

Quality Management Maturity and Its Relationship with Human Resource Development Strategies in Manufacturing Industry

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Abstract

The relationship between quality management maturity and human resource development strategies in manufacturing industries provide the understanding how organizations shape their human resources to realize their quality goals. In this study, data were obtained from manufacturing companies with at least 3 years experience in quality management implementation. The result of hypothesis testing indicated that there is a positive relationship between quality maturity and human resource development strategies. Based on the results, it can be concluded that as an organization's maturity in quality management implementation increases, the human resource development strategies in the organization can be expected to become more comprehensive.

Keywords: *Quality maturity, Human resource management, Manufacturing companies*

1 Introduction

Quality management philosophy has evolved over the years as a result of growing complexity in products, services and key business processes. The adoption and implementation of total quality management approaches were intense during the 1980s and 1990s compared to the collective adoption prior to the periods (Soltani, 2005).

Quality management maturity in organizations can be assessed in terms of the extent the programs and implementation period. Mature organizations range of formal quality management programs are from seven to twenty years in which a three year period is considered as the cutoff point between young and mature (Sousa *et al.*, 2001). In addition, the maturity can also be measured by the perceived use of quality management programs with the assumption that if

quality is a culture in an organization, the programs should be widely implemented in various functional areas and employees are familiar with quality tools and techniques being used (Patti *et al.*, 2001, Li *et al.*, 2002 and Fok *et al.*, 2003).

An understanding on quality management maturity and its relationship with other functions in an organization such as human resource development will be able to provide valuable insights on the factors that set the mature organizations apart in the quality of their implementation. Little studies that focused on the human resource factor have been conducted to identify the relationship between quality management maturity and human resource development strategies in organization. Rao *et al.*, (1999) stressed that human resource development is

at the heart of all total quality management program. Organizations will be expected to differ in quality management maturity along several dimensions which include supportive cultures for employee empowerment as well as their performance (Fok *et al.*, 2003).

There is no study on total quality management maturity for the Malaysia context, though Malaysian companies have implemented TQM for considerable time. In Malaysia, the intensification of interest in quality management can be witnessed in the 1990s when literally every sector of its economy started to implement the quality management philosophy in business activities (Thiagaragan *et al.*, 2001). According to Lasserre and Probert (1994), quality sophistication and expectation in Malaysia are better than in other growing economies of Asia and it is grouped with Japan in some quality dimensions. In addition, total quality management has become part of business thinking and many companies in Malaysia have adopted this concept in some form.

This study will be able to identify the crucial factors in quality management implementation that should be stressed by an organization in order for it to progress towards a higher level of maturity. In addition, it will provide a guideline for manufacturing companies, specifically in Malaysia that seeks to enhance their human resource potentials through effective human resource development strategies so as to achieve superior business and quality performance.

2 Literature review

Organizations that implement quality management will be inspired to change, seek continuous learning and improvement (Moreno *et al.*, 2005). However, in order to ensure that quality management program can be implemented successfully, organization-wide thinking must be adjusted (Laszlo, 1999). In addition, the organization must provide necessary training in quality assurance method to the employees so that coupled with excellence in thinking, improvement in efficiency, product and service quality can be obtained.

2.1 Quality Management Maturity

The definitions of quality management maturity by Patti *et al.* (2001) and Fok *et al.* (2003) supported the argument that the maturity of quality management program cannot be assessed based on quantitative

aspects only; namely the number of years an organization has been on quality management program or the tools that it used. Having a certified quality management program does not guarantee that an organization will completely follow the conformance requirements and practices all aspects of the program. Establishing a quality management program is the easier part. However, getting all the elements in the program running according to the requirements is what truly matter; and most of the time is harder to accomplish. This differentiates the mature organization and those with lower or less quality management practices.

Mangelsdorf (1999) noted the growing influence of maturity model that is developed based on quality award criteria pioneered by the Malcolm Baldrige National Quality Award in the 1980s. According to Tan (2002), the Malcolm Baldrige National Quality Award, for example, has evolved from its emphasis of quality assurance to process management. It closely mirrors the evolution from quality assurance, to process quality, to quality management and to overall performance management in an organization's journey of quality management. In short, the need to improve from quality of products and services to the quality of entire organizational system have been recognized in order to achieve competitiveness and performance excellence. A lot of companies which are implementing quality management practically follow a prescribed system with the introduction of quality standards and quality awards such as those introduced by International Standardization Organization (ISO). Furthermore, according to Motwani (2001), there is a universal set of practices in quality management that if implemented, will lead to high performance.

Chung (2001) in his study concluded that the level of best practices attained among the productivity leaders were similar and the widest disparity among the high-maturity and low-maturity organizations were human resource development and management, quality and operational results and customer focus and satisfaction. Consequently, these areas were found to be the areas with high priority for improvement.

Organizations will be expected to differ in quality management maturity along several dimensions which include supportive cultures for employee empowerment as well as their performance (Fok *et al.* 2003). While organizations attempt in implementing total quality management have met with different outcomes, they emphasized the need to

investigate why organization experiences vary in quality programs. Fok *et al.* (2003) suggested that the adoption and implementation of quality management program can be measured through examining the perceived use of quality management programs. They found that the level of an organization's quality management maturity impacts individuals' understanding of quality management concepts and leads to increased job enrichment. It will also affect employees' assessment of the organization's culture and performance.

Li *et al.* (2002) used the instrument that has been developed by Patti *et al.* (2001) to measure quality management maturity. Both studies concluded that the perceived use of quality tools and programs are sufficient in understanding an organizations quality maturity.

According to Peters (1994), total quality improvement always involve some way of addressing the business in terms of its key processes, and at some stage, an orientation towards customer-friendly delivery systems. Kaye and Dyason (1995) found that the lack of integration between human resource management strategies and quality improvements or strategic goals hinders an organization progress from quality assurance to strategic quality management practices. In addition, the appraisal schemes and reward systems are not linked and coordinated with an organizational development plan. The organizations that have reached beyond strategic quality management implementation are able to demonstrate vertical and horizontal integration of continuous improvement activities into the whole organization and from top to bottom.

Based on the literature of quality management measurement instrument that has been reviewed, it is apparent that quality management implementation area constitute of a broad-range of constructs derived from organizational management practices that transcend the internal operations to include the external stakeholders such as customers, suppliers as well as community. However, there is a lack of consistency in quality management research area which is mainly contributed by the absence of standard and universally accepted measurement instruments (Zeitz *et al.*, 1997). In addition, the growing state of practice in quality management such as noted by Singh and Smith (2006) called for an instrument that reflects the current practice in the area.

The instrument developed by Patti *et al.* (2001) to measure quality management implementation differs significantly from the ones that have been developed by Ahire *et al.* (1996), Zeitz *et al.* (1997), Zhang *et al.* (2000) as well as Singh and Smith (2006). While all the latter researchers developed somewhat lengthy and in-depth instruments with over ten constructs, Patti *et al.* (2001) focused on the various quality programs and tools as a basis for implementation measurement resulted in fewer constructs of quality management. Ahire *et al.* (1996), Zhang *et al.* (2000) as well as Singh and Smith (2006) instruments were developed specifically for manufacturing industry, and can only be used for respondents of upper-level management. The need to develop an instrument for service as well as manufacturing industry that can be used at the non-management level, shop-floor level as well as by upper levels has been recognized by Zeitz *et al.* (1997) and Patti *et al.* (2001).

2.2 Human Resource Management

The success of a total quality management program is very much associated with the people involved. Employees regardless of their position are one of the most important success factors in the implementation of total quality management program (Rao *et al.*, 1999). Therefore, the human resource development strategies must be adapted in ways that enable it to support the goals of total quality management.

According to Hassan *et al.* (2006), the principle of human resource development assumes that employees must be nurtured and developed and they cannot be treated like commodities that can be hired and discarded as the organization wishes. An appropriate human resource development will be able to develop and realize the full potential of employees and will be helpful in establishing an environment that is conducive to full participation, personal and organizational growth (Rao *et al.*, 1999). Therefore, sound human resource policies that concentrate on developing necessary motivation, attitudes and competencies must be established to ensure successful implementation of total quality management.

According to Laszlo (1999), organization can benefit from the quality management through the synergy of various people working together toward a common goal. In addition, an organization's ability to exploit the diversity of its employees in a way that enable them to compliment each other's strength will

indicate the maturity level of its quality management program. Among the general aspects that are important for the successful implementation of quality management is teamwork and mutual respect. A desire for improvement and the willingness of people to accept changes is an essential prerequisite for implementing quality management and it must go beyond the focus of doing things right; but must look for ways of doing things better. Therefore, the essence of quality management practices is culture change in order for it to be successful.

However, Zeitz *et al.* (1997) argued that even though culture and total quality management often overlap in practice, culture is distinct from total quality management programs and practices. They viewed total quality management practices as formal, programmatic and behavioral; whereas culture as attitudes, firmly held beliefs and situational and often not formally sanctioned interactions. Therefore, there is no clearly defined boundary between total quality management as a management program and it is as an organizational culture (Zeitz *et al.*, 1997). One clear operational distinction between the two is that cultural dimensions can be readily recognized without a total quality management present.

Organizations are beginning to realize the importance of developing their employees in ensuring successful implementation of total quality management programs. Among the essential elements in total quality management implementation is training and development since higher level of skills are required as a result of increased involvement in teams and quality improvement activities (Yong and Wilkinson, 2001). According to Rao *et al.* (1999), the important practices in the human resource dimension are training, providing resources for training, employee involvement and empowerment, building quality awareness and employee recognition for quality. They emphasized that organizations must create an environment that is conducive to full participation, personal and organizational growth through the dimension mentioned. Several issues related to human resource development have been investigated by Rao *et al.* (1999) including human resource management, employee involvement, quality education and training, employee recognition and performance as well as employee well-being and morale in three new industrialized countries namely China, Mexico and India. The researchers found that the best commonly followed human resource development practices in the countries were training in specific work skills and building quality

awareness. In addition, all countries also gave a high priority to the availability of resources for employee training. However, training in basic and advanced statistical tools and techniques as well as employee involvement and participation were found to be weak in all of the countries.

Meanwhile, Yong and Wilkinson (2001) indicated that quality awareness and job skills training were the most commonly used forms of quality management training among Singapore companies. Training in group problem solving as well as decision making skills which include the quality circle training, and team-building training are essential in order to facilitate teamwork. According to them, on job training is also important in upgrading employees' skills because it facilitates job rotation and able to develop multi-functional workers. The adoption of various trainings to develop employees indicate the importance of employee involvement to increase organizational performance in productivity and product quality (Yong and Wilkinson, 2001). Furthermore, it will also contribute to the improvement in employees' quality of work life which will eventually act as a motivation for them. They found that the most popular employee involvement mechanism in the total quality management process were cross-functional problem teams, quality control circles and staff suggestion

According to Lau and Idris (2001), the most important management resource in organizations is the people and attributed as the soft elements of total quality management implementation critical success factors. They conducted a study among Malaysia manufacturing companies on the effects of the soft elements, which among others include culture, trust, teamwork, education and training, top management leadership for quality and continuous improvement and employee involvement on the total quality management tangible effects such as growth, productivity and human resource development. It concluded that there were relationship between the identified soft elements and the tangible effects. Ooi *et al.* (2007) conducted a study on the impact of total quality management soft elements on employees' job satisfaction in a Malaysian outsourced semiconductor assembly and testing (OSAT) organization. The findings of the studies revealed that organizational trust, organizational culture and customer focus are positively associated with employees' job satisfaction. However, organizational culture and trust were significantly associated with improvement in job satisfaction. Most importantly, the findings

suggested that management must review their total quality management programs while taking into considerations of the training need of the employees within the organization. This is to ensure that higher level of employees' performance and commitment can be developed.

An understanding of organization maturity in quality management practices is important in order for its relationship with other systems in the organization such as the human resource management can be understood. As noted, increasing quality maturity will be able to lead to changes in the content of jobs and specifically to higher level of job enrichment. In addition, with increased maturity, workers see organizations as changing in intuitively expected directions. Therefore, as quality management increases, so do the perception that culture in an organization to be more dynamic and collegial. Furthermore, job design will reflect greater enrichment and empowerment and organization is performing better.

3 Methodology

Initially, based on the literature review, the constructs for quality management maturity and human resource development strategies were identified as shown in figure 1.



Figure 1: Quality Management Maturity and Human Resource Development Strategies Constructs

Patti *et al.* (2001) noted that the usage of quality programs factor can be used when a snapshot view of an organization maturity in quality management implementation needs to be obtained without having to conduct an in-depth analysis of all the programs factors such as leadership commitment, suppliers management and other constructs of quality management proposed by various author as previously discussed. The usage construct therefore, can be used as a quick and simple way to gain insight into an organization's level of quality maturity. Nevertheless, all quality management constructs were used in this study since every factor in quality management implementation needs to be considered in order to truly understand its relationship with human resource development strategies and to determine which construct contributed to the human resource development strategies being used the most.

A questionnaire based on the constructs was designed. Based on Standards and Industrial research Institute of Malaysia (SIRIM) quality assurance database, companies were selected at random and only thirteen companies were willing to participate in this study. All questions in the instrument used a 5-point likert scale and the questionnaires were mailed to respondents that constitute the quality manager and human resource manager for each manufacturing company. The companies that participated in the study consist of 3 each from the electrical/ electronic engineering, metal/mechanical engineering and the plastics/rubber company. Another 4 came from the chemical/oil company. Most of the companies (10) had more than 150 full time employees and 11 companies have implemented TQM more than 10 years, Data were analyzed statistically using descriptive and inferential statistics.

The hypothesis in table 1 was tested to identify the relationship between TQM maturity and human resource management. Regression analysis will be conducted if it was found that there is positive relationship between quality maturity and human resource development.

Table 1: Hypothesis

<p>H₀: There is no relationship between quality management maturity and human resource development strategies.</p> <p>H_a: There is a relationship between quality management maturity and human resource development strategies</p>

4 Results and Discussion

4.1 Results

The hypothesis was tested using Pearson correlation to determine the relationship between quality management maturity and human resource development strategies. An organization's maturity in quality management implementation can also be explained by the extent of use of quality programs as tested by Patti *et al.* (2001), Li *et al.* (2002) and Fok *et al.* (2003). The instruments used in this study also utilized the usage of quality programs construct developed by Patti *et al.* (2001). Therefore, the usage factors were also used to determine the relationship between quality management maturity and human resource development strategies.

Based on the correlation analysis, it was found that quality management maturity and human resource development strategies have a positive and statistically significant relationship as shown in Table 2. Therefore, the H_0 can be rejected in which there is a relationship between quality management maturity and human resource development strategies. It is interesting to note that there is a positive and statistically significant relationship between usage of quality programs and quality management maturity. It indicates that the use of quality programs in an organization will also determine the maturity level of quality implementation in the organization. The result is consistent with other research (Patti *et al.*, 2001, Li *et al.* (2002) and Fok *et al.*, 2003).

Table 2: Correlation Result Between Quality Maturity And Human Resource Development Strategy

	Usage of Quality Programs	QM Maturity	HRD Strategies
Usage of Quality Programs	1	0.640(*)	0.205
QM Maturity	0.640(*)	1	0.752(8*)
HRD Strategies	0.205	0.752(8*)	1

** Correlation is significant at the 0.01 level (2-tailed).

Given that the relationships are positive, it can be assumed that when quality management implementation increases in its maturity, the human resource development strategies will be more

comprehensive in which the job design is enriched in such a way that promotes greater employees involvement and empowerment as noted by Rao *et al.* (1999), Yong and Wilkinson (2001) as well as Lau and Idris (2001). In addition, the employees' job motivation may also be increased through attractive reward and appraisal system as well as training programs to enhance their skills. This assumption is supported by the results of correlation analysis between human resource development strategies' construct and quality maturity. The analysis indicated that there is a strong and statistically significant correlation between quality management maturity and employee involvement (0.800**), training (0.604*) and empowerment (0.698**).

The ANOVA result also showed that there was a significant difference in the usage of quality management programs between industrial sub-sectors – electrical and electronic, chemical and oil/gas, metal and mechanical engineering as well as plastic and rubber. This can associated with the number of years the companies in each sub-sector have been implementing total quality management, its nature of work as well as the companies' size.

The regression analysis was done since there was strong relationship between the quality maturity and human resource development strategies. Based on the results of regression analysis 56.6% of the variance in human resource development strategies can be explained by the quality management maturity. The manufacturing companies' quality management maturity also significantly influenced their human resource strategies. Several constructs of quality management implementation namely usage of quality programs, customer focus, supplier quality management, information and communication system as well as process control and improvement were found to influence most of the variation in human resource development strategies in manufacturing companies.

The regression analysis between all constructs of human resource development strategies and quality management maturity indicated that 72.3% of the variation found in quality management maturity can be explained by the constructs. However, the beta weight for all dimensions is not statistically significant which indicates that none of the constructs influences the variance most. Therefore, it can be assumed that an organization's maturity level in quality management implementation can influence the comprehensiveness of its human resource development strategies. However, while human

resource development strategies need to be responsive to the quality management requirements, it does not necessarily determine the maturity of the quality management implementation. This finding however, does not imply that human resource development is not one of the determinants of the success of quality management implementation.

According to Silvestro (1997), a profile of the extent of quality implementation within a company can also be generated by averaging the scores allocated to all the quality management constructs for each company and representing the results on a polar diagram. The diagram enables for visual comparison to be made on the extent of implementation of each quality management constructs across the companies. The data for all human resource development strategies were also transformed into polar diagrams.

The polar diagram showing the extent of quality management implementation of the thirteen manufacturing companies as illustrated in Figure 2 indicates that the implementation's extensiveness was at relatively different levels for each company in the manufacturing sample. Company B shows the most extensive implementation for most of the quality constructs and consequently was more satisfied with their implementation. It is indeed a very successful ISO 9001 certified manufacturing company with over RM20 million turnovers and more than 150 employees. In addition, it has implemented quality management system for more than 10 years and received the Pahang Chief Minister Quality Award as well as Malaysia Productivity Corporation's National Productivity Award.

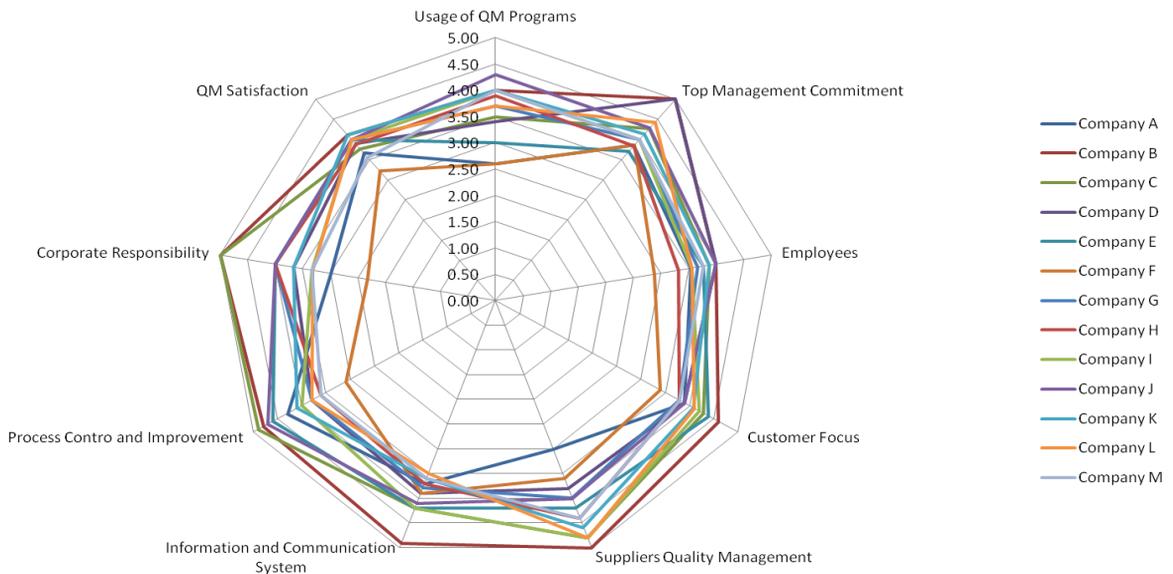


Figure 2: Polar diagram for Quality Maturity Construct in 13 companies

Company F which showed the most imbalanced and least extensive implementation of quality management program has been implementing the program for not more than 9 years. Based on its profile, it is clear that the company has achieved an acceptable level of quality management maturity with the average implementation for each quality constructs between 2.5 and 4. According to Peters (1994), the companies in which quality implementation is at the level, usually try to improve its efficiencies within and between processes or

departments before attempting any process redesign or reengineering. This is evident in the Company F profile of process control and improvement, the company perceived that its control on processes to be average and improvements may be hard to achieve without proper control of the process.

The human resource development strategies profiles of all respondents for manufacturing companies sample is shown in Figure 3. All companies showed balanced implementation strategies across the five

dimensions of human resource development. Company B which has the most extensive and balanced quality management implementation showed that it has a comprehensive human resource development strategies. Surprisingly, Company F with the least extensive quality implementation showed somewhat strong human resource development strategies. Company A in the mean time, which has a relatively better quality

management implementation compared to company F, is the company with the least comprehensive strategies in most of the human resource development constructs namely in employees empowerment and involvement programs as well as appraisal and reward system. That explains why the employees' behavior score of the company was the lowest since employees were most probably not motivated to perform their work.

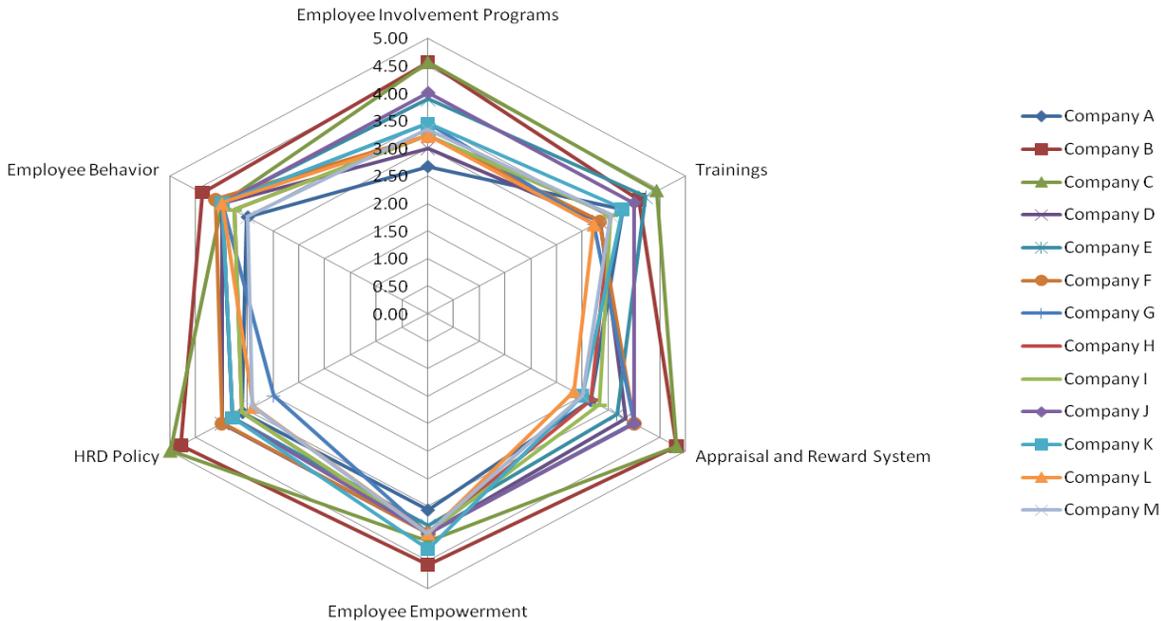


Figure 3: Polar Diagram for Human Development Constructs

4.2 Discussion

Hypothesis testing provides the information that is needed to understand the relationship between two variables in this study which are quality management maturity and human resource development strategies. Pearson correlation analysis has been used to test the hypothesis to determine whether a relationship exist between these two variables. The results of the analysis proved that there is a positive and statistically significant correlation between quality management maturity and human resource development strategies. Therefore, H_0 have to be rejected. The finding is consistent with the socio-technical system theory which predicts that changes in one or more systems in an organization will consequently resulted in changes throughout the organization.

A positive correlation between the two variables indicates that the extent of quality management implementation will have an influence on the human resource development strategies positively. It means, when an organization implemented its quality management programs more thoroughly throughout the organization, the human resource development strategies were expected to respond to the needs of such extensive implementation by providing the necessary programs to increase employees' readiness and awareness to accept the changes that normally occur in continuous improvement process of quality management practices. The findings of the study corresponded well with the findings of Rao *et al.* (1999), Yong and Wilkinson (2001) as well as Lau and Idris (2001) in their studies.

There were two items of quality management maturity used to test relationship between quality management maturity and human resource development strategies. The first item was the usage of quality management programs constructs proposed by Patti *et al.* (2001) that can be used to provide the snapshot of quality management program implementation in a company and the second item was the computed value of all quality management constructs obtained through literature review. However, the use of quality management programs item was found to be not statistically significant with overall value of human resource development strategies; the computed item showed a significant correlation.

While Patti *et al.* (2001), Li *et al.* (2002) and Fok *et al.* (2003) found the usage of quality programs can be used to determine an organization's overall implementation of quality management and its relationship with other factors such as performance, the correlation coefficients obtained in this study also showed likewise. The correlation analysis indicated that as the usage of quality management programs in an organization increases, its maturity level will also increase. There was also a positive and statistically significant relationship between use of quality management programs with organizational performance as well as employee involvement programs. The findings were also in line with the correlations found between quality management implementation relationships with the two constructs.

Laszlo (1999) noted that a positive working and organizational culture is crucial for a quality management system to be successful. When an organization able to nurture a culture that promotes the positive values such as trust, improved teamwork and respect, it will eventually affect the acceptance of changes that often occurs within a quality organization and will enable for quality management programs to be implemented more thoroughly and accepted by every level in the organization. Through the correlation analysis conducted to identify the relationship between quality management implementation and its constructs including culture, it was found that quality management programs will be implemented in a more high-quality manner as factors such as culture were to be more dynamic, receptive and organic. Increased top management commitment, employees' participation, empowerment, efficient knowledge management, availability of appropriate trainings, and other factors were found to be significantly contributed to the

increase in an organization's quality management maturity.

It is in the great interest of this study to try to place an organization being studied in a level of maturity in quality management implementation. However, the closest attempt at trying to determine their maturity level can only be done by examining the average score of their implementation for both variables through graphical presentation of the polar diagram. The polar diagrams were then compared to the 5-point scale used in the research instruments that were perceived to be able to represent the five levels of quality maturity proposed by Peters (1994) as well as Kaye and Dyason (1995).

The polar diagram analysis showed that the company that has most extensive quality management implementation is the most mature quality organization among the samples studied. In addition, it also has the most balanced and comprehensive human resource development strategies. Even though the company which the least extensive quality management implementation showed somewhat comprehensive human resource development strategies with average score for most constructs were more than 4, their maturity level in quality management was not too far behind the other companies. Its implementation of quality programs may be more concentrated on intra-process and inter-process improvements. Most of the companies which are able to control and improve their processes will progress towards a more mature level of total quality management; changes to work process are evident in preventive approach to errors instead of reactive and quality policy is integrated into business plan as well as linked to critical success factors. Organization-wide commitment and improvements are crucial in such organization as noted by Kaye and Dyason (1995).

5 Conclusion

The findings of this study showed that there is a statistically significant positive relationship between quality management maturity and human resource development strategies in manufacturing industry; thus resulted in the rejection of H_0 . The correlation coefficient, r for manufacturing companies sample is 0.752 which indicated that 56.6% of the variation found in human resource development strategies can be explained by quality management maturity. In addition, the usage of quality programs was found to have a positive relationship with quality management

maturity. It suggested that, as an organization usage of specialized quality tools and programs increases, the organization will become more mature in its quality management implementation.

The use of polar diagrams enable for the extensiveness of quality management implementation and human resource development strategies to be visualized to show the difference between each company. Based on the findings, it is apparent that one of the factors that set the mature quality organizations apart from the companies with lower extensiveness of quality management implementation is human resource development strategies. The employees of mature organizations are more involved in the organizations' activities and processes as well as empowered to improve their work through greater decentralization of control. The employees therefore, are being trusted by the organizations to make changes in their work and consequently affect performance and business results. The mature quality organizations are also more appreciative of their employees by providing an effective appraisal and reward system as well as necessary training programs to increase their motivation and enhance their skills. Therefore, an organization that wants to progress to higher level of maturity in quality management must observe and imitate the best practice of more mature organizations.

While an organization's level of quality maturity may determine the strategies used in human resource development, however, it is also possible that the strategies were already in place before formal quality management programs were introduced in the organization. It can be seen in the overlapping factors or constructs between quality management and human resource development strategies such as employee involvement, top management commitment and trainings. However, the results of regression analysis indicated that none of the human resource development constructs were able to significantly influence the variation found in quality management maturity. It is possible to assume that while quality management maturity can determine the comprehensiveness of the strategies used in human resource development, the strategies however does not necessarily will influence the maturity level of quality management implementation.

For future studies, a larger sample size and a longitudinal study need to be done to observe the relationship between quality management and human resource development strategies. A study on the

extent of a program implementation, employees' involvement, empowerment and behavior may be biased when done in a cross-sectional manner. A longitudinal study enable for the cause-and-effect relationships that exist in the dimensions of each variable's constructs in this study can be identified. Therefore, as an organization progresses in its quality management implementation, the impact of the progress and its relationship with other functions in a system can be observed to assess any improvement in the programs and the related functions of the organization's system. Even though longitudinal study is time consuming and expensive, it offers some good insights on what is really happening in the organization and factors being observed (Sekaran, 2003).

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