Current Use of Management Systems and Quality Tools in Companies Located in the State of Puebla Province, Mexico and Surroundings

L. A. Gómez-Jaimes and L. Cuautle-Gutierrez

Universidad Popular Autónoma del Estado de Puebla (UPAEP)

Author e-mail: luisantonio.gomez@upaep.edu.mx

Abstract: According to what Geert Hofstede stated in his study of *cultural dimensions*, the Mexican society it is characterized for having a relatively small desire to save for the future and wanting quick results; this type of disruption also occurs in most firms placed in Mexico. One way of effectively managing the companies and stopping them from falling into this kind of disorganization, is through the implementation of *quality tools* and *quality management systems (QMS)*. Nonetheless, are the companies in the state of Puebla and its surroundings, using these methods to achieve a *continuous improvement*? Or are these methods being "implemented" to keep operating in the current market? The main objective of this paper is to show that the knowledge acquired during college by employees about QMS and QCT and their application in the industries located in the studied region, allows highlighting a contrast as indicated in the study of cultural dimensions.

Keywords: Cultural Dimensions, Quality Management Systems, Quality Tools, Continuous Improvement

1. Introduction

Expanding on the origin of the study of cultural dimensions, Gerard Hendrik Hofstede, developed his first study between 1967 and 1973, allowed him to catalog the differences that existed among the forty largest nations in the world regarding the values and customs of these nations. Thus emerged the concept of cultural dimensions and made the first classification of four-dimensions, titled as "Power Distance", "Uncertainty Avoidance", "Individualism" and "Masculinity". Based on a study by Michael Harris Bond and his colleagues. Students (subjects) were drawn from 23 different countries. This survey was used included employees and Chinese managers. Based on its results, Hofstede introduced a new cultural dimension. This new dimension is the basis for of this research article. This new dimension was originally named "Confucian Dynamism" and would later be renamed the "Long-Term Orientation". It was not until 2010 that Professor Hofstede expanded these cultural dimensions to a total of six which prevails until today. Also the concept of "Indulgence" is introduced. Each of these cultural dimensions were evaluated with a score on a scale from 1 to 120 Thus representing how rooted or how is society agrees with the assessed cultural level (Hofstede, 2016). It is important to clarify the meaning of each of these cultural dimensions (Hofstede, 2016) as follows:

- *Power Distance*: Attempts to clarify the concepts of equality and inequality. It is the degree to which the less powerful members of any community, society, or organization accept that power is unevenly distributed.
- *Uncertainty Avoidance*: Indicates the level of agreement or disagreement of the members of a culture to unstructured situations. The latter referring to unusual concept to new or unknown moments in a societal context. Cultures that have strong uncertainty avoidance try as much as possible to minimize these situations through security measures, laws and rules. Another main feature of the members of these cultures is that they are tolerant to different opinions people and try to have the fewest possible rules.
- *Individualism*: This dimension and making a comparison with collectivism refers to the degree to which individuals are not members or groups within their communities. A high degree of individualism refers to the relationship between individualist is scarce with others outside their immediate social circle. Each cared himself and his immediate family. On the opposite side, on collectivism are companies in which the group bonds are wider. Thus showing that the family unit is more extensive.
- *Masculinity*: In this specific case, you cannot refer to masculinity without including the concept of femininity. A high index of masculinity in this dimension indicates that society is driven by competitiveness, achievement and success. On the other hand, a low score on this dimension or femininity, means that the dominant values in society are caring for others and the quality of life. A feminist society is one where quality of life is the key to success and the fact that someone outstanding is not just a matter of pride or admiration.
- *Long-Term Orientation*: As mentioned earlier, this dimension is one of the main objects of study. which this article. As in previous dimensions, the concept of long-term orientation goes hand in hand with its counterpart,

the short-term orientation. Countries with strong long-term orientation foster virtues that give greater importance to future results, as can be saving, persistence and adaptation to changing circumstances. On the other hand, countries that base their daily lives on the concept of short-term orientation, foster virtues associated strongly with the past and present as national pride, respect for tradition and fulfilling social obligations. In other words, it refers to the importance given in a culture to achieve quick results rather than planning in a long term. Such concerns may come to have, thus accelerate hasty decisions that often could lead to an erroneous conclusion.

- *Indulgence*: The study of Indulgence and its counterpart Restriction, refers to the degree to which people try to control their desires and impulses, based on their education, in such societies, its members are free to enjoy life and have fun your way. In contrast, the concept of restriction indicates that society suppresses meeting the needs of its members and regulated by strict social norms.

The International Organization for Standardization (ISO) (2005) defines Quality as the "degree to which a set of inherent characteristics fulfills requirement", namely, it specifies a pattern of minimum requirements that a product or service must fulfill to be considered satisfactory. According to Diaz (2010) some of the first steps taken by Mexico concerning the process of implementing the standards established by ISO was the first international standard for quality assurance, when the Comité Consultivo Nacional de Normalización de Sistemas de Calidad (CCONNSISCAL) performed an adaptation of these rules in the Mexican standards NMX-CC (1993). The final documentation is contained on the ISO website; this announces the first certification of a company in Mexico ISO 9001.

1.1 Problem Statement

Hofstede (2001) states that values in the workplace are strongly influenced by the culture of that country. Further Hofstead analyzed the rating assigned to Mexico with respect to its long-term orientation. It can be interpreted that this reluctance to plan ahead by Mexican society could affect the labor performance for the disorganization. As stated above, one of the main tools to prevent the disorder within organizations is the successful implementation of management systems and the proper use of the existent quality tools. Then the question becomes evident "does the culture of the Mexican society regarding its long-term orientation really influence the performance of Mexican labor in the Puebla region"?

2. Method

To verify what Hofstede's research, a study was conducted by analyzing data through the application of surveys, applied to companies. The survey assessed employees about the knowledge and the implementation of the quality tools and the quality management systems as directed by ISO in Mexican companies.

This survey was divided into three sections. The first two sections were based on the collection of personal information of respondents. The third section contained two essential questions for seeking the objectives of this paper. The respondents where they had acquired the knowledge concerning the quality tools and the quality management systems. They were also completed16 multiple-choice questions based on the Likert scale which specifies the level of agreement or disagreement of any statement. To analyze the study sample and compare to the data provided by the Asociación Nacional de Universidades e Instituciones de Educación Superior (ANUIES) on its 2014 website, a total of 3,116 students graduated from the areas of engineering and manufacturing, and production processes taught at different universities in the region. From this potential sample size, the sample size of 200 were chosen. For analysis the statistical confidence level of 95% the instrument was validated with a Cronbach's alpha higher than the acceptable value of 0.7.

The selected 200 employees from different manufacturing and service companies were chosen. A total of 190 employees (95%) answered this survey. Of these, 18 of the complete surveys were discarded due to the ambiguity of the answers given This left a sample of 172 valid questionnaires for conducting the data analysis.

2.1 Results Obtained

In the first part of the survey, general information was requested concerning respondents to determine if the subjects actually met the characteristics sought in the study sample.

Table 1 data was by gender. Table 2 was the level of education of each subject. And the location of the company. Table 3 displays information by gender to level of education, company location, and location. requested in this section was the respondent's gender (Table. 1), their level of education (Table. 2), the location of education, type business, and company

location. Very important to the study was the labor department in which they work. Their responses are contained in Tables 1, 2, and 3.

Table 1. Gender

Gender	*Total responses*	*Percentage*
Man	117	68.02%
Woman	55	31.98%
Total	**172**	**100%**

Source: Compiled by the authors based on the information supplied by the respondents

Table 2. Level of Education

Level of Education	*Total responses*	*Percentage*
Higher Technical University	4	2.33%
College degree	130	75.58%
Graduate degree	38	22.09%
Total	**172**	**100%**

Source: Compiled by the authors based on the information supplied by the respondents

Table 3. Company Location

Company Location	*Total responses*	*Percentage*
Puebla	125	72.67%
Tlaxcala	47	27.33%
Total	**172**	**100%**

Source: Compiled by the authors based on the information supplied by the respondents

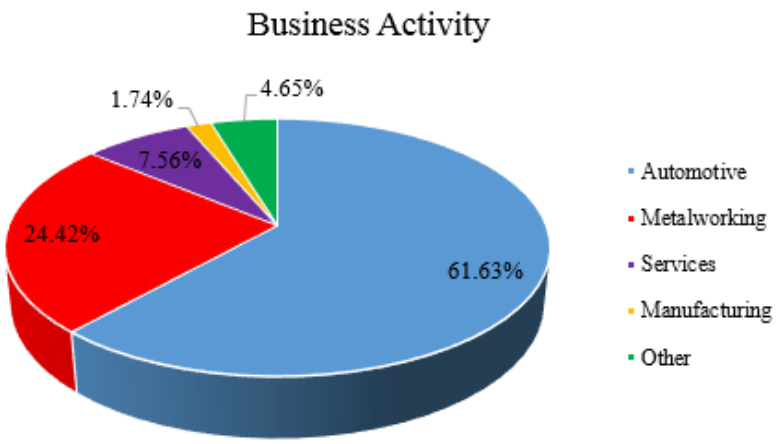

Figure 1. Business Activity

The Field "Other" includes: Information Technologies, Energy Sector, Textile and Chemical Industries
Source: Compiled by the authors based on the information supplied by the respondents

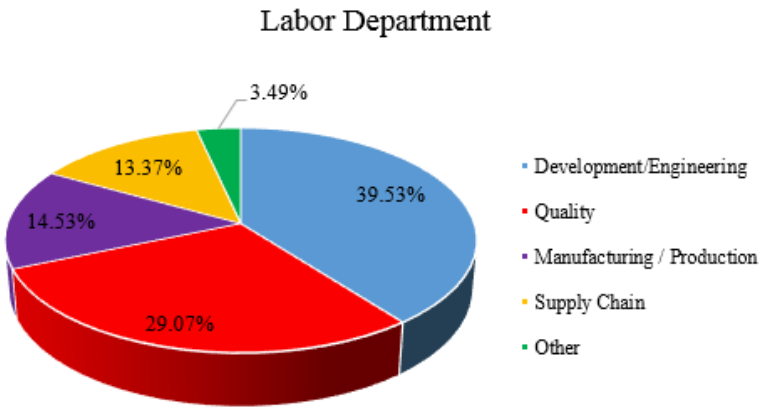

Figure. 2 Business Activity

The Field "Other" includes: Finances and Information Technologies. *Source: Compiled by the authors based on the information supplied by the respondent.* In the second section of the survey, two questions concerning a specific information about the company where the respondents work were conducted; these questions are related to the company's type of investment (Table. 4) and the company's CEO nationality (Table 5).

Table 4. Investment of the Company

Investment of the Company	***Total responses***	***Percentage***
Domestic	26	15.12%
Foreign	146	84.88%
Total	**172**	**100%**

Source: Compiled by the authors based on the information supplied by the respondents

Table 5. Nationality of the CEO

Nationality of the CEO	***Total responses***	***Percentage***
Mexican	56	32.56%
Foreign	116	67.44%
Total	**172**	**100%**

Source: Compiled by the authors based on the information supplied by the respondents

In the last part of the survey, the respondents were asked about when they learned the concepts of management systems (Figure. 3) and the quality tools (Figure. 4), these two questions were essential to achieve the objectives and conclusions of this paper, a deeper understanding of the interpretation of these data analysis is presented in the conclusions of this paper.

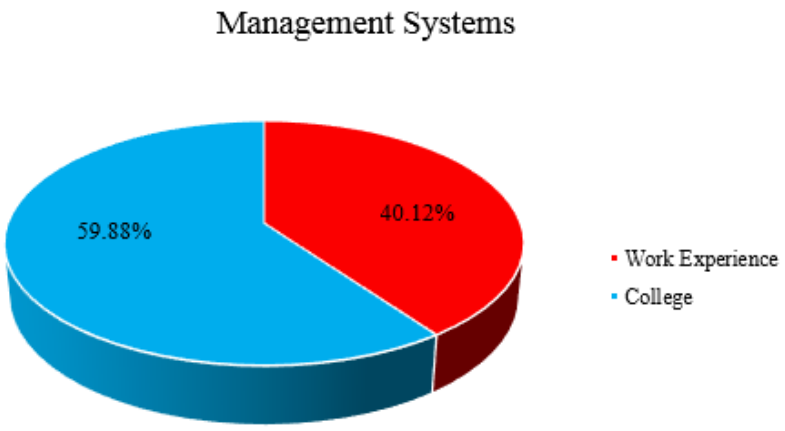

Figure 3. Place where knowledge was acquired (Management Systems)
Source: Compiled by the authors based on the information supplied by the respondents

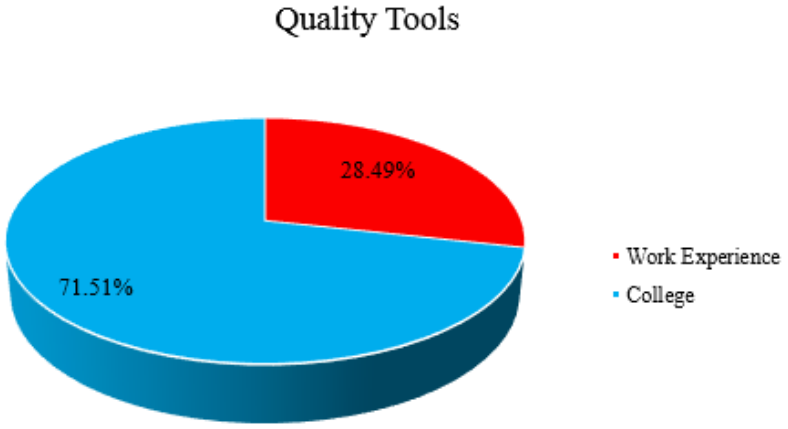

Figure. 4 Place Where Knowledge was Acquired (Quality Tools)
Source: Compiled by the authors based on the information supplied by the respondents

According to the results, this knowledge acquired by respondents mainly during college, allows them to assess the implementation's degree that have these systems in the company where they work. After conducting the above questions, and as mentioned earlier, this section of the survey was conducted through 16 multiple choice questions based on Likert scale, with five possible levels of answers, obtaining the following results.

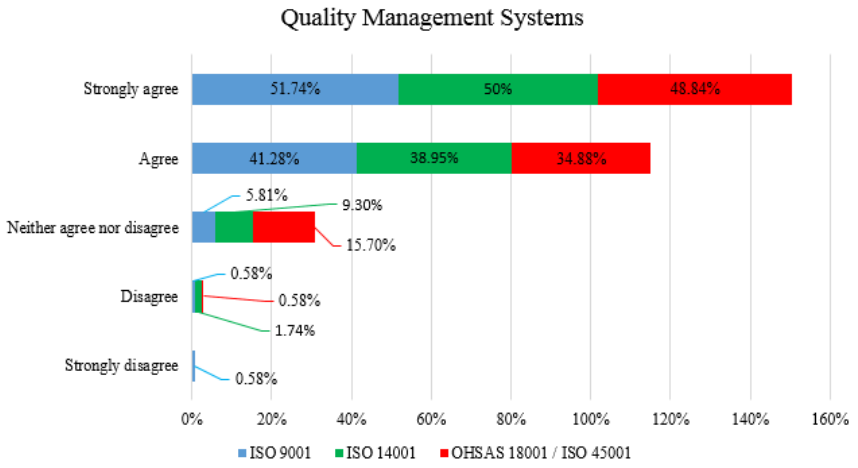

Figure 5. Current Use of Management Systems
Source: Compiled by the authors based on the information supplied by the respondents

The results obtained concerning to the use of management systems within companies (Figure. 5), show that a significant number of respondents are highly convinced that the implementation of each of these systems is well defined and strongly linked to their daily work; this is an indication that the companies located in the studied area fulfill in a very high percentage with the international standards dictated by The International Organization for Standardization (2015). These results are corroborated with a "good" value of Cronbach's alpha of 0.859, taking into account only the results concerning the perception of the various management systems.

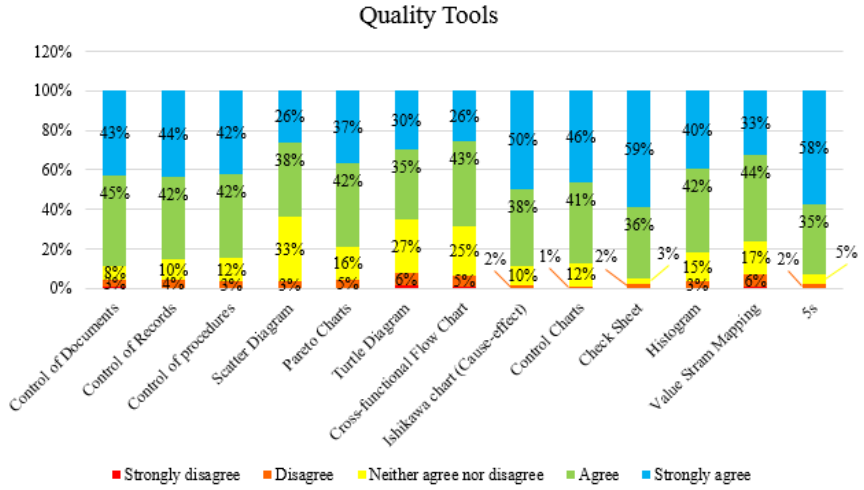

Figure 4. Current Use of Quality Tools
Source: Compiled by the authors based on the information supplied by the respondents

The uses of quality tools (Figure 6), illustrates that respondents are not only familiar with each of the existing tools but also that they use most of these tools to keep a tight rein in their daily activities. This spans all departments which they are employed. The results for use of quality tools, were corroborated with an "acceptable" value of Cronbach's alpha of 0.753.

3. Conclusions

In accordance with Moreno-Luzon (1993), the implementation of management systems in smaller companies involves both economic benefits and quality assurance concerning the products offered. Thus, for big companies such as the ones selected for this study, it is essential to have a precise implementation of those systems. Thereby, the right implementation of the management systems in the Mexican industry is vital because raising the quality standards is required in order to improve what is being produced in the country and, consequently, appealing to foreign investors. Dale and Bunney (1997) pose a sequential process of using quality tools leading to a full implementation of a management system. Similarly, Camison (2007) indicates that for a proper implementation of any management system, it is required. First, to use basic tools to view the current situation in these companies and, then, be able to use more complex tools such as statistical process control or 6σ, based on the foregoing.

Nowadays, once reached the correct implementation of these management systems, the next step that companies are taking is implementing an Integrated Management System which, according to the authors Karapetrovic and Willborn (1998) results when two or more systems are linked such that the independence of one or both systems is lost. Integration should result in a more comprehensive and stronger management system. Moreover, and in accordance with Douglas and Glen (2000), over time, companies are trying to simplify their management systems based on their own standards and those established by the certification bodies, thereby, as more systems are introduced, regardless of whether certified or not, their management will become increasingly more complex and the desire for an integral management will become gradually larger.

This study can be concluded that the reality of the companies located in the region of the state of Puebla, and its surroundings, differs from the stipulated by Geert Hofstede, at least in the selected industries. This difference could be explained by the level of knowledge that the graduates of different universities located in the studied region have about the Management Systems and the using of the Quality Tools; as indicated in Figures 3 and 4, this knowledge is acquired mostly in college and are and understand more easily the systems, tools and processes that companies use. Thus, disorganization characteristic of Mexican society (G. Hofstede's cultural dimension: Long Term Orientation) is not reflected in the foreign investment companies established in and around Puebla. In other words, the employees of these companies claim that the proper and efficient use of quality tools and management systems allow them to their daily activities orderly and easily.

4. References

Asociación Nacional de Universidades e Instituciones de Educación Superior. (2015). *Al servicio y fortalecimiento de la educación superior*. Retrieved July, 2015 from http://www.anuies.mx/informacion-y-servicios/informacion-estadistica-de-educacion-superior/anuario-estadistico-de-educacion-superior

Bunney, H., & Dale, B. (1997). The implementation of quality management tools and techniques: a study. *Total Quality Management Magazine*, *9*, pp. 183-189.

Camison, C., Cruz, S. & Gonzalez, T. (2006). *Gestion de la calidad: conceptos, enfoques*, modelos y sistemas. Madrid: Pearson Education.

Diaz, S. Apuntes (2010). *Aseguramiento de la calidad*. Retrieved August, 2015 from http://www.ingenieria.unam.mx/~dcayeros/apuntes2.html

Douglas A. & Glen D. (2000), Integrated management systems in small and medium enterprises, *Total Quality Management*, Vol. 11, No. 4/5&6, 2000, Peg. S686 – S690

Hofstede G., Hofstede G. J., & Minkov, M. (2010). *Cultures and Organizations: Software of the Mind*. Revised and Expanded 3rd Edition. New York: McGraw-Hill.

Hofstede G. (2001). *Culture's Consequences: Comparing Values, Behaviors, Institutions, and Organizations Across Nations*. Second Edition, Thousand Oaks, CA: Sage Publications.

ISO - International Organization for Standardization. (2015). *The ISO Survey*. Retrieved July, 2015 from http://www.iso.org/iso/home/standards/certification/iso-survey.htm

ISO 9000:2005 (2005). *Quality management systems — Fundamentals and vocabulary*

Karapetrovic, S. & Willborn, W. (1998) The system's view for clarification of quality vocabulary, *International Journal of Quality and Reliability Management*, 15(4), Peg. 99 – 120.

Moreno-Luzon, M.D. (1993). Can total quality management make small firms competitive? *Total Quality Management Magazine,4*, pp. 165 – 181.