Tqm could define as a philosophy management essay

Business, Management

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Abstract

The main objective of the literature review is to show the impact of implementing the total quality management approaches on the organization productivity. Total quality management (TQM) could define as a philosophy which aims to develop a continuous improvement and a better overall performance. When we mentioned the TQM, we have to mention Edward Deming (1900-1994) - as a father of the quality management (Fulop & Rosier, Geore1, 1995). Deming argued that employees were just responsible for less than 15 % of the production mistakes and the rest was due to the bad management. Accordingly, he puts fourteen points each one of them like a strategic plan for the top managers in order to improve the overall organization performance, product quality and increase the customer satisfaction (cite). When the company applying the TQM approaches, the organization's culture and strategic plans should be enhanced and improved as well as the employee's attitude towards the quality culture in order to apply a successful TQM practices like leadership and commitment, customer focus, continuous improvement, get things right first time, just in time and benchmarking. The organization productivity is one of the internal indicators which measures the organizational performance and developing in the business. The implementation of the TQM successful practices has a direct

and indirect impact on the organization productivity which affects the overall business performance. In spite of applying the TQM approaches adding more cost on the company budget, the final results by improving products quality and productivity, increasing customers' satisfaction and the market share will be returned back positively in the company revenue growth and the profitability. List of FiguresList of TablesList of Acronyms

Acronyms

Definition

TQMTotal Quality ManagementJITJust in TimeDMAICdefine, measure, analyze, improve and controlTable of Contents

Chapter 1. Introduction

This research study the impact of implementing the total quality management approaches as an independent variable on the organization productivity as a dependent variable.

Problem Statement.

To what extent the impact of implementing the total quality management approaches on the organization productivity. As a traditional concept, there is a revers relationship between productivity and quality. If the quality is increases to meet the customer satisfaction, the productivity will decrease due to much more process and procedures to achieve the required quality which means increasing in unit price and decreasing in market share. This literature review is investigating the relationship between the

implementation of the Total Quality Management approaches and practices and from the other side the organisation productivity.

Importance of the study.

As a fact, the implementation of the TQM practices increasing the company total budget which may be considered as a negative effect on the company profitability. Accordingly; in this research we investigate the impact of implementing the TQM approaches, and the effectiveness on the organization productivity and if it will results positively or negatively on the final company profitability as well as investigate the traditional concept of the negative relationship between quality and productivity of the product and services.

Research Questions.

What the meaning of the total quality managements? How we could apply the TQM concepts? What is the meaning of the organization productivity? How we could improve the organization productivity? To what extent the implement of the TQM approaches and practices affect the organization productivity? What is the impact of applying the Six Sigma as one of the TQM approaches on the organization productivity?

Chapter 2. The Total Quality Management

The Total Quality management philosophy.

The Total Quality Management (TQM) could define as a business philosophy which initiated and developed to meet customers' satisfaction. In the last 50 years, The TQM approaches and practices was applied in most international

companies across the world. By how the TQM as a management philosophy was perceived, it had different impact on the organization’s cultures, quality, productivity, profitability, innovation, and customer satisfaction (Emison, 2004).

Historical review.

Early 1950 Edwards Deming (1900-1994) – one of the total quality management fathers’- declared his hypothesis that the quality and productivity are incompatible. Deming was an American statistician and worked in the industrial field so he struggled to convince the American industrialists to apply his assumption and improve their product quality. As it was the production era and the prevalent philosophy in that period is management by production, Deming’s ideas were ignored (halachmi & G. Bouckaert, 1995). In the other side of the world; in Japan, they perceived Deming ideas with different outlook. Japan economy was in critical position as the Second World War had destroyed all the country’s infrastructure. No body today could imagine that in those days when you found any product stamped with " Made in Japan" it was means a very bad quality and Japan was not considered as one of the manufacturing countries. Thanks to Deming who made the transformation in the Japanese industries after applying his management philosophy by improving step by step their product’s quality and increase the productivity till makes japan one of the big industries countries. In the American industry crisis, Deming said it is a management fault as they concerned in the short term profit and ignoring the new innovations, improving quality, and achieve the customer

satisfaction. According to Deming philosophy, employees are responsible for less than 15% of the production faults and the other 85% because of the bad management (halachmi & G. Bouckaert, 1995). Deming also summarized his ideas in fourteen points for management as per (Figure 1.)Figure . Deming's fourteen points for management (halachmi & G. Bouckaert, 1995)Each one of that fourteen Deming's ideas was developed to be approach, strategy, and common practice which implementing in most international company across the world.

TQM approaches and practices.

The main objective of this section is to review the concepts and implementation of TQM approaches and practices. The most important thing in understanding TQM concepts is to know TQM philosophy and how to apply. Applying TQM means it have to be a part of the organization's culture as everyone and everything through all employees' levels and a cross all the organization functions should be subjected to that system. TQM focused on the long term business performance so it concerned in all the organization's influences inside and outside. TQM concern in teamwork, leadership, employees involved, recognition and reward, continuous quality improvement, customer satisfaction, and competitive benchmarking (Yusuf, Gunasekaran, & Dan, 2007).

Organization culture.

The organization culture as a mind-set controlled all the organization's strategies and implementations. TQM practices are implemented in organizations could be limited by the organization culture based on the

organization orientation strategy. As per an imperial research which focused on the relation between the TQM implementation and the organizational culture in one of the construction company in Singapore, the researcher reach to the following conclusion:" a balanced and strong organizational culture facilitates TQM implementation with its simultaneous internal/external and flexible/controlled orientations". And they added two recommendations as followings:"(1) Modification of organizational culture in response to the diagnosis on the weak cultural aspects that require fortification.(2) Adaptation of TQM practices to better suit the prevailing organizational culture so that quick results can be attained." (Yong & Low Sui Pheng, 2008).

Teamwork.

According to Mabey & Salaman (1995), teamwork is one of the most important approach in TQM implementation which is widely used and growing in most companies all over the world. Teamwork could be a proper tool to solve day to day work problem as product quality, performance, cost, delivery of product and services. A successful practice could be happened when the organization depend on the teamwork for managing conflicts, changes, implementing plans, and solving problems this build the sense of sharing and involvement inside each organization’s members which improve the communication and trust and developing interdependence (Yusuf, Gunasekaran, & Dan, 2007). The organization should build a quality environment, developed a team approach, motivating people, and coaching them to share knowledge, and any new and innovative ideas which leads to

accept and feel responsibility. Continuous improvement teamwork requires continuous communication, cooperative, and contribution between all the team members. This is what is called ‘ synergetic partnership’ (Tjosvold & Choy Wong, 1994). The two major components acting in the quality improvement team are content and process. By other works the designed quality plans which contents tasks and procedures in order to achieve the objectives. The quality team is not a separate people, it is a team created from the same people who involved in production and operation system. They held meetings in regular basis to discuss how to improve their works quality, productivity, reducing costs, and share any other ideas which return on the benefit of the organization. This influence in people motivation as they deciding the action plan which they have to apply by themselves (Kanji & Asher, Mike, 1993).

Customer focus.

Complying with customer’s delight is the essential thing for success in today’s business. Organisations that understand what customers really want and provide a product or service to meet these requirements could get step further in competitive advantage and profit. As a practice for an organisation to achieve this objective, TQM approaches provide an organisation continually examine its quality system to see if it is meets the change in customer requirements or not (Yusuf, Gunasekaran, & Dan, 2007). According to the TQM approaches and practices implementation the word ‘ customer’ doesn’t mean only the end user of the organization’s product and services only, but also all stake holders in the quality chains which includes the

internal organization members and also the external organization suppliers. Everybody in the organization is a part of the customer satisfaction target even if he don’t had a direct contact with the customer but he should consider his colleagues as his customer and meets their requirements in order to let them to meets the final customer or the end user delight. From the other hand the organization external suppliers is also a part of the organization quality chain and they must apply the organization’s quality plan which design and oriented according to the end user requirements. The organisation must see and understand the relevance of every job to the whole chain. Under this notion, a coordination of the whole organisation can be guaranteed, and all effort will at last contribute to improved external customer satisfaction (Filippini, Forza, C., & Vinelli, A., 1998). The organization should establish a customer’s satisfaction measuring mechanism in order to monitoring any change in the costumer taste or requirements. The regular reports and feed backs should be raised to the organization management in order to adapt the production process, the implementing strategies, and the internal procedures accordingly. This is for keeping the organization in continuous improvement and had the customer sense. Many methods could be applied such as market research, enquiring sales staff, and competitors benchmarking can be used to collect information (Tjosvold & Choy Wong, 1994).

Continuous improvement.

You could realized how the continuous improvement as a core of TQM is important, when you study the example of Japanese companies after the

Second World War and how they shifted and the transformed by applying the continuous improvement approaches. This principle focused on the long-term learning and knowledge accumulation which never-ending . Opportunities to develop better methods for carrying out work always exist, and a commitment to continuous improvement ensures that people will never stop learning about the work they do (Juran, 1969, Deming, 1986, Ishikawa, 1985) (Yusuf, Gunasekaran, & Dan, 2007). Dean & Bowen (1994) identified a number of techniques that are used in organizations implementing total quality initiatives, including flowcharts, pareto analyses, statistical process control, and fishbone diagrams. The continuous improvements application could be depending on to how extend the organization’s leader believes in it. From a leadership point of view, it will be easier to apply the continuous improvements system, when the managers and leaders hold the same values and he insist to transfer those values in action plans and emphasize to apply it. The results will be much more positive as they are more open minded to any new ideas, experiments, and innovations to create a means of obtaining improvement. The effectiveness of quality leaders will vary as a direct function of the degree to which they effectively communicate the importance of continuous improvement of both processes and outcomes to the members of their unit (Yusuf, Gunasekaran, & Dan, 2007). The most important thing in order to keep the continuous improvement approach working in organisations is the measurement system for quality and performance. The existing traditional performance measurement systems and performance measures and developed from costing and accounting systems, are considered as not very well suited to

the TQM environment. Because it have a lack of flexibility, lack of strategic focus, not covering performances relative to the competitive capabilities, not encouraging continuous improvement. Organisations need to implement TQM therefore face a necessity of finding changes in performance measurement so that the measures they use will, among others, include hard and soft measures and reflect both management and employee perspective (Kumar, Kumar, Vinod., de Grosbois, Danuta., & Choisne, Franck., 2009). Jonsson and Lesshammar (1999) identified the following characteristics of a performance measurement system consistent with the continuous improvement philosophy of TQM:"- The measurement system translates the corporate and business strategies to all levels of the organisation. The measurement system integrates all functions, activities and processes along the supply chain. The measurement system makes productivity control and comparison between internal function possible. The system interacts with customers and measures the level of customer satisfaction. The measurement system not only works as passive control, but is instead used for continuous improvement. The measurement system is simple and dynamic, since several dimensions are to be included and since the circumstances for measurement are fast changing" (Kumar, Kumar, Vinod., de Grosbois, Danuta., & Choisne, Franck., 2009).

Leadership and commitment.

One of the most important approaches in TQM implementation is the leadership. According to (Gilbert, 1992) leadership is the quality in a person that led the others to follow. (Oakland, 1995) argued that started of TQM

implementation must started from the organization top management. In a TQM implementation, effective leadership should develop a clear mission statement and then build up strategies to support the mission. The top management needs to identify the critical success factors and to review the management structure. The leadership must ensure that the principles of quality management are implemented correctly and in a continuous basis. Moreover, contribution by senior management is not enough. They have to be totally engaged in TQM which supported by senior managers and that they are serious about quality as a part of their believes and the organisation culture. So another important thing is encouraging effective employee to participate in the TQM. Employees are the people who do things right and leadership are the people who do right things (Puffer & McCarthy, Daniel J., 1996). Many quality experts believe that the key to successful management of quality begins at the top of the organization. But according to (Waldman, 1993), senior managers are responsible for applying the organization system and monitoring to what extend the product and services meets the original designed strategies and objectives. So the quality improvement process must begin with the both top and mid management values and commitment to total quality system which reflected on the end product and services. (Lakshman, 2006) Added that the success of middle and lower level leader will reflect in the organization culture and how smooth and systematic the organization applied the TQM approaches and implementation across all function and process as design, applying, measuring, monitoring, and feedback. Accordingly, leadership can be seen as that combination of

believes, values, attitudes, and behaviours that result in the effective long-term performance of organizations.

Get things right first time.

The different between reactive (waiting for something to happen) and proactive (doing something before anything happens) is the same different between TQM and the traditional quality control in supervision and inspection (Gaither, 2002). It means that everyone must engage and energize to try to get things right first time to reduce inspection and waste. This spirit is also called ‘ zero defects’. Bank (1992) argue that ‘ right first time’ or ‘ zero defects’ is the result of high concern in applying the approach by getting things right first time and prevent and mistakes, in addition to add more effort in measurement, process controls and the data-driven elimination of waste and error (Yusuf, Gunasekaran, & Dan, 2007). Right first time have to become in people mind set and perceived as a performance standard. It has changed the fixed and traditional ideas like failure is normal in normal work practices. In order to fulfil high organisation’s performance effectiveness and efficiency, management has establishing and disciplined to reduce errors and mistakes in the normal and routine work cycle. It requires that the process should be continually reviewed and improved. It also required heavily communication, staff discussion, and problem-solving. Right first time is one of the management methods of TQM that gives a way of setting targets and recognising the success of teams that meet them, so encouraging future efforts (Larson & Kerr, Stephen G, 2007).

Just in time (JIT).

JIT is an approach that aims to satisfy customers by delivering or producing the right product at the right time and in the right place without waste (Haag et al., 1998). As one of the ‘ hard’ approaches of the TQM process, JIT will not work well without TQM in operation. JIT technology improves speed and the overall productivity, eliminating the waiting time of workers and officers, and identifying their responsibility; hence, reducing the stock of inventory between stages and cutting down work-in-progress. As a result of lower inventory, shorter processing and lead times are also achieved. From a total quality point of view, JIT uses the minimum amount of resources including materials, people, and facilities, responds immediately on demand, to meet customer’s requirements exactly (Drummond, 1992). Moreover, through a JIT program, an organisation can get the process right before production. The probability of defects is reduced (Eker & Pala, Fikri., 2008). When implementing JIT, Oakland (1989) suggested a two stage process: Establish foundations. Introduce core techniques. Establishing foundations means the company must be designed, organised, and managed to achieve quality, low cost, minimum lead times and high flexibility. It requires that JIT is operated in a planned and coordinated approach such that the organisation has a company-wide JIT environment (Wilkinson, 1998). This is similar to the implementation of TQM. The second stage involves introducing some core techniques including visibility, JIT purchasing, multi-function workforce and enforced improvement. When using these techniques, an organisation must understand a basic principle that the JIT system requires reorganisation, which is sometimes termed a guerrilla method of production (Cullen &

Holligum, 1987). The aim is to respond easily to changes and meet customer requirements. Furthermore, an emphasis in JIT implementation is the involvement of all employees, especially those who directly face changes. JIT needs a staff who understands a variety of functions according to process demands (Lau, 2000).

Employee involvement.

The TQM implementation should be involving all employees in decision-making, problem-solving, and the financial success of the firm. That is, TQM joint all levels of people to become more closely related to the organisation's goals and objectives (Collard, 1989). The basic concept is that everyone is responsible for producing quality goods and services, meeting customer requirements, and achieving a company TQM strategy. Everyone is in control of their work and is able to participate in the business of the organisation. Involvement means to empower employees, give them information, increase their knowledge and reward quality performance (Oliver, 1998). Empowerment usually requires a change in the organisation's infrastructure which means giving up authority by senior management. This principle demands the whole organisation apply the quality plan and every part has its own contribution. It also requires employee involvement to continuously improve quality and increase productivity. The philosophy has been implied not only in all stages but also in almost every aspect of TQM, such as commitment, meeting customer requirements, and Just-in-time (Emison, 2004). As a part from asking every member of staff to participate in the quality process, an organisation should also pay attention to shared

responsibility. Individuals and groups have common objectives but different tasks. So they must do their own work well and understand the work of others to make sure the whole process operates effectively (Yusuf, Gunasekaran, & Dan, 2007).

Recognition and reward.

Recognition and reward are effective motivators, performance and employee satisfaction. They are the factor of positive reinforcement for the people who know they are valuable members of the organisation. People will aim to win them, not only for themselves but also for their team. Recognition and reward are acknowledged and promoted for goal-related activities. Recognition should be provided for the correct effort and results, for teams and individuals, for suggestions and achievements. But this does not always mean money. It should generate the employees' feeling of being appreciated, being approved, and having peer recognition. Reward can be given in many forms, times and places but must be deserved. It should be appropriate to the situation by being rank-ordered – the higher the achievement, the higher the reward (Besterfield, 1995). It also need be properly presented so that fellow employees can know about it and understand it. An organisation must use recognition and reward not to force people do things excellently but to encourage them to do so (Allen & Kilmann, Ralph H., 2001).

Competitive benchmarking.

Benchmarking, one of the most important approaches to TQM, is widely used by many companies to help them become better in their market. The

concept of Benchmarking is defined by the Society of Management Accountants of Canada as: ‘ A systematic and continuous measurement process; a process of continuously comparing and measuring an organisation’s business processes against business leaders anywhere in the world to gain information which will help the organisation take action to improve its performance’ (Parker & Harrison, 1995). The purpose of benchmarking is to provide a target for improving the performance of the organisation in order to achieve superiority in the market place (Canada, 93). Apart from benchmarking with the leaders in the industry, the company also needs to benchmark with its competitors’ performance. The aim is to discover best practices and adopt them in the company to achieve competitive advantages. According to Bank (1992), the competitive benchmarking process has five steps: Decide what is going to be benchmarked. This may cover all departments and products in the organization as well as customers. Select the competitors who are the best in terms of the aspects that one’s company wants to measure. Decide on the most appropriate measurements that will be used and develop a strategy for collecting data. Determine a competitor’s strengths and assess those strengths against one’s own performance. Develop an action plan. In the process, people must have the determination to learn from others because benchmarking involves finding gaps, problem solving, and continuous change. The link between benchmarking and TQM is improving performance based on industry best practice and should directly contribute to meeting customer requirements (Shah & Kleiner, Brian H., 2011).

Chapter 3. The Organization productivity.

What is the meaning of the organization productivity?

The organisation productivity is the amount of output per unit of input achieved by a business organization, industrial sector, or national economy. In the field of human resource management the primary interest is in labour productivity; that is, the amount of output per unit of labour input. Labour productivity can be expressed in different ways, including the volume or value of output per worker, per day, per shift, or per person-hour. Labour productivity can be increased by increasing working hours, adding intensive effort, or improving skills. It can also be raised by investment in laboursaving machinery or by improvements in the system of work and co-ordination of work activities. Attempts by employers to raise productivity may be resisted by workers, particularly when these involve extending working time or intensifying effort levels (Plowman, 2010).

How to improve the organization productivity.

The organisation productivity could be controlled and improved by different techniques as lean methods, Six Sigma, process re-engineering, and hybrid approaches. However; the most important factor in control or improve the organisation productivity is the measurement process and tools. Productivity measures are essentially as a one of the nonfinancial performance measures relating inputs to outputs. There are two types of productivity measures: partial productivity and total factor productivity. Partial productivity measures the relation between input and outputs, such as output per worker or energy use per unit of output. Total factor productivity measures the ratio

of total outputs to total inputs including capital. The various outputs or inputs are aggregated using average revenue shares. The goal of productivity measurement is to provide management with metrics that are useful for monitoring and improving productivity, by highlighting areas that would benefit from an increase or decrease in outputs or inputs (Johnston, 1995). Increased global competition over the past two decades has forced U. S. manufacturers to implement new manufacturing strategies in an attempt to increase productivity. One such strategy, lean production, incorporates a wide variety of management practices, including just-in-time (JIT), total quality management (TQM), cellular manufacturing, and integrated supplier management systems. It is believed that lean production methods ultimately yield a high-quality system, with high customer satisfaction and almost no waste (Tanninen, Puumalainen, Kaisu, & Sandström, Jaana, 2010).

Chapter 4. The impact of implement the TQM approaches on the organization productivity.

The impact of TQM on the organization productivity.

Companies implement much management, planning and controlling tools and hope that these implementations will have an effect on their performance. However; there is a difficulty of conducting researches in the organisation performance factors although there are the measurement tools and techniques. This is because of the limitation in access to the data that enables objective measurement of effectiveness as well as to provide reliable evidence on the causalities. Since we have unique profit unit level longitudinal data from a global industrial firm, we propose to show whether

the total quality management (TQM) strategy has an effect on profitability, productivity and customer satisfaction (García-Bernal & Ramírez-Alesón, Marisa, 2010). In an imperial study it uses objective performance measures, the level of analysis is the business unit, the depth of TQM implementation is operated as the development of self-assessment scores, and the significance of the age of TQM in various business units is clearly noted. To put it more precisely, in the research analysis the researcher study how the experience of TQM and the depth of TQM implementation affect the performance of the unit measured with customer satisfaction, profitability and productivity. This study aims at complementing existing research by the following first the productivity (tons per person) and customer satisfaction (customer satisfaction measurement model) are objective. Second, TQM is examined both with experience of the tool as well as with the output that the organisational unit achieves with the tool (the self-assessment scores). The results indicate that TQM has an effect on all type of performance. There is, however, variation in whether the effect comes from the experience or depth of TQM (Tanninen, Puumalainen, Kaisu, & Sandström, Jaana, 2010) . The results shown that productivity also increased as the experience of the TQM approach increased. The results support e. g. the study of Sun (1999), where he found that all the TQM practices contributed to the increase of customer satisfaction and business performance to a certain extent; human resource development, quality strategy and quality leadership were at the top in terms of contribution. It is good to remember, however, that none of the measures can guarantee improvement alone and there may also be other factors influencing the business environment (Tanninen, Puumalainen, Kaisu,

& Sandström, Jaana, 2010). The management accounting and operations management reviewed that the adoption of advanced manufacturing practices optimally requires complementary changes in the firm's productivity. This study focuses on JIT manufacturing as an engine of corporate productivity. The results of this study provide evidence that productivity measurement mediates the relationship between performance outcomes and investment in JIT practices. This study implies that a broader range of productivity measurement is beneficial for both JIT and non-JIT plants, although plants that adopt more intensive JIT practices benefit more. Also, this study implies that in order to appropriately measure performance outcomes in a JIT environment, the plant should use industry-driven productivity measures more intensively than idiosyncratic productivity measures (JEFFREY L. CALLEN, MINDY MOREL,, & CHRISTINA FADER., 2005). JIT plants should use a broader range of productivity measures than non-JIT plants in equilibrium, as illustrated in Figure 2. Figure . Optimal number of productivity measures JIT versus non-JIT plants (JEFFREY L. CALLEN, MINDY MOREL,, & CHRISTINA FADER., 2005).

Six Sigma implementation and the organization productivity.

As a historical preview, Motorola created the concept of Six Sigma in the mid-1980s to improve the performance of key processes, productivity and quality and at the same time reduce costs (Bhote and Bhote 1991, Chan and Spedding 2001, Anand et al. 2007). The main factor behind its development was continuous improvement in the manufacture of complex devices involving a large number of parts with a high probability of defects in the end

product. At the same time, customers were demanding that Motorola improve quality in their final product offerings. This external driver supported the need for continuous improvement (IWAARDEN, T. VAN DER WIELE, B. DALE, R. WILLIAMS, & B. BERTSCH, 2008). The goal of Six Sigma is value creation through quality improvement. The process by which this is attained would involve training of employees in tools and techniques as well as a problem solving protocol. Six Sigma makes use of quality engineering methods within a defined problem solving structure to identify and eliminate sources of variation to yield productivity, operating effectiveness, customer satisfaction, etc. (Bhote and Bhote 1991, McFadden 1993, Harry and Schroeder 1999, Pande et al. 2000, Linderman et al. 2003, Pyzdek 2003, Linderman et al. 2005, Chen 2008, Li et al. 2008). It is based on the well-established quality management idea of understanding and eliminating the causes of variation and robust designing for manufacture and assembly. Six Sigma gives these well-established techniques modern packaging to make them better applicable for non-quality professionals and to make them more commercially attractive. The well designed bottom-line benefits achieved by Motorola (Feo De 2000) led to its adoption by high profile organizations such as AlliedSignal (now Honeywell) and General Electric (IWAARDEN, T. VAN DER WIELE, B. DALE, R. WILLIAMS, & B. BERTSCH, 2008). Many of the objectives of Six Sigma are similar to those of total quality management (TQM) (e. g. customer orientation and focus, team based activity, comprehensive education and training, and problem solving methodology) and it undoubtedly builds upon TQM. However, there are also elements in Six Sigma that set it different from TQM: it requires clear financial gains within a

limited time frame; employees involved receive a rigorous training program; and it is top-down driven. There are also facets of the Six Sigma methodology contained within other techniques (e. g. the establishment of statistical facilitators in statistical process control and the defined set of phases and gates which a project undertaken by a quality circle is required to follow). However, there is no doubt that Six Sigma returns quality back to its roots, because it re-emphasizes engineering and statistical analysis as core elements of quality management (Chen & Chung, C.-H., 1996). The goal of this technique is improve quality so that the error rate is reduced to 0. 3 parts per million. The Six Sigma philosophy has two broad aims: create an in-house capability for quality improvement and use that capability to analyse business processes to produce high-quality products with minimal variations. There are five well-defined steps on a Six Sigma project to spot and remove causes of variation in performance and find ways to control processes: define, measure, analyse, improve and control (DMAIC), In each step sophisticated statistical and qualitative problem-solving techniques are used. Six Sigma is best applied to high-volume processes where the consistency and quality of the products are crucial. On smaller projects the level of governance and statistical analysis it entails can become costly. It is often used once lean or process re-engineering techniques have been applied to remove some of the more fundamental forms of waste, as it works better in conjunction with other methods and tends to deliver its benefits over the longer term. The success of a Six Sigma project depends on having highly qualified practitioners. Firms aiming to develop this capability must invest significant time and money in training their staff. They also require a

supportive management philosophy (IWAARDEN, T. VAN DER WIELE, B. DALE, R. WILLIAMS, & B. BERTSCH, 2008). It's no surprise that Six Sigma widely used in the industry where producing high-tech goods for a large markets. Motorola successfully developed and applied the approach to mobile phone production. The technique has been applied in many other contexts, particularly high-volume processing businesses such as call centres.

Conclusion

The Total Quality management (TQM) is a business philosophy established by numbers of scientists and statisticians as (Ishikawa 1985, Deming 1986, Cordon 1995) in order to improve the production and meet customers' requirements and satisfaction. The basic role in the TQM implementation is to change the organisation culture from the traditional production and profit oriented culture into quality and customer oriented culture. This is means changing in the management production strategies and plans, training programs, leadership and motivation strategy, competition strategy. TQM is not just a quality plans or strategy needs to apply, it is a type of culture which required continuous improving, measuring, and fast feedback. As a traditional concept, there is a negative relationship between the productivity and the quality; however, the implementation of the TQM approaches and practices have a direct positive impact on the organisation performance as increasing the product quality, the customer satisfaction, and the employee's productivity which reflect on the total profitability and the market share. The empirical studies approved that the implementation of the

TQM approaches like just in time (JIT) affect positively the productivity of the plant. Six Sigma considered as TQM approaches; however, Six Sigma nowadays is broadly wide used by the different organisation because it takes the financial perspective as well as the quality and productivity into consideration. In the world globalization and free market economy, the company and organisation which needs to survive should contentious improve the quality of their offered products and services; concentrate on the customer requirements and satisfaction, leading and motivate the internal employees in order to increase the productivity and maximize the profitability.