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Towards a Research Agenda on Clients and Users in Construction

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ABSTRACT

Both nationally and internationally, calls have been made for clients to become change agents of the construction industry and users have been promoted as co-creators of built facilities. Taking clients and users as a new analytical starting point for understanding building and buildings require a new research agenda. Thus, the objectives of this paper are twofold. First, this paper will map the organisational landscape of national client associations and international research networks on clients and users. Second, this paper will identify relevant R&D themes and questions to be addressed in future R&D activities. This study applied three types of methods: roll your snowball, consultations and personal experiences of collaboration with clients and users. The first key finding is that the organisational landscape is dispersed with most of the designated client organisations located in the developed countries. Secondly, the R&D themes addressed by practitioners include in generic terms legal, organisational and managerial issues, value and performance management, sustainability, digitalisation like building information modelling and building automation, and asset and facility management. From a theoretically informed perspective, this paper identifies three main areas for research and development on clients and users: 1) the dualism of agency/structure, 2) governance, and 3) innovation. In conclusion, the major challenge for generating and conducting research and development on clients and users appears to be bridging the more theme-based approach of client practitioners with the theoretically informed approach of academics in order to generate a fruitful collaboration between research and practice.

Keywords: Agency, governance, innovation, organisation, procurement

1. INTRODUCTION

Over the years, a number of public policies and reform programmes with an emphasis on clients – and less attention to users – have been initiated nationally and internationally to stimulate innovation in building and construction, in particular within the areas of performance improvement, building information modelling and sustainability.

National initiatives have been set up across the globe. In the Nordic countries for example, public policies have focused on the role of the client as change agent in construction. Another example is the UK where the third attempt – and by far the longest-lasting – to support a construction clients' group has illustrated how hard it is to persuade clients that they should fund and support something, which is not considered their core business. In South Africa, the Construction Industry Development Board (cidb) has developed a set of tools for procurement, delivery management and stakeholder management. In Australia, the Sustainable Built Environment National Research Centre (SBE nrc) is addressing the client role, among others through the priority area Driving Performance through Procurement.

In Europe, the European Commission has launched the Lead Market Initiative as a profiled supplement to the supply-side strategies dominating the European R&D programmes in general. The Lead Market Initiative aims at fostering the emergence of lead markets of high economic and societal value within six markets: eHealth, protective textiles, sustainable construction, recycling, bio-based products and renewable energies. The policy instruments include standardisation, legislation, public procurement and supporting activities. A central initiative is the establishment of networks of public procurers and contracting authorities in

order to stimulate innovation through public procurement or through pre-commercial procurement of products and services.

The role of procurement also plays an important role within United Nations who has produced several handbooks on procurement. The United Nations Office for Project Services (UNOPS) and the United Nations Environment Programme (UNEP) has in particular been active and published various guidelines towards improved procurement, in particular with regard to sustainable procurement.

Despite these initiatives, a core challenge is the need for a shift in focus from building as an end in itself to building as a means to achieve objectives related to the activities of the users in a building during its lifecycle. Achieving this shift requires a new research agenda to develop new conceptual frameworks of what constitutes clients and users as well as showcasing best practice.

The objectives of this paper are twofold. First, this paper will map the organisational landscape of national client associations and international research networks on clients and users. Second, this paper will identify relevant R&D themes and questions. The outcome of this study is intended to form the backdrop for developing a Research Roadmap on behalf of the CIB Working Commission W118 Clients and Users in Construction.

2. THEORETICAL FRAMEWORK

Gann & Salter (2000) provides an analytical framework for understanding construction as a business embedded in a context of both policy-making (the regulatory and institutional framework) and knowledge production (the technical support infrastructure). Inspired by the Triple Helix approach (Etzkowitz & Leydesdorff, 2000; Etzkowitz, 2003), Haugbølle et al. (2012) has elaborated and extended the model developed by Gann & Salter (2000) in two ways. First, the extended model distinguishes between building owners and building users. Second, the extended model suggest that the interactions between the various actors and activities in construction is not limited to knowledge flows as indicated by Gann & Salter (2000), but rather that these interactions take place through three different types of processes: 1) policy processes, 2) business processes, and 3) learning processes, which links government (black box), business (grey boxes) and academia (white box) together. The analytical model applied in this study is shown in Figure 1.

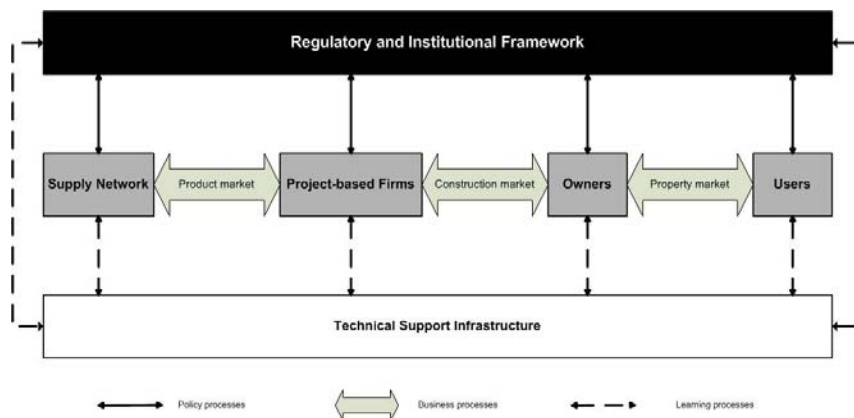


Figure 1 Theoretical framework. Source: (Haugbølle et al. 2012: 452).

3. METHODOLOGY

This study was conducted using a combination of three methods: roll your snowball, consultations and personal experiences. The first method applied was extensive web searches for client and user organisations, associations, networks etc. A simple search in for example Google will generate more than one billion hits on the search string “client” and almost seven billion hits on the search string “user”. Quite a significant part of this is associated with

computing, and more specifically the client/server configuration of computer systems. The term “client” is also used extensively within caretaking and the provision of a range of services like legal advisers, which are not necessarily linked to construction clients. Even a limitation of the search string to “construction client” or “building client” will generate around 200-400 million hits. Clearly, this data gathering method proved too cumbersome. Instead, the study has relied on the “roll your snowball” method (snowball sampling), which means that when the researchers came across a reference, link or similar to another group of clients, they have tried to follow this link. The drawback of this method is that one client group can only refer to another group if they know them or somehow make their acquaintance with each other known to outsiders. Undoubtedly, more organisations exist beside the ones identified in this paper.

Second, a number of consultations have been undertaken during a two-year period. The launch of these consultations took off with the CUBES workshop (Clients and Users in Built Environment Spaces) held in Copenhagen on 13 April 2011 with some 50 participants. A second round of commentary took place at a second workshop in Helsinki on 17 October 2011 in relation to the Sustainable Building '11 (SB11) conference. A third round of commentary took place at the CIB W118 Business Meeting in Montreal on 27 June 2012 in conjunction with the conference Moving Research Into Practice. A fourth round of commentary took place as a consultation webinar with a range of external stakeholders on 10 April 2013. The CUBES workshop and the subsequent consultations have crystallised and helped shape a number of research themes.

Third, this paper is based on the personal experiences acquired by the authors from working together with individual clients and client organisations over a number of years. Further, one of the authors has been the Acting Secretary of the International Construction Clients Forum, a network established by the CIB to encourage and support collaboration among client organisations across the world.

4. MAPPING THE ORGANISATIONAL LANDSCAPE

4.1 Associations and networks for practitioners

The landscape of client bodies is frequently changing as these arise and act for a short time often around a particular theme before being dissolved again. Thus it is not possible to present the landscape of client bodies in any definitive manner. For example a number of informal networks exist among public procurers in the Nordic countries within defence construction and postal services. Similar a number of time-restricted networks in relation to R&D projects emerge from time to time.

More permanent client bodies do however exist. In some countries, national associations or networks are established and committed to address client and user issues in a general sense. Further, local or regional networks exist with a more narrow scope on e.g. social housing or property management. Most of the designated client organisations are located in the well-developed countries and more specifically in the Northern part of Europe. These include:

- Sweden: The Swedish Construction Clients Forum.
- Norway: Norwegian Building and Property Association spanning the previous Construction Clients Forum, the association for key figures for benchmarking and the network for facility management.
- Finland: RAKLI – The Finnish Association of Building Owners and Construction Clients.
- United Kingdom: Construction Client’s Group at the heart of Constructing Excellence.
- Denmark: Danish Association of Construction Clients.
- The Netherlands: Dutch Forum of Construction Clients.
- Australia and New Zealand: Australasian Procurement and Construction Council Inc. (APCC).
- New Zealand: Construction Clients’ Group as part of the Construction Excellence initiative.
- South Africa: Construction Industry Development Board.

- USA: Construction Users Roundtable (CURT) and Construction Owners Association of America (COAA).

A number of other international practice-based initiatives and organisations are in place or emerging around the world. These include but are not restricted to the following:

- International Union of Property Owners.
- The European Consumers' Organisation.
- European Property Federation.
- CECODHAS Housing Europe – the federation of public, cooperative and social housing.
- Council of European Municipalities and Regions.
- ICLEI – Local Governments for Sustainability.
- International Construction Clients Forum – a network of client associations etc. initiated by CIB.
- PURE-net – a network for public real estate agencies.
- European Construction Technology Platform – the Advisory Group of Clients and Users.

The associations and networks mentioned have individually developed various sets of objectives and strategies. It is characteristic that only a few of these associations and networks have developed R&D programmes. Thus, the R&D activities seem to be more of an ad hoc nature than the result of strategic decisions. A second characteristic is that most of the R&D related activities as well as teaching and learning activities are strongly thematic in nature. Obviously the themes and headlines are formulated differently from organisation to organisation. In generic terms, the themes addressed by client associations and networks include:

- Legal issues like contracts, agreed documents etc.
- Organisational issues like lean, partnering and other types of collaborative arrangements along with integrated delivery systems.
- Managerial issues like process management, user involvement, health and safety, leadership, respect for people etc.
- Value and performance management like benchmarking and key performance indicators.
- Sustainable issues including energy and environmental performance of buildings and urban spaces.
- Digitalisation of the building process like building information modelling and building automation.
- Asset and facility management.

4.2 Research organisations

The International Council for Research and Innovation in Building and Construction (CIB) has established more than 50 CIB Working Commissions and Tasks Groups dealing with a broad range of subjects related to building and construction. Given the central and inclusive role of clients in the building process, the activities of all of the CIB Working Commissions and Task Groups will in principle be relevant to building clients. However, most of the Working Commissions and Task Groups take a more technical or supply-side perspective rather than a demand-side perspective. Some of these permanent Working Commissions and temporary Task Groups may address issues related to clients and users in various international contexts more explicitly without necessarily taking the client or user as the starting point of their activities or analyses. A range of permanent Working Commissions undertake activities relevant to clients and users, but are not restricted to:

- W065 Organisation and Management of Construction.
- W069 Residential Studies.
- W070 Facilities Management and Maintenance.
- W084 Building Comfortable Environments for All.
- W092 Procurement Systems.
- W096 Architectural Management.
- W110 Informal Settlements and Affordable Housing.
- W111 Usability of Workplaces.

- W113 Law and Dispute Resolution.
- W117 Performance Measurement in Construction.

Among the temporary Task Groups, the following execute activities and publish studies and analyses that could be considered relevant to clients and users:

- TG59 People in Construction.
- TG68 Construction Mediation.
- TG72 Public Private Partnerships.
- TG76 Recognising Innovation in Construction.
- TG84 Construction Reform.
- TG85 R&D Investment and Impact.

Other established international research networks and communities exist with a stronger focus on the operation of facilities like the European network for facility management EuroFM and the International Facility Management Association. Other networks focus on specific types of users, for example the European Network for Housing Research or consumers more generally like the Nordic Consumer Research Interdisciplinary Network ConriN. Several research institutes etc. at business schools or multi-faculty universities outside the typical boundary of construction-related research are working with issues related to consumers and users from a broader and more generic perspective.

Nationally, universities, national building research organisations and funding agencies pursue aspects that address clients' concerns. Similarly, many of the large construction companies undertake client research as part of their marketing to do with what product or method of procurement that they will offer. The advent of for example private finance initiative in the UK has meant that such companies are continually searching for new models of collaboration to offer to their customers.

5. MAIN RESEARCH THEMES

Taking the theoretical framework as a starting point, three main themes for research and development can be identified. The first theme is related to the classical agency/structure dimension or put differently how the individual construction actors can act freely or are bounded by structural or systemic constraints. The second theme looks at the construction system as such and addresses how governance can be exercised in the construction system. The third theme deals with how the system of construction may change or remain stable. More specifically, the three themes of agency, governance and innovation may deal with: 1) roles and responsibilities, 2) processes and mechanisms, and 3) change versus stability.

5.1 Agency: Roles and responsibilities

The major problem with regard to roles and responsibilities involves the belief whether clients can act independently to achieve their aim or whether they are always required to act in the way their environment expects them to act. The significance of this for practice is about how clients operate and how they are able to change. In academic terms this is related to the classical debate on the relationship between agency and structure (Giddens, 1984).

Put differently, do sociotechnical structures determine the behaviour of actors or are structures the result of human agency? Over time a range of different positions have evolved in sociology, philosophy etc. One main position is the structuralist position in which the agency of actors can largely be explained by reference to the socio-technical structures, which more or less determines what actors can and will do. In the opposite end of the scale, another position underlines the capacity of individual actors to determine the outcome of their actions. In between these two positions, a number of alternatives like constructivism (Berger & Luckmann, 1966) try to find a more balanced position between the two.

Based on a collection of papers from various theoretical starting points, Oudshoorn & Pinch (eds. 2003) show the creative agency of users in shaping socio-technical change as well as how agency is constrained by government regulations, gender relations etc. First, the collection of papers addresses the active role of users as well as resistance and non-use in

shaping socio-technical change. Second, focus is on the multiple collectives like advocacy groups and experts who attempt to speak on behalf of the users and the ways in which they represent the diversity of users. Third, focus is turned towards the multiple locations where the configuring of users in the development of technology is taking place. These locations include the design phase of a new technology, testing by clinical trials of drugs and the mediation process between production and consumption, in which mutual articulation and alignment of product characteristics and user requirements is taking place. In sum, although the collection of papers show the creative agency of users in shaping socio-technical change, the studies also show how agency is constrained by government regulations, gender relations etc. Along the same lines, Haugbølle & Forman (2006) have drawn attention to the multi-centeredness of clients/users/owners/facility managers etc. in a study of industrialised single-family housing. They show how users of single-family houses hold multiple perspectives, which are time-dependent in two ways: 1) coupled to the life-cycle of the building, as well as 2) coupled to the life-cycle of the actor.

In construction-related research, the work of Boyd & Chinyio (2006) is probably the most thorough example of recent work on the agency of construction clients. Boyd & Chinyio (2006: 26) developed a model for understanding clients, which in its basic version is shown in Figure 2. The model consists of two dimensions: 1) a means-end dimension that concerns change and time, and 2) a knowledge-and-process dimension that involves conception, communication and decision-making. The model involves three areas in which the client needs to be satisfied: the building, as an organisation and as people.

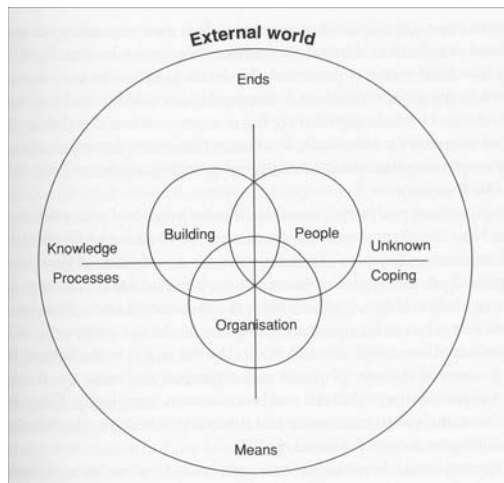


Figure 2 A basic model for understanding clients. Source: (Boyd & Chinyio, 2006: 27).

According to the Swedish Academy of Engineering Science (IVA, 1997), the client must maintain a broad spectrum of competences in order to manage planning, execution and operation of a building. The client role is defined through its relationship between supply chain (production) and the various stakeholders including the owner, the customer (users) as well as society in general. The client has the responsibility to identify requirements in particular those of the users, communicate these to the potential suppliers and selecting appropriate procurement framework. During the process it is the client responsibility to interact with supply side and stakeholders when necessary and finally take deliverable of the completed project, oversees its commissioning and its acceptance by users, and arranges for evaluations of performance in order to inform future projects. Thus, focus must be on the client's ability to handle the relationship with all stakeholders of the building, be they the owner, the customer, society or the building industry (see Figure 3). As the interface between users and supply side, the clients have a central role in developing the construction sector in to a demand-driven sector and providing a better user/client satisfaction.

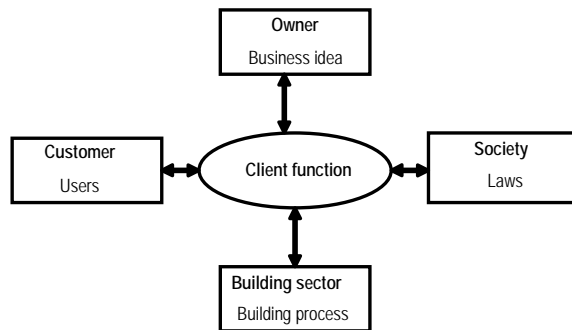


Figure 3 A framework on clients. Source: (Translated from IVA, 1997).

With regard to the dualism of agency and structure, this research theme raises a number of questions with regard to clients and users in construction:

- Map and compare the content and scale of clients' and users' value chains in various national and institutional contexts.
- Analyse how sociotechnical structures shape the roles and responsibilities of clients and users in construction.
- Develop a coherent model of what constitutes a client and a user under different structural conditions.

How do clients and users value buildings in terms of costs and benefits to their organisation and organisational development? A prerequisite will be for clients and users to be knowledgeable about their own values and needs, and to juxtapose, converge or otherwise position these in relation to other stakeholders. Thus, it is important to fully explore client needs and user values in different domains by mapping the content and scale of clients' and users' value chains in various national and institutional contexts.

A second core research question is related to how sociotechnical structures shape the agency of clients and users in construction. The ability of clients and users to influence the course of events is not only linked to their own will and wishes, but is shaped in part by their structural position, among others their roles and responsibilities. Public regulation, policy-making, market conditions etc. are among the conditions that shape the practices and behaviour of clients and users. Understanding the dualism between agency and structure is essential in order to identify the space for action available to clients and users.

A third core question to be addressed is the question of what constitutes a "client" and a "user". Understanding both terms and their various configurations under different structural conditions are imperative to develop theories and conceptual frameworks, which can be used to build a coherent model or even theory of clients and users. Viewed from a management perspective, the problem could be expressed as contingencies, convergence and contradictions in an organisation between the different roles and associated responsibilities. This will be essential to identify the client's and users' core competences and how these can be developed.

5.2 Governance: Processes and mechanisms

The main challenge with regard to processes and mechanism is how client organisations operate internally and collaborate with the external environment of suppliers, policy makers etc. Clients themselves are organisations but so are the bodies and agencies that surround them and who they supply. In academic terms, these issues of organisation, management, decision-making etc. is often referred to as governance.

Thus, the second research and development theme to be addressed is governance meaning the act of governing, which includes the rules, processes and mechanisms, and behaviour that affect the way powers are exercised (Bell & Hindmoor, 2009). Governance is a multi-faceted concept, which typically takes place at different levels: project governance, corporate

governance and regulatory governance, in particular for public clients and for urban developments.

In construction, focus may be on the client's ability to handle the relationship with all stakeholders of the building, be they the owner, the customer, society or the building industry (IVA, 1997). As the interface between users and suppliers, the clients have a central role in developing the construction sector in to a demand-driven sector and providing better user satisfaction.

One of the core processes for a client is the procurement of facilities and the associated services. For a number of years, the Working Commission W092 on Procurement Systems within CIB has discussed the proper design of procurement strategies and systems so as to ensure the best performance of the building. Rowlinson & McDermott (eds. 1999) provides a fine overview of procurement strategies and systems. First, the collection describes the background of W092 and introduces the key issues, which have emerged through time like procurement strategies and systems, contractual arrangements, forms of contract and the nature of the construction process. The second part deals with organizational issues in procurement systems with a focus on e.g. the client organization, strategic briefing, value management, organizational design and project success factors and organizational learning. In the third section, emergent issues in procurement systems are approached like the importance of culture, sustainability and the use of new web-based technologies. Finally, the anthology deals with procurement systems in practice in relation to partnering as well as methods and criteria for evaluating and selecting contractors. Gottlieb and Haugbølle (2013) provide an updated overview of new collaborative arrangements like partnering and public-private partnerships, which have been the main focus of much research in recent years.

With regard to governance, this research theme raises a number of questions:

- Analyse clients' and users' strategies, competencies and practices for procurement, management and use of built facilities in a life-cycle perspective.
- Assess different methods for involving users and stakeholders in decision-making processes on design, construction and operation.
- Understand the mechanisms behind successful/failed projects and why some tools etc. may be more appropriate than others.

The first research objective is to analyse clients' and users' strategies, competencies and practices for procurement, management and use of built facilities in a lifecycle perspective. The performance of built facilities depends on the behaviour and practices by clients and users, and vice versa. Insights into the differences and similarities of these strategies, competences and practices may provide researchers and practitioners with an improved understanding of the scope of action, useful inspiration on different approaches to solve problems etc.

The second objective is to assess different methods for involving users and stakeholders in decision-making processes on construction as well as operation of built facilities. These methods may include the use of new types of collaborative agreements like partnering and public-private partnerships in order to support a more demand-oriented construction industry. Other methods may be oriented towards managing the differences between customer needs and company objectives. To master existing methods and develop new methods for involvement and collaboration are instrumental for construction clients in order to provide more value for money to the customers.

The third objective is to understand the mechanisms behind successful/failed projects and why some tools etc. may be more appropriate than others. Studies of interactions and changes of processes and mechanisms are relevant because they are instrumental in bringing about sustainability, identify boundaries, managing information and developing briefing tools. Understanding the mechanisms and processes behind successful/failed projects are a prerequisite to develop appropriate guidance material for clients and users. For example how to manage the different phases in the early phases of the construction project and dilemmas like chaos versus planning, ideation versus rule-following etc.

5.3 Innovation: Change versus stability

The third research theme concerns how it is possible for organisations and systems to change. In particular, how is it possible for clients to innovate themselves as well as to assist the construction industry with their change process. Innovation is generally considered to be the key driver of improved wealth and welfare. Again this involves not just clients themselves but the system of organisations surrounding clients. In academic terms this can be seen as the implementation of innovation or a socio-technical transition. Thus, the third research and development theme to be addressed is innovation, or more generally speaking change versus stability.

Several definitions of innovation, technological change, technical development etc. can be found in the literature. One of the more authorised definitions is provided by OECD in its Oslo Manual (OECD & Eurostat, 2005). Compared to the two previous editions, the Oslo Manual now acknowledges four types of innovations: product, process, marketing and organisational innovations (OECD & Eurostat, 2005). The third edition of the Oslo Manual on collecting and interpreting innovation data defines innovation as (OECD & Eurostat, 2005: 46): *"An innovation is the implementation of a new or significantly improved product (good or service), or process, a new marketing method, or a new organisational method in business practices, workplace organisation or external relations."*

As Dodgson et al. (2002: 54-55) points out, analysts have dealt with four types of questions related to the nature of innovation activities, sources of innovation, innovation process and innovation systems. First, researchers have analysed the nature of innovation activities by asking questions on whether innovations are radical/incremental, continuous/discontinuous, has transience in its effects on existing ways of doing things, changes over life-cycles, are modular/architectural (systemic), results in dominant designs, or is sustaining/disruptive. Second, other approaches consider the sources of innovation which can broadly be grouped in the science-push model, the demand-pull model, and the coupling model. Third, approaches related to analysis of the innovation process include the chain-linked model, the innovation journey, and various innovation management approaches focusing on organizational integration, technology strategies and knowledge management. Fourth, approaches concerned with innovation systems has focused on systems of innovation on a national, regional, sector and technological level, analyses of networks to which firms belong, and the integration of complex product systems.

Within the demand-pull model, von Hippel (1986) has been highly influential in showing the importance of users in the development of new technologies. Von Hippel (1986: 791) has in particular introduced the concept of lead users: *"Lead users are users whose present strong needs will become general in a marketplace months or years in the future. Since lead users are familiar with conditions which lie in the future for most others, they can serve as a need-forecasting laboratory for marketing research. Moreover, since lead users often attempt to fill the need they experience, they can provide new product concept and design data as well."*

Innovation in construction has to recognise the systemic and complex nature of construction in order to succeed (Barrett ed., 2008; Gann & Salter, 2000; Gann, 2002). National public policies play a crucial role for innovation in construction as emphasised in an international review of the differences and similarities of national policies within different institutional regimes by Manseau & Seaden (eds., 2001). Stimulating innovation in construction is often attempted through various national reform programmes (George et al., 2004) or sometimes by using (public) procurement as a driver (Edler & Georgiou, 2007).

In construction, a notable internationally initiative is the establishment of the CIB Task Group 58 on client and construction innovation and the 'clients driving construction innovation' conferences in Australia (see e.g. Brown et al., 2005 & 2006). The quality of the individual papers notwithstanding, most of the contributions tends to focus on other subject matters e.g. information and communication technologies, sustainability or performance assessment rather than discussing the concept of the client and how clients act as change agents. Building on the conferences in Australia, Brandon & Lu (eds. 2008) has pursued the agenda of clients as

change agents in construction by collecting a range of papers addressing the context of innovation, the process of innovation and how to move ideas into practice. Behind the strategy of client as change agent, it is believed that the client through the choice of procurement methods, targeted goal setting, acting as a lead user etc. can have a decisive impact on the products and services from the building industry on behalf of the owner/end-user.

With regard to innovation, this research theme raises a number of questions:

- How can clients and users act as change agents of the construction industry?
- How do clients use buildings as instruments of change within their own client organisations?
- How will new technologies like BIM impact on clients and users?
- How can clients and users support the move towards a sustainable future?

There are at least two different dimensions with regard to innovation when it comes to clients and users. First, clients and users as change agents may induce change in the construction industry. In recent years, policy makers have advocated for construction clients to take on a greater responsibility for stimulating innovation through (public) procurement of construction products and services. However, this strategy seldom addresses some of the underlying dilemmas being faced by construction clients. The first dilemma is related to the issue of who will benefit from any extra effort from the client side. For most one-off clients the incentives for stimulating innovation is hardly present. For repeat clients, the situation may prove different. However, both types of clients will meet a second dilemma, namely that of risk. Doing things differently compared to industry practice and standards inevitably increases risks. Thus, for example public construction clients will often be caught between two different objectives: secure safe spending of public money and taking on risks for adopting new technologies.

Second, buildings themselves are instruments in the hands of clients to change the very business of the client organisation. As clients come to build they are exposing their values about building to their organisation and of their people. These values alongside the industry standards and norms determine the means and ends of an engagement around change. The client change and building change is set within an external environment, which provides purpose for the change but also constrains it. Client satisfaction requires achievement in three areas: the building, the organisation and the people. When the client organisation is changing to meet some organisational aspiration, conflicts of purpose and conflicts of values often becomes apparent.

A third question is related to the role of new technologies and what impact they may have on clients and users. New technologies and methodologies like building information models, lean construction and integrated project delivery offer a range of new opportunities and threats to clients and users. Opening the black box of technology and establishing a library of case studies may provide deeper insights into the potential of new technologies and how these may be utilised appropriately.

A fourth group of questions may address how clients and users can support the move towards a sustainable future. Clients play a particular important role with regard to procurement of sustainable buildings and refurbishments, while the behaviour of users has an equal importance with regard to the operation of buildings. Providing insights, showcasing best practice and developing new guidelines and simulation methods could be valuable contributions towards a sustainable future.

6. CONCLUSION

This paper provides an overview of the organisational landscape of national client associations and maps a number of international networks for practitioners as well as researchers.

Further, this paper identifies a range of R&D themes addressed by practitioners, which in generic terms include legal, organisational and managerial issues, value and performance management, sustainability, digitalisation like building information modelling and building automation, and asset and facility management.

From a theoretically informed perspective, this paper identifies three main areas for research and development on clients and users. The first research area is related to the classical dualism of agency/structure or put differently how individual construction actors can act freely or are bounded by structural constraints due to their roles and responsibilities. The second research area is occupied with the construction system as such and addresses how governance can be exercised in the construction system, companies and projects through different processes and mechanisms. The third research area deals with innovation or how the system of construction may change or remain stable.

In conclusion, the major challenge for generating and conducting research and development on clients and users appears to be bridging the more theme-based approach of client practitioners with the theoretically informed approach of academics in order to generate a fruitful collaboration between research and practice.

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