

The Moderating Effect of Kaizen Culture on the Relationship Between Innovation and Operational Performance

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ABSTRACT

Kaizen culture and Innovation are key competitive factors deeply imbued into the organizational products and processes to achieve optimal operational performance sustainably. Literature suggested that manufacturing companies needing to differentiate themselves adopt a culture of continuous improvement (Kaizen). Kaizen culture in this paper enables a change process in a seamless manner supporting innovation to optimize operational performance. This study aims to support theory and practice. Firstly, this study findings can be applied to improve operational performance which is pivotal to business sustainability among Malaysian Manufacturing Companies (MMC). Secondly, it also contributes to extend the Socio-Technical Systems (STS) theory. Thirdly, this study has the potential contribution towards the society as resources are scarce and waste elimination is imperative. Lastly, this study may provide some understanding on why these companies are more successful in securing operational performance from innovation implementation than other seemingly similar companies.

Keywords: *Kaizen culture, innovation, operational performance, Malaysian Manufacturing Companies (MMC)*

1. INTRODUCTION

The vital question for Malaysian Manufacturing Companies (MMC) of the E&E industry is how they can increase global competitiveness and become the engine of growth to support the nation's vision of becoming a high income nation by 2020. In order to stay competitive and survive in the rapid pace of advancing technology and growing customer demands, companies must continually seek new ways of improving value through operational performance by cost optimization, increasing the quality of the products and meeting the ongoing hyper changes in the market. Manufacturers need to adopt a continuously improving variety of innovative technological and process-based solutions in order to obtain and sustain competitive advantage over their competitors. Organizations have to reinvent, learn new knowledge of applications and acquire new skill sets to create, adapt and integrate distinctive technological solutions to transform the workforce and industries.

Kaizen culture practices are crucial in enabling a sustainable competitive advantage for organizations. This study in exploring operational performance highlights the human dimension; kaizen culture that nurture values, behaviors, attitudes, beliefs and a learning environment that support innovation to flourish and thrive continuously to deliver optimal operational performance that meet or exceed customers' requirements. This study is very important to the country as the Electrical & Electronics (E&E) industry has been designated as one of the three "catalytic subsectors" in

the 11th Malaysia Plan (2016 – 2020) to revive Malaysia's economy and support the nation's vision of becoming a high income nation by 2020 and incidentally Malaysia is the seventh-largest E&E exporter in the world nowadays. This means the E&E industry has the greatest potential to exert the biggest change across the widest portions of the manufacturing sector in the country, which in turn will create the biggest positive impact on the country's economy [1].

Problem Statement

Labor productivity performance is lacking in Malaysia. World Competitiveness Yearbook, 2018 had placed Malaysia last out of seven countries and Productivity Report by Malaysia Productivity Corporation, 2018 stated that the overall growth of Malaysia labor productivity at 3.5% is still low compared with that of emerging countries, such as People's Republic of China (7.1%), Thailand (4.0%) and India (5.6%) reflecting reduced competitiveness in the global market [2]. As at 2015, Malaysia has spent 46 years in the middle-income country category. By comparison, South Korea, which joined the middle-income group of countries in the same year as Malaysia, reached the upper middle-income level within 19 years in 1988. From that point, South Korea took only another seven years to attain high-income status in 1995. Not only has Malaysia experienced significant growth deceleration post-Asian financial crisis, the country has yet to reach the level of labor productivity achieved by the US in the 1970s and is

currently lagging 20 years behind Japan and 25 years behind Singapore.

Despite having some of the top technological manufacturing companies in Malaysia for the past four decades, nowadays sadly the nation has fallen behind the curve in terms of innovations and productivity. Organizations can invest a lot of time and money in innovation efforts but if the innovation efforts are not sustained over time, improvement fails. In order to truly sustain innovation efforts, organizations must address the kaizen culture in the company. In fact, it may be that the difficulty in implementing successful innovations is not in the techniques but in the cultural changes. If true, this assumption would mean that the success of any organization pursuing successful innovations depends not only on applying the tools and techniques, but also on the required culture to derive the sustained benefits from these tools and techniques that supports innovation that must be established [3]. However, no empirical studies have investigated the role of kaizen culture in sustainable innovations [4].

Research Gap

The study by (Negrão, Godinho Filho, & Marodin, 2017) traced 83 studies dealing with the degree of kaizen culture practices adoption around the world; Malaysia was placed fourth in the listing of 37 countries for publishing articles that assessed the degree of kaizen culture practices adoption but has no placement in the listing of 37 countries for articles on kaizen culture practices adoption that impact performance [5]. This confirms the research gap that this study proposes is too close. Irrefutably, operational performance is a prerequisite for business performance and sustainability of manufacturing companies in Malaysia. In addition, the highly competitive business environment with the dawn of digitalization makes a compelling case for manufacturing companies to seek and build kaizen culture in the organization.

In today's hyper competitive environment, fostering a learning approach is very important because business is changing rapidly. Hence, the need for companies to embrace the change is a must for its survival. However, for an organization to just decide that employees must embrace the change is not sufficient, because the decision must be backed by actions that create an environment that employees are comfortable, willing and have the desire to continuously leverage improvements. Therefore, will the speed of innovation diffusion and adoption increase with the support of kaizen culture and will it then lead to operational performance improvement and sustenance in the organization? Intrigued by these questions, this study hopes to examine the moderating effect of kaizen culture on operational performance via innovation through the study among manufacturing companies in the E&E industry located in Malaysia.

2. LITERATURE REVIEW

The literature described below covers the key variables of this study which comprises of kaizen culture, operational performance and innovation.

2.1. Kaizen Culture

Kaizen culture is aimed at nurturing and developing an environment that is conducive for continuous learning and innovation. It provides a conducive environment whereby front-line production employees are empowered to harness the next generation of know-how and encourages them to know the art of being possible. To be continuously improving, a company requires kaizen culture to be embedded into the organization. Organizations enhanced by kaizen culture as the added advantage will achieve operational performance sustainably while operating in a highly disruptive and unstable business environment [6]. Kaizen culture continuously and persistently guides organizational members to strive for continuous improvement and create a climate conducive for learning. Kaizen culture does not just happen; it needs long term kaizen inculcation from top management that cascades through the organization. Top management needs to visibly direct, instill, grow and imbue the kaizen culture in its business strategy. This is necessary because culture influences the way employees interact, the context within which knowledge is created, the resistance they will have towards certain changes, and ultimately the way they share (or the way they do not share) the knowledge. Obviously, this focus on the process of continuous improvement does not displace innovation or new technology improvement. The difference in kaizen culture practices within firms may explain why some firms are more successful in producing innovative solutions to problems, while seemingly similar firms are much less successful resulting in differences in operational performance. The four (4) key elements of kaizen culture when applied successfully may explain the difference in operational performance are Employee Empowerment, Kaizen Promotion Office (KPO), Management Support and Integration of Kaizen Culture into the Organization.

Firstly, employee empowerment is implemented to empower the employees, where the teams are established, trained and developed, the employees are engaged and empowered towards high performance. Performing employees create competitive edge through productivity, quality, innovations and good decision making [7], [8]. Secondly, KPO enables the firm to achieve a higher rate of project completion by enabling employees to be happy, engaged and play a proactive role. Organizations should assign a kaizen champion or leader who is an excellent communicator and a business process improvement specialist to take the lead in kaizen implementation. Thirdly, top management's commitment is crucial in instilling kaizen culture into an organization and authorize the required manpower. Finally, Integration of Kaizen Culture into the organization nurtures the values, behaviors, beliefs

and attitudes in a learning environment, so that the kaizen principles become a way of life in the organization.

2.2. Operational Performance

The current business world has no boundary, fast changing and maintaining global competitiveness is extremely challenging. Manufacturing organizations are under immense pressure to pursue operational excellence and improve their performance in order to optimize their costs and provide added-value by producing products of higher quality with shorter lead times. Manufacturing organizations pursue relentlessly various methods and tools that aim to improve the operational performance in order to deliver customer satisfaction and profitability. Once employees of manufacturing organizations adopted kaizen culture mindset, it facilitates achievement of continuous improvement in every facet of the organization to deliver operational improvements sustainably; hence customer satisfaction and profitability continuously [9], [10].

Most of the extensive empirical studies on the relationship between innovation and operational performance provide evidence that this relationship is positive [11], [12]. Sixteen relevant empirical studies of operational performance provide confirmation to the historical analysis of operational performance in companies to be quality, cost, delivery, flexibility and new product introduction speed that emphasize on efficiency and effectiveness. Finally, measurements for operational performance are important because operational gains can be subsequently used in competitive pricing. Ultimately, this improvement effort could lead to enhanced firm growth and long-term performance heterogeneously [13].

2.3. Innovation

The result obtained from a survey of the literature is that innovation is viewed as the engine of productivity and driver of growth for firms either in developed or in emerging countries. The adoption of innovation is generally intended to contribute to the productivity or effectiveness of the adopting organization. However, Damanpour and Aravind asserted that the relationship between innovation and performance had not been explained fully and more empirical studies were needed to explain it [14]. Though, most of the literature concluded that innovation was positively related to performance [15], [16], [17].

Underpinning Theory

Tacit knowledge is the key to innovation, and the acquisition of such knowledge by individuals within the company heavily depends on the ability of employees to share as well as to resolve the conduct of education and training. Socio-Technical Systems (STS) theory supports this framework and respond to the need of providing a conducive environment whereas autonomous work groups promote outcome such as cooperation between tasks groups and high personal commitment by team members that encourage the sharing of tacit knowledge in order to achieve

competitive advantage and operational performance. Teams are opportunities to leverage intellectuality and make a difference; testing grounds for new ideas, idea-launchers and best weapon to resist stultifying bureaucracy. All successful companies consider STS as an organizational goal for holistic development, sustainability and transformational change of organization [18].

Development of Research Conceptual Framework

The proposed research conceptual framework has been developed based on the research gap that has been identified and underpinning the theory, as exhibited in **Figure 1**. The Dependent Variable, Independent Variable and Moderating Variable are Operational Performance, Innovation and Kaizen Culture respectively.

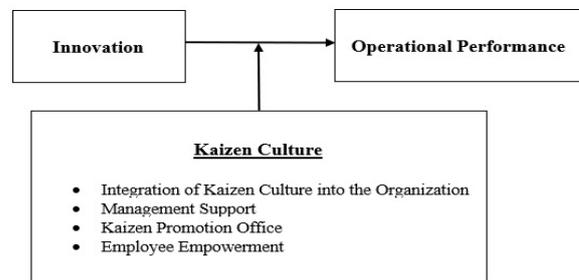


Figure 1 Proposed Research Conceptual Framework

Research Hypotheses

Based on the proposed research conceptual framework, five (5) hypotheses were developed to address the research objective and questions. The hypotheses are elaborated as follows:

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Kaizen culture can help enrich and inspire the way company coordinate and achieve sustainable innovations. Kaizen does not replace or preclude innovation. Rather, the two variables are complementary. After Kaizen has been exhausted, ideally, innovation should take-off, and Kaizen should follow as soon as innovation is initiated. To understand how Kaizen will support the improvement of existing activities; one need to understand how workers do their work and how innovation fit into their work to drive operational improvements. Hence, it is crucial for companies to drive innovation supported by an organizational kaizen culture environment. Kaizen culture inculcate a mindset of can-do attitude. Can-do mindset is imperative for radical innovation to succeed as it prepares employees to absorb changes brought about by innovations especially radical innovations. Hence, this study developed the following hypothesis:

Hypothesis 1: Kaizen Culture enhances the relationship between Innovation and Operational Performance of the E&E industry.

The moderating effect of Integration of Kaizen Culture into the Organization on the relationship between Innovation and Operational Performance

Organizational culture in every organization gives a positive strength and impact for employees in improving operational performances. This is due to the fact that culture formed based on mutual commitment will give more motivation to employees to perform their best [19]. Kaizen culture imbued companies facilitate new learning, continuous change, and improvement in administrative and work processes and encourage gathering and disseminating information from an array of sources to improve the mechanisms and processes within the company leading to improved operational performance [20]. Hence, this study intends to test-out the following hypothesis:

Hypothesis 2: Integration of Kaizen Culture into the Organization enhances the relationship between Innovation and Operational Performance of the E&E industry.

The moderating effect of Management Support on the relationship between Innovation and Operational Performance

Managers' commitment and support seem to be the main obstacles of kaizen implementation and success [21]. Researchers recently argue that not only is the support of an empowerment management system necessary, but it must also be in compliance with strategic plans and targets [22]. Literature noted that employees might rely on aspects of culture such as openness to new ideas and tolerance for risk for innovation creation and adoption. Management support is critical to operational performance as it relates to all management-controlled activities that affect the work of an entire organization; the processes and way of working and the formal and informal organization design, including how management views work-process change and all communication channels. For these aspects of culture to thrive and flourish, management support is mandatory. Hence, this study intends to test-out the following hypothesis:

Hypothesis 3: Management Support enhances the relationship between Innovation and Operational Performance of the E&E industry.

The moderating effect of Kaizen Promotion Office on the relationship between Innovation and Operational Performance

This is about mechanisms for the deliberate creation and change of culture by management [23], for instance by introducing certain individuals at key positions in the organization as in this study's hypothesis; Kaizen Promotion Office. The lack of organizational capabilities that facilitate incremental enterprise-wide innovation greatly hinder implementation and sustainability of kaizen in Chinese firms [24]. The lack of a systematic approach towards the documentation of kaizen activities is noticeable and most of the ten high-performing companies though rated matured failed to give consistent evidence of having organizational learning processes in place, as mainly seen in the lack of available documentation about past improvement activities [25]. Hence, this study intends to test-out the following hypothesis:

Hypothesis 4: Kaizen Promotion Office enhances the relationship between Innovation and Operational Performance of the E&E industry.

The moderating effect of Employee Empowerment on the relationship between Innovation and Operational Performance

Studies have shown that employees who are engaged and empowered tend to drive innovation as they learned to know the art of possibility. Employees who are engaged and empowered have a tendency to perform well on their jobs. Performing employees create competitive edge through productivity, quality, innovations and good decision making [26]. There are significant differences in the degree of emphasis on training, job enrichment and employee empowerment among firms that influence the varying levels of intensity on kaizen and quality management [27]. Besides with innovation routines being increasingly recognized as contributing to competitive advantage; being able to mobilize high levels of employee involvement makes a difference, as studies have demonstrated repeatedly [28], [29]. Hence, this study intends to test-out the following hypothesis:

Hypothesis 5: Employee Empowerment enhances the relationship between Innovation and Operational Performance of the E&E industry.

3. RESEARCH METHODOLOGY

The research methodology covers the research design, population, sample size, sampling technique, measurement, data collection method, statistical tool and data analysis to be carried out as described below:

Research Design

The research design is crucial as it provides the procedural steps of how to obtain important and accurate data in order to provide empirical evidence in answering the research questions raised in the study. It adopts correlational type of research that utilizes quantitative research method to collect data to address research objectives. The study of this correlation was conducted with minimum interference by the researcher, with normal work-flow in the natural setting of the organization [30]. This means that respondents have the freedom to answer the questionnaire with little or no interference to their intention. This research is also a cross-sectional type meaning that data is collected and gathered just once over a short-period in order to answer the research questions. The research design is suitable for this study as it best fits the constraints of time, costs, and resources needed to conduct this particular study.

Population and Sample Size

The target population of this study is the organization of companies in the E&E industry listed as members of the Federation of Malaysian Manufacturers (FMM) published in 2019. A popular rule of thumb for robust PLS-SEM estimations, Barclay et al. (1995) suggested to use a minimum sample size of ten times the maximum number of

paths aiming at any construct in the outer model (i.e., the number of formative indicators per construct) and inner model (i.e., the number of path relationships directed at a particular construct) [31]. Therefore, the minimum sample size for this study would be 90.

Sample Technique and Data Collection Method

This study is carried out using a stratified, purposive sampling technique, in order to generate the sample population. This sampling technique involved a stratification process to determine the required sample size and next, the purposive sampling method was applied whereas respondents were purposively selected from each stratum [30].

Data Analysis Techniques

In this study, data will be analysed using Statistical Package for Social Sciences (SPSS) and consequently, the Partial Least Squares - Structural Equation Modelling (PLS-SEM) techniques using SmartPLS 3.0 will be applied on acquired data from the E&E industry in Malaysia, in order to identify and determine the effects of kaizen culture moderation on innovation and operational performance. Data analysis includes descriptive analysis, factor analysis, reliability analysis, correlation analysis and multiply regression analysis.

4. CONCLUSION

This section elaborates the limitation faced in conducting this research and the final conclusion of this research as stated below:

Limitations

This research has several limitations. Firstly, researchers have only included four key elements when examining kaizen culture. However, the scope of kaizen culture is not only limited to those elements. For instance, studies have suggested that another key element, management leadership may be considered for kaizen culture. Secondly, even though 351 company names have been proposed, it may not be possible to contact all hence there is a need to use purposive sampling. Moreover, it may not be possible to get the most appropriate person in the company to answer the questionnaires all the time. Lastly, not all the company names proposed practice the innovation and kaizen. Thus, companies that do not practice innovation and kaizen will not be considered in this study.

Research Conclusions

The purpose of this model is to determine how Malaysia's E&E industry is able to gain sustainable operational performance through the moderation effect of kaizen culture via innovation. Literature review suggested that the relationship between innovation and operational performance is inconsistent, thus there is a need to identify

the moderator for this relationship. Therefore, the main purpose of this study is to integrate and identify kaizen culture as the moderator between innovation and operational performance as a conceptual framework. The framework will provide researchers and manufacturers an understanding on the importance of kaizen culture-innovation in optimizing operational performance in order to provide a sustainably competitive advantage in today's highly unstable, more complex, interconnected and very disruptive business environment.

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