

CY-ICER 2014

Quality Management: How do Brazilian Companies use it?

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Abstract

For more than 30 years, Total Quality Management (TQM) has been recognized as strategic for organizations worldwide. However, a significant number of Quality Management (QM) initiatives have still not been successful. Some authors argue that this number can achieve more than 60% of the implemented cases. This paper aims at describing how Brazilian Companies use Quality Management Practices. By conducting a survey with 125 respondents, the current status of Quality Management Practices utilization in Brazil was investigated. The analysis of QM practices reveals that companies prefer the usage and give more importance to soft practices such as teamwork and customer focus. On the other hand, companies give less importance to and do not use hard practices such as Analysis of Variance and Six Sigma. According to the respondents, Brazilian companies are at a middle stage of QM maturity level: more than 30% attest that their companies are at “inspection” age and less than 20% state that their companies have achieved strategic quality management. This unsatisfactory level of QM maturity can mean that Brazilian companies manage quality with more focus on inspection and control than quality assurance and strategic management. Therefore “improvement” in this context can mean bringing the operation back to the standard than indeed improving the standard. Finally, future research derived from these findings could investigate how QM practices would be effectively used and help companies to achieve higher QM maturity levels and strategic quality management.

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Peer-review under responsibility of the Organizing Committee of CY-ICER 2014.

Keywords: Quality management practices, survey research, Brazilian companies;

1. Introduction

“Quality” can be considered a very old and popular concept. For a long time, many people must have had a clear definition in mind about what “quality” means. However, as a knowledge area, it was developed principally at the

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end of the 19th century and beginning of the 20th century. Garvin (1988) classified the historical evolution of quality into four main eras: *inspection* (analysis of a product without statistical basis until the 1920s – guru: G. S. Radford), *statistical control* (recognition of variability as critical in quality control by the 1930s – guru: W. A. Shewart), *quality assurance* (about 1940s and 1950s, quality became a discipline beyond fabric limits addressing management as well as statistics – gurus: A. Feigenbaum, P. B. Crosby, J. Juran), and *strategic quality management* (quality defined according to customers’ needs – guru: W. E. Deming).

In 1979, Philip B. Crosby published his book *Quality is Free*, a best seller in the field of management. In general, *quality is free* means that a quality program can save a company more money than it costs to implement; profitability is best accomplished by reducing the cost of poor quality and preventing defects; and cost savings include prevention, appraisal and failure costs (Crosby, 1979). P. B. Crosby developed a concept of “Quality Management Maturity Grid”. In his concept, five stages of an organization’s maturity (*uncertainty, awakening, enlightenment, wisdom, and certainty*) can be measured by six categories (management understanding and attributes, quality organization status, problem handling, cost of quality as percent of sales, quality improvement actions, and characteristic statement) (Crosby, 1979). Table 1 briefly describes each maturity level of quality management proposed by P. B. Crosby.

Table 1. The Quality Management Maturity Grid Stages from Philip B. Crosby (adapted from Crosby, 1979)

Maturity Grid Stage	Overall description
I) <i>uncertainty</i>	“ <i>problems are fought as they occur</i> ”; “ <i>the cost of quality is unknown</i> ”; “ <i>there are no organized quality improvement initiatives</i> ”; statement: “ <i>we don’t know why we have problems with quality</i> ”.
II) <i>awakening</i>	“ <i>the organization is not willing to commit resources, although quality management may be valuable</i> ”; “ <i>emphasis on appraisal and moving the product</i> ”; “ <i>there are no long-range solutions</i> ”; “ <i>the cost of quality is reported as 3% (actually it is 18%, hugely underestimated)</i> ”; statement: “ <i>why do we always have problems with quality?</i> ”
III) <i>enlightenment</i>	“ <i>Quality is elevated to a functional level</i> ”; “ <i>problems are resolved openly and in an orderly way</i> ”; “ <i>the cost of quality is reported as 8% (actually it is 12%, still underestimated)</i> ”; statement: “ <i>we are identifying and resolving our problems</i> ”.
IV) <i>wisdom</i>	“ <i>top management participation</i> ”; “ <i>problems are identified in earlier development</i> ”; “ <i>cost of quality is reported as 6.5% (actually it is 8%)</i> ”; “ <i>quality improvement program is continual</i> ”; statement: “ <i>defect prevention is a routine part of our operation</i> ”.
V) <i>certainty</i>	“ <i>Quality is essential</i> ”; “ <i>problems are prevented</i> ”; “ <i>the cost of quality is reported as 2.5% (what it really is)</i> ”; “ <i>quality improvement is continual and normal</i> ”; statement: “ <i>we know why we do not have problems with quality</i> ”.

At the end of the 20th century (1980s), David A. Garvin, at Harvard Business School, firmed up the details of many aspects of Quality Management (QM) discipline. Besides the historical explanation of quality evolution, he published a paper in 1984 in the Sloan Management Review discussing “what does ‘product quality’ really mean?” Garvin defined five main approaches for quality: *transcendent* synonymous of “innate excellence”, absolute and universally recognized; *product-based* as precise and measurable variables reflected in the quantity of some attribute possessed by the product; *user-based* considering the premise that quality “lies in the eyes of the beholder”, having individual consumer different wants or needs; *manufacturing-based* concerned with “conformance to requirements”; and *value-based* providing performance at an acceptable price or conformance at an acceptable cost, i.e. quality here is discussed and perceived in relationship to price (Garvin, 1984). In 1987, Garvin published another paper in the Harvard Business Review presenting eight dimensions of quality, adding to the five approaches presented some years earlier. These dimensions are: *performance* (refers to a product’s primary operating characteristics); *features* (those characteristics or attributes that supplement the product’s basic functioning); *reliability* (the probability of a product malfunctioning or failing within a specified time period); *conformance* (the degree to which a product’s design and operating characteristics meet established standards); *durability* (the amount of use one obtains from a product before it deteriorates); *serviceability* (the speed, courtesy, competence and ease of repair); *aesthetics* (how a product looks, feels, sounds, tastes or smells, i.e. a personal and subjective judgment and a reflection of individual preferences); and *perceived quality* (sometimes indirect measures may be the consumers only basis for comparing brands; it is also a subjective dimension) (Garvin, 1987). Because of his contribution to the field, David A. Garvin can nowadays be also considered one of the gurus of quality development.

Despite the importance of a strategic approach for QM as previously discussed, quality improvement occurs at the operational level, and companies need practical ways to implement a Total Quality Management (TQM) program. According to Tari and Sabater (2004), firms must develop both the *hard* and *soft* parts of TQM in order to

succeed. While the *hard* elements are related to quality tools and techniques for continuous improvement, the *soft* side is associated with management concepts and principles such as leadership and culture (Fotopoulos and Psomas, 2009). The International Organizations for Standardization presents eight quality management principles, which could be classified in the *soft* side: *customer focus, leadership, involvement of people, process approach, system approach to management, continual improvement, factual approach to decision making, win-win relationship with suppliers (or partners in general)* (ISO, 2009). In their study about quality management tools and techniques, Tari and Sabater (2004) analyzed about 30 commonly used tools and techniques, for example *the seven basic quality control tools, the seven management tools*, and other tools and techniques such as *benchmarking, brainstorming, design of experiments (DOE), failure mode and effect analysis (FMEA), flow charts, poka yoke, quality function deployment (QFD), quality improvement teams and statistical process control (SPC)*.

Studies have revealed that *hard* and *soft* elements can directly influence the final performance of an organization. Moreover, *soft* elements indirectly affect performance, because they create an environment that facilitates the implementation of *hard* elements (Rahman and Bullock, 2005). According to Tari and Sabater (2004), the use of quality tools and techniques is necessary for quality improvement and it is an important component of TQM maturity, supporting the improvement of TQM levels and results (Tari and Sabater, 2004). For these authors, this means that techniques and tools are a reliable indicator of a superior level of TQM and therefore, of a superior performing company in terms of quality, cost, etc.

Successful implementation cases of QM programs have been conducted in several organizations worldwide. Despite recognizing QM, there are still many unsuccessful cases. Beer (2003) reviewed some studies on QM programs and concluded that 60% to 70% of firms fail in their effort to implement TQM practices or improve the quality of products and services not boosting their capacity to compete.

Based on the previous discussion, this paper aims at describing an analysis of QM practices utilized in Brazilian companies. According to The World Bank (2013), Brazil is the world's seventh wealthiest economy (Gross Domestic Product – GDP – of US\$ 2,223 trillion in 2012). It is also the largest country in area and population in Latin America and has a strong domestic market. Therefore, analyzing the quality management status in organizations embedded in such an emerging economy makes sense to understand the following question: how has Brazilian companies used QM principles and techniques in order to improve their quality and productivity?

Pinto et al. (2006/ 2008) carried out a survey to identify the main aspects of QM programs in Brazilian companies. They discovered that: companies that implemented *Six Sigma Program* were those with strongest traditions in quality programs; the more a company invests in quality, the better their quality and financial performance indicators; and the main causes for failures in QM programs were weak support provided by the top management team and lack of financial resources. Yamada et al (2013) carried out a qualitative study in Brazilian companies and observed a predominance of barriers during the implementation of QM practices related to the *soft* elements, which are connected to human factors and management, such as bureaucracy, communication and leadership.

This article has a further contribution because it tries to answer the following questions: *What is the quality concept adopted by Brazilian companies? Which principles, practices, techniques and tools are more or less used? What are the main barriers for implementation? What are the degree of evolution and the maturity level of QM in Brazilian companies? What are the practical outcomes of this research for the Brazilian industry?*

2. Methodology

In order to achieve the proposed objective and answer the research questions, a survey was carried out in June and July, 2013. Databases with companies' contacts and LinkedIn® discussion groups were used to launch a web-based questionnaire developed in an Internet instrument (SurveyMonkey®). Due to the use of different databases and professional networks, there is a likelihood of overlapping contacts and the number of contacted people is not accurate. However, we estimate that approximately 10,000 professionals in Brazilian companies were given the possibility to answer our survey. After three phases of contacts, 125 professionals answered the questionnaire.

Most of the respondents (71%) are professionals who have management positions in their organizations and 65% belong to the production or quality functional areas. Most of the companies are private (92%) and manufacturers (73%). Half of the respondents work in large companies and 27% work for medium-sized companies (100 to 499 employees). Manufacturing strategies more commonly identified refer to a make-to-stock production system (40%) and they prioritize quality (35%) and low cost (27%) as competitive strategies.

Although the research sample is relatively small, we found evidence to consider that the sample does not present a strong bias, because the stratification of the respondents by federal states has a similar distribution when compared to GDP or ISO 9001 certificates per state. To increase the reliability of our findings, we defined that our sample refers to large Brazilian manufacturers (all sectors). Although large companies are less representative in quantity, they are responsible for about 80% of Brazilian GDP.

3. Results

Quality concept: 56% and 53% of the respondents strongly agree or agree that Brazilian companies understand quality as a *manufacturing-based* and *value-based* approach, respectively. *Transcendental* and *product-based* approaches are on an intermediate scale of “agreeing” or “not agreeing”. On the other hand, very few respondents (16%) agree that their companies have a *user-based* approach. Respondents also gave points (from 1 to 8) for each quality dimension. According to the respondents, *performance* is the most important dimension of quality (74% of the respondents attributed points between 5 and 8) for Brazilian companies. The whole classification follows as: *conformance* (71%), *reliability* (63%), and *perceived quality* (60%) are above the average; and *durability* (47%), *serviceability* (44%), *features* (31%), and *aesthetics* (28%) are under the average.

Utilization of QM principles, practices, techniques and tools: Each respondent was asked to classify 29 quality practices (including principles and techniques) in terms of utilization and importance on a 0 to 10 grading scale. The respondents as more than 5 points in terms of importance classified all practices. When asked about utilization, the respondents attributed points ranging from 2 to 8. The respondents were coherent in their answers because the more important a practice is according to their judgment, the more used it is. Table 2 presents some practices classified by the respondents according to their utilization and importance degree.

Table 2. Utilization and Importance of QM Practices (source: research data)

Utilization degree (ranking)			Grade	Importance degree (ranking)			Grade
1	Team work		7.7	1	Team work		9.4
2	Performance Measurement Systems*		7.5	2	Involvement of people**		9.3
3	Customer focus		7.3	3	Customer focus		9.2
...
11	Involvement of people**		6.8	10	Performance Measurement Systems*		8.8
...
27	Six Sigma		3.0	27	Six Sigma		6.7
28	Quality Function Deployment (QFD)		2.9	28	Quality Function Deployment (QFD)		6.2
29	Design of Experiments (DOE)		2.4	29	Design of Experiments (DOE)		5.7

Barriers for implementation: the most cited barriers faced by the respondents in order to implement QM programs and quality practices are *resistance to change* (78%) and *lack of perception about shared responsibility among all organizations areas* (68%). It can be observed that many of the barriers are related to *soft* aspects such as human factors and management.

Degree of evolution and maturity level: Most of the Brazilian companies are, according to the respondents (68%), between the initial and intermediate stage of maturity level (*uncertainty, awakening, enlightenment*). However this analysis is only a snapshot and it does not provide more information about trends, for example, if the companies are rising up through the maturity level. Trying to better understands trends or wishes, other questions were asked in order to diagnosis the situation of companies in relation to the quality management eras. While most of the respondents (35%) attest that their companies are still in the *inspection* era, 59% say that their companies should be in the *strategic management* era of quality evolution, i.e. the opposite extreme. Only 17% of respondents agree that

their companies are already in the *strategic quality management* era. Therefore, Brazilian companies (according to the research sample) are in the *inspection* era of quality and have an intermediate level of quality maturity.

4. Discussion and Conclusions

Initial conclusions of this research confirm Garvin's theory that different quality approaches coexist (in this case, *manufacturing-based*, *value-based*, *transcendental* and *product-based*). The coexistence of different approaches has important implications. It helps to explain, for example, the often-competing views of quality of professionals who work in different departments (e.g. marketing and manufacturing). It is important that the coexistence of competing perspectives become openly acknowledged. Progress requires the recognition that different groups use different approaches. Despite the potential for conflict, companies need to cultivate different perspectives to achieve high quality products (Garvin, 1984). According to Garvin (1984), a *manufacturing-based* approach for quality implies in focusing on *conformance* and *reliability* dimensions, which is coherent with the research results. On the other hand, a *user-based* approach would imply, according to Garvin, in focusing on *aesthetics* and *perceived quality* dimensions, partially coherent with the results as *perceived quality* dimension had a significant amount of points (4th position).

The Brazilian companies, according to this research, are at an intermediate level of quality maturity. This level can mean that companies are more disposed to “manage quality” considering activities of *inspection* and *control*. Therefore, improvement in this area can mean bringing the operation back to the standard, instead of improving the standard. The results show that many quality principles and techniques are used by companies, however, advanced improvement techniques that could support the companies in achieving better performance, are still poorly used and also considered as of slighter importance, such as: ANOVA, DOE, FMEA, QFD and Six Sigma.

Although, theoretically, Quality Management is a solid and disseminated concept and this field has been constantly developed over the last decades, many organizations still do not take advantage of its strategic benefits. Consequently, there is a huge opportunity for Brazilian companies to boost their quality and productivity levels. Future research from these findings could investigate how QM practices would be effectively used and help companies to achieve higher Quality Management maturity levels and strategic quality management.

Acknowledgements

The authors gratefully acknowledge the São Paulo Research Foundation (FAPESP) for supporting this research.

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