SCHOOL OF MANAGEMENT

VICTORIA UNIVERSITY OF TECHNOLOGY

WORKING PAPER SERIES

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8/2004

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* The authors wish to acknowledge the support of Coopers Lybrand (UK) and the companies participating in the project for their support and cooperation.

Abstract:

This paper starts from the premise advanced by Jurgens (2003) that there are discernible national models of production rather than a convergence of production systems. This paper examines the nature and impact of Japanese idea of continuous improvement on 14 automobile components companies in Australia. This is undertaken by assessing the extent to which continuous improvement practices inform management systems and work organization and are reflected in Enterprise Agreements. The results indicate two patterns of production management in the companies termed the elaborated commitment and the basic commitment patterns respectively. The authors conclude that there is not one Australian production model. They also observe that company effects, as described by McDuffie (1989) seem to predominate. Industrial Agreements were seen as an important vehicle for the advancement of management strategies on continuous improvement, though management preferences in relation to work demarcations and training were not significantly advanced within the agreements.

INTRODUCTION

In a recent paper Jurgens (2003) developed the notion of a national production model as a way of describing the continuing differences between countries in their manufacturing and production systems in the automobile industry when compared with the notion that they are converging on a common model; the lean production model (McDuffie et. al. 1989; Womack et. al. 1990). Jurgens defines the national production system as the "core configuration of country-specific characteristics of production and work (Jurgens 2003,p. 213). He goes on to argue that contrary to the view that national production systems are converging under the influence of 'Japanese best practice' that each national system has a unique internal dynamic which is determining its evolution (2003, p. 214). He distinguishes five dimensions of national systems as a basis for his analysis of changes in Japanese, North American and German production systems. These are:

- process design (organisation of production flow)
- job design (tasks and responsibilities of individuals)
- involvement of rank and file employees in improvement activities
- employment security

- worker interest representation

In this representation of the national production system Jurgens sees employee involvement in improvement activities as the connection between process engineering and social integration. His definition does however eschew close attention to corporate governance, supplier relations and organisational structural issues, each of which might be thought to influence the character of production relationships (Boyer et. al. 1998; Boyer 2003, p. 4).

Jurgens concluded from his study of Japan, North America and Germany that there was some convergence in national models in the areas of process organization, job design and process improvement. This limited convergence around these three categories involves changes in Japan as well as the US and Germany. Such partial and limited convergence is interpreted by him as evidence for persistence of the core of national production models. This conclusion is consistent with Boyer's (1998) concept of hybridization derived from an analysis of case studies of both Japanese transplants and of attempts by western companies to adopt lean production in the automobile industry. Boyer's (1998) concept of hybridization allows for both adaptation and innovation in the application of lean production. In positing this concept of hybridization Boyer (2003, p. 40) emphasizes that those industrial models:

> … are shaped by the economic, social and political environment just as much as they shape the development of the latter.

Discussion of national production models also need to take into account company level differences within national contexts. Boyer, Charron, Jurgens and Tolliday (1998, p. 16), in an overview of case studies mentioned above, argue also that even within Japan there is no single model of lean production. Supporting this distinction is Lewchuk, Yates and Stewart's (2001) research on the different adaptation of lean production by the major US automobile companies due to varying industrial relations and product market circumstances. Such variety within US companies points to the importance of company specific factors in adopting lean production, whilst allowing for this to occur within broader national production models identified by Jurgens (2003).

As continuous improvement (CI) is a central notion in the lean production system, it allows a more sensitive analysis of differences between plants, allowing an estimate to be made as to whether there is a single country model, or whether there might be patterns reflecting particular circumstances of the companies or their production systems.

METHODOLOGY

The study is part of a larger comparison of automotive parts plants in UK, US, Japan. However, this paper looks only at 14 companies in the Australian automotive sector, of which three are final assemblers, the others being components suppliers. The research focused on particular production processes and products within the plant. The results of the study are based on interviews with a cross section of managers and workers in each workplace. These included where the relevant positions existed, the general manager, and functional managers for production supply, industrial engineering, and human resource management. In addition at least three team leaders in each workplace and a union job delegate were interviewed. This qualitative data was complemented by an extensive questionnaire covering issues such as the use of CI, the role of employees in CI, and data relating to company performance, plant size, suppliers and customers. In addition to this information the researchers examined Enterprise Agreements for 1999-2000 for each of the plants or companies involved.

CI AND LEAN PRODUCTION

The notion of lean production developed as part of the MIT study into the international automobile industry has had a profound impact on thinking about production systems and in particular the human dimensions of those systems. The model, as originally described by Krafcik and MacDuffie (1989) placed considerable emphasis on the importance of work organization and supportive human resource management practices as the foundation elements of a systemic approach to production. The ideas were embodied in the subsequent publication which popularized the notion of lean production (Womack, Jones & Roos 1992). An examination of Japanese industrial relations suggests an important link between these characteristics and the practice of industrial relations and human resource management. Company unions, employment to the company rather than a job, and the absence of significant occupational demarcations between different groups of workers or between those workers and their managers are features of the Japanese employment

system that have been well documented (Gordon 1998). They are each in their way factors that contribute to the ability of employees and managers to pursue such practices as CI, in that they provide the basis for cooperation and mutual problem solving by everyone involved in the workplace (Delbridge & Barton 2000). The ability of Australian companies to use such practices is thus quite importantly related to the way in which their workplaces are governed. The same idea is reflected in Jurgens's remark that changes in strategic direction within companies, or in regulatory institutions, determine the practice of production and work regulation (2003, p. 215).

As developed in Toyota, CI involved a complex interaction of workplace organization, shared authority, workforce skills and production engineering expertise. Management hierarchy, training relevant to the tasks being undertaken, shared responsibility for corporate production objectives and ready movement of workers across hierarchical levels are part to the array of factors that are relevant to this analysis. Krafcik and McDuffie (1989) presented CI as the means by which workers, working in teams with appropriate skills, logical task allocation, and a focus on a critical variable (e.g. quality) achieved a range of factory practice goals. These included the elimination of waste and improved material flows. In this model HRM practices are the means by which workers are employed, trained and allocated to the workplace. Work systems reflect the characteristics of Japanese employment practice. Employment is to the firm rather than a job, there is a lack of hierarchical barriers within the workforce, and payment systems are based substantially on seniority rather than position, job or skills. The influence of Japan's post war settlement (Gordon 2000) in which divergent industrial objectives were channeled into negotiation over wages at a national level, and into consultation over corporate goals provided the normative accommodation underlining the development of the Japanese system (Gordon 1998). Clearly the approach to industrial relations and employment systems in Australia differ from that in Japan. This provides a different institutional context for managerial adaptation of Japanese concepts such as Kaizen or CI.

The achievement of CI incorporates a number of these elements. Delbridge and Barton (2000) point to the radical implications of CI in their argument that the core assumptions challenge both existing business relationships and the nature of authority and power in the

workplace itself. The pursuit of a view that "Kaizen is everybody's problem" (2000, p. 6) goes to the core of authority relationships within the workplace and across the supply chain. Bessant and Francis (1999) proposed a typology of five different stages of development of CI in an organisation. This ranged from 'trying out the ideas' through 'strategic linking of CI to organisational goals' to 'the learning organisation'. While the typology is useful as a means of distinguishing between different forms of the practice, it does not address the contextual reasons for the projected stages of development in the form of CI. Factors such as labour relations and national training systems may be relevant explanatory factors in determining the degree to which CI is part of the governance of the organisation and therefore an effective link between societal and production engineering dimensions of a national production model. However their model does provide a framework for classifying some of the outcomes of the research reported in this paper.

In the following study two main categories are used to organise the data. These are management systems on the one hand, and workplace organization on the other. Management systems refer to a range of practices and approaches which managers might use to implement Kaizen. An important aspect of Kaizen is the assumption that it is built into the normative framework of the operation of the company – "it is everybody's problem". In an adversarial industrial relations environment the attainment of this accommodation and the substantive changes to work organization and management practice necessary in a CI system, may be limited by industrial relations considerations. However, the decentralisation of industrial relations has opened an opportunity for managers at company level to pursue industrial arrangements more attuned to the strategic interests of the company. The ability to negotiate clauses in Enterprise Agreements which provide a commitment to principles such as CI and even to aspects of its management such as 'Key Performance Indicators (KPIs) and expanded work roles is therefore an important part of the process of building normative accommodation to these management ideas and practices. Agreements show areas in which unions and have accepted some areas of management practice or intention. They also provide some evidence of practices that are part of a set of mutually reinforcing reciprocal relationships. Moreover the Agreement can be the means of shifting barriers to new forms of working which involve less defined job roles. Within a company the achievement of effective CI rests substantively on the

development of a range of management systems and structures that link corporate objectives with workplace practice. These systems are the means by which areas for improvement are identified and provide a ready means for identifying areas for improvement, and involve an allocation of responsibility for the initiation and development of production improvements (Delbridge & Barton 2000). This responsibility might include a leadership role for one management function, but it also assumes that work teams will exercise responsibilities for CI within a framework set by the management systems and processes.

Workplace organization has received considerable attention in studies of Japanese management (Krafcik & McDuffie 1989: McDuffie 1996; Womack et. al. 1990). The model of Japanese production developed by these authors gives particular attention to the way in which Japanese workers and work teams are integrated into the management of production. The factors underlying the ability of workers to contribute to the working of lean production systems rests on such factors as functional flexibility, clear delegation of authority over CI tasks, and the provision of training and development to ensure all workers are able to undertake the wider range of tasks implied by CI activities. In this study a company's pursuit of CI is thus likely to focus on the creation of conditions that allow them to achieve functional flexibility, skill levels relevant to participation, lean production and responsibility over a range of production issues. Industrial Agreements are one source where evidence of such practices being pursued might be found.

Management systems

The introduction of CI has been associated with a distinctive change in management rhetoric and behaviour. Managers in their promotion of CI commonly use terms such as team working and empowerment. When such terms are used in industrial agreements they suggest acceptance by Unions of the values and objectives being pursued by the company. The move to enterprise bargaining has enabled Australian companies to incorporate unions and employees in a common rhetoric covering management directions and practice. In this study an examination of the relevant Agreements was used to indicate the degree to which there might have been an accommodation between companies and unions over issues associated with CI. Companies successful in implementing complex organisational practices such as CI are more likely to be successful where the industrial parties have agreed to the overall direction.

Interviews with a cross section of management and employees were used to explore the way in which the companies developed management systems and allocated responsibility for CI activities. The information from these interviews were organised under three headings, viz. the extent to which workplace performance indicators (KPIs) were articulated to business goals; the use of management systems techniques such as suggestion schemes, and proprietary quality measurement systems; the allocation of management responsibility to a specific group or individual. The latter category is an issue raised in a study by Delbridge and Barton (2000). This research suggested that there was a significant difference in national approach between the UK companies and US companies in the automotive components sector. The authors suggested that companies in the UK tended to have a defined function associated with CI, whereas companies in the USA the responsibility was more diffuse.

Evidence of normative integration

An examination of the 14 Agreements suggested three approaches to this issue. There was one Agreement in which there was no mention of CI. The subsequent interviews affirmed that this company had made little attempt to implement a coherent CI strategy. In a second group consisting of 7 Agreements, there was a token attempt to identify the industrial parties with CI. In these agreements reference to CI was minimal, and unrelated in any specific way to other undertakings in the Agreement. In contrast a third group of 6 Agreements had a range of references to CI, and included a more elaborate approach to the changes envisaged in introducing it. Some examples indicate the tone of these agreements.

An example of this is an agreement where operators are expected to undertake ‘routine and planned preventative maintenance tasks’ and ‘attendance to minor equipment adjustments and failures’. A more ambitious approach was evident in another agreement. This agreement allows that:

> All [company name] people will be able to perform any task if they are trained and skilled in that task so that the business can maximise the benefits of all available skills. Examples … include greater flexibility between traditional staff and works functions and between trades and non-trades functions

The Agreement solicits against such flexible practices occurring over extended periods, but the principle of flexibility is accepted.

This examination provides an indication of the differences in the use of industrial agreements to further management strategies. The elaboration of industrial conditions relating to CI tended to be reflected in management practices such as the articulation of business goals or the determination of specific management responsibilities as discussed below. This suggests that for companies committed to continuous improvement, substantive management action needs to be taken in addition to the building of a normative accommodation around the principles underlying CI. The array of clauses dealing with managerial practices in the sample Agreements do indicate the importance of a decentralised bargaining system as a basis for the pursuit of management policies.

Articulation of KPIs to business goals

The analysis of this factor focussed on those with an elaborate approach to CI in their Industrial Agreements and those with a more basic approach. In those with a basic approach in the Agreements there was little evidence from interviews that the companies had developed a coherent and integrated approach to the pursuit of CI, with two significant expectations. In one of these the companies had clearly developed a very sophisticated approach to the management of CI. As the company was based in a non-metropolitan location, and most of its employees had very long periods of employment it was felt that a normative accommodation had emerged as a consequence of these characteristics. Moreover the company had been actively involved in change and modernisation of its production methods for over a decade. In these circumstances it was unnecessary for the company to pursue formal agreement over its goals. The other company in this group was one whose production levels and durability had been under question and that may have diverted managers from the further development of CI systems.

Allocation of managerial responsibility for CI.

Company interviews revealed that 6 companies had allocated specific responsibility to either a manager or a group of people for the oversight of CI activities. As indicated above Delbridge and Barton (2000) first examined this issue in a comparison of plants in the US and the UK. The evidence from the present study suggests that the companies with a more

developed approach to CI were those more likely to use specific groups as ‘flying squads’ to undertake a range of improvements in production practice over time. Where such responsibility was allocated in this way the action clearly reinforced the overall commitment of the company concerned to CI. However in a select group of three companies it was evident that CI activities were significantly embedded in the texture of the organization, obviating a need for a person to take direct responsibility. In these companies the practice of CI had been developed over a decade and generally included a broad based approach such as the use of lean production systems. In one of these companies a senior manager commented that:

> the major thing is that back in ’92 we actually went to a work group culture, training all the employees and … people being more self directed within the work groups, [which led] to a shop floor no longer dependent on a production control department to let them know what to do…

This suggests that there may be a temporal element in the experience of companies undertaking CI.

Workplace organization

CI relies on changes to the responsibilities and capability of people on the shop floor. One element of this is the notion of functional flexibility. The ability of people to work across traditional job boundaries and to focus on a range of tasks facing a whole work group improves flexibility and the ability to utilize the skills of the whole group to solve production problems. A second element of work group performance relates to their levels of skill. While some technical ability is desirable, the focus of skill building is on so-called generic skills such as problem solving, communication and the use of statistics to measure changes in workplace performance. The ability of a work group to accept responsibility for monitoring and initiation of improvement activities relies on the members having the ability to work together to improve aspects of performance within their immediate environment, or to contribute to more significant changes involving other work groups and specialists.

Functional Flexibility

In the seven companies in which there was only token reference to CI in the Agreement, four made no reference to functional flexibility. In the other three, two referred to

employees doing " any task to which they were trained" and the other had a more all-embracing comment about:

> employees being required to take responsibility for the whole production process not just traditional job or department.

This statement may reflect the fact that the company had a number of plants on their site and that workloads varied considerably between them.

Of the six companies with more elaborated expression of CI in their Agreements five Agreements contained reference to some form of functional flexibility such as production employees doing die setting, or an an integrated non-trades structure with the possibility of employees accessing Australian Qualification Framework Level 3. In the one company where there was no reference to functional flexibility the work was basic assembly work with little automation. Interviews indicated that employees in this company rotated between groups and did minor adjustments to their machines. The level of technology used did not dictate any significant need for traditional trades qualifications.

Skills Development

In most agreements there is a clear undertaking that employees be given access to training using nationally accredited training. The three exceptions to this pattern were companies in which there was little evidence that training was given a high priority at all. One explanation for the attention to nationally accredited training is the influence of unions, and most importantly the AMWU, to this issue. In agreements, including the AMWU as a respondent, it was normal for nationally accredited training outcomes to be linked to classifications. In those circumstances reference to nationally accredited training is, at a minimum, part of a wider pay related industrial issue, whereas the requirements for companies involved in CI may require training outside this framework.

For the companies whose agreements included an elaborate approach to CI there was equally significant attention to training. In each case these companies were using specific training outside the national training framework to provide for skills more closely related to problem solving, team working, quality improvement or more general proprietary management systems such as 'lean management systems'.

Workgroup involvement in CI

For CI practices to work effectively, the work of the teams should be integrated into the overall systems of management control and specifically those that are used to monitor production effectiveness. To ensure that teams then work effectively using their combined knowledge and skills to monitor and review production issues, the teams themselves should have communication skills and an understanding of their roles which distinguishes their work from a normal group of workers. This qualitative aspect of team working will be referred to as ‘teamness’.

In this research three patterns of integration of work groups into CI systems were observed. For five companies there was no evidence that any attempt had been made to integrate work place activities of employees into a larger improvement system. For the remaining companies there appears to have been some attempt to build linkage between management systems for CI and workplace groups concerned with improvement issues. Of this group three companies used ‘flying squads’ to initiate improvement activities rather than relying on the specific workgroups. In such situations the groups were voluntary. The remaining six companies had teams in which CI activities were embedded in team working practice and closely associated with management systems.

The other aspect of team working is that of ‘teamness’. The research did not provide for a detailed analysis of the way in which teams worked, though the Toyota pattern of directed teams (Berggren 1992) appears to describe the work group pattern found in most of the best performing companies. What the research did indicate clearly, however, was a range of factors that inhibited the achievement of team working. These include production layout issues which prevented interaction between workers nominally members of the same team; ethnic diversity within the workplace limiting easy communication between team members; lack of management interest in forming work teams, and the lack of training for team members. Such issues have been alluded to in the extensive literature on team working. The observation that they have limited the take-up of teams in this sample of companies is further testament to the difficulties in implementing this form of workplace organization.

Conclusion

The most striking outcomes of this research is the variation in production management, and more specifically CI practices, across the companies. The research suggests that there is not a uniform Australian production model. In the area of labour relations the development of enterprise bargaining in the first half of the 1990s has made the system more receptive to localised bargaining about issues relevant to CI. This has facilitated a clearer articulation of workplace practices such as CI and the operation of the national bargaining system. However, it is apparent that industry level agendas such as skills training still override workplace level developments. In that area the development of a very sophisticated competency based system of skills training has focussed on more traditional aspects of job roles leaving training for CI to be determined largely by enterprise specific initiatives. Furthermore the enterprise agreements suggest that there has been some movement away from narrowly defined job roles.

There appear to be two general patterns of CI in the Australian automotive components companies studied. One of these is that associated with companies demonstrating an *elaborated commitment* to CI. The other pattern relates to a group of companies more eclectic in their approach to the management of production, or in some cases at the early stage of reforming their production systems. This group forms a *basic commitment* pattern.

The *elaborated commitment* pattern includes companies that have some direct contact with the Toyota production system whether through ownership links or joint ventures. Five of the companies are either owned by Toyota, have been significantly influenced by Toyota management practices or have consciously adopted aspects of lean manufacturing philosophy. However four of these companies are not suppliers to Toyota. This suggests that integration into the Toyota supply chain is not a determining factor in the adoption of the elaborate commitment pattern.

In the *basic commitment* pattern there were three companies with links to a Japanese owner or partner, though none of them with a link to Toyota. This conclusion reinforces the argument developed by McDuffie (1995) that the company level influences may be more

important that national influences. It also supports Boyer's (1998) concept of hybridization, where contrasting mixes of practices are observed in different companies.

The findings also reflect Bessant and Caffyn's typology of the stages of development of CI. Companies with a basic approach or commitment pattern in agreements reflect their bottom level category of CI whereas the elaborate commitment pattern reflects their third level of development. However, this typology as stated earlier does not really address the broader issue of the interaction of CI and production models and their adaptation.

Company choices over workplace organization and practice were at the centre of this study. It was suggested earlier that a primary indicator of corporate commitment to the implementation of CI was found in the degree to which underpinning elements of the system were engaged in Enterprise Agreements. What may also be observed is that these Agreements have not fully reflected what managers have sought to achieve as part of their workplace reform process. Nationally accredited training is a strong feature of agreements, but has been supplemented by other more focussed training in the elaborate commitment workplaces. A similar group of agreements also included causes that hinted at attempts to breakdown traditional demarcations between different groups of workers, or between staff and workers. Managers have not made significant inroads into such divisions in the workplace.

In conclusion it should be observed that this study is snapshot at a point in time, and that the patterns described here might well change over the next few years.

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