

SUSTAINABLE MANUFACTURING PRACTICES IN A MALAYSIAN AUTOMOTIVE COMPANY: A PERSPECTIVE FROM HOFSTEDE'S CULTURAL MODEL

M.S. Syed Mohamed¹, A. Saptari² and M.I. Nor Ma'arof³

¹Fakulti Kejuruteraan Pembuatan,
Universiti Teknikal Malaysia Melaka, Hang Tuah Jaya, 76100 Durian
Tunggal, Melaka, Malaysia.

²Department of Industrial Engineering, President University, Jl. Ki Hajar Dewantara,
Kota Jababeka, Cikarang Baru, Bekasi 17550 – Indonesia.

³Department of Mechanical Engineering, Faculty of Engineering and Quantity
Surveying, INTI International University, Persiaran Perdana BBN,
Putra Nilai, 71800 Nilai, N.Sembilan,
Malaysia.

Corresponding Author's Email: ¹syafiq@utem.edu.my

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ABSTRACT: Industrial practices are moving towards an environmentally sustainable manufacturing philosophy. Depending on local environmental requirements companies have adopted practices with different priorities and different intensity. A survey was conducted with the aims to identify the awareness level of sustainable manufacturing practices and to analyze problems faced in implementing sustainable manufacturing from the perspective of Hofstede's cultural model. A small and medium automotive company in Malaysia, XYZ Automotive was chosen to be the focus of this study. Survey has been used to collect the data via questionnaire, interview and observation. Commitment from employees and top management is crucial for sustainable manufacturing success as explained by Hofstede's collectivism and power distance dimension. Collectivism and high power distance dimensions work hand in hand in determining the success of sustainable manufacturing practices in XYZ Automotive.

KEYWORDS: *Sustainable Manufacturing; Malaysia; Automotive; Awareness*

1.0 INTRODUCTION

Most of the manufacturers in Malaysia are familiar with the concept of sustainable manufacturing. The idea of sustainable manufacturing dovetails nicely with promoting cleaner environment overall. Companies who have promoted environmentally friendly manufacturing practices will find sustainable manufacturing easy to implement. Meanwhile, companies who have not practiced any form of environmentally conscious practices may find it difficult to integrate sustainable manufacturing practices into their company. According to the U.S Department of Commerce, sustainable manufacturing is defined as “the creation of manufactured goods that uses processes that minimize negative impact on the environment, while conserving energy and resources as well as economically sound and safe for employees and communities”. Compared to green and eco manufacturing, sustainable manufacturing offers a more global perspective by offering three elements of concern, environment, economy and society [1].

As a rapidly developing country, Malaysia is facing stiff competition from neighbouring countries such as Vietnam, Thailand and Indonesia since the cost of living in Malaysia is on the rise. This may have an impact on the labor productivity levels in Malaysian factories [2]. Malaysian industries need to take a serious look into the viability of sustainable manufacturing in their organizations since sustainable manufacturing has been proven to improve the company's profits in the long run [3-5]. Improving profits can come via additional revenue or decreased operating costs. Sustainable manufacturing can offer decreased operating costs since sustainable manufacturing advocates conservation of resources, recycling activities, proper waste management as well as optimal usage of resources. This is where companies are able to gain increased profits through the reduction of operating costs. However, the implementation of sustainable manufacturing is not without any hurdles for many Malaysian companies. As with any types of improvement programs in any organization, there needs to be a commitment from management and employees. If support is missing from any of these group the implementation of sustainable manufacturing in that particular company will only be partially successful.

One major stumbling block in the implementation of sustainable manufacturing is the commitment from management [6]. Senior management's role is crucial in setting up the relevant objectives for sustainable manufacturing programs, provide necessary support for

employee training, and facilitating team work across all the departments involved in the organization to ensure a smooth implementation of sustainable manufacturing practices in the organization [7]. Additionally, the access to necessary resources to facilitate sustainable manufacturing must be provided by senior management in order to overcome any hurdles in the implementation of sustainable manufacturing. Apart from the senior management, the employees in the company must also be aware of sustainable manufacturing and are willing to adopt sustainable manufacturing practices. More often than not, improvement initiatives such as Lean Six Sigma, Total Quality Management and others have failed due to lack of commitment from the employees themselves. Employees do have to understand the impact of sustainable manufacturing on the company, as well as many benefits that sustainable manufacturing may bring to them.

According to Meyer and Herscovitch [8], employee commitment is defined as the main driver that compels an employee towards a particular desired goal. Employee commitment comes from a few factors in the workplace, namely job satisfaction, management style, relationship and trust, as well as values and culture [9]. Values and culture of the employees and the employer need to be in line with any improvement initiatives the company is pushing for currently. Values and culture in any company depend on the current awareness of employees in and practices in the company.

There are several cross cultural models developed by researchers in order to study cultural differences. Among the commonly used models in business research are the Hofstede's cultural model [10], Hall [11], Trompenaars [12] and GLOBE [13]. Hall and Trompenaars cultural models' are distinctly different from each other in how cultural values are categorized and understood. Hall's model is based on a binary classification system based on low and high context cultures, while Trompenaars' model is based on several variables, in which some of them are similar to Hofstede's cultural model. The GLOBE model was constructed based on the earlier cultural models in which Hofstede's was included. Hofstede's model however is one of the most cited model by researchers in the Social Science Citation Index [14]. Hofstede's cultural dimensions consist of six items, power distance, uncertainty avoidance, individualism vs collectivism, masculinity vs femininity, long term vs short term orientation and indulgence vs restraint. In the context of awareness levels of sustainable manufacturing practices in Malaysia, Hofstede's model may also help to explain why sustainable manufacturing is successful

in certain country or organization. Cultural issues can and do influence any improvement initiatives in an organization.

Awareness and practices have been reliable indicator for the success of any improvement initiatives in a particular company. The level of awareness as well as practices of sustainable manufacturing needs to be measured in order to determine the "assimilation gap" between the knowledge of sustainable manufacturing and the practices of sustainable manufacturing. To date, very few studies have looked into the sustainable manufacturing practices, from the context of a business cultural model. Bearing this in mind, this study aims to explore the awareness and practices of sustainable manufacturing, in a small and medium manufacturing company in Malaysia from the context of Hofstede's business cultural model.

2.0 METHODOLOGY

In this study, a small and medium manufacturing company in Malaysia was chosen, XYZ Automotive. XYZ Automotive was chosen as automotive industry in Malaysia has long been established, and any awareness and practices of the current employees would reflect on the bigger picture on the awareness and practices of sustainable manufacturing in Malaysian automotive industry. As many as 50 employees of XYZ Automotive participated in the study. However, The employees who participated in the study held various positions in XYZ Automotive, such as quality control engineer, process engineer, industrial engineer, project manager, and planner. This ensured that the data obtained from XYZ Automotive is representative of the company.

A survey instrument developed by XYZ was used for the purpose of this research. Currently there are not many instruments available for measuring the awareness of sustainable manufacturing practices in organizations. Most of the survey was developed by researchers themselves for specific objectives. In this study, a survey instrument from the American Management Association (AMA) concerning sustainability was used for this study, since the survey is considered to be the most valid and reputable instrument for measuring sustainability practices in Malaysian companies [15]. The 2007 AMA survey on sustainability was developed based on the responses of more than 1000 respondents consisting of high level human resource professionals in companies. Therefore this instrument was used for the purpose of this research. The AMA survey consists of several

sections such as general issues concerning sustainable manufacturing, enablers of sustainability, barriers towards sustainability, and sustainability practices in the organization. Both descriptive and inferential statistics were used to analyze the results of this study.

Since the main aim of this study was to look at the levels of awareness of sustainability practices in the context of cultural model, basic descriptive analysis plus a simple regression analysis was deemed to be sufficient for the purposes of this study.

3.0 RESULTS AND DISCUSSION

The results from the survey were analyzed by looking at the general distribution of the responses for each category in the survey, which was divided into four sections, namely general issues concerning sustainable manufacturing, qualities for sustainability, sustainability practices, and barriers of implementation.

Table 1: General issues concerning sustainable manufacturing

Item	Rating (out of 5)
We actively develop and change our customers needs and requirements related to sustainable development	3.24
Sustainable development provides our company with new and / or additional business opportunities	3.16
We take sustainability of our products in sales and marketing	3.08
We design our products based on the principles of sustainable development	3.12
We consider sustainable development in our decision making	3.04
The principles and requirements of sustainable development are considered and taken into account when producing and operating	3.02
Packaging and use recyclable materials in our deliveries, purchases and acquisitions	3.22
Sustainable development has an effect on our logistics decisions	3.16
The after-sales service is an important part of our business	3.32

From Table 1, XYZ Automotive realized the importance of after sales service, meeting customer requirements and the usage of recyclable materials during packaging, but the actual practice of implementing principles of sustainable development in the company was seen to be lacking in XYZ Automotive as indicated in Table 1. The awareness of the principles of sustainable manufacturing in XYZ is also lacking.

Top management support, systems alignment, and stakeholder engagement are perceived to be very important as enablers of sustainability in XYZ Automotive, according to Table 2. The least important enablers as perceived by XYZ Automotive are centrality to business strategy and metrics.

Table 2: Enablers of sustainability

Item	Rating (out of 5)
Top management support – The CEO, the chairman of the board, and senior management teams show public and unwavering support for sustainability	3.18
Value – Key values related sustainability have been deeply ingrained in the company	3.08
Centrality to business strategy – Sustainability is central to the company's competitive strategy?	3.02
Systems alignment – The company's structure, systems, processes, and culture are aligned around sustainability	3.18
Metrics – The company deploys an array of rigorous sustainability measures	3.06
Organizational integration – Various aspects of sustainability are viewed holistically and integrated across the functions that I have responsibility for them	3.08
Stakeholder engagement – The company reaches out to and involves a broad array of external and internal stakeholders around sustainability issues, including customers, suppliers, governmental, and nongovernmental organizations (NGOs)	3.14

Table 3: Barriers towards sustainability

Item	Rating (out of 5)
Lack of demand from consumers and customers	3.2
Lack of demand from managers and employees	3.2
Lack of awareness and understanding	3.2
Lack of standardized metrics or performance benchmarks	3.18
Lack of specific ideas on what to do and when to do it	3.1
Lack of demand from shareholders and investors	3.16
Lack of demand from suppliers	3.12
Unclear or weak business case	3.08
Lack of demand from the community	3.14
Lack of support from senior leaders	3.24
Fear of competitors taking advantage of us	3.16

Consistent with the findings from Table 2, “lack of support from senior leaders”, followed by “lack of awareness” and “lack of demand from consumers and employees” are seen as barriers towards

implementing sustainability practices in XYZ Automotive (Table 3). “Unclear or weak business case” is not seen as a significant barrier towards implementing sustainability practices.

Table 4: Sustainability practices in the organization

Item	Rating (out of 5)
Ensuring the health and safety of employees	3.44
Ensuring responsible ethics at all levels	3.1
Participate in collaboration with community and nongovernmental groups	2.68
Support employees in balancing work and everyday life	2.26
Encourage volunteer workers	2.48
Involving employees in decisions that affect them	2.48
Highlight of our brand commitment to sustainability	2.76
Improving energy efficiency	2.96
Work with suppliers to strengthen sustainability practices	2.84
Getting groups across your organization working on sustainability initiatives to work more closely together	2.74
Use criteria related to sustainability in the recruitment and selection	2.7
Establish indicators to determine whether the organization is achieving sustainability goals	2.82
Using sustainability criteria for promotion and progress of career	2.76
Reducing emissions of greenhouse gases	2.8
Linking sustainability-related criteria for compensation	2.8

Referring to Table 4, “ensuring safety and health of employees” and “ensuring responsible ethics at all levels” are seen as the prevalent practices happening in XYZ Automotive related to sustainable manufacturing. In contrast, “support employees in balancing work and everyday life” is not seen as supporting sustainability in manufacturing, at least from the perspective of XYZ Automotive.

A multiple regression analysis was used to determine if enablers of sustainability (ENABLERS), barriers of sustainability (BARRIERS), and sustainability qualities (GEN ISSUES) significantly predicted the practices of sustainability (PRACTICES) in XYZ Automotive $F(3,11)=8.29$, $p < 0.005$. The results of the regression indicated that ENABLERS, BARRIERS and GEN ISSUES explained 69.3% of the variance in PRACTICES. The regression equation is given as $PRACTICES = 0.834 + 3.07\text{ENABLERS} + 2.62\text{BARRIERS} - 5.03\text{GEN ISSUES}$. It appears from the equation that general issues are negatively influences the practices of sustainability.

Consistent with the earlier points discussed in this paper earlier, top management commitment is vital for the implementation of sustainable manufacturing in the organization. However the commitment from employees was not seen to be as important as the commitment from the top management. This could be due to the unique cultural aspect of Malaysia, where top management is seen as an authority to be obeyed at all times. Business cultural model such as Hofstede Cultural Dimensions has rated Malaysia as one of the countries with a very high power distance index [16]. Power distance index describes the extent of acceptance of unequal power distribution in the society [10]. As a result any improvement initiatives in a company must be led and promoted heavily by the top management in order to succeed. Without the investment from the top management any initiatives in the organization are bound to fail [17-19]. As Malaysians are very high on the power distance index, any orders coming from the top management are obeyed without many questions, and therefore the role of top management in driving sustainable manufacturing is vital.

The second most influential factor in driving sustainable manufacturing in Malaysia is the collective support and demand from stakeholders and employees. Malaysia, as a collectivist society [10], relies on the support and loyalty from each other throughout their lifetime. Sustainable manufacturing practices won't be adopted in XYZ Automotive until stakeholders and employees collectively demand sustainable practices, which stems from the collectivist mindset of Malaysians in general. Apart from employees the demand from relevant stakeholders for the organization is also important for the adoption of sustainable manufacturing practices in an organization [20]. Stakeholders are seen as the parties that would be indirectly influenced by any actions performed by the organization. Stakeholders for a manufacturing organization may include suppliers, government agencies, and non-governmental organizations in Malaysia, such as the Federation of Malaysian Manufacturers. Malaysia being a collectivist society, will not embrace a new initiative unless a significant driving force comes from the stakeholders, as well as employees from the manufacturing organization itself.

4.0 CONCLUSION

As a conclusion, the majority of respondents believe that the awareness of sustainable manufacturing practices is moderate. Many of them still lack knowledge about the concept of sustainability. Apart from that, lack of support from senior leadership, lack of demand

from consumers and customers and less demand from managers and employees are three major obstacles to sustainability. Support from senior leadership is very important to subordinates to ensure that they are working in a conducive and vibrant environment. Senior leaders need to promote a culture of working towards sustainable manufacturing. Users and customers should also be exposed to the advantage or benefit of sustainable manufacturing which strikes a balance between the three pillars of sustainability, namely economic, social and environmental. Additionally, the company must provide training and knowledge regarding sustainability to managers and employees to help them understand what a sustainable manufacturing. Involvement of all parties together to towards sustainability is not impossible mission to become a sustainable manufacturing companies can be achieved [21].

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