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Integrating Six Sigma with Quality Management Systems for The Development and Continuous Improvement of Higher Education Institutions

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Abstract

Competitiveness, innovation and performance are the key words that best define the goals of the present business environment. Under the given circumstances concepts such as quality and continuous improvement become important actors in achieving these goals. Regarded as a whole, higher education plays various roles such as: training the students and preparing them for the economic environment by involving them in the teaching-learning and research processes and offering the example of a system whose outcomes meet the organizational goals by implementing Six Sigma. The paper focuses on the way Six Sigma is applied to higher education and on integrating Six Sigma with one of the quality management systems, namely the model ISO 9000, for the development and continuous improvement of universities. A synergetic approach created by analyzing and simultaneously using the benefits of Six Sigma and ISO 9000 plays an important role in the development and success of a higher education institution.

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1. An overview on Six Sigma

The Six Sigma methodology is one of the most popular business practices used today. Employees of the Motorola Corporation, which manufactures wireless infrastructure technology, are credited as the first to create and implement this methodology in the mid- 1980s. Many other quality control methods have come and gone, but Six Sigma remains as the most popular method currently in use. The Motorola Corporation has reported saving upwards of 16 billion dollars by using these concepts over the years. Many other companies have adopted this methodology

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as more than just a quality control system, but also as a total business plan. It has been praised by major leaders of industry such as the Chief Executive Officers of General Electric and The Honeywell Corporation. Even though the history of the Six Sigma Methodology spans only a few decades, it is now considered a vital part of quality development and efficiency in the top corporations of the world today.

Six Sigma allows a multidimensional approach, as it could be viewed as “a metric, a philosophy or a methodology for quality improvement” (Mitra, A., 2004). Six Sigma emphasizes on three levels: a metric, a methodology, and management systems (Andersson et al., 2006; Arnheiter, Maleyeff, 2005; Linderman et al., 2002, McCarty et al., 2006). Six Sigma could be defined as a metric not only at top management level, but at other levels, as well as, such as the level of the operating personnel (Mitra, A., 2004). As a quality management methodology Six Sigma uses different theories and tools to improve upon the processes of a certain business. Simply put, this results in near perfect products and services that meet and/or exceed the expectations of customers or end users, while simultaneously reducing the amount of time, money, and resources put in. In other words, with less input, a greater output will be realized.

The second way to define “Six Sigma” is the statistical way – metric system. “Sigma” (σ) is a Greek letter used to represent the statistical term ‘standard deviation’ which measures the deviations from average in a particular business process. With more “deviation” from normal, come defective products and services that do not fulfill customer needs and wants. These “defects” end up being returned or requiring resolution, which costs businesses increased time, money and resources in the long run. A 6 Sigma business process “produces only 3.4 defects per million opportunities” (Goffnet, S. P., 2004) with other words the concept is used for processes that, virtually, perfectly meet the customers’ requirements and needs. Thus 0.00034% of products produced in a Six Sigma Process are defective. A ‘5 sigma’ process produces 233 defects per million opportunities - DPMO (0.023% defective), a ‘4 sigma’ process produces 6,210 DPMO (0.62% defective), a ‘3 sigma’ process produces 66,807 DPMO (6.7% defective) and a ‘2 sigma’ process produces 308,538 DPMO (31% defective).

As a management system, it is reported to:

- Ensure improvements are sustained
- Bring production teams together to maximize their efforts
- Bring business strategies in line with improvement efforts
- Accelerate results

At the mid-management level Six Sigma is used by project leaders as a methodology to achieve quality improvement by reducing the defects in products, services and processes (Mitra, A., 2004). Whereas for products and services the DMAIC (define-measure-analyze-improve-control) approach is being used, for products and processes another approach is popular in the literature, namely DMADV (design-measure-analyze-design-verify) (Pfeifer, T. et. al., 2004).

The first goal of the Six Sigma Methodology is to discover all of the problems within an organization that may or may not be apparent. This is done through much research and data collection. The next step is then to take appropriate action to reduce the number of errors and reworks which are known to cost time, opportunities, money and clients. In this way, the Six Sigma process translates knowledge and awareness into an open opportunity for expanding business.

Often times, more than one problem is found through Six Sigma implementation. In this case, there are tools used within the methodology that make it easier to choose which project is the most important to tackle first. All improvements are done with the ultimate goal of increasing the quality of the business output. There are three key holders of quality; they include the customer, the employee and the process. Customers define the quality of a product or service, as they are the key decision makers. In other words, if your product or service is not up to par, the customer will not buy it. If you have no customers, you will never be successful in your venture. One of the key places to start collecting data is the customers. You cannot produce what they want and need if you are not directly asking them what they want and need. Universally, customers expect reliability, competitive prices, performance, efficient delivery of goods and services, etc.

The most important part of the entire process, is uncovering the gaps or defects in a business process. There are many Six Sigma tools within the methodology that help the Six Sigma professionals in charge improve the most critical processes first. One of the most important things to note about the Six Sigma process is that it does not rely on quick-fix programs to temporarily mask a business problem. It is a systematic methodology of hard work that is fused with a disciplined, factual, data-based and statistical problem-solving method. Therefore, it affects almost all

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