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ENABLERS OF TOTAL QUALITY MANAGEMENT, PERFORMANCE AND THE MEDIATING ROLE OF EMPLOYEE ENGAGEMENT: A CASE STUDY OF AN ELECTRIC COMPANY IN MALAYSIA

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Abstract

Purpose-The purpose of the study is to examine the influence of the Total Quality Management (TQM) practices on the Performance in an electronic manufacturing company in Malaysia. **Design/methodology/approach** –A close-handed questionnaire was used to collect data from 100 executives. A set of hypotheses arising from a conceptual model of TQM and business performance were tested using partial least squares structural equation modelling (PLS-SEM), and partial least squares multi group analysis (PLS-MGA). **Findings**-Empirical results revealed that only three variables significantly influence company performance. Employee engagement significantly moderates between TQM and business performance. MGA was employed to examine the magnitude and significance of these results by dividing the sample into two departments, i.e. automotive and parts production. Statistically, there is no significant difference between the coefficient values of two different departments. It further reinforces findings on the impact of TQM on Performance. **Practical implications** –The data were obtained at a single point in time; it is a cross-sectional study, leading to response biases. This study focuses solely on the electronic manufacturing industry, and its findings may not apply to other industries, such as the service sector. While the data source for TQM dimensions (independent variable) differs from organizational Performance (dependent variable), both variables are quantified using managers' perception data. **Originality/value** – This research study was conducted during the beginning stage of the COVID-19 pandemic, which provides a unique approach to conducting the study/research.

Keywords: Customer interest, Process management, new technology, Employee's engagement, Management approach, Performance

Paper type: Research paper

1. INTRODUCTION

Total Quality Management, or TQM, is a holistic strategy in which all individuals at all levels see quality as vitally important. However, building a favourable environment in which quality is taken seriously throughout a business involves a great deal of effort as well as a significant amount of time and attention. Leadership is not only crucial, but it is the most critical aspect in an organization's success in this endeavour. As a result, the leaders in any effort to implement

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or improve TQM must play very distinct roles. Rather of expecting employees to report on their performance, leaders are increasingly spending the bulk of their time in a support or coaching role, where team performance is paramount and it's all about working together to remove any barriers that inhibit the business from achieving customer expectations. In other words, there is a cultural shift, or a change in the way things are done or expected to be done within the organisation. Quality has been an essential aspect in each organization to ensure competitive advantage in the current fast-developing technology environment where continuous technology improvement contributes to the betterment of the organization (Alhamd and Yahya, 2021). Technology enhances the quality perception and minimizes the error on the product or services manufactured, which will assist the business to be sustained and accomplished to the greater level, as mentioned by Filiz, Duran and Yetisen (2015). Ngambi and Nkemkiafu (2015) have mentioned that most manufacturing-based companies have started incorporating quality related initiatives such as Six Sigma, Total Quality Management (TQM) and Experimental Design. According to Aletaiby, Kulatunga and Pathirage (2017), TQM has been classified as the most effective tool as evident by previous studies that have shown that by implementing proper TQM practices, the organization performance have improved and competitive advantage accordingly. For example, several organizations based in Ghana are showing strong involvement of TQM into their organization practices to boost the organization's performance and accomplish the customers' requirement (Addae - Korankye, 2013).

According to Anil and Satish (2016), TQM is a quality system that enhances the quality of the product and meets the customer's expectations, which influences the organization's performance. With the continuous improvement desired by the consumers and changes in the world's environment, businesses are looking at TQM is a culture that encouraging to establishment and continual improvement of quality. It consists of values, traditions, procedures, and expectations that promote quality.

According to Azer, Hamzah, Aishah and Abdullah (2016), manufacturing is the fabrication of single part to fully assembled parts and products with mechanisms, tools, and human resources. Each manufacturing process requires involvement of quality control procedures from start to finish. According to the Department of Statistics Malaysia (2019), the manufacturing industry has shown a significant improvement in Malaysia's economy, where the amount of the overall production worth has increased to 5.7% yearly to RM1,275.8 billion in the year 2018. In contrast, in 2015, it was recorded as RM1, 142.0 billion as published in the Annual Economic Survey 2018.

A Japanese manufacturing company making electronics parts and components in Malaysia chosen as a case study to examine how TQM practices influence business performance. The multinational company has two manufacturing plants which are based in Negeri Sembilan and Pahang, manufacturing automotive components for cars and motorcycles and switches components for household refrigerators. The company's main business profits came from the production of the automotive components. The multinational company complies with several quality standards, such as the IATF 16949-2016 standards and Built-in Quality Supply (BIQS)

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from General Motors to ensure the quality of the products manufactured is within the customers' expectations and requirements.

2. LITERATURE REVIEW

The literature review is divided into three parts starting with the theoretical definitions and TQM practices related to the five variables: Management Approach, Customer's Interest, and Improvement on Process Management, New Technology Implementation, and Employee's Engagement. These five variables become very relevant in total quality management. Total quality management has become a prevalent strategy in modern enterprises as a result of growing competition and globalisation. This tool is used by individuals (particularly managers and leaders) to improve a product's design, ensure improved revenue, minimise wastage and flaws, and improve the market image. They primarily assist individuals in finding purpose in their job while also boosting collaboration and team work. The second part presents the theoretical foundations, leading to the development of the conceptual framework for empirical analysis, while the final part articulates on arguments to draw the hypotheses of the study.

2.1 Management Approach, Customer's Interest, Improvement on Process Management, New Technology Implementation, and Employee's Engagement

2.1.1 Management Approach is defined as the techniques used to direct and control an organization. Management of the Organizations was one of the forces that strive for Total Quality Management. It is crucial that a manager puts more effort into implementing TQM to ensure it has practised accurately and sensible to the business activity. According to Zahari and Zakuan (2016), direction from management on quality concerns is essential to assure continual quality development and teamwork among the employees and top management. On the other hand, Obeidat, Hashem, Alansari, Tarhini and Al-Salti (2016) have stated that top management has a considerable responsibility in TQM practices as required to arrange a framework that clearly defines the job scope which to ensure every staff understand and do not come up with their perspective of job scope which will effect on the Performance of the company. Furthermore, strong encouragement from the management on the TQM practices shall lead all workers to engage in the quality-related job and utilize the expertise needed to handle the process, as explained by (Mohd Zaidi and Ahmad, 2020).

The involvement of top management in creating awareness of the quality within the organization is crucial. It will be a massive advantage for the employees if the management can provide adequate knowledge of TQM, which will lead to improved quality awareness among the employees, and thus, this will create a better environment for the employees. Besides that, choosing the most suitable client and confirming the clients for an excellent quality-oriented product shall be achieved by an excellent management approach regarding quality matters, like Singh, Kumar and Singh (2018).

2.1.2 Customer's Interest- Customer's Interest is one of the fundamental aspects that every organization takes seriously. This is because an organization's performance is based on the business provided by the customers. Ensuring the customer's expectations are met accordingly

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is crucial to ensure long-term business activities between the organization and customers. Besides, the confidence level of customers towards the product and organization brand is determined through excellent quality management and prompt communication with the customers if customers request clarification. Besides that, customer expectation can be achieved by providing continuous excellent quality products and services, maintaining the delivery of products as per the schedule, and the products are fixed at a reasonable price according to the quality and services. In addition, customer focus and strong encouragement from top management have played a crucial role in several aspects such as reducing excessive expenditure, enhanced management leadership, enhanced quality of the goods and services, increased customer's fulfilment, and improved business performance, as mentioned by Attakora-Amaniampong, Salakpi and Bonye (2014).

According to Mohideen and Vijayavel (2014), the price/worth of the manufactured goods may affect if the customer's expectations are not met, which has a significant relationship with the TQM's principles. This can be related to the fact that quality is a significant concern among the customers. Besides that, it is difficult to achieve the customers' expectations as the requirements on the quality matters vary according to customers.

2.1.3 Improvement on Process Management- Through a collection of methodological and behavioural activities, process management focuses on activities rather than results. It involves preventive and proactive approaches to quality management in order to eliminate process variances and improve product quality (Sadikoglu and Olcay, 2014).The quality of the products and process shall be maintained as per quality standards by continual improvement on process management. According to Mandava and Bach (2015), the focus of quality is not on the procedures or system but on forming a process management group that will monitor the stability of the process. Process management in manufacturing can be classified into four categories: Man, Machine, Material, and Method. Every employee must attend training in the process flow and previous defects history. This is a significant action that every manager needs to consider. The employee should understand the process flow of the production and history defects to ensure an effective operation process with minimal defect produced and maximum output produced. This will determine the competency of the employee. Moreover, workers shall develop their working skills through the training provided, which contributes to the significance of neither TQM, as stated by Ahmad, Yin, Muhd Nor, Hassan, Hamid and Aizat Ahmad (2018). Habtoor and Alharbi (2020) have mentioned a strong correlation on the human's contribution towards the quality aspect where human actions result in a pleasant working environment within the organization. The employee can grasp the process knowledge, and the result can be seen in the production performance. Employee's Performance shall be enhanced through the job evaluation approach, which will use a tool to boost the working skills of the employee. Besides that, job evaluation is vital for the organization to have detailed information on the job conducted and performed by the Employee, which will be an advantage for the employee's job promotion, which stated by Ngadiman, Hussin Bon and Abdul Hamid (2017).

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The machine's maintenance is crucial to ensure the output and quality of the products can be achieved as per the customer's expectation. Furthermore, lack of machine maintenance may result in more downtime during mass production mode, contributing to the organization's business performance. The maintenance team needs to have a system that can monitor the machine condition and perform the maintenance periodically. Maintenance activities can be divided into preventive, corrective, and emergency maintenance. According to Alimian, Saidi-Mehrabad and Jabbarzadeh (2019), preventive maintenance is scheduled maintenance such as daily inspection of the machine condition, quarterly, six months, and one year. In contrast, corrective maintenance is referred to as repairing or changing machine accessories due to defects in the product or process. According to Boon Ooi, Hsien Lee, Chong and Lin (2013), the prime objectives for improving productivity are improving and practising manufacturing approaches and perceptions that contribute to steady, compliant, and fewer operations expenses while maintaining excellent quality standards.

Overall equipment effectiveness (OEE) is medium to evaluate the machine's operations and efficiency with lower machine pricing of ownership (COO), which was mentioned by Boon Ooi et al. (2017). OEE is classified into three categories: Availability, Performance, and Quality, which shall evaluate the machine's performance and efficiency. Maintenance management is organized and orderly scheduling, arranging, observing, and assessing maintenance actions and expenses. Patel and Deshpande (2016) and Ramlan, Ngadiman, Omar and Md. Yassin (2015)stated that a well-structured maintenance system with an adequately experienced employee and vast experience would avoid any issue related to safety, health, and environmental concerns, resulting in longer equipment lifespan with minimal downtime and lesser operational expenses better-quality products able to manufacture. Managing material is a vital aspect of the organization. An effectual and well-organized managing material has a significant impact on the company's overall performance. In a manufacturing company, the managing material's urgency is high to have stable production performance without interference, as Akindipe (2014) stated. In addition, Akindipe (2014) also mentioned that keeping the adequate supply is also a factor that needs to be considered to ensure production lines were not stopped due to lack of material supply, which could affect the productivity and shipment of products to the customers.

Method of conducting the process and identifying the restriction of the process flow shall be determined through the Control Plan, which comprised of every process from incoming material to the finish good product shipment to customers and Process Failure Mode Effect and Analysis (PFMEA), which prevent the defects from having occurred and what are the corrective actions needs to be taken. PFMEA is performed during the design phase of the product or process to analyse the defect that occurred and the corrective action required to ensure similar defect mode shall be prevented during mass production condition as mentioned by Muzakkir, Lijesh and Hirani (2015) and Banduka, Veza and Bilic (2016). According to Siregar, Nasution, Prasetio and Fadillah (2017), maintaining better quality management of the product and lesser cycle time are the fundamental factors that contribute to the organizations achieving the competitive edge over their competitor. The organization needs to continuously improve the production process to optimize the performance of the production with lesser

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operational activities. While Jovanovic, Milanovic and Djukic (2014) have mentioned that the cycle period is classified as the combination of the actual time required to perform the process and preparation time of components for the next cycle and packing of the products. In a manufacturing organization, the cycle time was calculated based on the time taken to complete the process from initial to packing the product.

2.1.4 New Technology Implementation- The tremendous development in technology has given organizations a considerable opportunity to incorporate automation technology instead of manual processes to enhance their business performance, as Milana, Khan and Munive-Hernandez (2016) stated. Continuous development of technology has given an advantage to the organizations to minimize the operational cost through optimizing on the automation technology with less workforce required and efficiency of the products manufactured and process able to maintain throughout the whole working hours. Many organizations are providing better products and services with the help of introducing Information Technology in Total Quality Management. Global competition has enhanced quality in the business world, whereas competition is adding pressure to the organization. These challenges and pressures have placed a renewed focus on quality improvement for the organization's long-term survival. Khanam, Siddiqui, and Talib (2013) have stated that technology acts as an enabling mechanism, which results in enriched jobs and increases job satisfaction. TQM is a management philosophy and asset for customer-centric practices for delivering quality.

2.1.5 Employee's Engagement- To achieve excellent business performance, all employees' engagement from all departments is crucial. It is essential to have teamwork among all employees to ensure the business target of the organization can achieve as forecasted. Based on the previous studies, it is stated that teamwork among all the employees is considered a vital factor of TQM as all employees must express interactive response and positive thinking when working in a team, which is mentioned by Kheni and Ackon (2015). Adhvaryu, Sadish, Nyshadham and Tamayo (2019) have stated that to improve business performance, aspects such as the involvement of the employees, vast experienced, and high motivation are crucial at every portfolio of the organization to ensure the organization is successful and resourcefully organization. A good relationship between the management and employees plays a huge role in quality management, as Al-Salim and Jawad (2018) mentioned. Thus, it is essential to have a practice within the organization to consider all the employees as the associates of the organization rather than a downline employee as this will create a significant impact on the Employee and have a thought the Employee is one of the priceless assets to the company. This will result in the Employee performing well in terms of innovations and meeting the job scope requirements, which contributes to better profit achievement of the company. While Al-Salim and Jawad (2018) and Irawanto (2015), have stated that involvement is a flow of mental and emotional communication among the management and employees, which gathers the necessary encouragement and cooperation to meet the target of the organization.

2.1.6 Company Performance- An organization's performance determines the organization's status in the market, either a profit-making or underperformed organization. Several researchers like Eshikumo and Odock (2017) and Rasi, Rakiman and Ahmad (2016) have

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stated that a company's performance is determined based on the quality, speed, reliability, adaptability, price achieved at any period of manufacturing processes and shipments of goods and services. The company's performance can be determined through two categories: financial and non-financial perspectives. The financial perspective refers to the overall operation's efficiency where all the products are produced with minimal operational cost and fewer defective goods. At the same time, the non-financial perspective is referred to the customer's satisfaction and fewer defective products manufactured. Besides that, the company's performance incorporates establishing the company's business plan, observing the advancement towards achieving the business plan, and taking prompt action to ensure the business plan was accomplished, which Al-Damen (2017) mentioned. Based on Abbadi, Karim Husseinand Jermsittiparsert (2019), TQM implementation became famous among organizations as various investigations have been carried out and found that TQM contributes to performance. Performance is an essential aspect for every organization to analyse production efficiency. According to Munizu (2013), Performance was classified as a process that can achieve the performance target and client's expectation. It is also stated that the top management could not improve the process without proper analysis of its performance. Hence, classify the factors that affect the organization's performance and analyse them accordingly to enhance its performance in process effectiveness and quality management.

2.2 Theoretical Exposition

This study uses Deming's Theory as a theoretical foundation to explain the link between TQM and company performance. It is worth noting that this notion is closely related to TQM in the manufacturing industry (Deming and Deming, 1986).According to Deming and Deming (1986), meeting the client's expectations is the vital goal in maintaining the quality standard. Alghamdi (2018) quoted that the top management of the company has the authority to manage the company and has been the main reason for the company's working approach. In contrast, Deming and Deming (1986) has established a rule which is comprised of fourteen factors that tend to be a direction for an organization to provide better quality which is mentioned by Alghamdi (2018); Ngambi and Nkemkiafu (2015). The fourteen factors are related to the management approach, employee engagement, and continuous improvement towards the quality standard suitable to be put into practice by any company as the main aim of quality management is to find the company's performance. Deming's fourteen factors are 1. Establish objective consistency: Consistent objectives are required for a continuous effort to develop the process and parts produced. 2. Implement the new idea: Continuous effort to implement new ideas into the company's working culture relevant to the technology's improvement. 3. Reduce the necessity of checking the products produced: The quality aspect needs to be incorporated into the manufactured parts, leading to a lower requirement of checking the parts on a larger quantity scale. 4. Termination lowest possible proposal's agreements: Avoid granting business opportunities only by considering pricing. 5. Improvement of each portfolio in the organization: Continuous improvement in every section of the organization to enhance performance. 6. Establishment on the job training: Improvement of the training approach to enhance the understanding of the process among the employees. 7. Enhancement of Leadership Aspect: The purpose is to supervise the performance of the down line members and production

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line without any interruption. 8. Guide away from being anxious: Give the employee confidence to perform well without any hesitation, which will improve the organization's performance effectively. 9. Eliminate the hurdles: Eliminate the hurdles between the employees and management to promote a better working environment. 10. Reduce urgings: Prevent the use of catchphrases and banners that resemble no faulty products manufactured and produced without proposing an approach to follow the proposed objective. 11. Remove targets: Comprises apply the job requirement based on the job requirement daily rather than deploying the job description, which stipulates the number of allocations for the workers for the job. 12. Encouragement of working spirit: The management assists in the excellent working spirit among the employees by eliminating the difficulties faced by the employees within the organization. 13. Establish a robust influential plan for training: A vital influential training will significantly impact the employees to enhance their skills for future development. 14. The higher authority of the organization pledge: The management needs to be fully committed to the continuous improvement of the quality and performance aspect of the organization (refer to figure 1).

Figure 1: Deming's 14 Points

(blog.shakehandwithlife.in, 2011)

2.2.1 Hypotheses development

Based on the previous studies, there is a significant relationship between TQM and the company's performance, but there are some studies as well which stated that there is an inadequate contradiction between the relationship of TQM and the company's performance, according to Sadikoglu and Olcay (2014); Barros, Sampaio and Saraiva (2014). Based on the mixed findings from previous studies, there is a necessity for further examining the relationship between TQM and the company's performance. Based on the evaluation of the written work, several hypotheses were constructed to facilitate this research (see figure 2).

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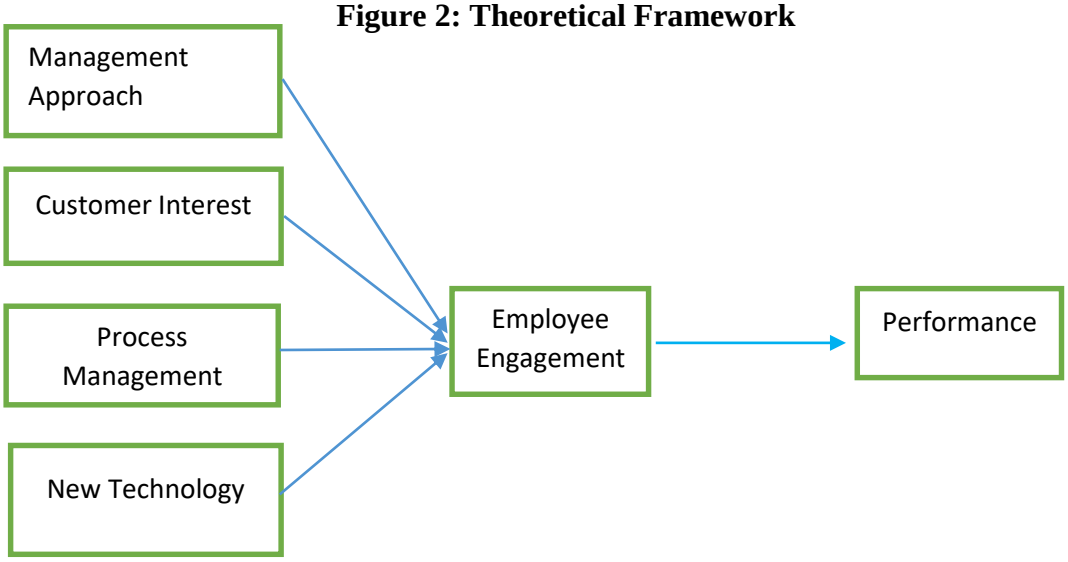
Figure 2: Theoretical Framework



Management Approach has a positive relationship with company performance

Successful leadership can convince people of the need for change, stimulate new thinking and problem solving, and encourage them to work together to accomplish project objectives in challenging work environments. Meanwhile, top management's leadership in total quality management is committed to creating an organization devoted to quality. A study by Turner (2014) revealed that effective leadership is viewed as a critical factor for success in organizations' and it has also been shown an appropriate leadership style can lead to better performance. Thus, the hypothesis was developed based on the previous research evaluation.

Customer's Interest has a positive relationship with company performance

A customer-centred approach has long been recognized as an essential strategy for improving business performance. This customer focus concept is also supported in a study byZou, Kumaraswamy, Chung and Wong (2014), where they found that an active customer relationship management strategy leads to better project performance as the relationship changes across project phases. Psomas, Vouzas, and Kafetzopoulos (2014), in their study, revealed that customer focus policy was the critical TQM factor, which positively affected Spain's service sector. This suggests a customer focus approach leads to a better understanding of customers' needs, which translates into internal actions being taken and eventually results in satisfied customers, and thus an organization's performance improves.

However, some previous studies have shown contrasting results. Talib, Rahman, and Qureshi (2013) stated that investigating quality performance observed that customer-oriented activities did not positively contribute to the Indian service sector. Having reviewed the logic of a customer focus strategy, there is strong support for the statement that increasing customer focus will enhance the organization's performance in the project environment. Based on the previous studies' analysis, the below hypothesis was developed.

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Process Management has a positive relationship with company performance

A customer-centred approach has long been recognized as an essential strategy for improving business performance. This customer focus concept is also supported in a study by Zou, Kumaraswamy, Chung and Wong (2014), where they found that an active customer relationship management strategy leads to better project performance as the relationship changes across project phases. Psomas, Vouzas, and Kafetzopoulos (2014), in their study, revealed that customer focus policy was the critical TQM factor, which positively affected Spain's service sector. This suggests a customer focus approach leads to a better understanding of customers' needs, which translates into internal actions being taken and eventually results in satisfied customers, and thus an organization's performance improves. However, some previous studies have shown contrasting results. Talib, Rahman, and Qureshi (2013) stated that investigating quality performance observed that customer-oriented activities did not positively contribute to the Indian service sector. Based on the previous studies' analysis, the below hypothesis was developed.

New Technology Implementation has a positive relationship with company performance

Effective production performance plays a vital aspect in raising a country's Gross Domestic Product (GDP). Most organizations have been practising incorporating new technology into their workflow to boost performance. According to Abri and Mahmoudzadeh (2014), adopting new technology has helped the organization eliminate unnecessary loss in production, such as time-consuming for the production process because machines have a limitation of technology features incorporated. According to De Wet, Koekemoer and Nel (2016), implementing IT into the company's process has become an essential aspect of enhancing effectiveness, minimizing operational cost, and gaining competitive advantages. Based on the extensive study from previous research, it has shown a relationship between new technology and the Performance of an organization and below hypothesis was developed.

Employee engagement moderates between TQM and company Performance

Employees are the company's most important asset, ensuring the production line runs smoothly and according to the plan for the shipment of the products to customers, as stated by Sabella, Kashou and Omran (2014). To sustain the employees' commitment towards the organizations, the management must provide adequate training to improve employees' skills and provide reasonable remuneration such as bonuses, salary increments, and promotions. Based on the previous studies by Psomas, Vouzas and Kafetzopoulos (2014); Valmohammadi and Roshanzamir (2015), the Employee's involvement in the organization contributes to significant development in the Performance.

3. METHODOLOGY

This research uses the case study approach to identify the influence of the TQM on company performance. Besides that, the case study approach will be helpful to analyse the actual situation occurring within the organization. The research design consists of defining the objective of the investigation, defining the sampling process, formulating the data collection

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and analysis method, and revealing the outcome of the research. The respondent chosen for this research is the employees of an Electric Malaysia on the executive level. The total respondent is about 100 employees, including Deputy General Manager, Senior Managers, Section Managers, Senior Engineers, Senior Officer, and Engineers.The primary data collection method was chosen for this study as there is no previous research done on the influence of TQM on the electronic company performance. A survey was developed based on the detailed literature review from past studies and personal experience working in the manufacturing industry. The questionnaire was distributed to the executive level personnel such as Deputy General Manager, Senior Managers, Section Managers, Senior Engineers, and Engineers as these individuals were directly involved with the TQM-related matters. Emails and Google form were chosen mediums adopted for this research to convey the survey. The intention of choosing emails and Google Forms is easier to convey and reply to the survey, time and cost consumption were minimal. Thus, it will be convenient for the executive personnel to answer the survey online. A cover letter that compromised the research's objectives, the scope of the study, significance, and confidentiality of the individual were secured.

Table 1: Executive for research

Designation	No of Employee
Deputy General Manager (DGM)	2
Senior Manager	5
Manager	8
Chief Engineer	10
Senior Engineer	39
Senior Officer	6
Engineer	30

Survey items were designed based on instruments adapted from previously published studies (see Table 2 below for details).

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Table2: Summary of Variables and Sources

Constructs	Items	Sources	Cronbach's Alpha
Management Approach	5	Flynn, Schroeder, and Sakakibara (1995); Ahire, Golhar, and Waller (1996); Anderson, Jerman, and Crum, (1998); Lau, Zhao, and Xia (2004); Saraph, Benson, and Schroeder (1989);	0.901
Customer Interest	5	Flynn, Schroeder, and Sakakibara (1995); Ahire, Golhar, and Waller (1996); Lau, Zhao and Xia (2004); Fotopoulos and Psomas (2010); Lee, Ooi, Sohal and Chong (2012)	0.869
Improvement on Process Management	5	Saraph, Benson, and Schroeder (1989); Flynn, Schroeder, and Sakakibara (1995); Lau, Zhao and Xia (2004); Lee, Ooi, Sohal and Chong (2012)	0.845
New Technology Implementation	5	Saraph, Benson, and Schroeder (1989); Flynn, Schroeder, and Sakakibara (1995); Lau, Zhao and Xia (2004); Lee, Ooi, Sohal and Chong (2012)	0.845
Employee Engagement	5	Saraph, Benson, and Schroeder (1989); Flynn, Schroeder, and Sakakibara (1995); Lau, Zhao and Xia (2004); Lee, Ooi, Sohal and Chong (2012)	0.935
Company Performance	5	Shenhar, Dvir, Levy and Maltz (2001);Ling, Low,Wang and Egbelakin (2007); Yeung, Chan and Chan (2009)	0.90

Source: Compiled by the Researcher

Hypothesized correlations were examined using partial least squares structural equation modelling (PLS-SEM). PLS was chosen because of three distinct characteristics. First, compared to covariance-based SEM (CB-SEM), this method has more statistical power (Hair, Ringle and Sarstedt, 2011). Second, unlike CB-SEM, this method effectively handles non-normal data. Lastly, PLS-SEM estimates are robust and consistent (Hair, Hult, Ringle and Sarstedt, 2016).

Three steps were used in PLS-SEM. The measurement models' reliability and validity were tested in the first stage. The influence of TQM on Performance was studied in stage two, both directly and indirectly. In the third stage, the researcher employed multi group analysis (PLS-MGA) and PLS-SEM to see if the impacts of TQM differed depending on the department (automotive vs parts production). "MGA enables a robust comparison of two departments even with the limited sample size and less normally distributed data," according to Hair et al. (2016).

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4. RESULTS

A total of 100 questionnaires were distributed to the respondents and achieved a complete questionnaire from 93 respondents. The data analysis shall be done based on the 93 respondents. Table 3 exhibits the complete demographic information of the respondent.

Table 3: Demographic Information

Demographic Information		
Department	**n**	**%**
Automotive	41	44.1
Parts Production	52	55.9
Production		
Production	25	26.9
Quality Assurance (QA)	7	7.5
Maintenance	18	19.4
Office	24	25.8
Incoming Quality Control (IQC)	4	4.3
Process Quality Assurance (PQA)	5	5.4
Outgoing Quality Control (OQC)	10	10.8
Production	25	26.9
Quality Assurance (QA)	7	7.5
Designation		
Department General manager	2	2.2
Senior Manager	4	4.3
Manager	7	7.5
Chief Engineer	9	9.7
Senior Engineer	36	38.7
Senior Officer	6	6.5
Engineer	29	31.2
Years of Service		
1-2	16	17.2
3-5	17	18.3
6-10	25	26.9
11-15	10	10.8
>16	25	26.9

The initial step in the PLS-SEM process was to determine the measurement model's reliability, internal consistency, and validity (convergent and discriminate). The CR and CB alpha tests were employed to assess the constructs' reliability (measurement model). CR values ranged from 0.81 to 0.86, whereas CB alpha values varied from 0.65 to 0.79. Both tests yielded results significantly above Nunnally and Bernstein's recommended threshold of 0.70(1994) (see table

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4). All of the constructs (measurement models) were found to be dependable. Confirmatory factor analysis CFA was used to assess two-dimensional validity (convergent and discriminate) (see table 5). The average variance extracted (AVE) values were utilized to examine the constructs' convergent validity.

Table 4: Reliability, Consistency and Convergent

Constructs	Items	Loadings	CB Alpha	CR	AVE
Management Approach	MA1	0.66	0.71	0.82	0.61
	MA2	0.77			
	MA3	0.89			
Customer Interest	CI1	0.81	0.68	0.82	0.61
	CI4	0.76			
	CI5	0.77			
Process Management	PM1	0.83	0.65	0.81	0.58
	PM4	0.70			
	PM5	0.75			
New Technology	NTI1	0.74	0.77	0.85	0.59
	NTI2	0.81			
	NTI3	0.84			
	NTI4	0.68			
Employee Engagement	EE2	0.86	0.73	0.85	0.65
	EE3	0.84			
	EE4	0.73			
Performance	P1	0.72	0.79	0.86	0.55
	P2	0.81			
	P3	0.71			
	P4	0.74			
	P5	0.70			

Table 5: Fornell-Larcker Criterion for Discriminant Validity

	VIF	CI	EE	MA	NT	P	PM
Customer Interest	1.66	**0.78**					
Employee Engagement	1.00	0.47	**0.81**				
Management Approach	1.31	0.46	0.40	**0.78**			
New Technology	1.56	0.52	0.52	0.23	**0.77**		
Performance	1.00	0.69	0.57	0.43	0.46	**0.74**	
Process Management	1.37	0.38	0.44	0.30	0.47	0.53	**0.76**

The results of path analysis are exhibited in Table 6. The first variable, the management approach, has a positive relationship with Performance (β 0.21, t 2.31).The second variable, customer interest, negatively correlates with Performance (β 0.15, t 1.36) and the third variable,

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process management has a negative relationship with Performance (β16, t 1.66). However, new technology implementation has a positive relationship with performance (β0.32, t 2.93). The mediating role by employee engagement was also established, where employee engagement mediates between TQM and Performance (β0.57, t 5.78).

Table 6: Hypotheses Testing

Hypotheses	β-value (t-value)	p-value
Management Approach has a positive relationship with company performance	0.21(2.31)	Sig,
Customer's Interest has no positive relationship with company performance	0.15(1.36)	NS
Process Management has no positive relationship with company performance	0.16(1.66)	NS
New Technology Implementation has a positive relationship with company performance	0.32(2.93)	Sig.
Employee engagement mediates between TQM and company Performance	0.57(5.78)	Sig.

Notes: Sig: Significant at 5% level and NS: non-significant

MGA was employed to examine the magnitude and significance of these results by dividing the sample into two departments, i.e. automotive and parts production. There is no statistically significant difference between the coefficient values of two different departments. It further reinforces findings on the impact of TQM on performance.

Table 7: Multi Group Analysis (MGA)

Hypotheses	(WS)p-value	(P) p-value
Customer Interest -> Employee Engagement	0.44	0.45
Employee Engagement -> Performance	0.47	0.50
Management Approach -> Employee Engagement	0.98	0.98
New Technology -> Employee Engagement	0.42	0.42
Process Management -> Employee Engagement	0.96	0.96

Notes: WS: Welch-Satterthwait; P: Paramteric

The values of R-square for the whole model are 0.40 and 0.32 for the total sample collected. The values of R-square show a "moderate" effect. Furthermore, q-square values greater than zero (0.23 and 0.15) show a meaningful predictive relevance of the PLS path model.

5. DISCUSSION

By integrating theoretical foundations from Deming's Theory, a framework was conceptualized connecting TQM (MA, CI, PM and NT), EE (employee engagement as a mediator) and Performance. The developed model was empirically tested across a sample of 100executive

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staff of electronic manufacturing companies. Two independent variables support the findings with the notion with empirical results showing a significant impact of MA and NT on the company's performance. The other two variables, customer interest (CI) and process management (PM), have no positive impact on the company's performance. Employee engagement mediated between TQM and the company's performance. Findings using MGA revealed that the effect of TQM on the company did not significantly differ by the two different departments.

5.1 Management Approach

Organizational Performance is strongly linked to top management support. Choi and Eboch (1998) and Kannan and Tan (2001) have previously found similar results. According to these studies, one of the TQM practices, leadership, has a non-significant association with quality and financial success. However, our findings contradict with Arumugam, Ooiand Fong (2008), who found a favourable association between top management support and quality performance in earlier studies. According to Simatupang and White (1998), top management support serves as a positive foundation for the company's entire procedures, which eventually affect organizational success. For successful performance enhancement in Malaysia's electronic manufacturing sector, senior management should promote effective decision making in quality implementation and maintenance. We can conclude from the preceding discussion that the current study achieves its primary aims. The study highlights the importance of TQM dimensions and organizational performance in Malaysia's electronic sector.

5.2 Customer Interest

Customer interest has no substantial impact on the Performance of the electronic manufacturing company. This conclusion agrees with Prajogo and Sohal (2001), who say that a customer-interest strategy stops companies from being broad-minded, limiting their ability to innovate and preventing them from becoming market leaders. According to Prajogo and Sohal (2001), enterprises with a high level of customer interest suffer large expenses and risks, which negatively impact their Performance. On the other hand, our findings contradict earlier research that revealed TQM elements like customer interest and satisfaction have a positive impact on organizational Performance (Agus, 2004; Brah et al., 2002; Fotopoulos and Psomas, 2010). As a result, company executives should make every effort to keep their customers. In order to increase overall performance, management should also consider customer complaints about quality.

5.3 Process management

Process management has little bearing on the Performance of an electronic manufacturing company. A strong performance measurement system allows a company to monitor data on quality and processes successfully and obtain current performance data as needed to manage its overall Performance. Process errors/mistakes can be recognized and corrected; processes can be improved, and the firm's performance can be improved by regularly managing processes and checking quality data. By applying strong knowledge and process management systems, the company can deliver upgraded products/services more frequently, increasing sales and

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profitability. Thanks to successful data quality monitoring, particular cause variation in the process may be eliminated, and particular cause variation can be separated from common cause variation. As a result, the deployment of new products or services and the development of new processes can be completed on time. This can lead to new products, services, or procedures being developed. Environmental implications of processes can be used in process monitoring and refinement, such as removing or reducing harmful parts/components in products or services that are harmful to the environment or society's health. When robust procedures are designed, the firm's total profitability improves.

5.4 New technology

The adoption of new technology has a favourable impact on firm performance. Many businesses stated that they had employed a moderate to a maximum level of IT to assist their data and analysis (Siam, Alkhateeb and Al-Waqqad, 2012). TQM is a data-driven management approach. Information is critical because all quality improvement operations are based on informed decision-making. Customers, suppliers, staff, projects/processes, and other essential areas must be covered in a company's database (Flynna, Schroederb and Sakakibara, 1994). Because quality management generates many data, it is crucial to figure out which data types are worth saving and organize them into a logical framework. To meet the information needs of each level (strategic, tactical, and operational) of decision-making activities, databases must be able to support various data processing and in-depth analysis (Zahedi, 1988).

5.5 **Mediating role of employee engagement**

Employee engagement is strongly linked to organizational performance. This finding is consistent with ALNasser (2013) research, which revealed that soft TQM factors such as supplier relationships, people management, and training and education improved corporate Performance. Martínez-Lorente, Dewhurst and Dale (1999) believe that well-trained employees are more inclined to give remarkable performance improvement and innovation ideas. Employee engagement is a crucial component of successful TQM implementation, especially in textile manufacturing organizations where the global market is crucial and TQM implementation via multiple quality standards certifications is commonly necessary. Cooperation and supportive employee management practices, as expected, increase employee productivity and problem-solving abilities, which in turn improves organizational Performance (ALNasser, 2013).

6. LIMITATIONS

Researchers point out some of the study's flaws that should be considered in future revisions. First, because the data was obtained at a single point in time, it is a cross-sectional study, leading to response biases. Second, because this study focuses solely on the electronic manufacturing industry, its findings may not apply to other industries, such as the service sector. The study's third disadvantage is that, while the data source for TQM dimensions (independent variable) differs from organizational Performance (dependent variable), both variables are quantified using managers' perception data. This difficulty is mitigated by

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combining the responses of two or more managers for each research variable. Changes should be monitored with many times of data in the future in order to turn quality certifications into performance enhancement (longitudinal study). Other industries in the manufacturing and service sectors should be investigated in the future. In order to better understand the TQM-performance relationship, future studies should look into mediators such as organizational learning capability and market orientation. In the future, structural equation modelling could better examine the mediating mechanism to understand TQM and performance relationships (SEM).

7. CONCLUSION AND FUTURE DIRECTIONS

In our environment, such an empirical investigation of the relationship between TQM aspects and organizational Performance in Malaysia's electronic sector is likely to be valuable for academics and practitioners. The TQM dimensions to improve organizational performance in Malaysia's electronic sector from a theoretical standpoint. From a theoretical standpoint, the research provides a theoretical framework that will assist academics in developing ways to maximize the impact of TQM components on organizational Performance. The study shows that managers of electronic manufacturing companies who want to improve organizational performance by implementing TQM and employee engagement should do so from a managerial standpoint. According to the current study, TQM characteristics and employee engagement are major indicators of organizational performance. To improve Performance, practitioners in electronic manufacturing businesses should focus more on the dimensions of TQM while implementing and maintaining TQM. TQM and performance measures have a beneficial association, demonstrating the value of each of these practices in improving sustainability. The motivations for TQM implementation and ISO certification might help managers understand how to inspire staff in these applications to improve company performance. To promote knowledge and comprehension of TQM principles, organizations in the planning or early stages of TQM practices might employ identifying the barriers to TQM. Companies can also use TQM for a while to review their progress and enhance their operations.

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