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RECOGNISING AND REWARDING INNOVATION IN CONSTRUCTION: EXPLORING DISCONNECTIONS IN MANAGERIAL DISCOURSE.

Michelle Littlemore and Paul W. Chan

School of Built Environment, Northumbria University, Newcastle-upon-Tyne, Tyne and Wear, NE1 8ST

The construction industry has often been considered a 'low innovation' sector. This research seeks to understand more deeply the manifestation of innovation at the construction workplace and raises questions as to whether there is really a dearth of innovative practices in construction. A series of 20 interviews were undertaken with manager and workers across a typical construction supply chain. The interviews were supplemented by participant observations in a single case organisation. The inquiry process sought the stakeholders' interpretation of what innovation meant for them in construction, and explored the implications 'innovation' had on practice. The findings revealed the existence of a (misguided) sense of orthodoxy in the way the extant literature defined the concept of innovation. Accepted measures of innovation mean very little for workers who have to deal with operational realities of making the construction project work. Managerial interviews have highlighted their tendency for offering idealised accounts of what innovation means to the business and how innovation works. Conversely, the differing explanations by the workers show a distinct lack of recognition and reward for innovative practices in the industry. This research makes the case for a need to broaden the way innovation is conceptualised and measured.

Keywords: Hidden innovation, participant observation, .

INTRODUCTION

The motivation and rationale behind this study comes from the first authors frustrations experienced within the industry and the traditional, staid attitudes of the workers and management associated with different innovative ways of working. It is perceived that there is reluctance to change and a "if it isn't broken then don't fix it" attitude that stifles the industry. Further research into the subject of innovation demonstrated that the reasons for this were more than just attitudinal.

Innovation has often been seen as a positive thing (e.g. Fagerberg, 2005; Von Hippel, 1988). Yet, a lot of research directed at the construction industry has criticised this sector for its lack of innovation, Conventional wisdom suggests that the industry is doggedly resistant to new ideas and that the staid attitude of workers is hampering progress made in modernising construction despite commentators suggesting that increasing innovative practices in the sector can significantly improve the performance of the industry (Slaughter, 1998; Dulaimi et al 2005; Kroskela and Vrijhoef, 2001). Furthermore, numerous government reports appear to reinforce this rhetoric. When Sir John Egan published Rethinking Construction in 1998, his findings

reflected an industry that was underperforming, as he described construction as a sector typified by “low profitability and little investment in capital, research and development and in training”. As a consequence Egan set hard-hitting targets in areas of productivity, profits, defects, reduced accidents for the construction industry to achieve. Still, critics such as Woudhuysen and Abley (2004) claimed that very little has changed in the way of innovation in this sector!

So why does the construction industry have such a statistically low activity rate in innovation compared to other industries? (Robson and Ortmans, 2005) After all the construction industry is of great importance to the economy “the UK construction output is the second largest in the EU and contributes 8.2% of the nations GVA (Gross Value Added)” it also “consists of 250,000 firms employing 2.1 million people in a multitude of roles.” (BERR, 2007). The biggest reason for this £71 billion industry having “such a statistically low activity rate” is the disparity between industries when measuring the parameters of innovation. It appears that the term “innovation” has been “patented” by the industries that conform to a traditional measurable sequence of events i.e. Expenditure on R&D and Patents. Winch (2003) questions the evidence to support that construction is any worse, or better, than that of any other industry for the reasons that have been alluded to in this research. He argued that any measurement of innovation outputs do not truly reflect the transience of project-based construction that is characterised by the peculiarities of its production process. Consequently, Winch (2003) suggested that the unique nature of construction bears little relevance to the innovation types and strategies that are applied in other non transient industries, much of which features heavily in the official perspectives of what matters in terms of innovation.

There have been recent calls for reconceptualising the nature of innovation in construction, and in particular, the way innovation is measured in the sector. In *Innovation in construction: Ideas are the currency of the future*, the Chartered Institute of Building (CIOB) also maintained that the construction industry is innovative in its own right (Dale, 2007). Arguably, the construction industry does not lend itself to straightforward comparisons with other industries, and so specific measures need to be developed that can assess the level of innovative practices, volume and quality of ideas that will be appropriate in advancing the construction industry (Dale, 2007). Interestingly, The National Endowment of Science, Technology and the Arts (NESTA) use the term ‘Hidden innovation’. In their report *Hidden innovation: How innovation happens in six ‘low innovation’ sectors*, NESTA (2007) challenged conventionally narrow methods and definition of innovation, as they proposed that government and corporate policy-makers should acknowledge that “different sectors innovate differently” and that “much of the innovation occurring in construction is not captured in traditional metrics because it is developmental, incremental, organisational and interactive”.

Indeed, our understanding of innovation has often been driven by policy-makers in a top-down fashion. Therefore, the term ‘Hidden innovation’ is especially useful since it broadens the view to include innovative practices that might manifest across all levels of organisations including the grassroots. Specifically in construction, the temporary coalitions that are formed across the supply chain imply a need to examine how innovative practices actually arise in reality. It is this desire to expose ‘Hidden innovation’ in construction that sets the motivation for the study reported here. The

purpose of this paper is to present recent empirical research that exemplifies what 'Hidden innovation' in construction might look like.

In this paper, the salient points of the literature on innovation in construction will first be presented. What transpires from this review is the fact that the definition of innovation in construction remains contested, thereby creating problems in the measurement and meaningful enactment of the concept. The review raises a need to examine deeper the operation of innovation at the grassroots level of construction organisations. Leading on from this, the methodology employed in this study – a phenomenological inquiry involving a series of interviews and participant observation across a typical supply chain – is explained. Finally, the findings of the study will be discussed, revealing disconnections between managerial discourse and human action that often epitomises hidden innovation in construction.

Rhetorical debates of innovation

The embodiment of innovation is widely reported from a public policy and corporate organisational perspective. It is considered that innovation is the fundamental cause of longer-term productivity and performance which is a consequence of increased competitiveness, customer demands and new market areas. In short, innovation is the driver of growth in the economy and is also essential in determining the success of an organisation.

Accordingly, the government's role in the innovation process is to guide, create awareness, offer incentives and support organisations in their quest to become more innovative because, "Without the income generated and the taxes paid by companies and wage-earners in innovative firms, economies stagnate" (Dodgson, 2002). It is therefore in the government's best interest that businesses evolve to sustain a competitive market.

In the UK, the Cox report highlights how the world is fast becoming more competitive and states that there is a "competitive threat from emerging economies, notably India and China" (Cox, 2005). Cox (2005) surmised that there is a possible window of 5 to 10 years whereby the UK industry needs to develop its creative capabilities in order "to create a viable, attractive future for the UK economy" and keep ahead of a rapidly growing global economy. Despite the governments backing and incentives, Cox goes on to say that they can only "help prepare the track and remove some of the hurdles; it can't run the race." This statement supports Gordon Brown and Stephen Byers statement in The Budgets 2001 Consultation Paper, "Increasing Innovation", in which it was said that the government can only create the environment by which businesses can innovate but it is the businesses that need to "rise to the challenge of making the most of these opportunities". By raising the profile of the need for innovation, Cox reports that the government are hoping to achieve an 'enterprise economy' and inspire small and medium enterprises (SMEs) that have the potential, to provide and aspire to a continuous growth.

At the same time, the construction industry is known to perform poorly on traditional metrics of innovation (Winch, 2003). In the UK and elsewhere, this is often attributed to the fact that the industry is made up largely of SMEs that do not have the necessary resources to invest heavily in formal R&D. As a result, construction companies consistently under-perform in the introduction of new products and services, measured

by such indicators as volume of patenting activity (Robson and Ortmans, 2005). Moreover, the construction industry largely revolves around the project as the locus of production organisation, and so its transient, project-based nature implies a sector that is in the main localised. Metrics that attempt to provide global comparisons of innovation therefore, it would appear, makes little sense. Nonetheless, governments that continue to promulgate measurement metrics that determine levels of innovation for competitiveness have a vested interest in seeking to develop an innovative construction industry. Besides, the government remains a dominant client of the construction sector, constituting roughly 40% of construction output (Fairclough, 2002; BERR, 2007).

Of course, there is much scope for innovation to happen in construction. According to Nam and Tatum, (1997) the construction industry has the potential to be extremely innovative since it relies heavily on technology. A corollary of this is that there are opportunities in the sector for step-change to materialise, through development of new products, components and technological solutions. Moreover, Nam and Tatum (1997) noted that the industry depends on a multitude of stakeholders across its supply chains of fabricators, all of whom will have a specific expertise to contribute to developing innovative ideas and practices. Yet, somehow, the industry, at least in the UK, still lags behind in terms of Research and Development engagement. Sir John Fairclough, in his 2002 report on Rethinking Construction Innovation and Research, recognised this shortcoming and recommended companies to improve R&D policies and promote innovative practices in the sector. It would seem, however, the transference of such recommendations to practice has far from materialised. The industry is still perceived as backward and unreceptive to new ideas (Woudhuysen and Abley (2004).

Contestation of Definitions

Innovation is in itself a process that brings about change and it is from the research and observations of government, corporate and academic sources that its definition has evolved over time. Each of these definitions has its own nuance imposed upon it. Nonetheless there are common characteristics that are indicative to all recent definitions and that is that innovation is “new” and is something to be exploited so as to bring about change that adds value (DTI 2006; Cox 2005; Dodgson et al., 2005; Fairclough 2002). Categorically, innovation has been studied as a ‘thing’ or an ‘action’; researchers have often distinguished between product and process perspectives of innovation (Dodgson, 2005) However, much of the political measurements of innovation have centred on the measurement of the physical ‘thing’, e.g. how many patents have been filed or how much money has been spent on research and development activity? Innovation policy, at least at the political level, has often been framed in numerical terms, thereby ignoring the more qualitative understanding of innovation as a process.

Indeed, there is a sense of orthodoxy with which innovation is defined, usually top – down (Dale, 2007) which fails to value the potential of the construction sector to innovate (Barrett 2007). Critics like Woudhuysen and Abley (2004) are quick to identify problems with the sector and label the construction industry as backwards. Innovation, however incremental, also occurs from a bottom up perspective and is implemented by the workers on site. Yet there is very little research done at this grass roots level as innovations carried out on site are seen as “normal features of the

business” (Koskela and Vrijhoef, 2001) These events are not recorded and are regarded as ephemeral. The extant literature in the construction innovation literature has been largely opaque in terms of how innovation is defined and enacted at the grassroots. Despite the recognition by several scholars (Dulami, 2005; Koskela and Vrijhoef, 2001) to call for an investigation of innovation practices at this level, very little work has been undertaken to expose what this means or even how this is defined. Therefore, this research attempts to uncover ‘Hidden innovation’ in construction by examining how a typical supply chain recognises and rewards innovation across various levels of the organisations involved.

METHODOLOGY

The methodology employed in this study follows a phenomenological inquiry. In attempting to expose ‘Hidden innovation’ in construction, the researcher collects qualitative data through a series of 20 semi-structured interviews and participant observations that co-produces constructs of innovation together with the research subjects. The lead researcher (also the first author) is also an active participant observer within a product manufacturing organisation that serves the construction industry. She has worked in this organisation for the last five years and regularly interacts with contractors, sub-contractors, manufacturers and fabricators. For the purpose of this research, the researcher deployed her personal contacts within a recent project and selected a broad range of participants to interview. The nature of the interviewees is depicted in Table 1 below. It must be qualified, however, that the organisations participating in this project have high profiles and are perceived by the UK public to be at the forefront of what is going on in the industry. Whilst this would have implications on the reliability and validity of the findings, and indeed might dampen the prospects of generalisability, it must be stressed that the purpose of this research is not to seek universal explanations of the phenomenon, but to offer some exploratory indications of innovative practices that might be hidden in construction.

The questions that this research sought answers for include:

- What is the interpretation of innovation at the various hierarchical levels within the three organisations and how does this vary from level to level?
- What are the implications of innovation on performance and work environment?
- What are the inhibitors and enablers of innovation in the construction industry?
- Is there any facility to share innovative practices/information within the industry?
- Are there any innovative practices currently being undertaken within these organisations that could possibly benefit the industry?
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The interviews lasted between 1 and 2 hours each and all interviews were recorded and subsequently transcribed verbatim to facilitate analysis. The structure of the research questions enabled relative ease in the coding process. Categories were formulated, which included the nature of innovation, examples of innovative practices and shared practices, drivers and inhibitors of innovation, and impacts of innovative practice. These will be further explored in the next section, which discusses the key findings.

DISCUSSION OF FINDINGS

The purpose of this research is to evaluate how innovation is perceived by workers and managers in the industry, identify what facilitates and inhibits innovation, and uncover where the barriers and facilitators and to explain how innovation is being recognised and rewarded the supply chain examined.

Table 1: Natures of the Interviewees

Participant	Position	Hierarchical Level	Type of Organisation
A	Director	Senior Management	Subcontractor
B	Project Manager	Middle Management	Subcontractor
C	Charge Hand	Operative	Subcontractor
D	Health and Safety Coordinator	Middle Management	Contractor
E	Senior Procurement Manager	Senior Management	Contractor
F	Engineer	Middle Management	Contractor
G	Senior Design Manager	Senior Management	Contractor
H	Senior Design Manager	Senior Management	Contractor
I	Construction Manager	Middle Management	Contractor
J	Mechanical Project Engineer	Middle Management	Contractor
K	Foreman Plumber	Operative	Subcontractor
L	Construction Engineer	Middle Management	Contractor
M	Apprentice Bricklayer	Operative	Contractor
N	Apprentice Bricklayer	Operative	Contractor
O	Clerk of Works	Middle Management	Subcontractor
P	Trainee Engineer	Operative	Subcontractor
Q	Business Director	Senior Management	Manufacturer
R	Shift Manager	Middle Management	Manufacturer
S	Team Leader	Operative	Manufacturer
T	Process Operator	Operative	Manufacturer

Participants' perspectives of innovation

The concept of innovation is commonly associated with some sense of "newness". This was in fact reflected in our interviewees' responses where a majority mentioned the word "new" as their main answer. The interviewees also suggested that innovation often resulted in some kind of "improvement", "change", and a sense of "moving forward", "different ways of doing things" and "refining current practices. Thus, these descriptions indicate that innovation is both appreciated as a thing (product) and an act (process). At a broad level, it was evident that the interviewees' understanding of innovation did not vary significantly with conventional definitions of innovation, regardless of their hierarchy within the different organisations. It was also notable that the participants considered innovation to be critical for doing their job; "better", "easier", "more efficiently" and "more quickly", thereby reinforcing the rhetorical performance effects of innovation.

However, when participants were asked to exemplify how innovation takes place in reality, disparities start to appear in the examples provided, which tended to be more specific, localised and connected with their respective lines of responsibility. So, for Participant C, a construction operative, innovation involved building "a storage bay for the card board boxes. It's generally speeding up the floor by putting materials altogether". On the other hand, Participant D, a Health and Safety Manager, considered sticking a sign up on all the mirrors in the toilets stating "you are looking at the person responsible for your health and safety" to be innovative, even though this is probably practised on other sites across the country anyhow. Interestingly, there seemed to be a lack of an overarching framework for making sense of, and validating, how innovation takes place across the supply chain, despite managerial interviewees claiming that innovation was systematically managed and rewarded.

Drivers and inhibitors

In terms of what facilitates and prevents innovation from taking place in construction, there is a certain level of commonality in the responses proffered by interviewees at all levels. Typically, a major inhibitor identified included "the resistant and staid attitudes of the people involved in the construction process". Nonetheless, participants also acknowledge that the converse is true in that optimism and the desire of people to make things work can also enable innovation to happen. So, a typical response offered by Participant A describes how the attitude of people within his organisation could potentially create a barrier to innovative practices within the organisation: "I suppose the inhibitor is, you know, we have talked about it within the context of trying to go for a new computer system is the deep rooted resistance to change that there are in an awful lot of people. So you know when they are challenging convention say well we know we have always done it this way but should we do it a different way." Participant H shares this view, as he stressed, "The inhibitors are the "dinosaurs". The inhibitors are the people who don't think it will work. They're pessimists rather than optimists. Some people will say that will never work - give it a chance!" At an operative level Participant T voices his frustrations by saying "Far too many people set in their ways that don't want to change and wont listen to anyone, "do it my way or not at all".

The perceived resistance by segments of the workforce could, in part, be attributed to lack of communication between managers and workers when setting up a systematic approach to managing innovation. The majority of participants, particularly at an operative level, were unaware of any facility that had been set up by the company to exchange knowledge or encourage innovation. The comments from participants employed by the main contractor at a senior and middle management level, gave an account of how they formally facilitate innovation via their intranet system. These corporate accounts mimic the promotion of this particular company as having an ethos that drive the innovation message in the construction industry. However it was apparent from the interviewees comments in this organisation that this facility was not fully utilised and is reflected in Participant I's comment; "As a group we have set a brilliant system where we are supposed to share best practice and you are supposed to go on there and log things that you have done but I don't know anyone who has ever done it. I mean the facilities are there but the uptake is poor." It was not established from the small sample interviewed how well this information was distributed. It does appear, however, that this type of implementation is indicative of a top down

approach. On the other hand, informal means of information sharing are often made possible by meetings both at an operative level and a more senior level. The more senior levels reflected on how informal groups are set up by the main contractor whereby personnel, usually management, are sent to other sites to experience innovative thinking on other sites around the country. Operatives working for manufacturing company that was interviewed described regular meetings when transferring from one shift to another as being the opportunity to express any innovative activity that has taken place. Meetings at this level are not necessarily recorded and therefore information could easily be lost. However, whilst both accounts of informal meetings were not specifically set up to encourage creativity or innovation, it is interesting to note that the interviewees unanimously considered such informal means to be a critical way of disseminating information and knowledge throughout the organisation. So, even here, there is a disconnection between (senior) managerial perspective of formal systems of innovation management and the more pragmatic approaches to learning across the organisation, particularly at the grassroots.

It is plausible that such a disconnection exists because of lack of communication and joined-up thinking in a project-based industry like construction. It could also be the case that whilst innovative practices are taking place at a “grassroots” level they remain 'hidden' from their managers simply because these tend to take place informally and therefore not reported through formal mechanisms. This is even more striking in the discussion of how innovation is recognised and rewarded in the supply chain examined, which we now turn our attention to.

Rewarding and recognising innovation

Despite the emphasis on the importance of innovation from all hierarchical levels there seems to be disparity between the impact of innovation and the incentives used to encourage it. Senior Management and Middle Management appear to be rewarded most as a result of innovative behaviour, via “Management bonus schemes”, “Profit Related Pay” and “Promotions”. On the contrary, operatives interviewed do not consider there to be any incentive other than that of recognition and therefore did not associate recognition as being a form of reward. That said operatives do not directly associate innovation with being recognised or rewarded but more as a prerequisite to getting the “job done”. Examples of this were given by Participant J, L and F respectively; “I think it is recognised if you’ve come up with an idea you know you get a pat on the back sort of thing but it’s a superficial reward. That’s what you are paid for at the end of the day I suppose.”. “You might get a pat on the back but I don’t think you get rewarded.”, “Not to my knowledge. As far as getting a job finished quicker without any problems it’s rewarded that way.” It is also evident that incentives such as bonus schemes, profit related pay and promotions are symptomatic of middle and senior management. Conversely the rewards directed at operatives come in the form of informal recognition from their supervisors/managers. This reflects an apparent disconnect between managers and operatives. It appears that despite working for the same company, the managers were claiming that there are reward schemes and yet the operatives failed to make the same connection.

CONCLUSION

This research set out to explore innovation in the construction industry, giving three different hierarchical perspectives from three different types of organisations connected with the process of construction. The reason for this was; to give a balanced view of how the industry performs, to assess the facilities offered by the organisations in order to promote the motivation to innovate and to ascertain what the enablers and inhibitors are perceived to be. From the research undertaken it can be concluded that there is an apparent disconnection between different hierarchical levels on the reporting, rewarding, recognition and communication of innovation. What did seem apparent was the false equilibrium between the three hierarchical levels. Although it was helpful and interesting to gain an insight into the different levels there appeared to be element of mimetic behaviour from middle and senior management who aspire to the ethos of the organisation which may not be a true reflection on their beliefs. Despite the inconsistency there is a consensus that it is the defiant attitudes of personnel to innovation that inhibits its innovative potential. Whilst this may confirm the critics' perceptions of the industry it is an ineffective solution to the stigma that has burdened construction over the years. Resistance to change is indicative to all industries and is by no means isolated to construction. It is therefore more relevant to acknowledge the disparity between the industry and the critics with regards to what is constituted as being innovative and how this innovation is measured. It appears from this research that innovation is not alien to construction. Innovation is frequently happening at a "grassroots level" but it is the fragmented transient nature of the industry that means that these activities are not always recorded and remain elusively 'hidden'. Even if they were it is not in the policy makers remit to accept such activities as this does not fit in with other industry norms for assessing innovation.

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