in the identity construction of the individuals involved in project-based learning within a CoP.

Identity, in the second place, is essential to understanding the evolution of CoPs. By creating their own discourses (i.e. languages with specific symbols, rituals and codes) CoPs are able to operate as recognisable entities within a programme of change. Parker (2000) states that identity can be differentiated in terms of 'higher and lower' order constellations. Alternative definitions of reality can develop within the various constellations of discourses that may compete with each other. As a result, the situation determines the definition of reality that the actors use when communicating. In patterns of continuous

interaction, each actor is constantly included in more than one social context with the other contexts always there in the background. An actor can bring definitions of reality that have been developed in a certain configuration into other configurations of which he or she is a part. The construction and reconstruction of realities is influenced by the inclusion of actors in multiple configurations. (The concept of multiple identifications can also be found in Tajfel's (1981) work on the concept of social identity.) Social identity refers to the self-concept that actors have based on their membership in one or more social groups combined with the emotional value that is attributed to this membership.

The actual practice, in the third place, is maybe the most important characteristic of a CoP. Practice, here, refers to the idea that members must be able to make the connection between the change discourses in the community and their own everyday praxis. It is in daily practice that learning takes place, which is far from a neutral phenomenon. The three basic characteristics of CoP's, as listed before, serve as a basic framework for the analysis of CoPs. The varieties of contexts in which CoPs evolve as well as the internal dynamics which result from this variety are underdeveloped in current debates. Contu and Willmott (2003) show that, in their original conceptualisation of CoPs, Lave and Wenger (1991) mention the wider context as 'political economical structuring', suggesting a need for further research on how such communities develop and are reproduced within wider contexts that include politico-economic relationships and institutions. Moreover, the theory proposes that concepts such as power relations, ideology and conflict are important for understanding situated learning.

For example, when new management initiatives are introduced in project-based organisations, it is not only a social endeavour but also 'one that involves bringing the impact of relations of power and influence within the organizational centre stage' (Bresnen et al., 2005, p.548). New configurations in project-based organisations conceived as a CoP not only create possibilities for learning because boundaries are blurred (Scarborough et al., 2004a), but can also potentially create internal conflicts, manipulated debates and disagreement. Therefore, for a CoP to operate successfully, *trust* is a precondition for success to be emergent from these settings (Preece, 2004). Knowledge sharing is a social and ongoing process that is dependent on interpersonal trust and even on the personal traits of individuals that participate in project-based organisations (Mooradian et al., 2006). It is the relative absence of hierarchy and the heterogeneity of participants that makes trust extremely important in these settings.

Contu and Willmott (2003) use Orr's (1996) ethnographic study, which illustrates the importance of considering the broader context (historical, cultural and social) when attempting to understand the learning and working practices of a community. They supplement Orr's analysis by showing the impact of a management strategy that was designed to retain control over the working practices of the technicians. In an attempt to gain more control and to impose discipline on the technicians' practices, the management mandated that technicians make use of manuals and directive procedures. Such requirements obviously limited the technicians' capacity for learning and development. Because of the identity they had built (i.e. that of heroic troubleshooters), the technicians came into conflict with such management decisions. Contu and Willmott (2003) considered this an example of the relevance of introducing concepts of contradiction, ideology and conflict to the study of situated learning processes. Conflict could cause resentment and stop the technicians from deploying their knowledge of how to find

remedies for problems with the machines (which would later be integrated in the procedures). For the same reason, i.e. their identity as heroic troubleshooters, however, the technicians appropriated the management's procedures and used them as tools with which to communicate their competence and knowledge. In this way, they discovered a means of preserving and reifying their identity.

The question remains as to how, in a project-based organisation – in our case represented by a CoP – learning takes place within and beyond the organisational borders. Three key aspects determine the learning processes in a project-based organisation. In the first place, a project-based organisation can break down the role patterns of participants that otherwise remain stable, fixed and closed, enabling what Scarbrough et al. call *learning-by-reflection*, a process by which 'individuals and groups make their prior and implicit knowledge more explicit to themselves and to each other through activities based on review and self-diagnoses' (2004b, p.295). In the second place, somewhat paradoxically, the knowledge production in project-based organisations can go beyond the fixed and static divisions of labour *because* these organisations function as relatively autonomous groups. Finally, knowledge integration can occur within project-based organisations because the participants work across sub-divisions and even organisations. The idea is that the most interesting flows of knowledge take place across (organisational) borders and boundaries. The temporal and relatively isolated character of a project-based organisation can generate learning and knowledge by *translation*, in which a new body of language is developed, and/or by *transformation*, where participants create a common ground for shared problem solving (Scarbrough et al., 2004a). In this process, it is important that the individuals are willing to overcome their self-interests, leaving their customised actions behind. In this process, *narrative capacities* can enable individuals to influence the process of meaning production within the community through stories of purpose, relevance and scope, whereas the theme of interaction resources focuses on the 'gatekeeper' potential in terms of inclusion and exclusion, influencing the knowledge capacity of community members.

An unintended side effect of these temporal settings is that the fruits of learning processes stay inside the CoP. It is important to ask how wider organisational levels, networks or institutional fields, such as infrastructural organisations, can profit from this learning process. On the one hand, participants develop a common understanding resulting in a problem-solving agenda within the project-based organisation. On the other hand, participants have to (re)connect the knowledge and outcomes of the project with the broader context (Sydow et al., 2004). In other words, if individuals in the wider organisational field (in terms of DiMaggio and Powell, 1983) want to profit from knowledge sharing within the project-based organisation, the key actors have to find ways to transcend the boundaries of the temporary organisation. What is important, therefore, is to stimulate *outcome drivers* that concern the instrumental potential for influencing community results, for instance through financial and material incentives. Referring to Porter and Whitley, Sydow et al. (2004) argue that this can be done by establishing regional or even national systems of learning and innovation, in which case 'it might be useful to combine both dimensions and add a certain level of organisational interaction that makes a field or ecology into a "cluster"' (Porter, 1998). Also, at a field level, national or regional 'business systems' (Whitley, 1992) may provide a particular context for project-based organising, for instance, 'if state regulations or culturally embedded practices are relevant for projects and project management' (2004, p.1479).

In this way, project-based organisations can be seen as loosely coupled (Orton and Weick, 1990) to the participants' own mother-organisation or setting. Loose coupling, like the attachment–detachment dilemma, is a dialectical concept that 'emphasizes complex patterns of simultaneous coupling and decoupling' (Orton, 2008, p.834).

In sum, project-based organisations that take the shape of a CoP can function as promising settings for learning, creating new organisational practices based upon trust and for reflexivity. The most important challenges for those who participate in a project-based organisation conceived as a CoP are to allow and stimulate narratives of change, create interaction resources such as role improvisation and building mutual trust, and develop skills to translate new knowledge from one organisational setting to another. These themes eventually result in four (pre-defined) key aspects that address what Contu and Willmott (2003) identified as the neglected power dynamics of community development: (1) narrative capacity, (2) interaction resources, (3) outcome drivers and (4) diffusion possibilities (see also Veenswijk and Chisalita, 2007).

Table 1 Schematic overview of the key aspects of power dynamics in CoPs

<i>Key aspect</i>	<i>Definition</i>
Narrative capacity	Sources for influencing meaning production
Interaction resources	Capabilities for influencing inclusion and exclusion of community members
Outcome drivers	Instruments(s) for influencing community results
Diffusion possibilities	Possibilities for anchoring new community practises within a broader context

In the following sections of this paper, we discuss a project-based organisation that functions as a CoP in the Dutch infrastructure sector, a case study that allows the internal dynamics of the learning process to come to the fore. At the same time, the dilemmas of project-based organisations as CoP become visible.

3 Methodology – analysing CoP dynamics and power contexts

The present study is an integral part of the larger Next Generation Infrastructure (NGI) research programme. The scientific mission of NGI is to develop a generic framework for understanding and steering infrastructure development in order to enable systematic cross-sector learning. In this study we concentrate on the 'PIB' group, a Dutch CoP initiated in the aftermath of a parliamentary inquiry into public–private collaboration in the construction sector. Parliamentary inquiries and investigations have made it clear that cultural change in the infrastructural chain is imperative (Flyvbjerg et al., 2003). Political and social developments of privatisation and liberalisation lead to the separation of the management and exploitation of infrastructure facilities (Veld et al., 1998), as well as a focus on public–private forms of collaboration (Klijn and Teisman, 2000; Flyvbjerg et al., 2003; Van Marrewijk and Veenswijk, 2006), which occur in a context wherein there is a lack of mutual trust between the government and businesses in the construction sector and confusion about the culture on which the collaboration should be based (Clegg et al., 2002). The significance of the government in the construction industry,

in particular the infrastructure sector, should not be underestimated. In the Netherlands, the government accounts for 90% of all infrastructural works and is therefore a dominant buyer that can exert great influence on the criteria for granting public work (Priemus, 2004).

In order to capture the power dynamics in CoPs, we used an ethnographic qualitative approach (Alvesson and Sköldbberg, 2000) carried out to improve our theoretical understanding (Eisenhardt, 1989). The choice of this research approach was based on the assumption that in a highly ambiguous and complex research field, such as public-private collaboration, an explorative, 'open' research mode would be the most natural 'solution' enabling us access to adequate research data and giving us a sound understanding of the related power processes (Alvesson and Willmott, 2002). In order to gain insight into the life-world of an organisational configuration, we preferred a long and detailed method of studying cultural differentiation over the random indications yielded by surveys or questionnaires. The intensity of the context is not the only argument in support of an intensive approach. Perhaps even more important is that when using ethnographic methods the object of the study should always be the 'way things normally go' in an organisation, at least to the extent that it is possible. The number of formalised research methods is severely limited, and researchers using ethnographic techniques must strive for optimal maintenance of the reality of the organisations they study (see Veenswijk, 2001, p.78).

Three methodological instruments have been used to guarantee the reliability of the research instruments and the internal validity. First, data, researcher and methodological triangulation was applied. The methodological triangulation included interviews, observation, participant observation, group interviews and desk research. Researcher triangulation was used as all interviews and workshops were conducted by at least two researchers, one taking notes, the other doing interviews. All researchers had long-term experience in the infrastructure sector and have occasionally been hired by project managers to work as consultant-researchers. The mixed background of the researchers in engineering, public administration, anthropology and consultancy helped to meet corporate demands and to collect the ethnographic data needed for the study.

Data triangulation was applied through the collection of data at different phases, times and amongst different people. From spring 2005 to spring 2008, two rounds of interviews with members of the board of directors from actor-organisations were held. Also, a series of round tables were conducted at a neutral conference setting located in the centre of the Netherlands. The meetings also included the use of Second Life¹ as an enabling 'instrument' for learning within the project-based setting (see also Esteves et al., 2008). A seminar of the community of practitioners on cultural change in the construction industry was attended by practitioners of the Dutch construction sector and by two of the authors of this paper. Data triangulation was applied through the collection of data at different phases, times and amongst different people. The data collection took place via different stages. In the first place, two rounds of interviews with members of the board of directors from actor-organisations were held. The interviews were taken from the spring of 2005 to the spring of 2008. Next to these interviews, a series of round tables were conducted at a neutral conference setting located in the centre of the Netherlands. These meetings also included the use of Second Life as an enabling 'instrument' for learning within the project-based setting (see also Esteves et al., 2008).

An important element of the use of Second Life as an instrument for improving project management was a thorough reflection upon the old and new (Second Life) practices. Therefore, a seminar of the community of practitioners on cultural change in the construction industry was attended in 2007 and a series of five interviews were held with project managers, coaches and trainers about their experiences with simulations and gaming in projects.

During the meetings with the community of practitioners, field data was systematically handled and analysed. During the research, four kinds of field notes were made: observational, theoretical, methodological and reflective notes. The notes were directly worked out and added to the interview reports. In this way, the authors of this paper were able to take the informal aspects of the meetings into consideration. On top of these interviews, observations and field notes, desk research resulted in the study of internal documents of the Ministry of Transport, Public Works and Water Management and material of the Dutch construction and engineering firms. It was especially the desk research that delivered the needed material for contextualising the meetings and Second Life as an instrument in the constructing sector.

4 Case description

4.1 Entering the 'Partners in Business' community

The establishment of the PIB group was initiated in 2005 by a board member of the Department of Public Works and Water Management in collaboration with two authors of this paper. Board members of five private partner-organisations (two construction companies, two engineering companies and a consultant) were asked to participate on an informal basis and contribute to the group development. All of the parties were supposed to make a financial contribution in order to be able to make this really happen. The administrative aspects (such as agenda handling) were in the hands of the research team. During the initial community stage, current problems in the construction sector were discussed and possibilities for new working practices were explored. The discussions resulted in an initial content aim of the group. Community members agreed on a plan to explore new types of collaboration during the tendering of contracts. In this sense, a sharp distinction was defined between the insufficient actual tendering regime, which resulted from the institutional interventions during the past years, and the espoused future perfect situation. In a future perfect strategy, actions are perceived as if the ideal situation has already been accomplished (Pitsis et al., 2003).

After an extensive group discussion, the current situation was summarised as problematic in following four aspects:

- 1 a lack of overall vision on the tendering approach
- 2 a lack of trust between the public sector client organisation and private companies
- 3 procedural unclearness at the various tendering stages
- 4 insufficient insight into necessary public versus market competences.

The future perfect image was not predefined but sought to provide an answer to what several group members described as 'the current culture of distrust' to result in an innovative tendering routine. One of the potential new tendering systems, called the

Design, Build, Finance, Maintain (DBFM) system, was introduced by the public sector. In this concept, market parties have integral responsibility for a project, while public parties limit their involvement to the evaluation of specific outcome criteria (such as requested levels of mobility). Although discussion basically concentrated on content aims, conversations were mingled with notions of who should be a member of the PIB group. Initially, two potential additional public sector organisations were initiated as candidate members. For practical reasons, i.e. fear that the community may become too large and lose its flexibility, these members were not selected.

4.2 Stages in community building

4.2.1 Stage 1: initiating the core

The first meeting of the PIB group took place in June 2005. The object of the first meeting was to discuss current practices and make sense of the problems they had been experiencing. The university team was invited to act as a moderator and to present state-of-the-art results of public-private partnership research. During the first meetings, participants in the PIB community experienced the need for a safe environment to reestablish trust and reflect upon new cultural practices. During the first discussions, much emphasis was put on the concept of equality. Equality between commissioner and contractor 'is needed', said most participants. Several group members suggested new cooperation images by introduction of alternative metaphors:

"I think of two metaphors on the rules of the game. The first one is that of an orchestra lead by the conductor. The other perceives the rules of the game as a football match with rules on off-side and positions." (Participant in PIB)

Or, as another participant said:

"As the execution of contracts has become very litigious, a feeling of inequality [between commissioner and contractor] has arisen." (Participant in PIB)

The ways in which the public sector organisation dealt with private firms was identified as a significant issue; participants from private firms stressed the Dutch government's exclusive focus on price. One group member argued that in the current situation 'innovation is being killed because we are being held responsible solely on price'. According to another (private) actor:

"There is a large misunderstanding between the two parties because of misinterpretation of market and political responsibility. Firms need cash flow to survive. The difference with the government is especially in the perception of time and risks." (Participant in PIB)

One outcome of the first discussions was to ask 'can we create a learning environment in which "we" (public and private partners) can reflect upon our collaboration in a truly open debate?' It was this question that guided our focus for the next stage of the community process.

4.2.2 Stage 2: exploring by gaming – developing a virtual 3-D simulation

During the second stage, the quest for practical and workable learning formats became evident. Alternative learning tracks were defined, varying from (1) evaluation of an accomplished megaproject, which had been executed in the past by community members, to (2) the experimentation of new projects. After extensive discussions on the potential

outcomes of these learning tracks, both alternatives were dismissed by a majority of the group. A third learning track was defined by one of the private actors. His main argument was that cutting edge learning could only be accomplished by use of unorthodox, new instruments and formats. After extensive discussions, the community members agreed that the third track should be developed as an out-of-the-box context.

“In the earlier days the world was perfectly divided: exploration, plan studies, selection, execution. But this doesn’t work any more. Innovative tendering. Nobody has experience with this, we activate the wrong half of the brain; it doesn’t work.” (Participant of PIB)

One of the other actors added:

“In the construction of terminal 5 at the London Airport, the constructors have put money together for risks and organised a simulation to practice the process of cooperation. Why isn’t this happening in the Netherlands?” (Participant of PIB)

The discussions evolved into a researcher’s suggestion for creation of a large-scale virtual environment, in which different kinds of new concepts could be tested and evaluated. Some of the private sector participants were not enthusiastic about the idea of an extensive virtual 3-D simulation. One participant wondered ‘if the outcomes of the processes [would] be different or [would it be] just the process [that was] different’. He was overruled by an actor from the public sector, who stated that learning from virtual simulations would have the advantage of substantial time and space creation:

“I think that one can accelerate decision-making procedures. When someone has objections, he can directly show these objections and emotions can be removed.” (Participant in PIB)

An outcome of this stage was that the research team was asked to design a virtual multi-actor tendering game in which future perfect images could be programmed and real-life lessons could be learned. The researchers accepted the invitation and chose Second Life as a platform for the simulation game.

4.2.3 Stage 3: sense-making by building for builders

During the third stage, the Second Life concept was literally transformed into a future perfect collaboration mode. Participants agreed upon the practicality of a simulation game. The game had to result in the development of a procedure, which could be applied in new innovative megaprojects.

“But we have to apply it somewhere. Otherwise it remains academic. We have to earn money. It is important that it lead ... to a new kind of tool that really will be used. Otherwise we are lost in space.” (Participant in PIB)

By now, all community participants were convinced that this track contained a true promise of creativity and innovation in order to reinvent organisational practice in megaprojects. The reason for this was partly because actors had to convince members of their own home organisation, which resulted in additional arguments for the path that had to be walked. The concept of Second Life more and more became a mantra for the community believers and generated a strong sense of emotion and shared exclusiveness.

By mid-2007, the researchers had designed a virtual ‘dealing dome’, to which the community partners gained exclusive access (every community member had a virtual avatar). The dealing dome was presented in the home organisations of the community members, and although the dealing dome was designed to serve as a virtual meeting place for public and private partners, it increasingly became a token for the community members and the symbol of a new collaboration. By the end of 2007, the public sector actor and the research team created a fictional assignment for a new megaproject that would serve as a basis for the simulation Zuidas. Although Zuidas is really an area in Amsterdam, the problems in the assignment – mobility, drainage and the quality of subsoil – were fictional. The simulation consisted of six rounds of two hours of participants playing the game. The first round took place in a virtual 3-D context oriented to the assignment on video which could be observed in the dealing dome. Furthermore, in this round a discussion of joint risk profiles was held. In this stage participants explored the assignment and potential alliance partners. At the end of the first round they came up with a decision as to whether they would take part in the tendering process. The second round concentrated on an open dialogue between public and private partners. In this round participants had to decide upon an agenda and topics of discussion. Public and private partners reflected upon their project visions. The third round focused on the design of a solution and the possible alliance form. Participants brought in ideas and designs to solve complex problems. In the fourth round a process of open selection took place in which single issue parties had a strong voice. After these four rounds in Second Life, two more rounds occurred in real life. The fifth round contained the presentation of the plans by the different consortia. A tentative choice was made by the client. Finally, in the last round a transparent debate was held on the final decision-making of clients in which argumentation and criteria were made transparent and an open debate occurred concerning their final choices.

4.2.4 Stage 4: redefining the CoP in an institutionalised frame: the Competence Centre

After the joint gaming experience, a discussion between the partners started on how to take the learning experience to the next level. There was a shared understanding that the gaming lessons should be preserved and become available for a larger group of infrastructural actors. During an informal meeting, the concept of an infrastructural ‘Competence Centre for Cutting Edge Simulation’ was brought up by the public sector actor. The private sector actors felt a major dilemma: on the one hand they were keen to share new practices with colleagues from potential alliance partners in a more structural way but on the other hand these potential partners were at the same time possible competitors in other tendering procedures. A consequence was that they felt deadlocked in coming up with new approaches to support this initiative.

It was clear that it was the public sector actor that was empowered to take the initiative for the next move, although all private parties declared they were willing to operate as founding fathers of the new centre. The parties agreed that the public sector actor and the university team should engage in broad consultation with the main Dutch construction firms to explore which of these firms were to be included in the PIB programme. By the end of 2008, eight private sector actors actively declared their support for the new Competence Centre. It was proposed that by spring 2009 an integrative learning programme would be available for the construction sector.

5 Power dynamics in 'PIB'

The PIB case shows a process through which community members struggle for new forms of *meaning* by a joint search for future perfect concepts of public–private collaboration. Although meaning production takes place within a broader context of the distrust between public and private partners in the construction sector, the group members experience the community as a positive out-of-the-box opportunity for new ideas. Indeed, excessive control in organisational networks hinders the development of cooperation and commitment between the partners (Josserand, 2004). New metaphors, such as the idea of 'the orchestra' and the 'football match', were examples of this integrative search for meaning. The researchers were part of the meaning process as both facilitator and 'constructor' of (virtual) interaction vehicles. *Identity* was created through a variety of cultural artefacts during the process. The claim of equality was reflected in the definition of the group as *partners* instead of legal public sector representatives versus contractors. The identity was reconfirmed at different stages of the community process by a series of tokens, such as equal financial contributions, the agreement among partners to take responsibility for one group meeting, joint presentations to the home organisations of the Second Life concept and a shared decision not to include new members to the group. In terms of *practice*, group members were actively promoting the innovative capacity of the PIB group by telling enthusiastic stories in the sector's networks and by producing evidence by means of inviting the researchers for presentations and workshops on the virtual projects.

On first viewing, the integrative capacity of the group seems to be accompanied by a sense of egalitarian relationships within the PIB community. However, additional analysis implies multiple dimensions of ambiguity, which emerge in the interaction dynamics between the partners. First, while active participation in the community may be interpreted as a sign of true involvement, it also provides a strategic opportunity for the private actors to interact on the ins and outs of current and future public sector assignments. The access to backdoor information may serve as an important driver for active connection to the group, especially to the public sector actor, who plays the role of the gatekeeper, which narrows down the possibilities for external players to become part of the PIB team. Second, from the perspective of the public sector actor, the idea of a small-scale frontline innovation community seemed to be an attractive idea. The selected private partners in the innovative community are reflections of the construction sector showing the innovativeness of the sector. Third, from a researcher's point of view, the PIB community process is a unique possibility to gain insights into community dynamics in a specific sector. The researchers must, however, consciously avoid becoming a source of external legitimacy for group prescriptions that result from specific sets of group think.

We can conclude that all community members had potential for specific empowerment, although the vehicles for this were not always explicit. The most obvious of these was the public sector actor who was not only the main initiator of the innovative community concept but who also claimed that new innovative tendering systems in which complete project responsibilities are outsourced to private sector organisations through DBFM contracts might be the best innovative future option. The private partners appeared to be followers of the CoP concept, and during the fourth stage, of the Competence Centre. The research team acted as co-producers of the CoP idea by supporting the group process. In terms of interaction resources, the public sector actor

had a significant role in the initial creation of a shortlist of potential partners. Later on, private partners strongly argued on not to expand the size of the group. Also, what is remarkable is that in terms of the development of a new collaborative culture, none of the actors had a clear vision of substantive outcomes. For the researchers, espoused outcomes were defined in scientific terms and the vehicles for this were basically situated in the exclusive know-how for building the 3-D simulation. In terms of possibilities to diffuse developed knowledge to other partners there were several options varying from activating political actors by the public sector actor to the inclusion of relevant actors within the home organisation.

Table 2 Aspects of empowerment

	<i>Public sector actor</i>	<i>Private sector actors</i>	<i>Research support team</i>
Narrative capacity	Explicit: Main producer innovative CoP concept Initiator Competence Centre	Diffuse: Followers of CoP concept Neutral to DBFM system	Explicit: Co-producer CoP narrative Neutral to DBFM system
Interaction resources	Explicit: Initiator 'initial' group	Explicit: Argumentation against group expansion	Neutral
Outcome drivers	Diffuse	Diffuse	Explicit: Scientific insights in CoP dynamics
Diffusion possibilities	Explicit: Activation Ministry of Public Works in Competence Centre	Explicit: Activation branch in Competence Centre	Diffuse

6 Conclusion

In this paper, we explored the development process of the innovative PIB community in the context of a disturbed public–private relationship in the construction industry concerned with megaprojects. The research shows that power dynamics play an important role in the PIB community. It also shows the pressure to institutionalise rather ambiguous processes surrounding community building in more or less objectified constructs such as Competence Centre(s) in which new power-related orders are reflected. Reflecting back on Wenger's (1998) theory of CoP, these aspects resemble, at least to some extent, the concepts of internal and external reconfiguration of a community. Wenger does not, however, develop these concepts further, a shortcoming we address in this research. The case study we have presented indicates the relevance of considering such concepts as power dynamics for CoP theory.

Enriched in this way, CoP theory can account for both the internal and external development of communities in terms of empowerment, as well as the conditions that constitute a favourable context for such developments. It can also explain how the bottom-up process of change that was induced by the PIB community took place within the organisational life-world. Although these findings do not represent generalisations, they give a valuable insight into the relevance of the phenomena investigated in a

particular situation. The results of this research show how a CoP can take advantage of certain external conditions and engage in a process of internal and external development, thus changing its position and identity within the organisational life-world. Moreover, the community also engaged in a process of changing the very organisational life-world in which they were functioning. The insights provided by this research may have the potential to enrich the body of knowledge surrounding CoP theory.

References

- Adamson, D.M. and Pollington, T. (2006) *Change in the Construction Industry: An Account of the UK Construction Industry Reform Movement 1993–2003*, Routledge, New York.
- Alvesson, M. and Sköldböck, K. (2000) *Reflexive Methodology*, Sage, London.
- Alvesson, M. and Willmott, H. (2002) 'Identity regulation as organization control: producing the appropriate individual', *Journal of Management Studies*, Vol. 39, No. 5, pp.619–644.
- Argyris, C. and Schon, D.A. (1996) *Organizational Learning II: Theory, Method and Practice*, Addison-Wesley, Amsterdam.
- Berends, H.H., Boersma, F.K. and Weggeman, M. (2003) 'The structuration of organizational learning', *Human Relations*, Vol. 56, No. 9, pp.1035–1056.
- Boersma, F.K., Kingma, S.F. and Veenswijk, M. (2007) 'Paradoxes of control: the (electronic) monitoring and reporting system of the Dutch High Speed Alliance (HSA)', *Project Management Journal*, Vol. 38, No. 2, pp.75–83.
- Bologna, R. and Del Nord, R. (2000) 'Effects of the law reforming public works contracts on the Italian building process', *Building Research and Information*, Vol. 28, No. 2, pp.109–118.
- Bresnen, M., Goussevskaia, A. and Swan, J. (2005) 'Implementing change in construction project organizations: exploring the interplay between structure and agency', *Building Research and Information*, Vol. 33, No. 6, pp.547–560.
- Bresnen, M. and Marshall, N. (2000) 'Partnering in construction: a critical review of issues, problems and dilemmas', *Construction Management and Economics*, Vol. 18, No. 2, pp.229–238.
- Clegg, S.R., Pitsis, T.S., Rura-Polley, T. and Marosszeky, M. (2002) 'Governmentality matters: designing an alliance culture of inter-organizational collaboration for managing projects', *Organization Studies*, Vol. 23, No. 3, pp.317–338.
- Construction Industry Review Committee (2001) *Construct for Excellence*, Construction Industry Review Committee, Hong Kong.
- Construction Industry Steering Committee (1999) *Re-Inventing Construction: Construction 21*, Ministry of Manpower and Ministry of National Development, Singapore.
- Contu, A. and Willmott, H. (2003) 'Re-embedding situatedness: the importance of power relations in learning theory', *Organization Science*, Vol. 14, No. 3, pp.283–296.
- Dorée, A.G. (2004) 'Collusion in the Dutch construction industry: an industrial organization perspective', *Building Research and Information*, Vol. 32, No. 2, pp.146–156.
- Dulaimi, M.F., Ling, F.Y.Y., Ofori, G. and De Silva, N. (2002) 'Enhancing integration and innovation in construction', *Building Research and Information*, Vol. 30, No. 4, pp.237–247.
- Eisenhardt, K.M. (1989) 'Building theories from case study research', *Academy of Management Review*, Vol. 14, No. 4, pp.532–550.
- Enberg, C., Lindkvist, L. and Tell, F. (2006) 'Exploring the dynamics of knowledge integration: acting and interacting in project teams', *Management Learning*, Vol. 37, No. 2, pp.143–165.
- Esteves, M., Antunes, R., Fonseca, B., Morgado, L. and Martins, P. (2008) 'Using second life in programming's communities of practice', in Briggs, R.O., Antunes, P., DeVreede, G.J. and Read, A.S. (Eds): *CRIWG 2008, LNCS 5411*, Springer-Verlag, Berlin, Heidelberg, pp.99–106.

- Flyvbjerg, B. (2005) 'Design by deception: the politics of megaproject approval', *Harvard Design Magazine*, pp.50–60.
- Flyvbjerg, B., Bruzelius, N. and Rothengatter, W. (2003) *Megaprojects and Risk: An Anatomy of Ambition*, Cambridge University Press, Cambridge.
- Jeannot, G. (2006) 'Diffusing values or adjusting practices? A review of research on French public utilities', *International Journal of Public Sector Management*, Vol. 19, No. 6, pp.598–608.
- Josserand, E., Clegg, S.R., Kornberger, M. and Pitsis, T.S. (2004) 'Friends or foes? Practicing collaboration – an introduction', *Management*, Vol. 7, No. 3, pp.37–45.
- Klijn, E.H. and Teisman, G.R. (2000) 'Governing public-private partnerships: analysing and managing the processes and institutional characteristics of public-private partnerships', in Osborne, S.P. (Ed.): *Public Private Partnerships: Theory and Practice in International Perspective*, Routledge, London.
- Lave, J. and Wenger, E. (1991) *Situated Learning: Legitimate Peripheral Participation*, Cambridge University Press, Cambridge.
- Macmillan, S. (2006) 'Chronicles of the revolution', *Building Research and Information*, Vol. 34, No. 6, pp.600–603.
- Martin, J. (2002) *Organizational Culture: Mapping the Terrain*, 2nd ed., Sage Publications, Thousand Oaks, CA.
- McMillan, J. (1991) 'Dango – Japan's price-fixing conspiracies', *Economics and Politics*, Vol. 3, pp.201–218.
- Mooradian, T., Renzl, B. and Matzler, K. (2006) 'Who trusts? Personality, trust and knowledge sharing', *Management Learning*, Vol. 37, No. 4, pp.523–540.
- Nijhof, A., Karssing, E., Wirtz, R. and De Bruijn, T. (2008) *En nu Doorpakken! Gedragsverandering in de Nederlandse Bouwsector*, Van Gorcum, Assen, The Netherlands.
- Orr, J.E. (1996) *Talking about Machines: An Ethnography of a Modern Job*, Cornell University Press, London.
- Orton, J.D. (2008) 'Loose coupling', in Clegg, S.R. and Bailey, J.R. (Eds): *International Encyclopedia of Organization Studies, Part 2*, Sage, London, pp.833–835.
- Orton, J.D. and Weick, K.E. (1990) 'Loosely coupled systems: a reconceptualization', *Academy of Management Review*, Vol. 15, No. 2, pp.203–223.
- Parker, M. (2000) *Organizational Culture and Identity*, Sage, London.
- Pitch, M., Loch, C. and De Meyer, A. (2002) 'On uncertainty, ambiguity, and complexity in project management', *Management Science*, Vol. 8, No. 8, pp.1008–1023.
- Pitsis, T., Clegg, S.R., Marosszeky, M. and Rura-Polley, T. (2003) 'Constructing the Olympic dream: A future perfect strategy of project management', *Organization Science*, Vol. 14, No. 5, pp.574–590.
- Pollitt, M. (2002) 'Declining role of the state in infrastructure investments in the UK', in Tsuji, M., Berg, S. and Politt, M. (Eds): *Private Initiatives in Infrastructure: Priorities, Incentives, and Performance*, Edward Elgar, Cheltenham, pp.67–100.
- Porter, M.E. (1998) 'Cluster and the new economics of competition', *Harvard Business Review*, Vol. 76, No. 6, pp.77–90.
- Preece, J. (2004) 'Etiquette, empathy and trust in communities of practice: stepping-stones to social capital', *Journal of Universal Computer Science*, Vol. 10, No. 3, pp.294–302.
- Prencipe, A. and Tell, F. (2001) 'Inter-project learning: processes and outcomes of knowledge codification in project-based firms', *Research Policy*, Vol. 30, pp.1373–1394.
- Priemus, H. (2004) 'Dutch contracting fraud and governance issues', *Building Research and Information*, Vol. 32, No. 4, pp.306–312.
- Scarbrough, H., Bresnen, M., Edelman, L., Laurent, S., Newell, S. and Swan, J. (2004b) 'The process of project-based learning: an exploratory study', *Management Learning*, Vol. 35, No. 4, pp.491–506.

- Scarborough, H., Swan, J., Laurent, S., Bresnen, M., Edelman, L. and Newell, S. (2004a) 'Project-based learning and the role of learning boundaries', *Organization Studies*, Vol. 25, No. 9, pp.1579–1600.
- Senge, P.M. (1994) *The Fifth Discipline Fieldbook: Strategies and Tools for Building and Learning Organization*, Doubleday, New York.
- Sydow, J., Lindkvist, L. and DeFillippi, R. (2004) 'Project-based organizations, embeddedness and repositories of knowledge: editorial', *Organization Studies*, Vol. 25, No. 9, pp.1475–1489.
- Tajfel, H. (1981) *Human Groups and Social Categories*, Cambridge University Press, London.
- Transparency International (2005) *Global Corruption Report 2005 – Corruption in the Construction Sector*, Transparency International, Berlin.
- Van den Heuvel, G. (2005) 'The parliamentary enquiry on fraud in the Dutch construction industry collusion as concept between corruption and state-corporate crime', *Crime, Law and Social Change*, Vol. 44, No. 2, pp.133–152.
- Van Marrewijk, A.H. (2005) 'Strategies of cooperation: commitment and control in a megaproject', *M@n@gement*, Vol. 8, No. 4, pp.89–104.
- Van Marrewijk, A. and Veenswijk, M. (2006) *The Culture of Project Management: Understanding Daily Life in Complex Megaprojects*, Prentice-Hall Publishers/Financial Times, London.
- Veenswijk, M. (2001) *The Dynamics of Cultural Change in Public Organisations*, Rozenberg, Amsterdam.
- Veenswijk, M. and Chisalita, C.M. (2007) 'The importance of power and ideology in communities of practice: the case of a de-marginalized user interface design team in a failing multi-national design company', *Information Technology and People*, Vol. 20, No. 1, pp.32–52.
- Veld, R. in 't, Heuvelhof, E. ten and Bruijn, H. de (1998) *Procesmanagement: Over Procesontwerp en Besluitvorming*, Academic Service, Schoonhoven.
- Weick, K.E. (1995) *Sensemaking in Organizations*, Sage, London.
- Wenger, E. (1998) *Communities of Practice: Learning, Meaning, and Identity*, Cambridge University Press, Cambridge.
- Whitley, R. (1992) 'Societies, firms and markets: the social structuring of business systems', in Whitley, R. (Ed.): *European Business Systems: Firms and Markets in their National Context*, Sage, London, pp.5–45.

Note

- 1 Second Life is a 3-D online, global virtual world build by users of the internet. Users, called Residents, can virtually meet each other on Second Life, socialise, connect and create new aspects of the virtual world.