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An Investigation of Improvement and Change Management Practices in a Brazilian Based Company

Luiz C. R. Carpinetti
Departamento de Engenharia de Produção,
Escola de Engenharia de São Carlos, USP, São Carlos, SP, Brazil
E-mail: carpinet@sc.usp.br

Mateus Cecílio Gerolamo
Departamento de Engenharia de Produção,
Escola de Engenharia de São Carlos, USP, São Carlos, SP, Brazil
E-mail: gerolamo@sc.usp.br

Olívia T. Oiko
Departamento de Engenharia de Produção,
Escola de Engenharia de São Carlos, USP, São Carlos, SP, Brazil
E-mail: olivia@sc.usp.br

Abstract
This paper reports the results of a case study research carried out in a Brazilian division of a multinational manufacturer of automobile components with the main objective of investigating improvement and change management practices. The theoretical framework for the research is based on the theories on improvement and change management programs, methods and capability development. After an overview of the theories, programs and approaches for improvement and change, the research method and questions of research are formalized so as to guide the case study. The case study itself is presented and discussed. Results of the study indicate that although several elements of improvement and change capabilities are present, functionally oriented organizational structure and a lack of formalized cross improvement and change business process undermine the potential for management performance improvements.

Keywords: continuous improvement, change management, innovation, total quality management

Introduction

In the past decades, several innovation and improvement programs have gained widespread acceptance as approaches to boost competitiveness. These are the case of Total

Quality Management (Goetsch and Davis, 1995) and, more recently, Six Sigma Programs (Pfeifer, Reissiger and Canales, 2004). Apart from this quality related programs, other programs such as Business Process Reengineering, Just in Time and Lean Production have also been adopted with the same broad objectives of improving customer satisfaction and production and operations performance (Ahmed and Montagno, 1996).

Adoption of these programs by companies in different industries has been generating a generally very positive outcome, although it is widely recognized that it is very difficult to sustain process improvement programs. Despite unexpected negative effects that may be generated by the improvement process dynamics such as low morale and collapse of commitment to continuous improvement (Keating et al, 1999), according to Bessant and Francis (1999) companies have to evolve through a process of continuous improvement capability acquisition to what they call a learning factory. In general the literature on improvement and change management emphasizes the importance of development of organizational values, capabilities and methods for systematic deployment and review of progress, based on strategic orientation of improvement and change actions (e.g. Carpinetti et al, 2000).

However since the ways in which companies can apply these concepts and the outcomes generated by such practices may vary considerably, investigating best cases can contribute to gain new insights on the matter. In view of that, this paper reports an investigation on improvement and change management practices carried out in a division of a multinational manufacturer of automobile components based in Sao Paulo State, Brazil and considered a best case in quality management and improvement. Before presenting and discussing the case study, a brief review is made on the subject of improvement and change management so as to place the research work in context. The research methodology is also presented, outlining research questions and procedures. Finally the case study itself is presented and discussed so as to conclude and suggest further research work.

Improvement and Change Methods

Total Quality Management (TQM) is certainly the most popular of the improvement and change management philosophies in both academic and practitioner communities. Having its roots in the work of writers such as Deming (1986) and Juran (Juran and Gryna, 1993), it has gained worldwide attention after being further developed and successfully applied by the Japanese industry and scientific communities (Ishikawa, 1990). In essence, TQM is concerned with quality improvement on a company-wide basis. It is a comprehensive approach to improving competitiveness through continuous improvement of customer satisfaction and operations performance. Continuous improvement is a very central idea for the TQM philosophy, which is well characterized by the PDCA cycle: a systematic and iterative process of incremental improvement forming a virtuous cycle (Kume, 1995). Therefore TQM strongly rely on total commitment of senior management as well as all

members of the organization with the principle of continuous improvement of products and processes as well as developing human resources capabilities to successfully apply total quality methods and tools in the effort of quality improvement (Kume, 1995).

Very much related with the TQM principle of continuous improvement is Six Sigma program. Initially developed by Motorola as part of its TQM implementation process, Six Sigma has gained considerable attention in the past few years, with many companies adopting it world wide (Henderson and Evans, 2000) and therefore has brought about a revival of quality programs. Six Sigma is based on the concept of bringing process output into statistical control aiming at reducing dispersion and the probability of out of tolerance results and therefore improving product quality and reducing the cost of non-quality (Lientz, 2000). The program ideal is reducing variation of process output so that tolerance interval equates to $\pm$ 6 σ (process standard deviation) which means that the chance of defective results is reduced to 3.4 ppm even in case the process is off mid-tolerance interval by as much as 1.5 σ. Its approach for improvement consists of training special champions, black-belts and green belts, who have to lead or initiate actions following a five steps improvement cycle (DMAIC: define, measure, analyze, improve and control) that resembles very much a PDCA cycle. Apart from the primary benefits, six sigma programs have reinforced the culture of quality management and continuous improvement, which are the main general benefits of six sigma.

Apart from these quality related movements, other management practices and tools have been proposed and applied over the past decades with the generic objective of improving organizational performance. In the late 1980 s and early 1990 s, Business Process Reengineering emerged as a new approach to improvement and change. BPR also aims at satisfying customer expectations and improving organizational performance, however its approach to improvements is more radical. In the words of Hammer and Champy (1991) "Reengineering is the fundamental rethinking and radical redesign of business processes to achieve dramatic improvements...". It is intended to revolutionize all the components which make up an organization by focusing on reengineering the business processes, which are defined as a structured set of activities designed to produce a specified output to a particular customer or market. Despite its top-down approach to change, a common criticism is that it generally fails to link and align BPR efforts with business strategy. Also, differently of TQM, it is argued that BPR falls short of methodologies and tools available to facilitate the outcomes required from its activities.

Just in Time (JIT) also stands as another very important philosophy of improvement that emerged in the 1980's. Although originally developed in the west, like TQM, the Japanese academic and industrial communities have further developed it. JIT aims to develop an encompassing philosophy which includes several concepts and practices such as (Currie, 1999): production management methods and techniques; total quality assurance; total preventive maintenance; customer supplier relationships; technology

innovation strategies; flexible working practices and; machine performance. However, JIT implementations tend to have a very narrow focus, concentrating on techniques for production and inventory control and missing the opportunity of integrating effort and benefiting from different programs such as total quality management. Other improvement management concepts and practices that emerged in the past decades are the Lean Production, Activity Based Cost (Cooper and Kaplan, 1991), Theory of Constraints (Dettmer, 1997), and Balanced Scorecard (Kaplan and Norton, 1992), among others.

Even though managers have such an arsenal of theories for improvement, it is certainly not easy to develop capabilities to put them in practice into a general improvement and change process. Most of the time, implementation of these management approaches tend to focus too much on implementing particular techniques. Even worse, it is not uncommon to see implementation of one of these programs be made disregarding the need of integration and even competing for attention in the management consulting business. To overcome these, companies need not only to get expertise on the different tools for improvement, but most important, they need to build capability to systematically deploy, implement and review improvement and change. The following section presents a brief review on methods for improvement and change implementation and assessment of progress.

Methods for Improvement and Change

Several authors have proposed methods for implement and review improvement and change actions, generally based either on the TQM or BPR philosophies of management. This is the case of the Japanese management by policies approach (Collins and Huge, 1993). Very much based on the TQM philosophy of management, it also applies the PDCA cycle, in this case with a much longer cycle, to establish strategic business policies, deploy and implement them through organizational levels, and to periodically review progress. Also based on the continuous improvement principle is the five steps method proposed by Harrington (1991) which consist of: organizing for improvement; understand the process; streamlining; measurement & control and; continuous improvement. This method is supposed to be applied by a team over 90 days period. It is more like a method for guiding consulting people in developing projects and it is unlike to create continuous improvement capabilities.

Based on the BPR approach for improvement and change is the method proposed by Kotter (1995), which suggests 8 phases for transformation projects: establishing a sense of urgency; forming a powerful guiding coalition; creating a vision; communicating the vision; empowering the others to act on the vision; planning for and creating short-term wins; consolidating improvements and producing still more change and; institutionalizing new approaches. Rentes, Van Aken & Butler also presents a method for transformation process management consisting of 7 phases: understanding the need for change; creating infra-structure for change; analysing current situation; setting direction for change;

defining improvement initiatives; deploying and implementing initiatives; reviewing progress and results.

Also a great contribution to the theory of improvement and change in the 1990's is the conceptual models and methods for developing performance measurement systems. The most widely recognized performance measurement framework is the Balanced Scorecard (Kaplan and Norton, 1992), which proposes four interconnected perspectives of performance measurement in which measures of internal business process performance and learning & growth are derived from shareholder and customer views of performance. It is fundamentally based on recommendations such as deriving measures from strategic positioning and planning, and balancing financial and non-financial measures derived from different perspectives of measurement and aimed at managing the process of performance improvement.

Neely and Adams (2000) also proposes a method, named the performance prism, based on interconnected perspectives of measurement, which they illustrate by the facets of a prism. They argue that identifying stakeholders' satisfaction will lead to strategic direction, which in turn will lead to development of solutions that satisfy stakeholders. Delivering satisfaction will depend upon capabilities, which in turn will depend on stakeholders' contributions. Fundamental recommendations implicit in the performance prism framework are: deriving measures from stakeholders' expectations and strategic directions; focus on critical business processes and capabilities and; identify stakeholders' contribution required to generate satisfaction and business excellence.

Generally, all the methods briefly presented above emphasize important principles of management as well the need of systematically performing improvement and change initiatives. However, implementation of any of those methods would be very difficult without an underlying organizational capability to manage improvement and change, as discussed next.

Improvement and Change Capability Models

The business excellence model of the Malcom Baldrige National Quality Award (Black and Porter, 1996) award is frequently cited in the literature as presenting the fundamental elements of management to enable a company to achieve excellence in performance. The basic criteria are: leadership; strategic planning; focus on customer and market; information and analysis; human resources management; business results. The same is true for the business excellence model of the European Foundation for Quality (Neely, 1998) which present similar criteria but divided into two main groups: enablers and results. The enablers are: leadership; human resources management; resources and; policies and strategies. The results are: customer satisfaction; impact on society, business results. These models, although originally conceived to evaluate the candidates for the prizes

are commonly used as a reference for assessment of a company capability for performance management.

Bessant and Caffyn (1996) present a model describing what they call the behaviours that need to be acquired and embedded in the organization in order to enable an evolution of continuous improvement capabilities. The model defines five levels of evolution, from level 0, characterized as no- CI activities, up to level 5, categorized as the learning organization in which there is ability to deploy competence, everyone in the company is actively involved in incremental and radical innovation and sharing of learning. The intermediate level 3, strategic CI, is characterized as having formal deployment of broader strategic goals to operational level activities; improvement driven by monitoring and measurement; training in basic CI tools; use of formal problem solving process and; participation and recognition. Thus, the model presented by the authors attempt to characterize how an organization evolves from operational to organization wide strategic management of improvement and change. This is exactly the question the case research reported in this paper aims to explore, as discussed next.

Research Method, Framework and Questions

The research reported in this paper was based on case study. Case study has been largely used in the field of operations management (Voss, Tsikriktsis and Frohlich, 2002) and is recognized as being particularly good for examining the how and why research questions in theory building and testing (Yin, 1994).

Based on the literature review, it can be said that improvement and change is most dependent on (Figure 1):

a) Organizational values to support the program (e.g. Juran and Gryna, 1993; Kume, 1995);
b) Organizational and individual capabilities on such programs (e.g. Bessant and Francis, 1999);
c) Strategic orientation (Goetsch and Davis, 1995; Carpinetti et al, 2000);
d) Systematic deploying and review of actions (Harrington, 1991); and
e) Measurement system (Kaplan e Norton, 1992).

Moreover, deployment and review of improvement and change actions (central box in Figure 1) should be part of a company wide PDCA cycle. A formal process of planning and prioritization of improvement and change actions, as portrayed in Figure 2, is proposed as a conceptual framework for improvement and change management. This model is based on the PDCA cycle and contemplates the elements of improvement and change identified in the literature and indicated in Figure 1: strategic direction, performance management, continuous improvement culture and improvement programs.

Therefore, the main objective of the field research carried out and described in the following section is to investigate whether a company that is known to have developed

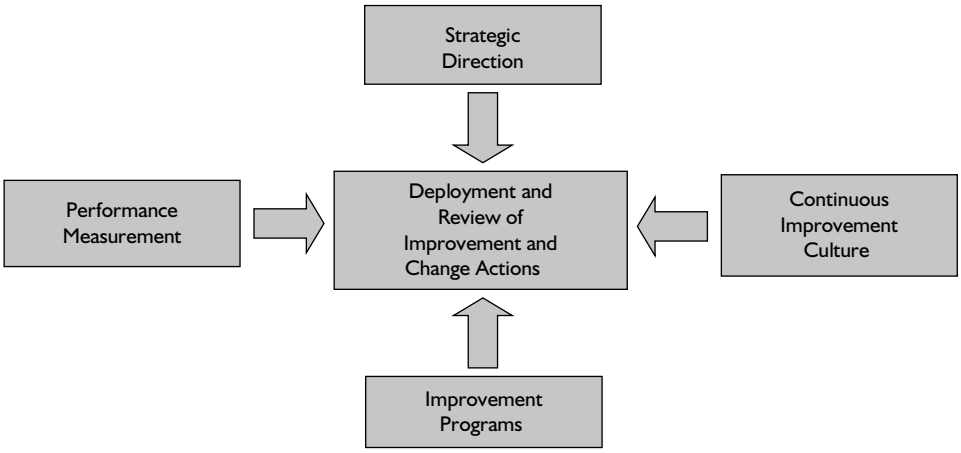

Figure 1 – Elements of improvement and change management in the case study.

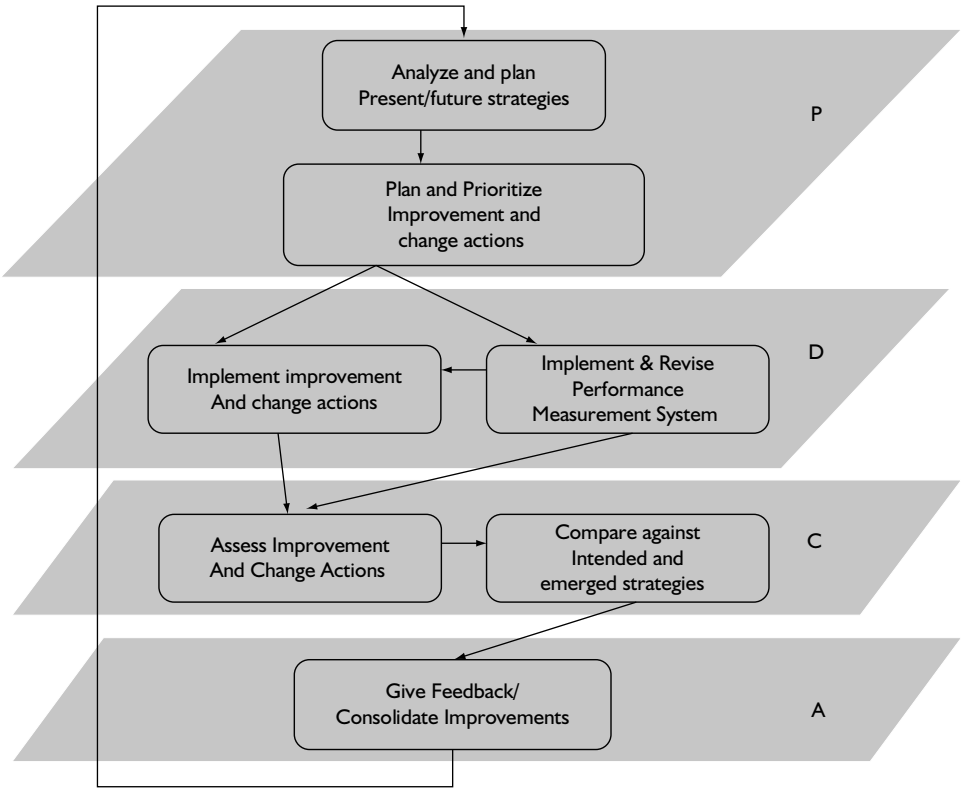

Figure 2 – Systematic activities for managing improvement and change.

capabilities for continuous improvement puts in practice these elements of improvement and change (described in Figure 1) and how it does that so as to integrate efforts into an organization wide improvement and change process (described in Figure 2) that enables systematic deployment and review of progress, based on strategic orientation of improvement and change actions that have been brought about by human resource capabilities.

Case Study Presentation

The case was developed in a plant of the South America division of multinational automotive company. The company as whole has 205 plants worldwide, and its range of automotive components include braking systems, engine components, steering wheel systems and suspensions, seat-belts and inflatable restraints. The South America division has 9 plants located in southwest region of Brazil, employs around 4000 people and its annual sales for the year 2001 was of US$ 307 million. Its main clients are the automobile and off-road vehicle makers such as Chrysler, Fiat, Ford, General Motors, Honda, Mercedes-Benz, Peugeot, Renault, Scania, Toyota, Volkswagen, Volvo, Agrale, Caterpillar.

The plant where the case study was developed, located in Sao Paulo State, is responsible for manufacturing braking systems. Before being incorporated by the multinational automotive company in the end of 1990's, this plant used be part of a Brazilian manufacturing company of braking systems with a long tradition in quality management, with many awards being received from its clients for quality assurance of its products. The plant has ISO and QS 9001 quality certification and by the time the study was developed, it was implementing the ISO-TS quality system.

The case study was developed through interviews, observation and analysis of documents. In total, there were 12 visits to the plant, including 40 hours of interviews with 5 employees and observation of working practices. The interviews were semi-structured, where some questions were made to guide the interviewee to the interests of research, that are:

- What are the improvement and change capabilities developed by the company and how that happens?
- What is the systematic for deploying improvement and change and review progress?
- What is the organizational structure that supports improvement and change?

The following section reports the findings of the case study.

Improvement and Change Programs

The company has several programs in place to develop capabilities in improvement and change. These are the case of the Shop-floor Continuous Improvement Program, Six Sigma and Lean Production programs (the company proprietary names of the programs are omitted).

The Shop-floor Continuous Improvement program started in 1991, before acquisition of the plant by the multinational corporation and its enormous success justified its continuation. It is a program that promotes a bottom-up commitment with continuous improvement through financial rewarding of any employee or team of employees that is able to succeed in idealizing and implementing a project that results in any sort of improvement. The program is coordinated by the human resources management area, which provides training and criteria for evaluating the improvement projects. The projects are conducted by the shop-floor workers, who have time available for meetings and material resources for implementing improvement ideas. The shop-floor managers evaluate the projects and attribute grades according to criteria defined by the program coordination. Although there is freedom to implement any good idea, the program coordination sets direction by defining yearly the main goals for the program and by better grading those projects that meet the goals defined for the program. Weekly, there is a session for presentation of the projects of the week and awarding of the best projects. Even projects that do not classify for prizes, accumulate marks that in the end contributes towards a better evaluation of the workers involved in the projects and to some sort of financial reward. Over more than a decade, this program has created commitment to the principles of continuous improvement and self-control. It is worth to note that this plant is the only one that maintains such a program in the entire organization and it is a benchmark case.

Another improvement program in practice is the lean production program. This program was launched by the company worldwide in 2000. It is a program that aims to get improvements in four dimensions: quality to customers; delivery performance; safety of workers; and cost. This program has a worldwide coordination, under the responsibility of a director of operations excellence who delegates to specially trained employees the responsibility for implementing the program. Mainly based on the principles and techniques of Lean Production, the program was conceived as a road map towards excellence in operations with several phases and gateways. In each phase, several practices based on concepts and techniques of lean production are expected to be implemented through a series of workshops involving technical staff and shop-floor workers and consisting of training, problem definition related to the daily work of the employees involved in the workshop and implementation of improvement actions devised during the workshop. The progress of the program is evaluated against a reference performance map, which evaluates the stage along the roadmap and the level of excellence in the practices expected to be implemented. Plants or units that acquire performance excellence in any of the practices become a benchmark case to the rest of the organization and are expected to share their experience with other plants.

Still another improvement program developed in the plant is Six Sigma. The program started in 2001 also launched world-wide by the organization, which created a Six-Sigma Director responsible for coordinating the process of implementation of Six Sigma world-

wide. It follows the general guidelines proposed by the creators of Six Sigma: the main objective is to reduce the cost of non-quality so as to get better results on customer satisfaction, profit and cash flow. The program is formatted in the same way as seen elsewhere: use of the DMAIC method and training of employees, the black and green belts, who become responsible for disseminating, leading and carrying on Six Sigma projects. Apart from these especially trained employees the program is coordinated by a steering committee, responsible for giving directions and support to the program initiatives in the plants. In the division level, there is a leader black belt, responsible for coordinating the initiatives in the plants, closing the bridge among black belts and steering committee and preparing reports to the steering committee.

Besides these programs, the company has a very mature quality assurance system, with ISO, QS 9001 and TS certificates.

Systematic for Deployment and Review of Progress

The systematic for management of improvement and change in practice is illustrated in Figure 3. At the corporate level, senior executives define company vision and mission that serve as the basis for deployment of annual objectives, goals and budgets, which are

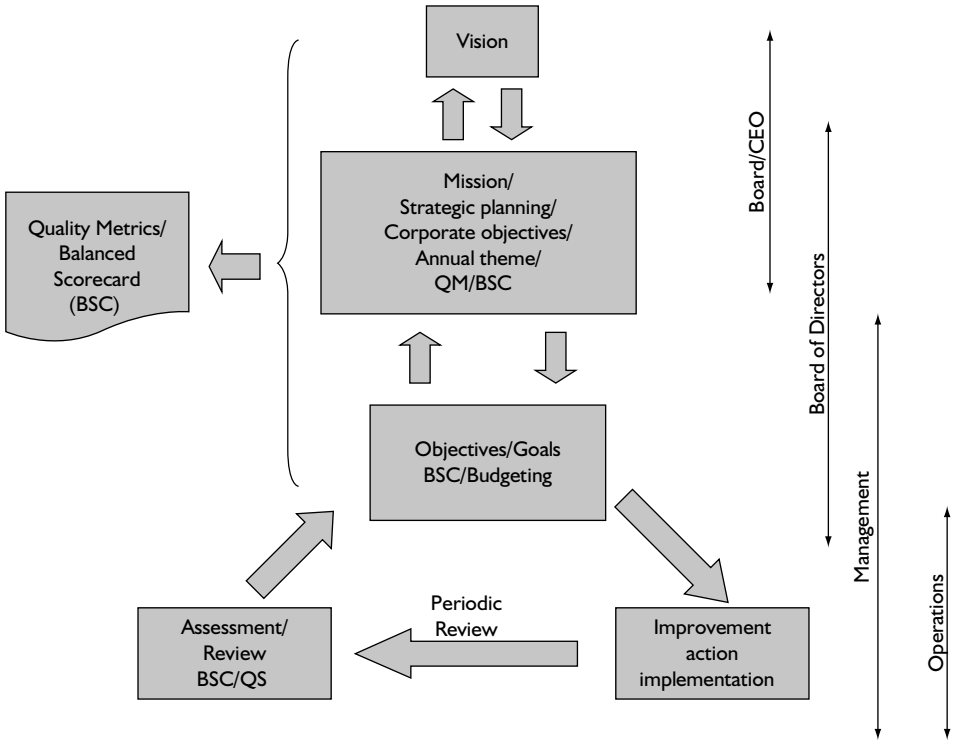

Figure 3 – Systematic for deployment and review of progress.

carried out by division and plant managers, discussed and finally agreed at the corporate level. Also agreed are targets and budget for improvement programs. These objectives and goals are also the base for deploying metrics and targets for them. The company adopts the concept of the Balanced Scorecard for defining its metrics, which are implemented and managed through a performance measurement system database.

At the plant level, the performance of operations is reviewed in monthly meetings involving plant mangers and middle managers responsible for different functional areas. In these meetings, performances on the different dimensions defined by the measurement system metrics are reviewed against target. In case of performance shortfall, managers are expected to present what has been done in the past month and a plan of action for improvement of performance to be reviewed in the following month.

The improvement program leaders do not have direct participation in this process of review of progress although they provide support in planning and implementing improvement actions.

Organizational Structure for Improvement and Change

The plant is organized in the following functional areas: manufacturing; customer support; purchasing; information system; customer development; quality and manufacturing engineering; human resources; controller and legal affairs. The human resources and quality & manufacturing engineering functions coordinate the shop-floor continuous improvement program and the quality assurance system respectively. The Six Sigma and Lean Production programs report directly to their respective organizational structure outside the plant at the corporate level despite the fact that the staff involved with these two programs belong to the quality & manufacturing engineering function and therefore also report to its manager.

The responsibility for management of improvement programs is focused on key individuals, who are responsible for coordinating and leading the programs at the plant level. On the other hand, the responsibility for continuous improvement actions related to plant performance is dispersed among the functional managers. At the shop-floor, the employees work in teams for routine problem solving or improvement actions devised by the programs such as lean production workshops or six sigma projects.

Analysis of Case Study Results

Analysis of results regarding improvement and change management capabilities has shown that the plant has managed to build a very strong culture of commitment to continuous improvement amongst its employee, mostly through its CI programs and training. Such commitment has created a foundation for the company to formally develop several improvement programs that are very well defined, structured and coordinated.

The programs all-together encompass quality related issues as well as improvement and change on other dimensions of performance of operations such as delivery performance as is the case of the lean production program. However, implementation of the improvement programs presents some problems as follows:

- The programs are under the responsibility of different senior managers, which may lead to a lack of integration among program objectives and actions at the plant level; and
- Annual planning of actions of the programs (for budgeting and future assessment) is made by the staff responsible for coordinating and leading the programs without participation of plant and functional managers, which may lead to a situation in which actions planned are not responding to priority improvement needs of the different functional areas.

There could also be seen evidences to suggest that the company systematically deploys improvement and change actions from strategic positioning and reviews progress as follows:

- Strategic orientation for improvement and change actions is ensured through deployment of corporate objectives and targets involving senior and middle management;
- Performance is assessed by a well structured performance measurement system that deploys objectives and targets into metrics and targets for the metrics of the plant performance measurement system; and
- Review of performance is made through a formal management cycle in which managers are expected to present past, present and future improvement actions in case of performance shortfalls.

Regarding implementation of systematic deployment and review of progress, some problems could also be seen as follows:

- There is not a periodic (e.g. annual) process of planning and prioritization of improvement and change actions involving functional managers and integrated with improvement programs to help managers to achieve their targets on defined objectives. The definition of actions is made on a non-systematic basis and not necessarily involving the improvement program leaders; and
- The program leaders are not co-responsible for achieving the targets of the metrics of the functional areas which leads to a certain lack of focus of the programs on the most important performance shortfalls faced by the functional areas.

Regarding organizational structure for improvement and change, it could be seen that:

- The company has a very well defined organizational structure for the improvement programs in place, with staff particularly assigned for the programs and reporting to

senior managers also particularly assigned for managing program implementation and results; and

- Functional managers are responsible for continuous improvement actions related to plant performance.

Additionally, during the interviews with the staff involved with improvement and change, there were some problems pointed out which we believe are related to the organizational structure as follows:

- There is no mechanism in the organizational structure to ensure that employees responsible for coordinating and leading the programs at the plant level also give account to the plant manager on the contribution of the programs in helping the functional middle managers to tackle the problems that are causing performance shortfalls and impede the plant to achieve its targets on strategic objectives; and
- Due to the fact that the program leaders belong to a particular functional area and also reports to its manager, it happens some times that actions developed by the programs tend to concentrate on the same functional area the leaders belong to.

When compared to the CI capability model proposed by Bessant and Caffyn (1996) the case study can be categorized in the intermediate level 3, strategic CI, which means the company has: formal deployment of broader strategic goals to operational level activities; improvement driven by monitoring and measurement; training in basic CI tools; use of formal problem solving process and; participation and recognition.

Conclusions

Analysis of the results of the case study has revealed that the company has a considerable level of maturity in managing improvement and change. It could be seen that the elements of improvement and change as identified in the literature were present in the case study. Most important, analysis of the difficulties in the process of managing improvement and change identified in the study could help to draw some recommendations so as to address the main research question to be answered by this case study, that is how a company puts in practice these elements and evolves an organization wide improvement and change process. The recommendations are as follows:

a) A formal process of planning and prioritization of improvement and change actions with full participation of the functional managers as well as program leaders. Focus on the business process of the value chain. Instead, deployment of actions focused on the functional areas;

b) An organizational structure that overlaps responsibilities for improvement and change among program leaders and functional managers so as to make both of them fully committed with program success as well as achievement of performance excellence on strategic objectives and targets; and

c) A process of improvement formally designed, with description of activities, input and output data and responsible for leading the activities as illustrated in Figure 3.

Finally, although we believe there is not a unique configuration of an improvement and change management process, the points discussed here may help a company to lay down a foundation on which it can built its improvement and change management process and capabilities.

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Biography

Luiz C. R. Carpinetti is an Associate Professor at the School of Engineering of São Carlos, University of São Paulo, Brazil. He holds a PhD in Engineering by the University of Warwick (UK) and a MSc in Metrology and Quality Assurance by the Cranfield Institute of Technology (UK). His present teaching and research interests are on the subjects of

Quality Management and improvement and change management, including performance measurement, system dynamics and other tools and methodologies.

Mateus Cecílio Gerolamo is graduated in Production Engineering with a Master of Science degree from School of Engineering of São Carlos, University of São Paulo, Brazil, where he is presently applying for a PhD degree. His PhD project focus on improvement and change management approaches for SMEs based on cooperation management in clusters of firms. His interests on research are on the subjects of Quality Management and Improvement and Change Management.

Olívia Toshie Oiko is graduated in Production Engineering by School of Engineering of São Carlos, University of São Paulo, Brazil, where she is presently applying for a Master degree. Her Master project focus on the development of a benchmarking database for SME´s. Her interests on research are on the subjects of Quality Management and Improvement and Change Management.