# Management control system and organization performance: A study of Malaysian manufacturing organization performance

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This research will focus on the belief MCS, boundary MCS, interactive MCS, as well diagnostic MCS. It used quantitative research whereby five 5-point Likert scale questionnaire was administered to 300 product development managers in 42 manufacturing companies located in Malaysia. The first theme is belief control, which focuses on the commonalities of value systems and corporate culture. Administrative activities are greatly influenced by boundary control, which involves defining appropriate conduct and limits. The results pointed out very high correlations between organizational performance and every element of MSMCS. interestingly, such an association with diagnostic control proved to be unusually strong, revealing the significance of monitoring and feedback towards guiding manufacturing companies to excellence. Management control has to be undertaken holistically with an eye on strategy and cultural alignment for sustainable success. Belief control, boundary control, interactive control, and diagnostic control are important for organizational performance. As an example, these practical tips advise companies on the creation of belief models, implementation of interactive controls, boundary controlling in a manner that promotes efficiency, and diagnostic controllability towards continued progress. More studies should be focused on the true mechanics of diagnostic control and ways in which emergent technologies could strengthen managerial controls as well as improve an organization's functioning and effectiveness.

## 1.1. Research Background

The main issue of this research is how management control systems (MCS) facilitate the organisation performance of manufacturing in the Malaysian context. The management control system in this context refers to a system that collects and uses the information to evaluate the performance of organizational resources in light of the strategies that an organization attempts to pursue (Azimovna et al., 2022). The research seeks to understand to which extent MCS information influences the organisation performance, which is a critical aspects of manufacturing companies run their business activities. In short, this research attempts to examine the implications of the management control system on the organisation performance of manufacturing organizations in Malaysia.

The research is motivated by the fact that there has been an increasing effort towards organisation performance by various businesses given its current importance in the competitive business environment. Organisation performance is becoming increasingly important but there are some sustainability challenges that businesses face when they become innovative (Nani & Safitri, 2021). It creates the need for organizations to understand the significance of MCS, which has not yet been a major focus of researchers (Diatlova et al., 2021). It means that the awareness of MCS when it comes to organisation performance is still low and more research is needed. Additionally, there is limited research regarding the influence of MCS on the organisation performance, which is the reason for the lack of awareness on its significance (Salma et al., 2019). Additionally, such studies are limited in the manufacturing sector but at least the studies have been done on other sectors such as banking and health (Chenhall et al., 2011).

Therefore, this research is concerned with the issue of the usefulness of organisation performance in the manufacturing processes, which many studies have not emphasized enough. Studies have suggested that the unwillingness of businesses to improve the performance of their organisation is associated with the

elements of uncertainties and ambiguities that surround these activities (Diatlova et al., 2021). It means that businesses lack adequate information necessary to facilitate or improve the efficiency of their organisational performance and the research shows how access to information is crucial for organisation performance (Mishchenko et al., 2021). The decisions and action process that facilitates organisation efficiency and performance in companies relies on communication and information circulation within an organization to provide paths for organisation performance (Kozlov et al., 2019). Hence, this research considers management control systems as formal information-based routines that are used by organizations to change or maintain organizational change.

### 1.2. Problem Statement

In the modern manufacturing sector, proper functioning of the organization depends on the clarity and coherence of the belief system and the boundary control mechanisms. In today's manufacturing industry, issues include ethical conundrums relating to product quality, environmental effect, and worker safety, in addition to the difficulty of complying with various legal requirements (Dobrotvorskiy, S., Basova,, 2020). Belief control consists of shared values and culture that guide individual’s behaviors within the organization while boundary control entails roles and decision-making authority (Mohamed et al., 2017). One major problem facing the manufacturing sector in relation to belief and boundary control is role ambiguity. Employees tend to lack clarity regarding their roles and responsibilities (Mañas et al., 2018).

In the Manufacturing Industry, there are persistent issues with boundary control and belief in the manufacturing sector. Ethical Dilemmas, concerning worker safety, the environment, and product quality, manufacturing organizations must make moral decisions. Belief control is important because it fosters a culture of ethical responsibility in workers, which helps to address these problems. For instance, problems like product recalls brought on by safety worries or environmental infractions can harm a business's brand and financial performance.

Everywhere in all organizations, there are often change resistance among the employees and this particularly comes when companies need to introduce new paths of conduction businesses. It is because many organizations fail to include their employees in the process of implementing changes or if they bring new ideas, they are not supported (Langfield-Smith, 1997). It causes reluctance among the employees to produce new ideas, leading to their unwillingness to participate in creating new changes and processes within the workplace. The cause of this challenge is because of some uncertainties in the communication channels that are used within organizations (Azimovna et al., 2022). All this also lead to lack of interactive control, top management and the first level management are the key levels in the organization that ensure all communications and directions from the stake holders are carried out correctly. As the employee of the company, it is their obligation to move forward together as a team to achieve the company goals and objective. Therefore, interactive control plays an essential role in improving organisation performance. This system is often used by managers to obtain feedbacks, track new ideas, trigger organizational learning. With constant involvement from the top and first level management in interaction with the lower level employees, they are bound to get real time feedback, be it positive or negative on the procedures or processes, is the information circulation clear and sufficient thus impacting better organisation performance.

Diagnosis control plays a vital role in ensuring smoother organisation activities, as ongoing processes or company procedures is being monitored from time to time thus improving organisation performance. Let us examine a manufacturing plant that uses an

intricate assembly line to make car parts. The facility uses a variety of equipment and robots to carry out diverse jobs including painting, welding, and assembling. The facility may use sensors, data analytics, and monitoring systems to execute diagnostic control. Let's say a robotic arm is in charge of joining parts together. The diagnostic control system may consist of sensors, data collection, analysis and corrective action, the manufacturing plant may prevent problems before they arise, save downtime, and preserve the effectiveness and quality of the production process by putting diagnostic control into place.

The main problem that these companies face is the inability to balance these market requirements of being efficient in their operations and reporting excellent economic returns, which is discouraging many companies from improving their performances. But, MCS has been an integral tool in such situations (Malmi & Brown, 2008). The importance of MCS is ignored by many companies when enhancing their performance while scholars have indicated how this system is important for Malaysian business survival. They need it not only to develop but to improve on their performance by making them more efficient within their organizations (Salma et al., 2019). Despite this, this research recognizes the existence of limited empirical observation from the Malaysian manufacturers' perspective on how MCS information is effectively enhancing organisation performance. Particularly, this research seeks an extension of knowledge prior to MCS through observation of the significance of the generated information towards facilitating organisation performance within manufacturing organizations. In fact, the previous studies gave little evidence on the role of mission and vision statements, performance measurement systems, and job scope descriptions as sources of management control system information that will help organizations to track their actual outcomes instead of objectives and goals in quantitative terms.

Generally, studies have shown the importance of belief control, boundary control, interactive control, and diagnosis control, all this can increase employee engagement, trust, and loyalty by cultivating a culture of ethical responsibility and adherence to rules and industry standards, this can lead to improved product quality, less opportunities to violate the law or the environment, and more organisational efficiency, to monitor and optimize their targets and outcomes and it helps the employees and the managers to create an environment of willingness to exchange views and knowledge. It means that research should focus on the implications of MCS on the specific type of innovation before examining the overall impact on the performance of these organizations.

On the other hand, the fact that businesses lack adequate information necessary to facilitate the improvement in organisation in their manufacturing processes and the research shows that there is a knowledge gap in this context (Endres et al., 2021). Many companies seem not to understand the implications of MCS in facilitating organisation performance during their process of change. The cause of this challenge is the insufficient knowledge from the previous studies existing on this specific framework of system controls. It is because most of the previous studies that have at least focused on this area have not offered practical and theoretical implications of their studies. Hence, most managers cannot acknowledge the significance of information systems such as MCS in facilitating the process of change within their organizations. Furthermore, only a few studies investigating this issue have applied various theoretical frameworks to underpin their studies (Haustein et al., 2014). It means that the majority of the studies have not applied theories in addressing the implications of MCS on innovation and subsequent organization performance in organizations. Hence, it makes it hard for the

readers to generate useful insights from the previous studies

### 1.3. Research Gap

The fact that businesses lack adequate information necessary to facilitate the improvement in organisation performance in their organisation activities and the research shows that there is a knowledge gap in this context (Endres et al., 2021). Many companies seem not to understand the implications of MCS in facilitating organisation performance during their process of change. The cause of this challenge is the insufficient knowledge from the previous studies existing on this specific framework of information and communication. It is because most of the previous studies that have at least focused on this area have not offered practical and theoretical implications of their studies. Hence, most managers cannot acknowledge the significance of information systems such as MCS in facilitating the process of change within their organizations. Furthermore, only a few studies investigating this issue have applied various theoretical frameworks to underpin their studies (Haustein et al., 2014). It means that the majority of the studies have not applied theories in addressing the implications of MCS on innovation and subsequent performance in organisations. Hence, it makes it hard for the readers to generate useful insights from the previous studies.

### 1.4 Research Objectives

The main objective of this research is to explore the role of MCS information towards subsequent organization performance among manufacturing companies. The research seeks to understand how MCS information influences the degree of innovation activity and the subsequent effects on the innovative efforts of manufacturing companies. To achieve this objective, the following are some specific objectives that the research will focus on.

1. To examine the relationship between the belief control and organisation performance in manufacturing companies in Malaysia.
2. To examine the relationship between the boundary control and organisation performance in manufacturing companies in Malaysia
3. To examine the relationship between the interactive and organisation performance in manufacturing companies in Malaysia.
4. To examine the relationship between the diagnostic control and organisation performance in manufacturing companies in Malaysia.

### 1.5 Expected Contribution

The research will contribute to extensive research on MCS and organisation performance by exploring the cost control, diagnostic control, interactive control, and elimination of waste in promoting organisation performance in firms. The study will particularly contribute to the importance of MCS in guiding organizations toward their streamlining their operations through communication and information circulation. Theoretically, the study will expand knowledge on prior MCS by observing the significance of information generated in facilitating organizational efficiency that leads to improved organization performance. Practically, the study will be of interest to practitioners in the sense that it will reveal finer details of control practices that will incorporate the strategic imperatives of organization performance in organizations. Furthermore, the study will contribute to calls in the management accounting and control pieces of literature that will further explore the relationship between organization performance and MCS. Manufacturing industry was chosen in this industry because they mostly prefer organizing their teams' efforts to a successful operation, which is why they need to adopt MCS. Since MCS helps organizations to measure and track actual outcome, manufacturing sector was mostly suitable because they frequently improve their organizational processes. Additionally,

it is the manufacturing industry that has been most ignored by researchers regarding the influence of MCS on organization performance.

### 1.6 Limitation of Study

The scope of this research is limited to examining the role of MCS on organizational performance among the manufacturing companies. The study mainly explores this role by examining the manufacturing companies in Malaysia. The study will also limited to a survey of 350 manufacturing companies within the manufacturing sector in Malaysia and collecting information from 350 research participants. These manufacturing organizations were chosen to help the study in collecting more information given that the study is quantitative. This limitation may affect the generalizability of the findings of this research to other sectors such as processing, finance, or agriculture which might also rely on MCS to enhance their performance. The study may also have some inherent methodological limitations that are associated with the method used in data collection. Questionnaire may not collect detailed and in-depth information on how MCS could enhance organizational performance because it is only based on close-ended questions. However, this study enhances the understanding of how interactive use of MCS can influence organizational performance by developing some organizational capabilities.

## 2.0 LITERATURE REVIEW

Organization performance has been one of the major strategies that organizations use to solve their needs and become more competitive while it is generated through technology. These abilities to reduce waste time while maintaining quality of products and services are implemented in organizations to help in meeting the growing changes in consumer demand and also help them in achieving economies of scale (Diatlova et al., 2021). Organization performance can be improved through two types of innovation that include radical and incremental innovation which are used in measuring the performance of organizations. Radical innovation involves the use of technologies and new knowledge to change the routine activities of an organization. Incremental innovation is a series of improvements and upgrades that a company makes to its products and services (Salma et al., 2019). While these innovations are important for improving the performance in organizations, the resulting outcomes must also meet the changing demands of consumers; hence, organizations must broaden their perspectives beyond processes and products to enhancing organization performance (García-Fernández et al., 2022). They need only to strategize but also to develop capabilities and a working environment that will enhance organization performance. They have to use appropriate approaches to manage these types of innovation because the activities involve greater extents of uncertainties. It is because of this reason that many researchers have established the significance of information in reducing these uncertainties and enhancing the innovativeness of organizations, which further helps organizations to improve their organizational efficiencies (Solaimani et al., 2019). However, the use of information significantly differs across organizations and depends on the types of activities that firms engage in.

### 2.1 Manufacturing Industry in Malaysia

Malaysia's economy has undergone a significant transition, with manufacturing playing a key role. Manufacturing is not only important in producing and delivering goods to the marketplace, but it is also important for economic reasons. Manufacturing is one of the major sectors in Malaysia that reached about RM365 billion in 2022 in terms of sales revenue. It comes after an 8.5% increase since 2020 when the pandemic hit the country and impacted their economic growth. In Malaysia, the manufacturing industry is majorly

comprised of petroleum, chemical, food, beverages and tobacco, rubber and plastic products, electrical and electronic (E&E), Machinery and Equipment (M&E), and Chemicals. So far, the industry is witnessing continued positive growth and contributes about 23.47% to the country's GDP. The skills needed to perform manufacturing tasks change together with the processes themselves. Due to the search for more affordable solutions and rising factory automation, increasingly sophisticated technology means that manufacturing will require staff skills and training to manage, while new materials and processes are changing particular industries.

## 2.2 Management Control System

**Figure 1**

*Management Control System cycle*


Management Control System (MCS) refers to a system that gathers information and uses it to evaluate the performance of the various organizational resources such as physical, human, and organization as a whole. The system mostly influences the organizational behaviours and many organizations rely on it to implement various strategies that use to achieve their objectives. It means that MCS comprise of tools that are used by organizations to aid in steering them towards achieving their objectives and the subsequent competitive advantages. They are the only tools that managers use when they need to implement their organizational strategic objectives.

The behavior of organizational resources is influenced by the management control system when organizational strategies are being implemented. An informal or formal management control system may be used. The formal, information-based routines and procedures managers use to sustain or change patterns in organizational activity are referred to as management control systems, according to Simons (1995). The management control system was depicted by Anthony & Young (1999) as a black box. The phrase "black box" refers to a process whose precise nature cannot be seen.

Ernest Anthony Lowe, professor of accounting and financial management at the University of Sheffield, was one of the first writers to define management control systems in his 1971 work "On the idea of a management control system." He stated that a planning and control system is necessary for the following four reasons:

- The need for a planning and control system within a business organization flows from certain general characteristics of the nature of business enterprises, the chief of which are follows:
    1. firstly, the enterprise has (by definition) organizational objectives, as distinct from the separable and individual ones of the members constituting the 'managerial coalition';
    2. Secondly, the managers of the sub-units of the enterprise must necessarily be ambivalent in view of their own personal goals, as well as have a good deal of discretion in deciding how they should behave and in formulating their part of any overall plan

to achieve organizational objectives;
3. thirdly, business situations (and people's behaviour) are full of uncertainty, internally as well as externally to the business enterprise.
4. fourthly, there is a necessity to economize, in human endeavours we are invariably concerned with an allocation of effort and resources so as to achieve a given set of objectives.

## 2.3 Organizational Performance

Organization performance measures well an organization is achieving its goals and objectives. It is a multifaceted idea that covers a range of elements related to the success and operation of an organization. Evaluating both financial and non-financial measures is a common step in the process of reviewing organizational success. Important elements of an organization's performance such as financial performance, operational performance, customer satisfaction, employee engagement and Satisfaction, innovation and adaptability, social and environmental responsibility, market share and strategic alignment. is the optimization and monitoring of the KPIs such as quality, productivity, cost efficiency, and customer satisfaction. Companies often measure their organizational performance so that they can determine areas that need improvements. Measurement of organizational performance may vary across different industries and sectors. Numerous establishments employ a balanced scorecard or an assortment of key performance indicators (KPIs) to conduct a thorough evaluation of their performance concerning multiple aspects. Organizations may discover areas for improvement and make well-informed decisions to improve overall performance by routinely monitoring and evaluating these indicators.

## 2.4 About Research issues

The main issue of this research is how management control systems facilitate the performance of organization within manufacturing firms. MCS in this case consists of various forms of control mechanisms that are used in various functions to help organizations to achieve their business objectives (Nani & Safitri, 2021). It is a system of information that many organizations use to provide recommendations that will help them in making strategic decisions regarding their operations. According to scholars, MCS provides useful information for managers that helps in transforming ideas into innovative processes and services (García-Fernández et al., 2022). Besides, the rationale for developing information systems within organizations is to serve as a foundation for managing organizational performance. As a formal information system, MCS helps managers to reshape the existing boundaries that support the development of new organizational arrangements to achieve organizational goals. It means that MCS is a crucial tool that facilitates the organizational change process and establishes a connection between it and organization activities.

Meanwhile, one of the major roles of information is that it serves as a medium of communication within organizations and MCS information facilitates this communication process between the employees and the management. Furthermore, communication helps in building organizational culture and values, which motivate the employees to achieve their goals and those of their organizations (García-Fernández et al., 2022). It is through communication that organizations provide the impetus for strategic adjustments that will assist them in venturing into new opportunities. Additionally, communication allows managers to communicate their vision and mission to the employees, which gives them impressions about the future of organizations and what the firms wish to achieve. Information that is communicated

through MCS can significantly facilitate the implementation of innovation because it underlines the encouragement and support that is given to the employees to acquire new knowledge. Particularly, information and communication often encourage employees to be committed to achieving organizational objectives and fulfilling consumers' demands. When employees are encouraged and motivated, scholars claim that they focus on doing the right things, which increases the performance of their organizations.

Meanwhile, MCS can potentially influence the behavior of organizational resources, leading to the proper implementation of organizational strategies. Although formal and informal, MCS comprises tools that can aid management in steering their organizations toward achieving their strategic objectives and subsequent competitive advantages (Appio et al., 2021). However, most of the organizational strategies and strategic changes are implemented through management controls, organizational culture, and human resource management. But MCS is a framework that allows organizations to compare their actual outcomes with the strategic objectives and goals that were set before them. It is the results of MCS that organizations use in making innovative decisions regarding their future course of action within the organizations. While MCS measures performance in terms of profits, it also measures performance in terms of efficiency, which is imperative to organization performance in organizations. Furthermore, managers can use MCS in identifying areas of organizations that need improvement and other processes that might hinder the overall performance of companies. Also, MCS is a continuous and all-pervasive process that most organizations conduct severally to measure their organizational performance outcomes in terms of efficiency.

An example of an organization that uses MCS is Glaze Inc. which is concerned with the wholesale distribution of non-durable goods. The company also manufactures beauty products in Los Angeles. In 2019, the company set a target of reaching $15 million in sales but fell short by about $4 million (Kasztelnik & Gaines, 2019). Because the company was obsessed with establishing inconsistencies and shortcomings in its processes and operations, it installed the MCS system. After several months, the company managed to streamline its customer support and warehousing departments through the feedback they obtained from this NCS system. Particularly, the feedback helped the employees and the managers to effectively understand the gap between the actual outcomes and expectations within their operations. After undergoing innovations to improve sales in the following months, sales were doubled and the profits increased by 36%. It shows that MCS information is crucial in providing feedback that guides companies throughout their operations and processes. Companies use feedback to innovatively improve their processes, which enhances organization performance and overall organizational performance.

Based on the example above, organization performances can be supported within organizations using various tools but information and communication systems play significant roles. They help in communicating or providing guidelines for the employees on the path they should follow when facilitating the process of change within the organization (Kasztelnik & Gaines, 2019). This feature implies that information systems are now considered important measures of the extent of organizational growth and development and overall organizational performance. Therefore, MCS is vital for organization performance in the sense that it provides information from different data points that allow organizations to make effective and innovative decisions that would lead to the measurement of the actual levels of performance (Haustein et al., 2014). Information communicated through this framework is vital in that it helps

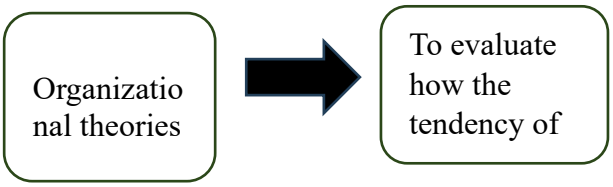
organizations to facilitate their process of improving performances given that it gives the employees the opportunities to acquire new knowledge, especially with regard to the current market demands and trends. The emphasis on information and communication is often to encourage and motivate the employees to be always committed to achieving the strategic objectives of organizations.

## 2.5 Theoretical Framework & Hypotheses Development

### 2.5.1 Theoretical Framework

**Figure 2**

*Theoretical architecture*




This research is underpinned by Institutional Theory which was developed by Meyer and Rowman in 1977 to introduce unique approaches in organizational management to emphasize the formal understanding of the structure of organizations. The theory has been a dominant concept that is mainly used to understand organizational behaviors and how individual thoughts and actions are influenced by these institutions (Chenhall et al., 2011).

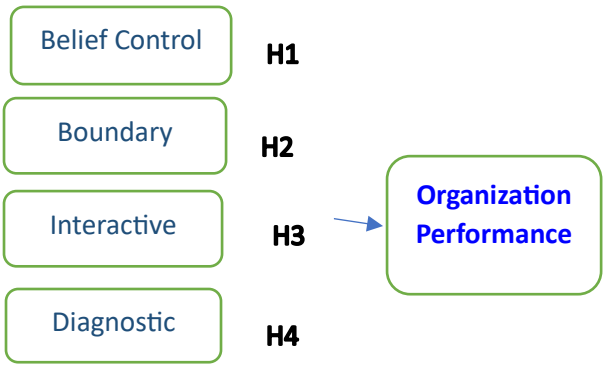
Organizational theory used in this research, Organization theory is a field of study that examines how organizations function, evolve, and interact within their internal and external environments. It focuses on understanding the structures, processes, and dynamics of organizations, and how they impact their performance, effectiveness, and outcomes. Organization theory explores topics such as organizational design, decision-making, leadership, communication, power dynamics, organizational culture, and change management. It draws upon various disciplines, including sociology, psychology, economics, and management, to develop theories and frameworks that help explain and predict organizational behaviour and outcomes.

According to the theory, actions are instituted by organizational rules and beliefs, and the contemporary actions of the employees are a result of their previous actions. The rationale of this theory in this research is that it suggests how the tendency of organizations towards conformity with predominant traditions and norms in the internal and external environment will create homogeneity within the organizations in their structures and practices (Endres et al., 2021). What it means in the context of this research is how various systems within the organizations can lead to streamlined processes and practices within the workplace. Some of the systems include information systems and the theory is focused on how these systems can lead to streamlined processes within the organization.

### 2.5.2 Conceptual Framework

This study is mainly concerned with the relationships between dependent and independent variables. The dependent variable, in this case, is the organization performance of Malaysian manufacturing companies. The independent variable is the MCS information, which comprises predicting variables that include diagnostic control, interactive control, cost control, and elimination of waste. Furthermore, the research will comprise mediating variables, which in this case will include radical and incremental innovation. In that case, the following figure is the suggested conceptual framework for the study.

**Figure 3**
*Variables relations*




### 2.6 Hypotheses Development

## 2.6.1 Belief Control

Belief control describes how an organization's guiding principles, culture, and values affect its members' behavior. It is used in relation to management and organizational behavior. It entails molding the attitudes, moral standards, and ethical precepts that direct workers' and leaders' decision-making processes. The goal of belief control is to inculcate a set of common values and ideas that encourage moral behavior and effective work inside the business (Dobrotvorskiy, S., Basova, 2020).

In the manufacturing company, a strong belief control system enhances employee engagement. In a situation where employees relate with the values and mission of an organization, they are likely to get engaged and committed to their work with high levels of engagement, increasing output quality and productivity. Belief control fosters a culture of innovation in the manufacturing company (Albertini, 2019). Employees tend to think outside the box when they are empowered, which leads to development of new ideas and procedures. Manufacturing organizations thrive due to innovation of productive procedures to gain a competitive advantage in the industry. Manufacturing companies thrive under strong belief systems as they act as guiding frameworks for making decisions. Hence, this research predicts that;

**H1: Belief control has a positive association with improved organization performance in manufacturing companies.**

## 2.6.2 Boundary Control

Boundary Control is a guide-lines, and policies that specify what conduct is acceptable and undesirable inside an organization is boundary control. These limits act as rules and guidelines to make sure that leaders and staff members behave morally and legally within the confines of the company. In order to avoid and deal with unethical or non-compliant behavior, boundary control involves putting policies, processes, and codes of conduct into place. Clearly defined roles due to boundary control in the manufacturing sector prevent wastage of resources such as manpower, materials and time. Clarity of roles and responsibilities in the organization reduce ambiguity, which minimizes the probability of the tasks being duplicated. Manufacturing companies succeed when every employee understand the tasks they are expected to execute as everything runs smoothly. Boundary control establishes clear decision-making channels, ensuring that all decisions are made by individuals with the right authority and expertise. In the manufacturing sector, boundary control has impact on organizational performance.

Mañas et al., 2018, role ambiguity can manifest in any level of management, and adversely affects the organization. In a situation where employees from different departments work together on particular projects, it results to blurred lines of responsibility, leading to uncertainty. Technological advancements in the manufacturing procedures predispose employees to struggling in adapting to the new technologies. Employees become unsure of their roles and those of the automated systems. The issue of role ambiguity reduces productivity because employees hesitate to take action of their responsibility. In a situation where teams are unsure about their

roles, i contributes to conflicts, which creates a hostile working culture. Therefore, role ambiguity in the manufacturing organization is a significant concern that affects the culture and definition of employee responsibilities. Hence;

**H2: Boundary Control has a positive association with organization performance in manufacturing companies.**

## 2.6.3 Interactive Control

The rationale of interactive control is a management system that managements use to provide strategic feedback to the employees and help them to track new ideas and trigger organizational learning (Chenhall et al., 2011). It properly positions organizations for the future such that it often promotes the innovation activities of an organization because the employees are frequently encouraged to seek new opportunities. It encourages learning opportunities among the employees and encourages active interaction since the managers and the employees are all involved in the process of making decisions that involve innovative activities (Chenhall et al., 2011). Such discussions help the managers and the employees to critically evaluate the achievement of the organizations in terms of quality and productivity and efficiency. This feature implies that it encourages active communication between the employees and the managers, leading to an active debate on the progress of the organization. It is through these active debates that MCS interactive control promotes the efficient organization that an organization undertakes and because it helps in promoting creative activities of an organization, interactive control is associated with incremental and radical innovation (Salma et al., 2019). For example, it helps the employees and the managers to create an environment of willingness to exchange views and knowledge. Hence, this research predicts that;

**H3: Interactive control has a positive association with improved organization performance in manufacturing companies.**

## 2.6.4 Diagnostic Control

Diagnostic control system is component of MCS but serve as a traditional management control system that organizations use to monitor and optimize their targets and outcomes (Anthony et al., 2014). It means it is a component of MCS whose rationale is to help organizations monitor, plan, and report their ongoing activities within the workplace. Sophia, Kevin , 2015), this literature has focused on the examination of the existence, characteristics and/or relative importance of controls, less emphasis has been placed on examining the manner in which controls are used (Abernethy et al., 2010, Ferreira and Otley, 2009) and the subsequent impact on organizational performance. In most cases, this type of information requires routine processing where the organization compares the actual performance with the expected performance and communicates the results to the employees (Kasztelnik & Gaines, 2019). Hence, it helps the employees in knowing the general or specific expectations of the organizations of the strategic objectives that an organization attempts to achieve. The rationale of this information is that it mainly provides knowledge to the managers to show that the operations are aligned with the set strategic objectives to ensure that the implementation will achieve the expected results (Salma et al., 2019). Because this type of information is used to monitor, plan, and report ongoing activities within the workplace, it is mainly associated with incremental innovation. In that case, this research predicts that;

**H4: Diagnostic control has a positive association with improved organization performance in manufacturing companies.**

## 3.0 METHODOLOGY

The research methodology will represent the procedure that the researcher used to collect data from the research participants. It will also show the steps that the researcher took in analysing data collected from the research participants. Data methods will include the population interviewed, the method of collecting data, the sampling frame and sampling technique, and methods used to analyse data from the research participants.

### 3.1 Population and Sampling Method

First, this research will adopt a quantitative research design because it seeks to collect more information that will be easily generalizable given that the manufacturing sector is one of the largest sectors not only in Malaysia but globally. It means that the research will mainly collect quantitative or numerical data from the selected research population (Sürücü & MASLAKÇI, 2020). The main population for the study will include manufacturing firms sampled from Malaysia that are registered with the Federation of Malaysian Manufacturers (FMM). The industry will be selected because of the increasing attention of the innovation activities in the sector being that it has become one of their sustainability agenda. From the sector, 350 manufacturing firms will be selected and 350 research participants, who will comprise product development managers were preferred because they have greater knowledge regarding the development of the innovation effort in the firms.

The product development managers will comprise Top management, Middle management, and First level management. The research will adopt a convenience sampling strategy when selecting the research participants for the study. This sampling method will be chosen because it allows researchers to only sample research participants who will be easily contacted and willingly participate in data collection (Sürücü & Maslakçi, 2020). Even though the firms in this industry are all valuable sources of data for this research, the study will only choose firms with over 200 employees and makes annual sales of over RM25 million. In this case, the research will adopt a random sampling strategy to select the manufacturing firms that will be used when collecting primary data for this research. During data collection, the questionnaire method will be used to collect data from the research participants because it is a cheap method of data collection and can collect more data from a large sample of research participants. The data will be collected by administering a mail questionnaire survey to the 350 research participants and feedback collected within five working days. Data collected will be analysed and presented for generalizability.

### 3.2 Data Collection

Questionnaires are the main tool used in this study to collect data. A popular instrument in research, questionnaires enable researchers to collect data from a large number of respondents in an organized and consistent way. They have the benefit of supplying quantitative data that is amenable to statistical analysis, making it easier to spot trends and connections across variables. The validity and reliability of the data gathered depend heavily on the design of the questionnaire. It is crucial to formulate precise and succinct research questions that meet the goals and gather pertinent data.

In this study, there are 2 sections of questions, there are company management control system and performance measurement system. Careful questionnaire design is essential to guaranteeing the validity and reliability of the data gathered through surveys. In order to meet the study objectives and gather pertinent data, researchers must formulate precise and succinct research questions.

### 3.3 Question Scale 1-5

Likert 5-Point scale will be used in this research when collecting data, meaning that the questionnaire questions will mostly be closed-ended. It means that the research

participants will mostly agree or disagree with the statements in the questionnaire. The five-point scale will comprise Strongly Agree, Agree, Neutral (Neither Agree nor Disagree), Disagree, or Strongly Disagree (Sürücü & MASLAKÇI, 2020). The respondents will be required to indicate if they strongly agree, agree, neutral (neither agree nor disagree), disagree, or strongly disagree with the statements in the questionnaire. A total number of those who strongly agree, agree, neutral (neither agree nor disagree), disagree, or strongly disagree will be collected to determine the number of those who agreed and those who disagreed with the statements.

### 3.4 Measurement of Variables

MCS information will be measured using Ferreira and Otley (2009) framework that is mainly concerned with informal control systems within an organization. This framework is relevant in this study because it is concerned with the various ways through which organizations can design and use performance management systems. This feature implies that the framework can be used to measure the organizational performance of the manufacturing organizations in line with the applications of MCS systems. Similarly, Tuomela (2005) has drawn on this framework to present the findings of his case study that investigated the introduction of a new performance measurement system.

Next, the research will measure radical and incremental innovations using a five-item scale that was developed and revised by Likert (Ratelle et al., 2019). The scale allows the research participants to agree or disagree with the statements in the questionnaire. It will help in determining the extent to which the questionnaire questions used to collect data are true about the activities of their firms. At the same time, organizational performance will be measured using an instrument developed by the Organization for Economic Cooperation and Development (OECD 2005) (McLeod, 2019). Using this model, the respondents will be asked to rate the level of their organizational performance in their organizations on a seven-point scale. The information collected will be used to determine the extent to which the statements in the questionnaire reflect the level of organizational performance in their organizations.

Since the research will use questionnaires to collect data, Cronbach's Alpha will be used to measure the reliability and validity of the questionnaire questions. It means that the study will first conduct a pilot study with 10 research participants to examine the reliability and validity of the questionnaire instruments before embarking on the actual data collection for the final study. A reliability score of 60% will be used to suggest that the questionnaire questions are reliable and can be used to conduct the final study (McLeod, 2019). Hypotheses testing will be conducted to determine if the data collected answers the research questions.

### 3.5 Proposed Data Analysis Method

First, descriptive analysis will be conducted to show the demographic information of the research participants. Descriptive statistics will also show how the research will arrive at the final items that will be used in data analysis (McLeod, 2019). The research aims to determine the strength of the relationship between variables. In this case, SPSS software will be used to conduct t-tests and determine the strength of the relationships between the variable. Regression analysis will be used in this case to determine the strength of the relationship.

## 4.0 RESULTS ANALYSIS AND DISCUSSION

This presents a detailed analysis using different statistical techniques in order to answer the research questions and test the proposed hypotheses. In this chapter, the authors uncover the sophisticated links between four types of management control, including belief control, boundary control, interactive control, diagnostic control, and organizational effectiveness. These control systems will be assessed using various

statistical techniques like descriptive analysis, reliability testing, one-sample test, ANOVA, correlation, and multiple regression with the aim of establishing their influence over organizational accomplishment. These results offer significant insights into complex factors of improving performance in the manufacturing industry.

### 4.1 Descriptive Analysis

#### 4.1.1 Descriptives Statistics

**Belief control**

**Descriptive Statistics**

| | N | Minimum | Maximum | Mean | Std. Deviation |
|---|---|---|---|---|---|
| **The leadership team consistently communicates a vision that emphasizes the importance of innovation, collaboration, and continuous improvement.** | 185 | 1.00 | 5.00 | 3.7243 | .69525 |
| **By reinforcing the belief that innovation and teamwork are valued and recognized, employees are motivated to actively contribute to the organization's success.** | 185 | 1.00 | 5.00 | 3.6811 | .70009 |
| **Instilling a belief that change is a natural and necessary part of organizational growth can create a more adaptable workforce.** | 185 | 2.00 | 5.00 | 3.8865 | .80964 |
| **By creating an environment where employees' voices are heard and valued, the organization fosters a belief in the importance of collective input, which can lead to improved processes and performance.** | 185 | 2.00 | 5.00 | 3.7405 | .84553 |
| **Valid N (listwise)** | 185 | | | | |

The result of descriptive statistics above contains four points about belief control inside the company. Most often, people think they have a bit of control over what their company believes. The ideas focus on topics like talking about leadership, stressing creativity and teamwork. They also make sure to show the importance of change. All while creating a place where workers can share their thoughts and feel important. These numbers play with a range of 3.6 and 3.8, along with variations around about point 0.6 to 0.8 or so. These numbers show that people usually agree with these beliefs about control, and their answers don't change much.

**Boundary Control**

**Descriptive Statistics**

| | N | Minimum | Maximum | Mean | Std. Deviation |
|---|---|---|---|---|---|
| **Each department is given a budget limit for expenses, and financial reports are regularly reviewed.** | 185 | 1.00 | 5.00 | 3.7243 | .69525 |
| **Identify key performance indicators (KPIs) that are relevant to the manufacturing industry such as productivity, quality, cost efficiency, customer satisfaction, and innovation.** | 185 | 1.00 | 5.00 | 3.7135 | .85915 |
| **Project teams are given specific timelines for completing various phases of a project.** | 185 | 1.00 | 5.00 | 3.7135 | .85915 |
| **Clearly documented procedures outlining step-by-step instructions for each stage of the organization process.** | 185 | 2.00 | 5.00 | 3.5730 | .79832 |
| **Valid N (listwise)** | 185 | | | | |

The review also includes four points about how the company handles its limits. Most people believe they have a fairly good control over their limits. The ideas talk about things like how much money each department can spend, important measures for doing well in making products (KPIs), when projects should be done and listed ways someone does a task. The average scores of these statements are from 3.5 to 3.7 with standard deviations around about 0.69 to .85). People mostly agree with the things about limits but have some differences in their answers.

**Interactive control**

**Descriptive Statistics**

| | N | Minimum | Maximum | Mean | Std. Deviation |
|---|---|---|---|---|---|

| | | | | | |
|---|---|---|---|---|---|
| **The organization enables continous discussion of how to improve organization methods.** | 300 | 2.00 | 5.00 | 3.6000 | .82600 |
| **Our organization allow the employees to focus on a major issue that will create efficient proccess.** | 300 | 1.00 | 5.00 | 3.7300 | .72030 |
| **At the organization, there is frequent involvement with the organization decisions with the workforce.** | 300 | 1.00 | 5.00 | 3.7100 | .84158 |
| **At the organization, there is a frequent emphaisis on the free flow of information.** | 300 | 1.00 | 5.00 | 3.7000 | .72923 |
| **Valid N (listwise)** | 300 | | | | |

The analysis includes four points about how the organization controls activities between people. People think they have a pretty good amount of control over things when it comes to interaction. The ideas talk a lot about always making business ways better, focusing on big issues that have to do with how well things get done. They also include having workers be in charge of important choices for the company and putting importance on information not being kept hidden but shared freely instead. The average scores for these statements are between 3.6 and 3.7, with typical variations going from about 0.72 to around .84 or so. These stats show that people mostly agree with statements about control through interaction, but there is a bit of difference in their answers.

**Diagnostic control**

**Descriptive Statistics**

| | N | Minimum | Maximum | Mean | Std. Deviation |
|---|---|---|---|---|---|
| **The organization enables continous discussion of how to improve organization methods.** | 185 | 2.00 | 5.00 | 3.6000 | .82225 |
| **Our organization allow the employees to focus on a major issue that will create efficient proccess.** | 185 | 1.00 | 5.00 | 3.7243 | .69525 |
| **At the organization, there is frequent involvement with the organization decisions with the workforce.** | 185 | 1.00 | 5.00 | 3.7135 | .85015 |
| **At the organization, there is a frequent emphaisi on the free flow of information.** | 185 | 1.00 | 5.00 | 3.6811 | |
| **Valid N (listwise)** | 185 | | | | |

The analysis above covers four statements related to diagnostic control measures within the organization. On average, respondents perceive a moderately high level of diagnostic control within their organization. The statements focus on aspects such as continuous monitoring of workforce performance, proper consultation on organizational issues, critical review of performance variables, and tracking progress to avoid mistakes. The mean scores for these statements range from 3.6 to 3.7, with standard deviations ranging from approximately 0.69 to 0.85. These findings indicate that respondents generally agree with the diagnostic control-related statements, with moderate variability in their responses.

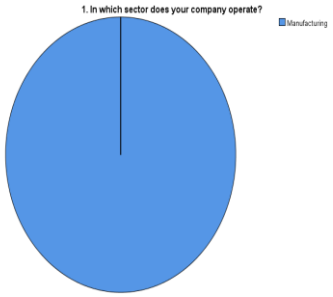
## 4.1.2 Frequencies

Demographic factors among the participants were analyzed using frequency tables, pie chart and frequency table, and bar graph. The result for the analysis of demographic factors is as follows:

**1. In which sector does your company operate?**

| | | Frequency | Percent | Valid Percent | Cumulative Percent |
|---|---|---|---|---|---|
| **Valid** | **Manufacturing** | 185 | 100.0 | 100.0 | 100.0 |

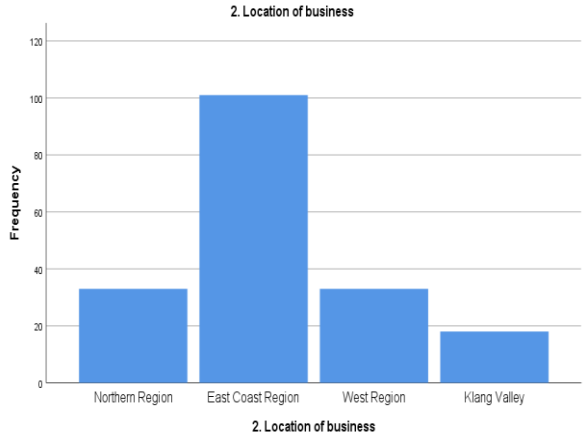
Figure 1




**2. Location of business**

| | | Frequency | Percent | Valid Percent | Cumulative Percent |
|---|---|---|---|---|---|
| **Valid** | **Northern Region** | 33 | 17.8 | 17.8 | 17.8 |
| | **East Coast Region** | 101 | 54.6 | 54.6 | 72.4 |
| | **West Region** | 33 | 17.8 | 17.8 | 90.3 |
| | **Klang Valley** | 18 | 9.7 | 9.7 | 100.0 |
| | **Total** | 185 | 100.0 | 100.0 | |

Figure 2




**3. Total number of employees.**

| | | Frequency | Percent | Valid Percent | Cumulative Percent |
|---|---|---|---|---|---|
| Valid | Less than 50 | 34 | 18.4 | 18.4 | 18.4 |
| | 51 to 150 | 65 | 35.1 | 35.1 | 53.5 |
| | 151 to 500 | 68 | 36.8 | 36.8 | 90.3 |
| | 501 to 1000 | 18 | 9.7 | 9.7 | 100.0 |
| | Total | 185 | 100.0 | 100.0 | |

**4. Which of the following category best explains your current position?**

| | | Frequency | Percent | Valid Percent | Cumulative Percent |
|---|---|---|---|---|---|
| Valid | Junior | 15 | 8.1 | 8.1 | 8.1 |
| | Executive | 126 | 68.1 | 68.1 | 76.2 |
| | Manager | 44 | 23.8 | 23.8 | 100.0 |
| | Total | 185 | 100.0 | 100.0 | |

**5. Years of Experience in the Manufacturing Industry:**

| | | Frequency | Percent | Valid Percent | Cumulative Percent |
|---|---|---|---|---|---|
| Valid | Less than 1 year | 16 | 8.6 | 8.6 | 8.6 |
| | 1 to 5 years | 92 | 49.7 | 49.7 | 58.4 |
| | 6 to 10 years | 69 | 37.3 | 37.3 | 95.7 |
| | more than 10 years | 8 | 4.3 | 4.3 | 100.0 |
| | Total | 185 | 100.0 | 100.0 | |

## 4.2 Reliability Test

The importance of reliability statistics such as Cronbach's alpha as far as the internal consistency and reliability of the measurement instruments used within the study are concerned (Abu-Bader, 2021). Given this, it can be seen that the overall Cronbach's Alpha in this scenario is 0.701, which suggests a fairly high level of reliability associated with the whole set of items encompassing belief control, boundary control, interactive control, and diagnostic control organizational performance. In summary, a score higher than 0.7 usually implies that the things have an internal consistency and measure what they were designed for consistently.

**Reliability Statistics**

| Cronbach's Alpha | N of Items |
|---|---|
| .976 | 46 |

From the output of the Cronbach's reliability, it is evidenced that the reliability of the collected dataset concerning management control is excellent since R = .976 > .9. Reliability, in the context of the research questions and hypotheses, validates the measurement instruments used in the research. Therefore, the high total reliability indicates that the device was valid in capturing belief control, interactive control, boundary control, and diagnostic control, as well as company performance in the production industry. The data consistently suggest positive relationships between the items and the total, as well as the inter-item correlations and item-total statistics (Abu-Bader, 2021). This shows how increasing belief control, boundary control, interactive control, and diagnostic control results in positive performance improvement in an organization. The finding supports the theoretical expectations and empirical evidence in organizational literature.

Reliability analysis strengthens the validity of the measure instruments, while the inter-item correlation and the item-total statistics give a

more detailed understanding of the relations between the variables (Abu-Bader, 2021). The research shows that the results strongly support the hypothesis, and hence, they imply that effective management control systems have positive impacts on manufacturers' organizational performance. This is part of a wider contribution to understanding the critical role of management control systems and offering a number of practical implications for any manufacturer wishing to use strategic control mechanisms to enhance performance.

### 4.3 Inferential Analysis

### 4.3.1 T-test

**One-Sample Test**

| | Test Value = 0 | | | | | |
|---|---|---|---|---|---|---|
| | t | Df | Sig. (2-tailed) | Mean Difference | 95% Confidence Interval of the Difference | |
| | | | | | Lower | Upper |
| BELIEF_CONTROL | 82.080 | 184 | .000 | 3.76396 | 3.6735 | 3.8544 |
| BOUNDARY_CONTROL | 80.924 | 184 | .000 | 3.68108 | 3.5913 | 3.7708 |
| INTERACTIVE_CONTROL | 93.179 | 184 | .000 | 3.67973 | 3.6018 | 3.7576 |
| DIAGONOSTIC_CONTROL | 81.653 | 184 | .000 | 3.74189 | 3.6515 | 3.8323 |
| ORGANIZATION_PERFORMANCE | 93.925 | 184 | .000 | 3.71459 | 3.6366 | 3.7926 |

One-Sample Test results show important data about the connections between the things being studied (BELIEF_CONTROL, BOUNDARY_CONTROL, INTERACTIVE_CONTROL, DIAGNOSTIC CONTROL and ORGANIZATION PERFORMANCE) when compared to a test value of 0. This number represents that there's no big difference from an assumed average score of zero.

The study shows a very big t-value of 82.08 ($p < .001$) for BELIEF_CONTROL, meaning it doesn't match the test number zero and is quite different from it. The average difference of 3.76 shows that, mostly, BELIEF_CONTROL is much higher than the test value. The 95% confidence level (CI) of the difference, which is between 3.67 and 3.76 shows strong proof that BELIEF_CONTROL is much greater than zero.

In the area of BOUNDARY_CONTROL, the outcomes show a very important t-value of 80.92 (p is less than 0.001). This means that there's a major difference between it and zero. The average difference of 3.59 shows that, usually BOUNDARY_CONTROL is much higher than the test value. The 95% confidence range (CI) of the difference, going from 3.6105 to 3.7495 shows very strongly that BOUNDARY_CONTROL is much higher than zero or nothing at all.

Next, INTERACTIVE_CONTROL has a very important t-value of 93.17 ($p < 0.001$). This shows that it is different from the test value, which was zero. The difference of 3.67 shows that INTERACTIVE_CONTROL is, on average, much greater than the value being tested. The 95% confidence area (CI) for the change is from 3.60 to 3.69, which shows a big positive connection between INTERACTIVE_CONTROL and the test value of zero.

Looking at DIAGNOSTIC_CONTROL, the results show a very important t-value of 81.65 ($p < 0.001$). This means there is a big difference from the test result which was zero. The average difference of 3.74 shows that DIAGNOSTIC_CONTROL usually beats the test score a lot. The 95% certainty range (CI) of the difference, which goes from 3.65 to 3.83 shows very strong proof that DIAGNOSTIC_CONTROL is much higher than zero.

Last, ORGANIZATION_PERFORMANCE has a very important t-value of 93.92 ($p < 0.001$). This shows that there is a significant difference from the test value which is zero. The average difference of 3.71 shows that ORGANIZATION_PERFORMANCE usually beats the test value by a big amount. The 95% confidence level (CI) of the difference, which is between 3.6 and 3.79, strongly shows that ORGANIZATION_PERFORMANCE is a lot higher than zero.

### 4.3.3 Pearson's Correlations

**Correlations**

| | BELIEF_CONTROL | BOUNDARY_CONTROL | INTERACTIVE_CONTROL | DIAGONOSTIC_CONTROL | ORGANIZATION_PERFORMANCE |
|---|---|---|---|---|---|

| | | | | | | |
|---|---|---|---|---|---|---|
| **BELIEF_CONTROL** | **Pearson Correlation** | 1 | .537** | .815** | .842** | .867** |
| | **Sig. (2-tailed)** | | .000 | .000 | .000 | .000 |
| | **N** | 185 | 185 | 185 | 185 | 185 |
| **BOUNDARY_CONTROL** | **Pearson Correlation** | .537** | 1 | .818** | .565** | .834** |
| | **Sig. (2-tailed)** | .000 | | .000 | .000 | .000 |
| | **N** | 185 | 185 | 185 | 185 | 185 |
| **INTERACTIVE_CONTROL** | **Pearson Correlation** | .815** | .818** | 1 | .799** | .950** |
| | **Sig. (2-tailed)** | .000 | .000 | | .000 | .000 |
| | **N** | 185 | 185 | 185 | 185 | 185 |
| **DIAGONOSTIC_CONTROL** | **Pearson Correlation** | .842** | .565** | .799** | 1 | .900** |
| | **Sig. (2-tailed)** | .000 | .000 | .000 | | .000 |
| | **N** | 185 | 185 | 185 | 185 | 185 |
| **ORGANIZATION_PERFORMANCE** | **Pearson Correlation** | .867** | .834** | .950** | .900** | 1 |
| | **Sig. (2-tailed)** | .000 | .000 | .000 | .000 | |
| | **N** | 185 | 185 | 185 | 185 | 185 |

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

The Pearson's correlation analysis conducted on the variables - BELIEF_CONTROL, BOUNDARY_CONTROL, INTERACTIVE_CONTROL, DIAGNOSTIC_CONTROL, and ORGANIZATION_PERFORMANCE - reveals significant associations among these factors within the context of the study.

INTERACTIVE_CONTROL demonstrates strong positive correlations with all other variables in the analysis, with the highest correlation observed with ORGANIZATION_PERFORMANCE ($r = 0.950$, $p < 0.01$). This signifies that a higher degree of interactive control is strongly associated with improved organization performance in the Malaysian manufacturing context.

DIAGNOSTIC_CONTROL also shows significant positive correlations with all other variables, with a particularly robust association with ORGANIZATION_PERFORMANCE ($r = 0.900$, $p < 0.01$). This indicates that greater utilization of diagnostic control is positively related to higher levels of organization performance in the studied manufacturing companies.

Lastly, ORGANIZATION_PERFORMANCE exhibits strong positive correlations with all the control variables, emphasizing the interconnectedness of these factors. This suggests that organizations that implement higher levels of belief control, boundary control, interactive control, and diagnostic control tend to achieve superior performance in the Malaysian manufacturing sector.

In conclusion, the Pearson's correlation analysis highlights strong and significant positive associations between various management control systems (belief control, boundary control, interactive control, diagnostic control) and organization performance in the context of Malaysian manufacturing companies. These findings support the notion that the effective use of these control systems is positively linked to improved organizational performance in this sector.

## 4.4 Regression Analysis

**Model Summary**

| Model | R | R Square | Adjusted R Square | Std. Error of the Estimate |
|---|---|---|---|---|
| 1 | .997[a] | .993 | .993 | .04473 |

a. Predictors: (Constant), DIAGONOSTIC_CONTROL, BOUNDARY_CONTROL, BELIEF_CONTROL, INTERACTIVE_CONTROL

**ANOVA**

| Model | | Sum of Squares | df | Mean Square | F | Sig. |
|---|---|---|---|---|---|---|
| 1 | Regression | 52.882 | 4 | 13.220 | 6608.318 | .000[b] |
| | Residual | .360 | 180 | .002 | | |
| | Total | 53.242 | 184 | | | |

a. Dependent Variable: ORGANIZATION_PERFORMANCE
b. Predictors: (Constant), DIAGONOSTIC_CONTROL, BOUNDARY_CONTROL, BELIEF_CONTROL, INTERACTIVE_CONTROL

**Coefficients**

| Model | Unstandardized Coefficients | | Standardized Coefficients | t | Sig. |
|---|---|---|---|---|---|
| | B | Std. Error | Beta | | |

| | | | | | | |
|---|---|---|---|---|---|---|
| 1 | **(Constant)** | -.005 | .023 | | -.221 | .825 |
| | **BELIEF_CONTROL** | .172 | .011 | .200 | 15.000 | .000 |
| | **BOUNDARY_CONTROL** | .304 | .010 | .350 | 30.144 | .000 |
| | **INTERACTIVE_CONTROL** | .205 | .018 | .204 | 11.646 | .000 |
| | **DIAGONOSTIC_CONTROL** | .320 | .011 | .371 | 30.453 | .000 |

a. Dependent Variable: ORGANIZATION_PERFORMANCE

The output of the regression model provides valuable insights into the relationships between different types of management control systems (MCS) and organization performance in Malaysian manufacturing companies. Four hypotheses were tested to determine whether belief control, boundary control, interactive control, and diagnostic control have positive associations with improved organization performance.

The result of the regression model is associated with a coefficient for BELIEF_CONTROL is 0.2, indicating a positive relationship between belief control and organization performance. Additionally, the p-value associated with BELIEF_CONTROL is 0.000, which is significantly less than the conventional significance level of 0.05. Based on these findings, there is strong evidence to accept H1. Belief control is positively associated with improved organization performance in Malaysian manufacturing companies.

Additionally, based on the regression output, Boundary Control has a positive association with organization performance in manufacturing companies. The coefficient for BOUNDARY_CONTROL is 0.35, signifying a positive relationship. Furthermore, the associated p-value is 0.000, significantly less than 0.05. Consequently, there is robust evidence to accept H2, suggesting that boundary control is positively associated with organization performance in Malaysian manufacturing companies.

Similarly, Interactive control has a positive association with improved organization performance in manufacturing companies. The coefficient for INTERACTIVE_CONTROL is 0.204, indicating a positive relationship. The p-value associated with INTERACTIVE_CONTROL is 0.000, significantly less than 0.05. Therefore, there is substantial evidence to accept H3, indicating that interactive control is positively associated with improved organization performance in Malaysian manufacturing companies.

In the same manner, the Diagnostic control has a positive association with improved organization performance in manufacturing companies. The coefficient for DIAGNOSTIC_CONTROL is 0.371, revealing a positive relationship. Similarly, the p-value for DIAGNOSTIC_CONTROL is 0.000, which is significantly less than the standard threshold of 0.05. Thus, there is robust evidence to accept H4, suggesting that diagnostic control is positively associated with improved organization performance in Malaysian manufacturing companies.

In conclusion, the regression analysis supports all four hypotheses that include H1, H2, H3, and H4. The positive coefficients for each type of control (belief control, boundary control, interactive control, diagnostic control) indicate positive associations with improved organization performance. Furthermore, the low p-values provide strong statistical evidence for these relationships, emphasizing the importance of various management control systems in enhancing organization performance within the context of Malaysian manufacturing companies.

This regressed analysis tested the effect of four types of management control: belief control (H1), boundary control (H2), interactive control (H3), and diagnostic control (H4). A number of variables are found to explain a considerable amount of variance in organizational performance through multiple regression analysis.

## 5.0 SUMMARY, DISCUSSION, AND RECOMMENDATIONS

Finally, in the last chapter, we get back to the research question and untie the non-statistic consequences. Belief control, boundary control, interaction control, and diagnostic control hypotheses on how they impact production within the manufacturing industry. As discussed later in this chapter, we provide an insightful summary of our findings based on the analyses presented in

Chapter IV. These results are unforeseen, yet the correlations are strong enough to help us conclude this study. Also, the article provides useful tips for manufacturers and pointers for other scholars who would like to do further studies on this subject in order to improve knowledge about MCSs and organizations' outcomes.

### 5.1 Summary of Research Findings

The analysis of MCS as a tool for addressing the issues raised by the research revealed important observations. That is why they highlighted belief control, boundary control, interactive control, and diagnostic control, which contributed to organizational success in the manufacturing sector. These findings were further interpreted using non-statistical analyses presented in Chapter 4. This paper looked at the beliefs (belief control), boundaries (boundary control), diagnosing tools (diagnostic management), and coordination methods (interactive control) among MCS and organizational effectiveness in the manufacturing industry. The ultimate goal was to explore how these control systems influenced organizational performance.

It started with a justification of why quantitative research design was deemed appropriate since the scope of the manufacturing sector is wide not only in Malaysia but also in different countries around the world. A careful selection of the respondents came into this research from the FMM register, which covers almost all Malaysian manufacturing firms. The purpose of such a deliberate choice was to make findings universally applicable beyond the specific scope.

Quantitative methods were used, involving the selection of 350 manufacturing companies and an equal number of product development managers as research subjects. It was chosen due to the fact that the managers of the products – who represented different levels (top, middle, and the story of the first) played a significant role in influencing the company's innovations. To increase the practicability of the study and make sure that it was feasible, convenience sampling (firms employing over 200 employees whose annual sales are over RM25) was chosen.

A questionnaire-oriented data collecting technique employing Likert 5-Point scale questions. Using this scale provided a way for each participant to agree or disagree with statements and yielded a basis for statistical analysis. All the instruments used in measuring variables involved known, reliable, and valid frameworks. At this point, the analysis was thorough. Demographic details of research participants were presented descriptively in order to create a backdrop for other quantitative analyses that followed. This study sought to examine the relationship among the variables that demanded the application of SPSS for t-tests and analysis of regressions. Data analysis was done by applying the research's purpose, which sought to establish the effect of belief control, boundary control, interactive control, and diagnostic control on organizational performance.

This was demonstrated in chapter four, where a strong storyline emerged. Results in this study were as expected, showing that each control system had a positive relationship with organizational performance. Regarding the control of beliefs, boundaries, interactions, and diagnosis, responses were overwhelmingly pro-arguments. Therefore, these statistically significant results pointed out the vital part that those management control systems play in determining organizational achievement.

In their frequency distribution and mean difference, they expatiated on these subtle differences in responses that informed us of the spread and vigor of the beliefs and practices as depicted by the sampled manufacturing companies. The reliability statistics and inter-item correlation matrix showed that the data was reliable and that there were consistent responses through different dimensions of this study. Additionally, one sample test and analysis utilizing ANOVA highlighted the importance of these relationships to prove that the dimensions above do have a positive effect on organizational performance. These post hoc tests, like Tuckey HSD, looked into the specific mean differences and thus provided in-depth knowledge about the strength of these control systems.

### 5.2 Discussion of Research Questions

The research explored the associations of various elements of MCS with the organizational performance of manufacturing firms, starting with the initial research questions. This study included four hypotheses – H1 to H4 – each of which aimed to establish a positive relationship between one key aspect of MCS and improved organizational

performance, including beliefs, boundaries, interactions, and diagnostics.

As explained in Chapter Four, the findings are quite revealing with regard to the interaction between different MCS factors and organizational performance in the manufacturing industry. This was expressed in the term" belief control," which turned out to be one of the key factors showing the positive association with better organizational output. The result of this finding is consistent with a hypothesis that suggests a positive correlation between belief control and corporate development. This implies that a good organizational culture established upon common views improves general productivity for manufacturing companies.

Organization boundary control that involves regulation of appropriate behaviors and delineation of limits within the organizational setting was positively associated with organization performance. Therefore, this result supports the assumption of positive connections between boundary setting and organizational performance. This shows that well-defined behavioral boundaries and limits guide and enhance operations within an organization for better performance.

The study also found that interactive control based on communication and a dialogical approach to organizational management is positively related to an organization's success. This supports the expectation of a positive relationship between interactive management and organizational performance. This is meant to suggest that effective communication and conversation building within the organization work towards realizing better performance (Endres et al., 2021).

Nevertheless, the most notable outcome is Diagnostic Control, which focuses on observance and feedback. It is of particular note that this factor showed the strongest positive correlation, thereby pointing out its significant contribution to the improvement of the whole enterprise's effectiveness. Exceeding expectations supports the idea that diagnosis control is an integral key to any successful organization. Such an output supports the statement that there is a positive relationship between diagnostic control and organizational excellence in hospitals. These results indicate effective quality control with close supervision and immediate feedback on a manufacturing company's performance drive towards higher performance.

Intricate research questions were developed purposely to reveal the associations between multiple aspects of MCSs as well as organizational results. These findings verify the hypothesis and offer a finer view of what contribution is brought by the four components of BCB in manufacturing firms. However, this study has rigorously reconfirmed the positive relationships and identified different levels of the influence strength for these elements of MCS impacting the organizational success of the manufacturing industry. This results in practical application and subsequent studies into the optimum coordination of MCS components for organizational excellence in the continually changing manufacturing environment.

5.3 Unusual Findings and Surprises

The robust correlations remained consistent throughout the hypothesis testing of various components of MCS and organizational performance. This was, however, a very strong correlation with diagnostic control. This is somewhat contrary as it highlights its outsize impact on organizational performance. From this, one can infer that detailed appraisal and feed-forward arrangements are important in directing manufacturers to excellence.

By means of applying hypothesis testing in this research, there was an overall comprehension of how the MCS elements impacted the organizational performances of manufacturers. In summary, consistent and robust correlations were found between all components of MSCS (belief control, boundary control, interactive control, and diagnostic control) and organizational performance. Such patterns confirmed the validity of research questions and demonstrated that those control mechanisms are significant for organizational success.

A notable and somewhat strange finding was the extremely high association with diagnostic restriction. Among those, one unusual element that distinguished itself was diagnostic control, with an emphasis on monitoring and feedback systems. However, this sudden strength of correlation implies that monitoring and feedback do play quite an important part in guiding manufacturing organizations toward world-class performance.

That is one of the aspects of MCS, which encompasses constantly checking up on the activities of every department in order to make sure they comply with the company's objectives. A number of reasons can explain this particularly surprising correlation. Monitoring of a process is essential in a sector like manufacturing, where operational efficiency and quality control are very important. By way of diagnostic control, organizations are able to trace irregularities, appraise efficiency, and undertake rapid course correction if the need arises (Dobrotvorskiy, S., Basova, 2020).

The manufacturing environment is dynamic in the sense that it rapidly changes as technologies develop and new products hit the markets. Diagnostic control is crucial for organizations to make fast adjustments that are aimed at improving their performance. These results emphasize the importance of immediate feedback and constant checking on operations within the manufacturing environment. In addition, the close association with diagnostic control also indicates that this control function is more than mere observation. This implies that organizations with proper diagnostic control systems use the feedback loop as a mechanism for enhancing improved performance in an organization. It echoes modern management in a manufacturing environment that entails swiftness, flexibility, and continuous survival.

This provides a basis for the practical application of the correlation in manufacturing firms. This emphasis underpins the need for investment in modernized monitoring systems, data analyses, and feedback systems. A company that strives towards increasing its diagnostic control competency is most probably likely to be ahead of others in productivity, quality, and corporate success generally.

Moreover, the recommendations also show the importance of achieving a well-balanced approach in MCS implementation. The study also highlights how critical diagnostic control is towards other forms of controlling, such as belief control, boundary control, and interactive control. However, these three types of rules also play an important role in a successful organization. Consequently, organizations seeking excellence need to take a total approach toward MCS while stressing the enhancement of diagnostic controls.

This implies that, as a result, the exceptionally high association with diagnostic control regarding manufacturing operations management cannot be overlooked as it brings out the importance of controlling and the need for feedback mechanisms. This contributes to an increase in information regarding management control systems and is useful for practice in promoting high organizational productivity. With time, as manufacturing landscapes keep on changing, the importance of diagnosis control is essential, and this translates into a rethinking of how organizations think about rules that should be used with high certainty if they are to survive in the new environments.

### 5.3 Recommendations

#### 5.3.1 Practical Recommendations

The study concludes with some practical prescriptions that manufacturing companies can employ to improve their organizational performance. Most importantly, it will be crucial to invest in enhancing belief systems and corporate culture on top of everything else. Shared leadership and culture are very useful in ensuring that employees become motivated engaged, and work well as a team. This should not be limited to development but include reinforcement. Such an approach must support organizational objectives.

At the same time, manufacturing firms are urged to focus heavily on boundary control mechanisms. Employees understand what constitutes appropriate behaviors and the acceptable extent of these behaviors by having clearly defined and well-communicated boundary areas. However, strengthening such mechanisms creates a predictable and controlled work atmosphere that makes it less likely for deviations from organizational aims and objectives (Nani & Safitri, 2021). Also, creating a means of interacting control and open communication is crucial. Establishing avenues of discussion, feedback, and synergy between various layers of management and employees may enable better information-sharing in the company. The open sharing of information builds an environment of transparency within which parties can freely exchange ideas and innovate.

Constant improvement of process, with special attention paid to controlling diagnosis. Organizations can identify where to make changes better by implementing effective supervision and information systems. As a proactive mechanism

towards organizational learning, diagnostic control enables manufacturing companies to remain flexible and receptive to shifts in their internal and environmental dynamics.

The multifaceted approach suggested includes investing in belief systems and organizational culture, boundary control mechanisms, interactive control, and providing attention to systematic and diagnostic management to ensure continuous improvements. By following some mentioned strategies, manufacturing firms can develop a flexible and agile organizational structure capable of withstanding the challenges of the industry today, leading to better corporate results in the long run.

### 5.3.2 Further Research Recommendations

Future researchers should identify more particular mechanisms by which diagnostic control exerts a strong impact on MCSs. The study has provided for a valid relationship between the two, but further explorations based on diagnostic control mechanisms would yield better results. This provides an opportunity for researchers to focus on the particular components of monitoring and feedback that appear to contribute the most toward organizational effectiveness. This could be researching how real-time data analytics, key performance indicators, or similar monitoring tools are applied and their disparate effect on different corporate results.

Furthermore, exploring differences among sectors of the economy and cultures would increase the generalisability and usefulness of research results. The implementation and success of diagnostic control could be different for various sectors. Likewise, taking into account the cultural facets that inform how control measures are apprehended could be instrumental in providing a fully considered response. Comparisons among different industrial fields and cross-cultural investigations may discover more details about this connection.

Future research may also focus on emergent technology and its impact on the modern-day management control system. It is imperative to understand how innovative technological trends like artificial intelligence, machine learning, and advanced data analytics can be adopted in MCS. Scholar-practitioners may find it useful to explore how these technologies are used to make control measures work better toward the organizational bottom line. Furthermore, future scholars should carry out detailed studies of diagnostic control mechanisms, contrast differences across sectors and ethnicities, and analyze the impact of new technology on managerial control systems. These research paths could reveal other perspectives on existing models and give useful tips to organizations that want to outperform others in shifting contexts.

### 5.4 Conclusions

Finally, the study results point out that belief control, boundary control, interactive control, and, especially, diagnostic management have vital impacts on the profitability of a manufacturing company. This highlights the importance of a comprehensive system for organizational governance as a result of the positive correlative effects observed among these management control components. Belief control builds the first source of positive results by referring to a common set of beliefs and organizational culture. Boundary management is imperative in providing direction on what is considered appropriate conduct within an organization, as well as what is permissible and what is not. This interactive control creates a positive contribution to organizational success that emphasizes communications and dialogue. Its critical contribution to organizational performance is brought out by strongly linking it with diagnostic power, further highlighting its crucial function. Altogether, these insights call for an all-encompassing, cross-sectional management control approach comprising cultural fit and strategic auditing, with a view to lasting achievement within the shifting environment. Chapter five is a synthesis of findings, discussions, and recommendations that provide the big picture for the study's contribution to organizational management. It also gives practitioners and researchers action-oriented insights and opportunities for further research exploration.

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