Chapter 12

Determination of the Critical Success Factors (CSF) in the Implementation of Six Sigma (SS) and Its Sustainable Benefits: Content Validity and Internal Consistency of the Measurement Instrument

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ABSTRACT

Currently, organizations seek to position themselves in the market as the most competitive and profitable in their branch, through the continuous improvement of their processes, products, and/or services, applying various techniques, tools, and methodologies. Particularly in this chapter, focus on Six Sigma (SS) will be shown, a strategy used in companies to achieve competitive objectives, continuously improving processes. In this sense, it is considered important to identify and know the main factors that are involved in its implementation. Likewise, the organizations are presenting a culture towards the sustainability and the environmental care, derived from this, the methodology used to develop a measurement instrument that allows to identify the CSF in the implementation of SS, the sustainable benefits that can be achieve with correct implementation, the procedure used for the validation of the content of the instrument, the validity of internal consistency and the obtained results.

DOI: 10.4018/978-1-7998-1052-0.ch012
INTRODUCTION

As is already known, organizations are in search of competitiveness, continuous improvement, profitability and recently of sustainable development and the environmental care, for the achievement of these strategic objectives supported by various techniques, tools and methodologies that help them to lead the path of success. Of the diverse techniques that exist for the continuous improvement of the processes, products and services; this chapter will present an approach towards Six Sigma (SS), used mostly in organizations to achieve competitive objectives, continuously improving the processes developed within it, in this sense, for Tlapa, Limon, García-Alcaraz, Baez and Sánchez (2016) the adoption of SS has increased significantly in those organizations that seek to apply best practices to increase or maintain competitiveness.

Therefore, it is necessary to identify the main factors that are immersed in the deployment of SS, which support successful implementation, the literature reports them as Critical Success Factors, and are defined by O’Sullivan (2009) as variables once identified and managed by the organization, they lead to success and the goals planned, while Suarez Amaya and Díaz Barrios (2013) define them as all those actions, capacities, resources, advantages, knowledge and skills that constitute a competitive advantage, while for Amberg, Fischl, and Wiener (2005), they are a limited number of areas in which the results is satisfactory, ensure a successful competitive performance for the organization, those characteristics, conditions or variables that, when maintained a properly management can have a significant impact on the company success that competes in a particular industry and as a this factors that, if addressed significantly improve the project implementation.

It is important to indicate that, in relation to the CSF, the literature reports a great variety, because each case study reports what for them represented a factor of success in the deployment of SS. Initially, a total of 145 factors were located through the literature review, from which a detailed analysis was carried out to identify and select the main ones to integrate this research. In another sense, in the recent literature Cherrafi et al., (2016), Faulkner and Badurdeen, (2014) there is a tendency for organizations to give priority to projects that include an evaluation or improvement of the environmental impact on the processes or product development.

In terms of the various benefits that can be obtained by properly deploying the SS strategy, sustainability is one of these, so organizations that implement continuous improvement and Green principles simultaneously consider having a better performance (Chugani, Kumar, Garza -Reyes, Rocha-Lona and Upadhyay, 2017). In this sense Díes, Tan, and Lim (2013), mention that only a group of environmental experts and researchers have investigated until now the relationship between the aspects of continuous improvement practices and Green.

In relation to sustainable benefits, Alhuraish, Robledo, and Kobi (2017) mention that a competitive advantage is achieved when companies maintain practices consistent with sustainable development strategies and, as such, control waste and the implementation of practices that are environmental and socially responsible.

With respect to the link between SS and sustainable development, there is the impression that SS can indirectly influence sustainable development through the application of its tools to environmental management systems, Sagnak and Kazancoglu (2016) and Camia et al., (2009).

Taking into account the above, it is considered pertinent and necessary to generate a measurement instrument that allows to identify the CSFs considered by the organizations that have developed SS, as well as to prove the relationship between the development of SS and the sustainability positive results.