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INNOVATION AS MEDIATING FACTOR BETWEEN TOTAL QUALITY MANAGEMENT AND COMPETITIVE ADVANTAGE AMONG MANUFACTURERS

Abstract: *This paper is aimed to explore the role of innovation as mediating role in relationship between TQM and competitive advantage within manufacturing sector in Malaysia. Quantitative method was used to find out the answer and questionnaires have been distributed to the management level in electrical and electronic (E&E) manufacturers in Malaysia. Statistical Package for the Social Science (SPSS) and ADANCO were the software used to analyze the data gathering from respondents. The result of analysis shown that total quality management (TQM) and innovation gave significant positive impact on competitive advantage. In addition, the innovation is mediate positively for the relationship between TQM and competitive advantage. Therefore, this research is expected to provide deep understanding regarding TQM, innovation, and competitive advantage for the manufacturing industry within Malaysia and acts as reference to future researchers*

Keywords: *Total Quality Management; Innovation; Competitive Advantage; ADANCO; manufacturers*

1. Introduction

Several studies had shown there is a positive relationship between total quality management and innovation. One of the studies, Martinez-Costa and Martinez-Lorente (2008), it demonstrated the practice included in total quality management provide synergy for a situation to implement innovation. Besides that, the total quality management enable organization train workers into experts and include these practices in innovation activities. After that, innovation create a continuous improvement within internal organization. Thus, implementation of total quality management and innovation helps organization to reduce cost and time required in development of product as well as eliminate process which do not create values for organization (Kim et al., 2012). Furthermore, innovation is able to create inspiration of workplace among worker and invention of new method or process aimed to enhance efficiency. Innovation has a significant impact on the organization's performance by enabling a better position in the market, which in turn will give it a competitive advantage and a better performance (Walker, 2008).

Vanichchinchai and Igel (2011) indicated that TQM is a management approach which enhance the effectiveness and efficiency of overall process of organization by meeting customer expectation continuously. The effectiveness and efficiency derived from TQM could result in cost advantage of organization subsequently. Nevertheless, some studies stated that there is an ambiguous

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or no relationship between TQM and competitive advantage (Kaur M et al., 2012; Lee V, 2010). These different findings of previous studies are caused by weakness of studies regarding innovation as mediating role.

However, several studies declared that there is no relationship between TQM and innovation, and innovation not even qualified to act as a mediator for quality management to achieve any objective (Wind & Mahajan, 1997; Slater & Narver, 1998). Moreover, a few studies indicate there is no or positive relationship in TQM, innovation, and performance (Ravichandran & Rai, 2000; Flynn et al., 1995). In contrast, there is some studies shown that there is a relatively weak relationship between innovation and competitive advantage of organization, such as studies Chandler and Hanks (1994) and Subramanian and Nilakanta (1996).

In response to these contrastive statements, the research managed to analyze the relationship between total quality management and innovation. Next, the research plan to identify the effect of quality management and innovation implementation on competitive advantage in manufacturing sector in Malaysia. A quantitative method was conducted to accomplish this research.

2. Literature Review

2.1 Total Quality Management (TQM)

Effectiveness and efficiency of all aspects of a business required to encourage continuous improvement through a comprehensive dynamic process which is TQM (Vanichchinchai & Igel, 2011). In addition, Evans and Lindsay (2011) stated TQM is a managerial approach which emphasize meeting customer needs and demand, and satisfaction in order to achieve organizational long-term success. TQM is described as quality or manufacturing philosophy aimed in sustainable product and process, and continuously improvement by utilizing on the involvement of management, workforce, suppliers, and customers for meeting customer and stakeholder expectation (Dean & Bowen, 1994; Hackman & Wageman, 1995; Powell, 1995). Several empirical studies had done the comparison between the practices within TQM. These studies lead to identification of nine element consist in TQM, which including cross-functional product design, process management, supplier quality management, customer involvement, information and feedback, committed leadership, strategic planning, cross-functional training, and employee involvement (Flynn et al., 1994; Powell, 1995; Black & Porter, 1996; Samson & Terziovski, 1999).

2.2 Innovation

Innovation is identified as one of the driven factors to enhance social welfare, sustainable competitive advantage, organizational growth, and firm performance by internal structure (Baumol, 2002). Innovation become concern of top management and acts as a sustainable competitive advantage due globalization threat (Veugelers & Cassiman, 1999). Nevertheless, the innovation is not a narrow managerial approach which enable organization gain benefits from it with easy way (Van de Ven et al., 1999; Tushman et al., 1997). Implementation and construction of strategy activities for multi-purpose that comply with organization objectives could be difficult task and involve complex steps (Faems et al., 2005).

According to several studies, the cooperation on innovation process among organization is trending and grown dramatically (Hull, 2003; Chen and Yuan, 2007; Navarro Arancegui, 2002). The cooperation between organization to develop technology and knowledge purpose for their mutually benefits. The elements of uncertainty in term of cost incurred, time taken to construct own-generated knowledge, and amount of resources needed (Chang, 2003). The

strategic alliances enable both or more companies pool their resources on particular project. This kind of relationship enable them to share their resources and access the unknown capabilities (Al-Laham et al., 2008). There are two types of innovation which are product innovation and process innovation (Gunday et al., 2011).

2.3 Total Quality Management and Competitive Advantages

Several studies stated that the practices within total quality management (TQM) is required to improve competitive advantage in initial step and enhance firm performance eventually. Basically, the practices of TQM enhance the manufacturing performance both internally and externally. In term of internally, the TQM improve the productivity and quality of product. Thus, the defeat rate decreased lead to low production cost. The low production low enable organization to achieve cost advantage. In term of externally, the high quality of product enable organization to achieve differentiation advantage. Besides that, the high quality of product improves customer satisfaction, repeat purchasing, and maintain customer loyalty. Thus, the customer satisfaction boosts the firm market share and performance in marketplace (Kaynak, 2003; Seth & Tripathi, 2006; Salaheldin, 2009).

The firm which adopt TQM as their quality management would perform well multiple aspect compared to firm which do not implement TQM. The strong positive relationship between TQM practices and competitive advantage of firm is identified (Joiner, 2007). TQM is directly affecting the competitive advantage in term of cost (Kumar et al., 2009). The practices of TQM such as customer focus, leadership management, training and education, process management, and product management would lead to superior quality of product, low defeat rate, and increase sales volume. Al these outcomes meet the competitive advantages of organization which are cost and differentiation advantages (Fotopoulos and Psomas, 2009). Through improvement of product quality with meeting customer expectation, the market share and sales volume will be increased at the same time (Gadenne & Sharma, 2009).

2.4 Innovation and Competitive Advantage

Innovation activities is a crucial factor in business strategy and operation (Long et al., 2015). Several researchers indicated that innovation activities regarding process innovation and product innovation have a significant positive relationship with competitive advantage of organization (Soreshjany & Dehkrodi, 2014; Miranda et al., 2014; Lopez-Mielgo et al., 2009). Normally, the studies on innovation just focus on areas such as novelty of innovation, the application of innovation on new product, and time taken from period of innovative idea generation to launch of innovative product (Harrington, 1991; Mahmud & Hilmi et al., 2015). The sustainable competitive advantage and long-term goal of organization can be derived from capability of organization to implement process innovation and acceptance rate of product innovation (Prajogo, 2015; Laforet, 2013). The important factors that triggers to formation of competitive advantage such as market leadership, market share, efficiency and effectiveness, profitability within organization. These factors created through innovation activities (Rosenbusch et al., 2011). Apart from that, the implementation of innovation activity shown a positive relationship with reduce defeat rate of product, reduce the complexity of process management, and reduce the customer complaint (Camison & Puig-Denia, 2015).

The organization tend to invest a large amount of resources and time in research of innovation as long as organization concern internal innovation. The innovation research will directly impact their ability to create, use, and recombine knowledge, access the

existing tacit knowledge and develop capabilities, technology, and competitive advantage which are difficult to imitate and suit their organizational objectives. All of these benefits enable organization obtains competitive advantages in long-term and put them in a better market position in marketplace (Chen & Yuan, 2007). A long-term competitive advantage also increases the return whether in financial or non-financial form on their innovation activities (Roberts & Amit, 2003). The internal innovation could enhance the innovation performance, thus bring impact to competitive advantage of organization. The successful implementation of innovation activities can transform investment by organization into desire outcome which is survival in competitive environment and gain long-term competitive advantage (Katila & Ahuja, 2002; Mairesse & Mohnen, 2001; Frenz & Letto-Gillies, 2009; Love & Roper, 1999).

2.5 Total Quality Management and Innovation

A few researchers examined and indicated that there is a positive relationship between total quality management (TQM) and innovation (Prajogo & Sohal, 2004; Prajogo & Sohal, 2006; Hoang et al., 2006; Prajogo & Sohal, 2003). Through examination of the relationship between TQM and innovation carried out, researcher concluded that innovation management emphasize quality as important role, thus TQM could act as a basis for innovation (Prajogo and Sohal, 2006). The TQM practices such as workforce management and process management trigger an innovative environment and form an innovative culture within organization. Quality management identified as a marketing tool for customer and investor and could be transform into competitive advantage for organization (Deming, 1986).

Martínez-Costa and Martinez-Lorente (2008), stated that the customer focus is one of the key elements in TQM and concerned by top management. When designing and construct quality of product, organization would consider the customer needs, demands, and preference. Through the innovation activities launched by organization, the following customer related factor transform into a new product or service that meet customer expectation. Therefore, the fact TQM oriented organization will certainly implement innovative product and process to success new product development. Process innovation is required to eliminate quality issue and improve productivity. The purposes of process innovation are complying with objectives of TQM clearly.

The studies concluded the exist of significant positive relationship between innovation and TQM (Flynn et al., 1994; Terziovski and Samson, 2000). The innovation strategic and quality management aimed to help organization to gain competitive advantage. The research also indicated quality management and innovation is intercorrelated and should not be isolated separately. This situation is referring to TQM and innovation act as a platform to enable organizations improve their performance through combination of both management (Nowak, 1997).

Prajogo and Sohal (2003), confirmed TQM practices trigger an innovative environment within organization. Thus, the positive relationship between TQM and innovation is confirmed. The customer focus is always tending to create more value to organization if compare to other elements. The customer-oriented organization would try to find out new demands and needs of customer. After that, the organization would develop a new product to meet those needs and demands. With the new product development, employees required to be creative and find possible solution to obstacle faced in development stage. The likelihood of human management provide innovation activities is high and has direct impact to objectives which align with TQM.

A few of researchers have carried out studies based on identifying the relationship between TQM practices, innovation, and competitive advantages. Nevertheless, some studies indicated an unclear correlation between TQM practices and innovation. There is also no evidence to proof that innovation could be a mediating role in the relationship between TQM practices and organizational competitive advantages. Therefore, in order to clarify the following relationship with sufficient evidence, this study presents research hypothesis according to the design of theoretical model supported from previous literatures.

2.6 The Relationship Between TQM and Competitive Advantage

Generally, a number of researchers found that there is a significant positive relationship between TQM practices and organizational competitive advantage (Witjaksono, 2012; Tasie, 2016). TQM is a managerial approach which emphasize on quality assurance and involvement of employees within organization to gain sustainable competitive advantage and improve market share. Other than that, TQM acts as a crucial factor to determine success of business by level of efficiency and effectiveness (Kaur et al., 2012). Despite the TQM aimed to help organizations to gain their competitive advantage, the stage of implementation TQM is considered as most important step. There are several factors which bring directly impact during implementation of TQM such as employees involvement, top management commitment, process management, information and data analysis, and communication within organization (Zehir et al., 2012; Valmoammadi, 2011).

In other hand, some researchers stated that the relationship between TQM and competitive advantage are still ambiguous (Kaur et al., 2012; Lee, 2010). Therefore, organization should select and implement TQM practices that suits to organizational objectives and obtain long-term competitive advantage through it. Thus, the better understanding between TQM and organizational competitive advantage is required and further discussion make a clear correlation between these two elements. According to the discussion above, the hypothesis of the study at below.

H1: TQM has a significant positive impact on competitive advantage.

2.7 The Relationship Between TQM, Innovation, and Competitive Advantage

Several studies indicated the positive relationship between innovation and TQM, and both elements are related to competitive advantage (Soreshjany & Dehkordi, 2014; Mahmud & Hilmi, 2015; Mirandan Silva, 2014). The variables are identified in the relationship between innovation and TQM, which including performance resulted from both factors and could be transform into competitive advantage eventually (Kanji & Wallace, 2000). Even though quality and innovation are two different managerial but sharing same objectives for organizational competitive advantage. The innovation is focus on quality issue, technology applied, and cost reduction (O'Connel, 2011). The TQM practices create an environment to build impressive innovation among workforce. After that, the innovation is an essence to organization to maintain competitive advantage such as uniqueness and lower cost (Deming, 1986).

Nevertheless, some of researchers argues that there is a partial relationship between TQM and innovation (Deming, 1986; Feng et al., 2006; Aoun & Hasnan, 2013). The ambiguous relationship between innovation and TQM grabs attention of researchers in the managerial area (Feng et al., 2006; Augusto et al, 2014). The inconsistency in relationship between TQM and innovation caused by a few factors. The TQM indeed help organization and has direct positive effect on product quality and process reliability, but not

for product and process innovation (Feng J et al., 2006). The unsuccessful implementation of innovation could be divided into two categories which are internal and external factors. The internal factors may include poor communication, leadership, human management, and employees involvement (Khurana V, 2007). The external factors may include government policy, change in marketplace, and intensive competition (Perdomo-Ortiz J, 2009). Some studies stated that innovation is not qualified to act as catalyst for quality management to achieve ant business objectives (Wind and Mahajan, 1997; Slater and Narver, 1998). Therefore, the lack of evidence to proof there is a strong positive relationship between TQM and innovation, and even related to competitive advantage (Damanpour F, 1991; Prajogo D I, 2015). According to the discussion above, we propose the following hypothesis.

H2: Innovation is positively mediate the relationship between TQM and competitive advantage.

2.8 The relationship between innovation and competitive advantage

The innovation activities are play an important role for enhance firm competitive advantage and value delivered to customers (Bowen et al., 2010; Llore'ns Montes et al., 2005). The innovation-oriented organization tends to have higher productivity and growth potential than organization which do not put effort in innovation activities (Cainelli et al., 2004). The process innovation is enabling organization improvement in variety of aspects such as cost, quality and delivery. Thus, the cost and differentiation advantage could be maintained (Tan et al., 2007).

A few researchers indicated a significant positively relationship between innovation and competitive advantage. The level of productivity and performance of organization are depending on the extent of innovation (Kafetzopoulos and Psomas, 2015). The competitive advantage could be enhanced through process innovation due to new production method and additional process applied for efficiency purpose (Hassan et al., 2013). The organization which put their effort in innovation activities tend to have higher probability to maintain competitive advantage than others through financial and non-financial performance improvement (Saunila et al., 2014). The product innovation enable organization obtains operational excellence by using new technology. Thus, enhancement of product features and differentiation advantage could be achieved (Evangelista & Vezzani, 2010). Process innovation brings direct impact to production line within organization. Thus, the cost of production decreased dramatically, and it boost operational performance (Ou et al., 2010). In addition, the product innovation improves the flexibility of organization to tackle any uncontrollable change by create novel technology or apply new method that maintain competitive advantage (Llore'ns-Montes et al., 2004).

In contrast, the innovation is not a guarantee for competitive advantage. The factors which may determine the successful of innovation in the organization are various such as organizational culture, innovation types adopted previously, and organizational objectives (Taherparvar et al., 2014). Thus, there is a need to declare the relationship between innovation and competitive advantage. According to the discussion above, we propose the following hypothesis.
H3: Innovation has a significant positive impact on competitive advantage.

3. Conceptual Model

The conceptual framework of this research is shown at below. The hypothesis of the research represented in H1, H2, and H3. The innovation is acts as mediating variable in the relationship between TQM and competitive advantage.

H_1: TQM has a significant positive impact on competitive advantage among manufacturers.

H_2: Innovation is positively mediate the relationship between TQM and competitive advantage among manufacturers.

H_3: Innovation has a significant positive impact on competitive advantage among manufacturers.

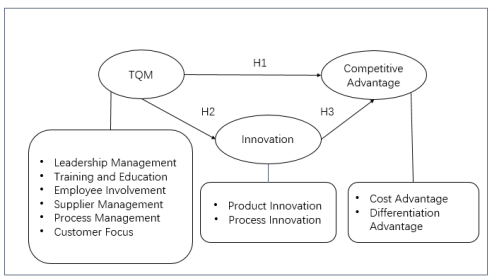

Figure 1. Conceptual framework
Source: Ang Wei Shan et al. (2016)

4. Research Methodology

This research tends to explain the relationship between the variables. For instances, the relationship between TQM and competitive advantage, the relationship between innovation and competitive advantage, and mediating role of innovation in the relationship between TQM and competitive advantage. Since Mark Saunders et al. (2016) defined explanatory research is aimed to establish a causal relationship between the variables, this research is clearly categorized into explanatory research. Apart from that, this research tends to adopt questionnaire which is categorized as quantitative method to answer research question. Since Cohen L, Manion L. & Morrison K. (2009) stated that quantitative method would be used in explanatory research and key variables are required to be identified at the same time, this research is an explanatory which meet all the condition stated by researcher.

Researcher provides a list of questions in respondent's demographic part. A list of answers would be consisted in each question. It is to ensure that respondents have consider all the possible answer when fill in the questionnaire (Saunders et al., 2012). Subsequently, a structured questionnaire developed for data collection purpose to measure variables in this research which are TQM, innovation, and competitive advantage. The 40 items would be measured by using ten-point interval scale. The ten-point interval scale would be adopted which aimed to provide a wider response option that suit their utmost judgement (Zainudin, 2014). The ten-point interval scale designed to examine the extent of subjects agreed and disagreed with statements on the scale with anchors which ranged from "strongly disagree" (1) to "strongly agree" (10).

This questionnaire in this research would be sent electronically through mail. The online questionnaire offers a variety of benefits such as time taken to complete reduced, low cost, and high response rate (Lo et al., 2014).

Other than that, questionnaire is managed to distribute among Electrical and Electronic (E&E) manufacturing companies in Malaysia. According to MIDA Worldwide Network (2014), the importance of Electrical and Electronic (E&E) are listed and contribute Electrical and Electronic (E&E) is chosen in this research to answer research question. Several reasons exist to trigger Electrical and Electronic (E&E) manufacturing companies is chosen in this research. Firstly, the Electrical and Electronic (E&E) sector is highly concerned in Malaysia and this research tends to contribute valuable theory for Electrical and Electronic field due to its high market demand in Malaysia. Next, the Electrical and Electronic (E&E) products is widely spread and correlated to other sector such as automobile, telecommunication, and service. There is a tremendous impact and influence of Electrical and Electronic sector to most of the sectors. Therefore, the improvement of Electrical and Electronic sector in term of quality, conformances of industry, and durability will bring a positive impact to other sectors. In another word, the contribution of this research would be great

since Electrical and Electronic company is one of the suppliers to other companies which in different sector. Furthermore, this research emphasizes on Electrical and Electronic sector due to the variables consist in research question. The mediating variables in this research which is innovation considered as an important element in electronic gadgets to product innovative product which able to grab customer attention. Therefore, the involvement of Electrical and Electronic sector would be given a helping hand to determine the innovation as mediating role in relationship between TQM and competitive advantage in accurate and valid way.

All the finding obtained would be used to develop a conclusion in valid way within research. After the data collection completed, the researcher could analysis the data collected statistically by using Statistical Package for Social Science (SPSS) and ADANCO. The descriptive analysis, regression analysis, Principal Component Analysis (PCA), cross loading, and path coefficient used as statistical analysis tools in this research.

In this study, 352 respondents are selected to complete the data collection session through questionnaire (table 1). There are 39.8% of overall percentage answered by middle management and 38.9% for executive management which is slightly lower than middle management. Dubrin et al. (2003) stated that executive and middle management carry out daily management in production and responsible for execution of quality program and mechanism. Therefore, low and middle management are engaged to complete this survey form. Moreover, the consumer sector dominating the sub-sector in E&E industry for this study which is equal to 42.3% or 149 respondents. MIRA (2011) indicated that products from consumer sector are widely spread within Malaysia and bring 42.4 billion for sales. For instances, mobile phone, speaker, camera, and other audio-visual products.

Table 1. Demographic Description of the respondents

Sales	Frequency
Less than RM 300,000	49
RM 1,500,000 to RM 50,000,000	133
RM 300,000 to RM 1,500,000	170
Total	352
No of employees	
Less than 75 people	79
75 to 200 people	135
More than 200 people	138
Total	352
Years of operation	
11 to 15 years	106
16 to 20 years	26
5 to 10 years	106
Less than 5 years	16
More than 20 years	98
Total	352

Furthermore, private limited dominating business's type in this study since it scores 150 frequencies and equal to 42.6%. Bowen (1995) stated that private limited company restricts the transfer of share to persons other than company's members. Therefore, preservation of shareholder's nature family could be achieved. After that, the organizational sales turnover is dominated by sales between RM 300,000 and RM 1,500,000 which have 170 frequency or 48.3% in this study. SME Corp (2013) stated that small size of manufacturing is defined by between RM 300,000 and RM 1,500,000. Since small size manufacturing of E&E in Malaysia have an outstanding number, it suits the following result for this study. Meanwhile, the number of organizational employees is dominated by employees number which more than 200 persons within organization. OECD (2019) stated that small size manufacturing organization could be defined as number of employees which between 200 to 250. Lastly, the organizational operation's year is dominated by two categories which are between 11 to 15 years, and between 5 to 10 years. MIDA (2012) indicated that approval of 112 Electrical and

Electronic (E&E) which sum up to RM3.9 billion by foreign investor create more than 4000 job opportunities within Malaysia in 2011. The following statement is supportive to the data which indicated most organization operate between 5 to 10 years. Other than that, MITI (2005) mentioned Malaysia is recognized as world's leading location in E&E industry, especially in testing operation and semiconductor assemble which consists RM 90 billion in term of export figure in 2005. Thus, this statement gives supportive explanation to most organization operate between 11 to 15 years

4.1 Validity and Reliability

The overall Cronbach's alpha(α) value is higher than 0.8 which indicate an extremely high reliability for each variable. Innovation score the highest value among all variable which is 0.9186 and followed by TQM, and Competitive Advantage which score 0.9098 and 0.8780 respectively.

Each measurement item was linked to its corresponding construct, and the covariance among the constructs was freely estimated. The model fit indices SRMR = 0.051, HTMT is less than 0.9 Thus, the model was acceptable Heir (2014) indicating convergent validity.Furthermore, all factor loadings were greater than 0.50 and each item's coefficient is greater than twice its standard . further demonstrating convergent validity. The estimates for the average variance extracted (AVE) were higher than 0.50 for four constructs, While there are suggestions that the minimum AVE should be 0.50 and we satisfied the more detailed criteria set by several other studies as indicated above. Therefore, our constructs have convergent validity.

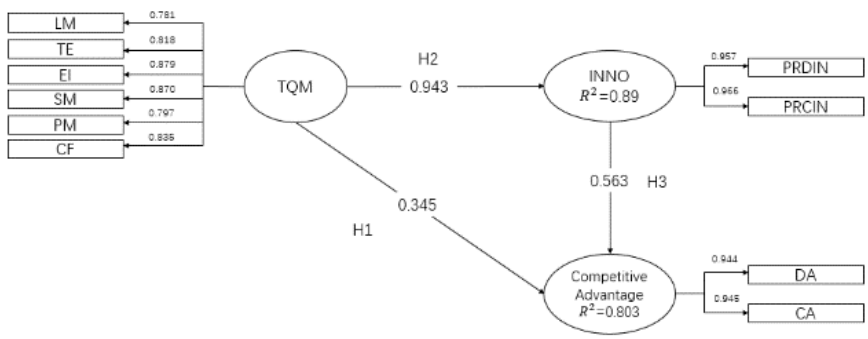

Figure 2. Total Effect of the Variables

1. H_1: TQM has a significant positive impact on competitive advantage

This study encompasses the path TQM→ Competitive Advantage, the path coefficient is 0.3453 (table 2) and t value is 67.5304. The significance level α <0.05 standard is proven for this relationship. Thus, the total quality management has a significant positive influence on competitive advantage, H_1 hypothesis is established for this study.

2. H_2: Innovation is positively mediate the relationship between TQM and competitive advantage.

This study encompasses the path of TQM→ Competitive Advantage, the path coefficient is 0.9431 and t value is 169.8292. The significance level α <0.05 standard is proven for this relationship. Therefore, the innovation is positively mediate the relationship between TQM and competitive advantage, H_2 hypothesis is established in this study.

3. H_3: Innovation has a significant positive impact on competitive advantage.

This study encompasses the path Innovation→ Competitive Advantage, the path coefficient is 0.5610 and t value is 7.0085. The significance level α <0.05 standard is proven for this relationship. Thus, innovation has a significant positive impact on competitive advantage, H_3 hypothesis is established in this study.

Table 2. Hypthesis Result

Hypothesis	Path Coefficient	Coefficient of Determination (R^2)	p-value	Status
H_1:	0.3453 (Weak Positive)	0.8025 (Strong)	0.0000	Accepted
H_2:	0.9431 (Very Strong Positive)	0.8895 (Strong)	0.0000	Accepted
H_3:	0.5628 (Moderate Positive)	0.8025 (Strong)	0.0000	Accepted

According to the research finding of this study, all hypothesis stated in previous chapter is established with valid data. Firstly, the TQM has a significant positive impact to competitive advantage. The same result is achieved by previous research to indicated there is a positive influence of TQM toward competitive advantage of organization. Witjaksono A D (2012) found that TQM practices has the significant positive effect to competitive advantage of organization whether in term of cost and differentiation advantages. Kaur M et al. (2012) also indicated the practices of TQM help organization to gain sustainable competitive advantage and improve market share.

Secondly, the innovation mediates the relationship between TQM and competitive advantage. Mahmud and Hilmi (2015) indicated that innovation and TQM are both positively related to competitive advantage. Other than that, O'Connel D (2011) found that TQM and innovation sharing the same objective for organizational competitive advantage. Although there is no previous research clearly concluded the mediating effect of innovation in the relationship between TQM and competitive advantage, the result of this study proven the following statement unambiguously

Thirdly, innovation has a significant positive impact to competitive advantage. Researcher provide some feedback and perception as implication which aimed to help manufacturing sector especially Electrical and Electronic (E&E) to have a better understanding regarding the total quality management (TQM) and innovation. Hassan et al. (2013) stated that competitive advantage could be enhanced through process innovation due to new production method and additional process applied for efficiency purpose. Furthermore, the organization which put their effort in innovation activities tend to have higher probability to maintain competitive advantage than others through financial and non-financial performance improvement (Saunila et al., 2014). After that, Llore'ns-Montes et al. (2004) found out innovation improves the flexibility of organization to tackle any uncontrollable change by create novel technology or apply new method that maintain competitive advantage.

The result of this study could be widely adopted and significant to theoretical and practical related individual or organization. For the theoretical, it could be act as reference for other research which study similar field and gained extra knowledge by understanding this study. For practical, the E&E organization could learn the way of boost up sustainable competitive advantage by innovation and TQM. Basically, the manufacturing organization need to undergo quality program to sustain themselves in marketplace. In order to keep the superior quality of product, the organizations are

highly recommended to implement TQM as their core program which consists practices to result in all-rounded outcome.

The customer demand keeps changing from day to day. Thus, the innovation is always the concern of marketplace and it could lead the organization to dominate the industry. The innovation could be product and process which emphasize internal and external of organization. The innovation must be penetrated into the manufacturing industry and embedded to organization. The process innovation could help organization to improve themselves from internal factor such as production line optimization, improve quality, greater efficiency and other important criteria that would affect the organizational competitive advantage.

The manufacturing organizations are required to have a deep understanding for competitive advantage. After implement all the practices and program, the organization need to measure the effectiveness of following program rather than refer to verbal persuasion of others. The competitive advantage could be divided into cost and differentiation. Cost differentiation help organization to mitigate the production cost and result in lower selling price. In the other hand, differentiation advantage is referring to encompass every positive element that make product different with others. By categories the outcome of program into both cost and differentiation advantage, it would make organization clearly understanding program implemented is whether make positive change toward organization or not. Based on finding of this study, the organization are highly encouraged to put more effort on innovation and TQM since these two programs are the main source of competitive advantage. The effort could be in financial support and technical mechanism in order to adopt TQM and innovation widely in organization.

Eventually, all the finding and result of this study is conducted by going through reliability and validity test. Thus, the finding of research would be helpful to researcher and manufacturing organization to keep their objectives respectively on the track.

5. Recommendations For The Future Research

There are some limitations which found in this study after finished conduct the research. Thus, appropriate suggestion is issued by researcher and suggested to other researchers whom interested to conduct similar study within Malaysia.

Firstly, future researchers are encouraged to encompass all the manufacturing instead of limited to Electrical and Electronic (E&E) sector. This study only focuses on E&E manufacturing sector due to time constraint. Thus, the future researcher should involve all manufacturing industry as respondents in order to enhance reliability and validity of data collected.

Moreover, the questionnaire which provided with statement may not really reflect the thought of respondents. The respondents asked to fill up the questionnaire by circle the option provided. Thus, future researchers could conduct interview with respondents to gain insight regarding TQM, innovation, and competitive advantage. The greater valid and reliable data would be obtained due to its subjective attribute. Other than that, the respondents background should be more detailed if future researchers proceed with google form to collect data. The staff name and ID could be required by researchers to prevent someone whom is not desired respondents to affect the validity of finding.

Furthermore, since the TQM practices could be varying and only six practices selected in this study, future researchers could conduct research other than these six practices. The practices are selected in this study due to supportive statement and suit to the geographical location. Therefore, the other practices could be conducted by future researchers and test whether these TQM practices could affect competitive advantage of organization.

Eventually, the future researcher could diversify the questionnaire by prepare multi-language version. Malaysia is a country which composed of multi-language which are Malay, English and Mandarin. This study carried out in English only may confuse the respondents who are inferiority to English. Hence, future researchers are encouraged to prepare questionnaire in triple-language version to ease the respondents and result in more valid data by avoid language ambiguous.

6. Conclusion

In technological advancement era, the manufacturing industry especially E&E is highlighted within Malaysia. It is crucial for manufacturing organization to gain sustainable competitive advantage by implement quality program which is total quality management. Other than that, innovation is acts as catalysis to foster the relationship between TQM and competitive advantage. There are six practices of TQM selected in this study and act as independent variable which are leadership management, training and education, employee's involvement, supplier management, process management, and customer focus.

The result shown that TQM has positive significant impact to competitive advantage of organization which could be divided into costa and differentiation advantage. In addition, the innovation has a significant positive impact to the competitive advantage. Meanwhile, the innovation is also positively mediate the relationship between TQM and competitive advantage. Thus, all the research objectives achieved, and research questions is answered.

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