Evaluation of Operational Excellence Implementation

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Abstract

This study examined the factors that influence the results and longevity of operational excellence projects. The evaluation took place through a set of four factors: technicians; strategic; management structure and motivation of teams. It was characterized as proposition a model of effectiveness of operational excellence projects.

Keywords: effectiveness, operational excellence, Lean and Six Sigma projects
**Introduction**

The global economic environment has become increasingly dynamic in accordance with the needs of changes offered by customers that require innovative products and services to meet their consumption needs. To meet these requirements, the capital goods industries and consumer service companies, hospitals, banks, insurance companies and others, has sought to develop internal tools to leverage their competitiveness and flexibility, i.e. transformation programs have become mandatory for these organizations to create or sustain their competitive advantages. Numerous projects in pursuit of excellence have been pinched internally by organizations with different objectives to meet the needs of the market.

Due to the transformations being mandatory in organizations, companies have focused heavily on innovation, continuous improvement, or both. In this context, oriental organizations, Japanese in particular, have allied to form more harmonious the concepts of innovation and continuous improvement to achieve better results in their processes of transformation.

This article aims to evaluate the impact of some factors that were extracted from the literature review, the result of operational excellence projects. In addition, sort from an exploratory study with specialists, the degree of impact of each factor on the results of the continuous improvement projects.

**Literature Review**

In this section will be presented the review of literature related to the themes of continuous improvement, innovation, organizational learning and performance measures. Discuss this study especially three theories, as shown in the figure below.

![Figure 1 – Theoretical structure](image)

The first group involves theories towards operational excellence and innovation processes with a focus on continuous improvement. In that respect, we seek to understand the objectives of applying continuous improvement, the methodology and the tools in a structured way and understand why apply and monitor. The second group covers the theory of performance measures, reporting the importance of performance measures to monitor, manage or monitor a process. The third group involves theories focused on organizational learning in companies, seeking to understand the preponderant elements of an organization dedicated to learning, addressing the issue of competence of people in terms of training and skills to perform their professional activities.
Roberts (1998) signals that Japanese industries, since post World War has invested more heavily in technology beyond simple research and development, working in innovation of existing products and technologies even in well-developed markets. For Japanese industries, the definition of innovation is the reform of products, production processes and operations to generate economic benefits and conveniences for business and customers. In other words, innovations are not simply inventions and discoveries, but rather generate operational and economic benefits over the existing inventions and discoveries.

Bressant, Caffyn and Gallagher (2001) proposed a model based on different levels of maturity in continuous improvement, where the innovation process is incremental, focused and continuous and involves the entire organization. This model presents a classification into five levels with regard to the use and employment of continuous improvement. According to the author, the multistage maturity models began to constitute a theory model important, allowing organizations to make decisions by levels and improve the management and efficiency of the processes. A highlight is the Capability Maturity Model (CMM) developed by Carnegie-Mellon University (2000). This model had the conceptual basis the total quality and later incorporated elements of personnel management becoming the PCMM (People Capability Maturity Model). The template in question focused on continuous improvement presents a simple and objective classification distributed in maturity levels:

- **Maturity Level 1: Initial.** Processes are unpredictable, reactive and poorly controlled by the organization. Chaotic practices.
- **Maturity Level 2: Managed.** Processes are planned, executed, measured and controlled by the organization. Repeated practices.
- **Maturity Level 3: Defined.** Processes are identified, understood and described in patterns, tools and methods for the organization. Practices based on skills.
- **Maturity Level 4: Predictable.** Processes are measured and controlled using statistics and other quantitative techniques. Practices measured.
- **Maturity Level 5: Optimized.** Processes are continuously improved based on a quantitative and comprehensive understanding of the causes of variation. Practices based on continuous improvement.

Liker (2004), based on the context of the Toyota Model, adds the aspect of organizational learning and collaborative work as relevant factors of a process of innovation with a focus on continuous improvement, where he characterized the need of long-term strategy, stable and standardized processes, a good relationship with suppliers and partners and a learning organization, focused on troubleshooting for that the continuous improvement projects succeed.

The Toyota model presented by Liker (2004) is highlighted as benchmarking primarily due to continuous learning and focus on problem solving. The organizational learning culture so rooted in Toyota makes the breathe organization continuous improvement. The industry's most profitable automobile manufacturer in the world in recent times, a pioneer in the process of continuous improvement, always presented his methodology and his tools in a very transparent manner, incorporating them into their internal processes, extending to their partners, suppliers and customers and subsequently spreading to the corporate world through an identity, the DNA of Toyota (Spear and Bowen 1999). This identification allowed the company to gain maturity over time becoming a reference in continuous improvement and operational excellence.
Cross and Lynch (1989) argue and share the responsibility for the effectiveness of operational excellence in: Cultural elements; Infrastructure elements; Knowledge and ability; People.

Senge (1994) addresses the issue of the five disciplines as well as the challenge of developing an organization geared toward learning how is Toyota. It highlights the way divided into five stages to develop the organization with focus on learning:

- “Navigation”. Focus: give the direction. Associates for “To Know”
- “Leadership”. Focus: communicate the future vision the Organization and make her understanding. Associates for “To Understand”
- “Enablement”. Focus: provide the organization with the competence, structure and environment to achieve results. Associates for “To Accept”
- “Ownership”. Focus: Getting people to make changes and breathe the improvements so that the change will be part of everyday life. Associates for “To commit”.

It is possible to infer that the closer 04 stage, the greater the probability of sustaining the improvement projects in the organization.

Nonaka (1991) features the learning organization as the product of socialization, externalization, combination and internalization to achieve organizational performance. Jensen (2005), mentions that the goal of a learning organization is generating new knowledge from data and information that provide the knowledge and make it possible to generate action and learning in order to obtain a new knowledge. He reports that the breadth of this new knowledge generated is directly related to the organizational culture.

Culture has been defined as the human part of the environment, including both objective and subjective elements (Triandis 1972); as a set of backup (Skinner 1981); as the collective programming of the mind (Hofstede 1991); as a system of shared meaning (Shweder LeVine 1984); as standardized forms of thought and as non-described operating procedures or ways of doing things (Triandis 1994). Although culture definitions vary, many emphasize that culture is shared, is adaptive or adaptable has been at some point in the past and is transmitted across time and generations (Triandis 1994). Soon the organizational learning and the generation of new knowledge are very related to sharing of culture, or as Senge (1994) mentions, to make people to make changes and breathe the improvements so that the change will be part of everyday life. Another important aspect related to people and which Senge also mentions regarding the qualification and training of people. For Eisenhardt and Martin (2000), the dynamic capability is that creative talent should be developed from training and ability people can generate good performances in its activities within the organization.

Oge and Dickinson, (1992), emphasize that the performance of an organization are tracked in the market share of its products, in quality, cost and time of its processes and standardization of its activities. The authors even propose a performance management system to monitor the performance of a project of improvement. Henry (2006), Neely (2002), Simon (1991) and Bourne et al. (2005) adds that there is a structured sequence to get the high performance that is since the use of continuous improvement tools such as Lean Manufacturing (Ohno 1991) and Six Sigma through monitoring with performance measurement systems, and closing the cycle in structuring and monitoring the engagement and motivation of people.

Based on the literature review, from visited theories, it was possible to list using non-exhaustive way some important factors that impact the results of the continuous improvement.
projects. The table below shows the correlation between the theories, the authors and the possible factors extracted from non-exhaustive review of the literature.

Table 1: Correlation between the theories and the authors with the extraction of factors

<table>
<thead>
<tr>
<th>Theory</th>
<th>Authors</th>
<th>Factors</th>
</tr>
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<tbody>
<tr>
<td>Process Excellence theory</td>
<td>Cross &amp; Lynch (1989)</td>
<td>Lean and Six Sigma tools and information technology, Motivation and engagement of team</td>
</tr>
<tr>
<td>Learning Organizational theory</td>
<td>Spear &amp; Bowen (1999)</td>
<td>Lean and Six Sigma tools and information technology, Motivation and engagement of team</td>
</tr>
<tr>
<td>Learning Organizational theory</td>
<td>Nonaka (1991)</td>
<td>Motivation and engagement of team</td>
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<tr>
<td>Learning Organizational theory</td>
<td>Senge (2005)</td>
<td>Motivation and engagement of team</td>
</tr>
<tr>
<td>Learning Organizational theory</td>
<td>Triandis (1994)</td>
<td>Involvement of Management</td>
</tr>
<tr>
<td>Learning Organizational theory</td>
<td>Eisenhardt &amp; Martin (2000)</td>
<td>Motivation and engagement of team</td>
</tr>
<tr>
<td>Performance measures theory</td>
<td>Oke &amp; Dickinson (1992)</td>
<td>Performance measures and monitoring</td>
</tr>
<tr>
<td>Process Excellence theory</td>
<td>Ohno (1991)</td>
<td>Lean and Six Sigma tools and information technology, Strategic alignment</td>
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<tr>
<td>Process Excellence theory</td>
<td>Roberts (1998)</td>
<td>Strategic alignment</td>
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<tr>
<td>Learning Organizational theory</td>
<td>Liker (2004)</td>
<td>Lean and Six Sigma tools and information technology, Strategic alignment</td>
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<td>Process Excellence theory</td>
<td>Bressant, Callin &amp; Gallagher (2003)</td>
<td>Continuous improvement maturity</td>
</tr>
<tr>
<td>Learning Organizational theory</td>
<td>Senge (1994)</td>
<td>Motivation and engagement of team</td>
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Source: Authors

According with Bourne et al. (2005), a structured way to get the high performance in the projects and programs of excellence, is through performance measures and monitoring, what characterizes this being a factor of control and monitoring only, a result of exploration of other factors. And the degree of maturity explored by Bressant et al. (2001) is the factor or variable object of study in addition to be derived in strategic, technical aspects, management involvement and motivation of teams (organizational learning). The figure below shows the purpose of the study:

![Figure 2 – Framework of detailing of Factors to arrive at objective variable from the Theory of performance measures](image)

From the authors vision which was presented it is possible to propose four factors group. They are:

1) Strategic alignment factors
   They are factors that relate to the connection of the operating practices with the business strategies of the company.

2) Lean six sigma tools and their concepts and integration with information technology tools factors:
Refer to practices that enable the Lean system taking into account the information technology.

3) Management factors:
   Refer to managing practices in enterprises.

4) Motivation and engagement factors of operation focused on organizational learning:
   They are factors that represent the behavioral and managerial aspects on viability of the Lean system.

Methodology

Through structured research was possible to raise initial data for understanding the factors that influence results and longevity in the projects of operational excellence. This effect considering the methodological perspective, intended to address the empirical, qualitative aspects of an exploratory study. With this search strategy is expected to be disseminated and exploited a little more knowledge about the discipline mentioned, as well as provide for students and practitioners interested in the subject, to use its contents and its conclusions (YIN 2001).

   The criteria used for selection of the respondents were for knowledge of the authors to the professionals who work with continuous improvement implementation in different industries. They took into account the aspects recommended by scientific methodology for the elaboration of the issues and approach with the respondents.

   The data collected were qualitative source that directs the type of study pursued. Data were analyzed according to inductive logic, i.e. set off a train of thought which considered the analysis of private events until the general facts.

   To clarify the methodological procedures adopted in this case was developed a research process, in which, initially, was made a theoretical review on the subject. A research protocol, then, was built in order to select the structured questionnaires. Then, it was structured a survey instrument aiming to get relevant information about the topic.

   Through structured instrument, it raised information based on a screenplay by interviews that had as its approach: respondent’s identity, identification of the main problems faced in the development process, important aspects for the good result of the improvement projects as well as the monitoring of improvements in operation. Suggestions and criticisms were raised.

Results

The results obtained with specialists on continuous improvement implementation programs showed the presence of some factors in relation to the others, as well as list other important elements to be studied in the corporate environment in order to generate a model for the evaluation of continuous improvement projects and programs.

   It was possible to point out the following evidences regarding factors surveyed:
   
   • Strategic Factors: both the strategy of the company be aligned the operation as well as the projects executed in the operation are aligned the strategy of operation are considered by specialists as indispensable to be successful deployments and support over time.
• Technical Factors: in this case, the technical elements were divided into methodology – Lean Six Sigma concepts and technology– use of integrated tools and monitoring for projects to perpetuate. In this case, the view of the experts is very clear about the indispensability of the methodological elements. However, the elements of technology are considered from the minimal to mean importance to sustain the continuous improvement projects and programs.

• Management Factors: as for the aspects of involvement of middle management, the experts qualify as having an mean influence the question of managers provide training for persons involved in the operation. However, consider of great importance, middle managers clarify the goals and objectives of the operation from a good visual management of performance metrics.

• Motivation of improvement Teams factors: How motivational aspects, experts qualify as vital and indispensable involvement of employees in the execution of their work standardized way, the concern of operators in identifying problems and generate opportunities for improvement and especially the involvement in developing solutions to the problems continuously learning constantly with the same. Experts qualify the concern for improvement must be being "breather" inside the operation.

In order to assess the factors surveyed the authors proposed a scale in which it was pointed to the intensity of each factor. In this sense sought to establish, for each factor how intense it is important according to the survey. Thus was established the concepts of weak-for weak factors influences; Mean-for significant factors; Strong-for factors with strong influence and fundamental-when the factors are essential. The results of this analysis are mentioned in Table 2.

| Source: Authors |
|-----------------|-----------------|
| Strategic Factor | NA | Weak | Mean | Strong | Fundamental |
| Technical Factor | NA | Weak | Mean | Strong | Fundamental |
| Tech - Methodological | NA | Weak | Mean | Strong | Fundamental |
| Tech - Information Technology | NA | Weak | Mean | Strong | Fundamental |
| Management Structure Factor | NA | Weak | Mean | Strong | Fundamental |
| Motivation of Teams Factor | NA | Weak | Mean | Strong | Fundamental |

• Additional factors: Some additional elements were evidenced by the specialists and they deserve an attention as to be incorporated in the object of study that will generate the model result of longevity of operational excellence projects and programs. They are:

  - High commitment organization leadership in the implementation of continuous improvement projects with formal agenda to follow the projects, collect results and provide feedback, showing the importance of the projects for the Organization and incorporating it into the culture;
  - Training of Champions and career plans within the area of continuous improvement;
Alignment with Financial and controlling areas of the Organization to calculate and validate benefits of the project.

Thus, cultural and related people aspects should be incorporated into the model to be built. Consequently the factors that should impact on the results of a transformation program using continuous improvement methodologies are:

- Strategic factors
- Technical methodological factors
- Management infrastructure factors
- Cultural factors
- People factors

The model to be tested through case study in different field operations must contain the elements mentioned contemplating strategies, culture, processes, people, training and business objective metrics, as shown in the figure below. Less emphasis should be directed to technology tools, however it was not and should not be completely disregarded. The figure below show the model:

![Figure 3 – Model of Operational Excellence to achieve sustainability](image)

Source: Authors

**Conclusion**

This article presented the results of a survey on the impacts of selected factors in the project results of companies seeking operational excellence.

Based on a survey with experts it was possible to verify the importance of motivational order factors as being the group of factors that most influence the results. It was possible to understand not only the importance of such factors as its causes, as well as the relationship with the other factors – strategic and technical alignment.

According with these results, the authors proposed a model, even embryonic, about operational excellence with emphasis on scope of sustainability.

Certainly the results of this research apply only to companies surveyed, given the methodological limits found. New research, from these results can be performed. It is recommended, in this sense, advance the understanding of the model so that the community specialized can use and optimize the results in companies.
REFERENCES


