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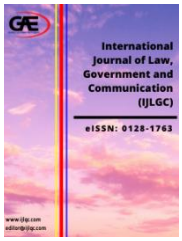

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KAIZEN CULTURE: DOUBLE THE GOOD, HALF THE BAD PERSPECTIVE OF ELECTRICAL & ELECTRONICS MANUFACTURERS

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Abstract:

Kaizen culture is extremely crucial for manufacturing companies operating in the electrical and electronics (E&E) industry in Malaysia. The productivity gains of the E&E industry is on a gradual downward trend, made worse by the current Covid-19 pandemic crisis. However, this trend could be arrested if kaizen culture is nurtured within the organization. Having kaizen culture will foster a culture of continuous improvements which is essential for productivity, thus increasing operational performance. The main aim of this study is to examine the impact of kaizen culture on operational performance as well as establishing the key attributes of kaizen culture. The data was collected through a survey conducted on 248 E&E manufacturing companies of which 127 responded. Results indicated kaizen culture having a significant positive influence on operational performance. Among the four key attributes of kaizen culture, management support ranked the highest, while kaizen promotion office ranked the lowest. For practitioners, this study confirmed that kaizen culture is vital for the optimization of operational performance to increase global competitiveness.

Keywords:

Kaizen Culture, Operational Performance, E&E Manufacturing Companies In Malaysia

Introduction

The current Covid-19 pandemic crisis has drastically affected Malaysia‟s industrial production output for the manufacturing sector. According to the Department of Statistics Malaysia, the industrial production index (IPI) significantly decreased by 32% in April 2020 in comparison

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with the same month last year (DOSM, 2020). The index of manufacturing suffered the highest decrease of -37.2%, while the indexes for mining and electricity also decreased by -19.6% and -19.2% respectively. It was further reported that the manufacturing sector‟s output in April 2020 reduced 37.2% on year-on-year basis with the electrical and electronics (E&E) industry contributing 34.1% of the loss. This data is alarming as the E&E industry is seen as the backbone of Malaysia‟s economic growth. In 2019, the E&E industry contributed 5.6% towards the nation‟s gross domestic productivity and 37.8% of the total exports at approximately RM986.4 billion (MPC, 2020 p.15 and p.32). Although the government is optimistic that the E&E industry will be able to quickly recover from the recent setback caused by the Covid-19 pandemic crisis, the manufacturing companies operating in the E&E industry will be facing extremely challenging times in the coming months.

Under today‟s turbulent conditions, operational performance becomes the main concern of E&E manufacturing companies. These companies are under tremendous pressure to perform well as prior to Covid-19 pandemic crisis, the business environment was already facing business contraction due to global competitiveness and high customer demands in product quality and options. Thus, E&E manufacturing companies need to step up on their effectiveness and efficiency in terms of quality, cost, delivery, flexibility, and speed of new product introductions, in order to achieve the desired operational performance (Abdallah et al., 2016; dos Santos & Tontini, 2018). Operational performance is extremely critical for E&E manufacturing companies as operational gains can be subsequently used in competitive pricing (Hallam et al., 2018). Ultimately, this will then lead to the overall growth of the company and its performance.

Recent studies have already established that the implementation of kaizen tools and techniques or practices in the manufacturing sector has significant impact on operational performance (Belekoukias et al., 2014; Bevilacqua et al., 2017; Janjić et al., 2020; Panwar et al., 2018). These tools and techniques are usually adopted in lean enterprise, lean management system, and lean manufacturing or production, to name a few. However, under the „new normal‟, what should E&E manufacturing companies focus when they resume their operations? This study theorized that E&E manufacturing companies in Malaysia should harness kaizen culture as a means to overcome the current uncertainties and disruptions in the business landscape. Having kaizen culture within the organization nurtures and develops an environment that is conducive for continuous improvement and innovation (Bevilacqua et al., 2017; Chattergoon et al., 2014). In fact, kaizen culture enables front line production employees of E&E manufacturing companies feel empowered in using the next generation of knowledge and engaging in the art of possible within their organizations (Hirzel et al., 2017). This is crucial if manufacturing companies want to increase their operational performance.

Despite numerous research being conducted on kaizen, most of the past studies focused on implementation of kaizen, with limited attention given to the effectiveness and sustainability of these kaizen principles (Bhamu & Singh, 2014). In addition, evidence from a systematic review indicated that Malaysian researchers have largely assessed the extent of kaizen adoption, but not on whether kaizen culture adoption impacted performance (Negrão et al., 2017). Another called for more research to explore creation of a continuous improvement culture and analyze its impact through lean management tools or kaizen practices (Danese et al., 2018). As such, in order to fill the research gaps, this study intends to examine the impact of kaizen culture on operational performance of E&E manufacturing companies in Malaysia

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(see Figure 1) as hypothesized in H_1: Kaizen culture has a significant influence on operational performance of E&E manufacturing companies in Malaysia. To further strengthen the significance of this study, attributes of kaizen culture will also be examined so that the E&E manufacturing companies are able to deploy their resources towards nurturing a strong kaizen culture within their organization.

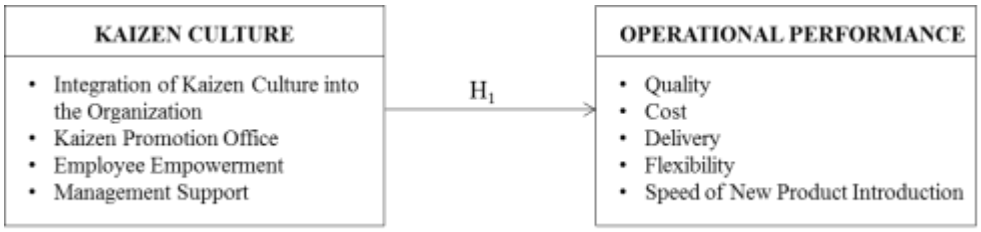

Figure 1: Research Model

Literature Review

Kaizen Culture: Double the Good, Half the Bad

Briefly, kaizen is synonymous to continuous improvement and is interchangeably used with continuous improvement by academics and practitioners (Brunet & New, 2003). Kaizen is usually associated with various organizational improvements based on lean manufacturing approaches, total quality management (TQM), employee involvement programs, customer service initiatives, and waste minimization activities (Janjić et al., 2020). On the other hand, kaizen culture is a constant journey in pursuit of excellence through incremental improvements in which 95% of organizational changes are evolutionary developments of incremental phases in rectifying a problem or modifying a part of the larger system. Moreover, it involves the spread of a continuous improvement culture within the entire organization (Costa et al., 2019). More specifically, kaizen culture infuses discipline, immaculate execution and cross-functional collaborations. Evidently, strong kaizen culture fundamentals are essential in any organization, more so, in current challenging and turbulent times.

In Malaysia, despite government initiatives and support given, E&E manufacturing companies still encounter recurring mistakes made by operators on the production shopfloor. All this translates to rejects and scraps resulting in manhour losses and additional rework costs. Poor product quality leads to missed shipments and poor on-time delivery. Some manufacturing companies have resorted to minimize the impact of missed shipments by having buffer inventory, but it might attribute towards waste and additional costs of manufacturing. Past studies have found that low productivity level significantly impacts delivery slippages in manufacturing companies (Sreekumar et al., 2018), while a strong quality assurance contributes towards continuous organizational operations (Jimoh et al., 2019). Both quality and delivery are main components of operational performance in organizations. In 2018, when measured by labor productivity, Malaysia was ranked last out of seven countries (IMD World Competitiveness Centre, 2018).

The E&E manufacturing companies are operating in a fast paced industry whereby change is the only constant. As such, these companies should not be overly dependent on existing knowledge or practices. The key here is to remain competitive through efficient, wellunderstood practices, and rapid execution of learning before doing (O‟Connor, 2008; Zailani et al., 2015). Essentially, E&E manufacturing companies need to have an environment

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that fosters knowledge creation and dissemination so as to enable their employees resolve problems and create synergies in a continuous virtuous cycle. Such environment can be achieved through kaizen culture as it is an enabler of transforming employees‟ mindset towards accepting rapid changes and new technologies (Zailani et al., 2015).

Past kaizen studies have focused more on the initial kaizen journey than the success of the journey itself. Garcia et al. (2013) discovered that out of 3000 US manufacturers, 90% of them had implemented kaizen or continuous improvement projects. However, only 10% perceived that they achieved the desired outcome. Further findings on 49 different Mexican industries highlighted the main causes of kaizen failure in the organization (see Figure 2). The top two causes cited are related to employees resisting organizational changes at 75% and lack of proper kaizen implementation and monitoring, also at 75%. The following two causes were at 50% each for lack of employees‟ motivation and management support. These issues are highly critical and must be immediately address in order for kaizen culture to take root.

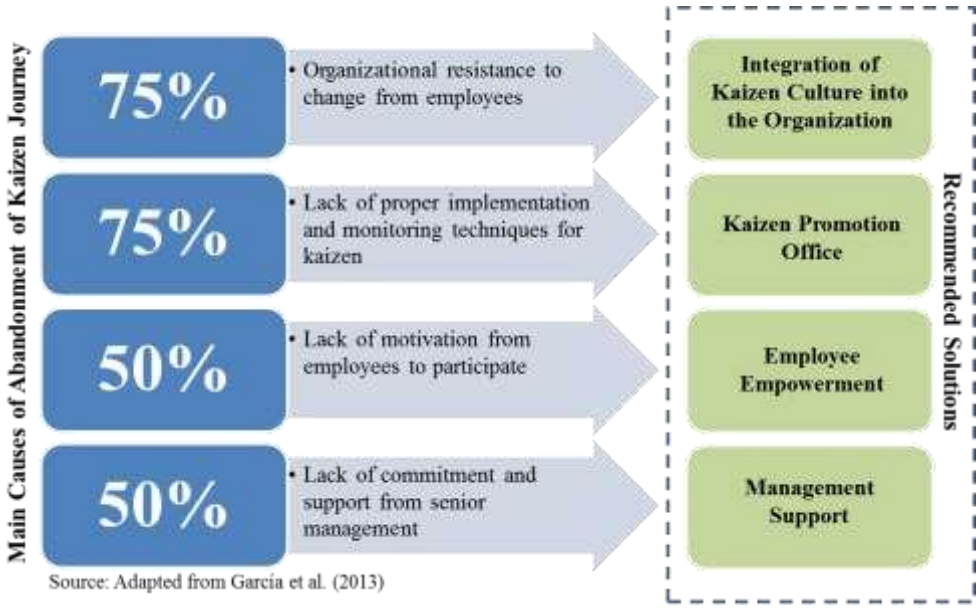

Figure 2: Top Causes of Kaizen Failure

Establishing Key Attributes of Kaizen Culture

Thus, based on Garcia et al.‟s (2013) discovery, this study is positioning the following four key attributes of kaizen culture to overcome the top causes of kaizen failure in organizations (see Figure 2):

Integration of Kaizen Culture into the Organization (IKCO): The first attribute is operationalized as the adoption of kaizen behaviors and capabilities that correspond to improvements for operational performance (Jørgensen et al., 2006). It is meant to addresses organizational resistance to change from employees (Garcia et al., 2013). The integrating function of IKCO cultivates values, behaviors, and attitudes in an organizational learning environment where kaizen is a way of life for everyone within the organization. This function supports the kaizen goal of “Double the Good and Half the Bad at Double the Speed”. By objectively assessing strengths and opportunities across internal and external divisions of the organization, and its value chain of customers and suppliers, organizations will be able to prioritize resources in increasing efficiency and effectiveness in all operations. Most

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importantly, this integrating function generates sustained kaizen involvement through an organized and systematic documentation, assessment of kaizen maturity status through kaizen maturity tracker, and celebration of success stories. Assessment of kaizen maturity is carried out with best practices being showcased to reward and recognize employees for their hard work, dedication and commitment to the kaizen journey, and increase replication of best practices across every divisions and levels within the organization. Over time, IKCO enables the organization to have a strategic sustainable competitive advantage.

Kaizen Promotion Office (KPO): The second attribute is operationalized as an organizational structure that drives effective and sustainable kaizen practices for increased competitiveness (Bessant & Caffyn, 1997) in order to address the cause due to lack of proper implementation and monitoring techniques for kaizen (Garcia et al., 2013). Extant literature has also highlighted on the need for a KPO structure within the organization. KPO is actually a deliberate mechanism used by management to introduce specific key individuals as champions for creating kaizen culture in the organization (Schein, 1990). KPO is able to overcome shortcomings such as lack of organizational capabilities to facilitate incremental company-wide innovation attributing negatively towards kaizen implementation and sustainability of overseas plants in China (Aoki, 2008); absence of a methodical documentation of kaizen events evidencing organizational learning approaches were in placed (Jurburg et al., 2015); no clear Plan-Do-Check-Act improvement process control sequence leading to time-consuming documentation process which will eventually not get done (Jurburg et al., 2016); and lack clear ownership of improvement process leading to fragmented improvement record-keeping (Jurburg et al., 2016). Given these findings, there is clearly a need for an improvement process owner in the form of a Kaizen Promotion Office (KPO).

Employee Empowerment (EE): The third attribute is operationalized as employees‟ knowledge and understanding of kaizen will increase motivation to work with co-workers to actively engage in improvement activities (Hirzel et al., 2017). This attribute addresses the cause due to lack of motivation from employees to participate in kaizen activities (Garcia et al., 2013). According to Muthuveloo and Teoh (2017), creativity only happens when knowledge and understanding are being applied in practice. For instance, team leaders and members regularly conduct trystorming, which is a lean concept that inspires quick developing and testing of ideas instead of just thinking for potential solutions, the needed values and tool competencies based on the kaizen principles. Additionally, kaizen concepts and practices are grounded by the socio-technical systems theory as they emphasize and revolve around autonomous team activities (Trist, 1981). For example, team conversations drive best overall results from high-performing individuals within a team context, while working in teams allows the company to leverage the team members‟ diverse interest and knowledge (Fisher, 2019). Subsequently, a motivated, empowered, and entrepreneurial workforce will develop where team members have strong personal commitment and pride at work, delivering high performance work for the companies (Muthuveloo & Teoh, 2017).

Management Support (MS): The fourth and final attribute is operationalized as support given by senior management for idea generation (Yasar et al., 2017). In particular, management needs to encourage their employees to contribute new and innovative ideas, and be aware and receptive to new ideas. This attribute addresses the cause due to a deficit of obligation and support from upper management pertaining to kaizen (Garcia et al., 2013). Management support is the crux of the matter. Without management support, IKCO, KPO, and EE can never

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function effectively. For instance, IKCO is meant to overcome organizational resistance of employees towards change. However, without management support, how can this be achieved? Here, employees are considered a vital element of change. Management must be able to convince their employees of the urgency to embrace change. They need to provide the necessary tools, training, a clear vision of the new changes, and constant reminders to reinforce that there is no going back to the old way of doing business. Most organizations are structured in silos, compartmentalized into divisions or departments. Management support has to be in the form of a favorable climate with the right rewards or measurement systems (Gollan et al., 2015). This then enables speed and ease in facilitating changes.

Conceptualizing Kaizen Culture as a Radial Cycle

Additionally, Figure 3 illustrates the Kaizen Culture Radial Cycle which is a novel way of capturing the relationship of all attributes of kaizen culture namely Integration of Kaizen Culture into the Organization (IKCO), Kaizen Promotion Office (KPO), Employee Empowerment (EE), and Management Support (MS) with kaizen culture being central in these relationships. As the interconnectivity among all attributes is in a continuous flow, the dimensions interact and support one another. For instance, KPO provides the necessary support in the form of training, documentation, standard kaizen tools, etc. to employees who have been empowered so that they can perform in the most optimal manner to support the company needs, vision and mission. Likewise, empowered employees will enable KPO to deliver its charter of building and sustaining Kaizen DNA in the company. Therefore, this study is positioning that all the four attributes comprising of IKCO, KPO, EE, and MS are necessary for achieving kaizen culture in an organization.

Figure 3: Kaizen Culture Radial Cycle

Research Methodology

This study adopted the quantitative approach in which a survey was used to measure objectively the impact of kaizen culture on the operational performance of E&E manufacturing companies. The measurement items were adapted from extant literature and measured on a 5-point likert scale of "1=strongly disagree" to "5=strongly agree". Data collected was analyzed using structural equation modelling and descriptive analysis based on the mean values where less than 3 is considered low, between 3 to less than 4 is moderate, and 4 and more is high (Sekaran & Bougie, 2013). The survey targeted managerial level personnel as they would have the breadth and depth of knowledge regarding their companies‟ kaizen practices and operational performance. The population of the study was obtained from the 2019 Federation of Malaysian Manufacturers (FMM) Directory which comprehensively listed manufacturing

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companies operating in Malaysia. A total of 351 E&E manufacturing companies were found in the directory, but the study only included those who were practicing kaizen. As such, only 248 companies were considered for the study.

Results and Discussion

Out of a total of 248 E&E manufacturing companies that were invited to participate in the study, 127 responded, but four were excluded due to evidence of straight-lining responses. Hence, only 123 responses were usable, with a final 49.6% response rate for the study.

Demographic Profile

The demographic profile is two-fold, presenting information of the respondents and their companies. Based on the data obtained, 20.3% of the respondents have long service in the industry for more than 21 years, 15.5% for 16 to 20 years, followed by 17.9% for 11 to 15 years. In contrast, 13.8% of the respondents have worked for 6 to 10 years and the remaining 32.5% was held by respondents who have worked five years or less. This shows that more than 50% of the respondents have more than ten years of working experience in the E&E industry. The managerial positions in the E&E industry are mostly held by men at 69.9%. As expected, majority of the respondents fall under the Generation-X and Baby Boomer categories at 73.9%. Generation-X usually refers to those born between 1965 and 1980, while Baby Boomer usually falls under 1944 to 1964 (Bao et al., 2019). But more importantly, 63% of the respondents are from the senior manager or director level and above positions. This means the respondents are very experienced and knowledgeable in the E&E industry and would have witnessed the impact of kaizen culture on the operational performance of their companies.

Further analysis on the demographic profile of the participating E&E manufacturing companies revealed there were representations from all industry group indexes listed in the 2019 FMM Directory, with nearly 59% of them fall under the 3190 industry group index for other electrical equipment not elsewhere classified. The industry group index is based on the different product classification of the E&E industry. Figure 4 provides a snapshot of the participating E&E manufacturing companies. Briefly, majority of the E&E manufacturing companies are owned by the Americans (41.5%), mainly located in Penang (48.8%), large with more than 1000 employees (43.9%), and well established with more than 15 years of establishment (83.7%). Based on the participating E&E manufacturing companies‟ profile, it indicates the strength of the E&E industry.

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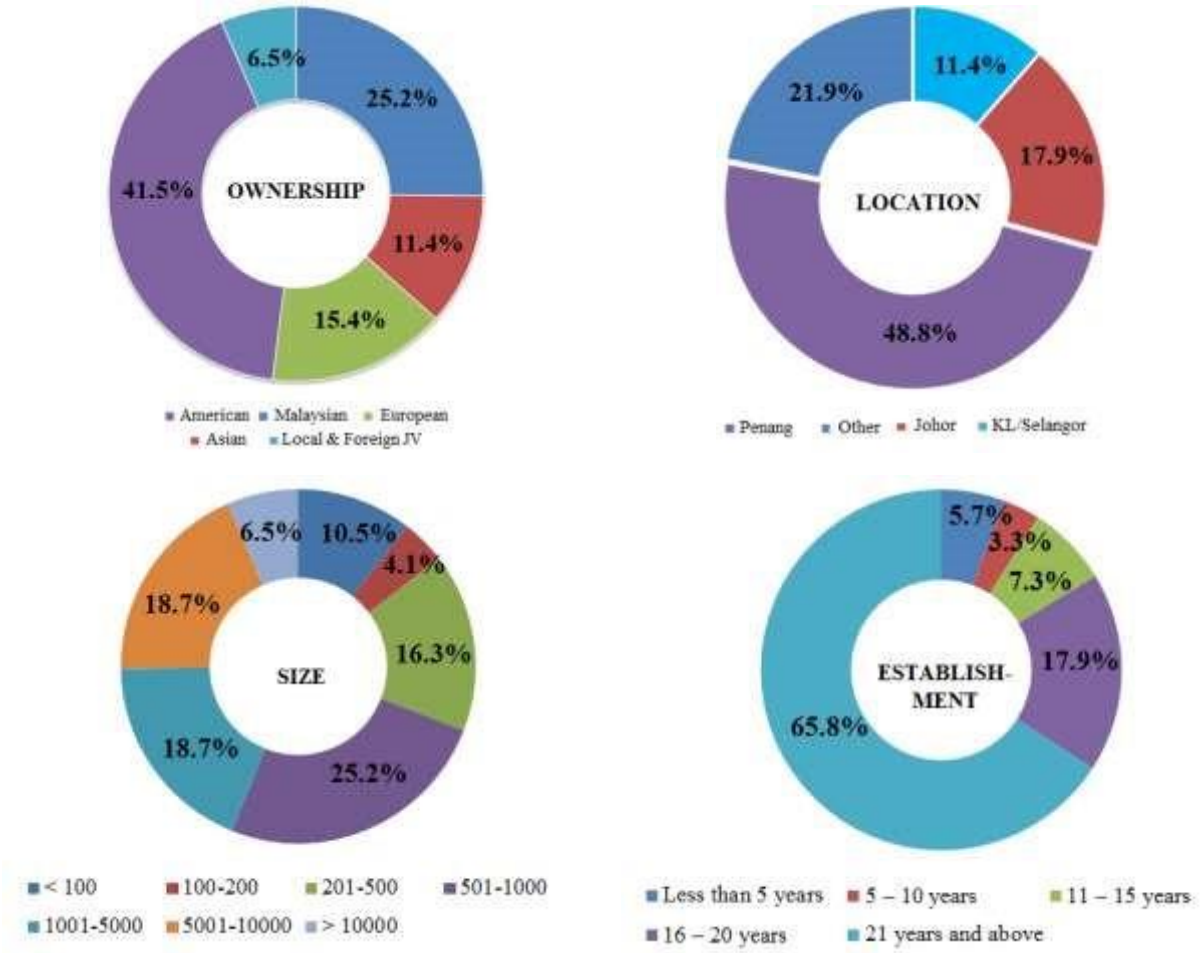

Figure 4: E&E Manufacturing Company Demographic Profile

The demographic profile of the participating manufacturing companies in the E&E industry provides further understanding and insight that may explain how kaizen culture impacts operational performance.

The Relationship Between Kaizen Culture and Operational Performance

Table 1 shows that the research model is valid and reliable. The study used SmartPLS following the two-step approach of Henseler et al. (2015). The factor loading range and average variance extracted (AVE) met the minimum criteria of 0.5 or greater, while composite reliability for operational performance and kaizen culture were above the acceptable value of 0.6 (Hair et al., 2016). Discriminant validity, which was based on the tighter heterotrait-monotrait ratio of correlations (HTMT) instead of the Fornell-Larcker criterion, met the required value of not more than 0.85 (Henseler et al., 2015).

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Table 1: Research Model Validity and Reliability

Construct	Convergent Validity and Reliability				Discriminant Validity	
	Items	Factor Loading Range	AVE	CR	OP	KC
Operational Performance (OP)	5	0.706 – 0.780	0.558	0.863	xxx	
Kaizen Culture (KC)	37	0.578 – 0.897	0.597	0.982	0.393	xxx

Note: AVE refers to Average Variance Extracted; CR refers to Composite Reliability.

The hypothesized relationship (H_1) between kaizen culture and operational performance was supported with a strong t-value of 4.653, β=0.372, and $p<0.001$. This indicates that kaizen culture has a strong positive relationship with operational performance.

Descriptive Analysis: The Current Kaizen Culture Scenario

All E&E manufacturing companies in this study practice kaizen with 43.9% of them are having more than 10 years of experience being engaged in kaizen and 49.6% having dedicated kaizen resources of more than 50 employees. 48.8% of the participating companies conducted more than 12 kaizen events in a year with 51.2% having external and a combination of internal and external consultants to support these kaizen events. The data demonstrated that the participating companies are supporting kaizen culture with actions and not just words judging from the survey results. For example, almost 50% of the 123 companies have dedicated kaizen resources of more than 50 employees, conducted more than 12 kaizen events in a year with the support of external or internal consultants to support these kaizen events are strong testaments. Table 2 depicts details of these data.

Table 2: Kaizen Status of E&E Manufacturing Companies

Description	Frequency	Percent (%)	Description	Frequency	Percent (%)
Years engaged in kaizen:			No. of employees dedicated to kaizen:		
< 1 year	13	10.6	< 25	40	32.5
1 – 5 years	33	26.8	26 – 50	22	17.9
6 – 10 years	23	18.7	51 – 100	10	8.1
11 – 15 years	17	13.8	101 – 150	6	4.9
>15 years	37	30.1	>150	45	36.6
No. of kaizen events conducted in a year:			Kaizen consultants are from:		
<12	63	51.2	Internal	60	48.8
13 – 18	21	17.1	External	10	8.1
19 – 24	7	5.7	Combination	53	43.1
>24	32	26.0			

In addition, a resounding “yes” was given by 82.1% of the E&E manufacturing companies when asked if they considered kaizen as part of their business strategy. This is important as linking kaizen to business strategy enables kaizen energy to be directed at the doing the right things thus enabling results that are meaningful for the companies. This in turn will sustain kaizen in the company. A majority of 73.2% of the E&E manufacturing companies are having

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a range of kaizen maturity levels of structured, goal oriented, proactive, empowered and full continuous improvement (see Table 3). These results jive with the earlier results that showcase the commitment of resources by the participating E&E manufacturing companies. This is important because having a kaizen maturity derived from a structure approach indicates that kaizen and results sustenance is done in a methodical and repeatable manner that enable best practices to be copied across the company with speed. Practical evidence from well-performing companies, stated that future empirical research should be executed to determine which important elements in the organizational structure for kaizen culture are still absent or need to be empowered in firms, provided further proof on the need of KPO (Jurburg et al., 2015).

Table 3: Kaizen Maturity Level of E&E Manufacturing Companies

Description	Frequency	Percent (%)
Company"s current kaizen maturity level:		
"Natural" continuous improvement, no formal efforts or structure	33	26.8
Structured	9	7.3
Goal oriented; structures with measurements	40	32.5
Proactive and empowered; structures with measurements and high levels of experimentation	13	10.6
Full continuous improvement capability – the learning organizations; everyone actively involved in incremental and radical innovation	28	22.8

Perception of Kaizen Culture Among E&E Manufacturing Companies

The study examined four key attributes of kaizen culture based on perceptions of the participating E&E manufacturing companies (see Table 4):

- Integration of Kaizen Culture into the Organization
- Kaizen Promotion Office
- Employee Empowerment
- Management Support

Table 4: Key Attributes of Kaizen Culture

Rank	Perception of Kaizen Culture	Mean
1	Management Support	4.22
2	Integration of Kaizen Culture into the Organization	4.17
3	Employee Empowerment	4.15
4	Kaizen Promotion Office	4.00

Results revealed that among all four key attributes of kaizen culture, the E&E manufacturing companies viewed management support as being the most important, followed by integration of kaizen culture into the organization, employee empowerment, and lastly kaizen promotion office. This finding is inconsistent with Garcia et al. (2013) who revealed that 49 various industries in Mexico ranked organizational resistance to change for employees, which could be addressed with integration of kaizen culture into the organization, as most important, and lack of commitment and support from senior management, which could be addressed with management support, as the least important. One possible reason for the differences could be due to the high power distance that arises due to the Asian culture of accepting a hierarchical within the organization (Hofstede, 1985, p. 347). More than 50% of the participating companies are multinationals with headquarters outside of Malaysia. As such, management

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support is viewed as very key to establish kaizen culture in the company as resource allocation and business strategy are made in the corporate headquarters.

In order to have a deeper understanding on each of the key attributes of kaizen culture, the measurement items with the top three highest and lowest (if any) mean values for each of the kaizen culture dimensions are highlighted and discussed. New insights from this analysis should enable E&E manufacturing companies to further improve their existing kaizen culture.

Attribute #1: Management Support

Table 5 shows the participating E&E manufacturing companies‟ perception of Management Support.

Table 5: Attribute #1 of Kaizen Culture

No.	Perception of Management Support	Mean
1.	Ensure that the development of innovative ideas is encouraged	4.33
2.	Very receptive to suggestions	4.22
3.	Encourage developing one‟s own ideas for the improvement of the	4.11

The high mean values ranging from 4.11 to 4.33 indicate that management does support the development of innovative ideas and is receptive towards suggestions for improvements. This finding is consistent with past studies that found management support being crucial for new idea generation which essentially strengthens the kaizen culture of continuous improvements (Yasar et al., 2017). As such, the E&E manufacturing companies should continue to enhance their support of kaizen and firmly make it part of the business strategy. This will enable the organizations to focus their scarce resources on the right things thus optimizing the right results for the company.

Attribute #2: Integration of Kaizen Culture into The Organization

Table 6 depicts the participating E&E manufacturing companies‟ perception of Integration of Kaizen Culture into the Organization.

Table 6: Attribute #2 of Kaizen Culture

No.	Perception of Integration of Kaizen Culture into the Organization	Mean
1.	Use measurement to shape the improvement process	4.33
2.	Accept improvements as integral to their work	4.30
3.	Recognize the contributions of employees to continuous improvement	4.24
4.	Ensure impact of their improvement activity on company‟s goals	4.24
5.	Use organization‟s goals to prioritize improvement activities	4.24
6.	Continually measure improvement results	4.24
7.	Organize specific improvement activities with suppliers	3.99
8.	Assess organizational improvement system for impact during major organizational change	3.98

On a positive note, the high mean values ranging from 4.24 to 4.33 reveal that continual measurement of improvements is essential as the results could be used to shape the improvement processes. Besides, acceptance of continuous improvement as being central at the workplace, and due recognition given for continuous improvement efforts are also indicated as important. Moreover, high mean values are also found for matters pertaining to

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alignment of organizational goals with specific continuous improvement efforts. This is consistent with the findings of past studies. When improvement activities are aligned with the company‟s goals and continually measured, organizations experience increased levels of operational performance (Jørgensen et al., 2006).

On a less positive note, there are two moderate mean values of 3.99 and 3.98 which are related to involvement of suppliers on specific improvement activities and assessment of organizational improvement system impact during major organizational change. One possible reason for the former moderate mean value could be that 30.9% of the participating E&E manufacturing companies are small companies with less than 500 employees. Thus, supplier relationship and specific supplier improvement activities might not be their main focus. As for the latter moderate mean value, it could be that majority of the participating E&E manufacturing companies are well established with 83.7% having more than 15 years of establishment, thus, remain stable without experiencing any major organizational changes.

Based on these findings, the E&E manufacturing companies should, first, continue to encourage the use of measurements to shape their continuous improvement processes. Second, they should make continuous improvement as a strong fundamental of their work. Only then a life-long habit of continuous improvement can be formed among the employees. Third, recognition should always be given to employees who have contributed towards continuous improvements. For example, getting the Kaizen Promotion Office to share and showcase best kaizen practices as a benchmark for others within the organization (Jørgensen et al., 2006; Jurburg et al., 2016). Fourth, E&E manufacturing companies should prioritize improvement activities and make them part of the organization‟s goals. Fifth, E&E manufacturing companies should allocate some resources on the top one to two problematic quality suppliers. This will enable quality at the source to be protected hence improving quality downstream with having to place more resources to inspect quality which is neither efficient nor effective. Lastly, when major organizational change happens, E&E manufacturing companies should be on the alert that important organizational improvement system does not fall into a crack during an unstable environment. With these recommendations, E&E manufacturing companies should experience more success in the adoption of kaizen behaviors and capabilities that correspond to improvements for operational performance (Jørgensen et al., 2006).

Attribute #3: Employee Empowerment

Table 7 displays the participating E&E manufacturing companies‟ perception of Employee Empowerment.

Table 7: Key Attribute #3 of Kaizen Culture

No.	Perception of Employee Empowerment	Mean
1.	Encourage teams to bring in suggested improvements	4.32
2.	Has a working environment that enables employees to count on co-workers‟ support	4.22
3.	Provide all the tools and information required to perform the work	4.07
4.	Observe improvements in the working environment due to kaizen activities	3.97

The high mean values ranging from 4.07 to 4.32 highlight that the employees are empowered to suggest improvements in an environment where teamwork is the focus, supported by the

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necessary tools and information to accomplish the improvement activities. The result is in line with past studies. The presence of autonomous team activities promotes creativity in practice as such team activities enable team members to leverage their individual diverse interest and knowledge (Fisher et al., 2019). This then enables employees become even more motivated to engage their co-workers in active involvement/participation of kaizen activities. Additionally, when employees are allocated the necessary resources (in the form of tools or information), they feel supported and empowered as they are in control of the resources to achieve their continuous improvement activities (Hirzel et al., 2017).

Nonetheless, there is one moderate mean value of 3.97 related to observations on whether kaizen activities impacted improvements in the work environment. Interestingly, 48.8% of the E&E manufacturing companies revealed in that they conduct more than 12 kaizen events in a year. This leads to a question of whether the respondents are more observers than active participants in the kaizen events. Hence, respondents who are holding strategic positions will not be influencing the direction, objectives, and results that they and the company hold dear. Instead of observations, Hirzel et al. (2017) suggest carrying out self-assessments which forces managers to prioritize improvement activities that strategically benefit the organization.

Based on these findings, the E&E manufacturing companies should mandate that kaizen starts from the top and cascade to the bottom. Once the environment is made conducive through management support for kaizen to take place continuously, employee empowerment will grow increasingly and naturally. With these recommendations, E&E manufacturing companies should be able to further increase the levels of employee empowerment thus increase employees‟ motivation to actively participate in kaizen or improvement activities (Hirzel et al., 2017).

Attribute #4: Kaizen Promotion Office

Table 8 exhibits the participating E&E manufacturing companies‟ perception of Kaizen Promotion Office.

Table 8: Attribute #4 of Kaizen Culture

No.	Perception of Kaizen Promotion Office	Mean
1.	Has a formal problem-solving process	4.24
2.	Encourage high levels of involvement	4.24
3.	Provide training in basic kaizen tools	4.03
4.	Has formal structure to share kaizen learning	3.93
5.	Link kaizen skills to business needs	3.84
6.	Conduct kaizen maturity tracking system to sustain kaizen	3.74

The high mean values ranging from 4.03 to 4.24 indicate that Kaizen Promotion Office (KPO) is functioning well in some areas for the E&E manufacturing companies to drive kaizen practices effectively, thus, able to address the improper kaizen implementation and monitoring techniques (Garcia et al., 2013). In particular, there is a strong presence of formal problem-solving process and high involvement in kaizen among employees. This finding is inconsistent with Aoki (2008) who found that overseas plants in China lack the organizational capabilities to facilitate company-wide kaizen implementation. This could be due to a lack of training to build up kaizen organizational capabilities. In the case of the E&E manufacturing companies in Malaysia, training was provided for employees in basic kaizen tools. According to Hirzel et

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al. (2017), training employees in problem-solving skills and implementing a system that is receptive to idea generation is crucial in enabling the right mindset and behavior towards kaizen. This is reinforced by Bessant and Caffyn (1997) who stressed that successful continuous improvement activities (in the form of kaizen) is based on adequate knowledge and understanding by the employees.

However, there are also moderate mean values ranging from 3.74 to 3.93 which reveal some weaknesses in the KPO of E&E manufacturing companies. There is a need to strengthen the areas of having formal structure in sharing kaizen learning, linking kaizen skills to business needs, and conducting kaizen maturity tracking system for sustainability. Past studies indicate that IKCO and KPO complements one another whereby in order for kaizen culture to be integrated into the organization, KPO needs to provide the necessary support such as sharing and showcasing kaizen best practices in a methodical and repeatable manner so that the best practices can be replicated across the company with speed (Jørgensen et al., 2006; Jurburg et al., 2016). One of the possible explanations could be that not all E&E manufacturing companies have established kaizen promotion offices in their organizations. This is evident from the demographic profile where 26.8% of them have a kaizen maturity level that is at the „natural" continuous improvement without any formal efforts or structure.

Based on these findings, the E&E manufacturing companies should appoint an all-rounder in operations and supply chain with good interpersonal skills to head KPO. This appointment is extremely important and key to the success of the company"s kaizen maturity journey. The appointed all-rounder is deemed as the kaizen maturity champion who acts as a beacon for the company to advance in the kaizen journey. The champion will need to understand the organization"s gaps in the kaizen maturity, outline the steps to close gaps, and propose and justify resources needed to the senior management to support the gap closure actions. With these recommendations, E&E manufacturing companies should have a better understanding on how to further improve their KPOs so as to be more efficient in driving kaizen practices that are effective and sustainable.

Conclusion

To conclude, the study has managed to provide evidence that kaizen culture does impact operational performance of E&E manufacturing companies in Malaysia. Especially when our economy is in turmoil due to Covid-19 pandemic crisis, kaizen culture is all the more critical of enabling manufacturing companies "double the good and half the bad" in their operational performance. Moreover, E&E manufacturing companies seem to have different kaizen culture practices. This may explain why some companies have more organized approaches to problem-solving and more success in innovative solutions to problems than seemingly similar companies that have not had much success; thus resulting in differences in operational performance. In addition, the study has also managed to establish the four main attributes of kaizen culture for E&E manufacturing companies to optimize their operational performance. The results suggested that E&E manufacturing companies perceived management support as the most important attribute of kaizen culture. Thus, the senior management team has a central role in building teamwork that is essential for ideas generation which incorporates the entire value stream. The next important attribute highlighted is integration of kaizen practices into the organization. E&E manufacturing companies need to do this so that kaizen practices are continuously sustained. Besides that, empowered employees are more accepting of change as they possessed increased learning and a transformed mindset. Hence, these employees are

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more aware of the role they play in the larger organization by accepting and adhering to changes. The final attribute is having a kaizen promotion office. This office acts as the glue that integrates the generation of ideas with successful implementation in a sustainable routine. All these insights when successfully implemented will provide strategic competitive advantage for the E&E manufacturing companies in Malaysia. Companies that have immaculate operational performance will be able to deliver extraordinary business performance. Unquestionably, operational performance is a prerequisite for business performance. Over time, E&E manufacturing companies become even more effective and efficient thereby increasing their global competitiveness and differentiation in a dynamic and disruptive business environment.

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