

Effectiveness of On-Site Communication in Residential Housing Projects

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Abstract –

Ineffective communication at work-front is frequently reported to hinder the successful delivery of construction projects. However, the efforts to address this shortcoming mainly revolve around adopting corporate communication strategies at filed-level. But, temporary nature of projects inhibits implementation of strategies developed based on permanent communication arrangement of established organizations. To bridge this gap, this study aims at understanding how effective communication is defined by construction professionals who manage construction processes on-site. Such definition determines requirements of an ideal communication system on-site and accordingly provides a measure to identify inherent characteristics of construction processes that compromise robustness of work-front communication. Finally, the input from selected construction professionals will be analyzed to map existing solutions to identified communication barriers. The mapping is essential to a) modify existing solutions to better overcome the associated communication obstacle and b) craft new solutions to tackle overlooked communication flaws.

As residential projects are known for their relatively simpler structure, they have been selected as the starting point of the attempt to modify project communication based on the constraints imposed by construction process. Semi-structured interviews were carried out with 10 construction professionals selected through judgmental sampling. It means that the research team picked one representative per residential building project based on overview of construction site, available personnel, and the likelihood of sharing the information sought in the study. Careful content analysis resulted in extraction of similarities, differences and trends from interview manuscripts that were required to deliver research objectives. The results surfaced nine attributes of effective communication on jobsite. Interestingly,

fitness of the communication medium for the purpose of transferred message ranked the most significant factor assuring integrity of the communication. Accordingly, our results show that although linguistics means is the most problematic communication medium on an active jobsite, dialogue within a crew is less vulnerable to failure. Lastly, analysis of data corpus revealed a trend towards creation of an informal communication protocol as a natural response to the lack of officially defined communication conduits.

Keywords –

Communication; Construction Site; Residential Housing

1 Introduction

Although the concept of communication has been studied for centuries, there is still prevailing confusion regarding the definition of communication [1]. Bubshait et al. [2] refer to communication as “a process by which parties assign and convey meaning in an attempt to create understanding.” Communication as a process comprises of several key elements: senders, encoding, the message itself, a transmission channel/medium, decoding, receivers, noise and feedback [3]. Senders encodes (creates) the message that will be sent through transmission channel/medium (e.g. email or text) to the receivers. The receivers then decodes (translates) the message received from the senders. The communication process is usually completed with feedback that is sent back to the senders.

Communication is an essential element of project management as it helps to ensure smooth and successful delivery of the project [4]. The several aspects of communication that need to be considered are namely a) Project communication level [5], b) Lines of communication in project management [6], and c) Methods of communication [7].

Ineffective communication during project execution

causes detrimental problems in terms of cost, project success and health and safety [8]. If problem caused by communication arises in the beginning of the project and is not fixed immediately, the cost and opportunity to fix it will become higher and harder as the project progresses through its life cycle. Although the importance of communication has been acknowledged, many studies report that ineffective communication is still one of the top reasons contributing to the failure of construction projects [9]. There are studies such as [10] that highlights the negative consequences of poor communication in terms of increased number of disputes in residential building. Similarly, [11] discuss ineffective communication in residential projects resulting in cost and schedule overruns. But, In particular, the communication mechanisms in domestic construction have been overlooked. Accordingly, this study aims to have a closer look at the communication architecture at the work-front of residential projects and evaluate its effectiveness to enhance project performance. To achieve these targets, 10 appropriate projects were selected by the research team and semi-structured interviews with project representatives were carried out. Judgemental sampling was preferred over random selection of projects as the research team anticipated that randomly selected participants may not provide honest answers to the sensitive questions regarding their communication and information sharing strategies. In other words, judgemental sampling was deployed to avoid unnecessary bias associated with people's inherent reluctance to share sensitive information with strangers.

2 Towards Effective On-Site Communication

This section reports the results obtained from the interviews. Firstly, to understand the importance of effective communication in projects in the housing industry, participants' perspective on the impact of effective communication on project performance was examined. Collectively, 19 different reasons, classified in six categories, were elaborated by the interviewees in support of the statement that effective communication is essential to project success. The most common category of response with six repetitions was the need for a mechanism to reliably convey correct and complete information among many stakeholders:

Participant 6: *“there is also chain of communication or instructions that need to be passed on from say the project designer to the project manager to the one who actually builds it on site. Of course there is also external consultants that need to be involved and hence*

effective, efficient and very smooth communication is essential.”

Other response categories highlighting that project prosperity rests on effective communication include:

- Communication is key to problem solving (frequency: 3).
- Conflict avoidance through enhanced communication (frequency: 3).
- Essential role of communication to foresee life-cycle requirements of the project (frequency: 3).
- Multi-agent nature of construction projects urges to improve communication (frequency: 3).
- Interruption to project is inevitable in case of communication breakdown (frequency: 1).

However, despite the stressed importance of communication, its reach, particularly on-site, is significantly tuned by the act of project management team. Accordingly, our participants were asked about their opinion on relationship between progress of on-site processes and degree of communication exhibited by the management team. In one way or another, all respondents mentioned that project management's communication skill consequently affects the “*chain of works*” at field. For example, Participant 2 explains how communication skills are implemented by the management team to fulfil client's expectations based on resources available at the work-front.

Participant 2: *“It [site management's communication skills] will affect the success. So the way the project manager handles clients and workers so that the project can run is very important.”*

The results indicate that three attributes of project manager role, mainly determine the extent of the communication taking place at the construction process level. Those three are:

1. Being the focal point to funnel information flow in- and out-wards the site boundaries. In the context of residential construction where referral projects are vital, satisfied clients will result in more opportunities. Therefore, in capacity of a mediator, project managers are to reflect client's message on site activities while reporting field constraints back to the client.
2. Offering a range of skills solidified by effective communication: Knowledge of and work experience in residential sector provide the foundation to the project managers to justify what they say.

3. Leadership provision and influencing project personnel by means of communication: Given their higher position in the project hierarchy, project managers' strategy in regard to utilisation of existing communication capacity determines the accessibility to the critical project information. It goes without saying that in case of smaller scale residential projects, the responsibility to keep workforce motivated rest solely on the shoulders of the project manager.

2.1 Elements of Effective Communication in Residential Construction

Careful analysis of participants' insight in respect to attributes of effective communication resulted in nine

pillar attributes listed in Table 1. The criterion to consider an element impacts quality of communication was the requirement to be mentioned by at least two of the participants. It is seen from Table 1 that there often exist competing forces such as completeness versus succinctness which eventually hinder effective communication. In other words, an effort to assure a message is complete may unintentionally results in less succinct statement. Another example is difficulty in utilizing the full capacity of existing communication routes if they are partially reserved to deliver frequently updated information. Therefore, depending on the occasion, elements of effective communications should be prioritized in an order that warrants the highest performance of the construction process in terms of productivity, quality and safety.

Table 1. Attributes of effective communication for residential projects

| Attribute | Frequency | Remarks |
|--|-----------|---|
| Communication medium fits the designated purpose | 7 | a) If a solution made on site, write it down and sign off b) Samples are provided for visual interaction c) Meet your client directly rather than sending email d) Table meeting are the most effective tool for problem solving |
| Clarity of message | 4 | a) Instructions need to be clear b) Unclear message creates confusion and delays work |
| Predefined routes | 4 | a) Structured chain of communication prohibits shortcuts b) Exclusive points of contact for urgent matters |
| Customized to the recipient | 3 | a) Deploy a style understandable to your target person b) Instructions need to be objective in a sense that everybody knows what it is saying |
| Completeness of the message | 2 | a) Drawings need to be complete |
| Succinctness of the message | 2 | a) Use less amount of words that explain the most amount of meaning b) Be to the point |
| Openness of the communicators | 2 | a) Be open to opposite opinions b) Be open to question if you've understood properly |
| Regularly updated message | 2 | a) Constantly report progress of project to every stakeholder b) Update everyone about the problems encountered on site |
| Responsive two-way interaction | 2 | a) Two-way means there is a response b) Feedback might be collected through other means such as monitoring requests for information or defects trend |

2.2 Tackling Communication Deficiency in Housing Construction

To better understand the root causes of communication deficiency on a jobsite, the research team provided participants the deconstructed communication model presented in Table 2. Each respondent was then asked to rank the most problematic component of each construct. Subjects highlighted in Table 2 show the items determined by the interviewees to be the dominant form of communication failures in their daily job. Interestingly, problems with informal transactions demonstrate the highly fragmented communication environment of smaller building projects. In fact, the tendency to deploy informal avenues even while formal arrangements are in place has been mentioned as main concern area in residential projects:

Participant 4: *“our client in this instance, really like to visit the project site every day without telling us. In my opinion, if they hire us or any other agencies to manage their project, they should have trust us to manage the project and*

they should not visit the site to give instruction to the workers themselves.”

On the other hand, associated with less organisational development of builders involved in residential housing, management of external affairs surfaced to be more challenging compared to handling of site issues. The fundamental differences between clients of housing projects compared to commercial or civil construction were expressed to be the root cause of failed external communications. In particular, clients' lack of understanding about construction was stated to hinder effective communication in many occasions.

Another key finding discussed in this section is the struggle of housing projects to adopt the most basic form of communication i.e. spoken language. This observation, however, doesn't mean that residential builders have mastered use of other communication media but it implies the fact that implementation of other methods is less vulnerable to error in the context of residential construction. In case of drawings, for example, the complexity of design is far less complicated compared to high-rise buildings which results in accurate interpretation of drawings when reviewed on-site.

Table 2. Bottlenecks of on-site communication

| Construct | 1 st order Metric | 2 nd order Metric | Example |
|-----------------------|------------------------------|------------------------------|---|
| Line of Communication | Formal | - | ✓ Method statement |
| | <u>Informal</u> | - | ✓ Casual quotes for the best price |
| Communication Reach | Internal | - | ✓ Negotiating sequence of work among trades |
| | <u>External</u> | - | ✓ Change orders from the client ✓ Acquiring legal permits |
| Medium | Linguistic | <u>Spoken</u> | ✓ Oral communication |
| | | Non-Spoken | ✓ Writing progress report |
| | Non-Linguistic | Spoken | ✓ Altering tone to express dissatisfaction ✓ Whistling to grab attention ✓ Laughter |
| | | Non-Spoken | ✓ Drawings ✓ Pointing ✓ Body language |

Definitions:

Formal: Structured channels officially enforced by the management

Casual: Unstructured personal links to selected partners

Internal: Matter of interacting with people present on jobsite

External: Sourcing information beyond site boundaries

Linguistic: Formation of statement using words and grammar consolidated under one particular language

Spoken: Interacting by creating voice uttered through the mouth

2.2.1 Barriers to Effective Communication

The research team were able to categorise seven most prevalent impediments to effective communication in a domestic construction setting into three main classes of a) Physical interruption, b) Language barrier, and c) Self-interest. The disruptive architecture of intra-project communication was notably the most detrimental aspect of physical barriers by counting for 27% of cases where interviewees mentioned about barriers to effective communication. Collected data suggests that a robust communication platform is an overarching one that is centrally developed and managed. An established system with explicitly defined links enables multiple users to draft their message in a standard fashion which is immune to noise, break down or information overload. Such a backbone system facilitates expansion of the communication matrix in a standard way when the project is growing or immediate responses are required to address dynamics of the jobsite.

Probably attributed to the more routine construction processes carried out in residential developments the dialogue between crew members is less vulnerable to language barriers. Our interview data reveals that even newcomers get used to jargons and slangs to refer to particular types of work in relatively short period of time. It was noticed that despite having different mother-tongues, the simplicity of the construction processes offsets the risk of communication failure even if broken common language (i.e. English) is used to exchange information at the work-front. With total weight of 13%, items of language barriers including jargon and different languages were the least concerning barriers among three recognized classes.

Self-interest, on the other hand was elaborated to count for the remaining 60% weight of significant barriers on site. Self-interest was found out to distort a message by compromising one's capacity as either receiver or sender. Selective perception, weighted 27%, deteriorates effective communication as the receiver tends to pick those parts of the message that are aligned with her/his self-interest. For example, labours interpret the verbal instruction in a way that results in less physical work usually by taking shortcuts. The same scenario applies to incomplete drawings allowing tradespersons make assumptions in their own favour. Oppositely, site personnel avoid initiation of a work-related conversation with people positioned higher than themselves in the hierarchy. This phenomenon, referred to as status block in the literature [12], identified to negatively impact site communication in 20% of occasions. However, status block isn't the only factor stopping field workers to send a message, in particular questing for information. To maintain a good reputation, rather than concentrating on the quality of outcome,

sometimes workers lean to promise "unrealistic goals" or to be the "smart Alec". Diverting the focus from construction process to self-image has been mentioned to reflect on accuracy of the exchanged information and consequently cause miscommunication. With similar 6.5% to the self-image barrier, site personnel's tendency to refine a message when acting as a mediator was recognised as the seventh common barrier to communication in domestic construction. Predominantly, if there is interest in hiding the information, refinement may be replaced by filtering. In either case, the spread of an altered message is a risk to communication.

2.2.2 Strategies to Alleviate the Barriers

Three tiers of preventive actions were extracted from responses provided by the interviewees. In fact, actions were grouped in different tiers based on frequency of their appearance as a practical solution to the issue of failed communication. The most demanding solution, sitting alone in tier 1 with 30% weight in terms of impact, is design of a robust architecture for site communication. The second tier incorporates regular update and proper documentation each with designated weight of 17.5%. The remaining five suggested solutions are grouped in the third tier given that they received the equal weight of 7% each. These five solutions include a) Maintaining clarity of information source, b) Confirming essence of the message with receiver, c) Provision of communication training, d) On-going discussion, and e) Development of ability to adapt. Figure 1 depicts how suggested solutions are mapped to the identified barriers.

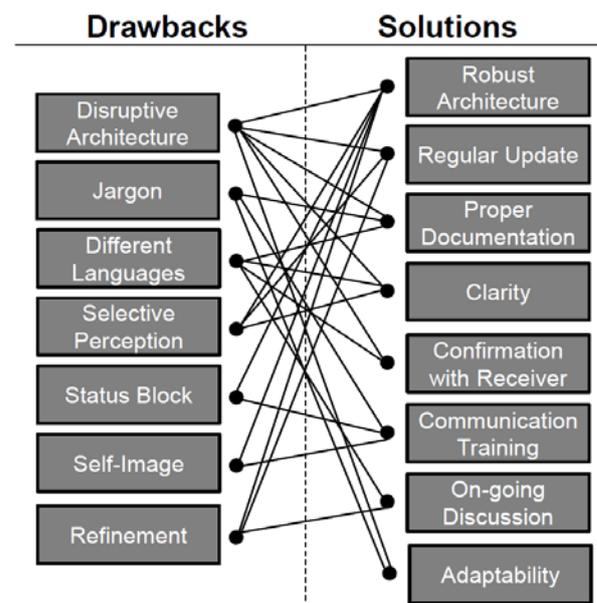


Figure 1. Potential impact areas of suggest solutions

3 Conclusion

Project management literature refers to communication as the key cooperative element for success. However, pattern of communication at construction projects specifically at field-level is not profoundly examined yet. Accordingly, this study evaluated the existing communication architecture that governs information flow at residential construction jobsites. For this purpose, 10 ongoing projects were targeted by the research team and a representative from each site was interviewed. The analysis of collected data depicted the critical impact of project managers on effectiveness of communication in housing projects. Consistent with the project management literature, participants emphasized the substantial role of communication in successful delivery of residential projects. But, to some extent, in contrast to large-scale projects where official conduits are in existence to connect different teams, shortcuts were found to dominantly portray the information links between stakeholders attending the site. Finally, eight recommended actions were extracted from the interview data to address communication deficiency in domestic construction projects. Through deeper understanding of characteristics of and barriers to effective communication, this research persuades practicing professionals in the industry to optimise communication in their projects.

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