12 Managerial implications and future directions

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Introduction

This chapter provides an overview of the main results of the international CI study and examines the implications of these results for organisations and the managers attempting to guide and develop these organisations. We also consider the possible future development of CI and suggest what areas might be most valuable for future research in this area.

Overview of the results of the study

In addition to highlighting specific results from the survey, it seems equally useful to discuss and reflect on the general similarities and differences.

Similarity across countries

Only minor differences exist between the calculated national means for the majority of CI aspects investigated as part of the study. When the data for different countries are grouped according to Hofstede's national culture characteristics, some differences do emerge. These differences are discussed in detail in Chapter 10. In all, little evidence was found to support the theory that national culture or infrastructure has a *dominating* effect on the implementation of CI within organisations. However it must be remembered that the survey was limited to medium-to-large manufacturing organisations many of which are exhibiting increasing evidence of globalisation. In the SME sector, the impact of national culture and infrastructure may be considerably more important.

Maturity matters

Of far greater significance were the broad differences identified between groups classified by the CI adoption status of the organisations. These classifications are discussed in various chapters. Although slightly different classifications are being explored in the book, the overall picture that emerges is very clear. In the present chapter we will refer to the four levels of maturity CI innovators, early adopters, late adopters, and laggards (see Table 12.1). A possible fifth category, companies that think that CI is not a suitable concept for their operations, are left out of the discussion.

Table 12.1   Distribution of CI maturity in the total sample

Survey classification statement	Category	Proportion
1. CI is not a suitable concept for our operations	Non-adopters	2%
2. Some people in the business unit are aware of the need of CI but there are no CI activities	Laggards	
3. There is widespread awareness about the need of CI but little action has actually taken place		45%
4. CI is an activity decided by management but very few activities have yet taken place	Late adopters	
5. We have initiated a systematic application of CI	Early adopters	
6. We have a widespread and sustained process of CI	CI innovators	53%

Relatively few differences were identified between firms in the early adopter category and even between early adopters and CI innovators, regardless of country, industry and other contextual descriptors such as product, process, and size. Some differences were observed for the broad late adopter category.

However, several consistent differences emerged between the laggards and the other categories. The content of the CI process in case of the laggards is mainly manufacturing costs, whereas in the other stages it is manufacturing quality. The laggards put buffer stock, layout and physical flow at third place. In all other stages this is at seventh position. Also, the laggards (and to some extent, the late adopters) exhibited differences when compared to the other categories across the sample with respect to strategy.

Laggards and late adopters focus more on price and low costs, early adopters focus more on quality, involvement, management/organisational support, and performance. Laggards and late adopters also demonstrated some different approaches to the selection and use of CI tools and techniques when compared to the earlier adoption groups.

Functional equivalents to the Japanese kaizen *approach*

From the survey findings, it can be concluded that the European and Australian CI profiles are quite distinct from the traditional Japanese *kaizen* approach, having more in common with employee-involvement practices and team-based organisations, in combination with simple improvement tools. Compared to *kaizen*, how can the relatively different profile of the CI practices found in our study be explained? Could it be that CI, based on employee-involvement and combined with advanced work organisations in the form of multi-functional work groups are functionally equivalent, that is, provide the same general outcomes regarding organisational improvement, to the Japanese Quality Control Circles and *kaizen* teams? Yet how could that be true when Japanese workers provide many more, in some companies up to 40 times the number of, improvement suggestions compared to the average of the workers in this survey?

Firstly, suggestion schemes do not seem to accurately reflect the level of improvement activity in our sample, partially due to the rather inflexible and bureaucratic systems accompanying suggestion schemes. If the questionnaire had asked about suggestions *generally* (that is, not only *registered* suggestions through formal suggestion schemes) the result may have turned out differently.

A second, and perhaps more important reason, is that the larger improvement domain included for work group activities make improvements of planning and order scheduling, material handling and administrative routines much more likely when compared to a narrow focus on the physical work process. The leverage of a more profound improvement and problem-solving domain can be argued to compensate for the lower suggestion activity, with respect to performance improvement.

Compared with the management, the organisation and the tools of Japanese *kaizen*, the multi-functional work group can serve as an example of how an organisational design can be functionally equivalent, although different from its original. It requires, however, that the design is adapted to its organisational context in terms of, for example, labour market, educational levels, industrial relations, incentive systems and motivational structure of the work itself (*cf.* Lillrank, 1995).

A key role for the management

Reflecting upon the entire survey results it is suggested that one of the determinants of embarking on the CI road or not, is simply management recognition and conception of the need for a complementary approach to operational improvements – complementary to the more traditional Industrial Engineering (IE) concepts. However, complementing IE with CI requires more than the incorporation of new methods and tools. Primarily, it requires that managers address some fundamental issues concerning the principles of managing change and development processes.

Managerial implications

Moving away from the characteristics of traditional IE and embarking on manufacturing development based on CI bears various implications for managers. The main ones are discussed below.

Management commitment to the importance of employee behaviour

It is by no means a simple task to change the priority and balance of organisational and human aspects over time in relation to technology. Technology is tangible, divisible and measurable and imposes concrete restrictions on what is possible to achieve with people and organisations. To counter this 'inherent and logical' imbalance, it is not sufficient to 'technically' balance different aspects in a redesign project as implicitly suggested in previous research (see e.g. Kidd, 1991). Instead, human and organisational factors must be upgraded via management commitment to a concept (idea) or policy emphasising the importance of employee behaviour for manufacturing performance. Several prominent authors of generic management theory have emphasised the importance of such a change in managerial practices. For example, Pfeffer (1994, pp. 30-65) extracts 16 generic practices for managing people. Bearing in mind the profile of early adopters it is clear that they subscribe to many of these principles, including participation and empowerment, teams and job redesign, training and skill development, information sharing, incentive 'pay', cross-utilisation and cross-training, long-term perspective, and overarching philosophy.

The significance of management commitment to placing a high value on employee behaviour is accentuated in the case of CI, which has few tangible or structural properties and builds primarily on changing employee behaviour through the work context. The survey shows that one of the cornerstones of successful continuous improvement of

manufacturing performance is widespread involvement through increased employee-commitment and improved co-operation and information. There are few similarities with the classical Japanese *kaizen* approach where the ordinary work context is separated from improvements. This does not imply that technological opportunities or restrictions should or could be disregarded. Increasing the complementary use of the two models, however, requires management commitment to upgrade non-technological aspects of manufacturing development, which otherwise tend to become subordinated.

This commitment is not a *laissez-faire* policy allowing all conceivable individual objectives to be pursued, but only those which are fully compatible with stated organisational goals and performance standards. Such a *laissez-faire* approach would constitute the other extreme on the continuum. In between these two extremes lies management facilitating CI by formulating strategy, organising (especially including the removal of barriers that hinder CI/learning behaviour and cross-functional/cross-level communication) and allowing for 'slack' to combine operational activities with learning. If anything, management have to commit themselves in words and actions to a re-evaluation of traditional assumptions concerning the relative leverage gained from 'hard' technological developments over 'softer' organisational or employee-related improvements. The results present evidence of such words and actions by highlighting the importance of decentralisation and management support for employee behaviour.

Combining planning and learning through team-based organisations

A second managerial implication is derived from the findings that concern the contrasting logic of the two approaches – deductive IE planning vs. inductive CI learning. With the traditional IE approach there is an evident risk that the development organisation becomes separated from and parallel to the regular line organisation, since there is no organisational mechanism or structure that can transform central plans and expert knowledge into a base for a complementary inductive learning strategy. The opposite seems to be equally evident in the early CI adopters, where establishment of multi-functional work groups is suggested to serve as a prime integrating force between the regular organisation and the development effort.

At the core of this issue is the degree of commitment being obtained. Argyris (1998) distinguishes between external commitment, i.e., employees meeting the expectations of others (read managers), and internal commitment, i.e., employees committed to (mostly) self-defined tasks, methods, importance of goals, etc. This is, of course, clearly related to the debate concerning intrinsic motivation versus external reward and recognition.

To some extent the development from solely deductive IE planning to a combination of this with inductive CI learning mirrors the maturity of the CI approach within the

organisation. Figure 12.1 provides an overview of the CI Maturity Model as developed by Caffyn and Bessant (1995) (see also Bessant and Caffyn, 1997). The diagram also provides an organisational self-assessment grid with columns for the most important capabilities relating to effective CI. We would expect to see little evidence of capabilities on the right hand side of the diagram at lower levels of CI Maturity. Thus the shaded areas represent a typical development of CI capabilities as organisations progress through the Maturity levels. However, self-assessment would almost certainly reveal differing developments of these capabilities. This would allow the organisation to 'fine-tune' its CI development.
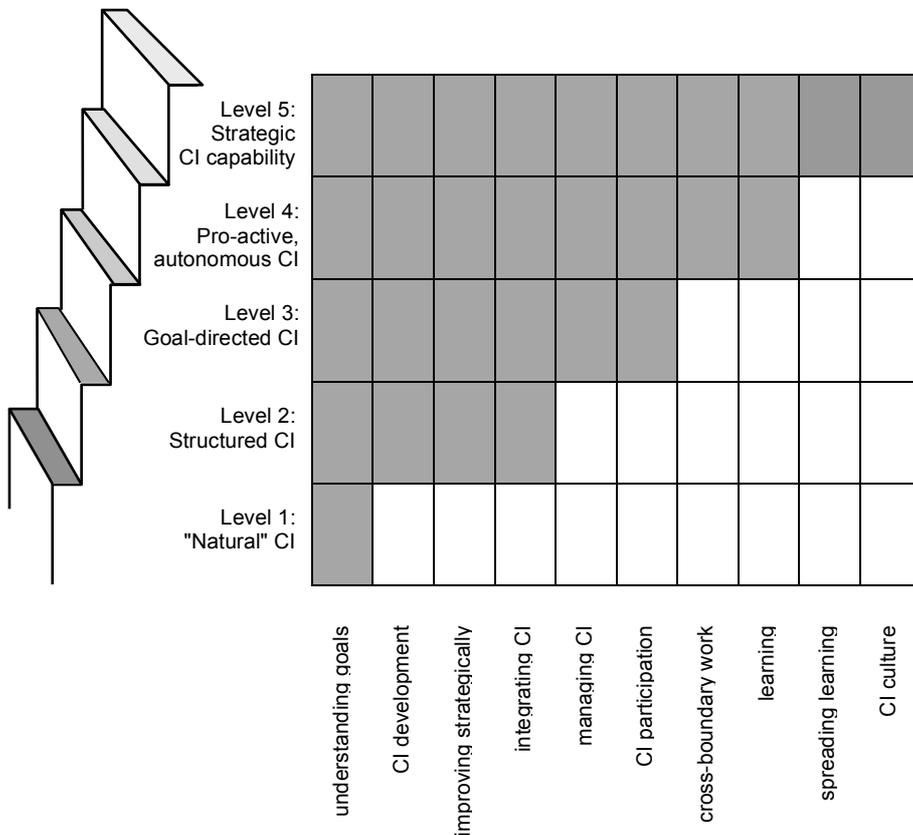
Figure 12.1   CI Maturity diagram with associated Organisational Assessment Grid

Source: after Caffyn and Bessant (1995)

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An improvement process may change nature as it moves along. After activities exclusively mastered by a group itself with the capability to implement proposed changes, at some point further improvement may require a substantial contribution from other departments, e.g. production engineering, engineering design, purchasing, or production planning. The approach taken by the new group to their involvement and responsibilities regarding the improvement activities will have a significant impact on the continued enthusiasm and commitment of the original group.

Over a period of two years, an industrial enterprise had carried out several Continuous Improvement activities in a production unit with increasing success. The group of employees associated with the unit had been actively involved in preparing statistics of their performance, discussing areas with potentials for improvements and successfully implementing several proposals.

At some point the group proposed a more radical change of the processes on the assembly line. The group felt that there was a need for increasing the stability of the particular process (cutting) which would significantly increase both productivity and quality. However, the change implied an effort of production engineers. When first involved, in fact, they completely took over the project leaving the group somewhat disappointed. After six months the engineers implemented the change and left it to the group to take over. With some hesitation they adopted the change and began to discuss further improvements, but with less enthusiasm than previously (Riis et al., 1996).

The difference in logic between the traditional IE and CI approaches also carries implications for the nature of participation. To characterise the difference in nature, one could state that advanced CI describes a higher degree of 'authentic' participation, i.e. employees having greater possibilities to contribute with their existing experience and knowledge to issues which are directly related to their immediate work context. With the IE approach, a development process commonly relies upon a 'representative' participation, in which employees are picked to participate in improvement efforts and represent the opinions and experiences of their team, department and profession, on issues that are somewhat less relevant to their immediate work situation.

The managerial implication suggested here, then, is that combining the deductive planning with the inductive CI learning logic requires an organisational form capable of integrating the development effort with the regular line organisation. As indicated by the

survey results, the multi-functional work group is suggested as one such organisational form, which will be addressed in some more detail below.

On the one hand, it can be concluded that the establishment of CI also depends partly on procedural planning at the management level in the form of for example policies, reward systems, and systematic training in methods and tools. On the other hand, CI activities and behaviour at the shop-floor level are less well suited for direct planning and control and rely instead on the inductive learning and improvements achieved by employees. The high degree of team-based organisations found in early CI adopters further supports the implication that work groups are efficient receivers and transformers of management plans. Work teams appear to provide an adequate (social) structure to support the conversion of plans into an inductive CI strategy based on changed employee behaviour. Inconsistencies between top-down controls and bottom-up learning are inevitable and most be managed carefully and openly to get the balance suited for the temporary situation and the specific organisational conditions. Note, however, that turning shop floor teams into CI teams may be a lengthy and painful process (painful for the operators and, perhaps even more so, for their supervisors) (see e.g. Ros, 1999).

Integration of CI operations through involvement and teamwork

The third managerial implication is based on a combination of the two former ones. As concluded in the previous section, the European and Australian CI profiles are quite distinct from the traditional Japanese *kaizen* approach, having more in common with employee-involvement practices and team-based organisations, in combination with simple improvement tools. These differences in practice become more apparent when attempting to differentiate the improvement activity level of CI from the methods and management levels of CI. One can only speculate whether this is a conscious adaptation of the CI concept to the national and organisational contexts, or a lack of knowledge and attention to the original details of *kaizen*, i.e. simply poor practice. In the latter case, the potential risk of not applying the detailed improvement activities (relying instead on isolated management initiatives to increase involvement), could be that CI may be increasingly perceived as management rhetoric with limited substance, particularly if performance is not improved (*cf.* Hackman *et al.*, 1995). However, we believe that the differences reflect a deliberate response to national and organisational culture differences. The most successful means of securing the maximum input from our increasingly skilled and knowledgeable workforce is through a team-based and employee-involvement dominated approach to CI.

The occurrence of an accompanying organisational development may actually be the main delineating dimension between a conscious adaptation of CI based on employee

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involvement and poor *kaizen* practice. That is, successfully applying the involvement-oriented CI approach requires the development of organisationally advanced and well-managed companies with respect to:

- Clear strategic support and top management commitment.
- Multi-skilled employees organised in work groups and supported by extensive training.
- Decentralised daily planning and control of operations and improvement activities generated from team-based structures which adhere to broad organisational 'values' and strategies, but allow innovative approaches to the achievement of these strategies.
- Production processes commonly (but not necessarily) organised in cellular layouts rather than in functional departments .

In line with the arguments of Caffyn and Bessant (1995) one might detect development patterns where distinctive features are added to the improvement process as CI practices progress. For example, the relative lack of strategic direction among the late CI adopters might indicate that CI still is emerging from an operational level. It does not receive any significant strategic support until its benefits are proven to workplace management. In a similar way, the signs of traditional *kaizen* focus (see Chapter 1 for details of this) are more prominent in early stages of CI, while the indirect employee-involvement approach tend to become more prominent with increasing CI maturity. Accordingly, it is possible to conceive a mutually reinforcing development of both improvement practices and organisational arrangements.

All this suggests that manufacturing managers striving for the integration of improvement activities with regular work, through the establishment of CI based on employee involvement, must be prepared to support this integration with advanced team-based work organisations, e.g., teams comprising engineers, technicians and operators. In fact, this feature is essential if the necessary behaviour and motivation for a sustained CI process (where improvement is 'part of the ordinary work') are to evolve. If the organisation of work is excluded by definition, it could rightfully be argued that the CI effort overlooks *its own implications* for changes in the motivational structure of work, allocation of gains and distribution of authority.

A new role for the management

A related and final reflection concerns the changes in managerial roles that tend to occur in the more mature CI organisations. As illustrated in a few country descriptions, the importance of workplace management commitment and involvement increases for firms pursuing CI activities. The same applies to first-line managers, who in their role of

coaching and supporting the work groups must possess more elaborate process skills (communication, conflict resolution, etc.) than conventional work-related skills. This is primarily due to their role requirements changing from direction/supervision to leadership/coaching. A prime reason for this shift in managerial roles and the subsequent need to upgrade process skills, is related to the differences encountered in managing the analytical skills of a few specialists vs. directing a co-operative problem-solving process involving the experience and collective skills of a majority of employees. The lack of first-line managers with this needed competence profile can prove to be one critical bottleneck and an explanatory factor for many firms struggling to get their CI effort in shape.

New HRM policies and practices

The upgrading of the importance of first-line managers and coaches in general (including their process skills) as well as the enlargement of the role of department managers and functional specialists in order to support the CI process, are thus two additional challenges for the manufacturing manager. The HRM function should play a key role, here, to the extent that this may require many companies to develop new HRM strategies and practices and additions to their 'portfolio' of selection criteria and training programmes through the inclusion of aspects such as leadership and communication skills. The actual implementation of these changes may vary from country to country. For example, in countries like Sweden, Finland, The Netherlands, and Denmark, where the HRM is typically more decentralised, the managers themselves are the most critical factors in this respect, as they are the ones to make the first steps towards changing their own and lower managers' roles.

Summary of managerial implications

A summary of the suggested implications for manufacturing managers striving for a better integration and complementary use of traditional IE approach and CI, is outlined in Table 12.1.

Table 12.1   Managerial implications for increasing the complementary use of traditional IE and continuous improvement

	Traditional IE	Key managerial issues to increase complementary use	Continuous Improvement
Driving force and focus	Technology- or design-driven change of structures/systems	Management commitment to the importance of employee behaviour for manufacturing development	Concept- and policy-driven change of employee behaviour
Change logic	Planned change at all organisational levels	Combining planning and learning logic through team-based organisations	Planned management action for adaptive change at workshop level
Relation to regular work	Encapsulated and organised in projects, apart from regular work, with limited participation	Integrating regular work and improvement activities through employee involvement and the development of team-based organisations	Part of and organised within regular work based on extensive decentralised participation

Future research – Expanding the concept of CI and moving from organisations as fixed states to the process of organising

One factor that may have restricted the successful *global* application of CI is the fact that most of the documented experiences to date have been gained from Japanese and American mass-production companies in industries such as automobiles or electronics. The production context for CI has, in these cases, predominantly been work environments with repetitive, fragmented tasks and highly standardised processes, such as in line assembly. Studies of CI in production environments where tasks are complex and holistic, and where standardisation of processes is low (e.g. in one-off or small batch assembly) are less frequent in the literature. Since the latter context is prevalent in many companies, there is a need to further investigate the implications of different product and production contexts when applying CI[1]. It would be important to consider the questions of potential benefits and costs of standardisation when work itself is non-repetitive and non-routine.

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1   Line processes account for 75% of the value added in large Japanese companies and 40% in US firms, while the corresponding average figure for the countries in this survey is 29%. One-off, batch processes and cellular layouts are used for the remaining 71% of the value added in the machinery and metalworking industry (Lindberg *et al*., 1994).

Similarly, the application of CI in product development processes where work processes are iterative rather than linear could be addressed, with special attention to potential trade-offs between innovations and incremental improvements.

Another area where CI-related research should be intensified concerns organisational designs for CI as well as related contingencies. The parallel structure of Japanese Quality Control Circles (QCC) and temporary taskforces are two designs, which need to be complemented with further research on CI integrated in regular work groups. The concept of 'functionally equivalent' organisational designs could be elaborated in different production contexts. What makes organisational designs or improvement processes functionally equivalent? Identifying the generic mechanisms might improve the transfer of knowledge and experiences between nations, organisations and people, much in line with the model described by Lillrank (1995). In his 'transfer-model' of management innovations, the problems of abstraction, transfer and application are exemplified by the failure to transfer the Japanese QCC concept to Western economies. Although designed (and organised) almost identically, the Western QCC organisation was not functionally equivalent.

The development of concepts such as *Business Process Re-engineering* (BPR) and *Process Management* (Hammer and Champy, 1993; Rummler and Brache, 1990; Alberts *et al.*, 1998) have introduced the logic of radical restructuring and management of the 'white space of the organisation chart'. Process Management is particularly focused on the improvement of interaction between departments by identifying the core operating processes of the business. The authors contend that the methodology for process improvement is equally applicable for the design of a new process, the redesign of existing processes or in the pursuit of continuous improvement (Rummler *et al.*, 1990, p. 116). In contrast to CI, however, BPR is characterised by its proponents through statements like "breaking the china and challenging the very purposes, principles and assumptions on which the businesses are based". They state that CI is simply not sufficient for making the rapid transformation necessitated by powerful change drivers such as cost, quality, regulation and shareholders (Johansson *et al.*, 1993, p. 6). The relationships between CI and BPR or process management need to be further investigated, and the potential conflicts and benefits of applying these concepts (in relation to CI) should be delineated.

That there exists a need for further research in this area can perhaps be illustrated by the somewhat paradoxical description of the development of the Toyota Production System (TPS). In the hands (or minds) of radical change proponents, the variety of concepts attributed to the TPS are clear evidence of 'breakpoint' changes and offer radical views on how to operate production systems (Johansson *et al.*, 1993). On the other hand, the development of the TPS is described elsewhere as a sustained and incremental

process over a time span of some 20 or 30 years, and often serves as a prime example of the virtues of Continuous Improvement (Shingo, 1988; Imai, 1986).

The role and impact of incentives, employee ownership, wage compression, new HR-strategies, and industrial relations developments such as the dramatic changes to lifetime employment practices in large Japanese industries, on the developing nature of CI all need to be considered in more depth.

Finally, as pointed out by several authors, the outcome of any one concept or combination of concepts is less dependent upon the technology inherent in the methods than on 'a different set of arrangements for the social organisation of production' (Storey, 1994, p. 7). This set of arrangements could be interpreted as a strategy for how 'organisations learn' in order to accumulate knowledge and develop distinctive competencies. Bessant *et al*. (1995) suggest that:

> *.... simply adopting new technologies, or taking on the latest managerial thinking (whether JIT, lean manufacturing, BPR or whatever) is in itself not a strategy. Strategy is increasingly seen as guiding the process of gradually becoming good at something ...* (Bessant *et al*., 1995, p. 32).

In comparison with the debate over *efficient organisational forms,* the above statement highlights the importance of addressing the issues and concepts related to the *efficient development of organisations*. The 'organisation' is no more a fixed state but the continuing processes of organising, in which CI has a vital role to play.