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## **ANALYSIS OF SIX SIGMA IMPLEMENTATIONS IN THE ITALIAN BUSINESS CONTEXT**

**Fabrizio D'Ascenzo<sup>1</sup>, Lucio Cappelli<sup>2</sup>, Francesca Rossetti<sup>1(\*)</sup>, Roberto Ruggieri<sup>1</sup>**

<sup>1</sup>Department of Management, University "La Sapienza" of Rome, Rome, Italy

<sup>2</sup>University of Cassino and Southern Lazio, Cassino, Italy

(\*)*Email*: francesca.rossetti@uniroma1.it

### **ABSTRACT**

The present paper discusses the results of empirical investigation aiming at analyzing the effects Six Sigma implementations in Italian companies. As it is well known, the Six Sigma methodology is focused on reducing business processes variability, improving the effectiveness and efficiency. Regarding the approach of Italian companies towards Six Sigma, the research question addressed is: Does really exist an improvement expressed in terms of economic performance, customer and employees satisfaction? In order to measure what are the effects and the benefits of Six Sigma implementation projects, it was specifically constructed for the survey a questionnaire characterized by 27 questions, using a Likert-type rating scale.

**Keywords:** lean manufacturing, six sigma, lean six sigma.

### **INTRODUCTION**

The main objective of this paper is to investigate in the Italian business context the impact of Six Sigma projects on economic performance, customer satisfaction and human resources involvement. The research was carried out taking into account the companies of the industrial and third sectors, the questionnaire has been disseminated to the companies located throughout the Italian country that implement the methodology Lean Six Sigma or Six Sigma. Mainly, the survey involved big companies with an average turnover exceeding €50 billion per year, but the diffusion of this method is growing among SMEs, a category which includes the majority of Italian companies. In order to measure what are the effects and the benefits of Six Sigma implementation projects, a questionnaire characterized by 27 questions was specifically constructed for the survey, using a Likert-type rating scale (from strongly disagree to strongly agree). The professionals who have been involved in the empirical investigation are Quality Manager, Continuous Improvement Manager, Supply Chain and Operational Excellence Manager, Quality Plant Manager, Procurement Quality Manager, Master Black Belt, Six Sigma and Lean Six Sigma Leader.

### **RESULTS AND CONCLUSIONS**

In reference to the data processing, we selected as an independent variable the variation of the Sigma level, while the dependent variables are:

- *Performance*, explained by the trend of the profits, competitiveness, costs and product reliability;

- *Employee Satisfaction*, described by the involvement of managers in the training process about the Lean Six Sigma projects, level of interaction between departments/strategic areas, and degree of satisfaction achieved following the implementation of this methodology;
- *Customer Satisfaction*, given by loyalty and claims satisfaction.

The results from the empirical investigation are shown in Figure 1.

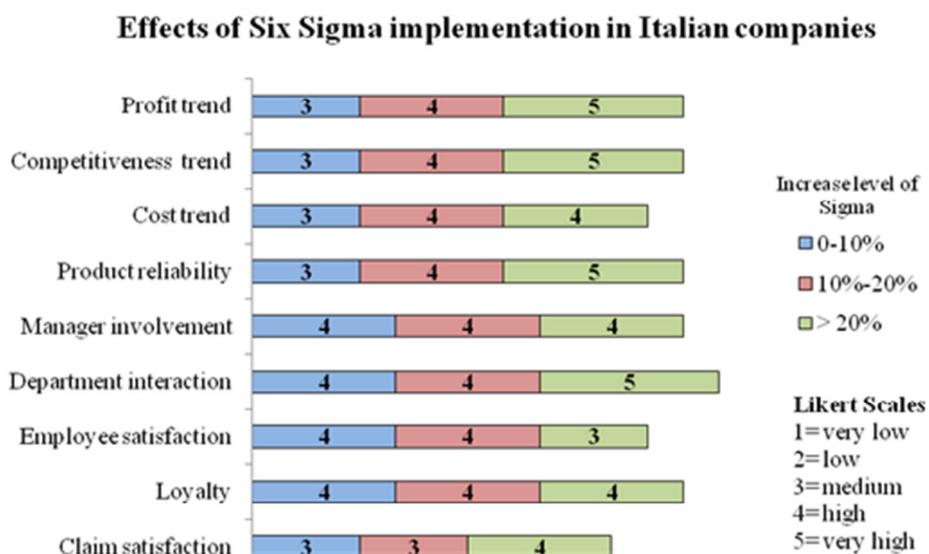


Fig. 1 - The effects of Six Sigma projects realized in Italian companies

As we can see, there is an inverse relationship when the Sigma falls in the range 0-10%: the level of client loyalty is high despite the value expressed by respondent which was 4/5 of the Likert scale. Furthermore, in the event that the Sigma variation has exceeded 20%, the level of employee satisfaction is “only” medium. This could be explained by the fact that in order to have a high Sigma level increase a greater effort to human resources that act, react and interact in the organizational business context is required.

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