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## **Can we still talk about continuous improvement? Rethinking enablers and inhibitors for successful implementation**

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**Abstract:** One of the principal goals of Western firms in the last few decades has been to improve competitiveness through continual incremental improvement. Within these spheres, continuous improvement, based on the active participation of a company's entire workforce, has been established as a powerful tool to achieve competitive advantages. There is ample documentation of companies' successful implementation of the tools for continuous improvement and many authors have worked towards identifying all of the barriers impeding the sustainability of continuous improvement. Nevertheless, continuous improvement must be furthered in Spain, above all among small and medium-sized enterprises. Even in the automotive sector, continuous improvement still finds itself in a fledgling state and, in many cases, lacking strategic orientation. This study aims to extend the literature about enablers and inhibitors in continuous improvement. For that reason, some interviews were conducted with first tier suppliers in the automotive industry that have succeeded or failed in implementing continuous improvement, with the aim to identify and prioritise enablers and inhibitors.

**Keywords:** continuous improvement; enabler; inhibitor; sustainability.

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## **1 Introduction**

Continuous improvement can be defined as the planned, organised and systematic process of continued and incremental change. It is based on Deming's cycle consisting of four phases (Bond, 1999; Bushell, 1992; Terziowski and Sohal, 2000):

- study of the current situation
- acquisition of the sufficient data to propose suggestions for improvement
- fit and implement the selected proposals; to verify if the proposals suggested are giving the desired results
- implement and standardise the proposals with necessary modifications.

In order to make these changes, and that the improvement could be called continuous improvement, they should be extended throughout the company and adopted by all staff members of the organisation (Jorgensen et al., 2003). These activities must be part of the day to day routine of the organisation and should be voluntary and not mandatory (de Lange-Ros and Boer, 2001). Finally, and to complete the definition, this process must be sustainable and be focused towards improvement (Rijnders and Boer, 2004).

Continuous improvement is referred to within the area's literature with terms such as Kaizen, coined by Imai (1986) and widely used through the industry. Nevertheless, the improvement represents not only the results of a team problem solving, but also the process itself (Bessant, 1998).

The objective of continuous improvement is to obtain improvements in costs, quality, flexibility (Bessant et al., 1993) and in productivity (Choi et al., 1997). One of the key factors of continuous improvement is that these improvements are implemented with low costs (Choi et al., 1997). In comparison with other strategies of innovation, it requires less financial investment, but a much greater effort to learn methods of improvement (de Lange-Ros and Boer, 2001). Also, the majority of these improvements do not take place in a radical way, but rather in an incremental or gradual way. The most important improvements must be formalised and if it is possible, extended to the entire organisation and implemented within a daily work routine (de Lange-Ros and Boer, 2001).

In companies, we can find mechanisms of problem solving teams or systems of individual suggestions as methods to implement continuous improvement. Among the problem solving teams, we can find quality circles, cross-functional groups that integrate the continuous improvement within their responsibilities or within a limited time frame (García Lorenzo and Prado Prado, 2001; Grutter et al., 2002; Kerrin and Oliver, 2002; Marin-Garcia et al., 2008; Rapp and Eklund, 2002; Sillince et al., 1996).

Systems of individual suggestions can also be used (Prado, 2001; Rapp and Eklund, 2002; Schuring and Luijten, 2001; Sillince et al., 1996) although individual suggestions

can only obtain a favourable result in comparison with the groups if they are exceptionally well-managed (Rapp and Eklund, 2002).

At the same time, you can find articles that research the subject of sustainability of continuous improvement in the long-term and attempt to identify enablers and inhibitors to achieve the desired results in long-term continuous improvement.

Existing literature seems to indicate that everything has already been written on the subject of continuous improvement. There is ample documentation about the success of the implementation of tools of continuous improvement in companies (Jorgensen et al., 2003) and of their effect on the improvement of various indicators, both productive and non-productive (Jung and Wang, 2006; Marin-Garcia et al., 2009). Spain is no exception, cases of successful implementations can be found across the industry spectrum, ranging from the automotive (García-Lorenzo and Prado, 2003; Marin-Garcia et al., 2009), to food and furniture (Marin-Garcia et al., 2008; Prado Prado, 2000; Prado, 2001).

Some cases have been detected in which the deployment of continuous improvement has been attempted and has failed. Many authors have developed models and identified enablers and inhibitors for continuous improvement (Bateman, 2005; Bessant, 1998; Jager et al., 2004). Nevertheless, continuous improvement must be furthered in Spain, above all among small and medium-sized enterprises (Albors and Hervás, 2006). Even the automotive sector, where this program has traditionally maintained a widespread presence, continuous improvement still finds itself in a fledgling state and, in many cases, lacking strategic orientation (García-Lorenzo and Prado, 2003). Because of this, the authors have tried to identify and characterise those enablers and inhibitors identified through interviews with middle management groups and individuals responsible for continuous improvement in companies located in Spain.

## **2 Enablers and inhibitors**

Enablers and inhibitors are elements or characteristics in an organisation, that due to their existence or absence in the company, act as catalysts causing the development of continuous improvement or on the contrary restrain or even cause limitation of continuous improvement within the company.

### *2.1 Management of process*

The management of the processes of continuous improvement must be carried out in a consistent and regular form. One cannot fail in achieving projects (Bessant et al., 1994; Dale et al., 1997), but other objectives such as the motivation of the workers can fail. Simultaneously, one should avoid returning to situations without prior achievements being settled in the way of working (Upton, 1996).

The situation should be avoided where the managers who lead the programs do not dominate the processes of problem resolution (Bessant et al., 1994), as well as the tools that they are trying to implement. Also, as indicated by Upton (1996), the projects must be selected in such a way that they will help to maintain continuous improvement in the future. In addition, Kaye and Anderson (1999) suggest that the process of continuous

improvement should be focused on critical processes and that they should involve all workers.

## *2.2 Motivation of the workers*

The main factors present in the literature and identified by leading authors who have written about the sustainability of continuous improvement (Bateman, 2005) and confirmed by later studies (Bateman and Rich, 2003; Jorgensen et al., 2003), are motivation and leadership management. Worker participation is a key factor in the sustainability of continuous improvement, not only as executors of the developed improvements but as a source of ideas as part of the improvement process; without the workers, according to the definition of continuous improvement, the improvement would not occur (Jorgensen et al., 2003). It is possible to highlight the differences between some authors (Dale et al., 1997; Tennant et al., 2001) that indicate difficulties when trying to involving the workers if they believe that they are going to be made redundant. And on the other hand, there exists the school of thought that (Bateman, 2005; Bateman and Rich, 2003) considers that excessive training and participation of the workers can lead to the possibility that these workers are pursued by other companies due to their new capabilities, which leads managers not to promote training and therefore motivation of its workers.

## *2.3 Involvement of direction and strategy*

Involvement of direction is known as ‘top management support’ (Bateman and Rich, 2003; Bessant et al., 1994) and ‘senior management involvement’ (Kaye and Anderson, 1999). Associated closely with the involvement of the management and therefore classified in the same section, we can find the strategy of the company as the enabler/inhibitor for continuous improvement (Bateman and Rich, 2003; Bessant et al., 1994). The focus upon improvement activities has to be maintained, growing from the centre of previous activity (Upton, 1996). For the same reasons, we have included in this section discussion relating to the lack of resources dedicated to continuous improvement (Dale et al., 1997) since the resources are usually provided when management is involved.

## *2.4 Management of leadership*

All the investigators whom have published their opinion on the subject are in agreement (Bateman and Rich, 2003; Dale et al., 1997; Upton, 1996) and they all raise the point regarding the lack of motivation due to the ignorance of the importance of improvement, as well as the existence of charismatic leaders.

Furthermore, the figure of the ‘champion’ (Bateman, 2005), or the ways to exercise leadership (Dale et al., 1997) or uniformity, when it comes to fostering continuous improvement in all workers (Kaye and Anderson, 1999) is identified in the articles written. One can notice the difference in the involvement of the management by understanding that the leadership should be executed by all the managers within the company and not only by the ‘top management’ of the company.

### *2.5 Objective setting and the necessity to measure*

The definition of objectives for continuous improvement, and in relation with them, the strategy of improvement followed by the company also is identified by most of the scholars (Dale et al., 1997; Upton, 1996).

At the same time, and as it cannot be implemented in any other way, the setting of objectives is closely linked to the necessity to measure. As has been stated (Moran and Avergun, 1997), to be able to measure is the key for successful and sustainable change. Without measurements, continuous improvement cannot exist. The correct deployment of a system of measurements and knowledge gathered from the obtained results, are also important elements (Bateman and Rich, 2003; Kaye and Anderson, 1999). Based on measurement – reliable and focused on results – one should set the objectives according to the global objectives and in agreement with the team leaders.

### *2.6 Cultural aspects*

A company's culture is a determinant of continuous improvement (Bateman and Rich, 2003; Bonavía Martín and Marin-Garcia, 2006). Continuous improvement will be received favourably in non-traditional cultural settings (Bonavía Martín and Marin-Garcia, 2006), where the people (directors and the workers themselves) manifest less resistance to change (Dale et al., 1997). Also of note, when workers are older or have spent many years with companies with a traditional culture, greater effort is necessary to deploy improvement programs.

Linked to the cultural aspects, one of the inhibitors in terms of sustainability is the merging of companies with differing cultures, in the same way as has been identified by Bessant et al. (1994) and other authors (Bateman and Rich, 2003).

### *2.7 Miscellaneous*

As well as the enablers mentioned above, other obstacles exist that cannot be classified in any of the other sections. The enablers and inhibitors mentioned and also summarised by Bateman and Rich (2003), place a large emphasis on: 'Big Bang' innovation and undervaluing of changes, inappropriate infrastructures, lack of suitable tools for continuous improvement, break up of improvements teams, credible campaign plans and stakeholder focus.

## **3 Methodology**

To qualify the data of our investigation we have followed the 'grounded theory' (Glaser and Strauss, 1967). This methodology has been used in investigations with a wide number of disciplines (Cutcliffe, 2005).

We have followed the following process (Charmaz, 2006):

- data collection following the procedure of theoretical sampling (theoretical sampling)
- initial codification

- orientated codification, the elevation of the codes to provisional categories by means of theoretical codification
- the reporting of the results produced.

The result of ‘grounded theory’ must be the demonstration of the main variables that explain how the group observed and solved their problems (Cutcliffe, 2005). This means: the results identify and form the basic processes that the people use to solve the key problems identified (Cutcliffe, 2005). In this sense, it is not sufficient to describe the phenomena without including conceptual elements. If one wishes to follow the guidelines of ‘grounded theory’ and not to only make an analysis of qualitative data, it is necessary to take a step further than just a brief description and to arrive to a conclusion and to explain what happens (Cutcliffe, 2005).

An essential feature of grounded theory research is theoretical sampling, a procedure whereby researchers consciously select additional cases to be studied according to the potential for developing new insights or expanding and refining those already gained (Pace, 2004).

Theoretical sampling is very different to statistical or random sampling, which are commonly used in quantitative studies. Theoretical sampling aims to maximise opportunities for exploring emerging concepts. Statistical sampling aims to be representative of the population under study. These differences need to be kept in mind when designing a study or judging its credibility (Pace, 2004). The researcher begins the study with a general idea of the type of people who will be interviewed, but needs to be prepared to modify those plans after the initial interviews. Data collection continues until the researcher achieves theoretical saturation – the point at which ‘no additional data can be found that would add to the categories being developed and examined (Pace, 2004).

The sample was chosen being based on:

- in the company they were introduced to the concepts of the continuous improvement around the year 1999–2000–2001
- they are first tier suppliers of the automotive industry
- they have or at least they believe they have a continuous improvement program in progress in the company.

The targeted companies for the study are first tier suppliers of the automotive industry based in the province of Valencia. In the sample, there are multinational companies with strong presence in the global automobile market and national companies with one or two plants in the province of Valencia. In our case, a total of 14 interviews were conducted between February and June 2008.

**Table 1** Profile of the interview pool

	<i>Full-time</i>	<i>Part-time</i>	<i>Total</i>
Plant manager	-	4	4
Continuous improvement (CI leader/manager)	4	6	10
Total	4	10	14

All interviewees were charged with some responsibility within the context of continuous improvement (Table 1). In some cases, plant managers were canvassed, though the majority of those interviewed were those responsible for continuous improvement in their respective operation. Some were dedicated full-time to continuous improvement, while others shared this responsibility with other functions.

The interview follows a semi-structured protocol. Unlike structured interviews, in-depth interviews have to be of a flexible and dynamic style of questioning and discussion aimed towards understanding the significance of human experiences from the informant's perspective (Pace, 2004). In these interviews, the investigators obtain data without conditioning or restricting the answers of the people interviewed. The type of the questions realised dealt with: What continuous improvement programs exist? What are the key of success/failure? What would you change?

The in-depth interviews were recorded and transcribed. We used the codification method outlined by (Glaser and Strauss, 1967), developing codes that represent the information, more than to create *a priori* codes that condition the field work.

The type of codification used has been *in vivo* codification and focussed codification. Codification *in vivo* allows one to preserve the content of the points of view of the participants and their actions in the same codes as starting points (Charmaz, 2006). Focussed codification serves to extract the most frequent or most significant previous codes from amongst all the data. Focussed codification requires decisions on which initial codes make more sense in categorising the data (Charmaz, 2006).

The codification of transcribed texts was studied with the aid of the application for the qualitative analysis of data, ATLAS.ti (version 5.2).

Altogether, 580 minutes of recording were made, that were then transcribed. The total number of words gathered was 39,420.

#### **4 Results and discussion**

In this section, the different elements are factors that act as inhibitors and enablers of the sustainability of continuous improvement. For this we will consider the elements without classifying them either as enablers or as inhibitors, in the style of Bateman (2005). Nevertheless, Bateman and Rich (2003) themselves highlight differences between different elements that act as inhibitors and other that act as enablers. We presented our findings in this mode, because a majority of the elements could be defined as belonging to either group, i.e., as enablers if in existence or as inhibitors if not in existence. Such as, for example, the first element: management involvement.

##### *Management involvement and strategy*

Management involvement is one compelling factor in the implementation and maintenance of continuous improvement, as all the people interviewed agreed, i.e., that managers had to be fully involved in the implementation of the process: 'the support of management, which is the fundamental thing'; 'management needs to be the primary impetus'. The key to this point is the support of the rest of the indispensable elements, for starting and sustaining continuous improvement. At this point, there is a general consensus between all the researchers who have written about the subject (Bateman and Rich, 2003).

*Objective setting and the necessity to measure*

All the people interviewed confirmed that one needed to measure to develop the continuous improvement programs. The final aim of continuous improvement is to improve the productive indicators, quality and customer satisfaction: 'metrics are something fundamental to seeing if there is improvement, as well as seeing how much improvement'. These indicators inform us about the quality of the effects of the continuous improvement, related to work teams or individual suggestions. These measures must be within real-time and are keys in the processes that are being used. These indicators must be able to be translated into financial indicators, i.e., money saved by the company.

At the same time the measurements are key to establish compensations, especially important in the first stage of launching the continuous improvement process, before assuring the sustainability and total integration of the concept of continuous improvement in the company: '[...] to get people to promote or drive improvement, you have to give something in exchange. And this recognition, monetary or otherwise, needs to be linked to the improvement achieved'.

As a measurement of the degree of implementation of continuous improvement it would be advisable, but not essential, to measure the number of events within activities of continuous improvement as well as to measure the level of worker satisfaction, so we know their level of motivation. For example, the index of absenteeism and the number of suggestions proposed implemented by workers over the year. It is possible to highlight that the managers belonging to companies with a good level of implementation of continuous improvement consider that the only proposals that need to be measured are those that have been implemented with the objective of avoiding time wasting.

The setting of clear objectives is named by Kaye and Anderson (1999) and Upton (1996) as one of the key points for the success, identified by the people in charge of the companies: "normally [the targets] come from management, from the department heads. Depending on their strategy, their annual policy deployment, there are certain activities which must be implemented that year". Although it is sensible to recognise that they do not refer to this point as the main key, this is possible because the setting of objectives is inherent to its position and is often taken for granted. One must set the objectives, realisable and focussed on results, based on these measures and in accordance with the global objectives and agreed with the team leaders. Without setting objectives that the team must follow at regular intervals, the objectives end up weakened and eventually disappearing.

*Management of the leadership – continuous improvement manager*

This element is identified clearly in literature by Bateman (2005). Other authors talk of the necessity of a charismatic leader (Upton, 1996) or of ways to exert the full potential of the leadership (Dale et al., 1997) or conformity at the time of the application of the continuous improvement process by all the workers (Kaye and Anderson, 1999). The interviewees confirmed that a person (continuous improvement manager), who should be dedicated to continuous improvement, that could act: as coordinator, facilitator of resources, somebody that could lead and provide support, that has the ability to teach: 'it is very clear to me: you need a person devoted to this, not a department, [...] but you need one person who's always devoted to improvement'. Almost all the participants in

the investigation stated that this leader must only report to the management and not belong to a department (specially the production department): 'they should have a hierarchical position, at the minimum, at the same level as the directors of the other departments'.

If it is not managed in this way, the work of the leader could finally be absorbed by the main functions of the department. In addition, there is special emphasis in the necessity of the unique dependency of the plant manager, since the rest of departments would end up disabling the task.

### *Motivation of the workers*

The involvement of the workers is a key component in the sustainability of the continuous improvement. Not only as executors of the developed improvements but as a source of ideas and part of the improvement process. Without them, and by the very definition of continuous improvement, it would not exist. In order to obtain the involvement of the workers, coaching is required and awareness as well as recognition of the managers: "[...] tickets to football games; XPS t-shirts, which is what we call the continuous improvement system; personal recognition; something that acknowledged by management so that the workers see that it's not just my thing'.

A great number of the people interviewed were of the opinion that the implementation of material incentives is a positive factor linked to improvements achieved working either in a team or by individual effort. But they also emphasised its fundamental value as an initiator of a continuous improvement culture and as an enabler for the sustainability of continuous improvement, i.e., when initiating the programs it is recommendable to have incentives but once the culture has been assimilated, it could be enough to have recognition of achievements by the manager just as highly as with material incentives: 'management thought that, at the time, the incentives would become intangible. Now the incentives consist of congratulating the employees when they deserve it; in other words, they are no longer material incentives but rather management recognition'.

### *Resources*

Any business program must have resources available to succeed. As stated Bateman and Rich (2003), the allocation of resources is necessary, but not as much financial resources as personnel resources (the mentioned 'continuous improvement manager') in considering continuous improvement as an extra work load, i.e., to reserve a weekly time to develop the potential of continuous improvement: 'money and the workers' time are the resources we need'.

At the same time, although the low cost of continuous improvement is recognised, it is also necessary to consider the necessities of material resources for continuous improvement. In fact this section is closely connected, firstly to manager involvement, since without resources to support the improvements raised by the workers, they feel that the management is not committed to continuous improvement and, therefore, we lose one of the key points: 'the worker needs to see that money is being spent on things that did not get any money before'.

### *Lean manufacturing and continuous improvement*

It seems common the confusion between concepts such as ‘lean manufacturing’ and continuous improvement. There is an element that can be critical when the first concept is confused with the second, while overlapping the two enhances the improvement.

Lean manufacturing is, in its most basic form, the systematic elimination of waste (overproduction, waiting time, transport, inventory, movement, excessive process, failures, etc.) and the implementation of the concepts of continuous flow based on customer demands (pull). In many times, the managers think that the application of all the basic tools of lean manufacturing (5S, Visual factory, kanban, SMED, etc.) are continuous improvement and its only mission is to implement them and to ensure that the workers fulfil them. In these cases, a great part of the potential of improvement is lost by confusion of concepts, and more serious still, the path towards continuous improvement is abandoned because it is believed that it is already correctly implemented and maintained.

On the other hand, some managers overlap the concepts, which are to say, do not make sense to apply the basic tools of lean manufacturing without taking into account the workers that must implement, maintain and improve these tools. In this case, it is easier to introduce continuous improvement.

It is important that all the personnel, or at least all the managers, understand the difference between both concepts, and that in any case, to know that the maximum potential of lean manufacturing is obtained with the application of continuous improvement tools.

### *Cross-functional teams*

There is necessity for cross-functional teams to implement the continuous improvement strategically. In other words, a team must be sufficiently independent to make their own decisions. This implies that they should have people from all departments involved in the improvement: ‘they need to work steadily with members from across all departments, which is not to say that everyone needs to attend every meeting’. In this sense, there are companies with continuous improvement implemented that decide to form regular teams, with all personnel integrated, and others have chosen to form the team based on the individual situation, i.e., the promoter in charge of training and objective setting makes the team as big as he considers appropriate: ‘that is why I am telling you that the key is structure and then building the structure, a sequence of meetings’.

### *Clarify functions and hierarchies*

For the starting of the improvement, some managers indicate the necessity to clarify functions and hierarchies in the organisational charts, as they are not always clear: ‘many times the real organisation charts do not correspond to the official organisation charts, and this reveals a problem’. Frequently, companies have a departmental structure: process department, engineering department, quality department and production department with overlapping functions. It is convenient, before beginning the implementation of the improvement, to clarify the functions and organisational chart to avoid conflicts that can end up aborting the start of a good program.

*Methodology for sustaining continuous improvement*

Some people interviewed pointed out as a great enabler for sustainability the creation of an individual, specific company methodology, similar to the path followed by: Toyota Production System, Ford Production System and equivalents, with the objective being to facilitate the expansion of best practices and improvements within the rest of the company: 'the methodology is what leads to sustainability'. This manual of best practices, allows companies to standardise these improvements and to make them more easily shared, not only to the already existing parts in the company but also in future expansion. This element can be compared with the consistent focus on improvement activities as is indicated in existing literature (Bateman and Rich, 2003).

*Cultural issues*

There was a common opinion shared by the interviewees, which was that resistance to change could act as a inhibitor when implementing continuous improvement (Dale et al., 1997) motivated by the age of managers and workers. For obvious reasons, the resistance to change on the part of the managers is less desirable since their involvement is essential for the success of the programs: 'older people show more wariness, the younger ones participate more. To change, age is the problem'. The resistance to change of workers of a mature age can be compensated for by the younger work force who can be encouraged to adopt the good practices mentioned.

One of the inhibitors found for the sustainability is the merging of companies with different cultures; in the same way that has been identified by some authors (Bateman and Rich, 2003). The best practice in some cases cannot coincide with the best practices of others, in spite of similarity of 90% in some cases. In order to solve this problem, the managers need to be trained to try to shape the new best practices in the methodology previously mentioned.

All the enablers/inhibitors mentioned above cannot be considered in the same way. The first ones: involvement of the management, setting of objectives, necessity to measure, need of a continuous improvement manager, involvement of the workers, to have resources and the misunderstanding of concepts between lean manufacturing and continuous improvement, has been considered essential. Whereas, the rest of the elements must be considered as enablers or inhibitors of continuous improvement; in other words, these last elements are not key for the success of the continuous improvement process but they can accelerate or slow down the process; and, in some serious cases, if they are badly managed, they can make the implementation of sustainability fail.

Occasionally, and in cases of successful and stabilised deployment over many years, the continuous improvement promoter can take on other functions.

It should be noted that only one of the interviewees in whose company continuous improvement was running, was at the same time the head of the production department. This fact does not contradict the previous ideas but in fact makes them clear. Only when the culture of continuous improvement is developed through all levels of the organisation, and the head of production as well as his direct subordinates, have proved with absolute certainty that the introduction of continuous improvement tools will benefit, in the medium and long-term, the stability of the department, then the continuous improvement department can be incorporated. That is, to start the process of settlement and sustainability of continuous improvement, it is necessary and indispensable to have a

person who leads, controls, trains the group and cooperates in extending and standardising the improvements. Only then can we achieve sustainability of the improvements. Most of the executives interviewed would not necessarily follow that path in their companies, but they would maintain a programme to ensure the sustainability of continuous improvement.

The existence of a continuous improvement manager is one of the key inconveniences to the introduction of continuous improvement in small businesses, because of the low profitability of a person dedicated 100% to improvement tasks. Therefore to solve this problem there has to be an accurate division of functions, and time for that leader to be responsible for continuous improvement, so that his main activity prevents him from developing his work as a continuous improvement manager.

The element defined as ‘confusion of concepts’ is particularly important because it prevents progress in the right direction. Some interviewees, with positions of responsibility in the area of continuous improvement, were convinced that their company had established continuous improvement as a way to work and that workers were involved in it (with more or less motivation). When analysing in depth the interviews, it could be observed that these companies had implemented only, and incorrectly, some tools of ‘lean manufacturing’ and their employees only followed written procedures by some departments.

From the interviews conducted, the concept of the right time to begin implementing continuous improvement also came up. This concept cannot be developed as the key or catalytic factor, but it is important since the completion of the main points for the implementation can only be accomplished with a major effort by the entire company and therefore it cannot be put completely within a strategy of extreme growth because the resources would be directed towards this strategy. In other words, continuous improvement can only be initiated and stabilised in situations of sustained growth. Only when the culture of continuous improvement is implemented in the company can it return to a strategy of accelerated growth.

## **5 Conclusions**

The main contributors of the research presented in this paper allowing the expansion of knowledge about continuous improvement are:

- Summarises the main inhibitors/enablers reflected in the academic literature (management involvement and strategy, the need to measure and objectives, management of leadership, motivation of the workers, resources, cultural issues, cross-functional teams...). Also we noticed that for the companies interviewed, these elements have been perceived as key elements and therefore, support the suggestions made by other authors (Bateman and Rich, 2003; Bessant et al., 1994; Dale et al., 1997; Jorgensen et al., 2003; Kaye and Anderson, 1999).
- We discovered that, within the important elements: management involvement, objective setting, need to measure, need of a continuous improvement manager, involvement of operators, availability of resources and no confusion between concepts of lean manufacturing and continuous improvement, are perceived as more important than others. Therefore, we proposed a hierarchy of priority.

- We have also proved that the priority of these elements will change over time or during the stages of development of the continuous improvement programme. In other words, the critical aspects at the time of launch of the programme are no longer as important when it is up and running; as for example the form in which management should participate, the incentive system, or the necessity of a continuous improvement promoter figure that in reality can change at any given stage according to circumstance.

In addition to these contributions we found that there exists some confusion in regard to the academic terminology used, on the behalf of the managers. The global system is often wrongly identified as one single element; for example, when considering lean manufacturing or total productive maintenance as a synonym for continuous improvement. While the academic literature has outlined that, there is a strong relationship between these parts of the system, some companies get the wrong idea and consider them as the same thing.

This study also intends to provide those responsible for continuous improvement within companies with a study that includes and clarifies all the contributions from the literature to allow companies to know which aspects they need to consider when implanting and sustaining continuous improvement. Besides this, the article will help companies to identify the key elements to be able to improve their continuous improvement programmes and to facilitate the extension of the same into all the areas of the company.

The main limitation of this study is that all the companies interviewed were first tier suppliers of the automotive industry located in the province of Valencia, although the result may be applied nationally because in the sample, there were both multinational companies with strong global presence in the automotive industry, as well as national companies with plants in different provinces. Also, not all companies have the same production systems: there are manufacturers of plastic parts for injection, metal parts and assemblies. The authors studied some companies with varying production processes, with some highly automated and others with manual processes. Additionally, in some cases, companies had complex logistic schemes such as delivery in sequence to the customer. Therefore, the outcome of the investigation may be extended to national level. The authors believe that the study should be extended to an international level in order to take a broad view of the results for the entire automotive industry.

However, our findings cannot be generalised to cover all categories of companies because we obtained our data from companies belonging to a specific sector and region. Therefore, it would be considered appropriate that any future research should compare findings to evaluate whether this research could be considered representative of other sectors or countries as well.

It would be advisable to create a comprehensive global model that covers all the inhibitor/enablers with the aim of simplifying the implementation of continuous improvement in companies.

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