The Future of Lean Construction: A Brave New World

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ABSTRACT

Lean construction is considered from a human resource management (HRM) perspective. It is contended that the UK construction sector is characterised by an institutionalised regressive approach to HRM. In the face of rapidly declining recruitment rates for built environment courses, the dominant HRM philosophy of utilitarian instrumentalism does little to attract the intelligent and creative young people that the industry so badly needs. Given this broader context, there is a danger that an uncritical acceptance of lean construction will exacerbate the industry's reputation for unrewarding jobs. Construction academics have strangely ignored the extensive literature that equates lean production to a HRM regime of control, exploitation and surveillance. The emphasis of lean thinking on eliminating waste and improving efficiency makes it easy to absorb into the best practice agenda because it conforms to the existing dominant way of thinking. 'Best practice' is seemingly judged by the extent to which it serves the interests of the industry's technocratic elite. Hence it acts as a conservative force in favour of maintaining the status quo. In this respect, lean construction is the latest manifestation of a long established trend. In common with countless other improvement initiatives, the rhetoric is heavy in the machine metaphor whilst exhorting others to be more efficient. If current trends in lean construction are extrapolated into the future the ultimate destination may be uncomfortably close to Aldous Huxley's apocalyptic vision of a *Brave New World*. In the face of these trends, the lean construction research community pleads neutrality whilst confining its attention to the rational high ground. The future of lean construction is not yet predetermined. Many choices remain to be made. The challenge for the research community is to improve practice whilst avoiding the dehumanising tendencies of high utilitarianism.

KEY WORDS

Lean construction, human resource management, utilitarian instrumentalism, propaganda, best practice.

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INTRODUCTION

> *"A really efficient totalitarian state would be one in which the all-powerful executive of political bosses and their armies of managers control a population of slaves who do not have to be coerced, because they love their servitude. To make them love it is the task assigned, in present-day totalitarian states, to ministries of propaganda, newspaper editors and school-teachers."*
> (Huxley, 1994; first published 1932).

The publication of the report of the Construction Task Force *Rethinking Construction* (DETR, 1998) has significantly shaped the current agenda for change in the UK construction industry. The recommendations of *Rethinking Construction* (commonly known as the 'Egan Report') have received an almost unanimous endorsement from the bodies that shape policy for the construction industry. Examples include the Construction Clients' Forum (CCF), the Construction Industry Board (CIB) and the Government Construction Clients' Panel (GCCP). The Movement for Innovation (M^4I) was established as a direct result of *Rethinking Construction* to deliver the identified performance targets and to promote change. The Egan agenda places an especially strong emphasis on the ideas of 'lean thinking', drawing heavily on their supposed success in the car industry. The ideas of 'lean production' were originally encapsulated within the Toyota Manufacturing System and are well articulated by Womack *et al* (1990). Lean thinking subsequently became the generic term to describe their universal application beyond manufacturing (Womack and Jones, 1996). The ideas of lean thinking comprise a complex cocktail of ideas including continuous improvement, flattened organisation structures, teamwork, the elimination of waste, efficient use of resources and co-operative supply chain management. Within the UK construction industry, the language of lean thinking has since become synonymous with best practice. Confidence in these ideas remains so high that 'lean construction' is an established component of construction best practice. The purpose of this paper and is to challenge the assumed neutrality of lean construction and to highlight the potentially regressive impact on human resource management (HRM).

HRM IN THE UK CONSTRUCTION INDUSTRY

There is an established dichotomy in the HRM literature between the 'hard' model, reflecting utilitarian instrumentalism, and the 'soft' model reflecting developmental humanism. The hard model of HRM sees humans as a resource to be 'provided and deployed' as necessary to achieve organisational objectives. In contrast, the soft model of HRM treats human resources as valued assets who offer a source of competitive advantage. In simple terms, the former comprises 'command and control' and the latter 'empowerment and commitment'. This dichotomy is undoubtedly an over-simplification of a complex field where rhetoric and reality are difficult to separate (Legge, 1995). Many organisations undoubtedly apply elements of both. Companies are also often fond of dressing up hard HRM in a soft rhetoric (Truss *et al*, 1997). The key distinction lies in whether the emphasis is placed on the human, or the resource (Guest, 1987; Storey, 1992). The dichotomy between hard and soft HRM is a

direct descendant of McGregor's (1960) Theory X and Theory Y.

Several previous studies have contended that the dominant culture of the construction industry consistently emphasises the hard model of HRM. The 1998 Workplace Employee Relation Survey (Cully *et al*, 1999) compared three measures of employee participation across twelve industrial sectors: (i) non-managerial participation in problem-solving groups, (ii) operation of suggestion schemes and (iii) formal survey of employee attitudes during the last five years. In the construction industry participation in problem-solving groups occurred in only 21% of workplaces. This was lower than any other sector with the exception of 'other community services' (17%). The construction industry came bottom in the other two categories by a significant margin. Whilst the high degree of sub-contracting in the construction industry may account in part for these results, research by Druker *et al* (1996) concludes that the hard model of HRM dominates not only for the construction labour force, but also for professional and managerial staff. Coffey and Langford (1998) further observe a low level of employee participation in construction, whilst concluding that there are no inherent reasons that prevent effective participation, even at trade level. The European survey conducted by Price Waterhouse/Cranfield (Brewster and Hegewisch, 1994) showed that the status and influence of HRM on corporate decision making was lower in the UK construction industry than in other European construction industries. These results confirm Hillebrandt and Cannon's (1990) previous findings on the low status of the personnel function within UK contractors. Recent research into career opportunities for women in construction companies has further pointed to a widespread discriminatory culture in the UK construction industry (Dainty *et al*, 2000).

The conclusion that emerges from the above is clear. The UK construction industry is characterised by an institutionalised regressive approach to HRM. The human resource is primarily conceptualised as a cost. This long-standing allegiance to hard HRM explains the popularity of management improvement recipes based on metaphors such as 'cutting out the waste', 'belt tightening' and 'becoming lean'. The question that arises is the extent to which the current vogue for lean construction will serve to reinforce the industry's established culture of 'command and control'.

AN INDUSTRY IN CRISIS

The dominance of Hard HRM in the construction industry goes some way towards explaining the current recruitment crisis. Student applications for built environment courses, including architecture, surveying, planning and civil engineering fell by 21% between 1994 and 1997 (Gann and Salter, 1999). Construction companies and professional firms find it increasingly difficult to attract the intelligent, creative young people that the industry badly needs. Other industries consistently offer better salaries, better job satisfaction, increased job security and more enlightened approaches to HRM. Whilst it is true that senior industrialists and government representatives increasingly endorse the rhetoric of Soft HRM, there is little real evidence of any significant shift in the industry's default model of HRM. Regressive attitudes to HRM are so embedded within the UK construction industry they will not be easily changed. It is the dominant culture of 'command and control' that determines the agenda for change as advocated by industry leaders. The problems of the construction

industry are invariably blamed on impediments to machine efficiency. Progressive improvement initiatives repeat familiar calls for 'attitudinal and cultural improvement' whilst advocating that others should become more efficient at meeting the efficiency targets of the technocratic elite. Rarely is there any consideration of the externalities that lie beyond the narrow domain of instrumental rationality. Even supposedly enlightened practices such as partnering and TQM are ultimately judged in accordance with their contribution to efficiency. Employees are continually conceptualised as cogwheels in a remorseless machine. In the UK construction industry, utilitarian instrumentalism reigns supreme. The primary source of competitive advantage is invariably equated with cost efficiency. There is little recognition of human resources as a source of competitive advantage. None of this does anything to attract new talent into the construction industry, or to empower the existing human resources.

PERPETUATING THE DOWNWARD CYCLE

Howell and Ballard (1999) have previously suggested that lean production techniques are neutral in terms of HRM. As an abstract theoretical construct, lean construction may well be neutral. Unfortunately, lean construction ultimately has to be implemented in real organisations. world. In common with every other change initiative, lean construction has to be enacted by *people*. Any implementation of lean methods will therefore be inextricably linked to aspects of HRM. The theory of lean construction may well be neutral, the way that lean construction is implemented can never be neutral. In the absence of positive efforts to shape the implementation of lean construction around an enlightened HRM agenda, the default industry recipe of Hard HRM will inevitably prevail. The rhetoric of improving efficiency by the elimination of waste is undeniably attractive in the short term. However, the long-term effect will be to perpetuate the construction industry's downward cycle whilst reinforcing its reputation for unrewarding careers. Long-term competitiveness and sustainability are too easily sacrificed for the sake of short-term efficiency. Whilst this perennial short-termism acts against the development of the industry as a whole, it continues to serve the immediate interests of the industry's technocratic elite. From a critical perspective, the last thing that current industry leaders need is a flood of 'empowered' employees teeming with innovative ideas. Far better to impose a regime of management-by-stress whereby employees are constantly under pressure to meet ever-increasing efficiency targets. Each successive financial cycle heralds a new drive towards cost efficiency. Many construction companies seem to be in a perpetual state of downsizing to satisfy the appetite of financial analysts. The increasingly short-term focus imposed by the marketplace inevitably reinforces the trend towards management-by-stress and regressive approaches to HRM. Such are the barriers to innovation in the construction industry.

As a caveat to the above, it should be emphasised that there are important exceptions. This is especially true for some of the UK's design practices and engineering consultancies. There are a few notable firms that compete very successfully internationally and have invested heavily in knowledge-based services. The competitive advantage of these firms is based on their employees and their capacity for innovation. Such firms seek to recruit and retain highly capable people by providing them with rewarding and challenging careers.

Central to the attraction of such organisations is the extent of job variation and the associated opportunities for continuous personal development. Strangely, the agenda for change within the UK construction industry does not look to its own success stories as exemplars of good practice. Instead, the industry is exhorted to follow the precedent of the motor industry. This advice remains intact despite continuing concerns regarding productivity in the UK motor industry. The recent Rover debacle is the latest in a long line of well-published management disasters in an industry characterised by poor industrial relations and lack of investment. The primary lesson to be extracted from the UK motor industry is that the rhetoric of gurus such as Womack and Jones (1996) should be treated with some considerable degree of caution. It is also notable that the Competition Commission has recently found the UK motor industry guilty of price fixing and anti-competitive behaviour. It hardly qualifies therefore as an exemplar of customer responsiveness. The rush towards lean construction seems equally bizarre in the light of the motor industry's questionable track record in HRM.

THE HRM IMPLICATIONS OF LEAN PRODUCTION

Whilst strangely ignored by lean construction researchers, there is a considerable body of research that equates the implementation of lean production to regressive policies of human resource management (HRM) (e.g. Garrahan and Stewart 1992; Hampson *et al*, 1994; IPD 1998; Rehder, 1994; Turnbull, 1988). The literature warning of the potentially adverse implications of lean methods on the quality of working life is so extensive it is difficult to understand why it has been so systematically ignored. The critical literature on the Japanese model of lean production dates from Kamata 's (1982) description of how Toyota's single-minded drive for success in the 1970s was accompanied by significant personnel deprivation on the part of the workforce. More recently, Sugimoto (1997) describes how the term *karoshi* is in common use amongst Japanese workers to describe sudden deaths and severe stress resulting from overwork. Benders (1996), Grönning (1995) and Rehder (1994) all refer to growing disillusionment in Japan amongst employees and increasing resistance from trade unions. Hutchinson *et al* (1998) describe how at a conference in 1992 the Japanese Auto Workers Union (JAWU) emphasised the 'triple sufferings' of the Japanese automobile industry:

> " *….the employees are exhausted, the companies make little profit and the automobile industry is always being bashed from overseas.*"
> (from Wickens, 1993)

Hutchinson *et al* (1998) further quote a survey that asked Japanese parents if they would advise their children to work in the automobile industry. Only 4.5% of respondents replied yes (Nomura, 1992). The most frequently cited reasons were as follows:

- *pay too low for intense work (43%);*
- *high work intensity (41%);*
- *onerous shift system (40%);*
- *much work on holidays and overtime (36%);*

- *unfriendly personnel practices (33%).*

Given the UK construction industry's difficulties in attracting high quality personnel, it therefore seems strange to model the agenda for change on the Japanese automobile industry. Criticisms are not limited to production plants in Japan, but also extend to overseas transplants. Fucini and Fucini (1990) point to poor safety standards, stress of work, loss of individual freedom and discriminatory employment practices at Mazda's US production plant in Michigan. Garrahan and Stewart (1992) and Turnbull (1988) provide similar criticisms of Nissan's plant in the UK, held up as an exemplar by the Egan Report (DETR, 1988). According to Garrahan and Stewart (1992) Nissan's supposed regime of flexibility, quality and teamwork translates in practice to one of control, exploitation and surveillance. Numerous other studies have demonstrated that the implementation of lean methods leads to work intensification (Parker and Slaughter, 1998; Cappelli and Rogovsky, 1994). On a similar theme, Berggren (1993) equates lean production with 'mean production':

> *"…unlimited performance demands, the long working hours and requirements to work overtime on short notice, the recurrent health and safety complaints, the rigorous factory regime that constitutes a new and very strict regime of subordinations".*

Howell and Ballard (1999) suggest that lean production techniques are themselves neutral. In an abstract sense, this is probably true. However, the implementation of lean construction in real contexts can never be neutral. Every organisational change initiative inevitably disturbs the *status quo*. Whilst theories of production can be developed in isolation of HRM considerations, they must be implemented in the context of real organisations. Organisational change initiatives are inextricably wrapped around an implicit HRM policy. Existing power structures are changed with direct implications for individual job boundaries and the quality of working life. Frederick Taylor (1911) famously maintained that 'scientific management' was neutral whilst leaving others to worry about the dehumanising side effects of treating people as mindless cogwheels in a remorseless machine. The relationship of lean thinking to Taylorism is well described by Dohse *et al* (1985):

> *"Toyotism is…not an alternative to Taylorism but rather a solution to its classic problem of the resistance of the workers to placing their knowledge of production in the service of rationalisation."*

Notions of empowerment and participation are therefore carefully controlled. Employees are only 'empowered' to implemented imposed targets more efficiency. They are not empowered to participate in the process by which targets are set or in the allocation of the proceeds of any resultant efficiency gains.

Whilst some of the above sources are undoubtedly somewhat one sided, this is equally true for the more evangelical advocates of lean methods such as Womack and Jones (1996) and the Egan Report (DETR, 1998). The most worrying thing is that the debate has not even started. It is of course conceivable that lean construction *could* be implemented in

accordance with Soft HRM. However, given the dominant culture of the UK construction industry, this is always likely to be the exception rather than the general case. What is currently so noticeably absent is any empirical research data on how lean construction is implemented. Strangely, there seems to be little interest in research of this nature. International researchers in lean construction seem content to develop theories of production entirely in the abstract, leaving others to worry about the dehumanising side effects.

BEST PRACTICE

None of the above doubts have prevented lean construction becoming an established component of construction best practice (CBPP, 1998). This is despite an alarming absence of convincing case studies. Lean construction seems to have been accepted as an essential part of best practice on the recommendation of the Egan Report (DETR, 1998). The existence of an extensive and convincing literature that equates lean production to regressive policies of HRM is clearly not sufficient to prevent lean construction from being immediately accepted as best practice. Lean construction is a good idea because Sir John Egan and the technocratic elite say it is a good idea. The task of research community is seemingly limited to supporting the prejudices of current industry leaders and thereby maintaining the status quo. Of course, the emphasis of lean thinking on eliminating waste and improving efficiency makes it easy to absorb into the best practice agenda because it confirms with the existing dominant way of thinking. Best practice rarely strays from the narrow domain of instrumental rationality in that it is invariably concerned only with the most efficient means of achieving a given end. Economic externalities such as traffic congestion, pollution and the human cost of regressive management regimes consistently fall outside the adopted frame of reference. The limitation of 'best practice' to issues of instrumental rationality is well illustrated by a recent flyer published by the *Construction Best Practice Programme* (CBPP):

> *Best Practice = Better Profits*
> - *Find out more about the relationship between Best Practice and improving profit levels.*
> - *Learn how to increase efficiency, reduce costs and improve competitiveness.*
> - *Hear, first hand, from organisations that have benefited from implementing Best Practice.*
> - *Discover the bottom line benefits from putting the theory into practice.*

The above illustrates the way in which current conceptualisations of best practice are invariably limited to narrow issues of instrumental rationality. Note also that the CBPP is funded by the DETR to the tune of £6M over three years (DETR, 1999). Why the UK taxpayer is being asked to help make construction companies more efficient remains unclear. The abandonment of the principles of the free marketplace seems strangely at odds with the frequently espoused doctrine of neoliberalism. The reality is that free-market principles seldom apply to the large organisations that seek to influence industrial policy. The status of BAA as a privatised quasi-monopoly did not prevent Sir John Egan from preaching best practice to the construction industry. The trend towards corporatism is readily

illustrated by the way large organisations seek increased control through partnering and integrated supply-chains. Come back Adam Smith, all is forgiven.

The above analysis provides a different starting point from which to understand 'best practice'. There is a subtle process at work across the numerous committees that shape the best practice agenda. It is not necessary to believe that such committees deliberately act to further their own vested interests; merely that they take no action that goes against their interests. The end result is the same. It then becomes understandable why definitions of performance improvement rarely stray beyond the domain of instrumental rationality. 'Best practice' is judged by the extent to which it serves the interests of the technocratic elite. Whilst it is true that the CBPP flags the importance of 'developing people', the caveat is quickly added that the effectiveness of training should be measured by its contribution to business performance. In other words, training is only worthwhile if it contributes to company profits. Metaphors such as 'teamwork' and 'customer-responsiveness' mask the reality that employees are required to act as mindless cogwheels in a remorseless machine. There is little pretence that any efficiency gains will be shared equally amongst the diversity of stakeholders in the construction industry. Targets abound for reducing the cost of construction and enhancing profitability. Lean construction thereby becomes the latest manifestation of a long established trend. The rhetoric is heavy in the machine metaphor whilst exhorting others to be more efficient. Nothing really changes.

RESEARCH ON THE RATIONAL HIGH GROUND

The preceding discussion provides a very different perspective on the mechanisms that have generated the current interest in lean construction. The lean construction literature consistently reduces organisational complexities to a mechanistic quest for efficiency. The intellectual origins are shared with the broader disciplines of production engineering, operational research and systems engineering. All of these are worthy areas of academic endeavour, but none are ever neutral in their implementation. Rarely have lean construction researchers descended from the rational high ground into the swampy lowland of human affairs where messy and confusing problems defy technical solution (Schön, 1987). The contribution of Koskela (2000) represents a significant intellectual achievement, but rarely does he descend from the level of high theoretical abstraction. Further important contributions have been made by Howell and Ballard of the *Lean Construction Institute* (LCI) (e.g. Ballard and Howell, 1997) and Tommelein (e.g. Tommelein, 1998). These US-based contributors draw heavily on the tradition of production engineering and are primarily concerned with the '*physics of production in the service of higher performance*' (Howell and Ballard, 1999). The domain of enquiry is invariably limited to instrumental rationality and as such provides no challenge to the industry's dominant ideology of utilitarian instrumentalism. Such research therefore passes the basic test of 'best practice'; others must become more efficient in serving the interests of the industry's technocratic elite. Tommelein has also done much useful work in supply-chain mapping and simulation, although consideration of the HRM implications of lean construction is once again notable by its absence. The dominant theme of all these sources is the quest for optimisation with associated assumptions of scientism and the treatment of people as passive objects. Whilst not addressing HRM issues

directly, the contribution of Seymour (1999) to the development of a sociological perspective on lean construction nevertheless warrants mention as a notable exception to the general trend.

The tendency of international researchers to ignore the HRM implications of lean construction is also reflected amongst many that have advocated lean methods in the UK (DETR, 1998; Flanagan, *et al* 1998; Saad and Jones, 1998). When issues of HRM are raised they tend to be at the level of the team, rather than being treated as issues of strategic significance. This tendency is notable within the people management research agenda of the *Agile Construction Initiative* (ACI) at the University of Bath (Hall, 1998). As with other generic notions of best practice, effective teamwork is seemingly judged by the extent to which it meets the needs of operational efficiency. Teamworking equates directly with compliance and conformity. Utilitarianism instrumentalism reigns supreme.

CONCLUSION

There is significant evidence to suggest that the UK construction industry possesses an institutionalised regressive culture of HRM, despite notable exceptions. This acts as a powerful disincentive to the young, intelligent and creative people that the industry so badly needs. Lean construction has been accepted as an essential element of best practice despite widespread concerns regarding the HRM implications of lean methods. The emphasis of lean thinking on eliminating waste and improving efficiency makes it easy to absorb into the best practice agenda because it conforms to the dominant way of thinking. Lean thinking too easily translates in practice to anorexic thinking. New ideas are only accepted as best practice if they reflect the construction industry's ingrained culture of hard HRM. Seemingly by definition, best practice must support the interests of the technocratic elite. Otherwise it does not quality as best practice. Best practice therefore cannot be innovative, but is inevitably concerned with making others more efficient. There is seemingly no demand for ideas that challenge the existing world views of industry leaders. The champions of best practice are programmed to consider only the narrow domain of instrumental rationality. Even supposedly enlightened practices such as teamworking, partnering and total quality management are ultimately judged in terms of their contribution to cost efficiency.

The dominant 'industry recipe' of HRM will inevitably shape the way that lean methods are implemented. Unless this issue is tackled explicitly, the implementation of lean construction will continue to reinforce the industry's dominant culture of 'command and control'. The ultimate victim will be the sustainability of the construction industry and its long-term capacity to serve the needs of the UK economy and society. The future of lean construction is not yet predetermined. Many choices remain to be made. The immediate challenge for the research community is to investigate the implementation of lean construction in real organisations. The HRM implications are of prime importance. Researchers must leave the sanctity of the rational ground if they are to reverse current trends. To be neutral is to be passive. The analysis of this paper will only become true if we allow it to become true.

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