Researching “Construction Client and Innovation”: pilot study and analysis

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Abstract

Clients or users of products, processes or services are being identified as the potential sources of innovation in research conducted in various sectors (e.g. IT, aviation, and laboratory equipment). At present there is concern about the construction client’s potential to be an innovation promoter within the construction industry. Several researchers have recommended proactive client involvement in construction. Within this background, the authors have designed a research with the aim of ‘improving the role of the client in promoting innovation’. In this context, this paper is an attempt to elaborate on the initial findings that emerged from the initial pilot case study

Keywords: Construction industry, Construction client, Innovation, Case study design.

1. Introduction to background of the research

Literature shows that there have been concerns regarding the level of innovation in the construction industry for some time despite having a considerable potential to be innovative [1, 2]. These concerns have motivated a number of researchers to conduct research on the innovation related issues in construction to identify solutions [3]. It was also identified that the lack of innovation is not caused by lack of capability but due to the lack of coordinated effort. Therefore there is a need for key personnel in the innovation process who can coordinate the team towards innovation using resources already available [4].

In the recent era, the construction client is looked upon as a person who can coordinate and direct the construction process towards innovation [5],[6]. Egemen & Mohamed [7] state that the “traditional assumption that clients only need projects which are completed within budget, on schedule and with a reasonable quality should start to change” implying a more proactive contribution is needed from the client for the development of the construction industry and its innovative outcomes.

Within this background authors have formulated a research with the aim of “improving the role of the client in promoting innovation” (see [8]). It is expected to derive answers to three main research questions that are ‘what are the roles and characteristics of client that favour innovation?’, ‘how do the identified characteristics effect innovation?’ and ‘what are the best practices that can be derived to promote innovations in projects?’. To cater for these research questions in line with epistemological, ontological and axiological assumptions, the authors have argued that the case study method is the best fit research strategy for this research. (see [9]).

After the philosophical stance and the research strategy the authors have moved on with the case study design, case study selection and execution of a pilot case study. The objective of this research paper is to highlight the criteria behind the case study process (section 2) and discussion of the main themes that emerged from the pilot case study (section 3). Finally the paper will be concluded with a summary and an introduction to the future direction of the research (section 4).

2. Case study design

“A research design is the logic that links the data to be collected to the initial question” [10]. Saunders et al [11] agree and further adds that the research design is required to satisfy the identified aim and objectives within the practical constraints where the constraints can be time and money etc. In the above section the authors have briefly introduced the background to the research design and how the ‘link’ between initial question and the data to be collected is established up to the research strategy selection. In this section the discussion on ‘link’ development is extended up to case study design. In the sub sections below the process is discussed briefly in logical sequence.

2.1 Definitions

As a first stage of the case study design the authors have developed working definitions for key elements of the case study design, which are discussed in following sub sections.

2.1.1 Case, unit of analysis and boundary

Construction is a loosely-coupled system with subsystems which are independent to a certain degree [12]. Further, the discontinuous and temporary project-based nature of construction presents a problem for the accumulation of knowledge [13]. Under this scenario, there is a risk that the knowledge and experience gained in one subsystem will not efficiently diffuse to other subsystems or to the whole system. Further, the temporary project-based nature hinders knowledge transfer beyond the project concerned. Under these circumstances the authors believe it is more effective to analyse the core of the knowledge. Therefore, the core; ‘the client’s role in innovation’ is being selected as the unit of analysis within the case of innovation of the project.

2.1.2 Innovation defined

Innovation; it can be a result of formal research and development or day to day problem solving [14]. A number of researchers have developed definitions for innovation. However in essence all the definitions refer to implementation of new products or processes that are new to the given context which yield an enhanced economic value [15-20]. In line with these established definitions the authors have adopted the 'application of knowledge to a given context in order to implement significantly new processes, products or management approaches that will lead to increase efficiency and enhance rate of return' as the definition of innovation for this particular research on innovation.

2.1.3 The 'Client' defined

Kometa et al [21] simply define the client as the one who pays the bills. The client can be an individual or an organisation responsible for financing the project. The authors agree with Kometa et al [21] and take the view of the client as the one who funds the project. However authors narrow the definition of client to member(s) of the funding body who directly interact with the project whereas the funding body can be an organisation or an individual.

In this research it is envisaged to study how the client interacted with the project in order to identify the client's role in the innovation. If the whole organisation is to be taken as the client (in a case of client organisation) the focus on this core issue would have been diluted. Further it would not facilitate the study of personal value of individuals as the focus would have been on organisational culture. On the other hand by narrowing down the definition of client to the individual level could enable the discussion on personnel traits and values. In addition, as a member of a larger organisation the "individual" will represent the overall organisational culture. Therefore, the authors argue that the focus on individuals rather than on the organisation is more suited and takes up the definition stated above for this research.

In this section the authors have highlighted the relevant definitions developed for the study. In the section below the discussion will be focused on the case selection aspect of the research design.

2.2 Case selection

The authors have selected the holistic multiple case study method as the suitable approach to case study design. Yin [10] identifies 4 types of case study - they are single embedded, single holistic, multiple embedded or multiple holistic in a 2 x 2 matrix. For a single case study to be justified the case should be critical, unique (or extreme), typical, revelatory or longitudinal case (see [10]). The authors do not intend to prove a well formulated theory thus this research does not fall in to the critical case criteria. Further, innovation is a common phenomenon thus cannot be argued to be unique or revelatory. Even though innovation is not unique, the context specific nature of construction leaves little ground to consider the typical case option. Furthermore, study the same case at different points of time is also not required as it will not add any value to

the achievement of aims and objectives. Thus this particular research cannot be justified as a longitudinal study.

The possibility of having multiple units of analysis within a case ceased with the selection of 'innovation' as the case, and 'client's role in innovation' as the unit of analysis; because of the none existence of two clients within a one case. Therefore, the authors argue the holistic multiple case study approach as the best fit method for this research.

In multiple case design, case selection had to be selected deliberately as one which predicts similar results or contrasting results for predictable reasons [10]. This approach in case selection enables the researchers to select cases that demonstrate characteristics which they are interested in [22].

To fulfil the aim of this particular research on 'client's role in innovation' it is required to select a case from a context where innovation is present or from a context where innovation is not present due to predictable reasons. However, authors have selected the option of 'context with innovation' because it provides comparable scenarios without the need of isolating other variables to achieve the objectives of the research. Further, it is also required to select a case with a high possibility of finding a well committed well interacted client.

In pursuit of the above requirements, authors have selected cases from the partnering or collaborative construction contracts. The partnering contracts provide opportunity for better communication, learning and innovation across supply chain [23]. The fact that 'innovation gets benefited from partnering environment' is well established in the literature [24]. Therefore, it can be argued that such an environment provides the client with better opportunity to participate in the innovation process more actively; thus there is a greater scope to study and reveal hidden knowledge regarding clients' roles in innovation within such environment. Further, the knowledge revealed from this study could also benefit the clients of projects where partnering is not the most suitable procurement method of delivery. In line with this argument authors have selected a project code named Project Y as the pilot case study. The background of the Project Y is discussed in the section 3.

In this subsection authors have described the process and arguments behind case selection. In the following subsection discussion is extended to data collection and analysis

2.3 Data collection and analysis

The researchers have devised the semi structured interviews as the main data collection method for this study due to its ability to facilitate in depth inquiry into the issues [10]. The interviews were conducted in two stages. In stage one, identified participants to the innovation (except clients' side participants) were interviewed to gather information related to the client's role in innovation and to identify 'what are the issues?'. The interviews were kept open ended to the maximum possible extent to make the interviewees feel free to express their views. The data gathered was transcribed and analysed to identify main themes or issues highlighted by the

interviewees. At stage two the clients were interviewed. Those stage two interviews were also semi structured open ended but took more focus on the themes identified with emphasis on 'why those happened'. This process enabled the researcher to gather an understanding of the issues in at least two distinctive perspectives as well as to triangulate findings to derive firm conclusions.

In this pilot study the data analysis was conducted using computer aided qualitative analysis software packages. The speed and rigour provided by these software as emphasised by Seale [25] is considered to be an advantage. Two types of software have been used in this study – namely *nVivo 2.0* and *Decision explorer 3.1.2*. The combination of software enabled the researcher to exploit the advantages of both for the successful data analysis. *nVivo 2.0* shows strengths in document or transcript management, coding and retrieval functions required for data management and analysis. It is, however, weak as a modeller which was then complemented by using *Decision explorer 3.1.2.*

The data collected from the pilot case was categorised or coded as initial step of data analysis (see [11]). General themes were identified from the set of data collected as well as from literature. These themes identified are discussed in the following section which includes a description of the background of the pilot case study; Project Y

3. Initial findings of the pilot study; Project Y

3.1 Project background

Case study Y is about the client's role in development and execution of an innovative repair solution to a condemned central pier of a bridge in North West of the UK. At the time the project team concerned in the case study took over the project, the bridge pier was expected to be completely demolished and a new pier to be reconstructed in its place as per the recommendations made by a third party. The recommendation was accepted and budget allocated for the reconstruction was also made available by the client organisation at that time. However, due to the possible disruption to traffic that would be caused by the reconstruction, the project team sought other ways of finding a solution to the problem. Through extensive value management and value engineering processes, a repair solution to the existing bridge pier using advanced concrete repair and cathodic protection systems was developed. Even though concrete repair and cathodic protection techniques have been in used for some time within the construction industry, using these techniques in a context where traditional reconstruction is expected had been considered to be an innovation. By challenging the established expectation of the bridge pier reconstruction the project delivery team managed to complete the project at a cost of £2.3 million saving approximately £2 million compared to original budget allocation.

Within this pilot case study three interviews were conducted. The Project Manager, the Designer and the Client were interviewed to gather data from diverse perspectives.

In the following sections findings and major themes revealed are discussed in a logical sequence.

3.2 Client as a manager of the innovation

This particular research on the client's role in innovation confirmed that the client is performing the basic functions of management which are planning, organisation, direction, and control [26, 27]. The client mobilised not only the innovation but the whole process of construction by planning and setting the scene for the project team to perform. The current literature identifies the client of a construction project as the initiator of most of the construction projects by identifying novel requirements to be delivered by the construction sector [28]. One of the interviewees in the study from the clients side stated "*What I used to do was to design the project in year 1 (one year before the construction). I also got innovation there because I got time to go up to other people in client organisation to get approval*" The planning and organisation for the innovation culture was done well ahead of the project to derive successful innovative outcomes. The importance of planning was further stressed "*What I need to do, research wise, is to bring that (innovation) forward and include it in my project. (if not) Lot of that is lost on ... sorted too late in the process*". The findings coincide with coordination role of the client that was stressed by Nam & Tatum [4], "they (clients) establish the mechanism by which the involved parties communicate and collaborate, make decisions on important technical matters throughout the project execution and sometimes share a high proportion of the risk".

The client takes an active part in the direction and control of the innovation process. "*I like to hear some good ideas and then say yes you can do that or no you can't do that depending on other criterion of the client*". The client's involvement in direct and control went beyond the initial planning of the innovation to the completion of construction. One of the other participants attests to the client's innovation director role "*Without doubt the client was behind encouraging the innovation*".

These initial findings enable the authors to confirm the managerial role played by the client in the process of innovation, by proving that the client inevitably performs the basic managerial functions of planning, coordination, direction and control in promoting innovation.

With this understanding of client as a manger the findings are further discussed below.

3.3 Roles of the client

The authors have thus argued that the client functions as a manager within the context of innovation. Within this section the emphasis is on the identification of specific roles played by the client within the context of innovation. As a structure for the analysis and the discussion, the authors have taken up the roles of manger identified by Mintzberg [26, 29, 30]. Mintzberg [26] identifies ten major roles of a manager within three broad categories which are interpersonal, informational and decision roles. In the following sub sections the role of the client will be discussed within these main categories.

3.3.1 Interpersonal role of the client

The activities or roles of the client that arise from formal authority and status are discussed within this subsection. The client's ability and willingness to be a team player was identified as one of the most important contributory factors to the innovation by the interviewees in the case study. Relationships built between client and the rest of the project team, strengthened by mutual trust and understanding and respect for people and clients' proactive approach resulted in highly satisfactory achievements. Participants to the project appreciated the team sprit of the client by stating "*it was precisely because of this interaction, trust and team work and I might say friendship that it worked so well*". The client admitted the team sprit that went beyond the professional members of the delivery team. "*I was invariably rubbing shoulders with the guy that did the painting. It was not a question.*" The mutual trust developed gave courage to other team members to make bold and inevitably risky decisions that formed the backbone of the innovation. "*Without doubt I can say that the client would have stood beside the team even if the project had failed*", stated the project manager.

Coordination is another important interpersonal role performed by the client. The client interviewed, overviewed the work involved "*it's not just me and the project team delivering Project Y. It is me working with various offline divisions delivering services to me so that I can deliver that product.*" The bringing in other offline divisions (divisions of the client organisation that are not directly linked to the project but essential, such as technical approval divisions) expedited the innovative solution. In the client's eye the innovation is essentially a "*departure to standard method of working*" which required an approval from the relevant division within the client organisation. The effective coordination mechanism set up by the client enabled the designers to directly liaise with relevant personnel in the technical division without going through the lengthy bureaucratic route. One designer recalled his experience regarding the dealings with offline divisions. "*It was just like talking to your colleague on next desk. OK, this is the idea, what do you think about this; and that's the way more or less we battered it from one side to another and knocked it into shape*".

The effective coordination mechanism established by the client helped to raise the innovation culture among the team members. Early contractor involvement was a key instrument behind the innovation outcome. One designer appreciated the client's effort by stating "*we are very lucky as the client actually funded these early consultations with specialist contractors who were able to convince the designers that new methods of working could actually solve this problem*".

During the interviews it was asked whether client can be seen as the driver of the innovation as it is a well debated topic among scholars. However, most of the participants were doubtful of considering the client or any one person as the driver but instead a collective team effort was emphasised. Even though the client half-heartedly admitted after some thought "y*es I like to think so (as a driver)...yes*" he went on to acknowledge the designers and specialist contractors as the main source of innovation.

3.3.2 Informational role of the client

It became evident that the client is engaged with a large amount of information processing and monitoring activities that have a bearing on the innovative outcomes.

The client's willingness to be kept updated with the scheme's development rendered positive outcomes. "*The client was so well up to speed about what we were doing. So they are able to sign things off very quickly for us*". However, it should be noted that the other members also played an important role in keeping the client updated. The project manager stated "*we kept the client informed from the day one*". The client also expressed gratitude for being allowed to be part of the scheme's development. "*I am also with them on site monitoring costs and everything else as it goes through the actual execution of the project*".

"*The client brought in … the knowledge about procedures and process (of client organisation) that we need to get through to get the project approved*" said the project manger. The client emphasised the importance of disseminating the knowledge of those procedures. "*I am well versed with the loops that we need to jump through to get the job from conception to completion. And I know which famous projects may be gone through which haven't quite worked*". The correct information leads the design team towards the correct goals that determined the project success.

3.3.3 Decisional role of the client

Within the context of the project the client was required to make decisions based on authority vested and the information received.

Any decision made regarding an innovation involves a proportion of the risk. Other participants were impressed with the client's ability to face that risk. The project manager complemented the client "*what we did at Project Y, was a quite bold piece of work to do*". The client also admitted that there was considerable risk involved but attributed the strength to face that risk on his experience and competence. "*As a professional engineer I keep up with the profession and I see what's going on out there in the wide world.*"

The client's ability to look forward at different angles was identified by the project participants as a major advantage. "*This particular project sponsor was a quite forward thinking man who was open to ideas and innovations*", stated the project manager. The client attested the statement of the project manager and further added "*the obligation is not just to take the obvious but to challenge (the present way of working) with a … risk and safety on board*". The vision of the client led the designers towards the innovative solution and the saving of considerable time and money.

Another one of the most valued aspects by the project participants was the timely decisions made by the client. However, project participants attribute it to the successful informational role of the client. The project manger stated "w*hat he didn't need to do is go away and then try and*

understand what we were asking" (because the client was well versed with the present development of the scheme). The designer stated "*they were quicker than what their procedure said*" appreciating the decision making efficiency of the client.

In this section the authors discussed the positive characteristics of the client and how they effected the innovation and the morale of other team members. In the next section effort is taken to identify areas where further improvement can still be made.

3.4 How can client improve in the role of innovation promoter

One of the designers of the project admitted that he is absolutely satisfied with the performance of the client, stating "*it would be very pragmatic or very picky (if you started to find fault with the client)*". Another participant identified inter-department relationships of the client organisation as a possible area of improvement. The client identified that they could have taken some action to prevent knowledge loss with the disbandment of the project team. "*I am not sure … lessons learnedt from that project, whether they are disseminated where they need to be within the client organisation*".

In the above sections the authors have discussed initial findings from the case study Y. In the following section the initial findings are summarised with an indication of the planned way forward.

4. Summary of findings and way forward

The study revealed that the client is performing a role of manager within the innovation setting. The ability of the client to be part of the project delivery team was highly treasured by other professionals. The development of mutual trust, coordination among various stakeholders, including in-house offline divisions of the client organisation, are valued contributions from the client. Even though the participants failed to identify the client as a source of innovation everybody acknowledged the client's contribution to setting the scene for the innovation. The knowledge brought in by the client regarding his organisation's internal processes and procedures together with his ability to 'ask the right questions' helped the design team to steer their design towards the correct direction. The study confirmed a correlation of the client's commitment and technical competency with the level of innovation which was identified by Nam and Tatum [4]. The commitment coupled with the technical background enabled the client in prompt decision making which was looked upon as a major advantage by the rest of the project team in developing the innovative solution. Even though the client managed the coordination between the project team and the in house divisions of the organisation, other participants identified it as a possible area of further improvement. The client identified that action should have been taken to preserve lessons learned for future use which is another burning issue within the construction industry.

The authors identified the collection of data from a further case study as an essential next step in the research. The data collected from a further case study will enable the researcher to carry out

in depth case data analysis as well as cross case data analysis which will improve the reliability and the generalisability of the findings.

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