

Management of Change and Operational Excellence in the Electrical and Electronics Industry

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Abstract

The study reveals the influence of change management (hard and soft systems) on operational excellence in Electrical and Electronics (E&E) Industry. The hard systems consist of technology, structure, and strategy, and soft systems include leadership, human resource, and culture. A survey of a sample of Malaysia's manufacturing leading sector, E&E industry was conducted. Among the key findings, there was a positive relationship between organic structure, operations strategy, transformational leadership style and human resource practices on achievement of operational excellence. The results showed that organic structure and operations strategy have effect on the achievement of operational excellence. Conversely, the manufacturing technology has not effect on operational excellence of Malaysian E&E manufacturing companies in which the hypotheses was not supported. Similarly, transformational leadership style and human resource practices were found to have an effect on the achievement of operational excellence for Malaysian E&E manufacturing companies. In contrast, the analysis showed that involvement cultural trait has no significant relationship with operational excellence, therefore, hypotheses was not supported. The implications of the findings promote better understanding of the operational excellence in E&E industry. In addition, the application of various factors in the area managing change, henceforth, adds value to both change management and operational management domains. The originality in terms of the model reflects a growing interest in extending operational management paradigms to emerging in developing country context.

Key Words: *Operational management, Operational excellence, Change management, Electrical and Electronics, Malaysia.*

Introduction

Operational management and performance have been an issue in both academia and industry for over three decades. The literature on operational excellence is growing, but Malaysian manufacturing industry is often lacking in these discussions. In Malaysia, studies of business or organizational performance were focus mainly in Small Medium Enterprises (SMEs) and little research solely in Electrical and Electronics (E&E) manufacturing. Among the studies in Malaysia manufacturing industry included Total Quality Management (TQM) practices (Arumugam, Ooi & Fong, 2008; Abdullah, Uli & Tari, 2008), business process management and reengineering (Ahmad, Francis & Zairi, 2007) and best practices (Yusuff, 2004; Anuar and Yusuff, 2011). At the macro level, competitive pressures emerging from today's market require companies to develop and maintain a high level of coherence between their strategy, actions, programmes, practices and performance. The rapidly changing landscape in the globalized market has put new demands on organizations. In order to stay ahead of competition, companies need to re-invent itself by injecting new ideas and strategies to achieve business excellence (Fok-Yew, Ahmad & Baharin, 2013). Excellence can be

achieved by meeting or exceeding the expectations of all stakeholders. Nonetheless, pursuing excellence keeps companies on right track to achieve their goals and mission. More important, companies today face incredible pressure to continually improve the products quality while simultaneously reducing cost, remain flexible, to meet short lead time delivery, everlasting legal, environmental and social requirements. The ability to achieve these goals depends to a large extent on how the managing its resources against the ongoing changing environment (Ahmed & Gelaidan, 2013; Duggan, 2011).

To guide organizations on their journey towards excellence, investigations have largely focused on the identification of critical variables that might better explain how organizational change can be managed to the best effect (Saka, 2002). Therefore, the paper provides an insight in understanding the contemporary influential systems that affect business excellence, particularly excellence in operations. The influential systems may serve as pre-conditions for any companies before embarking on the management of organizational change. The influential systems could be categorized either a 'soft' or a 'hard' (Peters & Waterman, 1982). Peters and Waterman recognised the important of soft dimension in terms of skills, staff, style, system and shared values along with structure and strategy of hard dimension. Furthermore, Kirk (1995) described hard system have precise objectives that can be expressed in mathematical terms while soft systems are used in relation to human activities where there is unlikely to be agreement about the precise objectives of the system.

In discussing the operational excellence, most of the researchers and practitioners like to relate it with manufacturers. The fact is, manufacturing operation is one of the prime strategic functions in any business. Manufacturing operation whether achieves its competitive position and strategic potential or not solely depends on how it runs its business (Fok-Yew et al., 2013; Yusuff, 2004). Additionally, as manufacturing firms encounter global competition and the pressure to become global, there is a demand for firm's ability to manage its organizational resources with the desire to attain operational excellence at global level.

When review the development in the world business market such as the issues of globalization, fierce competition and technology advancements, Mokhtar and Yusoff (2009) suggested that manufacturing organisations in Malaysia need to have an ability to adjust and change to survive the challenging business environment. Organizations need to have a new set of capabilities to ensure their survival and growth in the market. Managers in a firm need to build its own internal competencies to deal with organization issues, change, and strategizing. Even through E&E manufacturing sector is an important contributor to Malaysia's economic with manufacturing output, exports and employment, however, Malaysian E&E industry faces significant challenges in maintaining growth with growing competition from Taiwan, Singapore, China and other Asian countries. The E&E's share of Malaysia's exports has gradually declined over the last 10 years from 59 percent in 2000 to 41 percent in 2009 (ETP Annual Report, 2011). Therefore, Malaysia E&E's organizations need to have a new set of capabilities to ensure their survival and growth in the market. Managers in a firm need to build their own internal competencies to deal with organization at issues, changes, and strategies.

Therefore, present study reveals the insight of Malaysia electrical and electronics (E&E) firms managing change that influences the operational excellence. In fact, the E&E industry is the leading sector in Malaysia's manufacturing sector, contributing significantly to the country's manufacturing output (26.94 per cent), exports (48.7 per cent) and employment (32.5 per cent) (MIDA, 2012). The study incorporates both the hard systems (manufacturing technology, organizational structure, and operations strategy) and soft systems (leadership style, human resource, and organizational culture) under the change management that influence operational excellence.

Literature Review

Resource-Based View (RBV)

On the operational excellence, RBV is found appropriate, presenting internal resources as a crucial element to gaining a sustained competitive advantage and superior performance that is the operational excellence

(Barney, 2001; Ferreira & Azevedo, 2007). The current study corresponds to the hard and soft systems in E&E to the operational excellence. The core competencies explain the companies' competitive success based on their competencies (Ritter & Gemunden, 2004).

The resource-based view (RBV) highlighted the firm as a unique collection of resources (Barney, 1991), but emphasizes that not all resources possess the potential to provide the firm with a sustained competitive advantage (Clulow, 2007). Previous literature on the RBV has frequently focused on resources as a stable concept that can be identified at a point in time and will endure over time (Wright, Dunford, & Snell, 2003). RBV focused on strategic context, presenting resources and capabilities as essential to gaining a sustained competitive advantage and superior performance (Ferreira & Azevedo, 2007; Abu Bakar & Ahmad, 2010a).

RBV points to intangible resources as the main drivers of the sustainability of performance differences across firms. In fact, such assets that are scarce, specialized and difficult to trade, imitate, or appropriate are viewed as intangible (Barney, 2001). A variety of definitions have been offered when refer to these resources, including both tangibles and intangibles, and monetary and non-monetary (Abu Bakar & Ahmad, 2010a,b). Therefore, the argument established in this study is focus on the managing firm's resources as determinants for operational excellence. The changes of the firm's resource were identified through the operational excellence indicators.

Operational Excellence

According to Hillman (1994), assessment of excellence is the process of evaluating an organization against a model for continuous improvement in order to highlight what has been achieved and what needs improving. European Foundation for Quality Management (EFQM, 2010) defines excellence as "outstanding practice in managing the organization and achieving results". Van Assen (2011) argued that operational excellence is not just a matter of cost reduction and quality improvement, but also being smart about how to handle people and resources. It requires solid change management capability and strong leadership to become operational excellence. Operational excellence is also very much dependent on employees' empowerment, ownership and a culture of continuous improvement. Its adoption and introduction usually confronts a company with the need to change the way its employees think and act.

Mann, Adebajo and Tickle (2011) conducted an investigation the use of business excellence in Asian organizations. Organizations in the manufacturing sector accounted for more than 40 percent of the total survey population. Even through organizations believe that deploy business excellence is important in helping them reach key objectives but the Asian region still suffers from some barriers including lack of development of a business excellence culture, a lack of resources and a failure to fully train the staff in business excellence. This study examines the deployment of business excellence in five Asian countries (Japan, India, China, Thailand and Singapore) would be a gap undertake future study on other Asian counties which maybe at different stages of business excellence maturity.

In recent study, Waal (2013) examined factors that lead to sustained excellence whether they are "evergreen" or stayed the same over time. The eight factors included organizational design, process, strategy, technology, leadership, individuals and roles, culture, and external orientation. The finding shown that nearly 90 percent of the factors that create excellence found in studies done in and before 1995 are also found in studies done after 1995. Although the characteristics of factors may shift from time to time, however, those factor found to seem qualify as "evergreen of excellence" that are always crucial for creating and maintaining a high performance organization. In this respect, the research into factors that create excellence, as found in the earlier or recent literature, are constant over time.

In this study, results from application of operational excellence are focused operational performance and organizational sustainable performance. Operational performance reflects the performance of internal

operations of a company in terms of quality improvements, flexibility improvement, delivery improvement, productivity improvement, cost and waste reduction. On the other hand, sustainable performance is one of the contemporary business issues, organizations must find ways to foster and environmental prosperity while creating economic prosperity (Fok-Yew et al., 2013). The organizational sustainable performance indicator measures in present study are environment performance and social performance, while the financial measures such as sales growth, profit growth, return on equity (ROE), return on assets (ROA) and gearing (Hubbard, 2009) were ignored. In fact, many E&E manufacturing firms in Malaysia are owned by foreign investors and may listed in the their home country, thus the respondents may not be privy to the information and data related to financial performance. Although performance can be measured either as financial performance or as operational performance, operational priorities are more relevant than financial goals at the plant level (Brown, Squire & Blackmon, 2007). It is therefore the discussed performance indicators (quality, time, flexibility, cost and sustainability) were used to measure firm performance in achieving operational excellence. More specific, the dependent variable, operational excellence was operationalized by quality, flexibility, speed, cost, social and environmental in present study. Moreover, managing people, technology, leadership, strategy, structure, culture and employees' involvement to change are important variables affect the operational excellence.

Change Management

Due to the fact that the future and success of every organization depends on how well manager handle change (Kalyani & Sahoo, 2011), therefore, discussion on this research is assessing the relationship between change management and operational excellence. Change management means planning and realizing changes that concern organization's strategic success factors. These success factors might be the meaning of it, its policies, competencies and the capability of renewal. The firm critical success factors that influence organizational changes also identify through the empirical evidence (Ahmad et al., 2007; Fok-Yew et al., 2013).

The success criteria behind excellence, hard and soft systems are important in managing change which allowed managers to strike a balance between the 'hard-s' and the 'soft-s' systems of business. However, there is little agreement on what factors have most influence the organizational in change initiatives. In addition, the integration of soft and hard systems to predict operational excellence may not have a profound understanding by both academic and practitioners.

Manufacturing Technology

Modern technology is playing a key role in the ability of manufacturing companies to compete as world-class enterprises. Therefore, new manufacturing technologies are needed to assist in compressing the production time to move products to the market more quickly and efficiently than competitors (Chuang, Yang & Lin, 2009). Indeed, acquiring and implementing new technologies are perceived as high-risk investments and determinants of competition. Manufacturing technology has come from many sources. For example, flexible manufacturing system (FMS), enterprise resource planning (ERP), office automation (OA), computer, all of which are focused on doing things better, faster, more efficiency, and more cheaply.

But the field is rather scattered with many articles focusing on one or a limited set of new technologies, while the reasons why these technologies are considered best are often not accounted for. Moreover, why these technologies, not others, the authors regard the set as comprehensive remains unclear. Therefore, having realized that there is lack of integrated manufacturing technologies; it has driven the authors to make comparison of the manufacturing technology deployment among firms.

In this study, the manufacturing technology management construct consist of *selection, acquisition* and *exploitation*, is based on three out of five technology management assessment indicators in the study of Kurupparachchi & Perera (2010). This justifies that even the organizations are capable of selection and

acquisition of new technology, lack of technology exploitation or enhancement would lower down the performance dimensions, especially quality, cost, delivery, flexibility and sustainability, which is in line with Ahmad & Ahmad (2009). Thus, the following hypothesis captures the relationship between manufacturing technology and operational excellence.

H₁: The use of the manufacturing technology leads to an impact on achievement of operational excellence.

Organizational Structure

The major dimensions that characterize an organization's structure are its degree of centralization of decision making, and the formalization of rules and procedures. In order to achieve higher performance, appropriate structure is needed which suits best in changing organization's demand. The choice of an appropriate structure highly depends upon the condition in which an organization is operating (Mansoor, Aslam, Barbu, Capusneanu & Lodhi, 2012).

For instant, stable and change environment cannot be treated equally. Ashkenas, Ulrich, Jick and Kerr (1995) argued almost every organization experimented with some kind of structural change process. In order to match up with environmental changes, organizations must adopt optimum innovative organization design (structure) leads to superior performance. Ahmad et al. (2007) highlighted the importance of organic structure and supported by recent research, Mansoor et al. (2012) suggested that organic structure works well under dynamic or change environmental condition, especially in private sector in terms of performance as well as effectiveness where employees are involved in decision making.

Rather than using the dichotomy proposed by Burns and Stalker (1961), which considers the level of formalization and centralization, this study focused on formalization and decentralization. It described an organic structure as having formal rules and procedures that encourage creativity, autonomous work, learning, and decentralization of decision making to the greatest extent possible (Nahm, Vonderembse, & Koufteros, 2003). Therefore, it was interesting to explore this organic structure have significant relationship on operational excellence in Malaysia E&E industry. The hypothesis proposed as follows:

H₂: The implementation of an organic structure will have an impact on achievement of operational excellence.

Operations Strategy

Operations strategy literature has often been contextualised within manufacturing paradigms (Brown, Squire & Lewis, 2010). They summarized that firm's operations were linked to specific modern manufacturing terms which included mass customization, flexible specialisation, lean production and lean supply, agile manufacturing, strategic manufacturing. Operations strategy has often been written as an entity within itself, aside of the strategy or business mainstream. The monitoring mechanisms include operations strategy construct consists of four dimensions (i.e. flexibility strategy, quality strategy, delivery strategy, and cost strategy) used by Skinner (1974), and Schniederjans and Cao (2009).

A study of the literature reveals there are gaps in the previous literature including the specific links between change capability and operations strategy; and the links between these two entities and performance measures at manufacturing. To surpass this shortcoming, a new focus was on change capability in operations strategy to predict operational excellence in quality, flexibility, time, cost (Brown, et al., 2010) and sustainability (Muogboh & Salami, 2009). Additionally the change capability in operations strategy is based on Skinner's (1969) initial framework. In view of this, this research hypothesizes that:

H₃: Well defined of an operations strategy leads to achieving operational excellence.

Leadership Style

Leadership is the other key component of successful change. Leadership is the first criterion of the European Foundation for Quality Management (EFQM) Excellence Model, a model of organizational excellence which is used by more than 30,000 organizations across Europe (EFQM, 2010). While change management depends on leadership to be enacted, specifically, the leadership style that is primarily concern with the capabilities required enacts change successfully (Idris & Ali, 2008). Recent study by Abrhiem (2013) further addressed the importance of success in enacting change is a crucial issue faced by today's organizational leaders of today. Indeed, most of the research on the leadership paradigms has focussed on its relationship to followers (Bass & Avolio, 1994; Shin & Zhou, 2003); the success of TQM programs (Choi and Behling, 1997); organizational outcomes such team performance (Sauer, 2011); and financial performance (Idris & Ali, 2008). Based on researchers' knowledge, there were limited literatures done on leadership styles and its impact on operational excellence in manufacturing industry, especially in the Malaysian setting.

Leadership has been recognized as a major factor on organization success and this has been empirically validated throughout many fields (e.g. Ahmad & Gelaidan, 2011). However, a leadership style in the context of change management and its impact on operational excellence in manufacturing industry has not been as widely research. Moreover, a transformational style of leadership is perceived can produce positive organizational change and create exceptional performance than transactional and laissez-faire leadership (Ahmad & Gelaidan, 2011; Bass, 1985; Boehnke, Bontis, DiStefano & DiStefano, 2003). In the present study, we are interested in examining the positive impact of transformational leadership style on operational excellence. Hence, the researchers offer the following statement of hypotheses:

H₄: The inclination towards the transformational leadership style leads to achieving operational excellence.

Human Resource

Any change program would revolve around people, changing their mind set, behaviour and motivational level. Human resource has always been central to organizations, to-day it has taken on an even more central role in building a firm's competitive advantage. Success increasingly depends on "people-embodied know-how". Thus, includes the knowledge, skills, and abilities imbedded in an organization's member. Kalyani and Sahoo (2011) argued Human Resource is an intellectual asset, the sum total of the knowledge, skills and competencies that an organization processes and channelizes for sustained organizational excellence. Excellence is surpassing on outstanding achievement, achievable by the use of Human resource strategies and practices as tool.

Court (2011) suggested the future role of the Human resource function should focus on helping their organization to learn how to build a capability to change. In authors view, the human resource practices are Human resource tools use by organization to achieve excellence. However, very little attention has been paid to address the impact of managing human resource change on operational excellence.

The universal use of Human resource practices such as recruitment and selection, training and development, performance appraisal, and compensation and benefits (Ferguson & Reio Jr., 2009; Gurbuz & Mert, 2011; Kalyani & Sahoo, 2011) could be explored in present study to predict operational excellence. New knowledge generate from this study could inform theory building efforts in the Human resource field, particularly as it related to human resource-based view to meaningful organization outcomes and in due course excellence. Therefore, we hypothesize that human resource practices lead to positive impact to operational excellence.

H₅: Effectiveness of human resource practices leads to an impact on achievement of operational excellence.

Organizational Culture

Operational excellence is an enterprise culture that improves the way a corporation delivers products and services to its customers. Operational excellence calls for more than subject matter expertise and a talented internal team. It requires a deep commitment and a culture of change. Changing to a culture of continuous improvement usually requires a paradigm shift. This change requires taking risks, opening up the firm culture and a great capacity to learn (Markovic, 2008). You, Coulthard and Petkovic-Lazarevic (2010) suggested that a link between corporate culture traits and business performance exists. These four different aspects of culture traits can be stressed by different functions. Its *consistency* and *mission* either tend to or encourage or promote stability. However, the *involvement* and *adaptability* allow for change. Furthermore, consistency and involvement see culture as focusing viewpoint on internal dynamic of the organization. It mission and adaptability see culture as a way of life in addressing the relation between the organization and its external environment.

The present study embraces on managing change and focus on internal organization, therefore, the *involvement trait* (Internal Focus) is the best dimension to evaluate its effecting desired change within organization (Denison, Haaland & Goelzer, 2003; You et al., 2010). This trait is measured by the three indices namely empowerment, team orientation and capability development. In addition, Denison (1990) found empirical support for the involvement view of culture, higher levels of employee participation were correlated with better organizational performance. Whilst organizational culture has been researched worldwide, little research has been done in Malaysia, with its unique culture and concentrated business environment. This leads to the following hypothesis:

H₆: Higher levels of individual involvement cultural trait leads to an impact on operational excellence.

Overall, literatures indicate that firm managing change is vital in ensuring competitive advantage to the firms (Kotter, 2007). In essence, effective approaches in organizational change will involve not only one system but also have to understand other relevant systems of entire organization. Moreover, change management and these both hard and soft systems have not being integrated in any research which develop new knowledge in the study of operational excellence. Integrating change management maturity with associated hard and soft systems in order to remain competitive, is absent in most Operational Excellence initiatives.

Research Methodology

Population and Sample Size

The nature of the problem in this study determines that it leans more towards a causal. The main goal of causal research is to identify cause-and-effect relationship among variable. The literature review was carried-out in sufficient details to provide the understanding on the change management and operational excellence. The researchers also investigated how the previous studies done in order to study the relationship of both change management and operational excellence. Therefore, the researchers believed that it is appropriate to consider the manager who involved in the manufacturing operations to give inputs on the subject matter. In this context, samples of the population are drawn from the FMM-MATRADE Industry Directory Electrical and Electronics Malaysia 2007/08 (FMM, 2008) and Federation of Malaysian Manufacturers (FMM) Industry Directory 2012 of Malaysian Manufacturers (FMM, 2012). The sampling frame of this study is the manufacturing companies from electrical and electronics industry situated in Malaysia. By using systematic random sampling method, 321 manufacturers were identified from population of 1952 firms. All questionnaires were distributed to the respondents using postal mail. The unit of analysis for this study was organizational where one respondent represent one organization. Between February 2013 and June 2013, a total of 121 usable questionnaires were obtained which yielding a response

rate of 37.7 percent. Therefore, the response rate was normal and acceptable as compared with past studies in Malaysia.

Instrument Development and Measurement

The survey questionnaire was developed based on early studies (Laugen, Acur, Boer & Frick, 2005; Hubbard, 2009, Kuruppuarachchi & Perera, 2010; Nahm, et al., 2003; Cruz & Camps, 2003; Skinner, 1969; Oltra & Flor, 2010; Bass & Avolio, 1992; Snell & Dean, 1992; Denison et al., 2003; You et al., 2010). The Table 1 summarizes the reliability test of the measures. The results showed that all the Cronbach's Alphas measures were above the lower limit of acceptance ($\alpha > .70$). Therefore, all the measures were highly reliable (Hair, Black, Babin & Anderson, 2010).

Table 1: Summary of variable measurement

Variables Names	Cronbach's Alpha	N of Items	Authors
Operational excellence	.942	23	Laugen, et al. (2005); Hubbard (2009); Kuruppuarachchi & Perera (2010).
Manufacturing technology	.871	12	Kuruppuarachchi & Perera (2010).
Organizational structure	.820	8	Nahm, et al. (2003); Cruz & Camps (2003).
Operations strategy	.780	11	Skinner (1969); Oltra & Flor (2010).
Transformational leadership	.915	12	Bass & Avolio (1992).
Human resource practices	.843	12	Snell & Dean (1992)
Organizational culture	.772	9	Denison et al. (2003); You et al. (2010).

In a Likert scale, each respondent was asked to indicate the extent of each statement on a five-point. The options given in the questionnaires for Section A are "strongly disagree (1)"; "disagree (2)"; "Neutral (3)"; "agree (4)"; and finally "strongly agree (5)". For Section B, respondents are requested to rank their answers to 5-points Likert-type interval scale, ranging from 1 for "worst in industry (1)"; 2 for "bad in industry"; 3 for "average in industry"; 4 for "good in industry" and 5 for "best in industry". Thus, researchers were able to solicit answers about the given statement through a set of response keys.

Data Analysis

The data analysis tools such as Statistical Package for Social Science (SPSS) software was used to process the data obtained from this survey. Responses on all parts of the questionnaire was analyzed using frequency, means, standard deviations, reliability, and inter correlations to calculate different characteristics of the data. Factor and reliability analyses to test the goodness of measures, descriptive statistics to describe the characteristic of respondents, and correlation analysis to describe the inter correlation among the variables. Moreover, multiple regression analysis was used to achieve the objective with testing the hypothesis.

Results and Discussions

Profile of the Respondent Companies

The E&E industry is further breakdown to four sub-sectors which included (1) consumer electronics (2) electronic components (3) industry electronics and (4) electrical products (MIDA, 2012). As presented in

Table 2, the majority of the manufacturing firms that responded to the survey were under the electronic component sector which comprised 43.8 percent of the number of respondents, followed by those in industrial electronics (24.8%), consumer electronics (15.7%) and electrical products (15.7%).

Table 2: Respondents by sub-sector

Sub-sector	Frequency	Valid Percent
Electronic components	53	43.8
Industrial electronics	30	24.8
Consumer electronics	19	15.7
Electrical products	19	15.7
Total	121	100.0

Descriptive Analysis

The means and standard deviations of each variable were shown in Table 3. The results of Pearson's correlation test for independent variables and dependent variable was shown in Table 4. This result revealed that all the independent variables and dependent variable were positive and significant at a level of 99 percent. The strength of relationship varies from lowest at 0.456 and to the highest at 0.616. These findings support the notion that change management systems as predictor variables had a positive correlation and linear with operational excellence. On the other hand, the correlation was also further evidence of validity and reliability of the measurement scales used in this study.

Table 3: Means and standard deviations

	Mean	Std. Deviation
Manufacturing technology	3.7397	.55752
Organizational structure	3.5341	.52017
Operations strategy	3.8933	.39464
Transformational leadership style	3.6515	.56765
Human resource practices	3.7576	.48233
Organizational culture	3.7530	.41857
Operational excellence	3.7373	.48899

Table 4: Pearson's correlation test for independent variables and dependent variable

	Operational Excellence	Manufacturing technology	Organic structure	Operational strategy	Transformational leadership style	Human resource practices	Involvement cultural trait
Operational Excellence	1						
Manufacturing technology	.562**	1					
Organic structure	.570**	.472**	1				
Operational strategy	.604**	.616**	.486**	1			
Transformational leadership style	.611**	.596**	.487**	.495**	1		
Human resource practices	.607**	.611**	.532**	.524**	.524**	1	
Involvement cultural trait	.561**	.514**	.471**	.456**	.559**	.587**	1

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

* Correlation is significant at the 0.05 level (2-tailed)

Testing of Hypotheses

In order to measure the combined effect of all the change management systems towards operational excellence, the analysis of multiple regression was performed on the variables in question. Refer to Table 5, results from the analysis of multiple regression show that among six systems of change management which were proposed to have a significant relationship with operational excellence, four of them were significantly supported. All four systems namely organizational structure, operations strategy, transformational leadership, and human resource practices were found to have positive and significant ($p < 0.05$) relationship toward operational excellence, with Beta value of .175, .242, .228, and .184 respectively. This statistical result suggested that operations strategy have the strongest effect (most important) on operational excellence in this study, follow by transformational leadership, human resource practices and organic structure. However, manufacturing technology, and involvement cultural trait failed to produce sufficient support of significance in their relationship towards operational excellence. In sum of that, hypotheses H2, H3, H4 and H5 were supported, whereby H1 and H6 were not supported.

In *Model Summary* at Table 5, the adjusted R Square (.576), which is explained the change management (composite independent variables) accounted 57.6 percent of the variance (R squared) in operational excellence (dependent variable). According to Cohen (1998), R Square between the range of 1.0 to 5.9 percent is consider as small size, follow by the moderate range between 5.9 to 13.8 and range which is above 13.8 percent is consider large. In the result of multiple regression analysis, the R Square, .576 means 57.6 percent consider large effect. Therefore, the results explain that is 57.6 percent of the variance (R Square) in operational excellence has been significantly explained by the six independent variables under change management.

Table 5: Results of multiple regression analysis of change management and operational excellence

Variable	Coefficient			Model Summary
	B	T	Sig.	
Manufacturing technology	.019	.211	.834	R square: .576 Adjusted R square: .554 F: 25.836, P < .000 df1: 6, df2: 114 Durbin-Watson: 1.852
Organic structure	.175	2.244	.027*	
Operations strategy	.242	2.938	.004*	
Transformational leadership style	.228	2.710	.008*	
Human resource practices	.184	2.091	.039*	
Involvement culture trait	.123	1.499	.137	

Discussions

Responding to the hypotheses, this study found two out of three change management hard elements have effect on operational excellence of Malaysian E&E manufacturing companies. The results showed that *organic structure* and *operations strategy* have effect on the achievement of operational excellence. The hypotheses were positive and significant and thereby confirmed. Conversely, the *manufacturing technology* has not effect on operational excellence of Malaysian E&E manufacturing companies in which the hypotheses was not supported. Similarly, this study also found two out of three change management soft elements have effect on the achievement of the company's operational excellence. *Transformational leadership style* and *human resource practices* were found to have an effect on the achievement of operational excellence for Malaysian E&E manufacturing companies. The hypotheses were positive and significant and thereby confirmed. In contrast, the analysis showed that *involvement cultural trait* has no significant relationship with operational excellence, therefore, hypotheses was not supported.

Even through the relationship between manufacturing technologies which is the hypothesis, H₁ is not supported. The finding obtained in the present study appears to be consistent with other studies that looked

into similar issue on operational performance. Past studies support that both continuous improvement technique and adoption in manufacturing technology becomes a critical success factor for a firm but empirical and anecdotal evidence reveals that many firms are not getting their expected results from the investment in manufacturing technology or automation (Sim, 2001). They concluded that higher levels of advanced manufacturing technologies (AMT) or automation investment were not associated with higher quality, productivity or flexibility. Present finding is contrary to the hypothesized positive relationship, but strongly aligned with the finding in Kurupparachchi and Perera (2010) where they found manufacturing technology has no significant direct relationship on operations performance simultaneously with best practices. Arguably, selection, acquisition and exploitation of technology management have been found to be one of the most lengthy, expensive, and complex tasks a firm can undertake. In view of this, manufacturing technology is not considered as a good predictor on operational excellence in this study.

Another possible explanation could be due to Malaysian E&E industry may appear to be not fully automated. Majority of the responded companies are still using labor intensive rather than capital intensive. According to research carried out by Phillips & Henderson (2009), the integration of Malaysia's electronic industry into global production networks is dependent on low cost and labor-intensive production. Furthermore, the descriptive analysis revealed that company work force between 500 to 1000 employees and above 1,000, both comprises 62 percent of the total respondents. This justify that nature of Malaysian E&E manufacturing operations is much depend on human to operate, also to achieve high performance. Hence, as this variable is insignificant for E&E manufacturing companies which still labor-intensive production, this result deserves further analysis in future research.

The result of multiple regression analysis shows organic structure has positive and statistically significant relation with operational excellence. Therefore, H_2 is fully supported. In this study, the organic structure dimensions included both formalization and decentralization is a good predictor on achievement of operational excellence. This result support the view of Mansoor et al. (2012), who suggested that an organic structure works well under dynamic or change environmental condition, especially in private sector in terms of performance where employees are involved in decision making. In this study, all respondents are from private sector. Data analysis also revealed that most of the E&E manufacturers in Malaysia are fully foreign owned or multinational companies was 62%. According to recent study by Shah, Yusaff, Hussain, and Hussain (2012), multinational companies' structure dimension is tends to be decentralization rather than centralization because decentralization helps local motivation and morale, therefore, increase the firm's effectiveness.

Furthermore, most of the E&E manufacturing companies participated in this study were ISO9000/14000 certified (FMM, 2008; FMM, 2012). Therefore, organizational structure is well defined the duties and responsibilities attached to each functional role as per ISO standards requirements. High degree of formalization tends to have formal rules and procedures that encourage creativity, autonomous work, learning, and decentralization of decision making to the greatest extent possible (Nahm et al., 2003). The analysis result shows that under the change management environment, the organic ideal type who emphasizes role flexibility does influence the operational excellence.

Recapitulating on the effect of hypothesis H_3 , well defined of an operations strategy leads to the achievement of operational excellence. The final result from the empirical data analysis shows that operations strategy is positive and significantly affect on operational excellence. This finding is theoretically consistent with the finding where they have empirical shown that operations strategy that consists of quality, flexibility, time, cost (Skinner, 1974; Brown et al., 2010) were viewed as an effective of operations capability for achieving business excellence. This result support earlier studies by Chenhall (2005), which claim that operations strategy is associated with either operations performance or business performance. Another plausible explanation for this positive and significant result in this study may be associated with the well defined of operations strategy consists of quality strategy, cost strategy, flexibility

strategy and delivery strategy were used by Skinner (1974) and Schniederjans and Cao (2009) were better to predict operational excellence in quality, flexibility, time, cost (Brown, et al., 2010).

Another interesting findings from this study is operations strategy have significant effect on both economic and non-economic performance. This study not only validated the operations strategy have direct and positive relationship with operation priorities, but rather new to conclude that operations strategy also a good predictor on sustainability performance. The current findings offer contribute to fill up the performance gap which pointed out by Muogboh and Salami (2009) concerned the past studies on manufacturing studies have neglecting social performance measures.

This study also has provided evidence that transformational leadership style have a significant positive effect on operational excellence. The hypothesis, H₄ accepted is not surprising because strong theoretical and practical support transformational leadership is enacting change successful. Present study also concur with the findings of past study by Bass (1985), and Boehnke et al., (2003) who claimed that the transformational leadership style can produce positive organizational change and create exceptional performance. Furthermore, transformational leadership is directly correlation to long-term high performance (Cameron, 2008; Ahmad & Gelaidan, 2011), therefore, towards business sustainability.

This study adds another perspective into the earlier findings conducted in Malaysia, Idris and Ali (2008) found that the transformational type of leaders will give impact to company performance if best practices management takes place. Under these argument, transformational leader who promote the adoption of best practices leads to superior performance. This finding is consistent with the results from prior studies (Laugen, et al., 2005; Yusuff, 2004; Anuar & Yusuff, 2011) on companies that adopted best practices showed better operation performance. In this study, the effect of transformational leadership style on achieving operational excellence is supported. In other word, lower and middle management of Malaysian E&E manufacturing companies perceived their top management use transformational leadership style in pursuing excellence.

In this study, the statistical result revealed that the human resource practices have effect on operational excellence of Malaysia E&E manufacturing companies in this study. Therefore, the hypothesis, H₅ is fully supported. This finding is consistent with earlier studies by Kalyani and Sahoo (2011) who argued human resource is an intellectual asset that channelizes for sustained organizational excellence. This study also support past studies that the human resource practices included recruitment and selection, training and development, performance appraisal, and compensation and benefits, are human resource tools that used by organization to achieve excellence (Ferguson & Reio Jr., 2009; Gurbuz & Mert, 2011; Kalyani & Sahoo, 2011).

Moreover, above findings strongly support the empirical findings by Lee and Lee (2007), who suggested that human resource management practices help organizations to in improve their business performance such as firm's product quality, flexibility, and employee's productivity. The aforementioned results have also provided the required empirical support that influence of human resource management practices indicating positive and significant relationship on organizational performance in the area of research for the past 25 years (Qureshi, Hijazi, & Ramay, 2007). The finding of present study provides empirical evidence again on the role of human resource practices on the achievement of operational excellence. Obviously, the human resource has taken into account as a crucial factor in E&E organizations to develop internal capabilities for better fit with changing environment.

The result indicates that the involvement cultural trait, H₆ does not significantly have any impact in achieving operational excellence. The involvement cultural trait comprises of empowerment, team orientation and capability development does not play any major roles in the effectiveness of operational excellence. This finding is similar with past research showed that different cultural traits were related to different organizational effectiveness measures (Nasir & Lone, 2008; Abu Bakar & Ahmad, 2010). For

example, Denison and Mishra (1995) found that innovation was best predicted by the traits of involvement and adaptability. This finding also very consistent with the studies by You et al. (2010). In that study, they empirically argued that involvement cultural trait was considered very important by respondents, yet multiple regression identified it had little to do with explaining changes in business performance. Similarly, the result as obtained in present study in the simple regression analysis indicates that although involvement cultural trait is a key enabler, its application has no significant effect on operational excellence under change management.

Another plausible reason of insignificant relationship between involvement cultural trait and operational excellence was in the way the culture trait was measured. In previous studies by Denison (1990), and You et al. (2010), culture trait was measured on the four major aspects which are namely involvement, consistency, adaptability, and mission. Recently study, Rajala, Ruokonen, and Rusimaki (2012) argued that organisational culture is a complex concept and not easy to capture or define. Every organisation reveals a different culture. Some organisations have a "strong" culture and others have a "weak" culture. How is it possible to decide which kind of culture an organisation has? This study embraces on management of change and concentrate on internal organization, therefore, only involvement trait was measured. If use more than one cultural trait to predict excellence, they able to cover more types of organization situations. Thus, this result deserves further analysis in future research.

Furthermore, present study supports resource-based view (RBV) theories. The RBV on inimitable resources and dynamic capabilities suggested that organizational should have their own competence according to knowledge resources. These competencies must be rare and unique. Moreover, researchers also found many of resources and capabilities on which competitive advantage is based reside in the operations function (Lucas & Kirillova, 2011). Firstly, RBV suggested firms to formalize organic structures and to amass resources. Firm tend to do so will attain better performance levels than those that do not. Secondly, RBV may help operations strategy to better integrate the sources of strategic advantages within a coherent portfolio of optional capabilities towards the world practices. In addition, a resource view of the operations strategy focused on its ability to manage operations well, developing operations excellence (Waters, 2006). Thirdly, RBV may assist operations reach up to the leadership of excellence, the transformational leadership style will ensuring a firm's resources, competencies and capabilities are appropriately used as competitive weapons. Fourthly, RBV helps to providing clear rules to develop and train human resource and retain talents in a systematic manner. Thus, the argument established in this study was organic structure, operations strategy, transformational leadership style and human resource practices.

Conclusion and Future Research

This study is on the relationship among the change management and operational excellence. The multiple regression results revealed that the organic structure, operations strategy, transformational leadership style and human resource practices statistically significantly and positive relation with the achievement of operational excellence. In contrast, this study has showed that manufacturing technology and involvement cultural trait have no relationship between change management and operational excellence. Approaches to theory uses, this study utilize resource-based view.

The limitations identified would potentially represent opportunities for further exploration in future research. First, this study is a cross sectional study, as it is carried out once and represents the issue at a specific time. Therefore, future study may look into a longitudinal study in order to expand the findings that are pre-changes and post-changes. Second, this study used the Electrical and Electronics (E&E) manufacturing firms that have high foreign ownership but also many restrictions in responding to the study. It is suggested that using Malaysian local owned firms like small-medium enterprise (SME) or small-medium industry (SMI) may add more insight. In addition, future study in service industry will add richness to the area of interest. Third, this study had proven the important of few change management systems in affecting the achievement of operational excellence. In contrast, further studies could focus on

others systems or dimensions which have been excluded in this study. Fourth, future study can also investigate the change management due to external environment. Perhaps it will be able to provide a new insight on how firm react to external force and also improve the operational performance.

An evident in the data analysis findings above, this study has provided several contributions to practice, methodology and theory. The practical implications for E&E manufacturing organization is success in change initiatives depend on proper integration of organic structure, operations strategy, transformational leadership style and human resource practices. Hence, management is advised to establish policy, systems and process that integrate all four systems in their planning and strategic direction. This study has showed that manufacturing technology and involvement cultural trait have no relationship between change management and operational excellence. It is still necessary to develop appropriate technology and involvement culture as it helps firms to confront organizational change. Without having the significantly relationship does not mean that the elements are not important. What it indicates may be that some dimensions are not covered in this study.

On the other hand, the paper is hoped to provide the managers with the insight in order to assist them to identify the appropriate operational excellence model based on organizational needs. As for methodology contribution, this study was add-on sustainability performance metrics (non-economic measure) on top of the conventional performance metrics (economic measure) in a composite performance index by averaging scores across the six performance indicators.

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