
Continuous improvement in the Netherlands: current practices and experiences in Dutch manufacturing industry

Jose F.B. Gieskes, Frank Baudet,
Roel W. Schuring and Harry Boer *

University of Twente, School of Management Studies, P0 Box 217, 7500 AE
Enschede, The Netherlands

Abstract: In order to get insight into the current continuous-improvement practices in European industry, EuroCINet carried out a survey in its member countries. In this article, continuous-improvement activities in a sample of 135 Dutch industrial companies are described. The results show that CI is a relatively new development for companies in the Netherlands and the main motivators to start CI are costs, delivery reliability and quality. Many companies are starting a process of CI; few, however, have a sustained process. CI is widespread through companies and not limited to the manufacturing departments. However, less than 50 per cent of all employees are actively engaged in CI activities. The survey revealed that for companies it is difficult to **measure the effect of CI and link these results to market requirements.**

Key words: continuous improvement, the Netherlands.

Reference to this paper should be made as follows: Gieskes, J. F. B., Baudet, F., Schuring, R. W. and Boer, H. (1997) 'Continuous improvement in the Netherlands: current practices and experiences in Dutch manufacturing industry', *Int. J. Technology Management*, Vol. 14, No. 1, pp. 50-60.

Biographical notes: Drs. José F.B. Gieskes holds a degree in Public Administration (MScL, 1983) and is working as an assistant professor in Quality Management at the University of Twente, School of Management Studies. She has (co-)authored several articles on the subject of implementation of Total Quality Management and led a national survey on the state-of-the-art of TQM. Her current research interest is in Continuous Improvement.

Ing. Frank CM. Baudet studied Computer Science at a polytechnic (1992) and studies Management Studies at the University of Twente, School of Technology and Management. He is assisting in the data-processing of the Continuous Improvement Survey.

Ir. Roel W. Schuring studied Industrial Management at the University of Twente. He graduated in 1987. His initial research focused on the organisational impact and organisational design of assembly automation (in collaboration with the International Labour Office in Geneva). Later, he shifted his attention towards the organisation and applicability of Autonomous Work Groups. His current research interest is in Continuous Improvement.

Dr. Harry Boer is an associate professor of Operations Management and Organization Theory at the University of Twente, School of Technology and

*All the authors work for ContiNeth, a research group that participates in the EuroCINet.

Management. He holds a BSc in Applied Mathematics and an MSc and PhD both in Management Studies. He has (co-)authored numerous articles and three books on subjects such as Organisation Theory, Flexible Automation and Manufacturing Strategy. His current research interest is in Operations Strategy, Continuous Improvement and Concurrent Engineering and, especially, the links between these areas.

1 Introduction

Increasing competition, structural changes in the global market, rapid development of technology, increasing customer orientation; these are just a few examples of the challenges a company has to deal with nowadays in order to survive. During the last decade there has been a growing interest in the concept of continuous improvement (CI) as a means of coping with this upheaval and as a way towards improving business performance. CI is rooted in Japan, where it is known as *kaizen* — meaning ‘improvement’. It may be defined as a ‘company-wide process of focused and sustained incremental innovation’ (Bessant *et al.*, 1994).

Many companies have experienced difficulties with establishing a continuous-improvement process, despite the rather simple concept and tools. As yet, no confirmed road to success exists. In the Autumn of 1994, the EuroCINet was approved as a Eureka project with a three-year time scale. It is a project designed to encourage collaboration between industrial and academic partners throughout Europe who have an interest in CI.*

In order to get an insight into the current continuous-improvement practices in European industry, the EuroCINet carried out a survey in its member countries in 1995. More specifically, knowledge was needed of the diffusion of CI and the way CI was being put into practice. The main objective of this article is to portray continuous-improvement activities in a sample of 135 Dutch industrial companies.

After a short discussion of the characteristics of the survey, the most remarkable results will be presented and tentative conclusions will be drawn.

2 Characteristics of the survey

The survey asked about the company’s strategy for continuous improvement: that is, the motives, targets and means that were chosen to support the effort for creating a process of CI in the company. The survey was divided into five sections:

- general questions on the company’s background;
- questions on previous experiences with change processes (i.e. change efforts and the company’s general situation with regard to improvement);
- issues concerning the organization and operation of CI;
- tools and techniques used in the CI process, as well as the support for CI;
- the effects of CI.

*The following countries are currently engaged in EuroCINet activities: Denmark, Finland, Ireland, the Netherlands, Norway, Sweden, the United Kingdom, Italy and Australia.

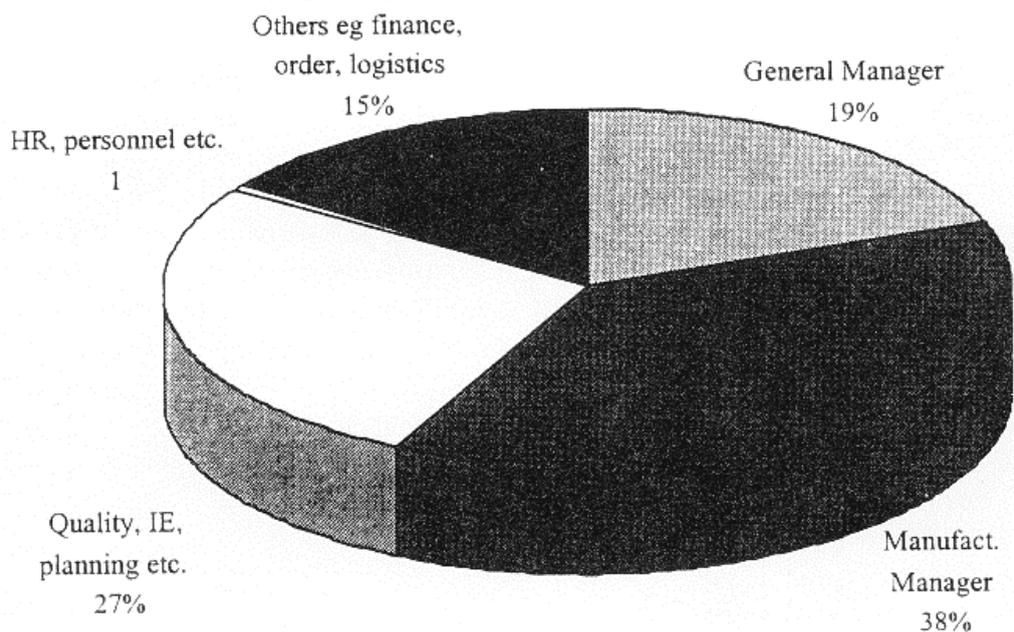
The questionnaire was to be completed by the person responsible for the company's operations, or the person with overall responsibility for the business unit's improvement activities. It was stated that the answers should reflect the situation of the business unit, regardless of whether the unit was an independent company or a factory in a larger organization. Results were promised to be presented anonymously.

In the Netherlands, 300 questionnaires were sent out (after the company had been contacted by telephone and had agreed to take part), of which 45 per cent were returned in a usable form. This is a remarkably high response for this kind of questionnaire.

It seems that CI is of interest to company representatives, as filling in the complete questionnaire was a time-consuming activity. It took at least thirty-five minutes, but still managers responded. A telephone survey showed that failure to respond was mainly due to lack of time: a second reason was that questionnaires were thrown away by secretaries, even before they reached the person to whom they were addressed.

In Figure 1 the position in the company of the respondent is shown: apparently, interest in CI is spread to a wide range of functional managers.

Figure 1 Position in the company of respondent



The companies in the survey represent different branches (SIC codes — see Figure 2) and there is a broad coverage of industries. Discrete manufacturing is best represented, but also a substantial number of companies are in the process industries. Companies that depend on standard products were better represented than companies with modular or unique products.

The majority of the companies are independent (70 per cent); the average turnover is 57 million ECU, the average number of employees 300. In 80 per cent of the companies the turnover per employee is between 100 000 and 200 000 ECU (see also Figure 3).

Figure 2 Classification of respondents by industry

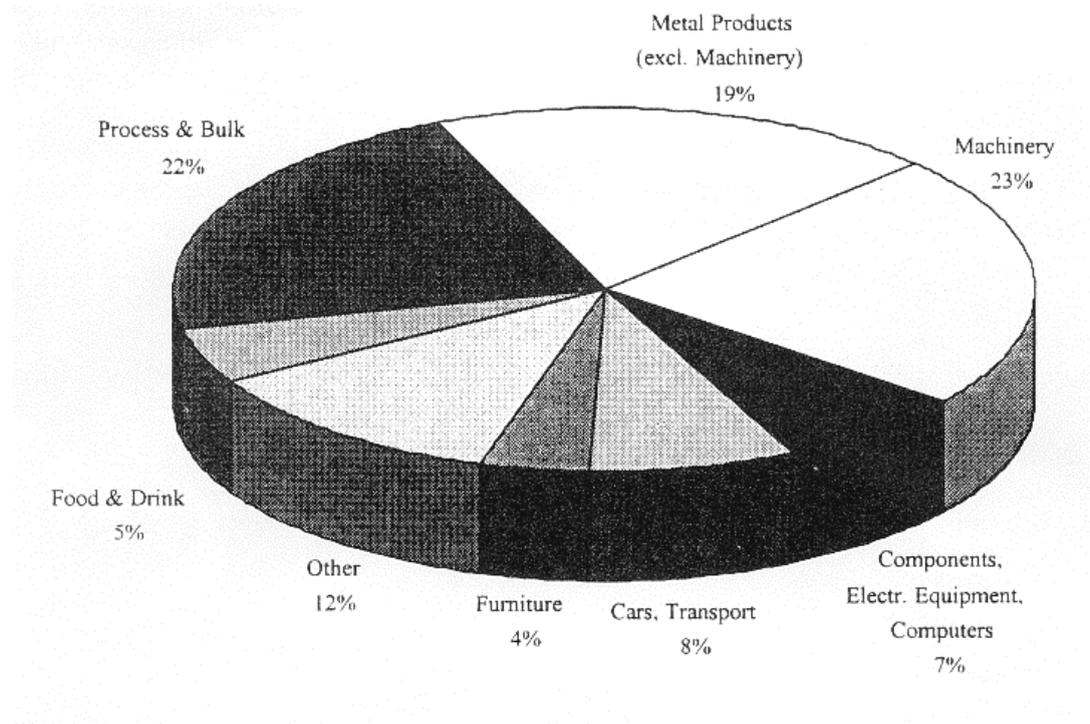
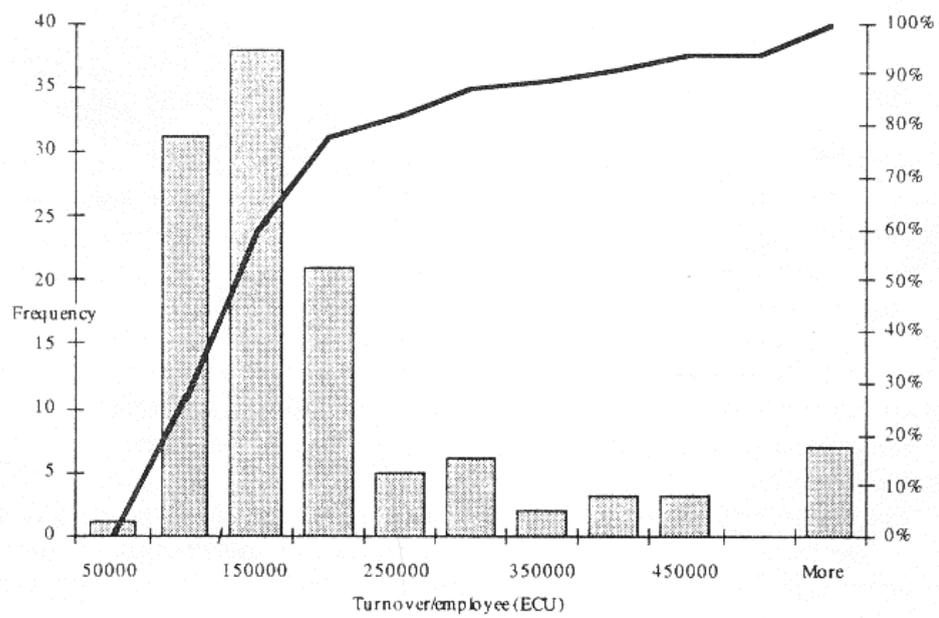


Figure 3 Turnover per employee



Eighty-two per cent of the companies made profits, 4 per cent made losses and the remainder ran about break-even. As already mentioned on average there were 300 employees, of which 61 per cent were blue-collar workers and 39 per cent were white-collar workers.

Some more specific information includes:

- Organizations are relatively flat; 78 per cent of the companies have four organization levels or fewer.
- In 51 per cent of the companies, more than 50 per cent of blue-collar workers work in teams.
- In 46 per cent of the companies, more than 50 per cent of white-collar workers work in teams
- Fifty-eight per cent of blue-collar workers have more than one operational task.
- Forty-nine per cent of white-collar workers have more than one operational task.
- Forty-three per cent of all tasks are machine-paced.
- Employees typically receive 25 hours training per year. There is no difference between direct or indirect personnel.

Multi-tasking appears to be high in the sample companies, which probably is a reflection of multi-skill. Apparently staff have gradually become specialists, while routine tasks are decentralized, especially to manufacturing.

Cross-tabulation shows that mainly repetitive tasks can be found in the food and drinks industry, whereas mainly self-regulating tasks exist in metal and machinery, rubber and plastics, and transport.

3 Results

In a number of respects the results of the survey were in line with existing opinions and theory. Next to this, however, there were also results that we would like to label 'remarkable' such as (a) internally inconsistent results and (b) results that challenge existing theory in some way.

3.1 General company situation on improvement

In assessing CI behaviour of organizations, market requirements serve as a basis. Respondents were asked to rank the three most important elements on which their products compete. The results show a clear picture (Figure 4).

Companies value product characteristics, such as customer-specific products and quality, as the most important (Rank 1) for competition. Quality, for instance, scores 72 per cent on first or second position (86 per cent in total). Price and delivery reliability are valued less important, since they rank higher in the third position. Interestingly enough, time to market and delivery time, on average, are not very important. This is remarkable since these factors often are thought of great importance in competing in the global market.

Figure 4 Order-winning criteria

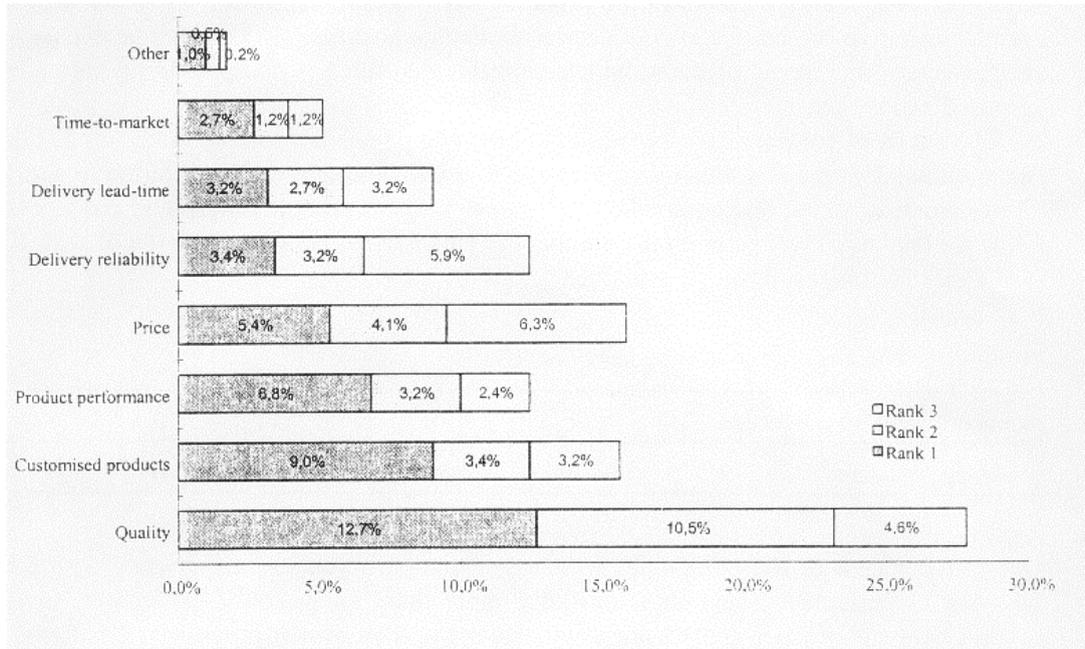
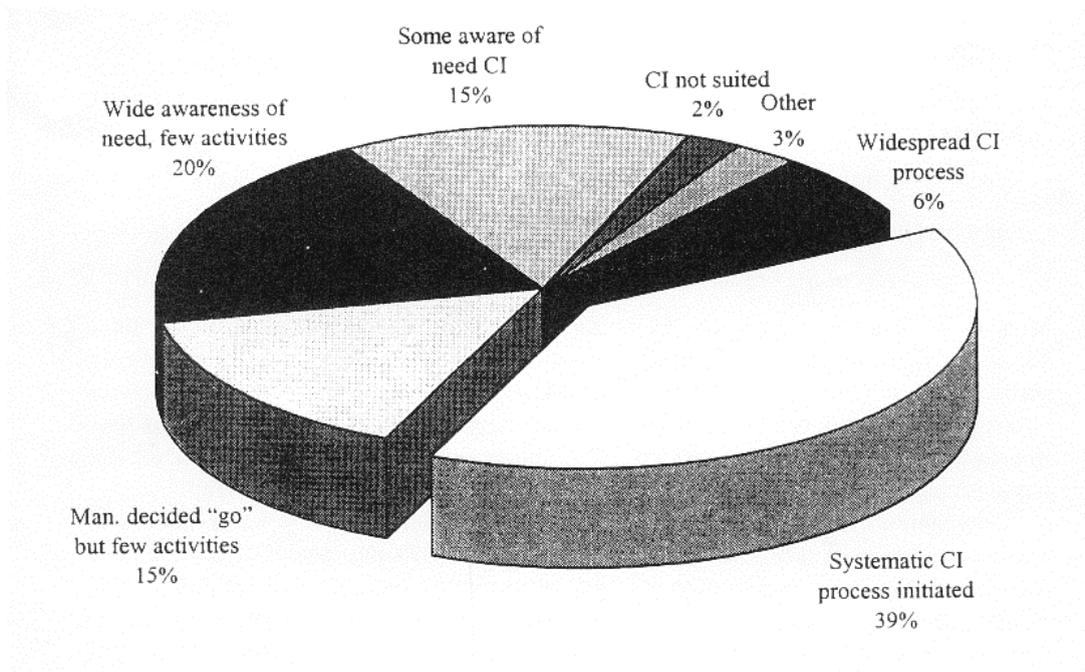


Figure 5 Status of continuous improvement



Before attention was focused on CI, companies were asked about general experiences with previous change projects in the organization. The survey shows that there are no specific negative or positive experiences with change projects, or dominant problems in certain stages or aspects of them, which indicates that there is no specific prejudice or coloured experiences.

The status of continuous improvement in the companies is depicted in Figure 5. The figure shows that many companies are engaged in CI activities and have started to apply CI systematically, but few companies really have a sustained and widespread process of CI. If we take into consideration the number of years the company has experience with CI (see Table 1), this result can be explained.

Table 1 Number of years of experience with CI

| number of years' experience | <1 | 1 | 2 | 3 | 4 | 5 | 6 |
|-----------------------------|----|----|----|----|---|---|----|
| percentage of companies | 9 | 16 | 34 | 19 | 5 | 6 | 11 |

Only 41 per cent of the companies have more than two years of experience with CI, whereas 11 per cent of the companies have more than five years of experience. Only seven companies (6 per cent) have a widespread and sustained process of CI. Cross-tabulation shows that at least four companies are still in the start-up phase after five years!

Apparently CI is new in the Netherlands and it is not easy to implement.

The motivation for a company to start with CI appears to differ only to a limited extent. The main reasons, as shown by the survey, are:

- cost reduction (82 per cent of the companies stated this to be a motive of importance);
- improvement of delivery reliability (76 per cent of the majority said this is very important);
- increase in employees' commitment/attitude towards change (79 per cent);
- improvement of quality conformance (79 per cent);
- improvement of the organization, communication and co-operation (78 per cent).

Motives of less importance are CI being imposed by management, improvement of administrative procedures, increase in production volume and increasing employees' skills. These findings are consistent with the previous analysis of the market factors. Cross-tabulation shows that quality is addressed by means of CI because CI is a means to improve quality conformance, reduce cost, improve delivery time and increase employee commitment.

Companies were also asked for the focus of their CI activities on a five-point scale. The results show a strong focus on manufacturing quality (46 per cent of the companies regarded this as very important and 77 per cent as important), employees' commitment (42 per cent, very important and 78 per cent, important), manufacturing costs (29 per cent, very important) and employees' skills (28 per cent, very important). This result is consistent with the focus on quality and manufacturing costs. Given the most important market requirements, it is surprising that there is no strong focus on reduction of set-up

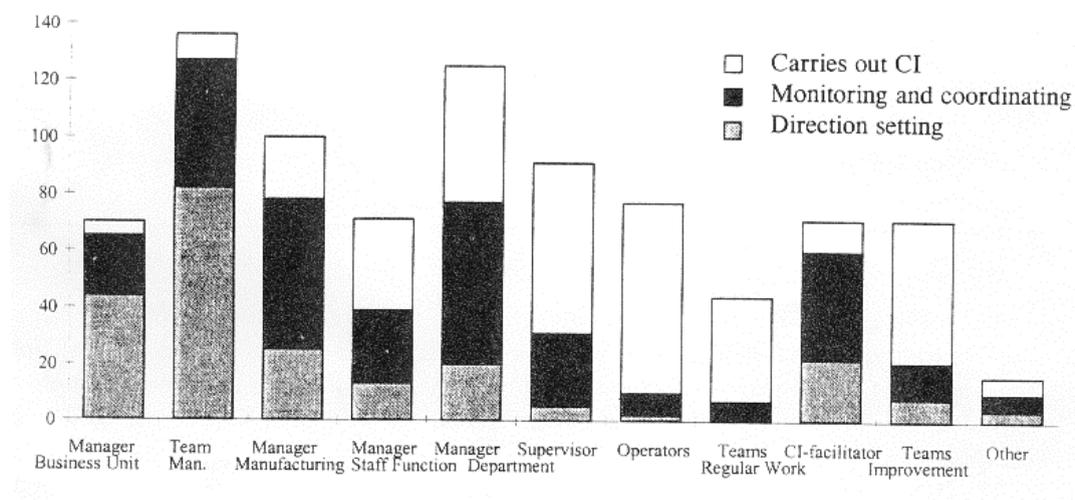
time, product design, reduction of materials waste and stock reduction. The survey shows that companies clearly distinguish means from ends. Few companies indicate that improvement of personnel skills is an end, but it is one of the most frequently mentioned means.

3.2 Issues concerning the organization and operation of CI

CI is a company-wide activity as 68 per cent of the companies indicate that the entire company, including design, engineering, purchasing, sales, etc., is involved in the CI process. This is a surprisingly high figure, since CI theory is mainly focused on manufacturing, including support functions. CI is to be expected in a repetitive environment, which manufacturing usually is, but office departments often have similar characteristics. CI in an engineering department is to be less expected because of the non-recurrence of its activities. The literature frequently stresses that a move to a company-wide process of CI is needed. Apparently this is not a problem in Dutch industry.

The implementation of CI was examined by identifying the groups responsible for direction setting, monitoring and co-ordinating and carrying out CI activities. A typical pattern emerged (Figure 6) with direction setting being the province of senior managers or management teams and the actual CI activities being undertaken predominantly by the supervisors, operators and work or improvement teams.

Figure 6 Responsibility for CI



Department managers, CI facilitators and management teams appear to undertake most of the monitoring and co-ordinating of the CI activities. The majority of the improvement activities are carried out in regular working time (88 per cent), mostly in meetings (53 per cent) or meetings dedicated to CI (44 per cent). CI activities are seldom carried out in unpaid overtime, which indicates that CI is part of regular activities.

Companies were also asked to indicate their level of maturity of working with CI in their organization. The majority of companies (58 per cent) claim to have mastered the basic skills, but only one company considered CI to be 'second nature'.

3.3 Support for CI and the tools used in the CI process

In order to implement CI in a company several tools, methods and aids are perceived as important and are actually used. Monitoring the overall CI system, working in teams or groups and the training of personnel in problem-solving tools are perceived as especially important. The usage of these tools and methods mirrors their perceived usefulness with nearly 80 per cent of the respondents using all or part of them. Methods concentrating on communicating the CI process, such as promotion through information boards, internal media, competition and awards were not seen as important support methods, although on average more than 50 per cent of the respondents use them. A major inconsistency was to be found in the use of problem-identification techniques: 69 per cent use them, while only 26 per cent say they are of major or great importance.

An even bigger inconsistency was the use of ISO 9000: the usage ranked high at 79 per cent; the perceived importance ranked low with only 27 per cent regarding it as of major importance and 35 per cent regarding it as of great importance.

A number of problem-solving tools and techniques were identified as important when using CI activities and these are depicted in Table 2.

Table 2 Importance and use of problem-solving tools and techniques

| <i>Tools/techniques</i> | <i>Major or great importance</i> | <i>Using all or part</i> |
|---|----------------------------------|--------------------------|
| problem identification tools/checklists | 69 per cent | 85 per cent |
| seven 'old' quality tools | 53 per cent | 80 per cent |
| seven 'new' quality tools | 38 per cent | 49 per cent |
| process mapping tools | 63 per cent | 90 per cent |
| failure mode and effect analysis (FMEA) | 39 per cent | 34 per cent |
| quality function deployment (QFD) | 26 per cent | 24 per cent |

In this case it can be concluded that in general there is a direct relationship between the perceived importance and the actual use. Another conclusion is that the majority of the companies prefer the more 'simple and easy to implement tools' such as process-mapping tools. The more advanced, sophisticated and specialized tools like FMEA and QFD are less valued and used.

This finding is very interesting, since a state-of-the-art survey on the implementation of total quality management in the Netherlands in 1995 presents the same picture (*Kwaliteit in bedrijf*, 1995). The question in this case is whether these tools are not used because they are perceived as unimportant or because the company lacks knowledge. The survey of TQM suggests the latter.

Companies were also questioned whether they use incentives (of whatever nature) to encourage CI activities. Twenty-five per cent of the companies did not use any incentives at all. This finding is in line with the limited use of methods for supporting the implementation of CI that concentrate on individual rewards. The companies that do use incentives show no specific preference for any means or system.

3.4 *The effects of CI*

The last section of the survey investigated the effects of CI. As far as the registration of improvement ideas and suggestions is concerned, less than 50 per cent of the respondents answered this question. Those that answered report an increase from 1992 to 1993. As well as an increase in the number of companies that have registration, the number of ideas and suggestions also increased (averaging about 30 per cent).

While on average less than 40 per cent of all employees are actively engaged in CI activities (34 per cent of direct and 37 per cent of indirect personnel) these activities do seem to contribute to a company's performance. Remarkably enough, this is where the response rate suddenly drops by 40 per cent when a question is raised about the link between CI and performance indicators. It is valid to question whether respondents have an idea of the effects of CI and whether companies are used to measuring improvements in their performance. The TQM survey in the Netherlands revealed that this kind of performance measurement is poorly developed in general.

Most companies report an improvement in performance during the past two years of 5—25 per cent. Some 50 per cent of these companies claim that CI is moderately responsible (10—30 per cent of this improvement) or highly responsible (> 30 per cent) for this. Improvement is reported to be the highest in product quality, production costs and productivity. Next to the 'hard and direct' performance indicators, companies were asked if CI had contributed to more indirect effects. Although few really major effects were reported, CI has had an important effect on:

- improved co-operation (67 per cent);
- increased engagement in work (63 per cent);
- improved attitude towards change (61 per cent);
- improved competence (42 per cent).

A number of companies spontaneously report that CI has had positive influence on materials reject, motivation, commitment/involvement of employees and work-in-progress. The influence of CI on the more 'soft' indicators is especially perceived to be substantial.

4 Cross-tabulations

Several cross-tabulations were made such as:

- industry against production volume;
- order-winning criteria against production volume;
- motives for CI against order-winning criteria (the market requirements);
- focus of CI against order-winning criteria;
- motives for CI against responsibility of CI in improving performance;
- focus of CI against responsibility of CI in improving performance;
- focus of CI against industry.

The results show that there are no statistically significant relationships between company-specific factors and market requirements, motives to implement CI or the effects of CI. Therefore no additional results can be reported, other than those from the survey, and it follows that apparently in the Netherlands CI depends on many organization-specific characteristics.

5 Conclusions

The survey presents a picture of contemporary practices and experiences with CI in Dutch manufacturing industry. From the survey it can be concluded that CI is a relatively new development for companies in the Netherlands, many companies are starting a process of CI, but few have a sustained process. Costs, delivery reliability and quality seem to be important motivators to start with CI. From this the conclusion might be that CI is mainly external-performance driven. Although CI is said to be widespread through the companies, on average, less than 50 per cent of all employees are actively engaged in CI activities. It appears to be difficult for companies to build an approach to CI that is in line with their own perception of what is important and what is not. Often the tools and techniques that are perceived valuable actually have limited use. If related to the importance that is given to the use of tools and techniques in a sustained and supported CI process, it follows that companies still have a long way to go. Apart from this, companies prefer the use of simple process-related and problem-identification tools. The organization of CI activities in practice is as to be expected: it follows organizational hierarchy, senior management being responsible for direction setting with little actual involvement in improvement activities, while shop-floor and improvement teams are the ones that perform improvement activities. Manufacturing management, department managers and CI facilitators and co-ordinators are responsible for co-ordination and monitoring. Last, but not least, it seems to be difficult to measure the effects of CI and link these results to market requirements. Registration in general seems to be poorly developed, although progress has been made if it is related to the increasing registration of improvement ideas and suggestions.

CI still is 'a sleeping beauty' in Dutch industry, perhaps even an 'awakening' beauty. There is a great potential for improvement in several areas to which CI can have a significant contribution. Further case studies will reveal whether it is possible to implement CI in a systematic way with satisfying results and how to sustain the CI process. It is to be hoped the beauty really does wake up and does not turn her head on the pillow to fall asleep again.

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