

TALKING ABOUT CONSTRUCTION INNOVATION

Richard Davies

School of Construction Management and Engineering, University of Reading, PO Box 219, Reading, RG6 6AW, UK

Lots of people talk and write about innovation. This is not a new phenomenon of course, nor is it restricted to the construction industry. Innovation is important, we are told, for organisations to secure competitive advantage in an increasingly dynamic, turbulent and contested marketplace. Firms are urged to adopt technological and process innovations in order to survive. There is a large body of published work on innovation in the field of construction management that generally supports this view and seeks to understand, and help to foster, successful innovation. Current research is described that examines the way people in the industry have come to talk about innovation. Innovation is a word that has been applied in many settings to a wide range of phenomena that are conceptually and practically distinct. Using a word so flexibly can lead to confusion rather than clarity. Important features of the phenomena that it subsumes can be obscured. Innovation is a word that carries positive connotations in its definition. It cannot help being a good thing. Combined with its flexibility of use, this gives innovation significant rhetorical weight. It becomes a useful word: a legitimising device and a political lever. From a theoretical perspective that stresses the social construction of technology, construction innovation is considered empirically using a discourse analytic approach. This is undertaken both as an antidote to determinist approaches and in the belief that adopting multiple perspectives on complex issues is analytically and practically useful.

Keywords: discourse analysis, innovation, social construction, technology

INTRODUCTION

“Innovation is the key to the future success of construction, using technology as the enabler. The industry needs to embrace a complete technology and innovation culture change so that research and development is seen as the core value for the future of construction and essential to business success.”

The quotation above is from the report ‘Constructing the Future’, the publicly available written summary output of a process of consultation and deliberation on the part of groups of individual academics, practitioners, clients and policy makers. The report was published by the Department of Trade and Industry in 2001 (DTI, 2001).

This paper has two aims. The first is to introduce an ongoing research project that approaches the subject of construction innovation through detailed analysis of innovation texts. The second is to introduce the research method adopted: discourse analysis. The current positive climate of writing about innovation in UK construction is discussed through a necessarily brief review of some widely cited academic literature. A research approach based on critical discourse analysis is then described and applied to some extracts from the report ‘Constructing the Future’.

CONSTRUCTION INNOVATION

Mainstream innovation writing, including scholarly treatments, popular prescriptive work and journalism has been dominated by consideration of big American or Japanese product-making multi-nationals. Read around the subject of innovation for a while and you will be told many times how Rubbermaid (a US household goods producer) seeks to ‘bury competitors in such a profusion of products that they can’t copy us’ and how Sony put out 170 different versions of the Walkman (Micklethwaite and Wooldridge, 1996). The predominant idea (e.g. Sabel, 1982) is that in a world characterised by ‘post-Fordist’ models of production, international low-wage competition, fluctuations in the prices of materials and environmental pressure groups, Western companies, unable to protect their markets through regulatory means, have to innovate (and adopt innovative ‘organic’ forms of organisation (Burns and Stalker, 1961)) in order to compete.

Construction innovation research

There is a large body of published work on innovation in the field of construction management that generally supports this view. So for example Slaughter (2000) states “Innovations can form the backbone of a company’s strategy” (p2). Similarly, Egbu *et al.* (1998) claim that “it is now generally accepted, within the construction industry, that there is a relationship between a firm’s efficiency or profitability and its ability to innovate” (p605). Given that the benefits of innovation are uncontested attention has focussed on how best to foster and encourage innovation. With this aim in mind Pearsuapp and Walker’s (2006) case studies of ICT implementation by construction contractors seek to understand the ‘barriers’ to innovation highlighting among others lack of management support and some user’s ‘personal learning capability. More broadly, Winch (1998) attributes construction’s low rate of innovation to structural features of the industry (a project-based complex product system industry with separate and conflicting systems integrators (see also Gann and Salter (2000)) arguing that a dynamic, enabling infrastructure is necessary to overcome these problems.

As well as being associated with a wide range of positive outcomes, innovation itself means different things to different people. Slaughter’s definition is typically inclusive: “a non-trivial improvement in a product, process or system that is actually used and which is novel to the company developing or using it” (2000; p 2). Features to note here are the inclusion of both the development or creation of an innovation and the use or adoption of an innovation (or the ‘innovative’ adoption or adaptation of old technology). Slaughter’s work (1993) has emphasised the latter, classifying construction workers’ numerous problem-based changes and on-site adaptations to proprietary products as innovations additional to and distinct from more explicit changes commercialised by manufacturers. The innovations examined in Egbu *et al.*’s (1998) case studies include foundation design, new materials, automation on the part of a materials manufacturer and the adoption of ‘digital information technology and teamwork’ by a project management firm.

The other significant strand identified in the literature is the idea that construction is somehow less innovative than other industries (Winch, 1998). Koskela and Vrijhoef (2001), citing Winch, argue that construction’s productivity and quality are low in comparison to other industries the ‘major explanation’ for which is the lack of innovation. Although Winch (2003) later pointed to the difficulties of such cross-sector comparisons concluding that frequent unfavourable comparisons with the car industry at least were unjustified.

Commentary

In the context of the current research the features of the construction innovation literature highlighted are; the overwhelmingly positive treatment of innovation, the position that technology can contribute towards an uncontested view of improvement to other objects and phenomena; that it is necessary to manage barriers to innovation and that innovation is applied in different settings to a wide range of distinct things.

This view of innovation is characteristic of approaches defined by technological-determinism. The construction literature is firmly located within this position and that of evolutionary economics with their respective machine and biological metaphors (McLoughlin, 1999). Organisations are viewed as rational, information seeking entities seeking to adapt to their environment through developing (or recognising) and benefiting from the pre-existing characteristics of technology. Exceptions to this model (typically labelled as ‘political issues’ or ‘cultural factors’) are framed as ‘barriers to innovation’ or ‘resistance to change’.

Less well represented are alternative ways of understanding technological and organisational change that stress their political and socially constructed natures. For example, labour process theory (Braverman, 1974) has informed analysis pointing out that technological changes have tended to remove control from workers to management, increase surveillance and de-skill work (Thompson and McHugh, 1995).

Within this political perspective ‘innovation’ becomes a useful word: a legitimising device and a political lever. The current research focuses on this process by considering construction innovation empirically using a discourse analytic approach. This is undertaken both as a critical antidote to determinist approaches and in the belief that adopting multiple perspectives on complex issues is analytically and practically useful. As it has been used so rarely in construction management research (a partial exception is Hill, 1999) the next section is intended to introduce discourse analysis to enable readers to engage with the analysis that follows.

DISCOURSE ANALYSIS

Discourse analysis is an approach to research that focuses on language use as a social practice in its own right and particularly on the way people use language in particular contexts to construct themselves and their social world. This description obscures the fact that the term ‘discourse analysis’ has been used to refer to a huge variety of research approaches (Potter and Wetherell, 1987). Examples range from cognitive psychological explanations of any unit of language greater than a sentence through consideration of turn taking in conversation analysis to consideration of grand discourses as systems of power and ideology. Key aspects of the discourse analytic approach adopted here (a ‘critical discourse analysis approach’: Fairclough, 2003; Dick, 2004) are discussed below in order to frame the current research but the description is limited and glosses over some important differences between approaches between discourse scholars. Alvesson and Kärreman (2000) provide a useful framework on which to map this diversity while providing a good description of the approach applied to organisational research.

The fundamental point about discourse analysis is that language is not treated as a system of rules and a method of communication but a practical and purposive social activity. This is in contrast to the, information-processing approach to language that sees it as a system of encoding transmitting and decoding information. Studies of natural language use show that people do not use language as a simple transmission

mechanism. All utterances both state things and do things. Frequently what statements do is related to the speaker's concerns and interests – to further their own case and to undermine others' (Edwards and Potter, 1992).

What this means for research is that discourse analysts focus on language as a focus of study in its own right. Many other researchers use discourse as part of the research process whether in the form of interviews, observed conversation, responses to questionnaires or written documents. Usually though discourse is used in research as a way of gaining access to some other subject of interest inaccessible (or difficult to access) except through language. Examples might include interviewing a bricklayer to gain access to his or her attitude to a new method of working or recording a group discussion between construction managers and using it to identify features of the organisation's culture. In both of these examples the researcher would be using language as a means to find out about some other pre-existing (social) objects or phenomena. Alternatively, a discourse analyst would focus on the way the participants use discourse to construct (rather than reveal) these phenomena.

In discourse analysis the key question is always 'What is the author trying to achieve?' Similarly important is to consider the context: the social events, social practices and social structures in which the discourse is embedded and with which it shares a dialectical relationship (Fairclough, 2003). Discourse analysis is an interpretive approach to research involving the analyst creating a 'reading' of the text. Although there is no one method to discourse analysis, Wood and Kroger (2000) give some examples of strategies that give a flavour of the approach. These include: considering your own reaction to a text and then looking for features that might explain your reaction; playing with the text such as inserting alternative words and phrases and noting the effect on meaning; and considering 'missing' content – aspects of the subject of the text that the author has omitted or obscured. Perhaps most important is to take nothing for granted. Critical discourse analysts like Fairclough (2003) argue that discourse has a powerful social-shaping role and plays a key part in establishing ideological positions as dominant taken-for-granted assumptions about the world that limit people's scope for interpretation and action. Revealing and challenging these assumptions is seen as an important outcome from discourse analytic research.

Discourse analysis in the current research

Discourse analysis is used in the current research as a way to focus in significant detail on language use around the subject of construction innovation as a means of textual analysis and social analysis. The proceeding section reports the results of a discourse analytic treatment of the report 'Constructing the Future' from which the introductory quotation was taken. It is intended to demonstrate an application of the approach and present some early findings from an ongoing research program. There are a few reasons for focussing on this single report here. In terms of the aims of overall research project, the report is located in the middle of the time period sketched for analysis (1994 - 2006), it is the result of, apparently, a significant amount of work by a wide range of people and it talks about innovation a lot. More practically, reports of discourse analysis take up a lot of space so focussing on one report helps to keep this manageable. The presentation is structured around three extracts from the text (discourse studies are more normally arranged around significant features of the analysis, illustrated by substantial passages of discourse). A number of specific

discourse analysis concepts are also introduced at the appropriate points in the analysis.

ANALYSIS: ‘CONSTRUCTING THE FUTURE’

Data and method

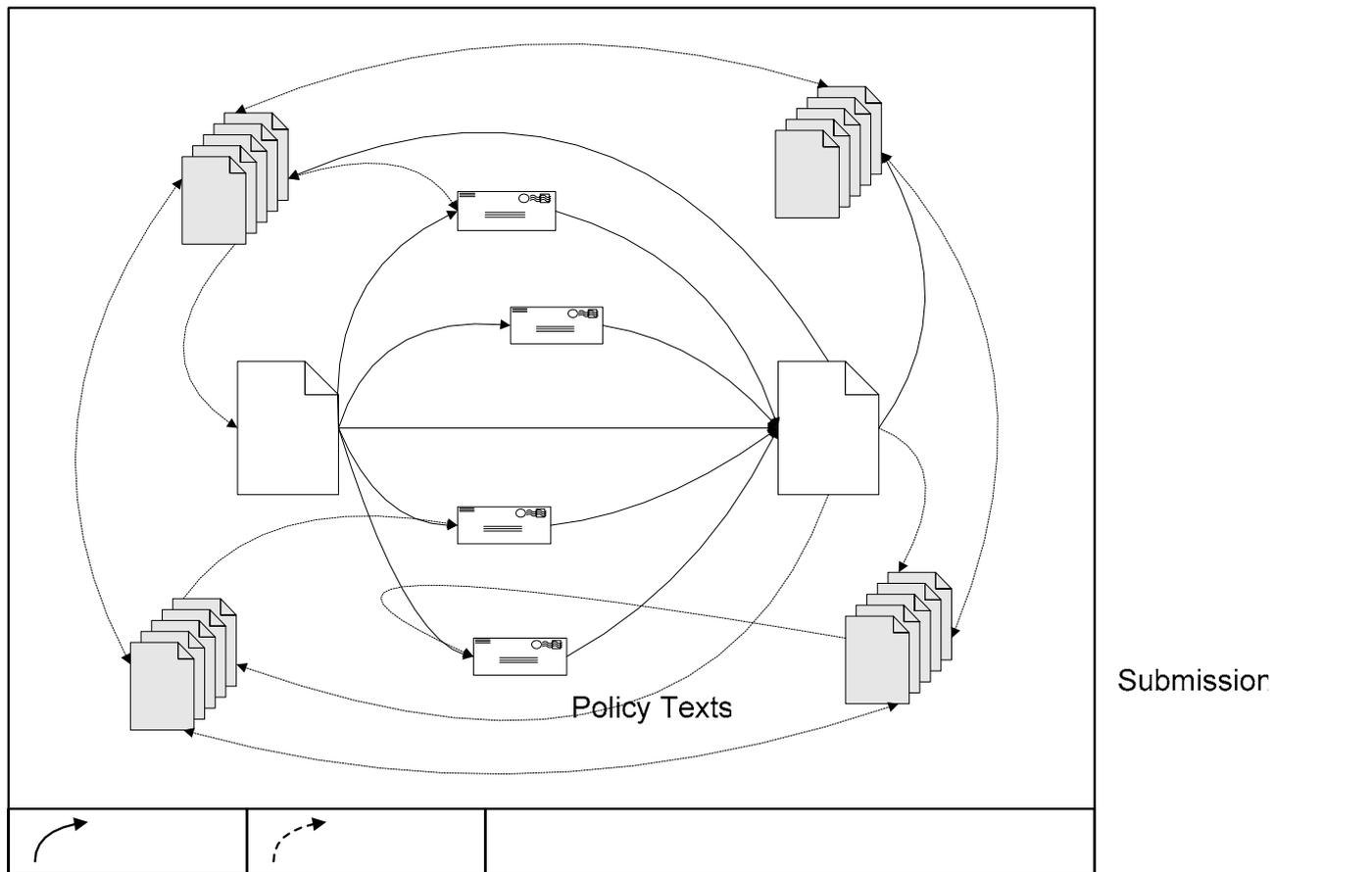
The report was downloaded from the DTI website in .pdf format and converted to text and reformatted for analysis. The whole report was read a number of times to gain an appreciation of the overall structure and mood of text. Detailed analysis was concentrated on extended passages of text that deal with ‘innovation’. What this meant in practice was those passages that include the word ‘innovation’ and its derivatives (‘innovative’, ‘innovating’). This was a provisional decision that excluded passages dealing with phenomena that have been described *as* innovation (e.g. new materials, use of information technology) but without the word innovation itself.

Constructing the future

‘Constructing the Future’ (DTI, 2001) is a thirty-page, 9,500 word document. It is structured into the following sections: ‘Overview and recommendations for action’, ‘Future scenario’, ‘Recommendations in detail’ and ‘Making the future happen’. The methodology used to produce it was the meeting of themed study groups (using what the Chairman’s Foreword describes as ‘structured approaches’), the production of a consultation document (‘Building our Future’), the receipt of responses to the consultation document that were taken into account in the production of the report.

Within the critical discourse analysis framework, the writing of the report can be seen as a social event and as part of a chain of social events (meetings, decisions about panel membership, reading the consultation documents, making submissions . . .). These events in turn are embedded within a range of broader social practices including; academic research, governing, business, and lobbying. These events and practices incorporate and are partly realised through discourse such as that contained within ‘Constructing the Future’. Discourse and meaning can move between social events and practices through one text being incorporated within others – an attribute of discourse referred to as ‘intertextuality’. ‘Constructing the Future’ has at least been incorporated into academic texts and other policy texts and spoken discourse. Some of these ideas and anticipated relationships at the level of texts are represented diagrammatically in Figure 1.

An important part of critical discourse analysis applied to whole texts is the question of identifying the text’s genre. Genre is used here to refer to “the specifically discursal aspect of ways of acting and interacting in the course of social events” (Fairclough, 2003; p65). Example of genres include; interviews, seminars, policy reports, and newspaper articles. Genres influence and constrain discourse – only certain types of interaction are appropriate in a job interview. In the current research, detailed genre analysis has not yet been undertaken although it is expected to form an important part of seeking to understand the links sketched in Figure 1 and extent to which the ‘official’ and ‘academic’ discourse on innovation is incorporated into ‘industry’ discourse and practice.



Textual analysis of ‘Constructing the Future’

The section presents some of the early analytical output from the research.

Innovation is the key to the future success of construction, ^{Building our Future} using technology as the enabler. The industry needs to embrace a complete technology and innovation culture change so that research and development is seen as the core value for the future of construction and essential to business success. [Extract 1]

A significant feature of Extract 1 is the confidence with which its assertions are stated: “Innovation is the key to the future” and “research and development . . . essential to business success”. In technical terms this is an issue of modality: what Verschueren (1999: cited in Fairclough, 2003) describes as the ways in which discourse signals ‘factuality, degrees of certainty or doubt vagueness, possibility, necessity and even permission and obligation’. The author might have chosen to write something like ‘innovation may contribute towards the improvement of some aspects of construction’. Instead, Extract 1 constitutes an assertion with high commitment to the truth of its content (Halliday, 1994) and this is a feature present throughout ‘Constructing the Future’.

Discourse of this sort is characteristic of authors seeking to establish a social identity as experts (Chiapello and Fairclough, 2002). In social analysis an important question is to consider who has the socially sanctioned ^{Practitioner Texts} to commit themselves to strong truth claims. As well as strong claims about what *is*, Extract 1 is also making a claim about what *will be*. Predictions are important in public discourse. Fairclough (2003) states that “injunctions about what people must or must not do [are often] legitimized

Documented links

Speculative links

Figure 1:

in terms of such predictions about the future” (p167). These features are also apparent in Extract 2.

In our future scenario the UK will have maintained its world reputation for innovative, bespoke buildings and civil engineering structures, and technically excellent engineering and project management. Britain’s world-class leading designers, engineers and project managers will continue to successfully export their services, using ICT to build on their strength in a greatly expanded networking market.

With UK customers demanding higher design standards and technical sophistication, some UK manufacturers will take the lead in e-commerce-enabled global sourcing and factory-manufacture of large sub-assemblies. A number of these more innovative companies will be working with and offering designers new and innovative standard solutions that deliver added customer value and compete on price with the foreign competition undercutting traditional bespoke design. [Extract 2]

Extract 2 has the same modality features as Extract 1 but offers more specific detail. In Extract 1 it was suggested that the way to realise innovation’s key role in ensuring the future success of construction is the rather vague prescription of a ‘complete technology and innovation culture change’. This reflects the assumption, implicit in the construction academic writing reviewed, that the ‘problem’ of construction innovation is one of failure to accept or cultural resistance to the beneficial pre-existing characteristics of technology. The beneficial technology in Extract 2 is factory-manufactured ‘large sub-assemblies’ transported and assembled on site. Pre-fabrication (as opposed to ‘traditional’ building trades work) has been promoted as the (future) answer to the industry’s problems since at least the Simon report (Simon Committee, 1944). Standardised building has had a troubled social history however (exemplified by the reaction to pre-fabricated social housing in the post-war years) and, in terms of the technological-determinist approach, limited ‘success’ (Koskela and Vrijhoef, 2001). Sexton and Barrett (2003) found that the social practice of design valued and rewarded newness and difference in such a way as to mitigate against standardisation.

In this context, ‘innovation’ is doing a lot of work in Extract 2. Firstly it is established that the reputation of Britain’s ‘world-class leading designers’ for ‘innovative bespoke buildings’ will be ‘maintained’. Note that this reputation for innovative is established as already existing but that it will be ‘maintained’ in the future by ‘Britain’s world-class leading designers’. There are also two possible readings of the second sentence of Extract 2; specifically whether all of Britain’s designers are considered ‘world-class leading’ or whether a difference is being established between those designers that are ‘world-class leading’ and those that are not. Taking the latter reading and seeing what it might mean for the analysis of the rest of the Extract, those designers who are not world class are given an alternative route to innovation in the form of ‘innovative standard solutions’ that exhibit ‘higher design standards and technical sophistication’.

The second paragraph of Extract 2 is structured using a ‘problem-solution’ form common to policy texts. In this case ‘innovative standard solutions’ are presented as the solution to the problem of rising customer demands and ‘foreign [price] competition undercutting traditional bespoke design’. A future is being established here in which to persist with bespoke design (characterised as ‘traditional’ now, rather than ‘innovative’) is to be undercut by ‘foreign competition’ and to fail to meet customer demands.

The reference to ‘foreign competition’ here is an example of nominalization, a discursive resource that generalises and makes events and processes abstract as opposed to concrete actions with identifiable agents. Nominalization is used in scientific discourse (Halliday and Martin, 1993) and governmental discourse (Lemke, 1995) within which it can be used to obscure agency and responsibility and suppress difference. An example from the academic construction literature is Peansupap and Walker’s introductory comment that “Information and communication technology (ICT) facilitates communication . . . enhancing productivity” (2006; p321). Here the people and organisations implementing ICT, communicating and experiencing enhanced productivity (and those who have unsuccessfully attempted to realise these benefits) are missing from the account. Nominalization is such a consistent feature of texts like ‘Constructing the Future’ (Fairclough, 2003) that the presence of specific agents in Extract 2 is worth consideration. It has already been suggested that part of the force of the text could be to configure a social distinction between ‘world-class leading’ organisations and those that are not (although these are present only by implication). The specific groups identified in Extract 2 (‘designers’, ‘engineers’, ‘project managers’, ‘customers’, ‘manufacturers’) omit and apparently exclude other groups like ‘contractors’, ‘builders’ and ‘tradesmen’ from the successful future of construction.

The housing market and housing design, driven by new forms of capital investment and funding from the private sector, will be more economically flexible and adaptable. With increasing land shortages, regeneration and new planning needs will be more complex, with greater housing densities made more desirable through innovative spatial design solutions. [Extract 3]

Like Extract 2 and the consideration of standardised building, Extract 3 discusses an aspect of the ‘desired future’ that may be undesirable to some and perhaps resisted. Here, the undesirability of ‘greater housing densities’ is signalled explicitly in the text through the need for it to be ‘made more desirable’. Again, innovation is enlisted as a way of framing the undesirable necessity of high-density housing developments in the future.

This use of the discourse of innovation to justify contested issues will be considered further drawing on the concept of ‘accounts’ used in conversation analysis within the wider discourse approach. Studies of language use have shown that discourse demonstrates what is referred to as ‘preference structure’ – a tendency for participants to maintain communication through agreements (Potter and Wetherell, 1987). Discourse incorporating ‘dispreferred’ elements tends to be followed by an ‘account’ (excuses, justifies, appeals or claims) that repair the damage caused by the transgression. The possibility that ‘innovation’ serves as an accounting resource within the construction industry is an early emergent issue that will be considered during the remainder of the project.

ONGOING RESEARCH

Further research will follow and expand the emerging lines of enquiry. Figure 1 provides a plausible map of the likely direction of future research. Practically, this will consist of further analysis on a wider range of ‘construction innovation’ texts – policy texts, client and practitioner texts and academic texts. Sampling of texts and analysis will proceed in an iterative process as new discourse suggests new issues and as emerging findings require the consideration of other discourse to pursue or warrant the

findings. During the later stages of the project it is anticipated that it will be necessary to analyse spoken discourse in the form of interview transcripts or recordings of conversations.

CONCLUSIONS

Although it is too early to present definitive conclusions from the research a number of findings are emerging, three of which were illustrated in the section on textual analysis. First of these is the strong truth claims associated with innovation discourse and the related suppression of difference. Second, is the use of innovation (or innovativeness) as a means of classifying actors and social groups with the industry. The third is the use of 'innovation' to promote (and account for) dispreferred policy solutions. Verifying and elaborating on these findings and exploring their implications will be the task of the ongoing research.

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