

OVERCOMING BARRIERS TO INNOVATION: DEMONSTRATING AN ARGUMENT IN FAVOUR OF COMMUNICATION ARENAS

Susanne Engström¹

¹ Luleå University of Technology, Division of Structural and Construction Engineering, SE-971 87
Luleå, Sweden

Continuous development efforts including steady-state innovations are necessary for such purposes as of improving short-term performance. However, there is also the need to enable more radical renewal, where development efforts typically stretch beyond the single-project milieu. Supplier-led innovation towards e.g. affordable, sustainable building constitutes such an example. To open up for more radical renewal, one implication of an earlier proposed innovation-barrier/enabler model is the need for sustainable client-contractor arenas for communication, enabling the continuous re-thinking of current experience and understanding by allowing for clients' and contractors' different/conflicting meanings to surface and interact. In Swedish building such arenas seem to be lacking. Underpinning the argumentation is previous research addressing barriers for supplier-led innovation from theoretical perspectives of organizational information-processing and descriptive behavioural decision-making. To better understand the significance of suggested arenas, data were collected in three steps. First, representatives of a building company were interviewed about their personal views regarding barriers/enablers for supplier-led innovation and what primarily determine clients' accept/reject of the builder's standardized system solution. Second, the building-company representatives met with representatives from three client organizations for a round-table discussion concerning barriers to innovation and sector renewal, and means to overcome. Finally, follow-up interviews with building-company representatives sought to capture personal reflections following from foregoing discussion. Collected data were analysed in relation to the previously proposed model, thus simultaneously developing the model and making it more accessible to building practitioners. Cross-analyses of interviews and client-contractor discussion revealed multiple gaps of understanding. Furthermore, to open up for innovation challenging steady-state it is suggested that both client organizations and contractor organizations need to pay close attention to how meanings and understandings are formed and shared within as well as between organizations. A subsequent implication is the need for a more systematically employed communication arena, stretching beyond the short-term project milieu.

Keywords: client, communication, contractor, innovation

INTRODUCTION

Government reports have, for decades, called for innovation initiatives in the construction sector, and the demands for construction renewal is ever increasing in Sweden as well as in other European countries. Continuous development efforts including steady-state innovations are needed and necessary for such purposes as of

¹ susanne@ltu.se

improving short-term performance. However, following from the challenging goals set by the EU and by local governments regarding the built environment, targeting e.g. carbon dioxide emissions and energy use, more radical innovations and renewal are also called for. In Sweden, the need for better provision of affordable housing is another longstanding issue in the construction innovation debate. To meet renewal challenges like these, development efforts typically stretch beyond the single-project milieu.

Contemporary examples of innovation initiatives initiated and undertaken well beyond the single-project milieu are the supplier-led innovation initiatives loosely brought together and referred to in Sweden as "*industrialized building*", "*industrialized construction*" and "*systems building*". Unlike steady-state innovations that can be developed and implemented within single projects, building on current knowledge and being about "*doing what we do but better*" (Phillips *et al.*, 2006 p 177), industrialized building has been found to encompass novelty in many different areas (e.g. new methods of building, new forms of organization and cooperation within the building process, and new technical solutions, c.f. Engström 2012) and subsequently challenge current practice and previous experience in the Swedish building sector (see e.g. Engström and Hedgren 2012). Emerging from these circumstances are challenges relating to client decision-making and information processing. These challenges may, in turn, help to explain why the up-take of industrialized building in many countries has been slower than expected and why building-clients' ability to take a leading role in driving innovations has been called into question (as discussed by e.g. Hedgren and Stehn 2014).

Previous research addressing these challenges (e.g. Levander *et al.* 2011; Engström and Hedgren 2012) has aimed to understand and describe client information-processing practices and decision-making relating to supplier-led innovation, discussing also potential barriers to such (radical) innovations and means to overcome. The purpose of the current research efforts is to provide opportunities to test how these suggested means for overcoming barriers to innovation can be employed in practice by providing a simple, tentative communication arena in terms of a round-table client-contractor meeting. Included in the analysis are also practitioners' reflections and understandings of innovation barriers and enablers.

As the title of the paper states the intention is that of demonstrating an argument in favour of communication arenas as means for overcoming barriers to innovation. The importance of communication as a core feature in the context into which building innovations are introduced (together with inter-organizational relations, work collaborations, power distribution and the project-based nature of construction) has previously been acknowledged by Harty (2005). Moreover, communication (between individuals, functional departments, areas of expertise, organizations, etc.) is implied for all the means to overcome barriers to radical innovation suggested by the previous research discussed in this paper. Indeed, an important note to make already at the outset of this paper is that although communication arenas are argued to be means for overcoming innovation barriers or, phrased differently, to support overcoming inertia in the particular context, the intention of the argument is not to normatively point towards any such arena as "*solving the problem*". Rather, a critical position is advised, as specifically discussed in the end of this paper.

SUGGESTED MEANS TO OVERCOME BARRIERS TO INNOVATION IN CONSTRUCTION

Stemming from a tentative model presenting barriers and enablers for clients managing information to unblock supplier-led innovation (Engström 2012 p. 59) the following suggested means to better understand and overcome barriers to innovation are discussed:

- i. Enable for different meanings and interpretations to surface and interact.
- ii. Mind the impact of project framing.
- iii. Mind the gap between the main organization and the project organization.

Enable for different meanings and interpretations to surface and interact

As a decision-making approach to cope with innovations and novel decision situations, the aim to reduce uncertainty, i.e. absence or lack of information as defined by Galbraith (1973), has been strongly questioned. For example, in a conceptual paper building on decision theory, Dinur (2011) suggested that in novel decision situations mechanistic decision-making rules do not apply and to rely on cognitive rules of thumb (i.e. heuristics) based on previous experience and expertise is not advised.

For innovation and in situations of novel decisions, research taking an interpretive approach to decision making and organizational information processing (e.g. Neill and Rose 2007; Dinur 2011; Levander *et al.* 2011) has, in addition to absence/lack of information, also acknowledged the human problem of managing multiple meanings and conflicting interpretations, i.e. equivocality (Weick, 1979; Daft and Lengel 1986).

Levander *et al.* (2011) found that equivocality was a more prominent issue relating to industrialized building than was uncertainty for the clients they studied (professional Swedish multi-dwelling property owner organizations with a long-term owner interest). Furthermore, the clients did not appear to be organized to manage equivocality (*ibid*) which would according to Daft and Lengel (1986) include the seeking of clarification, problem definition and agreement through the exchange of different opinions and subjective views (rather than by the seeking of answers to explicit questions in order to reduce uncertainty). Similarly, Weick (1995) stated that confusion stemming from multiple meanings calls for social construction and invention and rich, face-to-face, communication (c.f. Daft *et al.* 1987).

Given the high level of client equivocality concerning industrial building that was identified, a subsequent suggestion by Levander *et al.* (2011) was that the current information-processing practice did not support investment decisions in new-build concerning new-to-the-client alternative for new-build such as, in this case, industrialized building. Levander *et al.* (2011) also highlighted better facilitation of client-contractor communication in the process leading up to the investment decision to support clarity, agreement on meaning and shared understanding concerning new alternatives.

Engström and Hedgren (2012) proposed that client organizations that did choose to invest in supplier-led innovations have an organization that overcomes barriers to adoption by enable equivocality to surface and interact with their decision-making process. This proposition, concurring with suggestions made by e.g. Neill and Rose (2007), was further addressed and tested by Hedgren and Stehn (2014). They found their results supporting the proposition by Engström and Hedgren (2012). Examples of practices described by client organizations interpreted by Hedgren and Stehn (2014)

as enabling equivocality to surface and interact with clients' decision-making process include; interacting with suppliers and contractors on a continuous basis; involving many different functional departments and engaging contractors early in the pre-tendering phase to exchange ideas; and support learning between projects for development and change by frequent and close dialogues between internal (cross-functional) and external participants.

From research on human decision making it has also been suggested that the more information the decision maker lacks the more likely it is that he or she will rely on heuristics i.e. simplifying strategies and cognitive rules of thumb (c.f. Tversky and Kahneman 1974) to fill in the information gaps and simplify information processing (March 1994). Generally these cognitive rules of thumb are helpful for making inferences within a given population or context to which the decision maker's experience apply. However, in situations where innovations imply a break with current knowledge and practice, the cognitive rules of thumb can be misleading.

More recently, Beamish and Biggart (2010, 2012) in their research on diffusion and failed innovation in the commercial building industry found that social heuristics i.e. shared rules of thumb for making critical decisions could be helpful for addressing psychological as well as economic and social uncertainty. On the other hand, they also concluded that for example the interactional stability that these shared models helped generating, simultaneously contributed to a situation where practitioners "*resisted novelty in exchange for consistence, predictability and social accountability*" (Beamish and Biggart, 2010 p.38).

In addition to cognitive and social rules of thumb presenting barriers to innovation Engström and Hedgren (2012) observed organizational barriers to innovation in terms of practices among Swedish construction clients that instead of facilitating the re-thinking of heuristics further sustained inertia through e.g. policies, decision criteria and project risk-management protocols. Reductionism approaches, i.e. reducing equivocality by avoiding it or making simplifications, can according to Neill and Rose (2007 p.311) "*promote inertia and tunnel vision*", and subsequently be negatively associated with clients' ability to manage information for decision making on supplier-led innovation as proposed by Engström (2012). On the other hand, Neill and Rose (2007) concluded that when the decision-making process is exposed by multiple meanings and conflicting interpretations, this can release the organization from reinforcing the status quo and thus allow for innovation beyond current frames of reference. Neill and Rose (2007 pp. 306) further suggested that "*superior decisions are best arrived at when multiple meanings can interact rather than when differing views never surface*".

Mind the impact of project framing and the gap between the main organization and the project organization

The construction sector is typically described as project-based with project activities and responsibilities de-coupled from the main (business) organization (c.f. Dubois and Gadde, 2002). Similar to the organizational barriers previously discussed, the project setting provides the framing for managers to reduce the number of conflicting meanings and interpretations which support communication during the course of the project. At the same time, fewer meanings and interpretations will surface and project management to meet the project goals may stifle innovation as discussed by e.g. Koskela and Vrijhoef (2001).

Keegan and Turner (2002) also discussed the dominant idea about the project/innovation interface that neglects minding of the innovation by remaining mainly to be concerned with managing the project correctly. On analysing the innovation-related behaviour of a client known for "*best practice*" Ivory (2005 p. 868) noted that the client behaviour of reducing risk and costs for the organization in the short-term, project context, simultaneously tended to "*weed out innovation*".

Engström and Stehn (forthcoming) also concluded from a construction project case study where a process innovation were to be implemented that the decoupling of activities and responsibilities between project development and project management created meaning-making gaps between the client business organization and client project management organization, presenting a barrier to innovation by hampering its proper implementation (see also Engström, 2012).

METHOD

To better understand the potential significance of communication arenas suggested as means to overcoming barriers to innovation, a very simple client-contractor communication arena in terms of a round-table client-contractor meeting was tested in collaboration with a Swedish building company. This activity was undertaken as part of an industry development project focussing client receptiveness of innovations when innovations are developed and introduced to the Swedish construction market by a contractor. During the length of the project (on which the researcher spent approximately 200 hours during 2012-2013), several other activities were undertaken in and together with the contractor. However, data referred on discussing the argument were collected in three steps:

5. First, five representatives of the building company were interviewed (semi-structured interviews) about their personal views regarding barriers/enablers for supplier-led innovation and what primarily determine clients' accept/reject of new-to-the-client industrialized building-system solutions. The representatives were initially selected in cooperation with the marketing manager based on them being perceived as having key-positions in relation to a targeted radical product and process innovation recently introduced to the market (fictively named here "*The New Alternative*", TNA). These key-positions included the marketing manager, the market and business manager of TNA, a marketing and sales communicator, and a person with responsibilities related to business concept development. Following from a suggestion made by the market and business manager of TNA, an additional person was included representing the part of the organization managing construction projects from initial sale to building completed, thus working directly with the implementation of TNA.
6. Second, the building-company representatives met with representatives from three client organizations who were invited by the researcher to participate in a round-table discussion concerning barriers to innovation and sector renewal, and means to overcome. The client organizations were selected by the market and business manager of TNA to represent three different clients, i.e. an in-house client, a private developer and a public client. All clients were represented in the round-table discussion by two persons each.
7. Finally, follow-up interviews (semi-structured) with building-company representatives after the round-table discussion sought to capture personal reflections following from discussion during foregoing steps, including both previous interview talks and the round-table client-contractor communication.

Collected data were analysed in relation to the previously proposed model comparing interviews and client-contractor discussion and relating reflections made by respondents to the three parts of the argument (i-iii) as presented above.

RESULTS AND ANALYSIS

Enable for different meanings and interpretations to surface and interact

During the interviews with the contractor representatives, their views of the clients' views were discussed. As clients during the workshop shared their different understandings on innovation in general and about TNA more specifically, conflicting interpretations generated questions which, in turn, were reflected upon from multiple perspectives. The round-table discussion revealed that some of the assumptions that the contractor representatives had articulated during the interviews about clients and what they were perceived to value did not properly match what the clients themselves highlighted during the round-table discussion. Cross-analyses of interviews and client-contractor discussion revealed multiple gaps of understanding. One example that all the contractor representatives reflected upon during the follow-up interviews were how they had, in different ways, simplified the view of client value and how they had lacked deeper insight into why clients actually value the things they say they value. These reflections implied that the contractor representatives had developed a new understanding following from the round-table discussion.

The marketing manager also reflected on the perceived conservatism previously (during the interview) having been attributed to clients. After listening to and discussing with the clients and the other contractor representatives during the round-table discussion the marketing manager concluded that when introducing innovations they themselves in the contractor organization are also exposed to a great deal of uncertainty and tend to make interpretations and draw conclusions based on previous experiences. *"We think we know things and act accordingly. It prevents us from actually asking questions and to challenge our assumptions"*.

Furthermore, during the round-table discussion client value was addressed from both the perspective of the TNA and the clients' businesses in a more general sense. For example, different interpretations and meanings of functional requirements came to be highlighted. When moving back and forth between the general functional requirements, the expected solutions (based on clients previous experience) and the reasons for clients to expect adaptations of the contractors offer (communicated through potential future costs or losses expected by clients if the solution is not provided) a revised understanding of client requirements emerged. One of the contractor participants in particular reflected on how previously having had difficulties understanding why small adjustments beyond the TNA offer would be *"such a big thing for the client"*. From the contractor and TNA perspectives, these required adjustments were understood as mainly emerging during the project causing implementation problems and, in the end, contributing to very little added value to the client. However, as became apparent during the round-table discussion, some of the specific requirements were not emerging project specific needs but generic and, in fact, associated with highly valued business related functions, including for example the management of future costs. Insights like these triggered questions during the round-table discussion (and afterwards) which were stretching well beyond the specific, single project, e.g. questions regarding potential future directions for the continuous development of TNA and strategies for future market-niche approaches.

"Tradition" and "building culture" enforced by "everyone, from the joiner to the engineering expert, doing what we have always done in the same way" was a barrier to innovation being highlighted at the end of the round-table discussion. As a response to how this barrier best could be overcome, the participants suggested that; "a continuous dialogue between clients, contractors and other stakeholders, including different roles, areas of expertise and responsibilities is needed"; and "good examples needs to be shared and discussed". As the participants perceived such dialog to scarcely happen on any regular basis, the opportunities for it to happen in the future was also discussed. One suggestion was that "there is a new generation of project managers and builders emerging who are potentially representing a new building practice and new values where change and development is considered to be something positive [as opposed to a threat]". The suggestions made for improvements resembles well those practices understood to enable for equivocality to surface and interact with clients' decision process, also being the practice employed by early adopters of innovation in the study by Hedgren and Stehn (2014).

Mind the impact of project framing and the gap between the main organization and the project organization

At the end of the round-table discussion, two of the client representatives concluded that in order to support supplier-led innovation within contractor organizations, as well as supporting innovation in their own organization, they *"could be much better at frequently communicating to contractors our vision and what we value from a client business perspective "*. One of the client representatives added that the same goes for internal communication since people from different functional departments have different knowledge and understanding of building, project management and business-related things.

A reflection made by the marketing manager, the market and business manager of TNA and by the marketing and sales communicator during follow-up interviews were that rather than associating emerging questions and detected meaning conflicts as being part of a vital process of learning from project experience to support further developments of the innovation, they all thought that project management personnel rather seem to associate emerging questions during implementation of TNA with innovation shortcomings. This since the traditional alternative (bespoke services as opposed to a predefined building product offer) newer would have caused project management having to manage these communications, inflicting with project progress according to plan by calling for engagements with both clients and representatives from their own business organization. The round-table participants also agreed on that they missed having hands-on project personnel participating in the discussion to access their perspectives and understanding.

Client-contractor communication was also further discussed from the perspective of different representatives with different roles and responsibilities within the client and contractor organization. The importance of *"within client-organization communication"* was highlighted in order to bridge the gap between client personnel working in the project organization and those working in the business organization. A similar gap was also recognized in the contractor organization and, as the marketing manager concluded, taken together this presents a multiplicity of client-contractor interfaces where communication takes place and different understandings and meanings probably surface and interact. Although, not in any well-coordinated way.

A couple of other experiences from the round-table discussion further support the above notion. One reflection made by the marketing and sales communicator was that it became very clear that some of the client and contractor representatives had been interacting and discussing some of the issues relating to the topic of the round-table discussion previously during a construction project. They appeared to share some understanding from project interaction that the others lacked. *"It also becomes clear to me now how seldom we [in the business part of the organization] actually sit down and talk with clients"* the marketing representative concluded.

From a collective contractor-participant perspective, the round-table discussion and the interpretations of the TNA made by clients woke questions concerning how the innovation actually is understood by other functions in their own organization and subsequently communicated to clients. And the other way around, how the TNA as understood and communicated by clients impacts on the project organization's understanding of the innovation. These reflections in turn led on to further discussions concerning the communication infrastructure within the contractor organization.

The final reflection made and discussed during the round-table discussion was that experience, although generally regarded as something positive, not always is. *"What is the right experience, one must ask, previous building experience can be a barrier to innovation and change"*. During the follow-up interviews the marketing and sales communicator concluded that it was the client represented by people with very little previous experience from building that were closest to the market and sales communicator's own understanding of the innovation discussed.

CONCLUSIONS AND DISCUSSION

Even this very simple communication arena demonstrated that by enabling people with different perspectives to meet and for their different interpretations to surface and interact, taken for granted assumptions can be questioned and new questions can emerge. This in turn can facilitate for new answers to be sought and rules-of-thumb to be revised.

From the interviews and the round-table discussion it also became clear that the client-contractor interface is not just one interface but several. The schematic illustration of client-contractor interfaces in figure 1 was created to illustrate the gaps of understanding, meaning-making and interpretations highlighted during interviews and client-contractor round-table discussion. The round-table discussion revealed the perception among client and contractor representatives that there is a need for some sort of communication infrastructure (or communication arenas) to bridge the gaps between the business organization and the project organization within the client organization, as well as within the contractor organization.

To open up for innovation challenging steady-state it is suggested that both client organizations and contractor organizations need to pay close attention to how meanings and understandings are formed and shared within as well as between organizations. However, for renewal to take place limited, ad hoc activities are not enough. A subsequent implication is the need for a more systematically employed communication arena, stretching beyond the short-term project milieu. However, facilitating for communication that enables for multiple meanings and conflicting interpretations to interact does not necessarily mean that barriers to innovation are overcome. While the round-table discussion proved to support a more common understanding of things discussed, and even to support development of some new

understandings, bridging gaps between different roles, functional departments and people belonging to the main (or business) organization and others belonging to the project organization is not easily facilitated for within the current fragmented construction context.

To dig deeper into the matters discussed in this paper, institutional theory of innovation and organizational learning theories might provide powerful tools to support further understanding of the development and adoption of supply-led innovations in building.

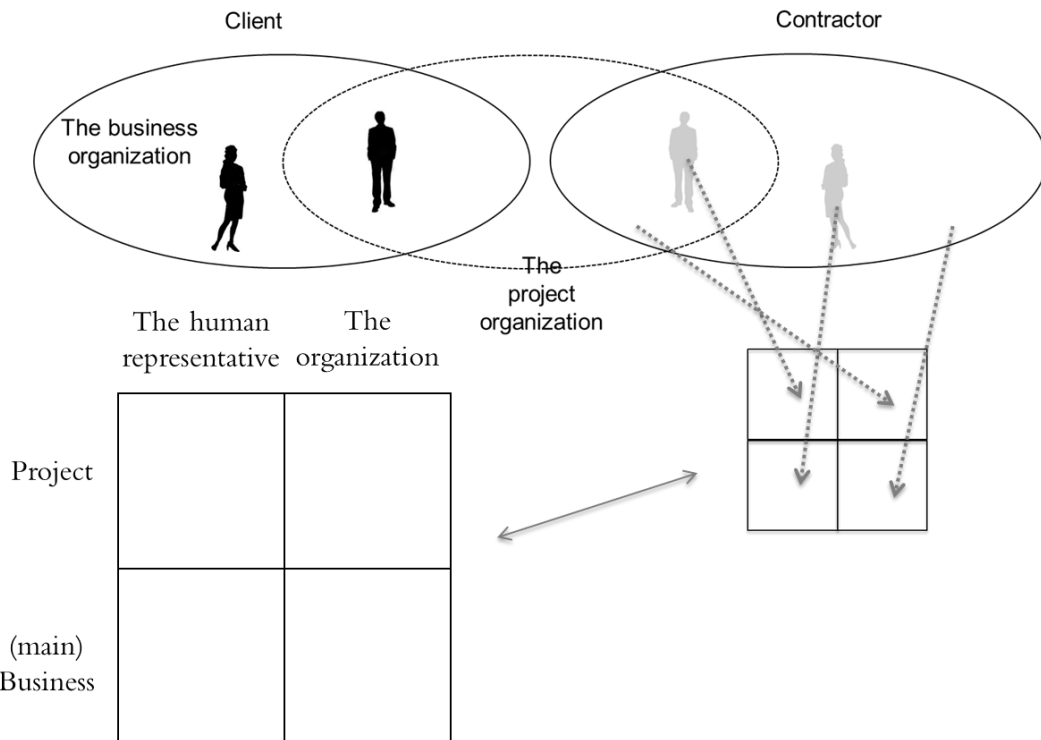


Figure 1: Client-contractor interface as not one but several interfaces.

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