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The Impacts of Adopting Performance Measurement Systems (PMSs) on the Performance of the Jordanian Industrial Estates' Companies

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The aim of this dissertation is to obtain a doctoral (PhD) degree in the scientific field of „Management and Business”

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I undersigned (name: **Lubna Qais Owais**, date of birth: 01.02.1994) declare under penalty of perjury and certify with my signature that the dissertation I submitted in order to obtain doctoral (PhD) degree is entirely my own work.

Furthermore, I declare the following:

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- I handled the technical literature sources used in my dissertation fairly and I conformed to the provisions and stipulations related to the dissertation;
- I indicated the original source of other authors' unpublished thoughts and data in the references section in a complete and correct way in consideration of the prevailing copyright protection rules;
- No dissertation which is fully or partly identical to the present dissertation was submitted to any other university or doctoral school for the purpose of obtaining a PhD degree.

Debrecen, 09/03/2024

Lubna Qais Owais

signature

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List of Abbreviations

Abbreviation	Definition
AIE	Abdullah II Ibn Al-Hussein Industrial Estate
AVE	Average Variance Explained
BSC	Balanced Scorecard
CPMSs	Comprehensive Performance Measurement Systems
CR	Composite Reliability
CSR	Corporate Social Responsibility
EBITDA	Earnings Before Interest, Taxes, Depreciation, and Amortisation
EBITM	Earnings Before Interest, Taxes, and Management
HIE	Hassan Industrial Estate
HTMT	Heterotrait-monotrait
HUIE	Al-Hussein Bin Abdullah II Industrial Estate
IS	Information System
JIEC	Jordan Industrial Estates Company
JIT	Just in Time
KPIs	Key Performance Indicators
LM	Linear Regression Model
MFL	Market-focused Learning
MIE	Al Muwaqar Industrial Estate
OEE	Overall Equipment Effectiveness
OPI	Overall Performance Index
PLS-SEM	Partial Least Squares Structural Equation Modelling
PMMSs	Performance Measurement and Management Systems
PMSs	Performance Measurement Systems
POC	Patient-oriented Care
QIZ	Qualified Industrial Zone

Abbreviation	Definition
RMSE	Root Mean Squared Error
ROA	Return on Assets
ROE	Return on Equity
ROI	Return on Investment
SEM	Structural Equation Modelling
SME	Small and Medium-sized Enterprise
SPMSs	Strategic Performance Measurement Systems
VIF	Variance Inflation Factor

INTRODUCTION

In today's world, the business field is suffering from a highly competitive environment that puts great pressure on organisations to achieve their desired goals. The rapid changes in the business environment are primarily driven by factors such as continuous changes in customer demands, globalisation, and advancement related to information and technology. As a result of these changes, organisations' strategies change consequently. Therefore, organisations strive to implement methods that help them sustain their existence in such difficult environments by periodically measuring their progress towards achieving their goals and continuously improving their performance. The organisations' position and the achievement of their long-term goals are significantly influenced by the frequent measurement of performance. This emphasises the critical role that performance measurement plays in the life of organisations, especially in the context of sustainable development (Zsidó & Fenyves, 2015).

One of the methods related to this manner that has spread greatly and widely is the Performance Measurement Systems (PMSs). Since the first use of performance management as an approach in the 1980s until now several definitions and frameworks have been presented. The increased interest in these systems gained lately by academics and practitioners is due to the current business environment. Applying any measurement system has the ultimate aim of gathering information related to the organisations' set of goals (Alegre et al., 2014), which significantly increases the chances of achieving these goals efficiently and effectively. It is important to note that there is an agreement regarding the fact that businesses cannot improve their performance unless they measure some indicators since the management will then use the results of these indicators to make corrective actions and concrete decisions. Furthermore, these measures will provide the firms with an indication of their current situation (Rajnoha et al., 2016).

PMSs can be defined as "a set of performance measures that are used to quantify the efficiency and effectiveness of past actions" (Neely et al., 2002), which assist organisations in planning, measuring, and controlling their performance according to a pre-defined strategy (Johnson et al., 2007). PMSs were initially unidimensional, focusing primarily on financial objectives and measures, short-term metrics and having poor linkage with organisational strategies (Neely et al., 1995). However, around the 1980s, these systems transformed into multidimensional systems, focusing on broader objectives and measures than just the financial. This evolution was triggered by the changes in the world market (Eccles, 1991), which resulted in firms starting to lose their position to competitors who could provide the market with more variants, better quality, and more affordable products. Consequently, organisations had to implement

new philosophies and technologies to regain their positions in the market. These new and innovative approaches highlighted the limitations of the traditional PMSs and emphasised the essential need to develop new and more adaptable PMSs to ensure continued success.

A PMS is a vital part of any company's managerial system (Nappi & Rozenfeld, 2015). Different organisations employ various approaches to measure performance. As noted by Parker (2000), measuring performance is a common practice across all organisations, however, the difference lies in the way they carry out these measurements. In comparison, some organisations assess their performance rigorously and comprehensively, while others decide to use informal and superficial approaches.

Several roles for PMSs have been extensively addressed in the literature. These systems are used for measuring performance (Lebas, 1995), enhancing performance (Neely et al., 1995), monitoring progress (Atkinson, 1998), and internal communications (Bititci et al., 1997). Moreover, they translate strategy into actions and improve the organisational competencies alignment with different processes (Chenhall, 2005; Micheli & Manzoni, 2010), thus having a crucial role in strategy implementation (Kaplan & Norton, 1996b; Koufteros et al., 2014). Ittner et al. (2003) highlighted that organisations adopt and use these systems to gain advantages and benefits and ultimately enhance organisational performance. Furthermore, modern PMSs have demonstrated positive impacts not only on organisational strategy but also on communication and development (Franco-Santos et al., 2012). These systems affect various aspects of organisations' performance. For example, they have effects on employees' behaviour, organisational capabilities, and organisational, managerial, and teams' performance. Franco-Santos et al. (2012) further emphasised that PMS positively affect the decision-making process, consequently improving organisational performance and achieving competitive advantages, making them a recognised and valuable resource for organisations. The empirical studies, however, present conflicting results regarding the impact of utilising PMSs on organisational performance (Guenther & Heinicke, 2019). Consequently, there is a recognised necessity for additional research into the impacts of these systems on performance (Asiaei & Bontis, 2020; Bourne et al., 2013; Gomes et al., 2017; Micheli & Mura, 2017).

When adopting PMSs correctly, organisations are expected to achieve several benefits, nevertheless, this is not always the case for all implemented PMSs. Unfortunately, in some cases, these systems either eventually fail or, for some reason, fail to initiate in the first place. Numerous factors contributing to the unsuccessful implementation of PMSs have been extensively discussed in the literature. Many of these factors are grounded in theoretical assumptions. These include a lack of understanding of PMSs (Northcott & Taulapap, 2012),

the poor definition and use of performance measures (Schneiderman, 1999), uncertainty surrounding PMSs (Neely & Bourne, 2000), required resources (Kaplan & Norton, 2001), lack of the managerial commitment and support (Bourne, 2005), and difficulties related to the Information System (IS) and data accessibility (Bourne & Neely, 2002). A comprehensive literature review reveals a dearth of empirical studies specifically addressing the underlying causes of PMSs failure. Moreover, the scarcity of in-depth analyses based on actual experiences that explore the reasons behind PMS failures has been highlighted by Van Camp and Braet (2016). They have emphasised that "successful business cases or failure analyses are a scarce find in literature".

Practices such as empowerment and engagement are very important to organisations since they have been proven to have several benefits to organisational performance. For instance, employee empowerment positively affects both the individuals' and organisational performance (Bordin et al., 2007; Spreitzer, 1995). Therefore, many researchers consider it vital for the success of organisations (Baird et al., 2018; De Geuser et al., 2009), especially in the current business environment. Employee engagement was further found to affect organisational performance positively (Farndale et al., 2014; Saks, 2006) since engaged people have passion for their work, which results in enhancing performance (Meyer, 2017; Sanneh & Taj, 2015). Many researchers refer to human resources as being the organisations' most important asset, which must be properly managed (Brown & Eisenhardt, 1998).

While an association between PMSs and employee empowerment (De Geuser et al., 2009; Kuwaiti & Kay, 2000), as well as the role of these systems and performance management practices in enhancing employee engagement (Bourne et al., 2013; Smith & Bititci, 2017; Sorenson, 2013), are recognised by researchers, there is still limited research on the behavioural consequences of these systems (Hall, 2008). Smith and Bititci (2017) further stressed that the way management and measurement practices affect employee engagement is usually neglected.

In the context of PMSs, it is important to explore their application and effectiveness in different settings. The existing literature on PMSs demonstrates a substantial research interest in their multiple roles and efficiency in organisational management. However, as we concluded from the literature, these studies have focused on developed countries, and there remains a dearth of research examining PMSs in developing countries (Othman & Mahmoud, 2020), particularly in the Middle East region, including Jordan.

This lack of research hampers our understanding of how PMSs are utilised and adapted to the unique organisational, cultural, and environmental factors in Jordan. As such, there is a need

for further empirical research on the adoption, usability, impacts, and effectiveness of PMSs, specifically in the Jordanian context. Figure 1 below displays the gaps in the literature regarding PMSs studies from Jordan. The VOSviewer software was used to represent the literature gap in PMSs studies from Jordan visually. The Scopus database was searched to identify relevant articles and conference papers published between 1995 and 2024 in the fields of social sciences and business and management. The search keywords included several combinations of terms such as "Performance measurement systems", "Performance management systems", "Performance management and measurement systems", "Balanced Scorecard", "Organisation", "Firm", "Company", "Performance", "Financial", "Non-financial".

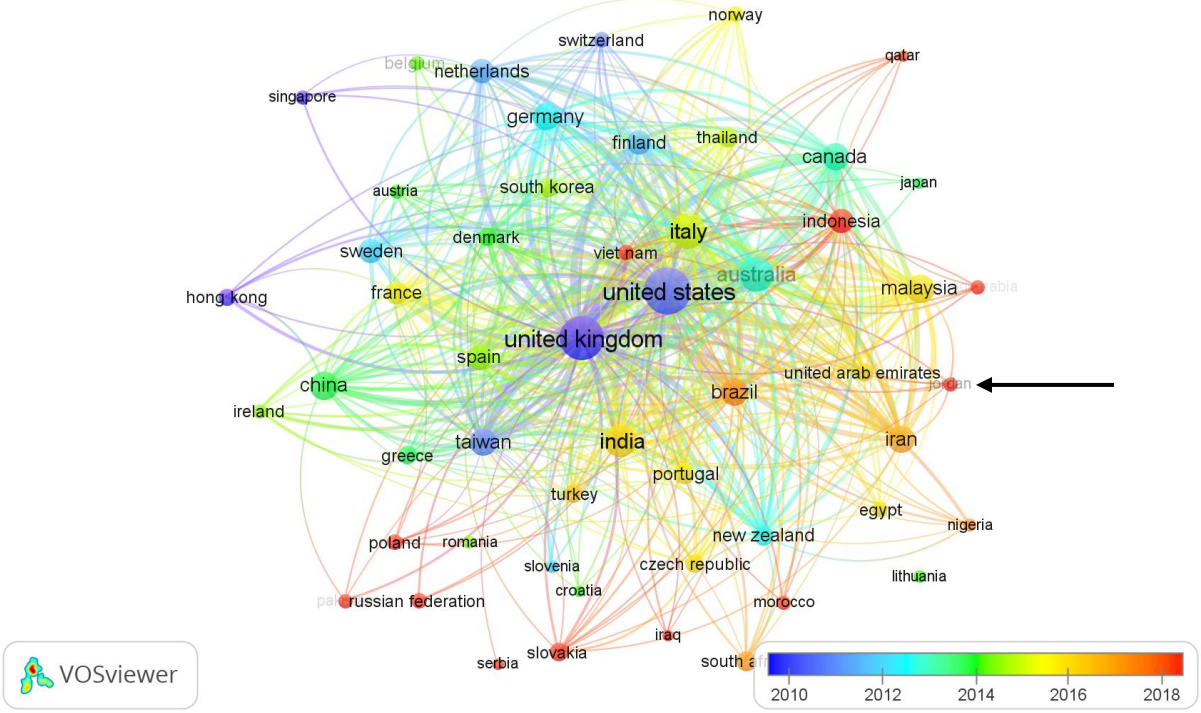

Figure 1: Map of PMSs Related Studies Conducted Based on the Countries

Source: Created by the author using Scopus database and VOSviewer (2024)

As shown in Figure 1, only a very few studies have been conducted in the Middle East. Furthermore, we can clearly see that there are extremely limited number of studies in Jordan. Given the limited number of studies on PMSs from Jordan, there is a gap in our understanding of how these systems are implemented, utilised, and contribute to organisational performance in the Jordanian context. This gap in knowledge not only limits our ability to make informed decisions about the design and implementation of PMSs in organisations in Jordan but also hinders the ability of practitioners and policymakers to utilise PMSs to drive performance improvement in the country effectively.

Based on what has been discussed so far, this dissertation aims to respond to the researchers' calls for further investigations into the impacts of PMSs on organisational performance. This research examines the impacts of these systems on the companies' financial and non-financial performance in the context of the manufacturing sector in Jordan. The impact of these systems on organisational effectiveness is also explored. Furthermore, it undertakes an investigation into the potential mediating effects of both employee empowerment and employee engagement. Another ultimate aim of this dissertation is to contribute to the literature by addressing challenges faced by organisations that caused failure in their PMSs or the factors that could have affected these systems' effectiveness in achieving the intended benefits.

1. TOPICS AND OBJECTIVES

1.1 Aims of the Research

The main focus of this research is to comprehensively examine PMSs in Jordan's manufacturing sector. The primary goal is to understand the various effects of these systems on the performance of manufacturing firms. Specifically, this research seeks to determine if PMSs significantly influence these companies' financial and non-financial performance, in addition to their overall effectiveness. Moreover, the study explores whether employee empowerment and engagement play a mediating role in the relationship between PMSs and companies' performance.

The research further addresses the degree to which companies faced various challenges during the implementation of the PMSs. These challenges have the potential to influence the ultimate success or failure of these systems.

1.2 Objectives of the Research

1. To identify the impacts of PMSs on the manufacturing companies' financial, non-financial, and overall performance.
2. To identify the PMSs impacts on organisational effectiveness.
3. To illustrate the relationships between:
    - PMSs and companies' financial, non-financial, and overall performance.
    - PMSs and both work engagement and employee empowerment.
    - Work engagement, employee empowerment, and companies' financial, non-financial, and overall performance.
4. To address the challenges encountered by manufacturing companies when implementing the PMSs.

1.3 Questions of the Research

This study aims to answer the following research questions:

1. What is the relationship between PMSs and companies' performance? How do these systems help achieve better performance?
2. What is the relationship between PMSs and the level of organisational effectiveness?

3. What are the relationships between PMSs, work engagement, employee empowerment, and companies' performance?
4. What are the major and most common challenges faced by companies during the implementation process of PMSs? What are their leading causes, and how can they be avoided?

1.4 Structure of the Dissertation

The dissertation is divided into six different chapters, each with its own specific focus and contribution:

Chapter 1: This opening chapter provides an in-depth discussion of the research's aims, objectives, questions, and hypotheses. It provides the necessary context and description, thus presenting a sufficient foundation for the construction of subsequent chapters.

Chapter 2: This chapter provides a comprehensive review of the existing literature, covering all topics related to the study and offering a synthesis of the current state of knowledge in the field.

Chapter 3: In this chapter, the methodology adopted for this study is presented and explained. It covers and explains the methods used for data collection and data analysis. This chapter provides a discussion of the research variables, population, and questionnaire development.

Chapter 4: This chapter discusses the data analysis and explains the primary findings of the research.

Chapter 5: This chapter provides a discussion of the research conclusions. Additionally, the chapter addresses research limitations and provides future recommendations based on the research outcomes.

Chapter 6: The chapter discusses the novelty of the findings, the significance of the study in the academic field, and its contribution to existing literature.

A summary of the dissertation, an extensive references section, a list of the author's publications, and the appendices can be found at the end of the dissertation.

1.5 Hypotheses of the Research

Hypothesis 1 (H1)*: Comprehensive Performance Measurement Systems (CPMSs) positively affect companies' overall performance.*

Hypothesis 2 (H2): *CPMSs positively affect companies' financial performance.*

Hypothesis 3 (H3): *CPMSs positively affect companies' non-financial performance.*

Hypothesis 4 (H4): *CPMSs positively contribute to organisational effectiveness (in terms of aligning, exploiting, and mobilising).*

Hypothesis 5 (H5): *CPMSs have a positive indirect effect on companies' overall performance through employee empowerment, as employee empowerment positively affects companies' overall performance.*

Hypothesis 6 (H6): *CPMSs have a positive indirect effect on companies' financial performance through employee empowerment, as employee empowerment positively affects companies' financial performance.*

Hypothesis 7 (H7): *CPMSs have a positive indirect effect on companies' non-financial performance through employee empowerment, as employee empowerment positively affects companies' non-financial performance.*

Hypothesis 8 (H8): *CPMSs have a positive indirect effect on companies' overall performance through work engagement, as work engagement positively affects companies' overall performance.*

Hypothesis 9 (H9): *CPMSs have a positive indirect effect on companies' financial performance through work engagement, as work engagement positively affects companies' financial performance.*

Hypothesis 10 (H10): *CPMSs have a positive indirect effect on companies'* non- financial *performance through work engagement, as work engagement positively affects companies' non-financial performance.*

2. LITERATURE REVIEW

This chapter thoroughly reviews the available literature on PMSs, and other topics related to this study. The topics include PMSs, their definitions, evolution, application, their several roles, impacts, and benefits, as well as the causes of their failure. Furthermore, this chapter will cover a review of employee empowerment and work engagement topics.

2.1 Introduction to PMSs

Performance measurement, as emphasised by Neely et al. (1995), is a topic that is frequently discussed; however, it is rarely defined. Due to the revolution of PMSs, numerous frameworks, approaches, and models are available to measure organisations' performance, which were developed by researchers with various backgrounds (Neely, 2005). In this part, a discussion of the most important terms, definitions, and fundamentals of PMSs is introduced and explained in four sub-parts.

2.1.1 Performance Management and PMSs Confusion

Kaplan and Norton (1996a) elucidate that PMSs encompass a complex amalgamation of performance measures, financial and non-financial objectives and goals which represent the key drivers of the organisations' success in meeting their strategic goals. In contrast, Neely et al. (2002) contribute to discourse by introducing a more detailed taxonomy of essential terms, emphasising the critical importance of precise distinctions. Four key terms within this taxonomy merit particular attention, namely: performance measurement, performance measure, performance metric and PMS.

- Performance measurement can be defined as "the process of quantifying the efficiency and effectiveness of past action" (Neely et al., 2002). Effectiveness refers to the degree to which stakeholder requirements are fulfilled, whereas efficiency measures the extent to which the firm utilised its resources economically when delivering a specific level of stakeholder satisfaction.

- The subsequent term, performance measure, serves as the analytical criteria for assessing organisational performance, and is described as a metric utilised for the quantification of efficiency and/or effectiveness of previous actions (Neely et al., 2002).

- Performance metric, in this context, refers to "the definition of the scope, content, and component parts of a broadly-based performance measure" (Neely et al., 2002).

- Finally, the PMS, is concisely defined as "a set of performance measures that are used to quantify the efficiency and effectiveness of past actions" (Neely et al., 2002). However, later, they acknowledged the simplicity and generality of this initial definition. To address this limitation, they propose a more convenient definition: a PMS facilitates informed decision-making and action by quantifying the efficiency and effectiveness of past actions through the acquisition, collation, sorting, analysis, and interpretation of relevant data (Neely et al., 2002). The latest definition is more convenient, and it covers the shortcomings in the first simple definition. The identified shortcoming pertains to ignoring the fact that PMSs include a supporting infrastructure of obtaining, collating, arranging, analysing, and explaining the data. These are crucial data processing activities; if any of them is not applied, the measurement process is incomplete, making it impossible to make informed decisions or take corrective actions.

In the literature, the term 'performance management' is usually used alongside PMSs. The existence of these terms together is elaborated differently, according to researchers. Some scholars differentiate between these two terms, employing both of them. Conversely, other scholars utilise these terms interchangeably, considering them two terms leading to one meaning. Certain scholars opt for the encompassing term "performance management systems" to encapsulate the amalgamation of performance management and performance measurement processes. Considering these differences in the use of both performance management and PMS terms, we would assume that the literature in this field is very confusing and broad. The thorough screening of existing literature supports this assumption, and researchers such as Franco-Santos and Bourne (2005) and Andersen et al. (2006) regarded this confusion as the fact that there is not any "generally agreed-upon" definition of performance management.

The first introduction of the term "performance management" was in the 1970s, and it evolved from being an incipient concept to a recognised and established procedure in the latter half of the 1980s (Armstrong, 2009). Consequently, many definitions of performance management from its beginning to this moment are available in the literature, each offering unique perspectives. For instance, Armstrong (2009) defines performance management as "a systematic process for improving organisational performance by developing the performance of individuals and teams. It is a mean of getting better results by understanding and managing performance within an agreed framework of planned goals, standards, and competency requirements". On the other hand, Lebas (1995) provided a different definition of performance management, he defines it as a process that precedes and follows performance measurement in a reciprocal and virtuous cycle, with performance management establishing the framework for

measurement. Consequently, any attempt to separate these two processes is destined to fail. Figure 2 below illustrates the interrelated relationship between these two processes.

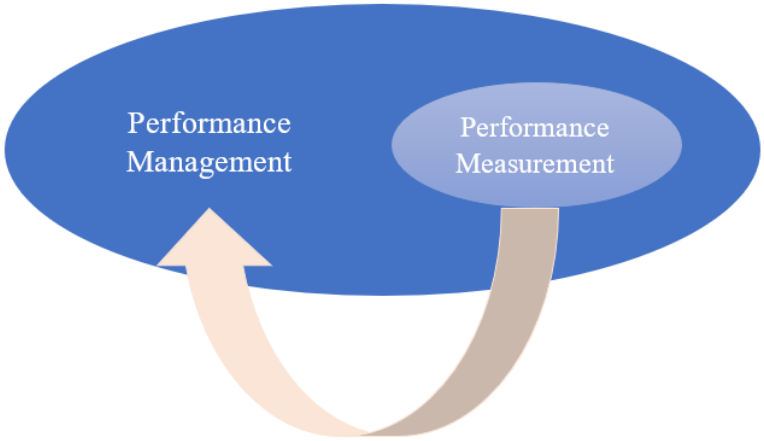

Figure 2: The Interrelated Relationship Between Performance Management and Performance Measurement

Source: Lebas (1995)

Similar to Lebas's (1995) definition, Bititci et al. (1997) provided one of the most logical and widely used interpretations of these two terms. According to them, performance management is a closed-loop control system that revolves around the deployment of policies and strategies, in addition to collecting feedback from different levels for the purpose of managing the organisations' performance. The PMS, on the other hand, is the information system which is central to the performance management process and is vital to the systems' efficient and effective functioning.

Parthiban and Goh (2011) followed the same definition as Lebas (1995), and they further explained that effective performance management conduction is ensured by following two necessary stages: performance measurement and performance improvement.

Several definitions of performance management in the literature were found by Ates et al. (2013), which reveal the complexity of this area and the existence of many different perspectives regarding this concept. Table 1 represents different definitions of performance management found by Ates et al. (2013).

Table 1: Performance Management Definitions

Field	Definition
Human resource	The act of managing people in order to increase the achievement of job-related success, in addition to working on activities that are connected with improving, motivating, rewarding behaviours, training, and developing skills.
Operations management	Performance measurements are a very crucial part of the performance management process, including all the procedures that are connected to developing performance measures, key performance indicators (KPIs), and reporting.
Strategy	A process that assists organisations in developing, applying, and modifying their objectives and goals and translates them into actions.
Quality-focused	Improving both the processes and the performance.

Source: Ates et al. (2013)

Evidently, the field lacks precise and universally accepted conceptual definitions of performance management and PMSs. The literature introduces another type of systems, denoted as performance measurement and management systems (PMMSs, and in some references PMSs). As per Neely et al. (2002), these systems are characterised by being balanced and dynamic. They support the decision-making process by gathering, elaborating, and analysing the provided data. A more simplified characterisation of PMMSs is presented by Okwir et al. (2018), who define them as processes assisting firms in setting their goals and tracking their progress over time. According to Chenhall et al. (2017), these systems consist of performance indicators, spreadsheets, and performance reports, improving decision-making by providing managers with valuable information.

While the extensive research in the field indeed provides insightful, comprehensive, and valuable assessment and exploration of these systems, one cannot but think that the persistent lack of conceptual clarity poses a significant barrier to both theoretical development and practical application. In the academic context, it raises the question whether the research findings are consistent and can be uniformly validated. While in practice, such ambiguity indeed creates challenges for practitioners seeking to adopt these systems for strategic decision-making.

Addressing this conceptual gap is essential however, it raises a critical concern, can such fundamental conceptual refinements be actionable at this stage without undermining the validity of existing empirical research? If significant definitional changes were introduced, prior studies may lose their relevance or comparability. This potential disruption underscores the need for a balanced approach, ensuring conceptual clarity is improved without compromising the integrity and applicability of existing knowledge.

The interest in performance measurement and management systems has experienced a significant increase in recent years. This can be attributed to the fact that firms realised the vital need to monitor and understand their performance to compete in the current continuously changing business environments. It has been established that these systems have the potential to not only enhance the capabilities of organisations but also to support their overall performance (Koufteros et al., 2014). Despite the attention accorded by researchers, a prevailing issue persists: many PMSs lack the dynamism and flexibility required to adapt to the variations within the internal and external environment of organisations. Meaning that firms are addressing static PMSs while running in dynamic environments and working on dynamic strategies. Thus, the efficient allocation of resources is negatively affected, and the complexity problem arises. According to Hourneaux et al. (2017), the effective use of these systems can be a very important support for corporate performance management. Nevertheless, using the traditional management style with PMSs could limit their effectiveness in supporting organisational strategic management since it may hinder the delivery of the management technology and support that these systems are designed to implement. However, refining managers' efforts to improve the decision-making processes by training them to understand these systems could prevent the previously stated problem. Thus, it has the potential to increase firms' profits and ultimately enhance productivity.

2.1.2 The Characteristics of PMSs and their Components

Franco-Santos et al. (2007) reviewed over 300 articles and found that researchers typically define PMSs according to three main attributes: their features, roles, and processes within the systems. Features of PMSs refer to the properties that make up the system, and both performance measures and objectives were the most discussed features. On the other hand, focus attention, strategy implementation, internal communication, measuring performance, and monitoring progress are the most discussed PMSs roles, referring to functions performed by the PMS. Finally, PMSs processes, represent the series of actions that combine to create the PMSs. The information provision, designing of the measures, and data capturing were the most

discussed processes. Table 2 below shows the other features, roles, and processes of PMSs that were mentioned by a few numbers of researchers.

PMSs processes were further categorised into five groups by Franco-Santos et al. (2007), selecting and designing measures, gathering and using data, managing the information, evaluating performance and rewards, and system review. They also noted that when the number of PMSs features, roles, and processes included in the definitions is greater, distinguishing performance measurement from performance management becomes more difficult.

KPIs are indicators that focus on the aspects of organisational performance that are most crucial for their current and future success (Parmenter, 2015), and they are the main tool in any PMS (Roubtsova & Michell, 2014). Parmenter (2015) highlighted seven important characteristics of KPIs to make the identification process of the performance indicators easier and more accurate to ensure effective and successful implementation. Table 3 below summarises these characteristics.

Table 2: PMSs Features, Roles, and Processes

PMSs features	PMSs roles	PMSs processes
Supporting infrastructure	Planning	Target setting
Targets	External communication	Rewards
Causal models	Rewards	Identify stakeholders' needs and wants
Hierarchy	Performance improvements	Strategic objectives specifications
Performance contract	Managing relationships	Data analysis
Rewards	Feedback	Decision making
	Double-loop learning	Performance evaluation
	Strategy formulation	Interpretation
	Benchmarking	Review procedures
	Compliance with regulations	Planning
	Control	
	Influence behaviour	

Source: Franco-Santos et al. (2007)

Table 3: Characteristics of the KPIs

Non-financial	Non-financial measures (e.g., not expressed in currency)
Timely	Measured frequently (e.g., 24/7, daily, or weekly)
CEO focus	Acted upon by the CEO and senior management team
Simple	All staff understand the measure and what corrective action is required
Team-based	A team can be phoned, and they will accept responsibility and can take action to improve measure
Significant impact	Major impact on the organisation's critical success factor
Limited dark side	Have been tested to ensure they have a positive impact on performance, with any unintended consequence being of minor significance

Source: Parmenter (2015)

2.1.3 PMSs Evolution: Beyond Traditional Financial Measures

PMSs have been through two phases. The first phase focused solely on financial indicators, such as profit, return on investment, and productivity. However, a transformative shift occurred in response to changes in the global market during the 1980s. Firms started losing their position to rivals that could offer the market more variants, better quality, and more affordable products, which led to the initiation of the second phase. Firms had to implement new philosophies and technologies to regain their positions. This evolution highlighted the limitations of the traditional PMSs and emphasised the essential need to develop new PMSs for success. Eccles (1991) regarded the detection of the shortcomings of traditional systems as the reason behind the business performance measurement revolution. The revolution pivoted around the fact that financial measures were not being considered as the measurement systems' foundation anymore; instead, they became considered as a single part among a broader number of measures.

The link between both the financial and non-financial measures is strong, and it is in the cause-and-effect relationships between both the financial and non-financial drivers. Nevertheless, recent studies indicate a prevailing reliance on financial measures. For instance, Abdallah and Alnamri (2015) observed that a substantial number of Saudi manufacturing subsidiaries predominantly employ financial measures, attributing this tendency to the familiarity, popularity, and ease of application of these measures in business practice. Similarly, Zizlavsky (2016) found that most managers in the Czech economy were mainly using financial indicators

such as EBITDA (Earnings Before Interest, Taxes, Depreciation, and Amortisation), revenues, and budget to evaluate their performance and its components. While there is a discernible trend towards incorporating non-financial, the dominance of financial indicators persists, as evidenced by Cakir et al.'s (2019) study in the retail sector. The financial indicators have an essential role in providing information to managers about the firms' capability to create value, they remain a crucial component of PMSs (Zizlavsky, 2016). Measuring performance using financial indicators has a significant effect on organisation' overall performance. Nevertheless, an exclusive focus on the firms' financial performance can influence firms' capability to enhance aspects such as customer and internal processes (Bajnai & Popovics, 2020).

2.2 The Balanced Scorecard (BSC)

After criticising the traditional PMSs for being unidimensional, concentrating solely on the financial objectives and measures, focusing only on short-term metrics, and being poorly linked to the organisational strategies (Neely et al., 1995), the modern PMSs were introduced. The main characteristics of these modern systems are that they are multidimensional, focusing on broader objectives and measures than just financial. The BSC is a strategic performance management tool developed by Kaplan and Norton, and it represents a paradigm shift by involving a multidimensional approach that extends beyond financial measures. Addressing the shortcomings of traditional systems, the BSC translates organisational strategies and missions into measures and objectives. Thus, it assists decision-makers in understanding and obtaining strategic objectives. The BSC was built on a careful selection and implementation of four perspectives: financial, customer, internal business process, and learning and growth. Figure 3 shows the four perspectives of the BSC.

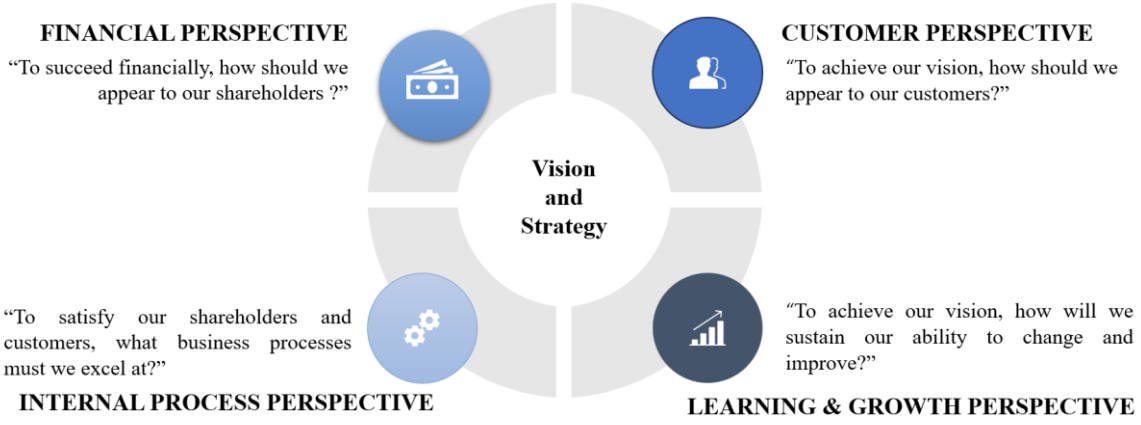

Figure 3: The Balanced Scorecard (BSC)

Source: Adapted version from Kaplan and Norton (1996a)

These four perspectives are explained by Kaplan and Norton (1996a) as follows. The financial perspective serves as a critical tool for measuring and evaluating a company's performance, focusing on indicators that guide the company toward its goals. It aims to reduce costs, achieve growth, enhance the company's image in the eyes of investors, and improve financial performance. The customer perspective, on the other hand, emphasises the importance of meeting customers' needs and wants to ensure the success and survival of the company. Key measures include market share, customer retention, customer satisfaction, customer acquisition, and customer profitability. The Customer Core Management Group represents generic measures essential for most companies, providing insights into market positioning and customer relationships. The third perspective, the internal business processes, focuses on processes that align with customer and shareholder objectives, this perspective seeks to improve overall company performance and customer satisfaction. It addresses what the company should contribute and internally do to assure customer satisfaction. Indicators are derived from processes influencing customer satisfaction, production cycle time, and employee skills, emphasising efficiency, effectiveness, and quality. The last perspective, learning and growth, is considered foundational to the BSC. This perspective identifies the infrastructure necessary for long-term growth, focusing on employees' intellectual capabilities, skills, IS, and administrative processes. They categorise it into three primary areas: employees' capabilities, IS capabilities, and motivation, empowerment, and alignment.

Kaplan and Norton (1996a) highlighted that these four perspectives "authorise kind of balance between short-term and long-term objectives, the demanded outcomes and the performance supporter of those outcomes, and between hard objectives measures and more subjective measures". They further explained and highlighted the existing cause-and-effect relationships between the four BSC perspectives. They consider these relationships fundamental, as "every measure selected for a BSC should be an element of a chain of cause-and-effect relationships" (Kaplan & Norton, 1996a).

Aidemark (2001) highlighted the importance of the customer, internal processes, and learning and growth perspectives to the financial perspective. He further noted the necessity of directing their efforts towards the financial perspective. Research findings present varying perspectives on the hierarchical nature of the BSC. Krishnan et al. (2014) study found a hierarchical relationship between the different BSC perspectives, with each lower perspective affecting the prior one. Moreover, Kober and Northcott (2020) found that the performance of non-financial measures affects future financial performance. Additionally, firms that increased their efforts toward improving the learning and growth perspective were found to achieve a higher return

on equity (ROE) and return on assets (ROA), according to Khan et al.'s (2010) study. In contrast to Krishnan et al.'s (2014) findings, Bento et al.'s (2013) study concluded that all learning and growth, internal business, and customer perspectives have direct positive effects on the financial perspective, hence suggesting that the BSC is not a hierarchical model as stated in previous studies, instead it is a complex model. These findings highlighted the necessity of investing in learning and growth and internal processes perspectives besides the customer perspective. Valmohammadi and Sofiyabadi's (2015) study on Iranian automotive manufacturers revealed that the customer perspective has an important role in supporting and attaining organisations' vision. Therefore, the organisations' financial objectives will be fulfilled through customer satisfaction.

Since its introduction, the BSC concept has evolved significantly (Braam & Nijssen 2004; Madsen & Stenheim 2015). Kaplan (2009) explained that the development of the BSC is in three distinctive stages. Initially, in stage one, the BSC served primarily as a measurement tool, offering a unique perspective by incorporating a comprehensive view of organisational performance beyond financial indicators. Progressing to stage two, the BSC concept shifted focus to underscore the significance of strategic objectives, emphasising the construction of these objectives within a 'strategy maps' framework. This stage introduced coherence in the causal-effect relationships among strategic objectives, enhancing organisational understanding of their interconnectedness. The final stage, a strategy management system, broadens the BSC's managerial scope. Here, strategies cascade to managers and staff proportionately, ensuring that each individual comprehends their direct or indirect contribution to the organisation's strategic objectives.

2.3 The Performance Prism

As noted earlier, organisations have recognised the limitations of the traditional PMSs based solely on financial measures (Narkunienė & Ulbinaitė, 2018). Another example of the modern PMSs is the performance prism. The framework was introduced by Adams and Neely in 2000 to assess organisations' performance through five perspectives: strategies, processes, capabilities, stakeholder satisfaction and stakeholder contribution. These perspectives help organisations evaluate performance not only from a financial perspective but also from the viewpoint of stakeholders and other important factors that contribute to overall success (Narkunienė & Ulbinaitė, 2018).

Research has identified two critical elements in the content and structure of PMSs: integrity and deployment (Bititci et al., 1997). Integrity refers to the alignment of performance measures with

the organisation's strategic objectives and values, ensuring that they accurately reflect the organisation's overall performance. Deployment, on the other hand, focuses on how effectively and consistently the performance measures are implemented and used within the organisation. The performance prism offers a comprehensive framework that addresses both integrity and deployment, making it a valuable tool for organisations seeking to overcome those limitations.

The performance prism is a performance management approach that aims to match the needs and requirements of all stakeholders effectively, and it is built upon three important fundamentals (Neely et al., 2002):

1. If organisations wish to survive and prosper for a long time, it is no longer acceptable to focus only on a few of the stakeholders.
2. If organisations want to optimise the delivery of tangible value to all of their stakeholders, then they must ensure the alignment and integration of their strategies, capabilities, and processes.
3. Organisations and their stakeholders must acknowledge the reciprocal nature of their relationships.

Neely et al. (2002) explain the five perspectives as follows. The first perspective in the performance prism is stakeholder satisfaction. It focuses on understanding and meeting the needs, wants, and expectations of all stakeholders, and it asks the vital question, " Who are our key stakeholders, and what do they want and need?". The second facet of the performance prism, strategies, asks the question, "What are the strategies we require to ensure the wants and needs of our stakeholders are met?". The third perspective, processes, looks at the actions and activities that need to be put in place to implement the strategies and meet the needs of stakeholders and it asks the question, "What processes do we need to put in place to enable us to execute our strategies?". The fourth facet, capabilities, examines the combination of people, infrastructure, practices, and technology that enable the execution of companies' business processes and ensuring the satisfaction of stakeholders, asking the question, "What capabilities do we need to put in place to allow us to operate our processes more effectively and efficiently?". The final perspective is referred to as stakeholder contribution. It focuses on understanding and evaluating the value that stakeholders bring to the organisation and asks the crucial question, "What do we want and need from our stakeholders?". The performance prism approach provides a comprehensive framework for organisations to assess and evaluate their performance by considering the satisfaction and contributions of all stakeholders. The performance prism framework and its five perspectives are displayed in Figure 4.

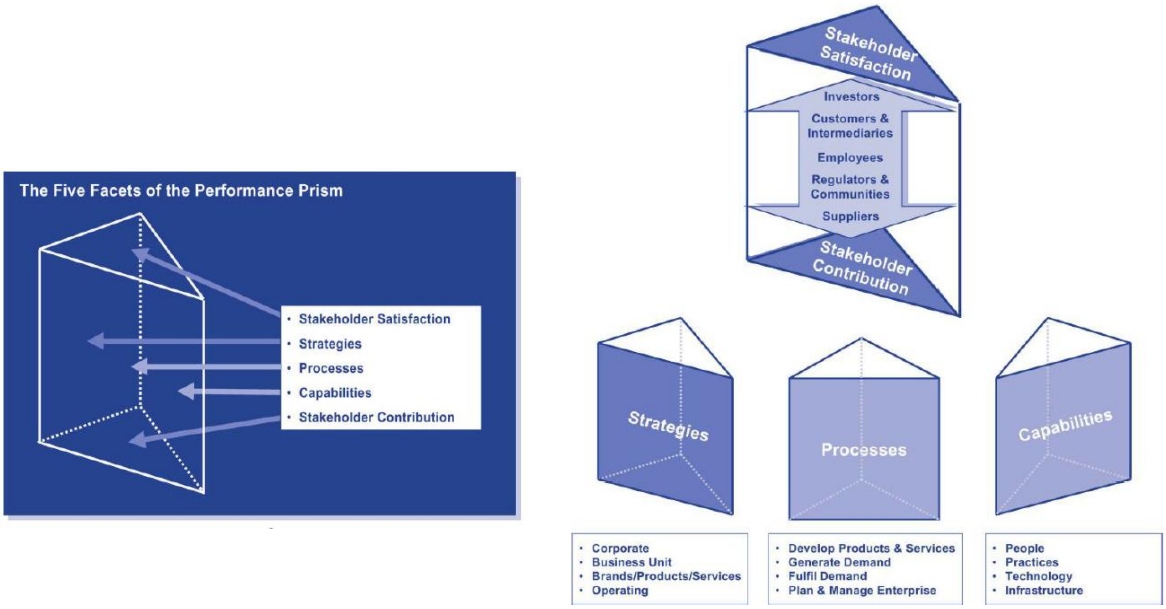

Figure 4: The Performance Prism Framework

Source: Neely et al. (2001)

In the context of the performance prism, designing a measurement system necessitates a clear articulation of how an organisation intends to create stakeholder value. In the performance prism, stakeholder satisfaction, viewed as results, is intricately linked to various determinants represented by different facets of the prism. Answering those key questions at the organisational level provides a comprehensive overview, with detailed insights for each facet, ensuring a thorough framework. This approach allows for the identification of measurement gaps. The authors emphasise the multidimensional nature of the framework, reflecting all aspects of performance influencing an organisation. This enables a balanced portrayal of the business, highlighting both external and internal measures, including financial and non-financial indicators. The framework proves adaptable across organisational functions and hierarchy, facilitating a holistic evaluation of efficiency and effectiveness throughout the organisation (Neely et al., 2007).

2.4 Complementary Frameworks in Performance Measurement and Management

While the BSC and the performance prism are considered among the most famous and widely adopted approaches by companies for measuring and managing performance, there are some other frameworks and systems that have a considerable importance in this regard. For example, around the late 1990, the first framework that focused on implementing management systems for intangible assets by highlighting the importance of investing in human capital was introduced by a Swedish financial company called Skandia. This framework, known as the

Skandia Navigator, covered five essential components, financial, customer, process, human, and renewal and development (Edvinsson & Malone, 1997). It was believed to be Skandia's equivalent to the BSC (Roy, 1999), with the difference of it being oriented more towards internal resources rather than client or shareholder (Wegmann, 2008). Moreover, the Skandia Navigator was designed as a holistic internal reporting model that emphasised the management of intellectual capital as a fundamental factor in building a wealth-enhancing and value-sustaining organisation, highlighting underlying dynamic factors, measures, and management approaches that are often unseen in traditional financial reports (Dufour et al., 2020). While the Skandia Navigator emphasises managing intangible assets and intellectual capital, another framework that focuses on aligning strategic objectives with operational execution is Hoshin Kanri management. Originating in Japan, Hoshin Kanri is a strategic management system developed in the context of large companies (Melander et al., 2024). It is built on the PDCA (Plan, Do, Check, Act) cycle, a scientific methodology that supports continuous improvement and iterative decision-making. Recognised as a key pillar of total quality management (TQM) and the lean manufacturing movement, the connection between these frameworks is well established (Ishikawa, 1985; Potter, 2022; Santhiapillai & Ratnayake, 2023). Hoshin Kanri offers a dynamic and adaptable approach to strategy deployment, ensuring that all members of the organisation have a clear understanding of the company's strategic direction (Thurer et al., 2019). A notable strength of Hoshin Kanri lies in its ability to bridge long-term strategic goals with day-to-day operational activities, ensuring that overarching objectives are consistently reflected in routine processes (Roche & Baumgartner, 2024).

Beyond the Skandia Navigator and Hoshin Kanri, which emphasise internal resource management and strategic deployment, respectively, other notable frameworks like the European Foundation for Quality Management (EFQM) Excellence Model and Common Assessment Framework (CAF) contribute to performance management by promoting organisational excellence, self-assessment, and continuous improvement.

Recognised as a universal structure that could be applied by organisations from any industry and of any nature, the EFQM provides a comprehensive framework for assessing and improving organisational performance (Fonseca, 2022) by focusing on key enablers and results, encouraging continuous improvement and innovation across various industries. It suggests that for any organisation to achieve success, regardless of its size, sector, or structure, it must have an effective management system, which can be structured through self-assessment. The model, built on nine criteria, five "Enablers" (covering what the organisation does) and four "Results" (covering what it achieves), is based on the principle that sustainable excellence in performance,

customer satisfaction, employee engagement, and societal impact is driven by effective use of partnerships, resources, and processes (Gómez Gómez et al., 2011). The EFQM model is also popularised as a great supporter for the successful adoption of TQM (Calvo-Mora et al., 2015).

Similarly, CAF, adapted from the EFQM model to suit the public sector, offers a practical tool for self-assessment based on TQM principles. It supports organisations in identifying strengths and areas for improvement, thereby fostering performance excellence and sustainable development (Macur & Radej, 2017).

Together, these frameworks, Skandia Navigator, Hoshin Kanri, EFQM, and CAF, highlight the other diverse approaches organisations can adopt for performance management, ranging from strategic alignment and intellectual capital management to excellence-driven self-assessment and continuous improvement.

While the discussed frameworks provide strong structures for aligning organisational strategies with performance measures, several critical issues arise concerning their practical application and theoretical assumptions. The BSC, despite its multidimensional approach, is criticised for oversimplifying cause-and-effect relationships among its four perspectives, with empirical studies presenting conflicting evidence about their hierarchical nature. Moreover, building these relationships was reported as a challenge in practice, thus questioning the system's effectiveness in eventually realising the intended benefits in case these relationships were missing from the framework or not correctly established. It is worth noting that several variations for this framework have been adopted in practice, with practitioners advocating the BSC as a flexible framework rather than a rigid one, allowing perspectives to be shortened, expanded, or modified according to the organisation's priorities. Despite that, doubts regarding its universality persist, particularly in dynamic environments.

The Performance Prism, though improving on the BSC by incorporating stakeholder satisfaction and contribution, faces implementation challenges due to the complexity of balancing competing stakeholder interests. Furthermore, one could argue whether the assumption of reciprocal stakeholder relationships may always hold, especially in transactional interactions.

Skandia Navigator on the other hand represents an innovative shift by focusing on intellectual capital. However, the subjective nature of measuring such intangibles limits its practical utility and comparability across organisations. Similarly, Hoshin Kanri is praised for aligning strategic goals with daily operations. Yet, this process requires intensive resources, and its success relies strongly on the organisational culture and the level of leadership commitment, which may not

be replicable across diverse contexts. Lastly, while the EFQM Excellence Model and CAF offer holistic approaches focusing on enablers and results, the EFQM model's flexible, non-prescriptive nature can create ambiguity and some challenges in implementation. The CAF, tailored for the public sector, may have limited relevance in competitive private-sector environments where profitability and market positioning are critical.

While these frameworks provide structured approaches to performance management and measurement, it can be reasonably concluded that none offers a one-size-fits-all solution. Their effectiveness is highly context-dependent, influenced by organisational size, sector, and external market conditions.

Future research and practice might benefit from hybrid models that incorporate the strength of each of these frameworks. For example, a tool could integrate the strategic clarity of the BSC, the stakeholder-centric approach of the Performance Prism, the intellectual capital focus of the Skandia Navigator, and the continuous improvement emphasis of Hoshin Kanri, while maintaining the adaptability of EFQM and CAF. Such an integrated approach could address existing gaps and provide a more dynamic, responsive, and stakeholder-aligned framework for performance management in diverse organisational contexts.

2.4 PMSs Effects on Organisational Performance

The theoretical assumptions of PMSs impacts on organisational performance have been extensively and comprehensively discussed in the existing literature. In this section, the results of a number of recent empirical studies on the impacts of using PMSs on organisational performance are provided. The researchers' assumptions of the existing multifarious positive effects of PMSs on the performance of organisations were supported by many studies. Nevertheless, their effects varied between being direct, indirect, mediating, or moderating. It is also important to highlight that when explaining the relationship between PMSs and organisational outcomes, it does not only depend on the presence or the design of the PMS, but the degree of PMS sophistication, the type of PMS use, and the PMS characteristics also impact the extent to which objectives are realised.

For example, in the context of Indonesian organisational performance, no significant direct relationship was found concerning the reliance on interaction strategic PMSs (SPMSs). Nonetheless, an indirect relationship was found through business strategy (Yuliansyah et al., 2017). Bisbe and Malagueno (2012) characterise SPMSs as systems that facilitate strategy implementation and enhance organisational performance by translating strategy into easily and clearly communicated objectives and measures. Guenther and Heinicke (2019) explored the

relationships between different uses of PMSs (interactive and diagnostic) and their accompanying advantages in mid-sized German enterprises. Diagnostic systems, defined as "formal feedback systems used to monitor organisational outcomes and correct deviations from pre-set standards of performance" (Simons, 1994), and interactive systems, described as "systems used by top managers to regularly and personally involve themselves in the decision activities of subordinates" (Simons, 1994). The study revealed that when the PMSs sophistication level is controlled, the emphasis on both uses of PMSs has a positive, direct, and significant relation with the achieved benefits. Notably, the interactive use of PMS demonstrated a higher path coefficient in its relationship with benefits compared to the diagnostic use of PMS.

Koufteroset al. (2014) also studied the effect of the interactive and diagnostic uses of PMS on public and private Italian as well as multinational firms operating in Italy. Their findings showed that the sole diagnostic or interactive use of PMS has a positive and significant impact on strategic management capabilities, nevertheless, when both the interactive and diagnostic uses are utilised together, a moderately significant positive effect exists. The findings further revealed that the sole or the combined utilisation of these uses positively affects operational capability. Notably, the diagnostic utilisation of PMS has been identified as having the most significant impact on operational capability. The sole diagnostic or interactive use also positively affected the capability of external stakeholder relations. Lowest levels of capabilities were recorded when the low levels of interactive use were utilised with high levels of diagnostic use, in contrast, when both types of PMSs were used at high levels, higher levels of capabilities were achieved. While the strategic management capabilities and operational capabilities effects on target performance were found to have a positive moderately significant effect, the external stakeholder capability influence was positive and statistically significant. Target performance, in turn, positively affected financial performance, ROA, and ROE, whereas it negatively affected earnings before interest, taxes, and management (EBITM). In the same context, Zhang and Yu's (2020) results suggest that the interactive use of PMS has positive impact on organisational learning and job performance. The findings further revealed that the interactive use of PMS and job performance relationship is strongly and positively mediated by organisational learning.

Rafiq et al.'s (2020) findings revealed that the four BSC perspectives positively impact perceived organisational performance and that all BSC perspectives, except the financial perspective, have a positive impact on sustainable development. Sustainable development according to them is described as improving economically while ensuring that natural resources

are not depleted and environmental sustainability is not compromised. Additionally, it focuses on economic development, environmental sustainability, and social values. The results of Mtar's (2017) study suggested a significant positive effect of BSC on improving a French Small and Medium-sized Enterprise (SME) performance, specifically; the BSC impacted labour productivity and firm turnover. In the context of SMEs, PMSs were found to positively affect both financial and non-financial performance of Finish SMEs, as per Länsiluoto et al.'s (2019) findings.

More CPMSs, which employ a wide variety of broad financial and non-financial indicators delivering information covering various areas of firms' operations, were found to support the cost-leadership strategy and differentiation strategy to deliver higher performance more than other PMSs which rely exclusively on just financial or non-financial indicators according to the study of Micheli and Mura (2017). Taheri et al. (2019) further found that CPMSs positively impact market-focused learning (MFL), nevertheless, these systems' impact on entrepreneurial orientation was negative. CPMSs and MFL were also found to influence employees' perception of a firm's performance positively. The indirect effects were also investigated, which showed that there is an indirect effect of CPMSs on employees' perception of firm's performance mediated by entrepreneurial orientation and MFL.

Using PMS for attention focus, strategic decision-making, and legitimisation was found to positively and significantly influence organisational performance through ambidexterity, according to Severgnini et al. (2018). Organisational ambidextrous firms are defined by Lubatkin et al. (2006) as firms that can balance and perform both, exploiting the already existing competencies in addition to exploring new opportunities.

The manufacturing sector is witnessing a continual and significant increase in competition, compelling organisations to focus on various objectives, particularly producing high-quality products at lower costs to advantage over competitors. Organisations employ PMSs to assess the effectiveness of achieving these objectives.

Research examining the impact of PMSs on manufacturing organisations reveals a positive significant association between various indicators, such as financial, flexibility, quality, delivery reliability, employees' satisfaction, customers' satisfaction, safety, environmental/community, and learning and growth with the Overall Performance Index (OPI) (Bhatti et al., 2014). However, a negative correlation was found between the cost indicator and the OPI, yet their relationship is not significant. Furthermore, the simple regression analysis results show that except for the learning and growth indicator, which has no effect on the OPI, measuring performance in terms of the other nine studied indicators positively and significantly

impacts the overall organisational performance. Ahmad and Zabri (2016) studied the impact of non-financial PMSs on Malaysian manufacturing firms' performance. The non-financial PMSs were measured using 29 different indicators under six important categories: internal efficiency, customer, product development and growth, employees, product quality, and corporate social responsibilities (CSR). The results of the analysis support the existence of significant effects of non-financial PMSs on firms' overall performance. Five of the six categories used to measure non-financial PMSs (except product quality) were found to have positive and significant relationships with performance. Furthermore, the regression analysis shows that all product development and business growth, efficiency, and CSR have strong relationships with the average performance. Although the results do not support a significant direct effect of the customer, quality, and employees-based indicators on performance, indirect effects could be present.

Subsequent research by Barroso et al. (2016) in the German electronic manufacturing sector found significant moderating effects of PMS sophistication. Specifically, PMSs sophistication positively moderates two relationships, the employees' commitment with market performance relationship and the organisational flexibility with financial performance relationship. However, it was also found that PMSs sophistication negatively moderates the relationship between internal efficiency and financial performance. Internal efficiency refers to the extent to which organisations effectively utilise their resources to produce the maximum possible outputs, thereby determining their level of productivity (Merchant & Van der Stede 2012). Another study on Malaysian manufacturing companies investigated the relationship between Just in Time (JIT) practices and organisational performance under the influence of PMSs. Both JIT and PMSs are methods adopted by companies to enhance manufacturing performance. The study reveals that higher extensive PMS is linked with higher benefits to the firms' performance, and firms implementing more advanced PMSs (including both financial and non-financial metrics) with the JIT system achieve higher performance. The association between JIT and organisational performance is positive and significant. However, it is stronger for companies that use more advanced PMS than the ones that use traditional PMS (Rasit et al., 2018). The results support the view that advanced PMSs may be best suited for organisations with the JIT system, and they indicate that companies, which use more advanced performance measures, perform better than those companies that use traditional performance measures.

Advanced PMSs, particularly SPMS, have been found to influence organisational learning and IS strategic alignment positively in Korean manufacturing firms (Choe, 2016). In the Australian manufacturing context, Baird (2017) identified three characteristics of SPMSs, the use of

performance measures that are multidimensional, the use of performance measures that are linked to strategy, and the use of performance measures that are linked to value drivers and studied their influence on the effectiveness. The effectiveness of these systems was measured through two dimensions, performance-related outcomes and staff-related outcomes. The results of their study confirmed the existence of a positive relationship between the use of multidimensional performance measures and both dimensions of SPMS effectiveness. However, contrary to expectations, the use of performance measures that are linked to value drivers was negatively associated only with performance-related outcomes. Interestingly, the use of performance measures that are linked to strategy was not associated with either of the SPMS effectiveness.

PMSs have various effects on organisations, influencing overall, financial, and non-financial organisational performance, employees' behaviour, labour productivity, operational capability, strategic management capability, and firms' turnover. Additionally, they impact organisational learning, effectiveness, ambidexterity, and capabilities.

Studies on PMSs are performed in almost every field, Table 4 presented by Owais and Kiss (2020), summarises the effects of using PMSs on organisations based on findings from 24 different empirical studies across various business sectors.

Table 4: Summary of PMSs Effects on Organisations' Performance

Nr	Author(s)	Country	Main Findings
		Manufacturing Sector	
1	Bhatti et al. (2014)	Pakistan	Measuring performance in terms of the number of indicators positively and significantly impact the overall organisational performance.
2	Barroso et al. (2016)	Germany	Significant moderating effects of PMSs sophistication on some relationships. Highly sophisticated PMS positively moderates the employee commitment and market performance relationship, as well as the relationship between the company's flexibility and financial performance. However, negatively moderates the internal efficiency and financial performance relationship.
3	Ahmad and Zabri (2016)	Malaysia	Non-financial PMSs have significant effects on firms' performance.
4	Choe (2016)	Korea	SPMS positively affects both organisational learning and information system strategic alignment.
5	Baird (2017)	Australia	Using multidimensional performance measures positively impact the SPMSs effectiveness.
6	Rasit et al. (2018)	Malaysia	More extensive PMSs achieve higher benefits to organisations. With higher extensive PMSs the positive and significant relationship between JIT and organisational performance is stronger.
		SMEs	
7	Mtar (2017)	France	BSC positively and significantly affects firms' performance.
8	Länsiluoto et al. (2019)	Finland	PMSs have a significant and positive effect on firms' financial and non-financial performance.
9	Guenther and Heinicke (2019)	Germany	The relationships between the two types of PMS uses (interactive and diagnostic), and their benefits are direct and positive. Nevertheless, the interactive use and PMSs benefits relationship is positively moderated by PMSs sophistication, whereas PMSs sophistication negatively moderates the diagnostic use relationship with PMSs benefits.
		Health Care Sector	
10	Demartini and Trucco (2017)	Italy	Using PMSs for strategic purposes significantly and positively affects the organisations performance. in terms of improved processes and the perceived managerial discretion.
11	van Elten et al. (2019)	Netherlands	The operational use of PMS positively affects the operational performance and negatively affects the degree of patient-oriented care (POC). However, the exploratory use of PMS positively affects both POC and collective work culture. In contrast, the incentive-oriented use of PMS does not affect hospital outcomes.

Public Sector			
12	Spekle and Verbeeten (2014)	Netherlands	Both the incentive use and the exploratory use of PMS have effects on performance, their effects are negative and positive, respectively. On the other hand, the operational use of PMS does not impact performance.
13	Ambalangodage and Fie (2016)	Sri Lanka	PMSs have a positive and statistically significant effect on employee behaviour and organisational capabilities.
14	Gomes et al. (2017)	Portugal	The level to which PMSs are used by agencies is positively associated with organisational performance.
15	Rasid et al. (2017)	Malaysia	Using comprehensive PMSs positively affects performance. However, using these systems in integration with enterprise risk management has no effect on organisational performance.
Wide Variety of Industries			
16	Koufteros et al. (2014)	Italy	Using PMS enhances the capabilities, which also influence performance.
17	Micheli and Mura (2017)	European Countries	CPMSs play a positive mediating role in the relationship between differentiation strategy and both organisational and innovative performance, and on the relationship between cost-leadership strategy and organisational performance.
18	Yuliansyah et al. (2017)	Indonesia	The reliance on interaction SPMSs does not have a direct effect on organisational performance, however, it affects organisational performance through business strategy.
19	Lisi (2018)	Italy	Using SPIs and social performance are strongly and positively associated. Moreover, using SPIs positively affects organisations' economic performance through social performance.
20	Severgnini et al. (2018)	Brazil	Using PMS for attention focus, strategic decision-making, and legitimisation is associated positively with organisational ambidexterity, which positively influences business performance. PMSs and performance relationships are mediated by organisational ambidexterity.
21	Lucianetti et al. (2019)	Italy	The level of BSC comprehensiveness has a great impact on organisational effectiveness.
22	Taheri et al. (2019)	Iran	CPMS has a positive impact on market-focused learning, therefore, perceptions of firm performance are positively affected. CPMS also has a negative impact on entrepreneurial orientation, which negatively impacts the perceptions of firm performance.
23	Zhang and Yu (2020)	China	The interactive use of PMS has a direct positive effect on both organisational learning and job performance. Furthermore, the interactive use of PMS and job performance relationship is mediated by organisational learning.
24	Rafiq et al. (2020)	Chinese companies in Pakistan	The four BSC perspectives positively impact on the perceived organisational performance, and the three perspectives other than the financial have a positive impact on sustainable development.

Source: Owais and Kiss (2020)

2.5 Causes of PMSs Failure

According to what has been discussed so far, adopting PMSs is proved to have great impacts and benefits for the organisations. Van Camp and Braet (2016) highlighted the fact that only limited overview papers are found discussing reasons for the failure of PMSs based on actual experiences, they added, "successful business cases or failure analyses are a scarce find in literature". Regarding this matter, a study was conducted in which several reasons discussed in the literature that have effects on the achievement of successful PMSs were addressed. The results were realised by reviewing scientific references published between 1995 and 2023. Authors in these references regarded the failure of these systems for quite a lot of reasons, some of them were discussed by several authors, some were mentioned by a few, and some were discussed by single authors. In this part, I discuss these factors.

Meekings (1995) pointed out that organisations often struggled with the inadequate use of PMSs. This finding underscores the importance of not just implementing PMSs but also ensuring that they are effectively used to achieve organisational goals. Neely and Bourne (2000) identified poor PMS design as a significant reason for failures. A well-designed PMS is critical for effective performance management and measurement. This highlights the importance of a strategic approach to PMS design. They also highlighted challenges during the implementation phase. Poor decisions made during this stage could hinder the effectiveness of selected measures and overall system success. Implementing PMSs effectively requires attention to detail and thorough planning. They further suggested that a "success map", explaining the cause-and-effect relationships between different perspectives of PMSs, was essential for successful design. Such maps can help organisations align their strategies with their PMSs, emphasising the need for a strategic roadmap. Then, after conducting the design maps, the right measures can be selected. Schneiderman (1999) also highlighted the importance of establishing clear linkages between non-financial and financial metrics for a holistic view. He further noted that misidentifying non-financial indicators as primary drivers of stakeholder satisfaction could lead to a biased focus and ineffective performance measurement. Understanding the true drivers of satisfaction is essential for successful PMSs. Neely and Bourne (2000) stressed that even if organisations succeeded in designing the PMS, unfortunately, they still could fail in the implementation process. They argued that there are three reasons behind the implementation difficulties of these systems: political, infrastructural, and focus. The political cause is related to the fact that measures threaten people, so people do not want the data to be revealed, especially if there is a "blame culture" in the organisation, so what happens is that employees could manipulate these measures. They refer to it as playing the "numbers' game", where

instead of delivering the actual performance, they would worry about achieving the right numbers. The second reason is the lack of supporting organisational infrastructure, which is that the PMSs data are distributed over the entire organisation and not being stored in a connected or interrelated database. Finally, the loss of focus the employees suffer from is due to the time, effort, and resources the implementation of the supporting infrastructure takes, which unfortunately leaves people drained.

Micheli and Manzoni (2010) noted that it is true that organisations invest strong resources to design and implement PMSs, nevertheless, the planned benefits may often fail to be achieved by the implementation of such systems. And what is much worse is that if these systems are poorly done, in this case, these systems will be harmful to the organisations, besides being very expensive. They argued that many organisations implemented PMSs to enhance strategy implementation and improve strategic decision. However, they failed to do so because of the wrong design of these systems. Marchand and Raymond (2008) further noted that the lack of clear and uniform definitions and basic concepts of the research object in the field of PMSs, makes it more problematic.

Literature also discusses challenges faced by organisations related to metric selection (Bourne et al., 2002; Meekings, 1995) and poor metrics definition (Bourne et al., 2003; Schneiderman, 1999). Hauser and Katz (1998) emphasised the critical importance of selecting the right metrics for success. However, they acknowledged that the process is not straightforward, highlighting the complexity of metric selection, "it is easy to select a metric, it is hard to select a good metric". Choosing the wrong measures could significantly impede performance evaluation and management. In regard to the poor definition of metrics, without well-defined metrics, organisations might struggle to measure and track their performance effectively. Clarity in metric definitions is imperative. Parmenter (2015) also explained that the reason why most monitoring and reporting of measures has failed is due to the lack of understanding of performance measures. Vachnadze (2016) further mentioned that despite the wide attention paid to performance measures, there is a certain misunderstanding and mixing up of the measures. He also confirmed that in many practical cases, performance measurement fails due to working with the wrong measures.

A fundamental challenge that has also been addressed is the lack of understanding regarding how these systems function (Dangayach et al., 2020; Garengo et al., 2005; Holloway, 2001) and doubts about the potential benefits of these systems (Bourne, 2005; Bourne & Neely; 2002; Bourne et al., 2002; Meekings, 1995). This scepticism might have arisen from a lack of clarity

regarding how these systems could enhance organisational performance. For organisations with past unsuccessful experiences with PMSs, the road to implementation became even more challenging. Rebuilding trust in PMS effectiveness and overcoming a history of failure are substantial barriers that need to be acknowledged and addressed (Meekings, 1995). Misconceptions and lack of clarity could hinder successful implementation. Clear communication and training are vital to overcome this barrier.

Schneiderman (1999) also regarded the absence of deployment systems to decompose goals for lower levels of the organisation as a factor contributing to PMSs difficulties, affecting the alignment of objectives throughout the organisation. Hence, having clear deployment mechanisms is vital for successful implementation.

Having a huge number of measures incorporated in the systems was also reported by the number of researchers as a disadvantage of PMSs (Bourne & Neely, 2000; de Waal & Kourtit, 2013; de Waal et al., 2009; Dumond, 1994; Kald & Nilsson, 2000; Landström et al., 2018; Meyer, 2007; Self, 2004). This abundance can contribute to information overload and make it challenging for stakeholders to discern the most crucial metrics. The volume may dilute the focus and significance of individual indicators and may cause information loss.

When talking about PMSs, it is essential to highlight that these systems require a lot of time and effort, and many researchers regarded this to be one of the reasons for these systems' failure (Agarwal, 2021; Bourne, 2005; Bourne et al., 2002; Holloway, 2001; Lewy & Du Mee, 1998; McCunn, 1998; Neely & Bourne, 2000; Northcott & Taulapapa, 2012; Schneiderman, 1999; Turner et al., 2005). Organisation resistance to change and measurement (Bourne et al., 2003; Cunha et al., 2023; de Mendonça et al., 2020; de Waal & Counet, 2009; Northcott & Taulapapa, 2012; Seotlela & Miruka, 2014) is another commonly cited barrier in the literature. It has been noted that employees and managers may resist the implementation and use of PMSs due to concerns about increased workload, loss of autonomy, or fear of being evaluated based on performance measures.

Holloway (2001) regarded the failure of these systems as that companies tend to copy the same PMS from other companies that reported successful outcomes. He further stresses the point that "what works well in some organisations may fail to deliver improvements in performance in apparently similar ones".

Kaplan and Norton (2001) identified two sources of failure for the BSC: design and process failures. Design failure encompasses issues such as having too many or too few measures, building KPIs or stakeholders' scorecards, and failing to achieve alignment with the overall strategy (Cunha et al., 2023; Gimbert et al., 2010; Van Camp & Braet, 2016). This category emphasises the importance of a well-thought-out design that directly supports the organisation's strategic goals. Researchers emphasised the critical importance of aligning performance measures with the organisation's overall strategy (Kanji, 2002; Morgan, 2004), as this alignment ensures that the measures directly contribute to the strategic objectives of the company. To address this, organisations should establish a clear linkage between performance measures and strategic objectives, regularly reviewing them to maintain alignment. This cohesive approach, integrating insights from such researchers, emphasises the strategic significance of aligning the PMSs with organisational values and objectives throughout both the design and implementation phases. In the process (implementation) failure category, issues include involving only a few individuals in the process, neglecting the engagement of the entire organisation, a lack of managerial commitment, hiring inexperienced consultants, and prolonged development processes (Kaplan & Norton, 2001). Bourne et al. (2002), Bourne (2005), and Agarwal (2021) have also regarded the lack of general managerial support as one of the main reasons why PMSs fail.

Turner et al. (2005) emphasised the significant role of IS in the implementation of PMSs. According to Nudurupati et al. (2011), challenges faced in implementing measures (Amaratunga & Baldry, 2003; McFadzean, 1995; Olve et al., 1999) were attributed to issues related to the infrastructure, availability and format of information within the Information Technology (IT) systems (Bourne, 2005; Bourne & Neely, 2002; Northcott & Taulapapa, 2012). Bourne et al. (2003) have further stressed that it is imperative to underscore the critical need for a highly developed IS. A sophisticated IS plays a pivotal role in addressing issues related to the availability, format, and presentation of data essential for PMSs. The insights from these studies emphasise that a robust IS not only enhances data accessibility and accuracy but also contributes significantly to the overall success and impact of PMSs within organisational frameworks. In relation to the PMSs information, Bititci et al. (2002) highlighted that how people explain and deal with the provided information from PMSs is the main reason why these systems are short-lived.

The dominant focus on financial metrics was one of the most discussed factors affecting the success and effectiveness of these systems by researchers like Meyer (2007) and Turban et al.

(2010). Tsang et al. (1999) raised the concern that the use of financial measures as performance indicators has shortcomings and tends to shape managers' behaviour to focus on short-term results. As highlighted by Narkunienė and Ulbinaitė (2018), relying solely on financial indicators has some disadvantages. These disadvantages include the fact that financial indicators reflect past decisions, do not reveal causal relations, and have a short-term perspective. Furthermore, the authors emphasised that these indicators are sensitive to external factors and do not provide detailed information about the current position and growth potential of a company. Micheli and Manzoni (2010) further noted that the sole focus on financial indicators when the financial results are negative would negatively affect the information flow, thus causing dysfunctional behaviours. They have further concluded that the lack of organisational alignment could also affect the success of these systems.

Another important cause of the failure of these systems discussed in the literature is that they are neither flexible nor dynamic in competitive business environments, which constrains organisational change. A study by Rompho (2011) on one SME that failed in implementing the BSC found that the reason was the company's strategy, the strategy was changed frequently because of the rapidly changing business environment, which led to a great misunderstanding and confusion that both managers and employees suffered from.

Hourneaux et al.'s (2017) study shows that PMSs are found to be used as a monitoring tool for different reasons and that the effective use of these systems can be a very important in supporting corporate performance management. However, a problem may limit the effectiveness of these systems for organisational strategic management, which is the traditional management style while using the PMSs. This problem could prevent the system from delivering the support and management technology that these systems are designed to deliver. This problem can be avoided by training managers to understand the PMSs better to improve their managerial efforts toward improving strategic decision-making, which will eventually improve productivity and increase the profits of the organisations. PMSs are receiving adequate attention from researchers, yet a lot of PMSs are neither dynamic nor flexible to the variations within the internal and external organisations' environment. Therefore, some organisations are running in dynamic markets, addressing static PMSs and working on dynamic strategies, resulting in complexity and a lack of resource allocation efficiency (Melnyk et al., 2014; Okwir et al., 2018).

Table 5 below summarises the most mentioned barriers to successful PMSs according to the reviewed articles.

Table 5: Summary of the Most Mentioned Barriers to a Successful PMS

NR	Barrier	Mentioned by
1	Poor metrics definition/ selection/ implementation	(Bourne et al., 2002; Hauser & Katz, 1998; McFadzean, 1995; Meekings, 1995; Neely & Bourne, 2000; Northcot & Taulapapa, 2012; Nudurupati, 2011; Olve et al., 1999; Parmenter, 2015; Schneiderman, 1999; Vachnadze, 2016; Vladimir, 2020).
2	Lack of understanding of PMSs	(Bititci et al., 2002; Bourne et al., 2002; Dangayach et al., 2020; Holloway, 2001; Marchand & Raymond, 2008; Meekings, 1995; Micheli & Manzoni, 2010; Neely & Bourne, 2000; Northcot & Taulapapa, 2012; Parmenter, 2015; Seotlela & Miruka, 2014; Vachnadze, 2016).
3	Required resources	(Agarwal, 2021; Bourne, 2005; Bourne et al., 2002; Holloway, 2001; Kaplan & Norton, 2001; Lewy & Du Mee, 1998; McCunn, 1998; Neely & Bourne, 2000; Northcott & Taulapapa, 2012; Schneiderman, 1999; Turner et al., 2005).
4	PMSs contain too many/ too few measures	(Bourne & Neely, 2000; de Waal & Kourtit, 2013; de Waal et al., 2009; Dumond, 1994; Kald & Nilsson, 2000; Kaplan & Norton, 2001; Landström et al., 2018; Meyer, 2007; Self, 2004).
5	Fear of the system / lack of perceived benefits	(Bourne, 2005; Bourne & Neely, 2000; Bourne & Neely, 2002; Bourne et al., 2002; Meekings, 1995; Neely & Bourne, 2000; Northcott & Taulapapa, 2012; Nudurupati, 2011).
6	Difficulties with the IS/ data accessibility	(Bourne, 2005; Bourne & Neely, 2002; Bourne et al., 2002; Neely & Bourne, 2000; Northcott & Taulapapa, 2012; Nudurupati et al., 2011; Turner, 2005).
7	Lack/ decreased managerial commitment and support	(Agarwal, 2021; Bourne, 2005; Bourne et al., 2002; Kaplan & Norton, 2001; Northcott & Taulapapa, 2012; Seotlela & Miruka, 2014).
8	Focusing solely/ dominantly on financial indicators	(Meyer, 2007; Micheli & Manzoni, 2010; Olve et al., 1999; Tsang et al., 1999; Turban et al., 2010).
9	Organisation resistance to change and measurement	(de Mendonça et al., 2021; Meekings, 1995; Northcott & Taulapapa, 2012; Turner et al., 2005)
10	Failing to align the PMSs with the overall strategy	(Gimbert et al., 2010; Kanji, 2002; Kaplan and Norton, 2001; Morgan, 2004)
11	Static PMSs in dynamic environments	(Melnyk et al., 2014; Micheli & Manzoni, 2010; Okwir et al., 2018).
12	Difficulties building cause-and-effect diagrams	(Northcott & Taulapapa, 2012; Schneiderman, 1999)
13	PMSs not linked to employee's reward	(Kanji, 2002; Northcott & Taulapapa, 2012)

Source: Author's own summary based on reviewed articles (2024).

2.6 Employee Empowerment

Empowerment emerged as a managerial concept in the late 1980s, and it is a type of employee involvement approach focused on attitudinal change and task-based involvement (Wilkinson, 1998). Many definitions of empowerment can be found in literature, for instance, Chaturvedi (2008) defines empowerment as "the process of enabling or authorising an individual to think, behave, take action, and control work and decision-making in autonomous ways".

The literature on employee empowerment distinguishes between psychological empowerment and structural empowerment (Baird et al., 2018). Psychological empowerment refers to the individual's perception of their ability to control their work and make meaningful decisions (Thomas & Velthouse, 1990; Spreitzer, 1995), while structural empowerment focuses on the organisational structures and systems that give employees the authority and resources, they need to perform their jobs effectively and make meaningful contributions to the organisation (Tyagi & Shah, 2018). Psychological empowerment emphasises the psychological state of employees, including their sense of competence, autonomy, and impact. On the other hand, structural empowerment emphasises the operational practices that empower employees, such as delegation of decision-making authority and collaboration within the organisational hierarchy (Wilkinson, 1998; Chaturvedi, 2008).

Wilkinson (1998) explained that empowerment might simply be connected to the act of redistributing power. However, practically it is perceived as a type of employee involvement, which is controlled by management for the purpose of improving the contribution of employees towards the organisation, in addition to initiating commitment.

Based on Conger and Kanungo's (1988) work, Thomas and Velthouse (1990) provided a definition of empowerment. They defined it as an "intrinsic motivation" demonstrated in four cognitions, impact, competence, meaning, and self-determination, and these cognitions reflect the individuals' orientation to their work. Logan and Grantster (2007) explain them as follows. Impact is the ability of individuals to influence the outcomes of the organisation, and competence represents the beliefs of individuals in their own ability to accomplish the job activities efficiently. Meaningfulness represents the degree to which employees believe that their job is meaningful and important to the organisation. Finally, self-determination refers to the ability of workers to initiate and control their behaviours and reactions. Thomas and Velthouse (1990) further highlighted that as the levels of these four cognitions are higher, intrinsic task motivation is higher. This indicates that all of the workers' efforts, attention on

tasks, task strategies, and persistence during tasks are expected to be improved (Mitchell & Daniels, 2003). These four cognitions are also known as the four dimensions of psychological empowerment.

Structural empowerment is essential for providing employees with the necessary tools, resources, and support to carry out their responsibilities effectively. By delegating decision-making authority and fostering collaboration within the organisational hierarchy, employees are empowered to contribute meaningfully to the organisation. Employee empowerment is a crucial aspect of modern management theory (Appelbaum, 1999; Styhre, 2001), as it not only involves giving employees the authority to make decisions and take actions autonomously but also encourages a shift in their mindset towards a more proactive and responsible approach to their work.

Performance information plays a significant role in improving psychological empowerment. According to the feedback theories from psychological empowerment, they do so by providing information regarding performance and task behaviour (Hall, 2008; Luckett & Eggleton, 1991). Kuwaiti and Kay (2000) emphasised that PMSs and the performance information they provide have a vital role in affecting empowerment. Their findings moderately supported the association between PMSs and empowerment.

Newman et al. (2017) discussed that employees who are empowered exchange opinions and ideas smoothly. Moreover, they show high levels of knowledge in learning and sharing (Wu & Lee, 2017). The employee empowerment positive effects on performance are supported by most of the existing research (Al-Omari et al., 2020; Yin et al., 2019). These practices enhance the employees' motivation and improve their responses to changes and competitive work environments, in addition to positively influencing the employees' attitudes (Patel & Cardon, 2010). Maynard et al. (2012) thus believe that organisational performance and employees' productivity can both be enhanced by empowerment practices, furthermore, they consider these practices to be the best way to do so.

2.7 Employee Engagement

Employee engagement is defined by Harter et al. (2002) as "individual's involvement and satisfaction with as well as enthusiasm for work". The roots of it can be found in the work of Kahn (1990). The work of Kahn (1990) and Schaufeli et al. (2002) differentiated between two types of employee engagement: personal engagement and work engagement. Kahn's (1990) definition of personal engagement is "the harnessing of organisation members' selves to their

work roles; in engagement, people employ and express themselves physically, cognitively, and emotionally during role performances". On the other hand, Schaufeli et al. (2002) define work engagement as "a positive, fulfilling, work-related state of mind that is characterised by vigour, dedication, and absorption". The consequences of these acts could be that they speak about their work passionately; however, this does not necessarily mean that they will be loyal to their organisation (Farndale et al., 2014). Saks (2006) differentiated between job engagement and organisational engagement. According to him, engagement refers to an individual's role, and that the majority of workers have two main roles; the organisational role and the work role. Farndale et al. (2014) discussed that organisational engagement refers to individuals who feel very positive regarding the organisation they work for; furthermore, they behave as representatives of the brand. On the other hand, Maslach et al. (2001) explain job engagement as the positive opposite of burnout, highlighting a state of active involvement and enthusiasm in one's work. It is important to note that burnout involves a decline or erosion of engagement with one's job.

People who are more engaged in their organisation are less likely to consider leaving it. Many studies have concluded that there is a positive correlation between work engagement and affective commitment (Wefald et al., 2011). The study of Farndale et al. (2014) also supported this conclusion, and they found that work engagement is significantly and positively related to affective commitment, active learning, and organisational performance. However, it is not significantly related to job satisfaction. Saks (2006) also found that the relationship between organisation engagement and job satisfaction is stronger than the relationship between job engagement and job satisfaction. He further found that organisational engagement is significantly and positively related to all affective commitment, active learning, organisational performance, and job satisfaction.

The employee engagement literature states that people engaged with their organisations have better performance and, therefore, positively impacting the performance of organisations. Employee engagement is found to be connected to the performance of organisations as engaged people have passion for their work, which results in enhanced performance (Meyer, 2017; Sanneh and Taj, 2015). Moreover, Akhmetshin et al. (2019) highlighted that concentrating on engaging the employees has several benefits in helping organisations survive and possibly prosper during economic crises. Huang and Fei (2020) noted that when employees are engaged, they are ready to invest their time, effort, and personal resources to ensure the successful completion of tasks.

According to Anitha (2014), engaged employees exhibit involvement in their work, strong commitment to both their work and the workplace, and enthusiasm for their jobs. A relationship between employee motivation and their work engagement was presumed by Evangeline and Ragavan (2016). This assumption was supported by Chinyamurindi and Tsvangirai (2019), who found a positive relationship between employee motivation and work engagement. They have further emphasised the importance of managing employees' motivation as it is a fundamental driver of companies' success.

2.8 Hypotheses of the Research

2.8.1 PMSs and their Effects on Organisations' Performance and Effectiveness

PMS has been recognised as an essential part of business performance improvement (Taticchi et al., 2010), the organisational benefits achieved from PMSs and their effects on improving the performance of organisations are the reasons behind the organisational motivation to adopt these systems (Ittner et al., 2003).

Moynihan et al. (2011) explained that developing performance systems that provide information will eventually enhance performance because leaders and managers will use this information to manage the plans, programs, and resource allocation effectively. Länsiluoto et al. (2019) also explained, "we expect that PMSs adoption helps managers to understand occurring development, trends, and events from different perspectives and that this kind of understanding enables them to respond appropriately, which in turn improves firms' performance".

Kaplan and Norton (1996a), the founders of the BSC, highlighted that performance measures and the financial and non-financial objectives and goals are the components of PMSs, which must be selected carefully to represent the key drivers of the organisation's success in meeting its strategic goals. A PMS explains the feedback related to the fulfilment of both customer expectations and strategic objectives, thus ensuring that quality and efficiency can be improved (Equbal & Ohdar, 2017). Furthermore, it assists managers and organisations in improving the decision-making processes, achieving competitive advantages, and enhancing future results (Coste & Tiron-Tudor, 2015; Franco-Santos et al., 2012). Additionally, the accuracy of data, the delivery of the aligned metrics, and the flexibility of decision-making processes can be improved through the PMSs implementation (Pavlov & Bourne, 2011). PMSs also enhance the translation of strategy into operations and the alignment between organisational competencies and different processes (Chenhall, 2005).

The study by Länsiluoto et al. (2019) concluded that PMSs have a significant and positive impact on both the financial and non-financial performance of Finish SMEs, and implementing the BSC was found to have a positive and significant effect on increasing the performance of French SMEs in Mtar's study (2017). He explained that the use of BSCs has significantly improved both labour productivity and firm turnover. De Geuser et al. (2009) also emphasised that the BSC positively contributes to the firms' performance.

Researchers assert the critical importance of PMSs to companies, and they consider PMS as a valuable resource which can be utilised to improve the decision-making process, which leads to gaining competitive advantages and, therefore, enhancing companies' performance (Barney et al., 2001; Franco-Santos et al., 2012)

Comprehensive PMSs (CPMSs) are systems that use a wide variety of broad financial and non-financial indicators to provide information covering different aspects of firms' operations (Micheli & Mura, 2017) and are integrated with strategy across the organisation (Hall, 2008). According to Micheli and Mura (2017), CPMSs support the cost-leadership strategy and differentiation strategy to deliver higher performance than other PMSs, which focus on just financial or non-financial indicators. Another study by Lucianetti et al. (2019) also found that with more CPMSs, higher levels of organisational effectiveness are achieved.

A recent study by Ahmad et al. (2023) on Malaysian manufacturing companies supports the view that using multidimensional performance measures helps companies evaluating their performance in terms of specific related activities, which subsequently assists them in enhancing their overall performance. Specifically, the findings revealed that using performance measures related to a diverse set of perspectives, such as production efficiency, quality and customer, social responsibility and innovativeness, is significantly related to improving firms' performance. The findings further indicate that the overall use of performance measures is significantly related to companies' overall performance. Thus, the results support previous findings that firms achieve greater performance with CPMSs. Overall performance in the context of our study refers to a comprehensive assessment of a company's performance and success, which includes both financial and non-financial indicators.

An interesting area of research in corporate performance management literature is understanding PMSs and their impact on organisational effectiveness (Franco-Santos et al., 2012; Koufteros et al., 2014; Maestrini et al., 2018). Although the positive effects of these systems on organisational effectiveness have been supported by previous research (Upadhaya et al., 2014), Maestrini et al. (2018) raised a concern regarding the limited number of empirical

information in the literature that investigates the relationship between CPMSs and the organisational effectiveness.

Based on what has been discussed so far, four hypotheses have been formulated:

Hypothesis 1 (H1)*: CPMSs positively affect companies' overall performance.*

Hypothesis 2 (H2): *CPMSs positively affect companies' financial performance.*

Hypothesis 3 (H3): *CPMSs positively affect companies' non-financial performance.*

Hypothesis 4 (H4): *CPMSs positively contribute to organisational effectiveness (in terms of aligning, exploiting, and mobilising).*

2.8.2 PMSs, Empowerment, and Organisations' Performance

The performance information and feedback provided by PMSs are the main factors influencing empowerment, and an association between PMSs and empowerment was moderately supported by the findings of Kuwaiti and Kay (2000). Additionally, the empirical findings of the study by De Geuser et al. (2009) found that the BSC empowers employees. They further highlighted the fact that decentralisation of power and employees' empowerment are vital to organisations in the current business field to ensure success.

Baird et al. (2018) highlighted that the use of enabling controls is anticipated to enhance employee empowerment. Furthermore, they highlighted the scarcity of studies researching the relationship between management control and employee empowerment within organisations. Houghton and Yoho (2005) emphasised the importance of focusing on employee empowerment and investigating the factors impacting it. They regarded their view to the increasing adoption of these practices by organisations.

One of the empowerment theory's major assumptions is that empowered people shall accomplish their work better than relatively less empowered people (Liden et al., 2000; Thomas & Velthouse, 1990). Furthermore, a positive direct relationship between employee empowerment and firms' performance is widely accepted (Al Mansoori & Aizat, 2023; Nuhu et al., 2019), empowerment was found to relate to enhanced firms' performance and outcome (Arogundade & Arogundade, 2015; Bordin et al., 2007). Matthieu et al. (2006) explained that higher employee empowerment levels allow organisations to be flexible and highly responsive in the current competitive business environment.

A positively related relationship between employees' understanding of the organisation's goals and norms and employees' motivation has been explored in previous studies, and high levels

of motivation are believed to be achieved through empowerment. “Employees’ participation and empowerment do not only enhance efficiency, growth and innovation, but they also increase employee motivation and trust in the organisation” (Dobre, 2013). Additionally, Kamalian et al. (2010) explained that motivated employees have both their goals and the organisations’ goals aligned in the same direction. Therefore, their efforts are directed in that direction. They further suggested that they are more successful because these organisations’ employees continuously explore new ways to improve their work. The existence of a significant relationship between job performance and power motivation was discussed by McClelland (1984), explaining that employees with high power motivation will show better performance.

Based on what has been discussed, the following hypotheses have been formulated:

Hypothesis 5 (H5): *CPMSs have a positive indirect effect on companies’ overall performance through employee empowerment, as employee empowerment positively affects companies’ overall performance.*

Hypothesis 6 (H6): *CPMSs have a positive indirect effect on companies’ financial performance through employee empowerment, as employee empowerment positively affects companies’ financial performance.*

Hypothesis 7 (H7): *CPMSs have a positive indirect effect on companies’ non-financial performance through employee empowerment, as employee empowerment positively affects companies’ non-financial performance.*

2.8.3 PMSs, Employee Engagement, and Organisations’ Performance

Generally, it is believed that there is a connection between employee engagement and business results (Harter et al., 2002), and Saks (2006) further discussed that the reason behind the recent popularity of employee engagement is due to the conviction that it has positive consequences for organisations. Several studies presumed a direct relationship between higher levels of employee engagement and firms’ performance (Chiva & Alegre, 2009; Tregaskis et al., 2013). Furthermore, Saks and Gruman (2011) noted that to achieve effective job performance, there is an important need for engagement.

According to Anitha (2014), “employee engagement is a good tool to help every organisation to strive to gain a competitive advantage over the others”, moreover, Baumruk (2004) emphasised that the most powerful factor in measuring organisations’ strength is employee engagement. There is a positive relationship between employee engagement and all of the productivity, profitability, employee retention, safety, and customer satisfaction. Furthermore,

"employee engagement is found to be higher in double-digit growth companies" (Markos & Sridevi, 2010).

The effects of employee engagement on performance are highly recognised (Alomari, 2023; Kurniawati & Raharja, 2022), however, the way management and measurement practices affect employee engagement is usually neglected (Smith & Bititci, 2017). Researchers such as Bourne et al. (2013), Smith and Bititci (2017) and Sorenson (2013) stress the importance of enhancing the practices of PMSs and performance management in order to improve employee engagement, which in turn will improve performance ultimately. Sorenson (2013) further emphasised that "concentrating on employee engagement can help companies withstand, and possibly even thrive, in tough economic times". Based on their finding, Bourne et al. (2013) argue that employee engagement results in better performance and that PMSs, in case implemented correctly, will act as a communication and guiding mechanism that can direct the employees' efforts toward achieving better performance.

Based on what has been discussed, the following hypotheses have been formulated:

Hypothesis 8 (H8): *CPMSs have a positive indirect effect on companies' overall performance through work engagement, as work engagement positively affects companies' overall performance.*

Hypothesis 9 (H9): *CPMSs have a positive indirect effect on companies' financial performance through work engagement, as work engagement positively affects companies' financial performance.*

Hypothesis 10 (H10): *CPMSs have a positive indirect effect on companies' non- financial performance through work engagement, as work engagement positively affects companies' non-financial performance.*

3. MATERIALS AND METHODS

3.1 Introduction

As discussed earlier, the aim of this research is to find the impacts of adopting PMSs on manufacturing companies' performance and effectiveness and, moreover, to find the possible mediating effects of employee engagement and empowerment in this relationship, in addition to exploring the factors most hindering the achievement of successful PMSs. In this part, a discussion of the research design, materials, methods, and strategies used to collect data, in addition to the methods used for the analysis of data, is provided.

3.2 Approach to Theory Development

According to Saunders et al. (2019), there are three approaches to theory development: abductive, deductive, and inductive. In this research, the deductive approach is adopted. This approach is considered dominant in natural sciences, and it usually starts by developing a theory by reviewing the literature, and then a research strategy is designed to test that theory. The deductive reasoning approach used in this research may be best explained by Figure 5.

Figure 5: The Deductive Reasoning Approach Used in This Research

Source: Adapted version from Sekaran and Bougie (2016)

Deductive reasoning is an approach that moves from general to specific. The first step of any scientific research is to define the aims and questions of the research. In the deductive approach, the next step is the hypothesis development. In this step, hypotheses are generated using secondary data, which help address factors and variables affecting the problem and provide support for the developed theoretical framework. Subsequently, tests are conducted to determine whether the formulated hypotheses should be accepted or rejected, relying on the interpretations drawn from the results of the data analysis phase. According to Popper (2005), a scientific hypothesis must be both testable and falsifiable, whereas falsifiable refers to the possibility of disproving the hypothesis in future research.

3.3 Research Methodology of the Study

Numerous methods for social sciences research are available. Quantitative research, according to Bell et al. (2019), is a "research that covers approaches which attempt to measure and/or

count social phenomena and the relationships between them. This approach has long been the dominant one for conducting business research and remains so, in spite of qualitative research becoming more influential since the 1980s". On the other hand, they view qualitative research as "a research strategy that usually emphasises words rather than numbers in the collection and analysis of data". This strategy is used to assist researchers in explaining and understanding how people behave and why they behave so, as well as to understand the cultural and social context (Myers, 2020). In this research, quantitative methods are employed.

Generally, there are two kinds of collected data: primary and secondary. Data collected by researchers from their main sources for the purpose of examining the specific research problem are the primary data. With every primary data collection, the existing social knowledge store has added new data (Hox & Boeije, 2005). On the contrary, data that have been gathered by others for purposes other than the current research and are obtained from secondary sources are known as secondary data (Rabianski, 2003). In this research, both primary and secondary data were collected. The survey strategy was chosen for the purpose of collecting the primary data through questionnaires. Secondary data were collected from various scientific references, official reports, documents, and websites. The current research methodology followed in this study is represented in Figure 6 below.

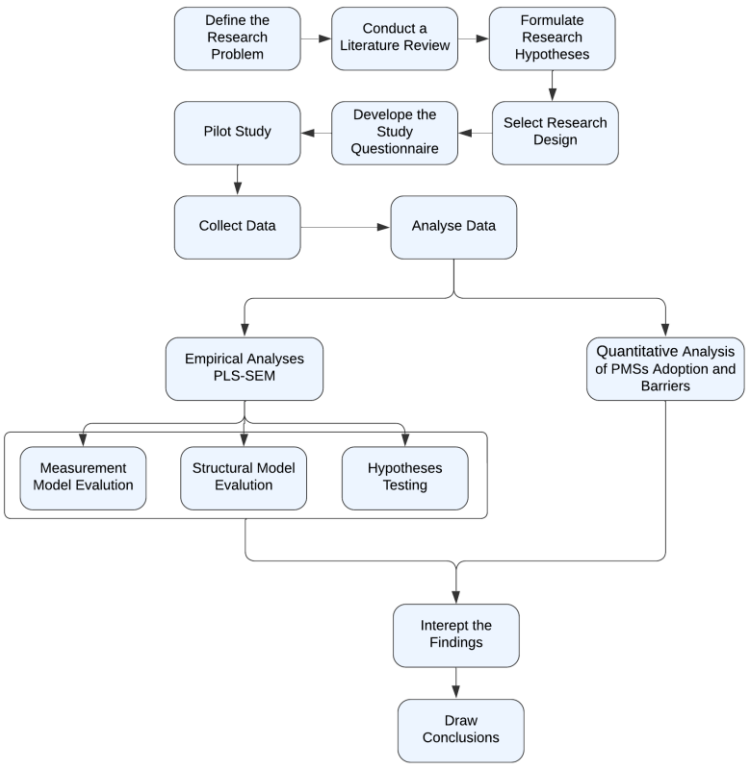

Figure 6: Methodology of the Study

Source: Author's own development (2024)

3.4 The Quantitative Research Approach

This study aims to investigate and explain the relationships between PMSs, financial performance, non-financial performance, and the effectiveness of manufacturing companies in Jordan. Furthermore, it examines whether empowerment and employee engagement mediate these relationships. To achieve these aims, a quantitative study is conducted to provide empirical evidence that explains these relationships.

This research is causal; it aims to identify the cause-and-effect variables as well as examine the relationship between them. The study took place in standard settings, specifically within the natural corporate environment. The primary data was collected by questionnaires adopted from previous studies and modified to suit the current study. The research mainly involves top managers of manufacturing companies in Jordan.

This research uses a cross-sectional time horizon; it investigates the relationships between the various variables within the context of the manufacturing companies in a specific period of time. The majority of the questions are closed-ended. Some open-ended questions and blanks were provided to give respondents the freedom to elaborate their points of view if needed.

The questionnaires were paper-based, written in English and Arabic, and sent to the targeted population. To increase the response rate, they were filled anonymously. The questionnaires were handled in person to the general directors' assistants of the two second largest industrial estates. For the rest of the estates, the main office of the Jordan Industrial Estates Company (JIEC) made arrangements to deliver the questionnaires. Furthermore, a visit was paid later to the largest industrial estate where I was able to handle the questionnaires personally for several companies and had the chance to discuss the questionnaire and its content with several managers of the companies there. The data collection process took almost four months, from August 2023 to November 2023.

3.5 The Study Population

All data provided in this section is based on information collected from the official website of the JIEC (JIEC, n.d.).

As mentioned earlier, this study focuses on the companies located in the Jordanian Industrial Estates. JIEC is the legal successor to the Jordan Industrial Estate Corporation, it was established in 1980 to contribute to the national economy. Over its 25-year history, JIEC has played a vital role in promoting Jordan as an attractive investment destination by collaborating closely with private sector institutions. Significant developmental and strategic milestones have

been achieved, such as earning ISO certification, the King Abdullah II Award for Excellence, and various international and national honours.

JIEC's responsibilities include establishing, developing, and managing industrial estates across all Jordanian governorates. They provide basic services like water, electricity, roads, and telecommunications, along with essential support services such as banking, customs centres, health, and security services. JIEC's support industrial companies in achieving success, meeting objectives, and expanding both horizontally and vertically.

There are seven existing industrial estates currently in Jordan that are under the full responsibility of JIEC. Abdullah II Ibn Al-Hussein Industrial Estate (AIE), founded in 1984 and located in Sahab City, stands as the largest Industrial Estate in the Kingdom, with a substantial total area of 253 hectares. AIE provides employment opportunities for more than 13,671 workers. The cumulative investment in these industries has reached a significant 1360 million euros. Al-Hassan Industrial Estate (HIE), established in 1991 and located in Irbid Governorate, HIE holds a unique status as it was designated as the first Qualified Industrial Zone (QIZ) in the world in 1998. QIZs are regions where certain goods can be produced and exported to the United States duty-free, subject to specific conditions. Covering a total area of 117.8 hectares, it stands as the largest QIZ in the Kingdom, playing a pivotal role in facilitating international trade. HIE accommodates more than 154 industries, boasting a total invested capital exceeding 640 million euros. These industries contribute significantly to the local economy by creating job opportunities, with a total of 36,509 job positions generated. Al Muwaqar Industrial Estate (MIE), strategically located along the international highway linking Jordan with Iraq and Saudi Arabia, and covering a substantial overall area of 250 hectares, MIE is equipped with infrastructure and services designed to meet the several needs of investors. The estate is divided into various-sized plots, including industries such as electronics, medical, food and beverage, electrical, engineering, cardboard, textile, metal, wood, and chemical. Al-Hussein Bin Abdullah II Industrial Estate (HUIE), located in Al-Karak Governorate, it has a strategic location place it 20 kilometres from the Amman-Aqaba highway, a vital route connecting the capital with Aqaba city and provides a crucial link between Jordan, the Gulf States, and Egypt. HUIE covers a total area of 186.6 hectares, with phase one developed on an area of 57.8 hectares. Currently, there are 34 operational companies at HUIE, collectively contributing an invested capital of more than 62 million Euro and employing 4580 workers. Madaba Industrial Estate, it offers developed industrial land and is set to provide ready-made industrial buildings within the estate, totalling an area of 17,000 square meters. These facilities are supported by industrial infrastructure. The targeted industries for Madaba Industrial Estate

include the technical, pharmaceutical, and light medical sectors. This strategic focus aligns with the estate's goal of attracting specific industries that contribute to the region's economic development and technological advancement. Salt Industrial Estate is strategically designed to accommodate a diverse range of industries, including technical, engineering, pharmaceutical, chemical, plastic, food, textile, paper, printing, packaging, services, logistics, and labour accommodation. Tafilah Industrial Estate is located on the road connecting Tafilah to the Amman-Aqaba Road. Tafilah Industrial Estate is well-suited for various industrial sectors, with a focus on food, pharmaceutical, engineering, metallurgy, chemical, paper, packaging, and light industries. Each industrial estates' location on the map can be found in Appendix 1.

3.6 Sample Frame and Sample Size

Sampling and the decision about which companies to include in the sample size are crucial for the research method (Maxwell, 2012). We had pre-identified a specific criterion for conducting the study on medium- and large-sized companies. This criterion has been set to increase the possibility that CPMS has already been implemented in such companies. An enterprise is classified as a medium-sized if it has between 50 and 249 employees, whereas large enterprises employ 250 or more employees (European Commission, 2005).

Table 6 below summarises the total number of registered companies in each industrial estate and the number of medium and large-sized companies.

Table 6: Number of Registered Companies in the Jordanian Industrial Estates

Industrial Estate	**Total number of registered manufacturing companies**	**Manufacturers with headcount of ≥ 50**
AIE	410	73
HIE	119	30
MIE	96	16
Madaba	31	6
Salt	30	4
Tafilah	17	4
HUIE	43	4
Total	**746**	**137**

Source: JIEC documents (2023)

3.7 Research Instruments

The questionnaire consisted of eight sections. The first section, the introduction, introduced the questionnaire topic, its aim, and assuring the respondents' privacy. The second section intended to collect general information about the respondents and their representative organisations. The general information includes questions about the organisation's size, business field, share of

export, respondents' years of working experience and job position, and whether the organisation uses any PMSs or not to direct the respondents through the questionnaire depending on their answers. Starting from the third section, the questionnaire covered more detailed questions about the research topics. Section three asked the respondents to report the reason(s) for their adoption of PMSs. The following section, section four, covered questions regarding the comprehensiveness level of the systems used. Section five asked questions to measure the effectiveness level of the organisation. Moving forward to section six, the respondents were asked to indicate whether they faced any barriers that affected the successful implementation of the PMSs and to rate, on a 7-point scale, the extent to which some barriers were faced. In section seven, the respondents were asked to rate their organisation's performance compared to their competitors. Finally, section eight collected information about the level of employees' engagement and empowerment in the organisation. The entire questionnaire used a 7-point Likert scale. The next section provides a discussion of each construct used in this study, its items, and labelling as they were employed in SmartPLS, the software utilised in this research. The full questionnaire can be found at the end of the dissertation in Appendix 2.

3.7.1 PMSs Comprehensiveness Level

To measure the comprehensiveness level of the PMSs, nine items were adapted from Chenhall (2005) and Hall (2008), to suit the current research objectives. Four items (CPMS 2, 4, 6, 8) were developed by Chenhall (2005) to measure the level of integration of the used measures with organisational strategy and across the value chain. The remaining five items (CPMS 1, 3, 5, 7, 9) were developed by Hall (2008) to measure the extent to which the used PMSs deliver various performance information covering important parts of the organisation's operations. The questions started as "*Please rate the extent to which your PMS…*". A 7-point Likert scale (1: not at all; 7: to a great extent) was used. Table 7 represents the CPMS construct along with its corresponding item labels as designated in SmartPLS.

Table 7: CPMS Construct's Items and Labelling

Construct (Labelling)	
Item	
Comprehensive PMS (CPMS)	
CPMS1	The extent to which your PMS provides a broad range of performance information about different areas of the organisation field of work.
CPMS2	The extent to which your PMS is produced in a fully documented form, which provides a record for evaluating performance.
CPMS3	The extent to which your PMS provides a diverse set of measures related to the key performance areas of the organisation field of work.
CPMS4	The extent to which your PMS provides consistent and mutually reinforcing links between the current operating performance and the long-term strategies of the organisation (how the current operating performance supports the achievement of the organisation's long-term strategies, and how the long-term strategies influence and guide the short-term decisions and actions).
CPMS5	The extent to which your PMS provides information on different dimensions (different aspects or perspectives of the organisation's performance that are relevant to its success; financial and non-financial) of the organisation's performance.
CPMS6	The extent to which your PMS links together the activities of different business units to the achievement of the goals and objectives of the organisation.
CPMS7	The extent to which your PMS provides a variety of information about important aspects of the organisation different business unit's operations.
CPMS8	The extent to which your PMS shows how the activities of a specific business unit affect the activities of other units within the organisation.
CPMS9	The extent to which your PMS provides a range of measures that cover the critical areas of the different business unit's operations.

Source: Author's own compilation (2023)

3.7.2 Organisational Effectiveness

To measure the organisational effectiveness, respondents had to rate the extent to which their organisation has achieved 13 benefits after implementing the PMSs, "*Please rate the extent to which your organisation has attained the following benefits after implementing the PMS".* The scale was adapted from Lucianetti et al. (2019), it used a 7-point Likert scale (1: completely

disagree; 7: completely agree). The authors conducted a principal component analysis (PCA) and extracted three meaningful factors. Aligning, the items of this factor (five items) reflect how the organisation adapt its life to its intended strategy. The second factor, exploiting, the five items of the factor reflects how organisations maximise and use their existing resources and capabilities to exploit the intended strategy. The third factor is mobilising, which includes three items that reflect the impact of PMSs on fostering enhanced communication and motivation and achieving a consensus around the organisation's vision and strategy. Table 8 illustrates the organisational effectiveness construct along with its corresponding dimensions and their item labelling as designated in SmartPLS.

Table 8: Organisational Effectiveness Construct's Items and Labelling

Construct (Labelling)	
Item	
Organisational Effectiveness (ORGEFFECT)	
Aligning (AL)	
AL1	Translating strategy into operational goals
AL2	Aligning the organisation with the strategy
AL3	Making strategy everyone's daily job
AL4	Improving employees' knowledge of how they are evaluated
AL5	Making the linkages between short and long-term objectives clearer
Exploiting (EX)	
EX1	Spending more time and effort on strategic-related issues
EX2	Adopting new performance measures
EX3	Explicating cause-and-effect relationships**
EX4	Increasing the participation of top management in the formalisation of the strategy
EX5	Linking performance measures to corporate strategy
Mobilising (MO)	
MO1	Improving internal communication among people
MO2	Motivating human resources (in comprehending their role within the organisation)
MO3	Building consensus around the organisation's vision and strategy

Source: Author's own compilation (2023)

3.7.3 Organisational Performance

Organisational performance was measured in two dimensions, financial and non-financial performance. A total of 16 items were used to measure the organisational performance in the two dimensions. The BSC framework identified the performance measures representing financial and non-financial performance. These measures are considered generic measures,

commonly used by manufacturing firms. In total, 11 items of the scale were compiled from previous studies (Barroso et al., 2016; Hoque et al., 2001; Santos & Brito, 2012), and the remaining five items were self-constructed. The added items were compiled from the literature, consultations with some manufacturing sector experts, and the pilot study results. These items are customer growth, level of errors, response time to business issues, overall equipment effectiveness (OEE), and the level of IT used. The respondents were asked, *"How would you rate your performance relative to your competitors in terms of each of the following?"*, on a scale from 1: clearly worse to 7: clearly better. The organisational performance construct with its corresponding dimensions and their item labelling as designated in SmartPLS are shown in Table 9.

Table 9: Organisational Performance Construct's Items and Labelling

Construct (Labelling)	
Item	
Organisational Performance (ORGPER)	
Financial Performance (FIN)	
FIN1	Operating income
FIN2	Sales growth
FIN3	Return on Investment (ROI)
FIN4	Net cash flows
Non-financial Performance (NON-FIN)	
NONFIN1	Market share
NONFIN2	Number of complaints
NONFIN3	Customer satisfaction
NONFIN4	Customer growth
NONFIN5	Manufacturing lead time
NONFIN6	Level of errors
NONFIN7	Response time to business issues
NONFIN8	OEE
NONFIN9	Employee satisfaction
NONFIN10	Training per employee
NONFIN11	Level of IT used
NONFIN12	Employee Turnover

Source: Author's own compilation (2023)

3.7.4 Employee Empowerment

The structural (behavioural) employee empowerment was measured using four items from Baird et al. (2018), who developed an adaptive scale from del Val and Lloyd's (2003) original measurement. The questions measured empowerment by the level of formalisation, collaboration, degree of influence, and directness. Formalisation measures the degree to which employees' participation is ensured through existing official channels and rules. In contrast, collaboration reflects the degree to which lower-level employees are involved in the decision-making process. The degree of influence, on the other hand, reflects the degree of authority lower-level employees have in making decisions. Directness refers to whether the employees can contribute directly to the decisions or must use intermediates. Respondents were asked *"To what extent do...",* for each of the items on a scale from 1: not at all to 7: to a great extent. Table 10 represents the employee empowerment construct, its items, and the labelling as designated in SmartPLS.

Table 10: Employee Empowerment Construct's Items and Labelling

Construct (Labelling)	
Item	
Employee Empowerment (EMPW)	
EMPW1	To what extent do the employees in your organisation have a high level of collaboration/involvement in decision-making
EMPW2	To what extent do official channels or certain norms or rules to guarantee their participation in the decision-making process exist in your organisation
EMPW3	To what extent do the employees in your organisation contribute directly to the decision-making process, rather than through intermediaries (e.g. superiors)
EMPW4	To what extent do the employees in your organisation have authority/power/influence to make and implement decisions about tasks

Source: Author's own compilation (2023)

3.7.5 Employee Engagement

For work engagement, an adapted version of the Utrecht work engagement scale shortened version (Schaufeli et al., 2003) was used to measure the construct. The shortened version consists of nine items measuring employee engagement in terms of absorption, dedication, and vigour. Absorption refers to one's concentration on one's work, feeling like time passes quickly,

and finding it hard to detach oneself from the work. Dedication reflects the level of involvement in their work and having a sense of significance, enthusiasm, and inspiration. Vigour reflects the high levels of energy and mental resilience they have when working and the willingness to invest effort in their work. The phrasing of the items was modified to suit the current research objective, and the respondents were asked to report *"How would you rate the extent to which people at your organisation..."*, for each of the scale items on a scale from 1: never to 7: always. Work engagement construct along with its items and their labelling are illustrated in Table 11.

Table 11: Work Engagement Construct's Items and Labelling

Construct (Labelling)	
Item	
Work Engagement (ENG)	
ENG1	Feel bursting with energy
ENG2	Feel themselves strong and vigorous at their job
ENG3	Feel like going to work when they get up in the morning
ENG4	Are enthusiastic about their job
ENG5	Feel inspired by their job
ENG6	Are proud of the work they do
ENG7	Feel happy when they are working intensely
ENG8	Are immersed in their work
ENG9	Get carried away when they are working

Source: Author's own compilation (2023)

3.8 Pilot Study

A pilot study is a smaller scale study usually conducted at the early stages of research; it allows researchers to detect any potential issues before conducting the full-scale study. Furthermore, it provides them with valuable insights to make the necessary adjustments that will ensure the success of the main study.

The content validity of the questionnaire was assessed prior to the pilot study. For this purpose, two academics and three professionals working in the manufacturing industry have reviewed the questionnaire and its content validity. As a result, rewording of some of the questions was suggested to improve the clarity of the questionnaire and the understanding of its questions, in addition to suggesting adding some items to measure the organisational performance.

In the current study, the pilot sample consisted of 25 questionnaires collected from top managers in Jordanian manufacturing companies. The main aim was to test the questionnaire's

reliability. These companies are not part of the main study population, and the responses were used only to assess the statistical reliability of the constructs.

Several methods can be used to measure a construct's reliability, and Cronbach's α is one of the most common methods used for that purpose. The SPSS software version 29 was used to assess the instrument internal consistency. For the construct to be considered reliable, Cronbach's α should be 0.7 or higher (Hair et al., 2010). Table 12 shows that all constructs' Cronbach's α values are higher than the 0.7 threshold, ranging between 0.795 and 0.935; thus, the research constructs are reliable.

Table 12: Reliability Analysis of the Pilot Study

Construct	Dimension	Number of items	Cronbach's α
CPMSs	-	9	0.909
Organisational Effectiveness	Aligning	5	0.796
	Exploiting	5	0.886
	Mobilising	3	0.833
Organisational Performance	Financial	4	0.826
	Non-financial	12	0.883
Empowerment	-	4	0.935
Engagement	-	9	0.795

Source: Author's own calculations (2023)

3.9 Data Analysis

In this part, all statistical tools used to analyse the data and test the hypotheses of the study are explained here. The SmartPLS 4.1 software is used for the purpose of analysing the data empirically and testing the proposed hypotheses.

3.9.1 Structural Equation Modelling (SEM)

SEM is considered one of the most powerful statistical tools in the field of social research. There are several advantages to SEM, for instance, "it enables researchers to simultaneously model and estimate complex relationships among multiple dependent and independent variables" (Hair et al., 2021). SmartPLS is considered one of the most popular software used for SEM, and it is especially suitable for complex and advanced models. Partial Least Squares Structural Equation Modelling (PLS-SEM) is a variance-based approach to SEM, and it differs from the covariance-based SEM (CB-SEM) in both the estimation procedure and the model's

assumption (Hair et al., 2022). PLS-SEM is particularly useful when the sample size is small, when the researcher has to deal with complex models incorporating many indicators and relationships, or when the data distribution is not normal as PLS-SEM makes no distributional assumptions (Hair et al., 2022).

PLS-SEM consists of two models, the measurement and structural models, shown in Figure 7, and are evaluated separately. The measurement model shows the relationships between the latent constructs and their observed indicators, while the structural model depicts the relationships between the latent constructs themselves (Hair et al., 2022).

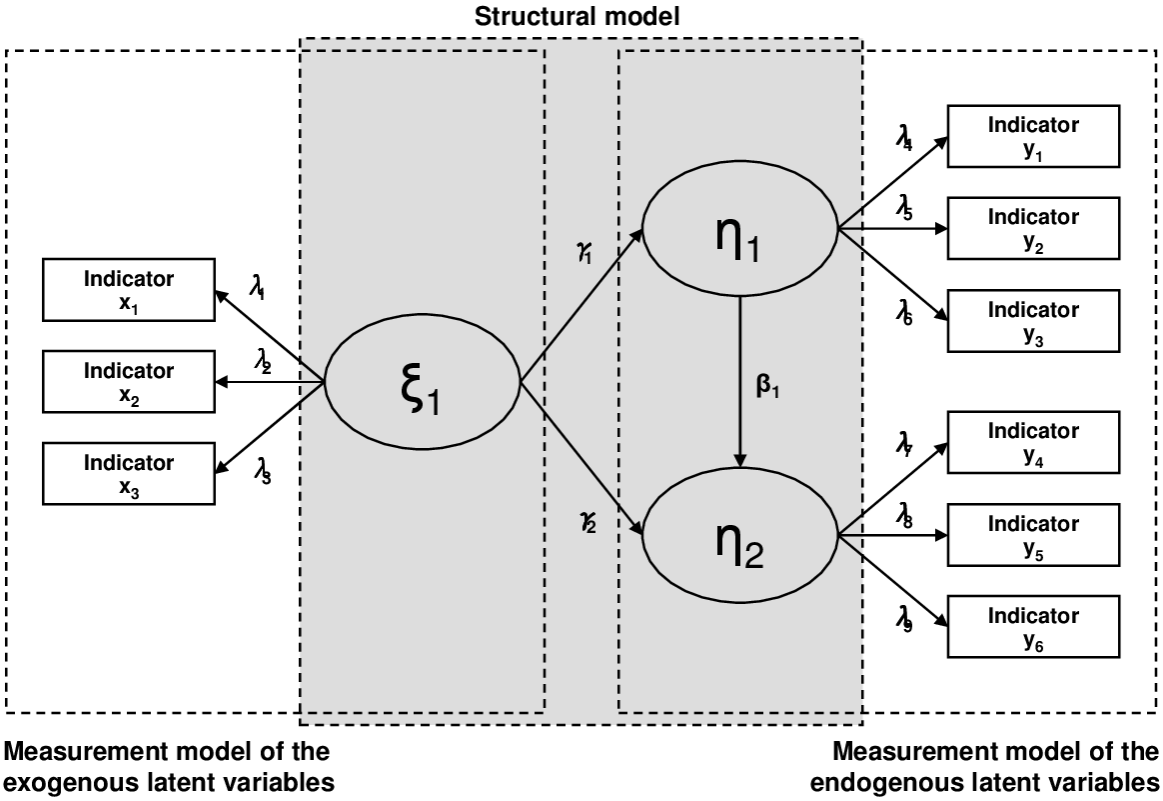

Figure 7: Measurement and Structural Models of SEM

Source: Urbach and Ahlemann (2010)

Measurement models can be categorised as either reflective or formative. Reflective measurement models are commonly employed in social science research. In reflective models, the indicators reflect the effect of the underlying construct, with the direction of the effect being from the construct to its indicators. It is expected to observe a high correlation between these variables, and the indicators measuring a specific construct are interchangeable. Therefore, if one of the variables is removed, the construct's meaning will not change, provided that the reliability is acceptable (Hair et al., 2017).

On the other hand, in formative measurement models, the direction of the effect is from the indicators to the construct; indicators causing the construct. In this model, a correlation among indicators should not exist, and furthermore, the indicators of the construct are not interchangeable (Hair et al., 2022).

Several methods exist in the literature to determine the required minimum sample size for PLS-SEM. The 10 times rule is the most widely used, and several variations of this rule are available. The most common is that the minimum sample size should be ten times greater than the maximum number of arrows pointing at a construct anywhere in the model (Goodhue et al., 2012). In our model, the maximum number of arrows pointing at a construct is three, therefore, according to this rule, the minimum sample size should be 30.

According to Hair et al. (2014), this rule provides a rough guideline and can be considered liberal to a certain extent. Thus, they suggested an alternative method. It is referred to as the minimum R^2 method (Kock & Hadaya, 2018) and is built on the power tables of PLS regression (Cohen, 1988). Three elements are used to determine the minimum sample size, the maximum number of arrows pointing at a construct, the significance level, and the minimum value of the R^2 in the model.

Table 13 displays a reduced version of the original table presented by Hair et al. (2014). This reduced version focuses on a 5% significance and assumes 80% statistical power.

Table 13: Reduced Table for the Minimum R^2 Method

Maximum number of arrows pointing at a construct	Minimum R^2 in the model			
	.10	.25	.50	.75
2	110	52	33	26
3	124	59	38	30
4	137	65	42	33
5	147	70	45	36
6	157	75	48	39
7	166	80	51	41
8	174	84	54	44
9	181	88	57	46
10	189	91	59	48

Source: Koch and Hadaya (2018)

The maximum number of arrows pointing at a construct in our model is three, and the minimum R^2 is 0.296. Although the exact value of R^2 does not exist in the table, taking the closest value (0.25), the minimum sample size in this case is 59.

SmartPLS 4.1 was used for this study to conduct the PLS-SEM analysis due to its ability to handle small sample sizes and complex models effectively. The specific steps and tests for estimating both measurement and structural models and testing the hypotheses will be detailed in the following sub-sections.

3.9.2 Descriptive Analysis

Performing descriptive analysis stands as a crucial initial phase preceding statistical analyses. This type of analysis provides statistics that describe the main features of the collected data. It provides researchers with descriptive information, such as mean, standard deviation, and frequencies, which assist researchers in conducting further statistical analyses.

3.9.3 Measurement Model Evaluation

In regard to evaluating measurement models, the assessment is different between reflectively measured constructs and formatively measured ones, and each has its own concepts and, hence, different evaluation measures. Assessing reflective measurement models is based on the internal consistency reliability, convergent validity, indicator reliability, and discriminant validity. In contrast, the initial step required for formative measurement models prior to the data collection and the PLS path modelling estimation is to ensure content validity. Later, these models are assessed based on collinearity between indicators, convergent validity, and the significance and relevance of indicator weight. All constructs are measured reflectively in this study; therefore, only criteria used to evaluate reflective measurement models are introduced.

Indicator Reliability

In this step, the indicators' outer loadings are assessed. As the indicators' outer loadings on the construct are higher, this means that the indicators have much in common. The outer loading should be at least 0.7 (Hair et al., 2022). However, they further noted that researchers could get an outer loading of less than 0.7. If the indicator loading is less than 0.4, then it must be dropped from the model. Nevertheless, indicators with loadings ranging from 0.4 to 0.7 should be considered for removal only in cases when deleting the indicator results in a significant increase in the internal consistency reliability or convergent validity above the suggested threshold.

Internal Consistency Reliability

Internal consistency measures whether the items that make up the construct are all measuring the same underlying attribute (Pallant, 2010). Typically, Cronbach's α is used to assess the internal consistency reliability of the reflective measurement model. Cronbach's α measures

the extent to which the items or indicators within a latent construct are interrelated or correlated. Since it assumes equal outer loadings of all indicators on the construct and is somehow sensitive to the number of indicators in the scale, it can be considered a more conservative measure of internal consistency reliability. An alternative measure that considers the individual reliabilities of the indicators is composite reliability. Composite reliability (CR) is calculated by considering the standardised outer loadings of the indicators and the measurement error. Both Cronbach's α and the composite reliability are considered acceptable between 0.7 and 0.95 (Hair et al., 2019; Nitzl, 2016). Cronbach's α is considered conservative, and composite reliability may be considered too liberal; therefore, another reliability indicator was suggested to capture the value in between, which is viewed as the construct's true reliability. This indicator is known as the reliability coefficient (rho_A), also denoted as ρ_A.

Convergent Validity

Convergent validity shows how well an item correlates positively with the other items of the same construct. The measure commonly used to establish convergent validity is the average variance extracted (AVE), and a value of at least 0.5 must be achieved to indicate that the construct explains more than half of the variance of the items (Hair et al., 2022).

Discriminant Validity

Discriminant validity is used to represent the extent to which a construct is empirically different from other constructs in the model. Establishing discriminant validity indicates the uniqueness of the construct and that it captures distinct phenomena not represented by other constructs in the model.

To assess discriminant validity, three measures need to be checked. The first is the *Fornell-Larcker criterion*, researchers usually relied on this criterion to establish discriminant validity (Fornell & Larcker, 1981). A construct should share more variance with its associated indicators than with any other construct. *Cross-loadings* is the second measure, and it reflects the correlation between an indicator and the other constructs within the model. This criterion is met if the indicator's outer loading on the associated construct is higher than its correlation on other constructs. Henseler et al. (2015) have raised concerns regarding the efficacy of these scales. Therefore, they suggested a more accurate discriminant validity measure, the *heterotrait-monotrait (HTMT) ratio.* To establish discriminant validity, researchers usually compare the values to a pre-defined threshold. However, the threshold is debatable. They range from 0.85, the most conservative value, to a more liberal cut-off value of 0.9 or higher (Roemer et al., 2021).

3.9.4 Structural Model Evaluation

After evaluating and validating the measurement model, the next step is to evaluate the structural model. The evaluation of the structural model involves several steps, best displayed in Figure 8, and explained further in detail.

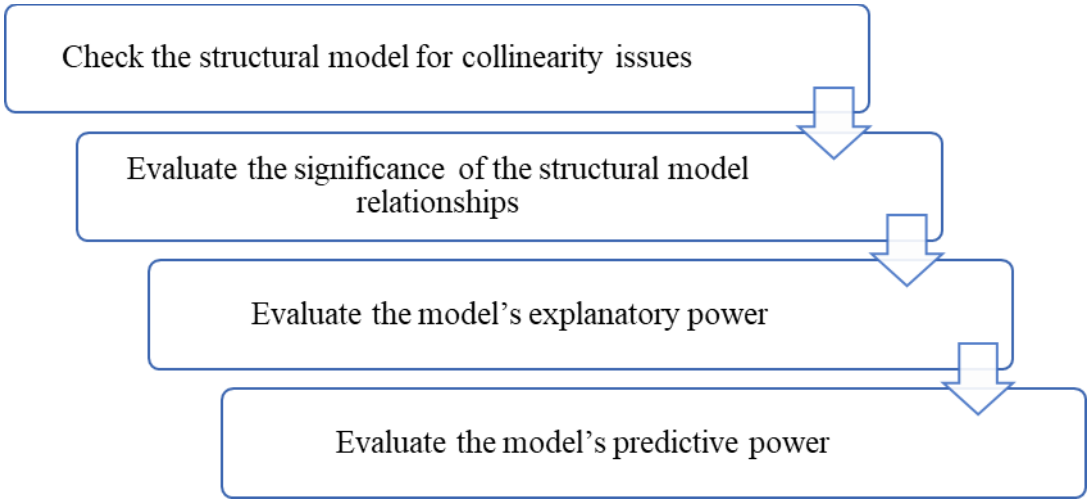

Figure 8: Steps for Evaluating the Structural Model

Source: Adapted version from Hair et al. (2022)

Step 1: Check for Collinearity Issues

The collinearity of indicators must be checked before further assessment of the structural model is made. High collinearity between predictor constructs may affect the path coefficients (Hair et al., 2022). The examination for collinearity involves using the variance inflation factor (VIF), and the threshold to ensure that the collinearity issue does not exist is for the values to be below 5, and preferably below 3 (Hair et al., 2019).

Step 2: Evaluating the Significance of the Structural Model Relationships

The path coefficients of the model are evaluated to assess the significance of the structural model relationships, and the previously developed hypotheses are tested. For this purpose, a routine called bootstrapping is applied to estimate the path coefficients between the constructs. This estimates the significance and strength of the relationships between the latent constructs. The *p* values are used to test the significance of the path coefficients. The *p* values are then compared to a pre-defined significance level. The commonly used significance levels are 1%, 5%, and 10%.

Step 3: Evaluating the Model's Explanatory Power

The coefficient of determination (R^2) stands as the prevailing measure commonly used to assess the explanatory power of a structural model. It demonstrates the extent to which the exogenous latent variables collectively explain the variance in the endogenous construct. This indicator enables researchers to understand the overall effectiveness of the structural model. R^2 values range between 0 and 1. According to Chin (1998), the following suggestions of the R^2 values were provided:

- $R^2 \geq 0.67$, is considered significant,
- $0.33 \leq R^2 < 0.67$, is considered moderate,
- $0.19 \leq R^2 < 0.33$, is considered weak, and
- $R^2 < 0.19$, is considered unacceptable.

In addition to R^2, researchers also utilise the effect size measure (f^2) to assess the practical significance of the constructs within the model. This measure provides valuable insight into the magnitude of the effects. It shows the change in endogenous construct R^2 if a specific predecessor construct is removed from the model. To determine the significance of f^2, Cohen (1998) recommended the following criteria,

- $f^2 \geq 0.35$, the effect size is large,
- $0.15 \leq f^2 < 0.35$, the effect size is medium,
- $0.02 \leq f^2 < 0.15$, the effect size is small, and
- $f^2 < 0.02$, there is no effect.

Step 4: Evaluating the Model's Predictive Power

Evaluating the model's out-of-sample power, known as the predictive power (Chin et al., 2020), is considered the final step in evaluating the structural model. This step is necessary to assess the power of the model to produce generalisable findings, which means assessing whether the results can be applied to other datasets that are not included in the current estimation process. To assess the model's out-of-sample predictive power, researchers commonly relied on Stone-Geisser's Q^2 statistic (Geisser, 1974). This measure blends explanatory and predictive power assessment (Sarstedt et al., 2017). Values must be greater than 0 to indicate a predictive relevance.

Another criterion used to assess the model's predictive power is the $PLS_{predict}$ (Shmueli et al., 2016). The procedure involves performing a k-fold cross-validation (k = number of subgroups) to evaluate the model's predictive power of the PLS paths (Hair et al., 2022). The $Q^2_{predict}$ values of more than 0 indicate that the current model predicts values better than a naïve benchmark (mean of indicators). Also, the root mean squared error (RMSE) values from PLS-SEM should be compared to the naïve benchmark linear regressions (LM). The prediction errors from the PLS should be smaller compared to the analysis with LM per item (Hair et al., 2022).

4. RESEARCH FINDINGS AND EVALUATION

This chapter seeks to represent the key findings of the research. In addition to testing the developed hypotheses, the research also aimed to collect information regarding some aspects of the PMSs. For example, the reason(s) behind the implementation of these systems as well as the degree to which certain factors have affected the implementation and success of these systems. Therefore, the research findings will be represented in two parts. The first part discusses the statistical analysis conducted for the purpose of testing the developed hypotheses, while the second part will provide further insights into the quantitative data obtained from the questionnaire. Before we delve into the two parts of the findings, the sample's characteristics and the descriptive analysis will be discussed.

4.1 Sample's Characteristics

Out of the 137 companies, five refused to take part due to privacy policy or the required long procedure to grant the board's agreement. In the end, 118 questionnaires were returned, and seven of them were disregarded due to missing data of more than 20% (Weiber & Mühlhaus, 2014) or straight-lining responses. The remaining 111 responses were retained for the study.

Table 14 presents the distribution of the highest level of education among respondents. The majority of respondents, totalling 55%, hold a bachelor's degree. This is followed by 33% of respondents who have a master's degree, while a smaller proportion, 7%, hold a Ph.D. degree. The remaining 5% consists of respondents with a college degree or a high school diploma.

Table 14: Respondents' Highest Level of Education

Highest level of education	Frequencies	Percentage (%)
High School	1	0.9%
Bachelor's	61	54.96%
Master's	37	33.33%
Ph.D.	8	7.21%
College Degree	4	3.60%
Total	111	100%

Source: Author's own calculations (2023)

For the years of working experience, represented in Table 15, the majority of respondents fall into the category of having more than 15 years of working experience, compromising 43% of the sample, followed by respondents with 11-15 years of working experience (29%).

Accounting for 20% of the sample, respondents with 6-10 years of working experience, while 8% of the sample consists of those who have 0-5 years of working experience.

Table 15: Respondents' Years of Working Experience

Years of working experience	Frequencies	Percentage (%)
0-5	9	8.11%
6-10	22	19.82%
11-15	32	28.83%
> 15	48	43.24%
Total	111	100%

Source: Author's own calculations (2023)

Table 16 displays the distribution of respondents according to their job positions. The most common job position reported is managing director/department manager, accounting for 26% of the sample. Following closely behind are the financial manager (17%) and general manager/chief executive officer (16%). Other notable positions include human resources professional/manager (13%), vice general director (9%), and operation manager (7%). The engineer, strategic manager, safety and health supervisor, managing partner, and technical manager each represent smaller percentages of the sample, ranging from 5% to 1%.

Table 16: Respondents' Job Position

Job position	Frequencies	Percentage (%)
Managing Director/ Department Manager	29	26.13%
Financial Manager	19	17.12%
General Manager/ Chief Executive Officer	18	16.22%
Human Resources Professional/ Manager	14	12.61%
Vice General Director	10	9.0%
Operation Manager	8	7.21%
Engineer	6	5.41%
Strategic Manager	3	2.70%
Safety and Health Supervisor	2	1.80%
Managing Partner	1	0.90%
Technical Manager	1	0.90%
Total	111	100%

Source: Author's own calculations (2023)

Table 17 illustrates the distribution of companies based on their ownership structure. The majority of companies, comprising 50% of the total, are entirely domestically owned. Close behind are companies that are 100% foreign-owned, constituting 40% of the sample. A small proportion of companies are classified as having a majority foreign ownership (5%) or a joint ownership structure of 50% domestic and 50% foreign ownership (4%). Additionally, a minority of companies are characterised by a majority domestic ownership by non-state entities (3%), while no companies in the sample are reported to have a majority state ownership.

Table 17: Companies' Ownership Structure

Ownership structure	Frequencies	Percentage (%)
100% domestically owned	55	49.55%
100% foreign owned	44	39.64%
Majority foreign owned	5	4.51%
50% domestically owned and 50% foreign owned	4	3.60%
Majority domestically owned (non-state)	3	2.70%
Majority state owned	0	0.00%
Total	111	100%

Source: Author's own calculations (2023)

The distribution of companies based on the share of exports in their 2022 sales revenue is represented in Table 18. The majority of companies, comprising 50% of the sample, reported a medium export activity level, with exports constituting between 26% and 50% of their sales revenue. Significant export activity, accounting for 31% of respondents, was observed among companies where exports represented 51% to 100% of their sales revenue. Additionally, a notable portion of companies reported low export activity (14%), where exports comprised between 0% and 25% of their sales revenue. A small proportion of companies (5%) indicated no export activity, with exports contributing to 0% of their sales revenue.

Table 18: Companies' Share of Export in the 2022 Revenue

Share of exports in the 2022 sales revenue	Frequencies	Percentage (%)
0%: No export activity	6	5.41%
(0-25) %: Low export activity	15	13.51%
(26-50) %: Medium export activity	56	50.45%
(51-100) %: Significant export activity	34	30.63%
Total	111	100%

Source: Author's own calculations (2023)

Table 19 below shows the distribution of companies according to their annual work unit size (number of employees). The majority of companies, constituting 69% of the sample, are medium-sized companies falling within the range of 50 to 249 annual work units. In

comparison, the remaining 31% of companies are large in size, having an annual work unit size of 250 or more.

Table 19: Companies' Annual Work Unit

Annual work unit	Frequencies	Percentage (%)
50-249	77	69.37%
≥ 250	34	30.63%
Total	111	100%

Source: Author's own calculations (2023)

The distribution of companies across various industry sectors, shown in Table 20, reveals a diverse landscape within the sample. The food industry sector encompasses nearly a quarter (24%) of the companies in our sample. Following closely behind, the textile industry sector accounts for a significant portion, approximately 20% of the total. Other sectors constitute fair percentages of the sample, including packaging industries (13%), engineering industries (metal & electric) (11%), and plastic and rubber industries (10%). Additionally, the pharmaceutical, chemical, wood and furniture industries and construction and building materials industries sectors represent smaller proportions of the sample, ranging from 9% to 2% each.

Table 20: Companies' Field of Industry

Industry	Frequencies	Percentage (%)
Food Industries	27	24.32%
Textile Industries	22	19.82%
Packaging Industries	14	12.61%
Engineering Industries (Metal & Electric)	12	10.81%
Plastic Industries	11	9.91%
Pharmaceutical Industries	10	9.01%
Chemical Industries	8	7.21%
Wood and Furniture Industries	5	4.51%
Construction and Building Materials Industries	2	1.80%
Total	111	100%

Source: Author's own calculations (2023)

Table 21 shows the frequencies of type of PMSs used in the companies based on the respondents' reporting. Almost 79% of the companies reported that their PMSs contains different performance perspectives incorporating financial and non-financial indicators, approximately 12% reported that it contains only financial indicators, 7% have their own measurement system, and 2% reported having other PMSs.

Table 21: Type of PMSs used by Companies

The type of PMSs used	Frequencies	Percentage (%)
The PMS contains different performance perspectives including financial and non-financial indicators	88	79.28%
The PMS contains only financial indicators	13	11.71%
We have our own measurement system	8	7.21%
Other	2	1.8%
Total	111	100%

Source: Author's own calculations (2023)

4.2 Descriptive Analysis

The initial analysis was conducted at the item level. Descriptive statistics were examined to identify any abnormalities in the data. The responses for most items covered the complete scale range of 1–7, indicating a diverse range of opinions and experiences. However, five items (specifically, items CPMS2, CPMS3, CPMS4, CPMS9 and NONFIN5) exhibited a narrower scale width, ranging from 2 to 7. Despite this, the standard deviations (SD) and mean widths for the majority of items did not indicate any significant abnormalities. The descriptive analysis is shown in Table 22.

Table 22: Descriptive Analysis

Item	Mean	Median	Observed Min	Observed Max	SD
CPMS1	4.631	5	1	7	1.665
CPMS2	5.18	5	2	7	1.447
CPMS3	4.55	5	2	7	1.32
CPMS4	4.586	5	2	7	1.305
CPMS5	4.523	5	1	7	1.518
CPMS6	4.577	5	1	7	1.647
CPMS7	4.414	5	1	7	1.372
CPMS8	4.36	4	1	7	1.5
CPMS9	5.207	5	2	7	1.281
AL1	4.369	4	1	7	1.5
AL2	4.378	4	1	7	1.6
AL3	4.432	5	1	7	1.68
AL4	4.162	4	1	7	1.522
AL5	4.072	4	1	7	1.523
EX1	4.252	4	1	7	1.492
EX2	3.811	4	1	7	1.625
EX3	3.27	3	1	7	1.571

Item	Mean	Median	Observed Min	Observed Max	SD
EX4	4.541	5	1	7	1.4
EX5	4.432	5	1	7	1.386
MO1	4.514	5	1	7	1.676
MO2	4.27	4	1	7	1.407
MO3	4.423	4	1	7	1.504
FIN1	4.339	4	1	7	1.491
FIN2	4.019	4	1	7	1.587
FIN3	3.86	4	1	7	1.519
FIN4	4.139	4	1	7	1.713
NONFIN1	3.883	4	1	7	1.592
NONFIN2	4.111	4	1	7	1.442
NONFIN3	4.63	5	1	7	1.67
NONFIN4	4.045	4	1	7	1.765
NONFIN5	4.394	4	2	7	1.313
NONFIN6	4.075	4	1	7	1.451
NONFIN7	4.832	5	1	7	1.732
NONFIN8	4.955	5	1	7	1.371
NONFIN9	4.333	4	1	7	1.503
NONFIN10	4.881	5	1	7	1.601
NONFIN11	4.901	5	1	7	1.627
NONFIN12	4.103	4	1	7	1.576
EMPW1	4.18	4	1	7	1.606
EMPW2	4.324	4	1	7	1.672
EMPW3	4.045	4	1	7	1.662
EMPW4	4.252	4	1	7	1.929
ENG1	3.288	3	1	7	1.539
ENG2	3.861	4	1	7	1.443
ENG3	3.009	3	1	6	1.319
ENG4	4.082	4	1	7	1.466
ENG5	4.126	4	1	7	1.402
ENG6	4.373	4	1	7	1.566
ENG7	4.073	4	1	7	1.506
ENG8	4.144	4	1	7	1.553
ENG9	3.036	3	1	7	1.47

Source: Author's own calculations (2023)

4.3 Part One: Empirical Analysis

In this section, the empirical results of the research are demonstrated. The results are discussed in two sub-sections, the first discusses the evaluation of the measurement model, and the second discusses the evaluation of the structural model.

4.3.1 Evaluating the Measurement Model

Indicator Reliability

The indicator reliability is assessed based on the outer loadings, which should be 0.70 or higher. Appendix 3 shows that all items, except CPMSs9 and ENG4-6, have outer loadings of more than 0.7. As mentioned in section 3.9.3, items having outer loadings between 0.4 and 0.7 should be removed only if removing them would increase the convergent validity and internal consistency reliability significantly. Thus, each item was removed individually to assess the effect of their removal. All items were eventually retained in the model, as each item's removal did not lead to any significant increase. Figure 9 shows the research model and each construct with its items and outer loadings.

Internal Consistency Reliability and Convergent Validity

Cronbach's α, CR, and rho_A were checked to assess the internal consistency reliability. Table 23 shows that all values fall within the recommended range between 0.7 and 0.95. Cronbach's α values ranged between 0.83 and 0.943, CR values ranged between 0.889 and 0.95, and the rho_A values between 0.831 and 0.946, indicating an adequate internal consistency.

Table 23 further shows the constructs' AVE. AVE was used to test for the convergent validity, all values were above the minimum value of 0.5, ranging from 0.521 to 0.883.

Table 23: Model's Constructs Internal Consistency Reliability and Convergent Validity

Construct	Cronbach's α	CR	rho_A	AVE
CPMS	0.927	0.940	0.932	0.635
AL	0.844	0.889	0.846	0.617
EX	0.874	0.909	0.876	0.666
MO	0.830	0.898	0.831	0.747
FIN	0.923	0.945	0.924	0.811
NON-FIN	0.943	0.950	0.944	0.615
EMPW	0.908	0.935	0.922	0.784
ENG	0.884	0.907	0.886	0.521
ORGEFFECT	0.902	0.937	0.946	0.833
ORGPER	0.868	0.938	0.876	0.883

Source: Author's own calculations (2024)

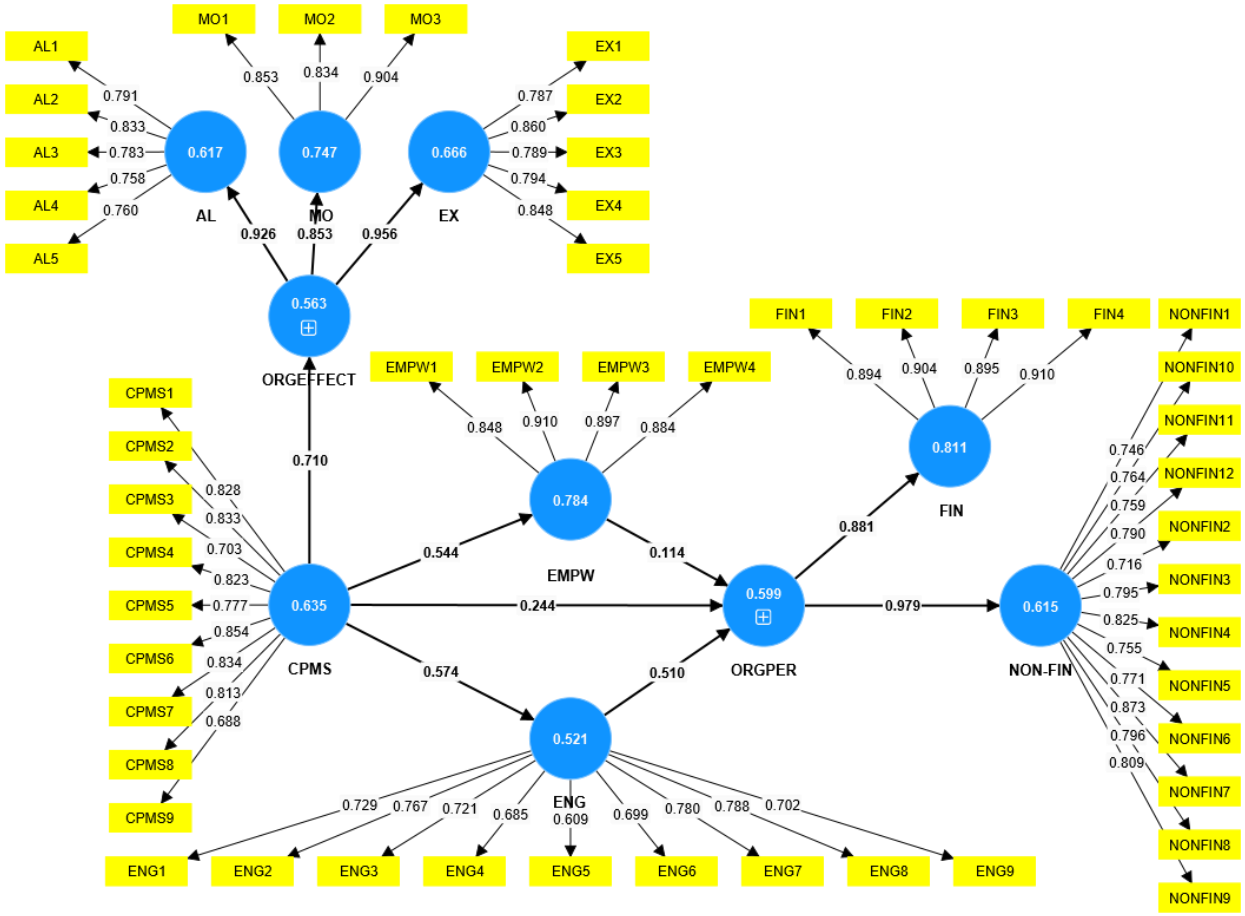

Figure 9: Path Model and Outer Loadings

Source: Author's own calculations based on SmartPLS 4.1 (2024)

Discriminant validity

Fornell-Larcker criterion, the cross-loadings, and the HTMT ratio were tested to establish discriminant validity.

Assessing the discriminant validity using the Fornell-Larcker criterion is based on the concept of comparing the square root of each construct's AVE with this construct's correlation with other constructs in the model. According to the criterion, to establish discriminant validity, AVE square root for each construct has to be greater than the construct's correlations with other constructs. In Table 24, this criterion was met given that each construct's AVE square root was greater that its correlations with the model's other constructs, indicating that each construct shares more variance with its own indicators than with indicators of other constructs.

Table 24: Fornell-Larcker Criterion

Construct	**Construct**							
	AL	CPMS	EMPW	ENG	EX	FIN	MO	NON-FIN
AL	0.785							
CPMS	0.727	0.797						
EMPW	0.505	0.544	0.885					
ENG	0.634	0.574	0.682	0.722				
EX	0.757	0.704	0.424	0.563	0.816			
FIN	0.597	0.544	0.482	0.645	0.572	0.901		
MO	0.674	0.450	0.498	0.544	0.760	0.480	0.864	
NON-FIN	0.693	0.578	0.600	0.711	0.664	0.766	0.682	0.784

Source: Author's own calculations (2024)

For the cross-loadings, it is checked if the indicator's outer loading with the associated construct is higher than its correlation with other constructs. Appendix 4 confirms that every item's loading on its construct is higher than its loading on any other construct.

The final indicator to establish discriminant validity is the HTMT ratio. As shown in Table 25, almost all of the values are below the most conservative threshold of 0.85. The two higher values are still within the recommended threshold of 1 (Gaskin et al., 2018).

Table 25: HTMT

Construct	Construct								
	AL	CPMS	EMPW	ENG	EX	FIN	MO	NON-FIN	ORGEFFECT
AL									
CPMS	0.819								
EMPW	0.569	0.573							
ENG	0.731	0.622	0.757						
EX	0.960	0.780	0.468	0.638					
FIN	0.672	0.582	0.520	0.705	0.633				
MO	0.804	0.508	0.565	0.638	0.890	0.544			
NON-FIN	0.773	0.610	0.640	0.776	0.728	0.816	0.768		
ORGEFFECT	-	0.757	0.549	0.698	-	0.650	-	0.784	
ORGPER	0.776	0.628	0.632	0.788	0.731	-	0.736	-	0.778

Source: Author's own calculations (2024)

Thus, all constructs met the quality criteria by being valid and reliable, and we can continue with the structural model evaluation.

4.3.2 Evaluating the Structural Model

Step 1: Check for Collinearity Issues

To check for collinearity issues in the model, the VIF values are calculated and checked. Table 26 shows that all VIF values were below the preferable value of 3 (Hair et al., 2019). As the highest VIF value is 2.1, no multicollinearity issue exists, and the model can be further examined.

Table 26: VIF Values for Multicollinearity Assessment

Construct	Construct									
	AL	CPMS	EMPW	ENG	EX	FIN	MO	NON-FIN	ORG-EFFECT	ORG-PER
CPMS			1	1		1.592		1.592	1	1.595
EMPW						1.991		1.991		1.998
ENG						2.094		2.094		2.100
ORGEFFECT	1				1		1			
ORGPER						1		1		

Source: Author's own calculations (2024)

Step 2: Evaluating the Significance of the Structural Model Relationships

A procedure called bootstrapping was used to evaluate the significance of the relationships. A two-sided significance test with a 5% significance level was performed. The path coefficients (*β)* represent estimations of the associations between the constructs within the model (Hair et

al., 2014). The path coefficients range between -1 and +1, where zero indicates that no relationship exists, -1 indicates a strong negative relationship, and +1 indicates a strong positive relationship (Garson, 2016). Therefore, the higher the path coefficients, the stronger the effects of predictors on the predicted variables. To identify the significance of the presumed relationships, the significance of the *p*-values for each path was compared with a threshold of $p < 0.05$, and in some cases, $p < 0.01$, to assess the significance of the path coefficient estimations (Henseler et al., 2009; Hair et al., 2017).

Table 27 illustrates the hypotheses for testing the direct relationships in the model in terms of the overall organisational performance. The table shows *β, t*-value, *and p*-value of each path, in addition to providing a decision regarding the acceptance or rejection of each hypothesis.

Table 27: Direct Relationships' Path Coefficients and Significances in Terms of Overall Organisational Performance

Hypothesis	Path	Path Coefficient (*β*)	*t-value*	*p-value*	A/R
H1	*CPMS → ORGPER*	0.244	3.087	0.002	A
H4	*CPMS → ORGEFFECT*	0.710	12.101	< 0.001	A
	CPMS → EMPW	0.544	8.656	< 0.001	A
	EMPW → ORGPER	0.114	1.077	0.282	R
	CPMS → ENG	0.574	10.615	< 0.001	A
	ENG → ORGPER	0.510	5.457	< 0.001	A

Notes: A= Accepted; R=Rejected
Source: Author's own calculations (2024)

The results reveal that CPMS significantly and positively affects organisations' overall performance ($\beta = 0.244$, $t = 3.087$, $p < 0.01$). Thus, the first hypothesis is accepted. The results further provide support for the effects of CPMS on organisational effectiveness ($\beta = 0.710$, $t = 12.101$, $p < 0.001$), which stands out as the highest among all tested relationships. This robust coefficient underscores the profound impact of CPMS on enhancing organisational effectiveness, thereby providing strong support for *H4*.

In addition to impacting organisational effectiveness and organisation's overall performance, CPMS also positively and significantly affects employee empowerment ($\beta = 0.544$, $t = 8.656$, $p < 0.001$) and work engagement ($\beta = 0.574$, $t = 10.615$, $p < 0.001$).

The results also indicate that work engagement has a significant positive effect on organisations' overall performance ($\beta = 0.510$, $t = 5.457$, $p < 0.001$).

The findings present a notable deviation from the hypothesised relationship, as employee empowerment failed to exhibit a significant effect on organisations' overall performance, contrary to initial expectations posited in *H5*, accordingly, *H5* is rejected.

To test the hypothesis related to the specific effects on financial and non-financial performance, the following model depicted in Figure 10 was assessed and used.

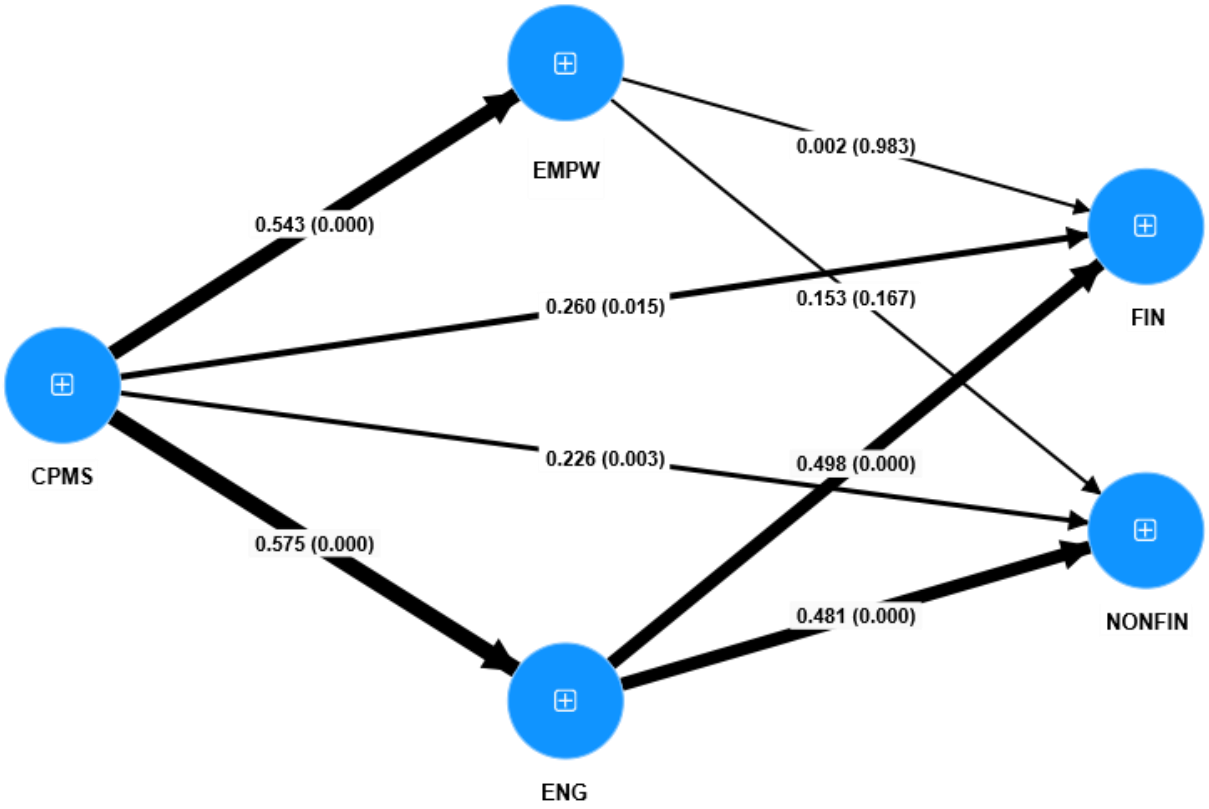

Figure 10: Model Used for Testing Specific Effects on the Financial and Non-financial Performance

Source: Author's own calculations (2024)

Table 28 shows the specific direct effects of the research constructs on financial and non-financial performance specifically. In terms of the specific direct effects of CPMS on financial and non-financial performance, the results reveal the existence of positive and significant relationships. Specifically, CPMS affects financial performance ($\beta = 0.260$, $t = 2.432$, $p < 0.05$) and non-financial performance ($\beta = 0.226$, $t = 2.969$, $p < 0.01$), thereby *H2* and *H3* have also been supported.

The effects of work engagement on financial and non-financial performance were further examined. Work engagement significantly affects financial performance (β = 0.498, t = 4.976, p < 0.001) and non-financial performance (β = 0.481, t = 4.928, p < 0.001), consequently, providing a strong support for *H9* and *H10*.

Contrary to expectations, employee empowerment was not found to have significant effects on either financial performance (β = 0.002, t = 0.022, p > 0.05) or non-financial performance (β = 0.153, t = 1.383, p > 0.05).

Table 28: Direct Relationships' Path Coefficients and Significances in Terms of Financial and Non-financial Performance

Hypothesis	Path	Path Coefficient (*β*)	*t-value*	*p-value*	A/R
H2	*CPMS → FIN*	0.260	2.432	0.015	A
H3	*CPMS → NON-FIN*	0.226	2.969	0.003	A
	EMPW → FIN	0.002	0.022	0.983	R
	EMPW → NON-FIN	0.153	1.383	0.167	R
	ENG → FIN	0.498	4.976	< 0.001	A
	ENG → NON-FIN	0.481	4.928	< 0.001	A

Notes: A= Accepted; R=Rejected
Source: Author's own calculations (2024)

The indirect (mediating) relationship analysis presented in Table 29 reveals significant insights into the dynamics between CPMS, employee empowerment, work engagement, and organisational performance. Contrary to expectations outlined in the fifth hypothesis, the data indicates that employee empowerment does not serve as a mediator in the relationship between CPMS and overall organisational performance. Moreover, further analysis demonstrates that employee empowerment similarly fails to mediate the relationships between CPMS and both financial and non-financial performance. Thus, rejecting all of *H5, H6, and H7*.

Conversely, the results underscore that CPMS and organisational overall performance relationship is mediated through work engagement, thus providing a support for *H8.* Additionally, the results indicate that work engagement similarly mediates the relationships between CPMS and both financial (β = 0.286, t = 4.364, p < 0.001) and non-financial performance (β = 0.276, t = 4.571, p < 0.001), providing support for *H9* and *H10*.

Table 29: Indirect (Mediating) Relationships' Path Coefficients and Significances

Hypothesis	Path	Path Coefficient (*β*)	*t-value*	*p-value*	A/R
H5	*CPMS → EMPW → ORGPER*	0.062	1.060	0.289	R
H6	*CPMS → EMPW → FIN*	0.001	0.021	0.983	R
H7	*CPMS → EMPW → NON-FIN*	0.083	1.362	0.173	R
H8	*CPMS → ENG → ORGPER*	0.293	4.916	< 0.001	A
H9	*CPMS → ENG → FIN*	0.286	4.364	< 0.001	A
H10	*CPMS → ENG → NON-FIN*	0.276	4.571	< 0.001	A

Notes: A= Accepted; R=Rejected
Source: Author's own calculations (2024)

To further identify the type of mediation, full or partial, researchers assess the significance of the direct and indirect relationships to decide on the basis of the following rules (Baron & Kenny, 1986):

- If both effects, direct and indirect, are significant, then there is a partial mediating effect.
- If the direct effect is not significant while the indirect effect is significant, then there is a full mediating effect.

Table 30 shows the significance of direct and direct effects for each of the accepted hypotheses with the decision regarding the type of mediation.

Table 30: Significance for Direct and Indirect Effects with Mediation Classification

Path	Hypothesis	Direct Effect		Indirect Effect		Decision
		β	*p*	*β*	*p*	
CPMS → ENG → ORGPER	H8	0.244	0.002	0.293	< 0.001	Partial mediation
CPMS → ENG → FIN	H9	0.260	0.015	0.286	< 0.001	Partial mediation
CPMS → ENG → NON-FIN	H10	0.226	0.003	0.276	< 0.001	Partial mediation

Source: Author's own calculations (2024)

Step 3: Evaluating the Model's Explanatory Power

In this step, the explanatory power of the model was examined using the coefficient of determination. Table 31 shows that all of the model's constructs, except for EMPW, had a moderate R^2. However, EMPW exhibited a weak R^2, suggesting that the model explains only a small proportion of the variance in this construct.

Table 31: Coefficient of Determination (R^2)

Construct	R^2	R^2_{adj}	
EMPW	0.296	0.289	Weak
ORGEFFECT	0.504	0.499	Moderate
ORGPER	0.586	0.575	Moderate
ENG	0.330	0.324	Moderate
FIN	0.467	0.452	Moderate
NON-FIN	0.568	0.556	Moderate

Source: Author's own calculations (2024)

The findings presented in Table 31 reveal the extent to which variations in specific constructs are accounted for by variations in CPMS. Specifically, approximately 30% of the variability in EMPW is elucidated by CPMS. Moreover, CPMS explains approximately 50% of the variance in ORGEFFECT and approximately 33% of the variance in ENG.

Furthermore, a combination of CPMS, EMPW, and ENG collectively explains approximately 59% of the variation in ORGPER and about 47% of the variation in FIN. Finally, the joint influence of CPMS, EMPW, and ENG is associated with approximately 57% of the variance in NON-FIN.

These results underscore the significant explanatory power of CPMS in understanding various dimensions of the model, with notable variations observed across different constructs.

In addition to R^2, the effect size (f^2) was also assessed according to Cohen's (1998) recommendations discussed previously in section 3.9.4. Table 32 shows that the f^2 ranged from no effect to large effect. The largest effect is for CPMS on ORGEFFECT (1.014), followed by the effects of CPMS on ENG and EMPW. EMPW has no relevant effect on ORGPER or FIN. The remaining effects varied between small and medium.

Table 32: Effect Size (f^2)

Path	f^2	*Remark*
CPMS → EMPW	0.420	Large
CPMS → ENG	0.493	Large
CPMS → ORGEFFECT	1.014	Large
CPMS → ORGPER	0.090	Small
CPMS → FIN	0.079	Small
CPMS → NON-FIN	0.074	Small
EMPW → ORGPER	0.016	No Effect
EMPW → FIN	0.000	No Effect
EMPW → NON-FIN	0.027	Small
ENG → ORGPER	0.300	Medium
ENG → FIN	0.223	Medium
ENG → NON-FIN	0.257	Medium

Source: Author's own calculations (2024)

Step 4: Evaluating the Model's Predictive Power

Subsequently, the model's predictive power was assessed. Q^2 for the endogenous constructs shown in Table 33 reveal that all endogenous constructs had Q^2 values higher than 0, so it can be concluded that the research model has a good predictive relevance.

Table 33: Predictive Relevance (Q^2)

Construct	Q^2
EMPW	0.278
ORGEFFECT	0.496
ORGPER	0.344
ENG	0.310
FIN	0.280
NON-FIN	0.325

Source: Author's own calculations (2024)

The next step is to apply the $PLS_{predict}$ procedure. As shown in Table 34, all Q^2_{predict} values are greater than 0, hence indicating that the current model predicts values better than a naïve benchmark (mean of indicators). Furthermore, the majority of the RMSE values from the PLS-SEM were lower than the RMSE values from the LM, thus, indicating an intermediate predictive power of the model (Hair et al., 2022).

Table 34: Out-of-sample Predictive Power

Item	PLS-SEM		LM
	Q^2 predict	RMSE	RMSE
AL1	0.332	1.238	1.342
AL2	0.315	1.339	1.401
AL3	0.326	1.394	1.495
AL4	0.323	1.263	1.262
AL5	0.277	1.310	1.333
EX1	0.281	1.277	1.343
EX2	0.340	1.333	1.318
EX3	0.410	1.219	1.196
EX4	0.224	1.244	1.213
EX5	0.357	1.122	1.174
MO1	0.217	1.497	1.410
MO2	0.117	1.423	1.503
MO3	0.157	1.394	1.419
FIN1	0.271	1.276	1.299
FIN2	0.209	1.409	1.466
FIN3	0.162	1.381	1.477
FIN4	0.263	1.468	1.547
NONFIN1	0.307	1.337	1.376
NONFIN2	0.138	1.335	1.395
NONFIN3	0.265	1.427	1.526
NONFIN4	0.327	1.455	1.532
NONFIN5	0.151	1.211	1.275
NONFIN6	0.143	1.333	1.417
NONFIN7	0.280	1.458	1.501
NONFIN8	0.168	1.259	1.280
NONFIN9	0.174	1.383	1.478
NONFIN10	0.220	1.415	1.411
NONFIN11	0.042	1.610	1.685
NONFIN12	0.127	1.464	1.535
EMPW1	0.114	1.524	1.526
EMPW2	0.212	1.734	1.750
EMPW3	0.185	1.517	1.537
EMPW4	0.336	1.376	1.385
ENG1	0.227	1.372	1.384
ENG2	0.096	1.370	1.475
ENG3	0.115	1.255	1.322
ENG4	0.139	1.368	1.442
ENG5	0.162	1.296	1.379
ENG6	0.176	1.429	1.504
ENG7	0.138	1.407	1.474
ENG8	0.074	1.513	1.573
ENG9	0.268	1.268	1.299

Source: Author's own calculations (2024)

4.4 Part Two: Quantitative Analysis of PMSs Adoption and Barriers

Part two focuses on quantitatively analysing the reasons for PMSs adoption and the barriers hindering their implementation, primarily focusing on frequencies and means. This section employs statistical methods to examine the prevalence of PMSs adoption within organisations and identify the barriers most affecting PMSs implementation and success.

4.4.1 Reasons for PMSs adoption

Respondents were asked to select the main reason(s) for the adoption of PMS in their organisation, drawing from a list compiled from scholarly literature (Henri, 2006; Severgnini et al., 2018; Sonson, 2019).

- Legitimisation, PMS, in this case, serves as a mechanism to justify decisions or actions, providing a sense of legitimacy to organisational practices.
- Secondly, measure performance, PMS plays a crucial role in monitoring progress, evaluating performance, and measuring outcomes, enabling organisations to assess their effectiveness and make informed decisions.
- The third reason is strategy management, PMS contributes to strategy formulation, execution, and alignment, facilitating strategic decision-making and ensuring organisational goals are effectively translated into action.
- Fourth, in terms of communication, PMS supports internal and external communication efforts, facilitates benchmarking activities, ensures compliance with regulations, and enables the inspection of suppliers, fostering transparency and accountability.
- Finally, learning and improvement, PMS promotes a culture of continuous learning and improvement by providing feedback, facilitating double-loop learning, identifying areas for performance enhancement, enhancing efficiency, exploring opportunities for development, mitigating risks, responding rapidly to change, and identifying opportunities for cost reduction.

As depicted in Figure 11, strategy management emerges as the predominant reason for the adoption of PMSs, as reported by 88 of the companies participating in the study. Following closely behind is performance measurement, reported by 72 companies. Notably, learning and improvement, as well as communication, were reported almost equally, with 49 and 43 companies respectively indicating these factors as drivers for PMS adoption. Legitimisation was reported by 26 companies, suggesting its importance though to a lesser extent.

Additionally, 10 companies indicated that all of the mentioned reasons contributed to their decision to adopt PMS.

These findings underscore the diverse motivations behind PMS adoption within organisations, with strategy management and performance measurement being the most prominent factors driving their implementation.

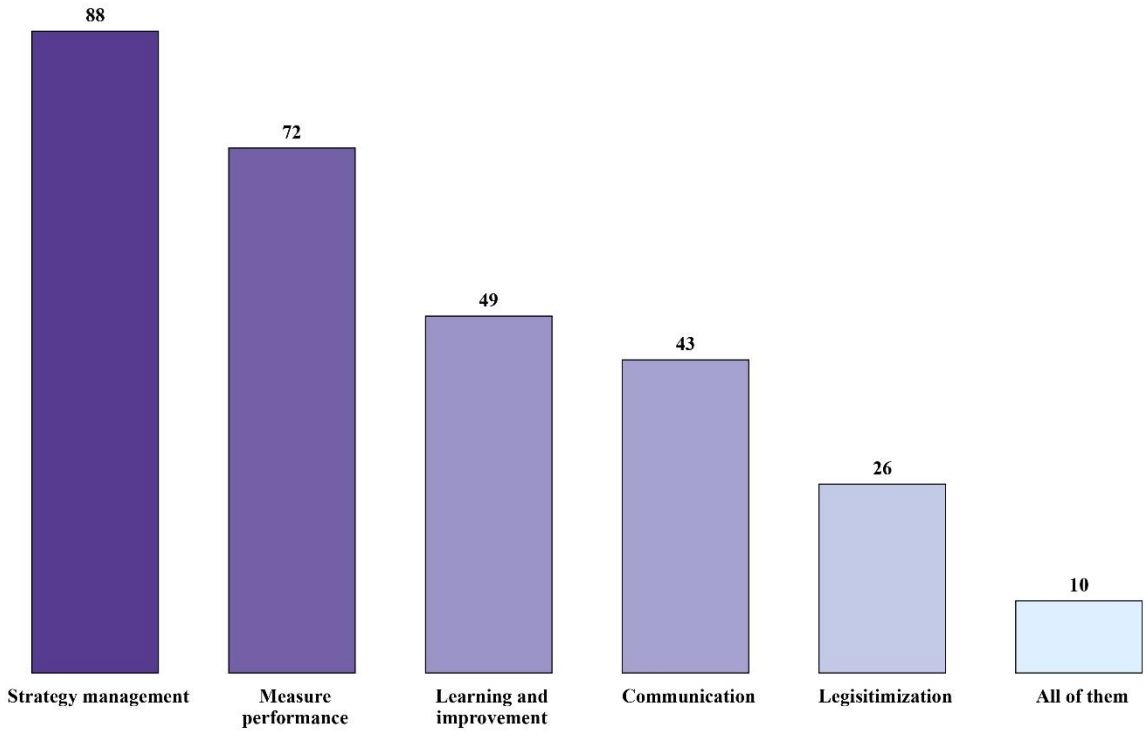

Figure 11: Reasons for PMSs Adoption

Source: Author's own calculations (2024)

4.4.2 Barriers to PMSs

Respondents were initially asked to indicate whether they encountered any challenges, barriers, or factors affecting the successful implementation of the PMS. Figure 12 illustrates that approximately 77% of the companies reported facing challenges related to PMSs, while the remaining 23% of companies were evenly split between those who did not face any challenges and those who were uncertain (i.e., "maybe").

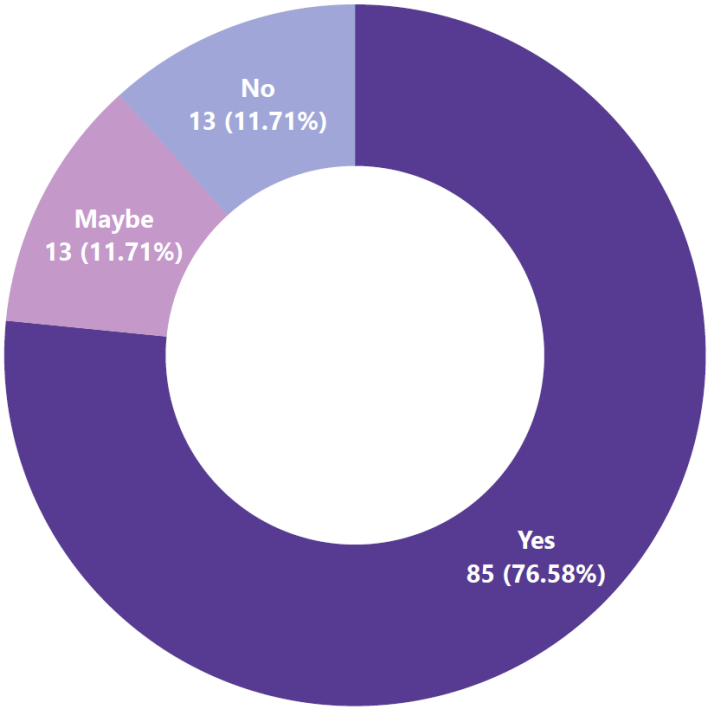

Figure 12: Frequency of Reported Challenges Faced by Companies

Source: Author's own calculations (2024)

Respondents were then asked to "*rate the extent to which each of the following barriers have affected or you believe could affect the implementation/achievement of successful PMS*", on a 7-point Likert scale, from 1: not at all to 7: to a great extent. The mean values provided in Table 35 represent the reported significance of various barriers to the success and implementation of PMSs, as perceived by respondents in our study. These barriers encompass a wide range of factors, which were discussed in section 2.5, that can impede the effective adoption and utilisation of PMSs within organisations.

At the forefront of these barriers is the challenge of required resources, indicated by the highest mean value of 5.216. This suggests that organisations often encounter difficulties related to resource allocation, including financial, human capital, and technological resources, which are essential for implementing and maintaining robust PMSs. Another notable barrier is the presence of static PMSs in dynamic environments, with a mean value of 4.946. This highlights the challenge organisations face in ensuring that their PMSs remain relevant and adaptable to changing internal and external circumstances. Poor implementation (mean = 4.928) and lack/decreased managerial commitment and support (mean = 4.856) are also significant barriers. These findings underscore the importance of effective implementation strategies and

strong leadership to drive successful PMS adoption and utilisation. Furthermore, the lack of knowledge/understanding of the systems/frameworks and their components (mean = 4.676) and incomplete set of metrics (mean = 4.568), where metrics are not carefully chosen within a clearly identified scope for clearly identified goals, indicate the importance of ensuring clarity and comprehensiveness in PMS design and implementation.

Issues related to data accessibility and system usability, such as lack of data/difficulties with the IS/data accessibility (mean = 4.378), and insufficient frequency (mean = 4.486), referring to failure in updating the metrics, also pose significant challenges to PMS effectiveness. Using unbalanced amounts of metrics (mean = 4.288), monitoring too many or too few measures, organisational resistance to measurement or change (mean = 4.288), and fear of the system/fear of personal consequences of PMSs (mean = 4.252) reflect the human factors that can hinder PMS adoption and implementation efforts.

Difficulties building causal linkages (success maps) (mean = 4.099) and prior unsuccessful experiences with PMSs (mean = 4.072) highlight the importance of learning from past experiences and ensuring clarity in the cause-and-effect relationships embedded within the PMS framework. Frequently changing strategy (mean = 3.964) and the transposition (copying) of PMSs from other companies (mean = 3.928) suggest challenges related to alignment with organisational goals and the suitability of adopted PMSs to the specific organisational context. Lastly, the dominant focus on financial metrics (mean = 3.595) and the lack of robust metrics (mean = 3.811), where metrics can be manipulated, point to the importance of adopting a balanced and comprehensive set of performance metrics that align with organisational objectives and provide a holistic view of performance.

Notably, the fact that the dominant focus on financial metrics was ranked as the least affecting barrier reveals companies' continued belief in the strength and importance of financial metrics as a key aspect of performance measurement and management, despite theoretical and modern PMSs emphasis on a more balanced approach to performance measurement and management.

In conclusion, the discussion of these barriers underscores the multifaceted challenges organisations face in successfully implementing and utilising PMSs. Addressing these barriers requires a comprehensive approach that encompasses strategic alignment, resource allocation, leadership commitment, stakeholder engagement, and continuous improvement efforts. By recognising and proactively addressing these barriers, organisations can enhance the effectiveness and impact of their PMSs.

Table 35: PMSs Barriers

Rank	Barrier	Mean	Median
1	Required resources	5.216	6
2	Static PMSs in dynamic environments	4.946	5
3	Poor implementation	4.928	5
4	Lack/ decreased managerial commitment and support	4.856	5
5	Lack of knowledge/understanding of the systems/frameworks and their components	4.676	5
6	Incomplete set of metrics	4.568	5
7	Insufficient frequency	4.486	5
8	Lack of data/ difficulties with the IS/ data accessibility	4.378	4
9	Organisational resistance to measurement or change	4.288	4
10	Unbalanced amounts of metrics	4.288	4
11	Fear of the system/ fear of personal consequences of PMSs	4.252	4
12	Difficulties building causal linkages (success maps)	4.099	4
13	Prior unsuccessful experience with PMSs	4.072	4
14	Frequently changing strategy	3.964	4
15	PMS was transposed (copied) from other companies	3.928	4
16	Lack of robust metrics	3.811	4
17	Dominant focus on financial metrics	3.595	4

Source: Author's own calculations (2024)

5. CONCLUSIONS AND RECOMMENDATIONS

5.1 Conclusions

PMSs have become increasingly prevalent in organisations as a mean to enhance performance. These systems are designed to provide valuable information about an organisation's performance and help guide decision-making processes. They offer a structured approach to monitor and evaluate the achievement of organisational objectives, develop strategies, and improve performance. However, these systems' effectiveness and impact on companies' performance have been a topic of debate among researchers and practitioners.

The main goal of the study was to examine the effects of using PMSs on companies' performance. Specifically, manufacturing companies in the context of Jordanian industrial estates were studied to determine the relationship between PMSs and companies' financial, non-financial, and overall performance. Furthermore, the effect of these systems on organisational effectiveness and the mediating role of employee empowerment and work engagement were also explored. Quantitative and qualitative methods were utilised to fulfil this aim and answer the research questions.

A questionnaire was developed and distributed to manufacturing companies in the Jordanian industrial estates to test the research hypotheses. A model was then developed using the SmartPLS software to explore the relationships between the different research constructs.

CPMS, organisational performance, and organisational effectiveness

The results of the data analysis revealed that these systems indeed have significant effects on the performance of manufacturing companies in Jordan industrial estates. The adoption of PMSs that are comprehensive and incorporate a wide variety of performance measures covering different aspects of organisations positively affect financial, non-financial, and overall organisations' performance. These systems also contribute significantly to organisational effectiveness in terms of aligning the organisations' activities and operations to its intended strategy, exploiting the organisation's resources and capabilities to ensure the optimal implementation of the strategy, and fostering improved communication and motivation within the organisation. A summary of the relationships between CPMSs, organisational performance, and organisational effectiveness is depicted in Table 36.

Table 36: Summary of the Hypotheses related to CPMSs, Organisational Performance, and Organisational Effectiveness

Hypothesis Number	Hypothesis	Result
H1	CPMSs positively affect companies' overall performance.	Supported
H2	CPMSs positively affect companies' financial performance.	Supported
H3	CPMSs positively affect companies' non-financial performance.	Supported
H4	CPMSs positively contribute to organisational effectiveness (in terms of aligning, exploiting, and mobilising).	Supported

CPMS, employee empowerment, and organisational performance

According to the findings of testing hypotheses five, six, and seven, there is a significant relationship between the use of CPMSs and structural empowerment. The results indicate that organisations that effectively implement CPMS are more likely to empower their employees. However, contrary to exceptions, our results did not find any effects of employee empowerment on organisations' financial, non-financial, or overall performance. The study suggests that while the use of CPMSs can lead to employee empowerment, it may not directly impact the financial, non-financial, or overall performance of organisations. Therefore, employee empowerment does not mediate the relationship between CPMSs and companies' performance. Nevertheless, it is important to note that this study focused on a specific context and further research is needed to explore the link between employee empowerment and organisational performance in other contexts and industries.

The results suggest that the relationship might be more complex than originally proposed. While previous literature often assumes a direct positive link between empowerment and performance, this research's findings suggest that empowerment alone may not be sufficient to drive organisational performance. This raises critical questions about the underlying mechanisms through which CPMSs influence organisational outcomes. One potential explanation is that empowerment requires supportive organisational conditions, such as appropriate leadership styles, organisational culture, and complementary resources, to translate into measurable performance gains. The absence of a direct link in this context suggests the need to explore other potential variables that might affect the relationship.

Future research could also benefit from conducting longitudinal studies to explore whether empowerment exerts a delayed but significant effect on organisational performance, thereby offering a more comprehensive understanding of its role in CPMS effectiveness.

Table 37 provides a summary of the relationships between CPMSs, employee empowerment and organisational performance.

Table 37: Summary of the Hypotheses related to CPMSs, Employee Empowerment, and Organisational Performance

Hypothesis Number	Hypothesis	Result
H5	CPMSs have a positive indirect effect on companies' overall performance through employee empowerment, as employee empowerment positively affects companies' overall performance.	Not supported
H6	CPMSs have a positive indirect effect on companies' financial performance through employee empowerment, as employee empowerment positively affects companies' financial performance.	Not supported
H7	CPMSs have a positive indirect effect on companies' non-financial performance through employee empowerment, as employee empowerment positively affects companies' non-financial performance.	Not supported

CPMS, employee engagement, and organisational performance

The results of testing the mediating role of work engagement in the relationship between CPMSs and organisational performance support the notion that the effective implementation and utilisation of CPMSs can lead to increased employee engagement, which in turn positively impacts organisational performance. These findings suggest that PMSs have the potential to significantly enhance organisational performance by promoting employee engagement. By fostering communication and motivation, CPMSs can engage employees in the pursuit of organisational goals and objectives. This highlights the importance of creating a work environment that encourages active participation and commitment from employees, ultimately contributing to improved organisational performance. Table 38 presents an overview of the interconnections among CPMSs, work engagement, and organisational performance.

Table 38: Summary of the Hypotheses related to CPMSs, Work Engagement, and Organisational Performance

Hypothesis Number	Hypothesis	Result
H8	CPMSs have a positive indirect effect on companies' overall performance through work engagement, as work engagement positively affects companies' overall performance.	Supported
H9	CPMSs have a positive indirect effect on companies' financial performance through work engagement, as work engagement positively affects companies' financial performance.	Supported
H10	CPMSs have a positive indirect effect on companies' non-financial performance through work engagement, as work engagement positively affects companies' non-financial performance.	Supported

In conclusion, the findings of this study underscore the significant role of PMSs in organisational performance enhancement. The research has shed light on the interplay between CPMSs, employee empowerment, and work engagement, and their collective impact on companies' performance. By providing a structured framework for goal setting, progress monitoring, and improvement identification, PMSs serve as key enablers for organisational effectiveness when aligned with strategic goals.

The study has revealed that the effective Implementation of CPMSs can lead to organisational empowerment and employee engagement. While a direct relationship between employee empowerment and organisational performance was not established, the mediating role of work engagement in enhancing organisational performance through CPMSs has been clearly identified.

PMSs are not free from challenges and difficulties, as previously highlighted in the literature. The comprehensive literature review revealed that many barriers and factors can hinder the effective implementation and utilisation of PMS. In the context of our study, the required resources stood out as the factor most affecting the successful implementation of these systems. As these systems require investment in infrastructure, technology, and training, organisations need to allocate sufficient resources to ensure their successful implementation. Furthermore, static PMSs in dynamic environments were found to be another significant challenge. With the business landscape constantly evolving, organisations must ensure that their PMSs are flexible

and adaptable to changes in the external environment. This may involve regular reviews and updates to the performance measures to align with the strategic goals of the organisation and the industry best practices.

The poor implementation of these systems, the decreased managerial commitment and support, and the lack of understanding of these systems and their components were also identified as significant barriers to effective PMS implementation.

The implications of this research extend beyond the specific context studied, emphasising the need for further exploration of PMSs in diverse cultural, geographical, and industry-specific contexts. Understanding the variations in PMS effectiveness across different organisational settings will be critical in developing tailored strategies for implementation and maximising their potential impact on companies' performance.

Overall, this study signifies the enduring importance of PMSs as critical components of organisational strategic initiatives and operational practices. As organisations continue to strive for excellence and sustainable growth, the effective implementation and utilisation of PMSs will undoubtedly remain central to their success.

5.2 Research Limitations and Recommendations

While this dissertation provides valuable insights into the effects of using PMSs on companies' performance, it is important to acknowledge certain limitations.

First, the study focused on selected manufacturing companies in Jordan, which may limit the generalisability of the findings to other contexts. Future research could explore the effects of PMSs on companies' performance in different industries and countries to provide a more comprehensive understanding.

Second, the study primarily relied on self-reported data from surveys, which may introduce response bias and subjectivity. Future research could consider using objective measures and longitudinal designs to strengthen the validity of the findings.

Third, due to the extremely low response rate achieved through attempts to collect data using online questionnaires in Hungary and Jordan, where around 2200 companies in total were contacted through e-mail and phone calls, the decision was made to collect data from the manufacturing companies located in the Jordanian industrial estates. This led to the sample size used in this research being small (111 responses). Therefore, the findings might not fully represent the population of manufacturing companies in Jordan. However, efforts were made

to ensure representativeness and diversity within the sample. Future research should aim to obtain a larger and more diverse sample size to improve the generalisability of the findings.

6. THE NOVEL FINDINGS OF THE DISSERTATION

This dissertation contributes to the body of knowledge by filling some research gaps in the literature in the field of PMSs. The novelty of this dissertation can be summarised as follows.

1. The dissertation was conducted in the context of manufacturing companies in a developing country, Jordan. While the literature discusses the effects of PMSs on companies' performance, the majority of these studies are conducted in developed countries. To the best of the researcher's knowledge, studies conducted in the Middle East, and specifically in Jordan, are scarce. This scarcity of research in the region underscores the significance of the present study in contributing to the understanding of PMSs effects within a unique socio-economic context. Additionally, exploring the application of PMSs in Jordan provides valuable insights that can inform both theory and practice in similar contexts across the Middle East and other developing regions. Hence, this study offers a significant contribution to the existing literature by examining the PMSs impacts on companies' performance within Jordanian industrial estates, thereby enhancing the global understanding of this subject matter.

2. The research also contributed to the literature by examining the possible mediating effects of certain human resources practices, such as employee empowerment and work engagement, in the relationship between PMSs and companies' performance. By exploring these mediating mechanisms, the study fills a research gap regarding the role of human resources practices as mediators, providing a more comprehensive understanding of how PMSs impact companies' performance.

3. This study further contributes to the existing literature by providing a comprehensive analysis of the obstacles and challenges faced by organisations in implementing effective PMSs. Additionally, it offers insights into the factors that significantly impact and hinder the successful implementation of these systems, drawing from real-life experiences within organisations. This addresses a notable gap in the literature. By examining the practical challenges encountered during PMS implementation, this research enhances our understanding of the complexities involved in adopting and integrating such systems within organisational contexts. Through the reporting of these critical factors, the study offers valuable guidance for organisations seeking to navigate and overcome the challenges associated with PMS implementation, thereby facilitating more informed decision-making and strategic planning processes.

SUMMARY

The study aims to investigate the effects of PMSs on the performance of manufacturing companies within Jordanian industrial estates, addressing a significant gap in the literature. PMSs are increasingly adopted by organisations to enhance performance through structured monitoring, evaluation, and decision-making processes. However, the effectiveness of these systems remains debated. This research seeks to explore the relationship between PMSs and financial, non-financial, and overall organisational performance, as well as their impact on organisational effectiveness. Additionally, the study examines the mediating role of employee empowerment and work engagement in this relationship.

Data was collected from manufacturing companies in Jordan through questionnaires and analysed using the SmartPLS software. The findings indicate that CPMSs positively affect financial, non-financial, and overall performance, as well as organisational effectiveness. However, while CPMSs significantly impact employee empowerment, empowerment does not have a direct impact on organisational performance. Conversely, effective implementation of CPMSs leads to increased employee engagement, which in turn positively influences organisational performance.

The study also identifies the degree to which some challenges are faced in PMS implementation as reported by companies. Such challenges include resource constraints and the need for adaptability in dynamic environments.

The structure of the dissertation follows a logical progression. **Chapter 1** establishes the research aims, objectives, questions, and hypotheses, laying the foundation for subsequent chapters. **Chapter 2** conducts an extensive literature review, synthesising existing knowledge in the field. **Chapter 3** outlines the methodology adopted for the study, covering data collection, analysis methods, and questionnaire development. **Chapter 4** discusses the analysis of the data and the primary findings of the research. **Chapter 5** presents the conclusion of the study results and discusses the research limitations and some future recommendations. **Chapter 6** highlights the novelty and significance of the study in the academic field.

Overall, the research contributes to understanding the role of PMSs in organisational performance enhancement, addressing challenges in implementation, and highlighting the importance of employee engagement. Limitations include the focus on manufacturing companies in Jordan and reliance on self-reported data, suggesting possibilities for future research to explore PMS effects in diverse contexts and industries with objective measures and larger sample sizes.

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LIST OF PUBLICATIONS

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   SEA: Practical Application of Science. 12 (34), 41-47, 2024. EISSN: 2360-2554.
2. **Owais, L. Q. A.**, Al, W. M. S. E. A., Kiss, J. T.: Managing water consumption per capita using performance indicators: a case study.
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3. **Owais, L. Q. A.**: A brief overview of performance management systems.
   SEA: Practical Application of Science. 9 (25), 23-30, 2021. EISSN: 2360-2554.
4. **Owais, L. Q. A.**, Kiss, J. T.: The Effects Of Using Performance Measurement Systems (Pmss) On Organizations' Performance.
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6. **Owais, L. Q. A.**, Kiss, J. T.: Performance Measurement Systems (PMSs) and Companies' Performance - The Mediating Role of Employees' Engagement and Empowerment. In: "New Trends and Challenges in Management" Conference "Kihívások és tanulságok a menedzsment területén" Konferencia: Abstract booklet = Absztraktfüzet, Debreceni Egyetem Műszaki Kar, Műszaki Menedzsment és Vállalkozási Tanszék, Debrecen, 1-2, 2023. ISBN: 9789634905127

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DEBRECENI EGYETEM * Egyetemi és Nemzeti Könyvtár *

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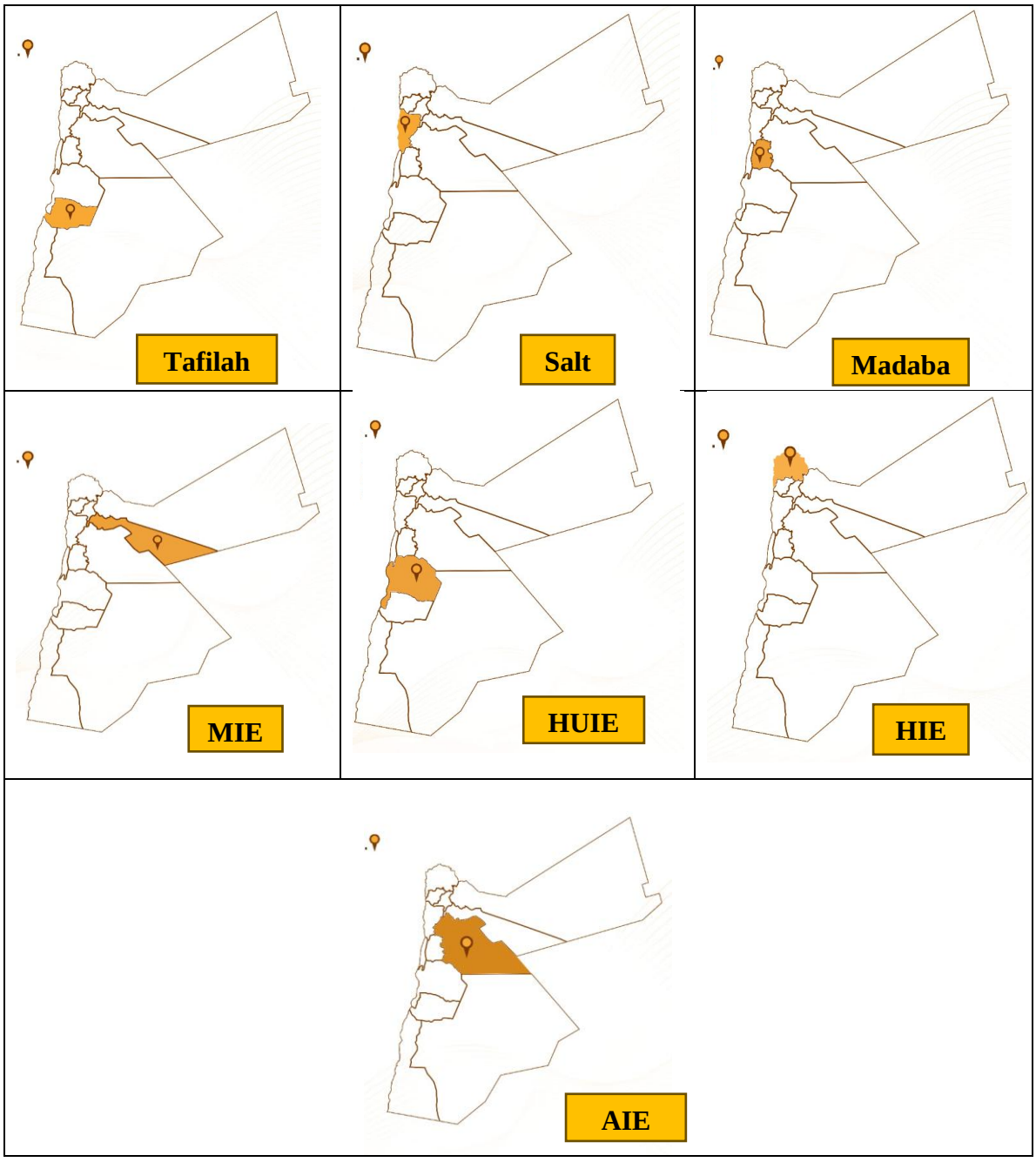
APPENDICES

Appendix 1. The Industrial Estates' Location on Map



Source: Author's own development (2024)

Appendix 2. The Study Questionnaire

The Effects of Performance Measurement Systems (PMS) on Organisations' Performance

Section 1 (Introduction):

Dear participants,
We are inviting you to participate in our research by filling this questionnaire. We are, Dr. Judit T. Kiss (Associate Professor at University of Debrecen) and Lubna Q. Owais (a Ph.D. Candidate of Management and Business at the University of Debrecen), researchers in the field of corporate performance management.
Performance Measurement Systems (PMSs) are very common management methods that are adopted by most organisations and are widely discussed in the literature. They can be defined as "a set of performance measures that are used to quantify the efficiency and effectiveness of past actions" (Neely et al., 2002), which assist organisations in different areas like planning, measuring, and controlling their performance according to a pre-defined strategy. The literature suggests various benefits that organisations receive from adopting PMSs, for example, they have effects on employees' behaviour; organisational capabilities; organisational and managerial teams' performance; and the organisational performance and its competitive advantages.
This questionnaire is the most important part of my Ph.D. dissertation, in which I would like to study the actual impacts of these systems on organisations' performance.
Your response to this survey will be a great added value to the body of knowledge for both academics and practitioners.

We would like to assure you that all of the respondents' information and their organisations provided in this survey will be confidential, unless chosen otherwise. The information from this survey will be used only for academic research.

Thank you very much for your valuable time answering this questionnaire. We really appreciate it.

Dr. Judit T. Kiss
Lubna Q. Owais
University of Debrecen

Contact information (owais.lubna@eng.unideb.hu)

Section 2 (General Information):
This section seeks to collect general information about the respondents and the representative organisation.

1. Company's name (filling this field is optional):

2. Your highest level of education:
☐ High School ☐ Bachelor's ☐ Master's ☐ Ph.D. ☐ College ☐ Other, specify:

3. Years of working experience:
☐ 0-5 years ☐ 6-10 years ☐ 11-15 years ☐ >15 years

4. For how long have you been working in your current organization?
☐ 0-5 years ☐ 6-10 years ☐ 11-15 years ☐ >15 years

5. What is your position?
☐ General Manager/ Chief Executive Officer ☐ Managing Director/ Department Manager ☐ Financial Manager
☐ Project Manager ☐ Strategic Manager ☐ Engineer ☐ HR Manager ☐ Operation Manager ☐ Other, specify:

6. How many employees (annual work unit) does your organisation have?
☐ <10 ☐10-49 ☐50-249 ☐ ≥ 250

7. **To which business field does your organisation belong to?**
☐ Food industry ☐ Pharmaceutical industries ☐ Engineering industries (Metal & Electric)
☐ Plastic & rubber industries ☐ Chemical industries ☐ Textile and cotton industries
☐ Leather industry☐ Wood and furniture industry ☐ Packaging industry, paper, cardboard and office supplies
☐ Construction and building materials industries ☐ Other, specify:

8. **To which sector does your organisation belong?**
☐ The Public Sector ☐ The Private Sector ☐ Both Sectors (Public-Private Partnership)

9. Is your organization:
☐ 100% domestically owned ☐ 100% domestically owned ☐ Majority foreign owned
☐ Majority domestically owned (non-state) ☐ 100% foreign owned
☐ 50% domestically owned and 50% foreign owned

10. The share of exports in the 2022 sales revenue is:
☐ 0%: No export activity ☐ 0-25 %: Low export activity ☐ 26-50 %: Medium export activity ☐ 51-100 %: Significant export activity

11. Please choose the best option that describes the status of the Performance Measurement System (PMS) application in your organisation:
PMSs are defined as "a set of performance measures that are used to quantify the efficiency and effectiveness of past actions" (Neely et al., 2002).
☐ The PMS contains only financial indicators.
☐ The PMS contains only non-financial indicators.
☐ The PMS contains different performance perspectives including financial and non-financial indicators.
☐ We don't measure performance, but we are familiar with PMSs*
☐ We don't measure performance and we are NOT familiar with PMSs**
☐ Other, specify:
**In case this option was chosen, please move directly to section six (Barriers to the successful implementation/ perceived benefits of PMSs)*
***In case this option was chosen, please move directly to section seven (Organisational Performance)*

Section 3 (General information about the used PMS):

12. What is (are) the main reason(s) for the adoption of the PMS in your organisation?
☐ Legitimisation: PMS is used to justify decisions or actions.
☐ Measure performance: Encompasses the role of monitor progress and measure performance/ evaluate performance.
☐Strategy management: Encompasses the roles of planning, strategy formulation, strategy implementation/execution, focus attention**/provide alignment, and strategic decision-making.
☐Communication: Encompasses the roles of internal and external communication, bench marking, compliance with regulations, and inspection of suppliers.
☐ Learning and improvement: Encompass the roles of feedback, double-loop learning, performance improvement, increasing efficiency, exploring opportunities for development, risk reduction, rapid response to change, and exploring cost reduction opportunities.
☐ Other, specify:
** *Attention-focusing: PMS is used by top managers to send signals throughout the firm.*

Section 4 (PMS comprehensiveness level):

Comprehensive PMSs (CPMSs) are defined as "systems able to provide a broad set of measures which are integrated with the strategy across all the various functional entities" (Hall, 2008).

In this section, we would like to measure the comprehensiveness level of the applied PMS. *Note: the lowest score is 1 and the highest score is 7.*

Please circle the number of the answer closest to your evaluation from Question No. 13 to Question No. 21.

1 Not at all	2	3	4	5	6	7 To a great extent

13. Please rate the extent to which your PMS provides a broad range of performance information about different areas of the organisation's field of work.
14. Please rate the extent to which your PMS is produced in a fully documented form, which provides a record for evaluating performance.
15. Please rate the extent to which your PMS provides a diverse set of measures related to the key performance areas of the organisation field of work.
16. Please rate the extent to which your PMS provides consistent and mutually reinforcing links between the current operating performance and the long-term strategies of the organisation (how the current operating performance supports the achievement of the organisation's long-term strategies, and how the long-term strategies influence and guide the short-term decisions and actions).
17. Please rate the extent to which your PMS provides information on different dimensions (different aspects or perspectives of the organisation's performance that are relevant to its success; financial and non-financial) of the organisation's performance.
18. Please rate the extent to which your PMS links together the activities of different business units to the achievement of the goals and objectives of the organisation.
19. Please rate the extent to which your PMS provides a variety of information about important aspects of the organisation different business unit's operations.
20. Please rate the extent to which your PMS shows how the activities of a specific business unit affect the activities of other units within the organisation.
21. Please rate the extent to which your PMS provides a range of measures that cover the critical areas of the different business unit's operations.

Section 5 (Attained benefits of PMSs):

In this section, we would like to measure the extent to which some benefits have been achieved after implementing the PMS.

22. **Please rate the extent to which your organisation has attained the following benefits after implementing the PMS:**

	1 Completely disagree	2	3	4	5	6	7 Completely agree
Translating strategy into operational goals							
Aligning the organisation with the strategy							
Making strategy everyone's daily job							
Improving employees' knowledge on how they are evaluated							
Making the linkages among short and long-term objectives clearer							
Spending more time and effort on strategic-related issues							
Adopting new performance measures							
Explicating cause-and-effect relationships							
Increasing the participation of top management in the formalisation of the strategy							
Linking performance measures to corporate strategy							
Improving internal communication among people							
Motivating human resources (in comprehending their role within the organisation)							
Building consensus around the organisation's vision and strategy							

Section 6 (Barriers to the successful implementation/ perceived benefits of PMSs):
In this section, we want to collect information about the extent to which each of the following barriers have affected or you believe could affect the implementation/ achievement of successful PMS.

23. Did you face any challenges/barriers/ factors that affected the successful implementation of the PMS:
☐ Yes ☐ No ☐ Maybe

24. Please rate the extent to which each of the following barriers have affected or you believe could affect the implementation/achievement of successful PMS.

	1 Not at all	2	3	4	5	6	7 To a great extent
Lack of knowledge/understanding of the systems/frameworks and their components							
Poor implementation							
Dominant focus on financial metrics							
PMS was transposed (copied) from other companies							
Prior unsuccessful experience with PMSs							
Lack of data/ difficulties with the information system/ data accessibility							
Difficulties building causal linkages (strategy maps)							
Fear of the system/ fear of personal consequences of PMSs							
Frequently changing strategy							
Required resources							
Lack/ decreased managerial commitment and support							
Organisational resistance to measurement or change							
Monitoring too many or too few measures							
Metrics are not carefully chosen within a clearly identified scope for a clearly identified goal							
Metrics could be manipulated							
Failing in updating the metrics.							

*** The strategy map describes, in a visual form, the one-way chains of cause-and-effect by linking the different perspectives of the PMS (i.e., customer perspective to the financial perspective) that explains the strategy of the organization and how it can be achieved*

25. Please rate the extent to which the static PMSs in dynamic environments have affected or you believe could affect the implementation/achievement of successful PMS?

Explanation: The current business environment is characterised by the rapid changes in the internal and external organisations' environment, which results in dynamic markets and strategies. Addressing static PMSs in dynamic environments means that these systems are not updated and modified accordingly as the strategies and other crucial factors change.

1 Not at all	2	3	4	5	6	7 To a great extent

Section 7 (Organisational Performance):
In this section, we would like to gather information about your organisation's performance compared to your competitors.

26. How would you rate your performance relative to your competitors in terms of each of the following:
For measures that are not related to your business please choose the "Not related" option.

	1 Clearly worse	2	3	4	5	6	7 Clearly better	Not related
Operating income								
Sales growth								
Return on Investment (ROI)								
Net cash flows								
Market share								
Number of customer/client complaints								
Customers'/clients' satisfaction								
Customer/client growth								
Manufacturing lead time								
Level of errors								
Response time to business issues								

Overall Equipment Effectiveness (OEE)								
Employee satisfaction								
Training hours per employee per year								
Levels of IT application used								
Employee turnover								

Section 8 (Employee empowerment and engagement):
In this section, we would like to collect information about the level of employee engagement and empowerment at your organisation.

Please circle the number of the answer closest to your evaluation from Question No. 27 to Question No. 30.

1 Not at all	2	3	4	5	6	7 To a great extent

27. To what extent do the employees in your organisation have a high level of collaboration/involvement in decision making?
28. To what extent do official channels or certain norms or rules to guarantee their participation in the decision-making process exist in your organisation?
29. To what extent do the employees in your organisation contribute directly to the decision-making process, rather than through intermediaries (e.g. superiors)?
30. To what extent do the employees in your organisation have authority/power/influence to make and implement decisions about tasks?

31. **How would you rate the extent to which people at your organisation:**

	1 Never	2	3	4	5	6	7 Always	I don't have information
Feel bursting with energy								
Feel themselves strong and vigorous at their job								
Are enthusiastic about their job								
Feel like going to work when they get up in the morning								
Feel inspired by their job								
Feel happy when they are working intensely								
Are proud of the work they do								
Are immersed in their work								
Get carried away when they are working								

32. Would you like to provide us with your contact information for a further interview/discussion if needed?

☐ Yes ☐ No

Name: Phone number:
E-mail: LinkedIn:

Please feel free to add any comments, feedback, or suggestions.
Contact information (owais.lubna@eng.unideb.hu)

Thank you! We would like to thank you very much for your participation!

Appendix 3. Indicators' Loadings

Item	Outer loading
CPMS1	0.828
CPMS2	0.833
CPMS3	0.703
CPMS4	0.823
CPMS5	0.777
CPMS6	0.854
CPMS7	0.834
CPMS8	0.813
CPMS9	*0.688*
AL1	0.791
AL2	0.833
AL3	0.783
AL4	0.758
AL5	0.760
EX1	0.787
EX2	0.860
EX3	0.789
EX4	0.794
EX5	0.848
MO1	0.853
MO2	0.834
MO3	0.904
FIN1	0.894
FIN2	0.904
FIN3	0.895
FIN4	0.910
NONFIN1	0.746
NONFIN2	0.716
NONFIN3	0.795
NONFIN4	0.825
NONFIN5	0.755
NONFIN6	0.771
NONFIN7	0.873
NONFIN8	0.796
NONFIN9	0.809
NONFIN10	0.764
NONFIN11	0.759
NONFIN12	0.790
EMPW1	0.848
EMPW2	0.884
EMPW3	0.897
EMPW4	0.910
ENG1	0.729
ENG2	0.767
ENG3	0.721
ENG4	*0.685*
ENG5	*0.609*
ENG6	*0.699*
ENG7	0.780
ENG8	0.788
ENG9	0.702

Source: Author's own calculations (2024)

Appendix 4. Cross Loadings

Item	Construct							
	CPMS	AL	EX	MO	FIN	NON-FIN	EMPW	ENG
CPMS1	***0.828***	0.662	0.587	0.326	0.476	0.467	0.413	0.534
CPMS2	***0.833***	0.584	0.543	0.419	0.453	0.552	0.552	0.482
CPMS3	***0.703***	0.511	0.441	0.330	0.342	0.337	0.323	0.363
CPMS4	***0.823***	0.667	0.614	0.386	0.525	0.489	0.493	0.561
CPMS5	***0.777***	0.563	0.524	0.264	0.386	0.394	0.310	0.356
CPMS6	***0.854***	0.547	0.538	0.283	0.406	0.475	0.359	0.455
CPMS7	***0.834***	0.574	0.531	0.286	0.460	0.488	0.478	0.508
CPMS8	***0.813***	0.605	0.672	0.470	0.426	0.452	0.459	0.426
CPMS9	***0.688***	0.472	0.570	0.442	0.390	0.452	0.451	0.383
AL1	0.587	***0.791***	0.689	0.585	0.518	0.638	0.372	0.580
AL2	0.569	***0.833***	0.635	0.587	0.473	0.539	0.397	0.485
AL3	0.581	***0.783***	0.646	0.468	0.406	0.514	0.420	0.372
AL4	0.581	***0.758***	0.617	0.483	0.458	0.538	0.325	0.462
AL5	0.536	***0.760***	0.654	0.517	0.485	0.486	0.467	0.584
EX1	0.535	0.672	***0.787***	0.733	0.454	0.537	0.445	0.426
EX2	0.589	0.738	***0.860***	0.629	0.513	0.595	0.308	0.531
EX3	0.658	0.637	***0.789***	0.528	0.579	0.535	0.317	0.553
EX4	0.484	0.622	***0.794***	0.548	0.371	0.499	0.318	0.427
EX5	0.608	0.693	***0.848***	0.653	0.417	0.539	0.340	0.366
MO1	0.479	0.613	0.658	***0.853***	0.402	0.650	0.555	0.498
MO2	0.255	0.571	0.625	***0.834***	0.393	0.494	0.273	0.392
MO3	0.427	0.563	0.687	***0.904***	0.448	0.619	0.455	0.516
FIN1	0.534	0.635	0.618	0.571	***0.894***	0.739	0.499	0.624
FIN2	0.472	0.525	0.567	0.486	***0.904***	0.695	0.465	0.570
FIN3	0.420	0.424	0.371	0.322	***0.895***	0.629	0.385	0.497
FIN4	0.528	0.555	0.490	0.336	***0.910***	0.692	0.381	0.626
NONFIN1	0.579	0.541	0.566	0.538	0.741	***0.746***	0.503	0.566
NONFIN2	0.383	0.425	0.364	0.375	0.474	***0.716***	0.306	0.518
NONFIN3	0.523	0.639	0.547	0.516	0.512	***0.795***	0.510	0.622
NONFIN4	0.589	0.646	0.619	0.564	0.709	***0.825***	0.489	0.579
NONFIN5	0.402	0.452	0.479	0.506	0.619	***0.755***	0.522	0.478
NONFIN6	0.397	0.556	0.486	0.535	0.603	***0.771***	0.404	0.522
NONFIN7	0.539	0.599	0.557	0.562	0.701	***0.873***	0.615	0.621
NONFIN8	0.421	0.561	0.575	0.586	0.478	***0.796***	0.553	0.551
NONFIN9	0.431	0.583	0.576	0.545	0.622	***0.809***	0.416	0.648
NONFIN10	0.476	0.561	0.560	0.638	0.543	***0.764***	0.479	0.587
NONFIN11	0.285	0.414	0.391	0.449	0.525	***0.759***	0.381	0.450
NONFIN12	0.382	0.517	0.499	0.587	0.641	***0.790***	0.437	0.535
EMPW1	0.477	0.463	0.342	0.431	0.460	0.540	***0.884***	0.673
EMPW2	0.445	0.407	0.402	0.503	0.336	0.474	***0.897***	0.548
EMPW3	0.598	0.523	0.459	0.494	0.470	0.596	***0.910***	0.650
EMPW4	0.370	0.369	0.276	0.320	0.425	0.497	***0.849***	0.522
ENG1	0.495	0.464	0.459	0.342	0.519	0.524	0.384	***0.729***

ENG2	0.342	0.524	0.410	0.417	0.524	0.574	0.439	***0.767***
ENG3	0.361	0.463	0.347	0.393	0.367	0.445	0.453	***0.721***
ENG4	0.389	0.516	0.463	0.457	0.364	0.515	0.581	***0.685***
ENG5	0.411	0.330	0.288	0.318	0.386	0.421	0.431	***0.609***
ENG6	0.431	0.408	0.382	0.383	0.485	0.571	0.520	***0.699***
ENG7	0.393	0.534	0.474	0.544	0.434	0.574	0.693	***0.780***
ENG8	0.324	0.419	0.377	0.475	0.479	0.529	0.553	***0.789***
ENG9	0.546	0.446	0.427	0.222	0.582	0.443	0.384	***0.702***

Source: Author's own calculations (2024)

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