

# TOWARDS IMPROVING CLIENT-CONTRACTOR COMMUNICATION IN INDUSTRIALISED BUILDING

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Criticism of the building sector in Sweden, concerning for example high cost and poor quality, has led to a growing interest in industrialised building. However, the effect on the sector and the overall building market is still quite insignificant. One business challenge for industrialised building companies to face in order to become more competitive is to further improve client/market interaction, improve mutual understanding and to reduce uncertainties in client relations. In this ongoing work the communication between industrialised building companies and building clients is examined. The aim is to identify important points of client-contractor communication that affect project outcome and present barriers to effective communication. In addition to a literature review, with the aim to define 'effective communication', the client-contractor communication in different building projects has been studied. Empirical data was collected through interviews and workshops, observations and project-specific documentation, addressing both clients and contractors. The results indicate that, in order to improve client-contractor communication, it seems important to assess if a barrier to effective communication is client uncertainty, and concerned with lack of information, or if it is client equivocality, which requires richer information rather than more information. The barrier must then be addressed accordingly. In the industrialised building context, client-contractor communication is probably distorted by lack of market/client knowledge concerning the industrialised building process, but also by previous experiences from traditional building.

Keywords: client, communication, industrialised building, uncertainty

## INTRODUCTION

Criticism of the building sector in Sweden, and demands for change concerning for example high cost and poor quality, have been put forth by society, researchers and the sector itself (Egan 1998, Winch 1998, Josephson and Hammarlund 1999, SOU 2000). The demands for changes to improve the building industry have resulted in a growing interest in what the building industry can learn from the experiences and methods developed within the manufacturing industry (Howell 1999, Koskela 2000, Diekmann *et al.* 2004). One of the more significant results of such benchmark is the development of industrialised building as a niche market within the Swedish building sector (Lessing *et al.* 2005). However, the effect of industrialised building on the building sector and the building market in general is still quite insignificant.

A business challenge for industrialised building companies to face in order to become more competitive is to further improve client/market interaction, to improve mutual understanding and to reduce uncertainties in client relations. This is a multi-level challenge. Firstly, timber is the predominant framing material for many industrialised

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building companies in Sweden and these companies are challenged with the task of convincing the market that timber is as sufficient as concrete and steel (Johansson and Sardén 2008). Secondly, industrialised building companies strive towards replacing craftsmanship with repetition, variation with control, and a major gain for industrialised building companies resides in the planning of operations. Consequently, the building process must become clear, robust, and possible to control and manage. Due to this, industrialised building companies face a different set of demands in order to carry out the building task, than is traditional building companies, and accurate and timely delivery of information from the client is of great importance. Lastly, but not least, the building culture is closely related to the onsite, project-based setting, as it is the norm and traditional way of 'doing things' in the sector (Höök 2008). Existing means of control were therefore also developed to fit this traditional, non-industrialised, building context, which presents a special communication challenge to the industrialised building companies in changing the frames of reference.

In this research, the communication between industrialised building companies and clients on the building market is examined. The aim is to identify important points of client-contractor communication that affect project outcome and present possible barriers to effective communication.

The reported research is part of a larger study focusing on the client's role in industrialised building in Sweden. Industrialised building generally involves different levels of onsite and offsite activities, (Höök and Stehn 2008). Different types can be distinguished; (i) offsite prefabrication of materials and parts, (ii) prefabrication of components and subassemblies, and (iii) up to 80 % of the total work completed offsite in a factory environment (Höök and Stehn 2008), see also Gibb (1999). In this report, unless explicitly stated otherwise, all of these types are included in the term industrialised building, while items that are never considered for onsite production (level 1 of offsite according to Goodier and Gibb (2007)) are included in non-industrialised building, further referred to as traditional building.

Empirical data in this ongoing work, preceding a larger survey-study, was collected during the period November 2008-April 2009 through interviews, workshops, observations and project-specific documentation, addressing two building client organisations (representing a public and a non-public organisation) and two building contractor organisations (representing different types of industrialised building: one working with elements in solid wood technique, and the other one with volumes in traditional timber frame technique). The interviewees addressed at these organisations were: three CEOs, one marketing manager, one project manager, five project leaders, two structural engineers and one head of installations. During the interviews and workshops, a total of 13 different projects were addressed, featuring small and large client organisations, public- and non public client organisations and new and returning clients. Data was also collected through observations and the study of project specific documentation at one of the building projects, including (for example) client-contractor meetings and inspections.

## **CLIENT SATISFACTION AND CLIENT SURPRISE**

The key to business success is client satisfaction, and according to Winch *et al.* (1998) the key to client satisfaction is twofold; the client must understand why changes it has not initiated have taken place, and also the client must understand the full implications of the changes that it has intended.

Winch *et al.* (1998) and Winch (2002) suggest a combination of the gap model (Parasuraman *et al.* 1985) and the model of project as an information process (Winch *et al.* 1998), that distinguishes four problems to be solved for minimising the project performance gap between what the client thought it was going to get and the client's perception of what it actually got. The smaller that gap Winch *et al.* (1998) state, the smaller the level of client surprise and the greater the level of client satisfaction. The project performance gap is closing as the four other gaps in the model are minimised. According to Winch (2002) that is the minimisation of:

- the briefing problem, i.e. turning the client's desire for a built product into a clear brief
- the design problem, i.e. exploring options and translating the client's brief into a complete definition of the building
- the planning problem, i.e. turning the definition of the building into a complete description, encompassing detail design and project planning, that allows construction to actually start
- the execution problem, i.e. realising the facility so that it conforms to the complete description

Winch (2002) states that there is little overall benefit from solving one of these problems extremely well, but failing on the others. According to Winch (2002) there has in the end of any building project "inevitably been changes", and the key success criterion is therefore not to match the original statements in the client's brief, but to make sure that differences due to these changes do not come as a surprise to the client.

Over time and as the building project progresses, information flows and major decision points are passed, points at which the flow is narrowed and uncertainty significantly reduced (Winch *et al.* 1998).

## **CLIENT UNCERTAINTY AND CLIENT EQUIVOCALITY**

From early work in psychology, uncertainty has come to mean "the absence of information", implying that as information increases, uncertainty decreases (Daft and Lengel 1986). Galbraith (1977) also defines uncertainty as "the difference between the amount of information required to perform the task and the amount of information already possessed by the organisation". To reduce uncertainty Daft and Lengel (1986) argue that organisations need to ask a large number of questions, acquire information and learn the answers. An important assumption here is that the people, supposed to ask the questions, work in such an environment where questions can be asked and answers obtained, i.e. that data can be acquired so that tasks can be performed under a reduced level of uncertainty (Daft and Lengel 1986).

However, an organisational situation can often be interpreted in more than one way, participants can be in no position of knowing what questions to ask, or the situation can be such that there are not clear answers to the questions being asked (March and Olsen 1976). In such cases, instead of uncertainty one rather has to deal with a situation of equivocality, meaning ambiguity (Daft and Lengel 1986). According to Daft and Lengel (1986), low uncertainty is then about having access to the data that answers questions, while low equivocality is about being able to define which questions to ask.

## **COMMUNICATION**

Communication is commonly defined as the transference of meaning from one person to another (Berlo 1960) and is known to be affected by such things as beliefs,

attitudes, values and knowledge. It can also be defined as the formal and informal sharing of meaningful and timely information between organisations (Anderson and Narus 1990).

The process of communication can be thought of as a flow, and problems occur when this flow is blocked or deviated. This is a matter of getting the message through, overcoming transmitting and semantic problems (Weaver and Shannon 1959), but it is first of all a question of sending the correct message in order to receive intended effects from the communication process. That is, if the wrong message is sent, even if correctly interpreted the outcome in the sense of effective behaviour and actions will be omitted. Winch *et al.* (1998) argues for example that closing the gap between the client's requirements and the client's brief, i.e. solving the briefing problem, is made possible by improved communication and complete involvement of the client, The client's previous experiences of similar projects and the clear understanding of its own requirements are also vital (Winch *et al.* 1998).

Uncertainty, in the meaning of absence of information, can be decreased by facilitating high amount of information. Reducing equivocality is instead a matter of enabling debate and clarification and therefore 'richness of information' rather than 'information amount' is the key. Following the discussion of Daft and Lengel (1986), information is defined as "the ability to change understanding within a time interval". Communication transactions are considered rich when they can manage to overcome different frames of reference, or change ambiguity into understanding. Communication media differs in their capacity to process rich information due to: their capacity to provide immediate feedback; the number of cues and channels utilised; the level of personalisation; and language variety. Media well-suited for reducing uncertainty is therefore not optimal for reducing equivocality, and vice versa (Daft and Lengel 1986).

### **Effective communication - a suggested definition**

Following the previous discussion, effective communication is in this research defined as:

*The timely transference of meaning by sharing understandings and meaningful information between supplier and customer (i.e., contractor and client) for such purposes as to close the project performance gap, reduce uncertainty, reduce equivocality, avoid client surprise, and increase client satisfaction.*

Barriers to effective communication are defined as such factors that obstruct effective communication as defined above.

## **IMPORTANT POINTS OF CLIENT-CONTRACTOR COMMUNICATION**

In the interviews the interviewees were asked what they considered to be important points of client-contractor communication, affecting project success or failure. The points identified were represented by a stage in the building process (pre-tendering), by a document (tender), by client's decisions (acceptance of tender and approval of building documents), and by activities (coordination on site and final inspection/delivery). The compiled results from the interviews were further discussed with representatives from each organisation one-by-one, and also in two workshops where all organisations were represented. The results are summarised in table 1. In the table, the most common or severe problems, i.e. barriers to effective communication, that the interviewees associated with each important point of client-contractor

communication are also summarised. The barriers to effective communication are further discussed in the following section.

*Table 1: Compiled results from interviews and workshops concerning important points of client-contractor communication, affecting project success or failure.*

Important points of client-contractor communication for project outcome	Related problems, possible barriers to effective communication, identified by interviewees
Pre-tendering communication:	Contractors often not/not always part of pre-tendering stage.
a) Briefing	Client's previous experience/knowledge of building/ industrialised building (in wood).
b) Preliminary design/ specifications of needs	a) Client's ability to capture end-customer(s)', and other significant stakeholders' needs, i.e. quality of stakeholder analysis and analysis of needs, including market analysis to identify possible future buyers and their needs.
c) Tender documents	b) Client's ability to translate needs into a specification. c) Client specifies non-essential/non-value adding features or, is not specifying essential/value adding features.
Tender	Contractors often not/not always part of pre-tendering stage. Client's previous experience and knowledge of building/ industrialised building (in wood). Public client/public procurement regulations. Type of contract/potentially low degree of influence over choice of actors/project participants.
Acceptance of tender	a) Client's understanding of what he is buying when accepting the contractor's offer.
a) Client's acceptance of contractor's offer	b) Client-organisation's understanding of the buy, i.e. is the tender representative for the actual needs?
b) Internal communication of tender/offer in client-organisation	c) The production's understanding of what sales have sold, i.e. are production engineering documents representative for what the client is buying?
c) Internal communication of offer in contractor organisation and translation of offer into production engineering documents	
Approval of building documents	Contractor's ability to communicate so that the client and the client's organisation clearly understand what will be delivered, as well as the client's ability to assess building documents.
Coordination on site	Client's/coordinator's understanding of the effects on the building process of logistics and coordination on site (landscaping and foundation vs. building).
Final inspection/delivery	Mismatch between the completed building and the client's requirements. Completed building fit the description of the building, but not the client's requirements or the needs of the client/client's organisation/end-users.

## BARRIERS TO EFFECTIVE COMMUNICATION

The important points of client-contractor communication as well as the problems and barriers to effective communication identified by the interviewees (see Table 1) are not generally new, and neither are they unique for industrialised building. To improve communication and/or to reduce uncertainty, the significance of knowledgeable

clients and building actors brought into the design process earlier has for example been discussed previously by numerous researchers (Barrett and Stanley 1999, Micelli 2000, Ryd and Fristedt 2007, Yu *et al.* 2007, Vennström 2008). However, the different building process, introduced by industrialised building, does also create some specific communication problems between actors. In the following paragraphs, the barriers to effective communication presented in Table 1 are further discussed.

### **The contractor not being a part of pre-tendering**

If the contractor is a part of the pre-tendering stage, face-to-face communication with the client and other stakeholders is made possible. This facilitates the handling of problems related to the client and other stakeholders being unfamiliar with industrialised building, i.e. facilitates the reduction of potential equivocalities due to the industrialised building process. This, in turn, supports the reduction of uncertainty before important decisions are made, concerning the brief. Interaction in the pre-tendering stage also gives the contractor a richer view on the requirements and the underlying needs as well as how clear the client's decision-making context is. This helps in reducing the design, planning and execution problem, and therefore possibly also the project performance gap. Consequently, if the contractor is not a part of the pre-tendering stage, the consequences of equivocality, as well as those of uncertainty, will need to be dealt with later on. This means that the level of changes, that needs to be undertaken during the latter parts of the building project, probably will increase.

### **The client's previous experience/knowledge of building**

The amount as well as the richness of information needed depends on who the client is. If the client experience high levels of equivocality, rich information is needed. But the problem of equivocality can be relevant even if the client by itself is not experiencing any equivocality. For example, if clients are very familiar with traditional building, the taken for granted in the traditional context might prevent them from asking necessary or adequate questions. How they understand the requirements for (inter alia) timely delivery of information and the contractor's deadlines concerning when changes are no longer possible (or not possible to a reasonable cost) is based on another frame of reference, i.e. another building process.

For other clients, who return to the same industrialised building contractor, the level of equivocality concerning the industrialised building context has decreased due to their previous experience. They might also have changed their means of control to fit the industrialised building process, as is exemplified by one of the contractors in this study. As the clients learn to ask the 'right questions', any uncertainty can be managed more effectively as the client is able to actively demand and collect information. As clients, or groups of clients, return to the same contractor for additional buys, there is also a potential for the contractor to learn more about the needs and requirements of that specific client (or group of clients), which also helps to reduce gaps and improve client satisfaction.

### **The client's ability to capture and translate stakeholders' needs**

Even if the contractor delivers according to the complete description of the building, closing the project performance gap is also a matter of properly satisfy the overall client organisation and the end-users. If the client's brief and the contents of the tender do not represent the requirements of the overall client organisation and/or the end-users, their requirements will probably not fit the completed building. Effective communication between client and contractor is therefore dependent on the effective

communication between the client and the client's organisation, as well as the effective communication between the client/the client's organisation and the end-customers. The client's ability to capture and translate stakeholders' needs is therefore also a factor to consider for a contractor that wants to improve client satisfaction.

The quality of the initial brief and the relevance of the demands in the tender are reviled as the project progresses and uncertainty as well as equivocality is reduced, following from the information exchange and interaction between actors that take place during the course of the project. In building, the closing of the project performance gap is traditionally, at least partly, handled by undertaking changes late in the building process. In industrialised building, however, changes might be impossible to undertake after certain points have been passed. Therefore, the quality of the briefing becomes especially important for reducing the project performance gap. The quality of the brief, together with the equivocality and uncertainty experienced by the client, is an important issue when contractors try to realise potential benefits from industrialised building that is gained from the standardisation of processes rather than from offering clients high degree of production flexibility.

### **Public client/public client procurement regulations**

The equivocality as well as the uncertainty may also lead the client to discriminate the industrialised building alternative, even if not intending to do so. It is argued by the sales manager and the project leaders at one of the industrialised building companies that “clients many times present to us a tender in which they ask for things we are unable to deliver to a competitive price, rather due to how they have formulated the question than to what they actually want”. They refer this problem to clients lacking knowledge concerning the industrialised building process, and possibly also the public procurement regulations, not supporting clients in buying from industrialised building companies. The CEO of the public client organisation does not see any problems of that sort as long as the clients are familiar with industrialised building and its peculiarities, and consider industrialised building as an alternative that must be possible to evaluate together with traditional ones. This indicates that the reduction of equivocality is most necessary to overcome the problem.

### **Type of contract**

In addition to the possibility of clients lacking knowledge concerning the industrialised building process, so could also be the case for other project participants. Due to the form of contract, building companies may have little influence over who they will cooperate with within projects. Contractors/sub-contractors and suppliers may not understand the importance of keeping within the set tolerances, which is essential when the house is assembled rather than built on site, and also the need to keep time-limits as assembly is not an easy to delay activity. This can increase the execution problem.

### **Acceptance of tender and approval of building documents**

If the client's tender documents do not address the important issues, the offer from the contractor most likely will not either, especially if the tender documents represent the first and only information passed from the client to the contractor. If the equivocality is high at this point, the process of reducing uncertainty by transferring information is probably also progressing slower, as there is little information-pull in terms of adequate questions being asked. Even if the written offer is assessed by

representatives from the client's organisation or end-users, the information richness is limited, and will probably not deal effectively with (high levels of) equivocality.

Within the contractor's organisation the offer to the client is translated into production engineering documents. One of the interviewed project leaders argued that if project leaders are not part of the preceding client-communication, the communication between sales and production becomes critical in order to deliver according to the clients wishes. Communication barriers of this kind might lead to clients not approving the building documents, or approving them on the basis of what was previously discussed with sales rather than on what is actually said in the building documents. In the latter case, solving the execution problem and closing that gap will not minimise the project performance gap.

### **Coordination on site**

Winch (2002) refers to the execution problem as “the moment of truth” for all the plans laid in the earlier phases of the building project. He exemplifies with problems such as: assumptions made may prove to have been optimistic or based on limited data; and design compromises may prove not to work in practice. Problems like these were also mentioned by interviewees in this study. As previously discussed, if sub-contractors and suppliers lack experience and knowledge on the peculiarities that may follow from an industrialised building process, where the house is assembled rather than built on site, this might affect the execution problem. If the coordinator also lacks experience and knowledge on industrialised building, there are little means to handle the problem. For example, in one of the building projects in this study the client and the contractor who were responsible for the ground work, decided on a new and improved solution. This improved solution, however, did interfere with the housing contractor's assembly of the pre-fabricated walls, which caused substantial problems in meeting cost- and time-targets.

### **Final inspection/delivery**

Is the client satisfied? This is, as stated earlier, the key to business success. As the previous discussion has shown, there are several possible barriers to effective communication during the course of the building process. At the final inspection the outcome is evaluated. Even if the building conforms to the full description of the building, and even if the description has been approved by the client as well as by the client's organisation, there can be a mismatch between the completed building and the clients' requirements (or the needs of the client's organisation or those of the end-users). As previously mentioned, a mismatch can also be due to that the building contractor has been unable to meet demands for change posed by the client during the building process. In addition, even if the client is satisfied, the project is not a business success unless it has been managed effectively by the industrialised building company.

## **CONCLUSIONS**

The need of ‘more information’ versus ‘rich information’ seems to vary with the progression of the building process. In addition, information exchange must be client-differentiated in order to reduce both equivocality and uncertainty in an effective and efficient manner, i.e. leading to high client satisfaction as well as an effective information- and production process flow.

The client-contractor communication in industrialised building is probably distorted by lack of market/client knowledge concerning the building process, but also by

previous experiences from traditional building. In addressing such barriers it is important to recognise that it might not be a problem that can be solved by increasing the flow of information, as there is also a need for handling the problems of equivocality. This might be relevant to reflect on whenever discussing the use of information technology tools in the interaction with different stakeholders. Actually, more information might lead to information overload and make it increasingly difficult for an actor to extract the information relevant to him or her, especially if the actor experiences equivocality (rather than uncertainty). To solve a problem of uncertainty using rich information and information channels, i.e. personal meetings and face-to-face communication, is on the other hand also inefficient as the amount of information that can be transferred is quite low, and the process is time-consuming.

Industrialised building companies want to exercise operations planning and control. Changes during the course of the project are therefore regarded as a problem, especially late in the process. Clients' need for process flexibility, i.e. the need for being able to make changes even late in the building process, might be related to equivocality in the beginning of the project concerning the end-customers' needs and the needs of the overall client organisation. It could, however, also be related to equivocality and uncertainties concerning the industrialised building process itself.

Clients that want to be able to consider industrialised alternatives, and gain advantages from standardisation of processes, must learn more about industrialised building. To better understand the process enables the client to ask the relevant questions. Together with the answers to these questions, this in turn enables clients to make more well-educated investment decisions. From the industrialised building company perspective, supporting the clients learning is possibly one of the more important activities to be undertaken in order to become more competitive. The clients must also be competent in producing high-quality briefs, reducing their need for process flexibility, or the way to work and interact with the contractor must change.

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