Organisation Culture, IT Infrastructure and KM Process influencing KM Effectiveness in a Malaysian Manufacturing Company

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Abstract **- This study aims to examine the relationship between Organisation culture, IT infrastructure and Knowledge Management Process, towards Knowledge Management implementation effectiveness in a Malaysian manufacturing company. This study was conducted among the permanent employees across all departments in the GLC Manufacturing Plant in Malaysia. Quantitative data were collected using self-administered questionnaires to a sample of 108 permanent employees. Based on the findings from multiple regression analysis, Organisation Culture had the most significant impact towards KM implementation effectiveness; whilst IT Infrastructure had a significant relationship but KM Process had no significant relationship with KM implementation effectiveness. The study had made significant contribution where it extended the literature on KM enablers influencing KM implementation effectiveness and contribute towards strategizing better policies on organizational culture and IT Infrastructure to improve overall KM effectiveness in manufacturing organization.**

Keywords *– Organisation Culture, IT Infrastructure, Knowledge Management Process, Knowledge Management Effectiveness*

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I. Introduction

Knowledge management practices are seen as a crucial element in the 'global business process' within organisations and a major source of competitive advantage. It is considered essential for an organisation today to manage its knowledge resources and to make them efficiently in used in order to reap full benefits from it. The success of business organisations is crucially affected by knowledge management (KM) whereby the purpose of KM is to create organisation intelligence with rich knowledge assets (Mageswari, Sivasubramanian, & Dath, 2017).

Given that knowledge is a strategic asset for organisations, KM is one of the strategic pillars in organisations that create value for its shareholders. Consequently, KM Effectiveness is a fundamental support to attain information from outside of the organisation, either to access knowledge within the organisation or to increase efficiency, applying flexibility and agility, to curtail operational costs, to decrease time to market and to enhance the transparency of business activities (Ghasemi & Valmohammadi, 2018). Effectiveness of KM is not limited to create organisational knowledge, but also to enable proactive decision making, enhancing customer focus by improving quality and performance (Mageswari, Sivasubramanian, & Dath, 2017) to stimulate cultural changes especially on innovations. Moreover, it also helps to increase competitive advantage for the company to be ahead of their competitors (Boroujerdi, Hasani, & Delshab, 2019).

This research is a case study on a manufacturing company based in Malaysia where it experienced some internal issues with regards to the knowledge management. Based on a preliminary interviews conducted with the Manufacturing Production Manager, there seemed to be lack of knowledge sharing within individuals in the company hence creating significant knowledge gaps between individual, between departments as well as between managers and executives. Some individuals in the company were not exactly aware on what their peers were doing in the other departments. Lack of knowledge sharing was also evident by the fewer collaboration projects between departments, and each department only takes care of its area of responsibilities and key performance indicator (KPI) only. There were also occurrences where the more experienced employees were keeping their expert knowledge all to themselves and rarely shared with their peers or juniors. Another observation made was the lack of sessions and avenue for tacit knowledge sharing which is an important practice to capture knowledge and recollect the skills within the employee in the organisation. These issues had consequently resulted to overly dependence to certain individuals in the organisation to perform specific tasks, hence under-utilising other potential talents. Individualism versus collectivism mentality can also occur at this rate when employees are not sharing knowledge within the organisation as a whole but are keeping the knowledge for their own benefits.

Another issue confronted by this manufacturing company is the underutilisation of knowledge management system (KMS) that is already in place. Even though there are a few KMS tools installed in the company to capture, store and distribute information or knowledge, certain KMS tools have limited accessibility. Some system can only be accessed by a limited number of people and this has led to the inability to expedite certain decision-making process. There are a lot of decision-making process in the manufacturing environment which include process troubleshooting, customer complaints, supplier and customer relations, procurement, logistics and even financial and accounting, in which having an effective and efficient KM system will benefit not only the operation but also the management team. There are also under-utilisation of KM tools or system in terms of data analytics that are not being fully utilised to assist in solving production process or expediting procurement process in manufacturing plant.

Lastly, even though there are some KM practices seen in the organisation for example, training program to acquire new knowledge, the establishment of the Standard Operating Procedure, a checklist, internal records for knowledge storage, installation of KMS such as internal communication portal, enterprise resources planning (ERP) and business intelligence (BI) system to store and distribute knowledge, there is no measurement or key performance indicator (KPI) metrics to gauge how far is the effectiveness of the KM implementation in the organisation. No review and coordination were conducted by the specific community of practices in the KM area within the organisation. Everyone and each department are allowed to manage their own knowledge, and the awareness to create an organisational knowledge seemed absent. This would create further issues in the organisation whereby the KM system will not be fully effective and utilised to its true potential of creating more value to the organisation. Knowledge management is important for businesses especially for a manufacturing company as it can help the organisation to improve their service, increase quality of product, reduce cost and provide faster response to customers. Having a robust system is not enough, but the questions on how to ensure the effective implementation of KM in the organisation should be given more attention. Hence, the questions surfaced on how this manufacturing company managed the overall KM process in their organisation with the absence of KM performance monitoring in place.

According to Sedighi and Zand (2012), several factors contribute to the success of KM Implementation in an organisation which include Organisation Culture, Structure and Procedure, Human and Financial Resources, Technology and Infra, Strategy and leadership and also process and practices. However, based on the issues discussed above in regards to the manufacturing plant company, this study will be focusing on problems of knowledge sharing and knowledge gaps related to Organisation Culture, under-utilisation of KM tools related to technology and infrastructure and lack of KM monitoring related to the process and practices of KM. The study will further investigate to what extent do the Organisational Culture, Technology Infrastructure and KM Process/Practices Control of the company account for the perceived effectiveness of KM Implementation in the organisation. Hence, transmit the signal to the management on areas that need to be given attention and to be improved further.

II. Literature Review

KM Effectiveness

According to Centobelli, Cerchione, and Esposito (2019), KM effectiveness represents the capability to apply KM in the organisation and able to manage the precise organisation's knowledge. Meanwhile, KM efficiency has been defined as the capability of organisation to use the acceptable KM to manage its specific knowledge without wasting the organisation's financial and human resources, and also time, in incompetent systems. As per previous study done by Song and Sun (2018), they had conceptualized KM effectiveness as the fulfilment of KM with the process of creation, acquisition, transfer and application of knowledge for performance of task in the organisation.

Effective knowledge management applies a set of methods to organisational knowledge including its accumulation, utilisation, sharing and ownership. In terms of accumulation, through internalisation or externalisation in an organisation, the higher the efficiency of knowledge accumulation, the KM effect will be greater. For utilisation, the higher the utilisation of the current knowledge in an organisation, the better the KM results. While the improvement of sharing of formal and informal knowledge will affects the KM positively.

Adeinat and Abdulfatah (2019) mentioned in their study that organisation need to understand the significance of managing knowledge viably in the contemporary serious business climate. Knowledge has become a significant device for improving the nature of all cycles in numerous sorts of associations, and therefore, information must be viewed as a main impetus for cultural, financial and innovative advancements in all areas around the world. Having the information required for an offered organisation to work efficiently gives a foundation to leaders and managers to settle on precise and convenient choices, in this way improving the inward productivity of cycles, delivering the organisation more adaptable in reacting to threats and opportunities and empowering responsibility among the organisation's members. Therefore, effective knowledge management is very important to organisations for some of the benefits.

Sedighi and Zand (2012) had highlighted that there are several factors contributing to the success of KM in an organisation which been identified as KM Enablers. It includes Organisation Culture, Structure and Procedure, Human and Financial Resources, Technology and Infra, Strategy and Leadership and the Process and Practices within the organisation itself. A study conducted by Mageswari et al. (2017) had attempt to give an inclusive perspective that evaluates the connections between the KM enablers, KM processes and performance. The following research results support and confirm the basic principles of the relationship proposed in the model: KM has significantly affected the organisational innovation and KM has significantly affect organisational performance.

Organisational Culture

Organisational culture has been defined by Bharadwaj, Chauhan, and Raman (2015) as a way of organising life so that people can inspire them to create, share and use knowledge in order to benefit the organisation and achieve lasting success. It represents the company's value system and will become the code of conduct for employees. The existence of a "knowledge culture" is essential to the success of KM within the organisation, because it shows management's commitment to the KM plan and promotes the sharing of tacit knowledge to achieve higher quality decision making.

Organisational culture also can be defined as the ethics and norms within the organisation, which includes beliefs, feelings and the flow of transferring those values among all organisation's members. Stojanović-Aleksić, Erić Nielsen, and Bošković (2019) had defined organisational culture as the values, beliefs and basic assumptions that act as base attitudes about what is beneficial and unfavourable, right and wrong, necessary and unnecessary, as well as any other parts of a culture, effects the way in which the reality is practiced and

understood. According to Adeinat and Abdulfatah (2019), a positive culture is important and significant to organisational growth. Organisational culture is the key element of managing the cooperation of employees as organisational culture makes the attitude, values and norms of employees in the organisation concrete. Organisational culture also contributes to the improvement of the organisation's technical results where organisational culture oriented to process or product innovation and knowledge management.

Organisational culture is also important as considerable wellspring of competitive advantage where it depends on existing information as well as on organisational culture, frameworks, strategies and practices to accumulate, incorporate and share organisational knowledge inside the organisation's limits. In addition, organisational culture supports new idea and concentrate on gaining than losing as knowledge sharing practices are influenced by social assumptions, for example, what information ought to be shared inside the association and what ought to be stored by people; by underlying connections, for example, how rapidly the information courses through conventional announcing connections; and by essential needs, for example, what information is to be focused on and what is to be disregarded.

IT Infrastructure

Technology and infrastructure is listed as one of the key driving enablers of knowledge management and it is believed that any organisation should focus in making an improvement onto this enabler in order to improve the decision-making process and managerial efficiency (Yadav, Pant, & Seth, 2020). Most organisations allocate a large amount of money in providing a structured system or technology for management efficiency. Technology and infrastructure referred as a tool or skill, a product or process, physical equipment or execution methods by human's capability increases (Rafiei, Akhavan, & Hayati, 2016). It is one of the components in knowledge management infrastructure where it is used in collecting and transmitting data (Ghasemi & Valmohammadi, 2018). It also known as a tool which is able to manage, store and transmit structural knowledge where can support the efforts to make knowledge in the human brain or in documents available to all employees of an organisation (Tseng, 2008).

With the presence of technology, it helps to boost the effectiveness of knowledge management in the organisation. Employees are able to extract information in a short time and lead to reducing the dependency on other employees to gain information or details to solve tasks. In addition, employees can depend on technology for improving the communications especially if they work in distributed teams (Haamann & Basten, 2018). This can boost cooperation between employees in terms of social networking in information exchange without having to do it by face to face via physical gathering. By using technology, the information sharing and collaboration can be done efficiently in the end will affect the performance of the employees and organisation.

The technology and infra can furnish a good impact on the management where it satisfies the needs and wants among the employees in the entity or company and come along with the maintenance of system's efficiency. The frequency of using technology through a tool such as intranets, web browsers or software agents can measure how often the storing and sharing knowledge about processes are carried out within the entity (Chión et al., 2019). It can give a view of processes have been improved or not by implementing knowledge management through the convenient facilities of technology.

KM Process

Process is one of the knowledge management enablers where they can moderate knowledge management activities such as codifying and sharing knowledge within organisation. Each organisation has differed in all essential and sub activities depending on the knowledge with the nature (Mohammed, 2015). This enabler is one of the contributors that able to guide knowledge management within the organisation. Process defined as a structural process that being constructed and implanted into daily activities with the objective in gaining a desired outcome for the organisation (Mat Nor, Mat Khairi, Rosnan, Maskun, & Johar, 2020). It acts as a supporting role where it constructs a framework of information system with knowledge management where it involves four interdependent knowledge processes which is knowledge creation, knowledge sharing, knowledge transfer and knowledge application (Hegazy & Ghorab, 2014).

A process as a KM enabler is an essential role in the effectiveness of knowledge management by delivering good product output. It also can help the organisation to be aware of the knowledge at every level of position and can encourage the utilizing of knowledge to shape its development and construct an efficient process and effective knowledge management system (Latif, Afzal, Saqib, Sahibzada, & Alam, 2021). KM processes implementation and activities is an important factor in creating a successful knowledge-based firm. Therefore, the process-based view of KM plays an important role in executing the KM system effectively. KM processes help the management of the company to interpret the KM program to employees' daily task or activities. All the

KM process models assumed that steps and sub processes are often concurrent, sometimes repeated, and not always in linear sequence (Sedighi, 2012).

Conceptual Framework

The framework of this study is shown in Figure 1. The independent variable is Orgnisational Culture, IT Infrastructure and KM Process, whilst KM Effectiveness is the dependent variable.

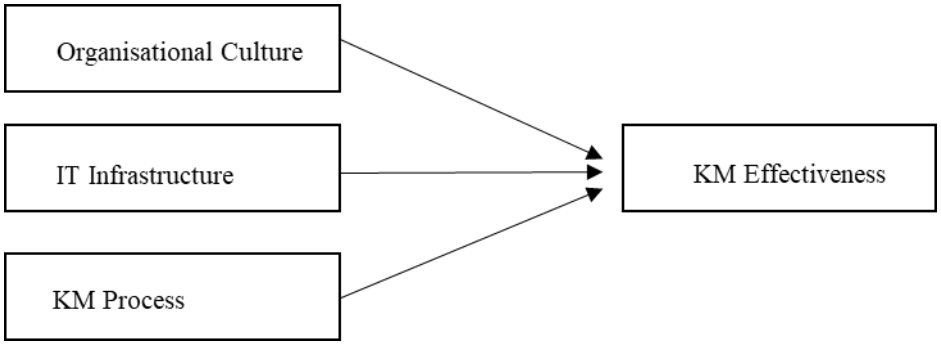

Figure 1: Conceptual Framework

III. Data and Methodology

Data Collection and Sampling

This research is a correlational study using quantitative approach conducted on KM implementation within manufacturing plant company in Malaysia. It integrates scientific research to investigate the degree of association between independent variables with dependant variables. Sampling technique used was census, whereby it involved the entire population consist of 108 permanent employees of the manufacturing company, with 21 is from the Executive level while the balance of 87 is from non-executive level.

Cleaned up data from the questionnaire was analysed using SPSS version 27 software. Pearson correlation analysis and Multiple regression analysis were conducted in determining the correlation between independent variables and determining which independent variable among Organization Culture, IT Infrastructure and KM process has the most impact towards KM effectiveness in this manufacturing company.

Measurement

The study was using self-administered questionnaires as a main research instrument for primary data collection. A set of questionnaires with Likert type scale (1-5) were distributed to respondents. The dependent variable in this study is KM effectiveness and the measurement for KM effectiveness have been adapted from previous research by Mageswari et al. (2017). The measurement for KM Effectiveness were based on two dimensions which are Organizational Performance (3 items) and Organizational Innovation. (3 items). While the instruments for the three independent variables for this research which are Organizational Culture, IT Infrastructure and KM Process were also adapted from previous studies.

For Organizational culture, the measurement consists of 5 items which was adapted from Chión, Charles, and Morales (2019), Elwany and Mahrous (2016) Ghasemi and Valmohammadi (2018). For second independent variable IT Infrastructure, the measurement was adapted from Al Shamsi and Ajmal (2019) and Ghasemi and Valmohammadi (2018) consisting of 5 items. Lastly, for KM Process, 6 items were used and was adapted from previous research by Ghasemi and Valmohammadi (2018) and Yadav et al. (2020).

All measurements were using Likert Scale (1-5) with 1 indicates a response of strongly disagree, 2 indicates disagree, 3 is indicative of neutral, 4 is indicates of agree and 5 is indicates of strongly agree response. The items were modified in terms of their wordings and restructured to ensure better suitability and relevance to the application in the manufacturing industry. The Cronbach's alpha value for this study is reliable where the overall reliability test is 0.964.

IV. Findings and Results

In this section, the relationship between independent variables KM effectiveness and dependent variables Organizational Culture, IT Infrastructure and KM process were analysed. Based on correlation table below, Organisational culture, IT Infrastructure and KM Process have a significant positive correlation towards KM Effectiveness. Organisational Culture has a correlation of 0.717, IT Infrastructure has a correlation factor of 0.742 and KM process is having a correlation factor of 0.737 with KM effectiveness. These shows that all three independent variables have highly positive and very significant correlation relationship with KM effectiveness.

Table 1: Result of Correlation Analysis

	Organisational Culture	IT Infrastructure	KM Process & Control	KM Effectiveness
Organisational Culture	1			
IT Infrastructure	.760**	1		
KM Process & Control	.806**	.849**	1	
KM Effectiveness	.717**	.742**	.737**	1

Based on the adjusted R^2 value, it can be interpreted about that 61.7% of the variability in KM Effectiveness can be explained by the variance in Organisational Culture, IT infrastructure and KM Process in the SDK Manufacturing plant.

Table 2: Result of Multiple Regression Analysis

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.786[a]	0.617	0.6	2.589

Predictors: (Constant), SUM KM PROC, SUM ORG CULT, SUM IT INFRA

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	5.477	1.843		2.972	0.004
	Organisational Culture	0.332	0.157	0.278	2.111	0.039
	IT Infrastructure	0.371	0.16	0.343	2.324	0.023
	KM Process & Control	0.218	0.16	0.222	1.369	0.175

a. Dependent Variable: SUM KM EFFEC

From the coefficient table, it can be seen that IT Infrastructure has the highest value of standardized Beta coefficient with 0.343, followed by Organisational Culture with a value of 0.278 and lastly KM Process with the lowest Beta coefficient of 0.222. This can be interpreted that; IT Infrastructure is having the highest contribution as enabling factors in influencing KM effectiveness in the SDK Manufacturing plant. This was followed by Organisational Culture, as the second highest enabling factor and lastly KM Process which has the lowest contribution in explaining KM effectiveness in SDK Manufacturing plant. The outcome from the analysis also showed greater confidence that the coefficient of IT Infrastructure and Organisational Culture are having stronger predictive ability in explaining the KM Effectiveness in SDK Manufacturing plant as compared to KM Process. P-value from the table shows that Organisational Culture and IT Infrastructure are statistically significant with p-value < 0.05. However, as for KM Process, the p-value is higher than 0.05, showing that it is not statistically significant thus having no association with the KM Effectiveness.

V. Discussion

Based on the findings of correlation analysis, all three independent variables have high positive correlations towards KM Effectiveness. This was in line with the study by Sedighi (2012) which mentioned that several factors contributing to the success of KM in an organisation includes Organisational Culture, Structure and Procedure, Human and Financial Resources, Technology and Infra, Strategy and Leadership and the Process and Practices within the organisation. In the manufacturing company understudy, these three enablers Organisation Culture, IT Infrastructure and KM Process were related closely to the issues discussed in the problem statement and was predicted to have influenced KM effectiveness hence the survey findings have been collected and analysed. Based on the findings, it has been confirmed the correlation exists between the studied KM enablers towards KM effectiveness in SDK Manufacturing Plant.

The findings from multiple regression analysis also indicated the same but in a slightly different interpretation. The adjusted R^2 value of the regression analysis already confirmed that 61.7% of the variability in KM Effectiveness in the manufacturing plant company can be explained by all three independent variables. However, based on the p-value, only two variables are significant to explain this variability which KM Process was not one of them. By looking at the regression analysis results and standardized Beta coefficient, IT infrastructure was found to have the highest influence on KM effectiveness in the organisation, followed by Organisational culture and lastly KM Process. This was reflected in a literature study by Elwany and Mahrous (2016) and Osman & Ngah (2016), which asserted that few key enablers including organisational culture and information technology, when aligned and coordinated within an organisation, may result in better KM effectiveness.

In the manufacturing company context, IT Infrastructure may be the most important influential enablers towards KM Effectiveness. According to Yadav et al. (2020), any entity should focus on improving this IT infrastructure or technology enabler in order to improve the decision-making process and managerial efficiency. IT infrastructure in KM effectiveness has the function of collecting and transmitting data (Ghasemi & Valmohammadi, 2018), managing, storing and transmitting structural knowledge in an organisation, both tacit and explicit for it can be accessible by all the employees (Tseng, 2008). The company has already installed few KM systems in their organisation, for example, which include SAP ERP system, internal communication portal, CRM for marketing, and warehouse management system. However, based on the findings specifically focused on IT Infrastructure enabler, the reliability of the KMS system installed is questionable. This was based on the answer of the survey questionnaires, whereby the question on KMS reliability had the lowest mean average score of 3.51. Reliability in this context refers to system quality, and the degree to which a system is dependable to the users, the technical availability over time, uptime, downtime, or mean time between failures (Nelson, 2005). The other two lowest scores in average mean are the adequacy of IT tools installed in the company and the acquaintance or conversant level of the system installed in the perception of the users. KM System reliability, system adequacy and system literacy level of all users in the manufacturing plant company may need to be accessed further to improve the efficiency and increase KM effectiveness in the organisation.

VI. Conclusion

This research has answered the research objectives by conducting a multiple regression analysis that describes the relationship between organisational culture, IT infrastructure, KM process and KM effectiveness. The issues observed in the company was the main concern with regards to KM effectiveness and was highlighted in the study.

Few strategies have been recommended, particularly to improve the effectiveness of KM in the company by concentrating on the three related enablers. For IT Infrastructure, it is proposed for the company to fully utilise the systems that is already in place. Develop social media platform and mobile apps for collaboration, communication, knowledge sharing; and also evaluate IT users based on job description and competencies for accessibility and usability. The suggested strategies for Organisational Culture includes the transformation of good QMS practices into intelligent KM system; communication and engagement activities; top management proactive involvement in supporting KM initiatives, creating policies and values, giving rewards and incentives; and active engagement session for KM awareness and communication, online learning initiatives to increase collaboration (Mohd & Tuan Besar, 2020). As for the KM Process, real-time updates on regulation and customers' requirement via the online system; conduct KM Audits and KM Performance Measurement System must be held consistently and regularly.

The limitation of this study needs to be addressed by future research to assist future researchers in conducting studies on KM Effectiveness in order to have more understanding in a broader scope of KM Effectiveness. As this research was more of a case study focusing on the issues confronted by this one particular organisation, possible considerations to apply on a larger sample targeting at a larger population from various organisations and different industries could be studied in future research.

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