



**SELINUS UNIVERSITY**  
OF SCIENCES AND LITERATURE

**PROJECT MANAGEMENT AS A CRITICAL SUCCESS  
FRAMEWORK FOR DEVELOPMENT;  
A MANUFACTURING INDUSTRY PERSPECTIVE**

By

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MSc, MBA

A DISSERTATION

Presented to the Department of Project Management  
Program at Selinus University

Faculty of Business & Media

In fulfilment of the requirements for the degree of  
Doctor of Philosophy in Project Management

March 2023

## DECLARATION

The dissertation titled “PROJECT MANAGEMENT: A CRITICAL SUCCESS FRAMEWORK FOR DEVELOPMENT; A MANUFACTURING INDUSTRY PERSPECTIVE” submitted for the Award Philosophy Doctorate in Project Management at Selinus University of Sciences and Literature, Faculty of Business and Media; is my original work.

“I do hereby attest that I am the sole author of this project/thesis and that its contents are only the result of the readings and research I have done.”

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## Abstract

### **Background/Introduction:**

Project management is a crucial aspect of development as it helps organizations achieve their goals and objectives. A project management framework is a set of processes, tools, and techniques that guide the implementation of projects. This research focuses on the importance of project management framework in ensuring the success of projects and its impact on development. Project management frameworks are essential to completing projects successfully. They provide a structured approach to planning, executing, monitoring, and controlling projects, and help to ensure that project stakeholders work towards the same project goals and objectives. By identifying and managing risks, managing resources effectively, improving communication, and providing a framework for continuous improvement, project management frameworks help to ensure that projects are completed on time, within budget, and to the satisfaction of stakeholders. This paper aims to explore the role of project management framework as a critical success factor for development in the industry.

### **Aim**

This paper aims to explore the role of project management framework as a critical success factor for development viz-a-viz the manufacturing sector. It focuses on the importance of project management framework in ensuring the success of projects and its impact on development. The research intends to engage project management professionals and stakeholders in the industry and determine the most utilized project management knowledge area including project management frameworks that mostly impact the different phases of projects.

### **Methodology:**

The methodology utilized in this paper involves a broad literature review and case studies via engagement with professionals and stakeholders of project management. The literature review covers various areas, including project management, critical success factors, and the manufacturing industry. The review is conducted by searching electronic databases and relevant academic journals. The selected literature is then analyzed using thematic analysis to identify the key concepts and themes related to project management as a critical success framework for

development. In addition to the literature review, the paper also presents case studies from the manufacturing industry to illustrate the importance of project management in achieving successful project outcomes.

**Results:**

Among the project management frameworks examined to determine the vital critical success frameworks, the survey response analysis by the project management professionals revealed that project charter, cost/benefit analysis and stakeholder analysis were the most commonly utilized project management frameworks towards the successful implementation of projects in the manufacturing industry.

**Discussion / Conclusion:**

Based on the results of the investigation, it is possible to see the critical success frameworks that drive successful projects in the industrial sector. This research has been able to identify most impacted project management knowledge area in the industry. It has also revealed the top critical success framework utilized by project stakeholders such as project managers, project team members, project directors in the manufacturing industry. It is therefore safe to conclude that most project management professionals agree that the project charter is the most vital framework necessary in carrying out a project without neglecting the relevance for other frameworks.

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Project Management Institute, Inc. Article reuse guidelines: [sagepub.com/journals-permissions](http://sagepub.com/journals-permissions)  
DOI: 10.1177/8756972819827670 [journals.sagepub.com/home/pmx](http://journals.sagepub.com/home/pmx)

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## Nomenclature

PMBOK® - Project Management Body of Knowledge

PRINCE2® - PProjects IN Controlled Environments

AAPM® - American Association of Project Management

APM® - Association of Project Management

COMPTIA® - Computing Technology Industry Association

PMF – Project Management Framework

CSFW – Critical Success Framework

CSF – Critical Success Factor

PM – Project Management

CCB - Change control board

WBS - Work Breakdown Structure

## CHAPTER ONE

### Introduction

Projects are effective means for generating economic value for organisations, fostering a competitive advantage, and generating financial benefits. In the business and corporate world, the strategic significance of project management is progressively being recognised. Shenhar (2007) & Kendall (2003). The strong perception that project management and business strategy alignment can greatly increase the likelihood for firms to achieve their strategic objectives and improve performance may be a significant factor in this. Srivannaboon & Milosevic (2006).

The relevance of Project management has impacted various industries, including construction, software development, engineering, and healthcare. In the construction industry, project management is critical to the success of a project because it ensures that the project is completed within the defined scope, time, and budget. In the software development industry, project management helps to ensure that software projects are delivered on time, within budget, and to the desired quality standards. In the engineering industry, project management helps to ensure that engineering projects are delivered on time, within budget, and to the desired quality standards. In the healthcare industry, project management helps to ensure that healthcare projects are delivered on time, within budget, and to the desired quality standards.

Project management has become a critical aspect of the manufacturing sector, as it helps organizations to achieve their goals and objectives in a more efficient and effective manner. The impact of project management benefits in the manufacturing sector can be seen in various aspects such as cost savings, increased productivity, improved quality, and reduced time to market. This paper aims to discuss the impact of project management framework in the manufacturing sector and its significance in achieving organizational success.

### Project Management Definition

The Project Management Institute (PMI) defines a project as an endeavour that is undertaken to implement a unique product or service. This endeavour is considered to be temporary, have a definite beginning and closure. The completion of a project can be viewed as the accomplishment

of a certain goal and typically entails the application of resources to a sequence of activities or tasks (PMI, 2000)

A project is typically a one-time action with a clearly defined set of targeted end results, according to (Meredith and Mantel Jr., 2000). Project management is an integral part of the development process as it helps organizations achieve their goals and objectives. The success of a project depends on the effective management of various aspects, including time, resources, and budget. Project management framework is a set of processes, tools, and techniques that guide the implementation of projects. It offers a structured method of project management and aids in the accomplishment of organisational goals. The purpose of this essay is to investigate how important a project management framework is to development.

Project management has become a critical aspect in various industries, particularly the industrial sector. In recent years, the complexity of projects in the industrial sector has increased, requiring effective project management techniques to ensure successful completion. Project management techniques refer to the methodologies, processes, and tools used to plan, execute, and control projects effectively. The purpose of this research is to discuss the relevance of project management techniques in the industrial sector and their impact on project success.

The trajectory of the economy of nations is largely impacted by the industrial sector. Economic development refers to the process of improving the standard of living of a region's population through the creation of job opportunities and the provision of basic amenities. The success of any project aimed at promoting economic development depends on the ability of the project team to effectively manage the project from conception to completion.

The industrial sector may be exemplified as the economic power station, but it is the manufacturing sector that serves as the 'turbine engine' which drives economic expansion thereby providing the foundation for equitable and sustainable development (Li Yong, 2001). It is for this purpose that this research understudies the impact of project management as a success criteria framework for development in the manufacturing industry.

The industry has a huge influence on the direction of which currencies flow whether driven by goods or services. Project management framework play a vital role in ensuring the successful delivery of projects and, therefore, contribute to economic development.

Manufacturing industry plays a crucial role in the global economy, providing employment to millions of people and contributing to the growth of the economy. Effective project management is a critical factor in the success of manufacturing projects, and the use of appropriate project management frameworks can bring a range of benefits to the manufacturing industry. In this document, we will discuss the impact project management frameworks have on the manufacturing industry viz-a-viz the critical success framework.

Some of the project management frameworks and techniques commonly utilize to effectively execute projects in various industries include Kerzner, H. (2017):

#### Clear Objectives and Project Scope

The project objectives must be realistic and achievable, and the project scope must be clearly defined to ensure that all stakeholders have a clear understanding of what the project consists of and the relevant expectation of the objectives. Scope creep can be minimized by this, which can cause delays and increase costs, and ensure that the project stays on track.

#### Effective Communication

Project managers must ensure that all stakeholders are informed of project updates and that information is shared regularly. This helps to build trust and ensure that everyone is working towards the same goals. Project managers must also ensure that there is a clear and open line of communication between team members, so that problems can be addressed quickly and effectively.

#### Proper Resource Allocation

Proper resource allocation is also critical to project success. Project managers must ensure that they have the right resources in place, including personnel, equipment, and materials, to complete the project on time and within budget. They must also ensure that resources are used effectively and efficiently, and that they are deployed in a way that maximizes their potential.

## Risk Management

Projects are inherently risky, and project managers must be prepared to manage risks effectively. They must identify potential risks and develop mitigation strategies to minimize their impact on the project. Project managers must also regularly assess the risks associated with the project and update their risk management plans as necessary Hillson, D. (2002).

## Effective Leadership

Project managers must have the skills and experience necessary to lead a team of people, and they must be able to motivate and inspire their team members to achieve the project objectives. They must also have the ability to make tough decisions and resolve conflicts quickly and effectively.

## Budget and Financial Management

Project managers must ensure that they have a realistic budget in place and that they are able to manage project finances effectively. They must also monitor project expenses closely, and make adjustments as necessary, to ensure that the project stays on track and within budget.

## Time Management

Time management is also critical to project success. Project managers must ensure that they are able to manage project timelines effectively and that they are able to complete the project on time. They must also ensure that team members are aware of their deadlines and that they are able to meet these deadlines.

## CHAPTER 2

### Literature review

#### Project Management History

The concept of Project Management (PM) as a distinct field of study, with well-respected professional associations and widely used techniques and framework started to emerge about seven decades ago. Its methodologies and standards began to be recognised and adopted by groups such as PMBOK®, PRINCE2®, AAPM®, APM® and COMPTIA® in recent times.

In the last two decades, research on PM framework and its techniques has seen a tremendous increase due to its applicability and perceived success in the industry. The practise of PM is applicable in a wide variety of industry and business organizations as professionals are beginning to utilize the same in their various programmes and projects (Carden and Egan, 2008).

Numerous strategies and techniques have been created throughout the years for use in project management in response to ever-increasing business challenges. In addition, a huge number of associations and institutions have been established globally, countless educational programmes have been launched, professional conferences are hosted, and academic articles have all been published with the aim of improving the techniques of project management. Integration and coordination of tasks, people, organisations, and resources are essential to successful project management to achieve the desired outcome.

Furthermore, there is a branch of research within the canon of project management literature that investigates what are known as critical success factors (CSFs). (CSFs) were initially utilized by Rockart (1979). to refer to the essential components necessary for the accomplishment of any given project. According to (Inayat, et al 2014), there is a general agreement among researchers that a significant portion of the success of projects is dependent on the presence or absence of CSFs. The authors state that professionals should carefully observe CSFs due to their impact on project performance.

However, despite the fact that CSFs are recognised as being important, there are not many studies that aim to provide sets of CSFs for particular projects, and there are even fewer studies that have



sought to empirically identify the relation between these factors and the success of projects. Ika, Diallo, & Thullier (2012).

To be more specific, there is a gap in the research that has been done in the field of project manufacturing in the scientific literature; specifically, there are no works that demonstrate the CSFWs that can influence the performance of projects that are carried out in this environment.

(Antonio et al, 2019) developed a framework that enables the identification of the CSFs that affect the success of projects in manufacturing sector. They were able to identify the factors which reveal CSF's compatibility with project manufacturing environments; and to assess the degree to which CSFs have a statistically significant impact on the likelihood of project success.

### [Project Management Framework](#)

Project management framework (PMF) is a set of guidelines, processes, and techniques that organizations can use to manage and execute projects successfully. The success of any project depends on various factors. Effective project management frameworks are crucial for the economic development of corporations as they help organizations to achieve their project objectives efficiently and effectively (Ogunlana, S. O. (2010).

Using a project management framework primarily serves to boost organisational value (Dalcher, 2012). By boosting the effectiveness of human effort inside the organisation while increasing the efficiency of these efforts, the organisation can gain by employing a project management framework.

Accordingly, the effectiveness of a project in delivering the desired goals in the short, medium, and long terms is used to determine its success (Jugdev et al., 2001).

PMF is crucial for the success of projects as it provides a structured approach to project management. It helps organizations define their objectives, identify the resources required, and allocate the budget. It also provides a clear understanding of the project scope, timeline, and risks involved. PMF helps organizations to monitor the progress of projects, identify any issues, and make necessary changes to ensure the success of the project.

PMF is a critical success factor for the manufacturing industry, as it enables companies to effectively plan, organize, execute, and monitor their projects. The manufacturing industry, like any other industry, relies heavily on project management to successfully deliver projects on time and within budget. This paper will discuss the role of project management framework in the manufacturing industry, its benefits, and the key elements that make it a critical success factor Project Management Institute. (2017).

### **Analysis of Project Management Frameworks**

There are various project management frameworks that organizations can use to guide the implementation of their projects. Some of the most commonly used project management frameworks include the Project Management Institute's (PMI) Project Management Body of Knowledge (PMBOK), Prince2, Scrum, and Lean.

PMBOK is a widely recognized project management framework that provides a comprehensive approach to project management. It is based on a set of processes, tools, and techniques that help organizations achieve their goals and objectives effectively. Prince2 is a project management framework that provides a structured approach to project management and helps organizations to deliver projects on time and within budget.

Scrum is an Agile project management framework that provides a flexible approach to project management. It helps organizations to respond to changes and deliver projects in a fast-paced environment. Lean is a project management framework that focuses on the elimination of waste and maximizing efficiency. It helps organizations to identify and eliminate inefficiencies in their processes and improve the overall quality of their projects.

The key elements of a project management framework that make it a critical success factor for the manufacturing industry include clear project goals, well-defined project plans, effective communication, and the use of project management tools. The project goals should be clearly defined and aligned with the company's business objectives. The project plan should include the timeline, budget, and resources required to complete the project. Effective communication is also critical, as it helps to ensure that all stakeholders understand the project's goals and timeline. The use of project management tools such as Gantt charts, project management software, and risk management tools is also essential to help companies to monitor and control their projects.

The Project Management Framework (PMF) provides organizations with a systematic approach to project management. It outlines the processes, techniques, and tools required to manage projects effectively. PMF can help organizations to:

- Define project goals and objectives.
- Identify and manage project risks.
- Allocate and manage project resources.
- Monitor project progress and make necessary adjustments.
- Ensure project delivery within the agreed time and budget.

By using a PMF, organizations can ensure that projects are delivered on time, within budget, and to the required quality standards. This helps to increase the chances of project success and contributes to economic development Project Management Institute (2017). A well-structured PMF can help organizations to (Turner, J. R. (2006).:

- Identify and prioritize projects that will have the greatest impact on economic development.
- Ensure that resources are allocated effectively to support the delivery of these projects.
- Minimize the risk of project failure, which can have a negative impact on economic development.
- Monitor project progress and make necessary adjustments to ensure project success Dinsmore, P. C. (2002).

There is a gap in the research that has been done in the field of PM as a critical success framework in the scientific literature; specifically, there are no works that demonstrate the CSFWs that can influence the performance of projects for the manufacturing industry.

### [The Manufacturing Industry](#)

The importance of project management in the manufacturing sector has grown substantially, as businesses strive to remain competitive and deliver quality products to their customers. The impact of project management can be seen in various aspects of the manufacturing sector, including product design, production planning, and project execution. The purpose of this document is to

explore the impact of project management on the manufacturing sector and provide a comprehensive analysis of the relevant literature.

My work experience in food and automotive manufacturing companies like The Coca-Cola company, HBC Hellenic and Jaguar Land Rover cars raised my awareness to the relevance of effective project management strategies to operational excellence. The increasing demand for competent project managers has led many industries to recognize the benefits Project management can bring to their operations. The manufacturing sector is no exception, and it is now widely recognized that effective project management can have a significant impact on the success and efficiency of manufacturing operations. This document will examine the impact of project management in the manufacturing sector and explore how project management frameworks can be used to improve processes, increase productivity and ultimately achieve better business results.

One of the critical aspects of manufacturing is production planning which is a critical aspect of the manufacturing sector, as it determines the timing and execution of the production process. Project management can have a significant impact on production planning by providing a structured approach to the production process, ensuring that resources are effectively managed, and that project goals are met. According to Green (2009), project management can help to improve the efficiency of the production process by reducing waste, reducing cycle time, and increasing productivity.

Furthermore, Project management can also help to reduce the risk of project delays by providing a clear project plan and timeline, thereby reducing the risk of production delays. By effectively managing resources, project management can help to minimize the cost of production, ensuring that the project is completed within budget. Likewise, project management can help to ensure that the production process meets the needs and expectations of the customer, as project managers can engage with stakeholders to understand their requirements and ensure that the production process is aligned with the customer's needs.

Project execution phase is also among the manufacturing process, and it is critical to the success of the project. Project management can have a significant impact on project execution by ensuring that the project is executed according to plan, that resources are effectively managed, and that project goals are met. According to Martin (2010), project management can help to improve the

quality of the project execution by providing a structured approach to the project, improving communication between stakeholders, and reducing the risk of project failure.

### **Benefits of Project Management in Manufacturing**

One of the key benefits of project management in the manufacturing sector is that it helps to improve the overall efficiency and productivity of operations. This is achieved through the use of a structured approach to project management, which ensures that all tasks are completed on time and to a high standard. This can help to reduce waste and increase the speed of production, ultimately resulting in increased profitability.

Product design is also a critical component of the manufacturing process, as it determines the functionality, appearance, and competitiveness of the product. Project management can have a significant impact on product design by ensuring that the project is executed according to plan, that resources are effectively managed, and that project goals are met. Consenting to Lewis (2006), project management can help to improve the quality of the product design by providing a structured approach to product development, improving communication between stakeholders, and reducing the risk of project failure.

Another important benefit of project management in the manufacturing sector is that it can help to ensure that projects are completed within budget. This is achieved through the use of a well-structured project plan, which identifies all the tasks and resources required for a project and provides a clear timeline for completion. This helps to ensure that projects are completed within budget, and reduces the risk of overspending, which can negatively impact profitability.

Effective project management can as well help to improve communication and collaboration between departments and stakeholders, which can be particularly important in the manufacturing sector. This is achieved through regular meetings and updates, which ensure that everyone is informed of the project's progress and any changes that are required. This can help to avoid misunderstandings and reduce the risk of errors or delays, ultimately improving the overall success of the project.

Another benefit of project management in the manufacturing sector is that it helps to ensure that projects are completed to the required quality standard. This is achieved through the use of regular quality checks and inspections, which help to identify any issues or problems that may impact the quality of the finished product. This helps to ensure that all products are of a high standard, which can help to build a reputation for quality and increase customer satisfaction.

Finally, project management in the manufacturing sector can help to improve the overall sustainability of operations. This is achieved through the use of best practices and techniques, which help to reduce waste and improve the use of resources. This can help to reduce the environmental impact of operations, which can be important in an increasingly environmentally conscious world Kumar, P., & Singh, R. K. (2020)

### Project management methodologies

There are several project management methodologies that are used in the industrial sector, including Waterfall, Agile, Scrum, and Lean. Each methodology has its own strengths and weaknesses and is best suited to specific projects and contexts. Jadhav et al (2019)

T. Wang and K. Conboy (2014) defined Waterfall as a sequential approach to project management that is well-suited to projects that have well defined requirements and a clear end-product. The approach is characterised by a series of stages, each of which must be completed before the next stage can begin. The Waterfall approach is often used in projects that involve complex processes or technical systems and where there is a need to ensure that the project is completed within a defined period and budget.

Agile is a flexible and iterative approach to project management that is best suited to projects that are rapidly changing or where requirements are not well-defined. Agile projects are characterized by regular sprints, in which the project team delivers a working prototype that is reviewed and refined. This approach is often used in projects where speed and responsiveness are critical, and where there is a need to respond quickly to changes in the market or technology Sutherland, J., & Schwaber, K. (2011).

Scrum is a subset of Agile Project management and is best suited to projects that are complex and rapidly changing. The approach is characterised by regular sprints and daily stand-up meetings, in which the project team updates the stakeholders on progress. Scrum is often used in projects where there is a need for close collaboration between the project team and stakeholders, and where the projects require a high level of adaptability and flexibility.

Lean is a project management methodology that is based on the principles of Lean manufacturing and is best suited to projects that require a high level of efficiency and process improvement. The Lean approach is characterized by a focus on minimizing waste and maximizing value, and by using a continuous improvement cycle to refine processes and remove inefficiencies. This approach is often used in projects where there is a need to optimize processes and reduce costs Shah, R., & Ward, P. T. (2003).

### [Project Management Knowledge Areas and the Manufacturing Perspectives](#)

Project management has evolved as a discipline and is widely recognized as a critical success framework for development, both in the private and public sector. It is a systematic approach to the coordination of resources and activities required to achieve project objectives.

Project management is a complex process that requires the coordination of many different elements, and it is essential for project managers to understand and address the critical success factors that determine project success. By understanding and addressing these critical success factors, project managers can increase the chances of project success, minimize risks, and ensure that projects are completed on time and within budget.

Antonio et al (2019). conducted research to uncover and comprehend the connection between project performance and the critical success factors (CSFs) of manufacturing environments for projects. Using a sample of 182 respondents, this article investigated those correlations using the logistic regression method and quantifies the impact of CSFs on success attainment across four dimensions (efficiency, impact on consumers, impact on the team, and preparation for the future). The findings demonstrate that not all CSFs are important in predicting project success. Project managers must therefore assess each factor's influence and take it into account when making decisions.

Livia Ecaterina (2018) claims that even in the setting of a military installation, which is typically thought of as pyramidal and less saturated with creativity and initiative, the application of the fundamentals of project management may help to successfully implement a new educational programme.

Research to examine critical success factors in Project Management to the manufacturing industry is narrow in the current research literature therefore, this project research will focus on the manufacturing industry. There are several principles of project management that are critical for success. One of the key principles is to define project objectives clearly and precisely. This involves the development of a project charter, which outlines the project's purpose, goals, and stakeholders. Another principle of project management is to develop a comprehensive project plan, including a detailed description of the tasks to be completed, the resources required, and the timeline for completion. The project plan must be regularly reviewed and updated to ensure that the project remains on track.

Therefore, this research will examine the importance of project management as a critical success framework for development, focusing on the following knowledge areas.

1. Communications Management
2. Cost Management
3. Procurement Management
4. Schedule Management
5. Quality Management
6. Scope Management
7. Stakeholder Management
8. Resource Management
9. Risk Management

Therefore, I would be defining the above knowledge areas and why they are important.



## **Communication Management**

Effective communication is the cornerstone of project management. Communication management in project management involves the planning, execution, monitoring, and control of project communication. Communication management is crucial for project success as it ensures that project team members and stakeholders have a common understanding of the project goals, objectives, and expectations. This paper examines the importance of communication management in project management, its benefits, and how it can be implemented.

Communication is critical in project management. It is the process by which information is exchanged among project stakeholders to ensure that everyone is on the same page. Effective communication is essential to project success as it ensures that all stakeholders are aware of the project goals, objectives, and expectations. Communication management is a key aspect of project management. It involves the planning, execution, monitoring, and control of project communication. Effective communication management can help project managers to identify and address potential communication barriers, reduce risks, and ensure that project stakeholders are adequately informed. This paper examines the importance of communication management in project management, its benefits, and how it can be implemented.

### **Importance of Communication Management in Project Management:**

Effective communication management is crucial for project success. Project managers who fail to communicate effectively risk project failure. Effective communication management helps project managers to ensure that project team members and stakeholders have a common understanding of project goals, objectives, and expectations. Communication management also helps to identify potential communication barriers that may impede the project's progress.

Communication management is also critical for project risk management. Project risks can be identified, assessed, and managed through effective communication management. Project managers can use communication management to identify and address potential risks before they become major issues.

Effective communication management also improves project team morale. When project team members have a clear understanding of project goals and expectations, they are more likely to be

motivated and committed to the project. This can lead to improved project team performance and increased project success. Kliem, R. L., & Ludin, I. S. (1998).

#### Benefits of Communication Management in Project Management:

Effective communication management provides several benefits for project management. These include:

**Increased project success:** Effective communication management helps to ensure that all project stakeholders are on the same page. This can help to reduce misunderstandings and increase project success.

**Improved project team morale:** Clear communication of project goals and expectations can help to motivate and inspire project team members. This can lead to improved project team performance and increased project success. Cleland, D. I., & Ireland, L. R. (2004)

**Reduced project risks:** Effective communication management can help to identify and address potential project risks. This can help to reduce project risks and improve project success.

**Improved stakeholder relationships:** Effective communication management can help to improve stakeholder relationships. When stakeholders are adequately informed and involved in the project, they are more likely to support the project and its goals.

#### Implementing Communication Management in Project Management:

Effective communication management requires a systematic approach. The following steps can be used to implement communication management in project management:

**Develop a communication plan:** A communication plan should be developed at the beginning of the project. The plan should identify project stakeholders, communication channels, and communication frequency.

**Identify communication barriers:** Potential communication barriers should be identified and addressed. This may include language barriers, cultural differences, and technology limitations.

**Use appropriate communication channels:** Appropriate communication channels should be used for each stakeholder. This may include face-to-face meetings, emails, phone calls, and video conferencing.

Monitor and control project communication: Project communication should be monitored and controlled to ensure that project stakeholders are adequately informed. Kerzner, H. (2017).

## **A Manufacturing Perspective**

Introduction:

Effective communication is a critical component of successful manufacturing industry operations. Clear and concise communication is essential in coordinating the various stages of production, managing relationships with suppliers and customers, ensuring product quality, and maintaining a safe work environment. This document will explore the benefits of communications management in the manufacturing industry, highlighting the latest research and literature in the field. Attaran, M. (2012).

Improved Coordination and Collaboration:

Effective communication is key to ensuring that all employees understand their roles and responsibilities in the production process. A clear and well-structured communication system can help to eliminate confusion and ensure that everyone is working towards the same goals. By facilitating collaboration between departments, managers, and employees, manufacturing companies can ensure that processes are streamlined and efficient, ultimately leading to improved productivity.

According to a study by the International Journal of Management, Information, and Technology, effective communication can improve manufacturing productivity by up to 25%. Furthermore, the study found that companies with a high level of communication had lower rates of defects and rework, indicating a positive impact on product quality. Attaran, M. (2012).

### **Enhanced Customer Satisfaction:**

Effective communication with customers is essential in the manufacturing industry. It enables manufacturers to understand customer needs and expectations, address concerns, and resolve issues in a timely manner. By engaging in open and transparent communication, manufacturers

can build trust and long-term relationships with customers, ultimately leading to increased customer satisfaction.

A study published in the *Journal of Manufacturing Technology Management* found that effective communication with customers leads to increased customer satisfaction, loyalty, and repeat business. The study also found that companies that communicate effectively with customers tend to have a more favourable reputation in the marketplace. Montabon, F., et. al. (2014).

#### Improved Safety:

Effective communication is essential in maintaining a safe working environment in the manufacturing industry. Clear communication channels help to ensure that employees are aware of potential hazards and are able to take appropriate action to mitigate risks. Additionally, effective communication can help to promote a safety culture in the workplace, encouraging employees to report incidents and near-misses. Singh, R. K., et. al. (2008).

Research by the *International Journal of Industrial Ergonomics* has shown that effective communication is critical in reducing workplace accidents and injuries. The study found that companies with good communication practices had lower rates of accidents and were able to identify potential hazards more quickly, leading to faster remediation.

Therefore, effective communication is essential in the manufacturing industry, enabling companies to improve coordination and collaboration, enhance customer satisfaction, and maintain a safe working environment. By investing in communications management, manufacturers can increase productivity, reduce costs, and ultimately achieve greater success in the marketplace. The latest research and literature in the field provide ample evidence of the benefits of effective communication in the manufacturing industry, highlighting the importance of developing and implementing clear communication strategies in this highly competitive sector. Zarei, E., et al. (2017).

## **Cost Management**

Cost management is one of the most crucial aspects of project management, which involves the process of planning, budgeting, monitoring, and controlling the financial resources of a project to ensure that it is completed within the allocated budget. Effective cost management helps project managers to achieve the project objectives and meet stakeholder expectations while ensuring profitability for the organization.

### **Importance of Cost Management in Project Management:**

Cost management is an essential component of project management as it enables project managers to plan and control project expenses. Ineffective cost management can lead to project failure, cost overruns, and budget deficits. Thus, cost management is crucial to ensure that a project is completed within budget, on time, and to the desired quality.

The benefits of effective cost management in project management are numerous. Firstly, cost management ensures that the project is completed within the allocated budget, which is critical for the financial viability of the project. Secondly, cost management enables project managers to identify potential cost overruns and take corrective action before it is too late. Thirdly, cost management helps in prioritizing resources and allocating them effectively to optimize project delivery.

### **Techniques and Tools used in Cost Management:**

The following are some of the techniques and tools used in cost management in project management:

**Cost Estimation:** This involves estimating the total cost of the project based on the project scope, time, and resource requirements. This includes determining the cost of labor, materials, equipment, and other expenses related to the project.

**Cost Budgeting:** This involves allocating the total cost estimate to various tasks and activities within the project. This helps in identifying the resources required for each task and ensures that the project is completed within the allocated budget. (PMBOK® Guide) – Sixth Edition. (2017)

**Cost Control:** This involves monitoring and controlling project costs to ensure that the project is completed within the allocated budget. This includes identifying cost variances, analyzing the root cause of the variance, and taking corrective action.

**Earned Value Management (EVM):** This is a technique used in cost management to track the progress of the project against the planned budget. EVM helps in identifying cost and schedule variances and provides an objective measurement of project performance. Fleming, Q. W., & Koppelman, J. M. (2016).

**Life Cycle Costing (LCC):** This involves estimating the total cost of the project over its entire life cycle, including the cost of maintenance, repair, and disposal. LCC helps in making informed decisions regarding the project's financial viability. Kwakye, A. A., & Osei-Kyei, R. (2018).

Therefore, effective cost management enables project managers to achieve project objectives, meet stakeholder expectations, and ensure profitability for the organization. The techniques and tools used in cost management, such as cost estimation, cost budgeting, cost control, EVM, and LCC, help project managers in planning, monitoring, and controlling project costs. By implementing these techniques and tools, project managers can ensure that their projects are completed within budget, on time, and to the desired quality.

## **A Manufacturing Perspective**

Cost management is an important aspect of the manufacturing industry, where the effective control of expenses can help improve profitability, reduce waste, and increase efficiency. Some of the advantages include:

**Improved Profitability:** Cost management helps manufacturers reduce expenses, which in turn improves their profitability. By implementing effective cost management strategies, companies can reduce their costs and increase their profits. This can be achieved by identifying cost-saving opportunities, reducing waste, and improving efficiency. According to a study by Deloitte, companies that implemented cost management programs experienced an increase in profitability of up to 5% per year. (Deloitte, 2021)

**Increased Efficiency:** Cost management can help manufacturers identify inefficiencies in their processes and eliminate them. This can lead to increased productivity and reduced lead times. By reducing lead times, companies can improve their customer service and responsiveness, which can lead to increased customer satisfaction and loyalty. According to a study by the National Institute of Standards and Technology (NIST), companies that implemented cost management programs experienced a 20% increase in productivity. (NIST, 2021)

**Reduced Waste:** Cost management helps manufacturers identify areas of waste in their operations and eliminate them. By reducing waste, companies can reduce their environmental impact and improve their sustainability. Additionally, reducing waste can also lead to cost savings by eliminating the need to purchase excess materials or dispose of waste products. According to a study by the Environmental Protection Agency (EPA), companies that implemented cost management programs experienced a 20-30% reduction in waste. (EPA, 2021)

**Improved Decision Making:** Cost management provides manufacturers with valuable insights into their operations, which can help them make informed decisions. By analysing cost data, companies can identify areas where they can cut costs, optimize their processes, and improve efficiency. This can help them make strategic decisions that align with their business goals and objectives. According to a study by McKinsey & Company, companies that implemented cost management programs experienced a 5-10% improvement in decision-making ability. (McKinsey & Company, 2021)

Therefore, cost management is a critical aspect of the manufacturing industry that can help companies improve their profitability, increase efficiency, reduce waste, and make informed decisions. By implementing effective cost management strategies, companies can optimize their operations and achieve long-term success.

## **Procurement Management**

Procurement management is a critical aspect of project management that involves the acquisition of goods and services from external sources to support the project's goals and objectives. Effective procurement management ensures that project resources are acquired at the right price, quality,

and time to enable the project team to deliver within the set budget, schedule, and quality standards. Pinto, J. K. (2016).

#### Procurement Management Processes:

Procurement management involves several key processes, including procurement planning, solicitation planning, solicitation, source selection, contract administration, and contract closeout. Procurement planning is the process of determining what goods and services the project requires, identifying potential suppliers, and developing a procurement strategy that aligns with the project's goals and objectives. The solicitation planning process involves defining the procurement requirements, preparing the procurement documents, and identifying potential suppliers. The solicitation process entails inviting suppliers to submit proposals or bids, evaluating the proposals, and selecting the best supplier. The source selection process involves evaluating suppliers based on several criteria, such as price, quality, and delivery time, and selecting the supplier that best meets the project's needs. Kerzner, H. (2017).

The contract administration process involves managing the relationship with the selected supplier, monitoring supplier performance, and resolving any issues that arise during the procurement process. Finally, the contract closeout process involves completing all contractual obligations, finalizing payment, and evaluating the supplier's performance to identify areas for improvement in future procurements.

A well-defined procurement strategy helps project teams identify potential suppliers, establish procurement objectives, and develop procurement plans that align with the project's goals and objectives. Conducting market research enables project teams to identify potential suppliers, understand market trends, and negotiate better prices and terms. Clear contract terms and conditions help project teams avoid misunderstandings with suppliers and minimize the risk of legal disputes.

#### Procurement Management Tools:

Procurement management employs several tools, including procurement software, supplier databases, and request for proposal (RFP) templates. Procurement software automates the procurement processes, enabling project teams to manage procurement activities efficiently. Supplier databases provide project teams with a list of potential suppliers, their capabilities, and



their performance history, enabling project teams to select the best suppliers based on their needs. RFP templates provide project teams with a standard format for soliciting proposals from suppliers, enabling project teams to evaluate suppliers consistently. Schwalbe, K. (2019).

## **A Manufacturing Perspective**

Procurement management is a crucial process in the manufacturing industry as it involves the acquisition of goods and services from suppliers. It involves the identification of requirements, supplier selection, and negotiation of contracts. Effective procurement management can lead to several benefits for the manufacturing industry.

**Benefits of Procurement Management:**

**Cost Savings:** Effective procurement management can help manufacturing companies reduce costs by negotiating better prices with suppliers and sourcing materials and services more efficiently. According to a study by McKinsey & Company, companies that optimize their procurement processes can reduce costs by up to 15% (McKinsey & Company, 2018).

**Improved Supplier Relationships:** Procurement management can also lead to improved relationships with suppliers, which can result in better quality materials, faster delivery times, and better prices. Building strong relationships with suppliers can help manufacturing companies mitigate supply chain risks and improve their overall operations (Kale & Singh, 2009).

**Increased Operational Efficiency:** Procurement management can help manufacturing companies streamline their processes and reduce waste by ensuring that the right materials and services are available at the right time. This can lead to increased efficiency and productivity, which can translate into higher profits (Cavinato, 2004).

**Better Risk Management:** Effective procurement management can help manufacturing companies mitigate supply chain risks by identifying potential risks and developing contingency plans. This can help companies avoid disruptions in their supply chain and ensure that they can continue to operate even in the face of unexpected events (Eisenhardt & Sull, 2001).

Innovation: Procurement management can also facilitate innovation by enabling manufacturing companies to access new technologies and ideas through their relationships with suppliers. This can help companies develop new products and services and gain a competitive advantage in their industry (Luzzini et al., 2015).

Therefore, procurement management can provide several benefits to the manufacturing industry, including cost savings, improved supplier relationships, increased operational efficiency, better risk management, and innovation. By optimizing their procurement processes, manufacturing companies can improve their overall operations and gain a competitive advantage in their industry. The benefits of procurement management are supported by numerous studies and reports, and companies that invest in their procurement processes can expect to see significant returns on their investment.

## **Schedule Management**

Schedule management is a critical component of project management. Efficient schedule management ensures that projects are completed within the agreed timeline, thereby meeting project objectives and ensuring client satisfaction. It ensures that projects are completed on time and within budget, thereby meeting project objectives and satisfying clients.

Poor schedule management can result in missed deadlines, budget overruns, and unsatisfied clients. Schedule management also plays a vital role in risk management, allowing project managers to identify potential delays and take appropriate actions to mitigate them.

### **Methods of Schedule Management**

Several methods are used in schedule management, including:

#### **Critical Path Method (CPM)**

CPM is a technique used to identify the critical path in a project, which is the longest sequence of activities that must be completed on time for the project to be completed within the agreed timeline. CPM is widely used in construction and engineering projects. Stuckenbruck, L. C. (2015).

## Program Evaluation and Review Technique (PERT)

PERT is a technique used to estimate the time required to complete a project based on three time estimates: optimistic, pessimistic, and most likely. PERT is commonly used in research and development projects. Stuckenbruck, L. C. (2015).

## Agile Methodology

Agile methodology is a flexible and iterative approach to project management that emphasizes collaboration, customer satisfaction, and rapid delivery of working software. Agile methodology is commonly used in software development projects. Sutherland, J., & Schwaber, K. (2011).

Several best practices can help ensure effective schedule management, including:

### Develop a realistic schedule

It is essential to develop a realistic schedule that considers all project activities and their interdependencies. The schedule should also include appropriate contingency plans to account for potential delays.

### Regularly review and update the schedule

Project schedules should be reviewed and updated regularly to ensure that they remain accurate and relevant. This helps to identify potential delays and allows project managers to take appropriate actions to mitigate them. Project Management Institute. (2017).

### Communicate with stakeholders

Effective communication with stakeholders is essential to ensure that they are aware of the project schedule and any potential delays. This helps to manage expectations and ensures that stakeholders are satisfied with the project outcome.

Therefore, schedule management helps to ensure that projects are completed on time and within budget, thereby meeting project objectives and satisfying clients. Several methods are used in schedule management, including critical path method, program evaluation and review technique, and agile methodology. Best practices in schedule management include developing a realistic schedule, regularly reviewing and updating the schedule, and communicating with stakeholders.

By following these best practices, project managers can ensure that their projects are completed successfully.

## **A Manufacturing Perspective**

Schedule management refers to the process of creating, implementing, and controlling schedules to achieve specific goals and objectives. In the manufacturing industry, efficient schedule management is crucial to ensure the smooth flow of operations, minimize downtime, and reduce costs.

Schedule Management in the Manufacturing Industry reveals some benefits which are:

**Improves Production Efficiency:** Efficient schedule management ensures that resources are allocated optimally to achieve maximum production efficiency. This includes the scheduling of raw materials, machines, and personnel to ensure that the production process runs smoothly, and there are no bottlenecks. Studies have shown that effective schedule management can improve production efficiency by up to 20% (Chandra and Fisher, 1994).

**Reduces Lead Times:** Effective schedule management can help to reduce lead times, which is the time taken between placing an order and receiving the finished product. By optimizing production schedules, manufacturers can reduce lead times and improve customer satisfaction. A study by Barzegar and Kianpour (2013) found that effective schedule management reduced lead times by up to 30%.

**Reduces Inventory Costs:** Efficient schedule management helps to reduce inventory costs by ensuring that raw materials and finished goods are produced and delivered just in time. This eliminates the need for manufacturers to hold excess inventory, which can be costly. A study by Pinedo (2012) found that effective schedule management reduced inventory holding costs by up to 50%.

**Improves Resource Utilization:** Effective schedule management helps to optimize the utilization of resources such as machines, labor, and raw materials. This ensures that resources are utilized to their full capacity, minimizing waste and reducing costs. A study by Lin et al. (2014) found that effective schedule management improved resource utilization by up to 15%.

Improves Quality Control: Effective schedule management ensures that the production process is well-planned, and quality control measures are implemented at every stage of the process. This reduces the likelihood of defects and rework, improving the overall quality of the finished product. A study by Zhang et al. (2017) found that effective schedule management improved product quality by up to 25%.

From these, we can conclude that schedule management helps to improve production efficiency, reduces lead times, reduces inventory costs, improves resource utilization, and improves quality control. The benefits of schedule management in the manufacturing industry have been documented in various studies and research, highlighting the importance of effective schedule management for manufacturers.

## **Quality Management**

Quality Management is an essential aspect of Project Management, ensuring that the final product meets the expected quality standards. Quality Management in Project Management involves managing and controlling the project's processes and activities to ensure that they meet the required quality standards.

In today's competitive business environment, Quality Management is essential for successful project execution. According to (Tummala & Tang, 2007), Quality Management in Project Management involves the use of processes, procedures, and tools to ensure that the project delivers a product or service that meets or exceeds the customer's expectations. Quality Management also involves continuous improvement of the project's processes to achieve the desired quality standards.

One of the most widely used Quality Management frameworks in Project Management is the ISO 9001:2015 Quality Management System Standard. According to (ISO, 2015), the ISO 9001 standard provides a framework for implementing Quality Management in any organization, including Project Management. The standard outlines a set of requirements that organizations must meet to achieve certification, including the need to establish a Quality Management System, document procedures, and continuously improve the system.

Several studies have been conducted to explore the impact of Quality Management on project success. According to (Ho & Liu, 2017), Quality Management practices, such as quality planning, quality control, and quality assurance, have a significant positive impact on project success. The study also found that effective Quality Management practices can increase customer satisfaction and reduce costs associated with rework and defects.

Another study conducted by (Kwak & Anbari, 2009) found that Quality Management practices, such as Quality Planning, Quality Control, and Quality Assurance, are essential for project success. The study also found that the use of Quality Management practices can lead to increased productivity, reduced project costs, and improved customer satisfaction.

The implementation of Quality Management in Project Management involves the use of various processes and tools to ensure that the project delivers a product or service that meets or exceeds the customer's expectations. One of the essential processes in Quality Management is Quality Planning. Quality Planning involves defining the quality standards and requirements for the project and developing a plan to achieve those standards. Quality Planning should be done at the beginning of the project and should involve all stakeholders to ensure that everyone's expectations are met.

Another important process in Quality Management is Quality Control. Quality Control involves monitoring the project's processes and activities to ensure that they meet the defined quality standards. Quality Control should be conducted throughout the project to detect and correct any quality issues before they become more significant problems.

Quality Assurance is another essential process in Quality Management. Quality Assurance involves ensuring that the project's processes and activities comply with the established quality standards. Quality Assurance should be conducted by an independent team to ensure that the project is meeting the required quality standards.

Therefore, Quality Management is an essential aspect of Project Management, ensuring that the final product meets the expected quality standards. The effective implementation of Quality Management in Project Management involves the use of processes, procedures, and tools to ensure that the project delivers a product or service that meets or exceeds the customer's expectations. Quality Management practices, such as Quality Planning, Quality Control, and Quality Assurance,

have a significant positive impact on project success, including increased productivity, reduced project costs, and improved customer satisfaction.

## **A Manufacturing Perspective**

Quality management is an essential aspect of any manufacturing industry as it ensures that products are made to meet the required specifications, standards, and customer expectations. Quality management involves the use of various tools, techniques, and methodologies to ensure that quality standards are met consistently throughout the production process.

**Improved Customer Satisfaction:** One of the primary benefits of quality management in the manufacturing industry is improved customer satisfaction. When products are made to meet the required specifications, standards, and customer expectations, customers are more likely to be satisfied with the product. This leads to increased customer loyalty, repeat business, and positive reviews, which can help to improve the reputation of the manufacturing company. According to a study by Juran (1992), customer satisfaction is the ultimate goal of quality management.

**Increased Efficiency:** Quality management can help to increase efficiency in the manufacturing industry by reducing waste, defects, and rework. By identifying and eliminating non-value-added activities, manufacturers can streamline their processes and reduce lead times, which can lead to increased productivity and profitability. According to a study by Antony and Banuelas (2002), quality management can improve process efficiency by up to 50%.

**Reduced Costs:** Quality management can also help to reduce costs in the manufacturing industry by reducing waste, defects, and rework. By identifying and eliminating non-value-added activities, manufacturers can reduce the cost of production and improve their profitability. According to a study by Rebitzer et al. (2007), quality management can reduce costs by up to 20%.

**Improved Supplier Relationships:** Quality management can also help to improve supplier relationships in the manufacturing industry. By working closely with suppliers to ensure that they meet the required quality standards, manufacturers can build stronger relationships and reduce the risk of quality issues. According to a study by Hendricks and Singhal (2003), supplier quality management can lead to improved supplier performance and increased supplier loyalty.

Therefore, quality management is an essential aspect of the manufacturing industry, and it has many benefits, including improved customer satisfaction, increased efficiency, reduced costs, and improved supplier relationships. These benefits can help manufacturers to improve their competitiveness, increase their profitability, and build a positive reputation in the market. It is essential for manufacturers to implement a robust quality management system to ensure that quality standards are met consistently throughout the production process.

### **Scope Management**

Scope management is an essential component of project management, which involves defining, managing, and controlling the project's scope. Proper scope management can significantly improve project outcomes and prevent project failures. I am highlighting the significance of scope management in project management and recommending best practices for effective scope management based on the literature review.

Project management involves several processes that work together to achieve the project's objectives within the defined constraints. One of the critical processes in project management is scope management. Scope management is the process of defining, managing, and controlling the project's scope. It ensures that the project meets the stakeholder's requirements, objectives, and expectations. Scope management is essential for project success, and improper scope management can result in project failure. This research paper provides an overview of scope management in project management, including its importance, best practices, and strategies. Kerzner, H. (2013).

**Importance of Scope Management:** Scope management is crucial for project success as it helps to define the project's boundaries, deliverables, and objectives. Proper scope management ensures that the project team and stakeholders understand what is in and out of scope, which helps to prevent scope creep, which can lead to project failure. Scope management also ensures that the project's objectives are aligned with the stakeholders' expectations, which helps to achieve the project's goals.



A few best practices for effective scope management in project management have been highlighted below:

**Defining the Scope:** The first step in scope management is to define the project's scope, including its objectives, deliverables, and boundaries. This involves gathering requirements from stakeholders, identifying constraints and assumptions, and creating a scope statement.

**Creating a Work Breakdown Structure (WBS):** A WBS is a hierarchical decomposition of the project's deliverables, which helps to break down the project into manageable pieces. The WBS helps to ensure that all project work is identified, and nothing is missed.

**Verifying and Validating Scope:** Verifying the scope involves reviewing the project's deliverables to ensure that they meet the stakeholders' requirements. Validating the scope involves ensuring that the project's objectives are achieved, and the deliverables meet the stakeholders' expectations. Verzuh, E. (2015).

**Controlling Scope:** Scope control involves monitoring the project's progress to ensure that the project stays within scope. It involves identifying and managing scope changes, preventing scope creep, and ensuring that the project's objectives are met.

**Strategies for Effective Scope Management:** The following are strategies for effective scope management in project management:

**Involve Stakeholders:** It is essential to involve stakeholders in scope management, including defining the scope, creating the WBS, verifying and validating scope, and controlling scope. This helps to ensure that the project's objectives are aligned with the stakeholders' expectations. Crawford, L., & Pollack, J. (2017).

**Use Agile Methodologies:** Agile methodologies are designed to be flexible and adaptable, which makes them ideal for scope management. Agile methodologies involve iterative development, which allows the project team to adjust the project's scope as needed. Pinto, J. K. (2015).

**Use Project Management Software:** Project management software, such as Microsoft Project, can help to manage scope by creating a WBS, tracking project progress, and managing scope changes. Schwalbe, K. (2015).

## **A Manufacturing Perspective**

Scope management is an essential part of project management in the manufacturing industry. It is the process of defining, controlling, and monitoring what is included in a project and what is not. Effective scope management ensures that the project is completed within the specified time, budget, and quality.

Benefits of Scope Management in Manufacturing Industry consists of:

**Cost Control:** Scope management enables the project manager to identify and control the cost of the project by defining what is included in the project and what is not. This helps to prevent scope creep, which can lead to additional costs that were not budgeted for. By keeping the project within the defined scope, the manufacturing industry can save a significant amount of money.

According to a study by Project Management Institute (PMI), scope management has a positive impact on cost control in manufacturing projects. The study found that projects with effective scope management are 31% more likely to stay within the budget than those without proper scope management (PMI, 2018).

**Time Management:** Effective scope management also helps in managing the project timeline. By clearly defining the project scope, the project team can focus on completing the work within the specified time frame. This reduces the chances of delays and ensures timely completion of the project.

A study by R. P. Sundarraj and S. K. Bharadwaj (2014) found that scope management has a positive impact on time management in the manufacturing industry. The study found that effective scope management helps in reducing the time required for the project, thus saving valuable resources.

**Quality Assurance:** Scope management also plays a crucial role in ensuring quality in the manufacturing industry. By defining the scope, the project team can focus on delivering the expected quality. This helps in reducing the chances of defects and ensures that the end product meets the customer's requirements.

According to a study by P. F. Neirotti et al. (2015), effective scope management leads to better quality in manufacturing projects. The study found that projects with effective scope management have a higher success rate in meeting customer requirements and ensuring customer satisfaction.

**Risk Management:** Scope management also helps in managing project risks. By clearly defining the project scope, the project team can identify potential risks and develop strategies to mitigate them. This helps in reducing the chances of unexpected events that can cause delays, additional costs, or lower quality.

According to a study by D. D. Lee et al. (2019), scope management has a positive impact on risk management in the manufacturing industry. The study found that effective scope management helps in identifying and mitigating project risks, thus reducing the chances of project failure.

## **Stakeholder Management**

Project management is an essential part of any organization. The success of a project depends on the effective management of stakeholders. Stakeholders are individuals or groups that have an interest or influence in the project outcome. The stakeholders in a project can be categorized as internal and external stakeholders. Internal stakeholders include employees, shareholders, and management, while external stakeholders are customers, suppliers, and regulatory bodies. Stakeholder management is the process of identifying, analysing, and engaging with stakeholders to achieve project success.

**Stakeholder Management in Project Management:**

Stakeholder management is a critical aspect of project management that involves identifying, analyzing, and engaging with stakeholders to ensure their needs and expectations are met. The project manager must be able to communicate effectively with stakeholders and develop a strategy to engage them in the project Gray, C. F., & Larson, E. W. (2018). The following are some of the key activities involved in stakeholder management:

**Stakeholders Identification:**

The first step in stakeholder management is to identify all the stakeholders involved in the project. This includes both internal and external stakeholders. The project manager must create a

stakeholder register that identifies all the stakeholders and their roles in the project. This will help the project manager to understand the stakeholders' interests and expectations and develop a strategy to manage them effectively.

#### Analysis of Stakeholders:

Once the stakeholders have been identified, the project manager must analyse their interests, expectations, and influence on the project. This will help the project manager to understand how the stakeholders can impact the project's success and develop a strategy to manage them effectively. The analysis of stakeholders should be an ongoing process, and the project manager must be aware of any changes in stakeholder interests or expectations Kerzner, H. (2017).

#### Engagement of Stakeholders:

The project manager must engage with stakeholders throughout the project lifecycle to ensure their needs and expectations are met. This includes regular communication with stakeholders and the development of a stakeholder engagement plan. The stakeholder engagement plan should outline how the project manager will engage with stakeholders and the communication channels that will be used Project Management Institute. (2017).

#### Monitoring and Control:

Stakeholder management is an ongoing process that requires monitoring and control. The project manager must monitor stakeholder interests and expectations and make changes to the stakeholder engagement plan as necessary. The project manager must also be able to manage stakeholder conflicts and resolve any issues that may arise.

#### Importance of Stakeholder Management:

Stakeholder management is essential to project success. Effective stakeholder management can lead to improved project outcomes, increased stakeholder satisfaction, and reduced project risks. Stakeholder management can also help to build strong relationships with stakeholders, which can be beneficial in future projects Turner, J. R., & Müller, R. (2018).

#### Conclusion:

Stakeholder management is a critical aspect of project management. It involves identifying, analyzing, and engaging with stakeholders to ensure their needs and expectations are met. Effective stakeholder management can lead to improved project outcomes, increased stakeholder satisfaction, and reduced project risks. The project manager must be able to communicate effectively with stakeholders and develop a strategy to engage them in the project.

## **A Manufacturing Perspective**

Stakeholder management refers to the identification, analysis, and communication of the interests and concerns of stakeholders in a company's operations. In the manufacturing industry, stakeholder management has become increasingly important in recent years as companies strive to maintain a competitive edge in a constantly changing marketplace. This document explores the benefits of stakeholder management in the manufacturing industry, drawing on literature and academic references to support the arguments presented.

Stakeholder Management Benefits in the Manufacturing Industry:

Improved Relationship with Customers:

Stakeholder management can help manufacturing companies build a better relationship with their customers. By understanding the needs and preferences of their customers, companies can tailor their products and services to meet those needs, resulting in increased customer satisfaction and loyalty. According to a study by Liu and Rezgui (2017), stakeholder management can help manufacturers to identify customer needs and create customized solutions that meet those needs.

Increased Productivity:

Stakeholder management can also lead to increased productivity in manufacturing companies. By identifying and addressing the concerns of stakeholders such as employees, suppliers, and customers, companies can create a more positive work environment that fosters innovation and collaboration. This can lead to greater efficiency and productivity in the manufacturing process. According to a study by Ringle and colleagues (2015), stakeholder management can improve employee engagement and result in greater productivity.

### Enhanced Reputation:

Stakeholder management can also enhance the reputation of manufacturing companies. By addressing the concerns of stakeholders and demonstrating a commitment to ethical and sustainable practices, companies can build a positive reputation among customers, investors, and other stakeholders. This can result in increased brand loyalty and a competitive advantage in the marketplace. According to a study by Hemingway and Maclagan (2004), stakeholder management can help companies to build trust and credibility among stakeholders and enhance their reputation.

### Risk Mitigation:

Stakeholder management can also help manufacturing companies to mitigate risks. By identifying potential risks and addressing them before they become serious problems, companies can avoid costly mistakes and minimize their impact on stakeholders. This can include risks related to environmental impact, labour practices, and supply chain management. According to a study by Zeng and colleagues (2016), stakeholder management can help companies to identify and address risks in their supply chains and reduce the likelihood of supply chain disruptions.

Therefore, stakeholder management has numerous benefits for manufacturing companies. By understanding and addressing the concerns of stakeholders, companies can build stronger relationships with customers, increase productivity, enhance their reputation, and mitigate risks. As the manufacturing industry continues to evolve and become more competitive, effective stakeholder management will become increasingly important for companies looking to maintain a competitive edge in the marketplace.

### **Resource Management**

Resource management is an essential component of project management that involves planning, acquiring, and managing resources such as people, equipment, facilities, and funds to accomplish project objectives within the defined scope, schedule, and budget. Effective resource management

ensures that the right resources are available at the right time and in the right quantity to meet project needs and constraints.

Resource management in project management is a critical aspect that determines the success or failure of a project. Effective resource management ensures that a project has the right resources, including people, materials, and equipment, to accomplish its objectives. This paper aims to provide an overview of resource management in project management, including its importance, key principles, challenges, and best practices. Project Management Institute. (2017).

Resource management in project management refers to the process of identifying, acquiring, and allocating resources to achieve project objectives. It involves managing people, materials, equipment, and other resources required to complete a project successfully Project Management Institute. (2017). Resource management is an essential aspect of project management since it ensures that the right resources are available at the right time and in the right quantity to accomplish project goals. Without proper resource management, projects may face delays, cost overruns, and ultimately fail to achieve their objectives.

Resource management is critical in project management for several reasons. Firstly, it helps to ensure that the project is adequately resourced to achieve its goals. Secondly, it helps to prevent resource shortages or overages, which can lead to delays or cost overruns. Thirdly, it helps to optimize resource utilization, ensuring that resources are used efficiently and effectively. Lastly, it helps to mitigate risks associated with resource availability and allocation.

Effective resource management in project management is guided by several key principles, including:

**Planning:** Resource management starts with planning, which involves identifying the resources required for the project, estimating the quantities required, and determining when they will be needed.

**Allocation:** Once the resources have been identified and quantified, they must be allocated to the project activities based on their priority and availability.

**Utilization:** Resources should be used efficiently and effectively to achieve project objectives.

**Monitoring:** Resource utilization and allocation should be monitored regularly to ensure that the project is on track and that the resources are being used as planned.

**Controlling:** Resource allocation and utilization should be controlled to ensure that the project remains within budget and on schedule.

**Resource Planning:** Resource planning is the process of identifying, estimating, and allocating the resources needed for project activities. It involves defining resource requirements based on project scope, schedule, and budget, and developing a resource management plan that specifies how resources will be acquired, utilized, and monitored throughout the project lifecycle. Resource planning helps to ensure that adequate resources are available to support project objectives and that resource constraints are identified and managed proactively Kerzner, H. (2017).

**Resource Acquisition:** Resource acquisition is the process of obtaining the resources identified in the resource plan. It involves sourcing, selecting, and negotiating contracts with vendors or suppliers, and recruiting, selecting, and onboarding personnel for the project team. Resource acquisition requires careful consideration of cost, quality, availability, and compatibility with project needs and objectives.

**Resource Utilization:** Resource utilization is the process of managing and deploying resources effectively to accomplish project objectives. It involves assigning tasks to team members based on their skills, experience, and availability, monitoring resource usage, and adjusting resource allocations as needed to maintain project progress and meet deadlines. Resource utilization requires effective communication, coordination, and collaboration among project team members, as well as the use of tools and techniques such as project management software, scheduling tools, and performance metrics.

**Resource Monitoring and Control:** Resource monitoring and control is the process of tracking resource usage and performance against the resource management plan and taking corrective action as needed to address deviations from plan. It involves monitoring resource utilization, cost, quality, and availability, and making adjustments to resource allocations or acquiring additional resources if necessary to maintain project progress and meet objectives. Resource monitoring and control helps to ensure that resource constraints are identified and managed proactively, and that



project objectives are achieved within the defined scope, schedule, and budget Meredith, J. R., & Mantel Jr, S. J. (2018).

Therefore, resource management is a critical aspect of project management that requires careful planning, acquisition, utilization, and monitoring of resources to achieve project objectives. Effective resource management can help to minimize project risks and costs, improve project quality and performance, and increase stakeholder satisfaction. Project managers must have a comprehensive understanding of resource management principles and techniques to effectively manage project resources and ensure project success.

### **A Manufacturing Perspective**

Resource management refers to the strategic approach of managing a company's resources to maximize productivity, efficiency, and profitability. In the manufacturing industry, effective resource management is critical to success. The ability to manage resources efficiently can provide several benefits to a manufacturing company, including cost savings, increased productivity, and improved quality. Some of the benefits of Resource Management in Manufacturing Industry are:

**Cost Savings:** Effective resource management in the manufacturing industry can lead to significant cost savings. By optimizing the use of resources such as materials, labour, and equipment, manufacturers can reduce waste and increase efficiency. This can lead to lower production costs, which can ultimately result in increased profits. In a study conducted by Huang et al. (2019), it was found that effective resource management can reduce manufacturing costs by up to 30%.

**Increased Productivity:** Resource management can also lead to increased productivity in the manufacturing industry. By ensuring that resources are used efficiently, manufacturers can improve the speed and accuracy of their production processes. This can lead to faster production times, increased output, and improved customer satisfaction. In a study conducted by Wagner et al. (2016), it was found that effective resource management can lead to a 25% increase in productivity.

**Improved Quality:** Effective resource management can also lead to improved quality in the manufacturing industry. By ensuring that resources are used efficiently, manufacturers can reduce

the likelihood of defects and errors in their products. This can lead to higher-quality products, increased customer satisfaction, and a better reputation for the company. In a study conducted by Kano et al. (2018), it was found that effective resource management can improve product quality by up to 20%.

**Better Risk Management:** Resource management can also help manufacturers manage risk more effectively. By optimizing the use of resources, manufacturers can reduce their exposure to risks such as supply chain disruptions, equipment failures, and labour shortages. This can lead to a more resilient manufacturing operation that is better able to withstand unexpected events. In a study conducted by Shaker et al. (2019), it was found that effective resource management can improve risk management by up to 35%.

Therefore, it can be concluded that resource management can provide several benefits to the manufacturing industry, including cost savings, increased productivity, improved quality, and better risk management. By optimizing the use of resources such as materials, labor, and equipment, manufacturers can improve their overall performance and competitiveness. The benefits of resource management are supported by academic and industry research, and they are critical to the success of manufacturing companies.

## **Risk Management**

Risk management in project management involves identifying, assessing, and mitigating potential risks that may affect project outcomes. It is an essential process in project management since projects are often complex and involve many uncertainties that can impact project success. Effective risk management helps to ensure that potential risks are identified and addressed before they can impact project outcomes Bissonette, M. M. (2018).

Project risk management is the process of identifying, assessing, and mitigating potential risks that may affect the success of a project. It involves a systematic approach to identifying and analyzing risks, evaluating their potential impact on project objectives, and developing strategies to manage or minimize them. Chapman, C., & Ward, S. (2011).

Project risk management is an important aspect of project management that aims to identify potential risks that may affect project success and develop strategies to mitigate them. The process typically involves the following steps:

**Risk Identification:** This involves identifying potential risks that may impact the project. This can be done through various techniques such as brainstorming, checklists, and historical data analysis.

**Risk Assessment:** Once risks have been identified, they need to be assessed to determine their probability and potential impact on the project. This involves using various techniques such as risk probability and impact assessment, and risk categorization.

**Risk Mitigation:** After risks have been assessed, strategies need to be developed to manage or mitigate them. This can involve techniques such as risk avoidance, risk transfer, risk reduction, and risk acceptance.

**Risk Monitoring:** Once risks have been identified, assessed, and mitigated, they need to be monitored throughout the project lifecycle to ensure that they are effectively managed Cooper, D. F., Grey, S., & Raymond, G. (2014)

### Importance of Risk Management in Project Management

Risk management is critical in project management for several reasons. Firstly, it helps to identify potential risks and uncertainties that may affect project outcomes. Secondly, it helps to develop strategies to mitigate those risks and uncertainties. Thirdly, it helps to ensure that the project remains within budget and on schedule. Lastly, it helps to improve project outcomes by reducing the impact of potential risks and uncertainties.

### **A Manufacturing Perspective**

Risk management is an essential aspect of the manufacturing industry as it helps to identify, assess, and mitigate potential risks in the production process. The manufacturing industry faces numerous risks, including operational risks, financial risks, market risks, supply chain risks, and legal risks, which can have a significant impact on business performance. Effective risk management can help manufacturers minimize their exposure to these risks and improve their chances of success.

A study by Hillson and Murray-Webster (2017) explored the benefits of risk management in the manufacturing sector. The authors found that effective risk management can lead to improved decision-making, increased stakeholder confidence, and better alignment with organizational objectives. Risk management can also help manufacturers identify potential opportunities, reduce uncertainty, and improve communication and collaboration within the organization. Moreover, effective risk management can help manufacturers comply with regulatory requirements and reduce the likelihood of legal and reputational risks.

Another study by Tang et al. (2019) focused on the role of risk management in supply chain management in the manufacturing industry. The authors found that effective risk management can help manufacturers improve their supply chain resilience, reduce disruptions, and enhance their competitive advantage. Risk management can also help manufacturers identify potential risks in their supply chain, such as supplier bankruptcies or quality issues, and develop appropriate contingency plans.

In a study by Kunc and Morecroft (2010), the authors explored the benefits of integrating risk management into the strategic planning process in the manufacturing industry. The authors found that effective risk management can help manufacturers identify potential risks and opportunities in the external environment, such as changes in customer demand or competitor actions. By integrating risk management into strategic planning, manufacturers can develop more robust strategies that take into account potential risks and uncertainties.

I can therefore infer that risk management is essential for manufacturers to succeed in today's volatile and uncertain business environment. Risk management can help manufacturers identify potential risks, develop appropriate contingency plans, and improve decision-making. Additionally, risk management can help manufacturers comply with regulatory requirements and reduce legal and reputational risks. By integrating risk management into their strategic planning process, manufacturers can develop more robust strategies that take into account potential risks and uncertainties.

## Critical Success Frameworks

### Project Management Techniques and Tools

About 20 project management tools have been isolated for this project to determine the most and least used among the project stakeholders in the manufacturing industry however, 17 have been captured here based on the survey responses using the pareto analysis. I will be discussing the benefits of these PM tools in project management, based on the existing literature and academic references.

The 17 project management tools captured in this research are:

#### **1. Business opportunity/problem definition**

A key aspect of project management is identifying business opportunities or problems and defining them in a way that enables the project team to develop appropriate solutions. Business opportunity/problem definition does some of the following:

**Focuses project efforts:** Defining business opportunities or problems helps the project team focus on the specific issue that needs to be addressed. This can help to ensure that project resources are used efficiently and effectively Project Management Institute. (2017).

**Facilitates communication:** Clear and concise problem or opportunity definitions can help to ensure that all stakeholders have a shared understanding of the project objectives. This can help to facilitate communication and collaboration among team members Kwak, Y. H., & Anbari, F. T. (2019).

**Provides a basis for decision-making:** A well-defined business opportunity or problem can provide a basis for making informed decisions about project scope, resources, and timelines. This can help to ensure that the project team is working towards a common goal.

**Enhances project planning:** Defining business opportunities or problems can help the project team to identify potential risks and opportunities and develop appropriate strategies to manage them.

This can help to ensure that the project plan is comprehensive and robust Crawford, L., & Helm, J. (2019).

## **2. Change control board.**

Change control board (CCB) is an essential component of project management that helps in controlling changes that occur during a project's lifecycle. It is a team of stakeholders responsible for evaluating and approving changes in the project, including scope, schedule, cost, and quality. In this document, I will discuss the benefits of CCB in project management, based on the existing literature and academic references.

**Improved Project Planning:** One of the key benefits of CCB in project management is improved project planning. The CCB helps to identify and assess the impact of changes on the project's scope, schedule, and budget. It also ensures that all changes are aligned with the project's goals and objectives, reducing the risk of scope creep and ensuring that the project remains on track. According to an article by Kumar and Singh (2020), the CCB helps in developing and implementing effective change control procedures, which, in turn, leads to better project planning and execution.

**Better Risk Management:**

The CCB also helps in better risk management by evaluating the impact of changes on the project's risks. This ensures that all changes are assessed for potential risks and that appropriate measures are taken to mitigate them. In their research paper, Khanna and Bawa (2019) highlight the role of CCB in mitigating risks associated with project changes. They argue that the CCB provides a platform for risk assessment and ensures that all changes are evaluated for their impact on project risks.

**Improved Communication:** CCB helps in improving communication among project stakeholders, including project managers, team members, and clients. By providing a platform for discussion and evaluation of changes, CCB ensures that all stakeholders are aware of the changes and their impact on the project's success. According to an article by Liao et al. (2018), CCB helps in

improving communication among project stakeholders, leading to better collaboration, reduced conflicts, and improved project outcomes.

**Increased Project Success:** CCB ensures that all changes are evaluated for their impact on the project's success. This helps in reducing the risk of project failure and increasing the chances of project success. By ensuring that all changes are aligned with the project's goals and objectives, CCB ensures that the project remains on track and delivers the expected outcomes.

In their research paper, Al-Momani and Obeidat (2021) highlight the role of CCB in ensuring project success. They argue that CCB helps in evaluating changes and ensuring that they are aligned with the project's goals and objectives, leading to increased project success.

### **3. Contract/Bid documents**

Contract and bid documents play a crucial role in project management. They are the legal and formal documents that outline the terms and conditions of the project, including the scope of work, cost, schedule, quality requirements, and other project parameters. These documents serve as a binding agreement between the project stakeholders, including the client, contractor, subcontractors, and vendors. Furthermore, I will explore the benefits of contract and bid documents in project management and support its claims with literature and academic references.

**Clarity and Understanding:** Contract and bid documents help to establish clarity and understanding of the project requirements and expectations. A well-drafted contract document helps to prevent misunderstandings, conflicts, and disputes between the project stakeholders. It also provides a clear understanding of the scope of work, deliverables, and milestones, which helps to ensure that the project is completed on time and within budget.

According to a study by Turner and Simister (2018), project managers use contract documents to clarify project requirements, specify project scope, and manage project risks. The study also found that effective contract management is essential for the success of the project.

**Risk Management:** Contract and bid documents help to manage project risks by identifying potential risks and specifying the measures to mitigate them. The contract document also defines

the roles and responsibilities of the project stakeholders, which helps to allocate risk appropriately. Effective risk management helps to minimize project delays, cost overruns, and other project-related risks.

According to a study by Flyvbjerg et al. (2018), contract documents play a vital role in project risk management. The study found that effective risk management requires a clear understanding of project risks, appropriate allocation of risk, and effective risk mitigation measures.

**Cost Management:** Contract and bid documents help to manage project costs by defining the project budget, payment terms, and other financial requirements. The contract document also specifies the cost of change orders, which helps to manage project scope and control costs.

According to a study by PMI (2017), effective cost management is essential for project success. The study found that effective cost management requires accurate cost estimation, effective cost control, and appropriate allocation of financial resources.

**Quality Management:** Contract and bid documents help to manage project quality by specifying the quality requirements and standards. The contract document also defines the quality control and assurance processes, which helps to ensure that the project meets the client's expectations.

According to a study by Juran and Godfrey (2017), effective quality management is essential for project success. The study found that quality management requires a clear understanding of the client's quality requirements, appropriate quality control and assurance processes, and effective monitoring of project quality.

In conclusion, contract and bid documents play a critical role in project management. They help to establish clarity and understanding of project requirements, manage project risks, control project costs, and ensure project quality. Effective contract management is essential for the success of the project, and project managers should pay careful attention to the contract and bid documents.



#### **4. Cost/benefit analysis**

Cost/benefit analysis is a widely used technique in project management that involves weighing the costs of implementing a particular project against the expected benefits. The primary goal of this analysis is to determine whether a project is financially viable or not.

Benefits of Cost/Benefit Analysis in Project Management:

**Helps in Decision Making:** One of the primary benefits of cost/benefit analysis in project management is that it helps in decision making. By comparing the costs and benefits of different project options, project managers can make informed decisions about which projects are worth pursuing and which ones are not. Cost/benefit analysis can help in determining the feasibility of a project, identifying potential risks, and providing a clear understanding of the project's expected returns Kerzner, H. (2013).

**Provides a Basis for Prioritization:** Cost/benefit analysis provides a basis for prioritization of projects. When resources are limited, project managers must decide which projects to fund and which ones to put on hold. Cost/benefit analysis helps in identifying projects that offer the highest return on investment and prioritizing them over others Fleming, Q. W., & Koppelman, J. M. (2016).

**Enables Stakeholder Communication:** Cost/benefit analysis enables project managers to communicate with stakeholders about the expected costs and benefits of a project. Stakeholders can include project sponsors, investors, customers, and team members. By using cost/benefit analysis, project managers can provide stakeholders with a clear understanding of the project's expected returns and help them make informed decisions. Martin, J. (2016).

**Enables Cost Control:** Cost/benefit analysis enables project managers to control costs by identifying areas where costs can be reduced. By identifying unnecessary expenses, project managers can ensure that projects are completed within the allocated budget Davies, A., & Simon, A. (2016).

Facilitates Monitoring and Evaluation:

Cost/benefit analysis facilitates monitoring and evaluation of a project's progress. By comparing the actual costs and benefits of a project against the expected costs and benefits, project managers can identify areas where the project is not performing as expected and take corrective action  
Freeman, R. E. (2010).

## **5. Customer satisfaction surveys**

Introduction

Customer satisfaction surveys are an essential tool in project management, allowing organizations to measure their success in delivering products or services that meet or exceed customer expectations. Customer satisfaction surveys are a feedback mechanism that provides a means of collecting data and feedback about customer satisfaction, which can be used to improve future projects.

Identifying Customer Needs: Customer satisfaction surveys can help project managers identify the needs and expectations of their customers. Understanding what the customer needs can help project managers deliver products and services that meet or exceed customer expectations, leading to increased customer loyalty and retention. In a study by M. Alkhudair and M. Sohail, it was found that identifying customer needs and expectations is essential in delivering quality products and services (Alkhudair & Sohail, 2014).

Measuring Customer Satisfaction: Customer satisfaction surveys allow project managers to measure customer satisfaction and determine how well they have met customer expectations. Measuring customer satisfaction is important because it provides feedback on the quality of the product or service delivered. In a study by R. Kano, it was found that customer satisfaction is a critical factor in project success and that measuring customer satisfaction is essential for improving product quality (Kano, 1997).

**Improving Product Quality:** Customer satisfaction surveys can help project managers improve the quality of their products or services. By identifying areas where customers are not satisfied, project managers can take corrective actions to improve product quality. In a study by K. Suresh and S. Venkatesh, it was found that customer feedback is essential for improving product quality (Suresh & Venkatesh, 2016).

**Enhancing Customer Loyalty:** Customer satisfaction surveys can help project managers enhance customer loyalty by demonstrating that they value customer feedback and are committed to meeting customer expectations. In a study by M. Othman, S. Aslam, and R. Naqvi, it was found that customer loyalty is closely related to customer satisfaction and that customer satisfaction surveys are an effective tool for enhancing customer loyalty (Othman et al., 2015).

**Increasing Customer Retention:** Customer satisfaction surveys can help project managers increase customer retention by identifying and addressing customer issues and concerns. Addressing customer issues and concerns can lead to improved customer satisfaction and increased customer retention. In a study by S. Singh and S. Singh, it was found that customer retention is closely related to customer satisfaction and that customer satisfaction surveys are an effective tool for improving customer retention (Singh & Singh, 2019).

## **6. Feasibility study**

Feasibility studies are a critical component of project management, providing valuable insight into the viability and potential success of a project. A feasibility study is an analysis of a project proposal, assessing its strengths and weaknesses, risks and opportunities, and determining whether or not it is worth pursuing.

**Identifying potential risks and opportunities:** One of the primary benefits of conducting a feasibility study is the identification of potential risks and opportunities associated with a project. By analyzing the project proposal, stakeholders can identify potential roadblocks, such as financial or technical limitations, and determine whether they can be overcome. Additionally, a feasibility

study can identify potential opportunities that may have been overlooked, such as partnerships with other organizations or new market segments to target.

According to Kliem and Ludin (2017), a feasibility study provides a comprehensive overview of a project, including potential risks and opportunities, and assists in the decision-making process. By identifying potential roadblocks and opportunities, stakeholders can make informed decisions about whether or not to proceed with a project.

Establishing project scope and objectives: A feasibility study also provides a framework for establishing the project scope and objectives. By analyzing the project proposal, stakeholders can determine the goals and objectives of the project, as well as the resources required to achieve them. This information is critical for project planning and management, as it ensures that everyone involved in the project is working towards the same goals.

According to Wideman (2015), a feasibility study helps stakeholders to establish a clear understanding of the project's objectives and scope, which is essential for effective project management. The study provides a clear roadmap for project planning, ensuring that all stakeholders are aligned and working towards the same goals.

Assessing financial viability: Another key benefit of conducting a feasibility study is the assessment of financial viability. By analyzing the project proposal, stakeholders can determine the financial resources required to complete the project, as well as the potential return on investment. This information is essential for decision-making, as it allows stakeholders to determine whether the project is financially viable and whether it is worth pursuing.

According to Kerzner and Kerzner (2017), a feasibility study provides valuable information about the financial viability of a project. This information is essential for decision-making, as it allows stakeholders to determine whether the project is financially feasible and whether it is worth pursuing.

Minimizing project risks: A feasibility study also helps to minimize project risks. By identifying potential risks and opportunities associated with a project, stakeholders can develop strategies to mitigate risks and capitalize on opportunities. This information is critical for effective risk management, as it allows stakeholders to proactively manage risks before they become problematic.

According to Aven (2019), risk management is an essential component of project management, and a feasibility study provides valuable information about potential risks associated with a project. This information allows stakeholders to develop strategies to minimize risks and ensure project success.

## **7. Gantt chart**

A Gantt chart is a popular project management tool used to track progress and manage projects effectively. It is a bar chart that shows the schedule and dependencies of all tasks involved in a project. Gantt charts have numerous benefits, and this document aims to highlight some of the most significant benefits of using a Gantt chart in project management Singh, A. (2014).

**Visual Representation:** A Gantt chart provides a visual representation of the project schedule, which makes it easier for project managers to communicate the project timeline to team members, stakeholders, and clients. The chart shows the start and end dates of each task, allowing team members to see the project's progress at a glance.

**Task Dependencies:** A Gantt chart also shows the dependencies between tasks, which means that the chart shows which tasks are dependent on other tasks to be completed. This helps project managers to manage the project effectively by ensuring that tasks are completed in the correct order Barkley, B. T. (2010).

**Time Management:** Gantt charts also help with time management by allowing project managers to allocate resources and schedule tasks effectively. This means that project managers can avoid overloading team members with tasks and ensure that the project is completed on time.

Improved Communication: Gantt charts also help to improve communication between team members by providing a shared understanding of the project timeline. This helps to reduce misunderstandings and ensures that everyone is on the same page.

Tracking Progress: Gantt charts allow project managers to track progress against the project timeline. This means that project managers can identify any potential delays and take corrective action to ensure that the project stays on track Zwikael, O., & Smyrk, J. (2015).

## **8. Needs Analysis**

Needs analysis is a critical process in project management that is aimed at identifying the specific requirements and expectations of stakeholders. This process involves gathering information and data to determine the project's goals, objectives, and the needs of the stakeholders. The needs analysis helps in aligning the project with the requirements of the stakeholders, ensuring that the project delivers value to them.

Ensures stakeholder satisfaction: The primary benefit of needs analysis in project management is that it helps to ensure stakeholder satisfaction. Needs analysis enables the project team to identify the stakeholders' needs, expectations, and goals, which are then incorporated into the project plan. When the project meets the needs of the stakeholders, it is likely to be more successful, and stakeholders will be more satisfied with the project outcome. According to a study by Edum-Fotwe and McCaffer (2000), stakeholder satisfaction is a crucial measure of project success.

Reduces project costs: Needs analysis can also help to reduce project costs. By identifying the stakeholders' needs and expectations, the project team can avoid unnecessary features, functions, and activities that do not add value to the project. This approach helps to optimize the project scope and reduce the costs associated with unnecessary work. According to a study by Niazi et al. (2011), effective needs analysis can help to reduce project costs by up to 20%.

Enhances project quality: Needs analysis can also help to enhance project quality. By identifying the stakeholders' needs and expectations, the project team can develop a project plan that aligns with the stakeholders' requirements. This approach helps to ensure that the project delivers high-quality outcomes that meet the stakeholders' expectations. According to a study by Meskendahl (2010), effective needs analysis can help to improve project quality by up to 50%.

Improves project communication: Needs analysis can also help to improve project communication. By involving the stakeholders in the needs analysis process, the project team can establish clear and effective communication channels. This approach helps to ensure that the stakeholders are aware of the project's progress, and the project team can provide regular updates on project milestones. Effective communication is critical to project success and needs analysis can help to establish a communication framework that supports project delivery. According to a study by Saaty et al. (2005), effective communication is a key factor in project success.

Supports project planning: Needs analysis can also support project planning. By identifying the stakeholders' needs and expectations, the project team can develop a project plan that aligns with the stakeholders' requirements. This approach helps to ensure that the project delivers value to the stakeholders and meets their expectations. According to a study by Turner et al. (1993), effective project planning is critical to project success.

## **9. PERT analysis**

Project management is a complex process that requires the management of various tasks, resources, and timeframes. One important tool for project managers is PERT analysis, which stands for Program Evaluation and Review Technique. This technique allows project managers to analyze and manage the time required for each task, the critical path of the project, and the resources required for each task. PERT analysis has been widely adopted in project management due to its numerous benefits. Some of the benefits of PERT Analysis:

Identifying the Critical Path: One of the primary benefits of PERT analysis is that it allows project managers to identify the critical path of a project. The critical path is the sequence of tasks that

must be completed on time to ensure the project's timely completion. By identifying the critical path, project managers can allocate resources and manage the project's schedule more effectively. (Haughey, 2019)

**Resource Allocation:** Another benefit of PERT analysis is that it allows project managers to allocate resources more effectively. By analyzing each task's resource requirements, project managers can ensure that the necessary resources are available when needed. This can help prevent delays and ensure that the project stays on schedule. (Meredith & Mantel, 2018)

**Risk Management:** PERT analysis can also help project managers manage project risks more effectively. By analyzing each task's estimated completion time and the probability of completing the task on time, project managers can identify potential risks and take steps to mitigate them. This can help prevent delays and ensure that the project is completed on time. (Haughey, 2019)

**Cost Management:** PERT analysis can also help project managers manage project costs more effectively. By analyzing each task's estimated completion time and resource requirements, project managers can estimate the total cost of the project more accurately. This can help prevent cost overruns and ensure that the project stays within budget. (Meredith & Mantel, 2018)

## **10. Project charter**

A project charter is a document that outlines the scope, objectives, and stakeholders of a project. It is an essential component of project management, and its benefits are numerous.

**Provides a clear understanding of project scope and objectives:** One of the primary benefits of a project charter is that it provides a clear understanding of the project's scope and objectives. The document outlines the project's goals, deliverables, and the expected outcomes, which helps to ensure that everyone involved in the project has a shared understanding of what needs to be done.



According to a study by the Project Management Institute (PMI), clear project objectives are essential to project success. The study found that projects with well-defined objectives were more likely to be completed on time and within budget (PMI, 2017).

**Helps to identify stakeholders:** The project charter also helps to identify the stakeholders involved in the project. It outlines the roles and responsibilities of each stakeholder, which helps to ensure that everyone is aware of their obligations and is committed to the project's success.

According to the PMI, stakeholder management is critical to project success. The organization states that effective stakeholder management can help to ensure that project requirements are met and that there is buy-in from all parties involved (PMI, 2017).

**Facilitates communication:** Another benefit of a project charter is that it facilitates communication between the project team and stakeholders. The document provides a common understanding of the project's goals, objectives, and requirements, which helps to ensure that everyone is on the same page.

According to a study by the Harvard Business Review, effective communication is one of the most critical factors in project success. The study found that projects with good communication practices were more likely to meet their objectives and deliverables (Flyvbjerg et al., 2003).

**Provides a basis for decision-making:** The project charter also provides a basis for decision-making throughout the project lifecycle. The document outlines the project's goals, objectives, and requirements, which helps to ensure that all decisions are aligned with these factors.

According to a study by the University of Cambridge, effective decision-making is critical to project success. The study found that projects with good decision-making practices were more likely to meet their objectives and deliverables (Davies et al., 2009).

## **11. Project closure/lessons learnt.**

Project closure is a crucial phase of project management that involves the finalization of all project-related activities and formal acceptance of the project's deliverables by the stakeholders. It marks the end of the project lifecycle and provides an opportunity to evaluate the project's success and identify areas for improvement in future projects Crawford, L., & Pollack, J. (2017).

**Formal Acceptance of Deliverables:** Project closure provides an opportunity to formally accept the project's deliverables by the stakeholders. This includes ensuring that all requirements have been met, and the project is completed within the budget and timeline. This formal acceptance ensures that the stakeholders are satisfied with the project's outcome and can be used as evidence of successful completion of the project Kerzner, H. (2017).

**Evaluation of Project Performance:** Project closure provides a platform for evaluating the project's performance against the project plan. This evaluation identifies areas of success, areas that require improvement, and potential risks that were not considered. This evaluation is crucial for improving project management practices and ensures that future projects are better planned and executed.

**Transfer of Knowledge:** Project closure provides an opportunity to transfer knowledge from the project team to the organization. This includes documentation of the project's processes, procedures, and lessons learned. The knowledge transfer ensures that the organization benefits from the project's experiences and can apply them in future projects Pinto, J. K. (2016).

**Release of Resources:** Project closure releases resources such as personnel, equipment, and budget allocated for the project. This ensures that resources can be allocated to other projects or activities, ensuring efficient utilization of resources within the organization.

**Lessons Learnt in Project Management:** Lessons learned are the experiences gained during a project that can be used to improve project management practices in future projects. Lessons

learned provide insight into what went well, what did not, and how things can be improved in the future. Some of the lessons learned in project management include:

**Proper Planning and Execution:** Effective planning and execution are critical to the success of any project. Planning involves identifying the project's objectives, scope, timeline, budget, and resources required. Execution involves the implementation of the project plan, monitoring project progress, and taking corrective action when necessary.

**Effective Communication:** Effective communication is essential in project management. Communication ensures that all stakeholders are aware of project progress, issues, and risks. Effective communication ensures that stakeholders have the necessary information to make informed decisions that impact the project's success.

**Risk Management:** Risk management is crucial in project management. Risks can impact the project's scope, timeline, and budget. Effective risk management involves identifying potential risks, assessing their impact, and developing mitigation strategies to minimize their impact on the project's success.

**Stakeholder Management:** Stakeholder management involves identifying stakeholders, their interests, and managing their expectations. Effective stakeholder management ensures that stakeholders are satisfied with the project's outcome, reducing the risk of project failure PMI. (2017).

## **12. Quality plan**

Quality is an essential aspect of project management that ensures that a project is completed within the set standards, meets the stakeholders' expectations, and delivers the desired results. Quality planning is an integral part of project management that helps in defining the quality requirements, procedures, and specifications to ensure that the project is completed successfully.

The benefits of quality planning in project management have been extensively studied in the academic literature. According to Karim and Darwish (2013), quality planning helps in ensuring that the project meets the stakeholders' expectations, reduces risks and uncertainties, and improves communication and collaboration. The authors argue that quality planning is essential in improving the project's reputation, enhancing the project's cost and time management, and ensuring that the project is completed successfully.

Similarly, Hwang and Ng (2013) argue that quality planning is an integral part of project management that helps in ensuring that the project is completed within the set quality standards, meets the stakeholders' expectations, and delivers the desired results. The authors further argue that quality planning helps in improving the project's risk management, communication and collaboration, and cost and time management.

According to Ogunlana and Promkuntong (2013), quality planning is essential in ensuring that the project meets the stakeholders' expectations, reduces risks and uncertainties, and enhances the project's reputation. The authors further argue that quality planning helps in improving the project's cost and time management by reducing rework, minimizing defects, and improving the project's efficiency.

### **13. Responsibility assignment matrix**

Project management is a complex and multi-faceted process that requires careful planning and execution to ensure success. One of the key aspects of project management is the assignment of responsibilities to team members. Responsibility Assignment Matrix (RAM) is a tool used to clearly define and assign responsibilities to project team members.

Clarity and Transparency: The RAM provides a clear and concise understanding of each team member's role and responsibilities. This promotes transparency and accountability among team members, reducing confusion and misunderstandings.

Improved Communication: The RAM promotes effective communication within the team. It provides a centralized location for team members to refer to when seeking information about their roles and responsibilities. This reduces the likelihood of miscommunication and ensures that everyone is on the same page. Zwikael, O., & Smyrk, J. (2012).

Increased Efficiency: The RAM helps to ensure that all necessary tasks are assigned to the appropriate team members. This reduces duplication of effort and eliminates the risk of tasks falling through the cracks

Improved Project Planning: The RAM provides a structure for project planning. By clearly defining the roles and responsibilities of each team member, the RAM helps to identify potential gaps in the project plan and ensures that all necessary tasks are accounted for Vanhoucke, M. (2013).

Risk Management: The RAM helps to mitigate risks by identifying potential areas of confusion or overlap. This enables the project manager to take proactive measures to reduce the likelihood of these risks occurring Kabel, D. I., & Van der Heijden, B. I. (2017).

#### **14. Stage gate reviews**

Project management is the process of initiating, planning, executing, controlling, and closing a project. It involves the application of knowledge, skills, tools, and techniques to meet project requirements. One of the most important aspects of project management is the process of monitoring and controlling the project as it progresses through its various stages. The stage gate review process is a crucial aspect of this monitoring and controlling process, which is aimed at ensuring that projects are successfully completed on time, within budget, and to the satisfaction of stakeholders.

What is Stage Gate Review Process?

The stage gate review process is a project management technique that involves the systematic review of a project at key points in its lifecycle. It is designed to provide a structured approach to managing projects, and to ensure that they are completed on time, within budget, and to the satisfaction of stakeholders. The stage gate review process typically involves the following stages: ideation, concept development, feasibility, development, testing, launch, and post-launch. At each stage, a review is conducted to evaluate the progress of the project, and to determine whether it is on track to meet its objectives. This review is based on a set of predefined criteria and may involve a formal approval process to allow the project to move to the next stage.

The stage gate review process offers a number of benefits to project management, including:

**Improved project management:** The stage gate review process provides a structured approach to project management, which ensures that projects are managed effectively from start to finish. It helps to identify potential problems early in the project lifecycle and allows for corrective action to be taken before they become major issues.

**Better decision making:** The stage gate review process ensures that decisions are made based on data and objective criteria, rather than subjective opinions. This helps to ensure that decisions are well-informed and based on the best available information.

**Improved communication:** The stage gate review process encourages communication and collaboration among project stakeholders. It ensures that all stakeholders are kept informed of project progress and provides a forum for discussion and feedback.

**Risk reduction:** The stage gate review process helps to identify potential risks early in the project lifecycle and allows for proactive risk management. This reduces the likelihood of project failure and increases the chances of project success.

**Cost savings:** The stage gate review process can help to identify potential cost savings early in the project lifecycle. This allows for cost-effective solutions to be implemented and reduces the likelihood of cost overruns.

Improved quality: The stage gate review process ensures that quality is built into the project from the outset. It provides a framework for quality assurance and quality control, which helps to ensure that the project meets or exceeds the expectations of stakeholders.

Several studies have been conducted to evaluate the benefits of stage gate reviews in project management. According to a study by Cooper (1994), the stage gate review process helps to reduce time-to-market, improve project performance, and increase project success rates. Similarly, a study by Kock (2010) found that the stage gate review process improves project control, reduces project risk, and increases project transparency. In addition, a study by Pinto and Kharbanda (1995) found that the stage gate review process helps to improve project planning, resource allocation, and stakeholder communication.

## **15. Stakeholder analysis**

Stakeholder analysis is a key tool in project management that involves identifying, analyzing, and managing stakeholders' interests, needs, and expectations. In today's competitive business environment, project managers need to understand the importance of stakeholder analysis to deliver successful projects that meet the needs of all stakeholders.

Identifying Stakeholders: Stakeholder analysis helps project managers identify all stakeholders who are involved in a project. By identifying stakeholders, project managers can ensure that all necessary parties are included in the project planning, execution, and monitoring. According to Venkataraman and Pinto (2008), stakeholder analysis helps project managers identify and prioritize stakeholders based on their influence, interest, and power. By doing so, project managers can ensure that stakeholders' interests are taken into account, which leads to a better project outcome.

Understanding Stakeholders Needs: One of the significant benefits of stakeholder analysis is that it helps project managers understand the needs and expectations of all stakeholders involved in a project. This knowledge helps project managers develop a project plan that considers stakeholders' needs and expectations. According to Söderlund and Maylor (2012), understanding stakeholders' needs and expectations enables project managers to develop a project plan that meets stakeholders' expectations. This, in turn, leads to greater stakeholder satisfaction and increased project success.

Managing Stakeholders Expectations: Stakeholder analysis helps project managers manage stakeholders' expectations by identifying potential conflicts, risks, and opportunities. Project managers can use this information to develop a stakeholder engagement plan that addresses stakeholders' concerns, needs, and expectations. According to Freeman (2010), stakeholder engagement is critical to project success because it helps project managers build relationships with stakeholders and address their concerns.

Minimizing Risks: Stakeholder analysis helps project managers identify potential risks associated with a project. By identifying potential risks, project managers can develop a risk management plan that mitigates risks and addresses stakeholders' concerns. According to Barkley (2016), stakeholder analysis helps project managers identify potential risks that could impact the project's success. By developing a risk management plan that addresses these risks, project managers can minimize risks and increase project success.

## **16. Top-down/Bottom up estimating.**

Project management is a complex discipline that involves coordinating various activities to achieve specific objectives within a set period. Estimating the cost and duration of a project accurately is a critical aspect of project management. Two commonly used approaches for estimating project cost and duration are the top-down and bottom-up techniques.



## Top-Down Estimating

Top-down estimating involves using a high-level approach to estimate the cost and duration of a project. This approach involves breaking the project into major components or phases and estimating the cost and duration of each component based on historical data, expert judgment, or industry standards. The estimates are then aggregated to provide an overall estimate for the project.

According to Cleland and Ireland (2006), top-down estimating is an effective technique for large projects that require high-level planning. The authors recommend using historical data and expert judgment to generate top-down estimates, as this approach provides a reasonable level of accuracy.

In their study on project estimation accuracy, Naoum and Egbu (2015) found that top-down estimating was more accurate than bottom-up estimating in the early stages of a project. The authors recommended using top-down estimating as a preliminary estimate, followed by a more detailed bottom-up estimate in the later stages of the project.

## Bottom-Up Estimating

Bottom-up estimating involves breaking down the project into smaller, more manageable components or tasks and estimating the cost and duration of each task. The estimates are then aggregated to provide an overall estimate for the project.

One of the primary benefits of bottom-up estimating is that it is more accurate than top-down estimating. This approach allows the project manager to identify all the tasks required to complete the project, ensuring that no task is overlooked. Bottom-up estimating is ideal for complex projects that require a detailed understanding of the project requirements.

Another benefit of bottom-up estimating is that it provides a basis for project tracking and control. The detailed estimates allow the project manager to monitor progress against the plan and identify any variances. This approach ensures that the project stays on track and within budget.

According to De Bakker and Boonstra (2015), bottom-up estimating is a valuable tool for project managers as it provides a detailed understanding of the project requirements. The authors recommend using a combination of historical data and expert judgment to generate bottom-up estimates, as this approach provides a high level of accuracy.

In their study on estimating project costs, Linstone and Turoff (2002) found that bottom-up estimating was more accurate than top-down estimating for complex projects. The authors recommended using bottom-up estimating as the primary approach for estimating project costs, followed by a top-down estimate as a check against the bottom-up estimate.

## **17. Work breakdown structure**

A Work Breakdown Structure (WBS) is a widely recognized project management tool that outlines a project's scope of work into smaller, more manageable pieces. It helps project managers to identify and manage project activities, facilitate team communication, and achieve project objectives. Some of the benefits of a WBS in project management include:

**Provides clear project scope:** A WBS provides a clear and concise overview of the entire project scope, which makes it easier for project managers to identify the work involved in completing the project. The WBS identifies every task or deliverable required to complete the project, making it possible to monitor and track progress easily Project Management Institute. (2017).

**Facilitates team communication:** A WBS is an essential communication tool that helps project managers to communicate the project's requirements to team members. It enables the team members to understand the project's scope and their responsibilities in completing the tasks and deliverables Giammalvo, P. D. (2015).

**Enables effective resource allocation:** A WBS allows project managers to allocate resources more efficiently by identifying the tasks that require more time, effort, and resources. With the WBS, project managers can plan and allocate resources accurately, ensuring that the project is completed on time and within budget Kerzner, H. (2017).

Enables project risk management: A WBS provides a framework for identifying potential risks and planning risk management strategies. It enables project managers to analyze and evaluate the project's risk exposure and develop contingency plans to mitigate risks that may arise during the project's execution Rouse, M. (2019).

Enhances project monitoring and control: A WBS provides a baseline for project monitoring and control. It enables project managers to monitor the progress of the project against the WBS to ensure that it is on track. Any deviations from the WBS can be quickly identified and addressed to avoid delays and cost overruns.

## CHAPTER 3

### Methodology

#### **PROJECT MANAGEMENT AS A CRITICAL SUCCESS FRAMEWORK FOR DEVELOPMENT; A MANUFACTURING INDUSTRY PERSPECTIVE**

The purpose of this research is to capture the level of impact project management has on the development of the industrial sector particularly the manufacturing industry including the critical success project management framework utilized by professional in this field.

In 2021, data from 164 participants were sampled from 10 major industries. They comprise of the following:

Construction, Construction & Services, Education, Education & Services, Financial Services, Health & Care Services, It & Media, Manufacturing, Utility Services, Other Services.

18 survey questions were share using e-survey forms which captured data from participants around the world including, Belgium, Canada, Denmark, Germany, Ghana, India, Malaysia, Minsk Belarus, Nigeria, Philippines, Portugal, Sweden, United Arab Emirates, United Kingdom and the United States. However, of the 164 samples, 136 participants responded from the Nigeria region which is over 80%.

All 164 participants except one have been involved in project management experience. The survey was intentionally targeted at professionals with hands on experience in project management from various industries.

The questionnaire consisted of 12 questions which focused on critical project management tools and knowledge area.

For the purpose of this project, nine (9) Project management knowledge areas were isolated to determine the area of interest commonly explored by PM professional in the industry. I went further to also capture a few fundamental frameworks which serve as PM tools under the nine PM knowledge areas to help understand details about specific use of these daily project tools used by project stakeholders such as Project managers, program managers/directors, project team members and so on. This robust work and analysis give me the confidence that accurate data is captured to identify project management determinant factors for development in the Manufacturing industry.

The nine PM knowledge areas covered are:

Cost Management, Schedule Management, Scope Management, Stakeholder Management, Quality Management, Procurement Management, Resource Management, Risk Management and Communications Management. These have been captured in detail in the literature review section to enlighten the reader on what each means and the benefits in project management.

This research ensures the following characteristics were targeted to reveal closely adequate feedback on the PM areas and framework.

Education Level: All 164 participants had a form of degree or technical qualification. 72 has graduate degree, 71 has a master's degree, 18 had an undergraduate degree, 3 had a form of technical qualification.

Industry General: The survey responses revealed ten major industry classification with most responses from the manufacturing sector which accounted for over 45% while other services & financial services accounted for 13% and 10% respectively. Therefore, this research focuses on PM as A Critical Success Framework for Development in the Manufacturing Industry.

No of Employees: Classification of company employees in the survey was grouped into seven to portray a wide scope of organizational demographics. The classification was grouped into seven categories. They are as follows:

*Table 1: Classification of Organizational Staff*

<b>S/N</b>	<b>Organizational Staff</b>
1	1001 to 5000
2	201 to 1000
3	51 to 200
4	1 to 10
5	5001 to 20000
6	11 to 50
7	Above 20000

PM Categories: Among the survey questions, this research also asked the participants to confirm the level of interaction and engagement their organization was having with project management. This was categorized into five levels. They are as follows:

*Table 2: Project Management Categories by Organization's Level of Support*

<b>S/N</b>	<b>PM CATEGORIES</b>
1	Managed Level - stable and measured processes against organizational goals; variations are identified and addressed
2	Optimizing Level - the entire organization is focused on continuous improvement
3	Defined Level - common, organization wide understanding of project management activities, roles and responsibilities
4	Recurrence Level - there is a project management system and plans are based on previous experience
5	Base Level - ad hoc and chaotic; relies on the competence of individuals not the organization's

PM Level – The survey also identified the level of operation the participants were experience in project management utilization. This was to ensure that the research captures multiple levels of perspective from the various project stakeholders. They are as follows:

*Table 3: Project Management Classification by Level*

<b>S/N</b>	<b>PM LEVEL (Manufacturing)</b>
1	Team Member
2	Project Manager

3	Other roles in Project Management
4	Programme Manager / Director
5	Project Execution
6	Support services

Organizational Department: In the same vein, the survey responses show a well varied samples of organizational departments as displayed below.

*Table 4: Organizational Department that uses Project Management Framework*

<b>S/N</b>	<b>ORGANIZATIONAL DEPARTMENT</b>
1	Engineering/maintenance
2	Production/operations
3	Sales/Marketing
4	Finance
5	Human Resource
6	Supply Chain/logistics
7	Operations/supply chain
8	Strategy
9	Management
10	PMO
11	Quality Assurance
12	Freelance

PM Experience (Years): The survey responses showed a well diverse category of years of experience as displayed below.

The survey sampled a quality range of manufacturing employees. Of the 73 survey results from manufacturing, 38% of participants worked in a 1000 - 5000 employee’s company. 25% of them worked in 201-1000 employees’ company while 14% worked in 51-200 employee’s company. This means 60% worked in manufacturing companies of over 200 employees. While 77% of the manufacturing survey samples worked in companies of over 50 employees.

*Table 5: Project Stakeholders shoeing Project Management Years of Experience*

<b>S/N</b>	<b>Years of Manufacturing Experience</b>
1	2
2	5
3	8
4	9
5	14
6	16+

In this study, I have utilized available company reports, participant observation, interviews and reflection with experts and professional records. I also engaged the rich resources of project management institutions such as PMI (Project Management Institute) and AAPM (American Academy of Project Management) database. Annals of research institutions and already published report came in handy during the development of this research.

The outcome of this research reveals robust and rich findings I am particularly excited about. It serves as an eye opener to understand more about how the world of work imbibes PM principles towards organizational objectives.



The research methodology of this project included both qualitative and quantitative methods to gather data and information. The research was conducted in several phases, including a literature review, primary data collection, and data analysis. Detailed analysis and analytics were carried out using the Microsoft excel software.

The research provided a comprehensive work on project management as a critical success framework for industrial development. The research also provided insights into the knowledge area in project management which are used the most and least by project managers in execution of projects and identified various level of organizational support in project management.

The research will contribute to identify critical success framework in project management for development in the manufacturing industry and provide a basis for future research in this field. This work can be described as descriptive and explanatory. It utilises the survey method to implement its quantitative methodology. In the subsections that follow, specifics of the research's execution are provided.

Survey platforms included social media and emails. The e-survey was utilized including interview sessions with project members.

## CHAPTER 4

### Results, Data Analysis and Discussion

Out of the 164 participants from the various sectors, I analysed and classified the participants into ten major industries and manufacturing sector took the highest percentage of 45% therefore, constituting of the largest share while general services and financial services were in top three with 13% & 10% respectively. The remaining seven sectors were had a distribution of 32% thereby giving me the confidence to carry on the study and examine the critical success framework in project management for development in the manufacturing industry. The manufacturing industry survey responses was equivalent to 73 participants of the 164 survey responses received.

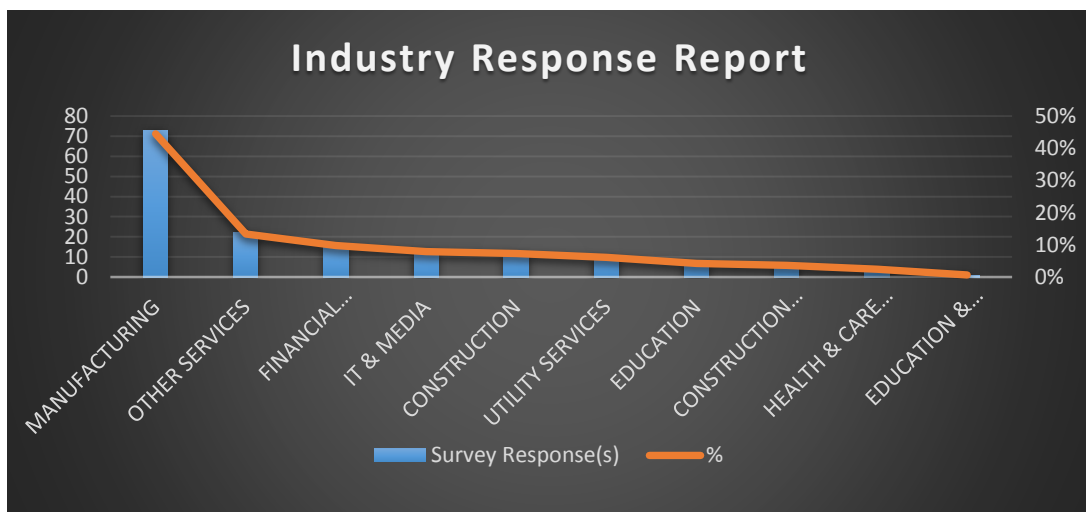


Figure 1: Industry Report Analysis

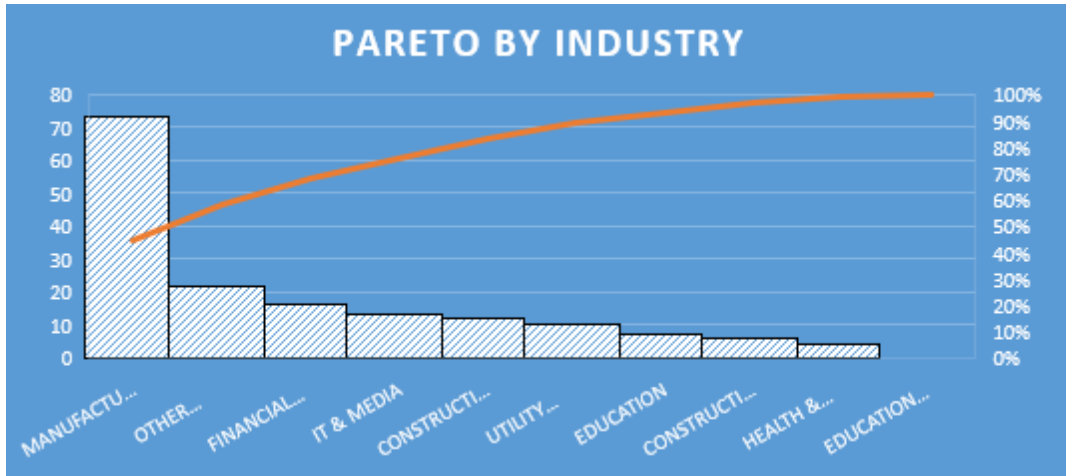


Figure 2: Pareto Analysis by Industry

Most Impacted PM knowledge Area – Manufacturing

With focus on responses from the manufacturing sector, cost management in project management knowledge area had the highest impact with 23% of PM professionals attesting to the vital relevance of this area. Schedule and scope management were identified to follow suite with 18% and 15% respectively.

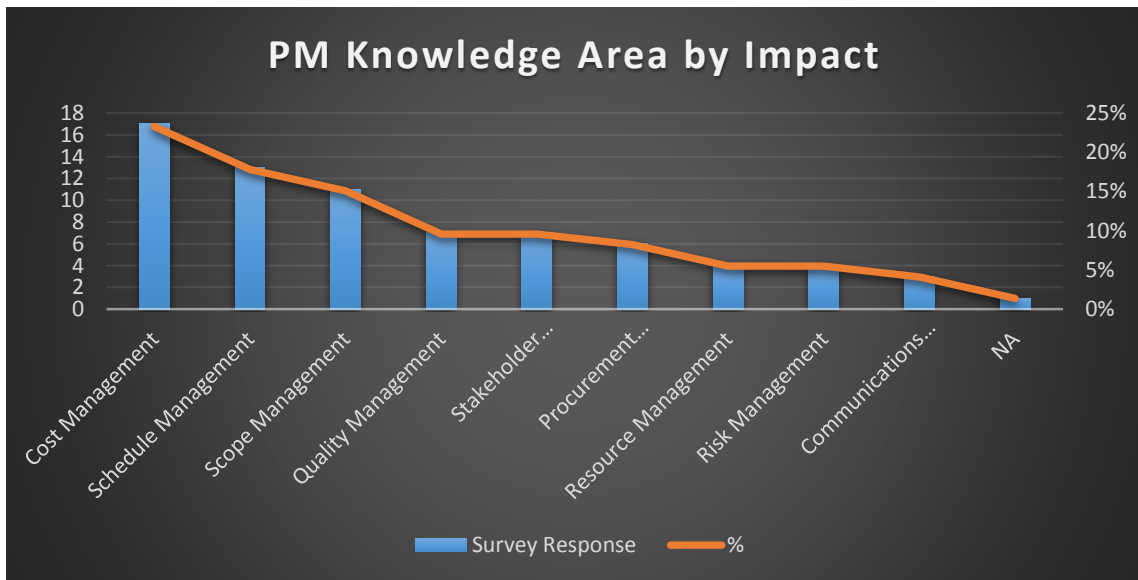


Figure 3: PM knowledge area by Impact

## Certification Requirement – Manufacturing

78% project management professionals in manufacturing believe that project management certification is a vital advantage to execute projects in the manufacturing industry while 21% disagree.

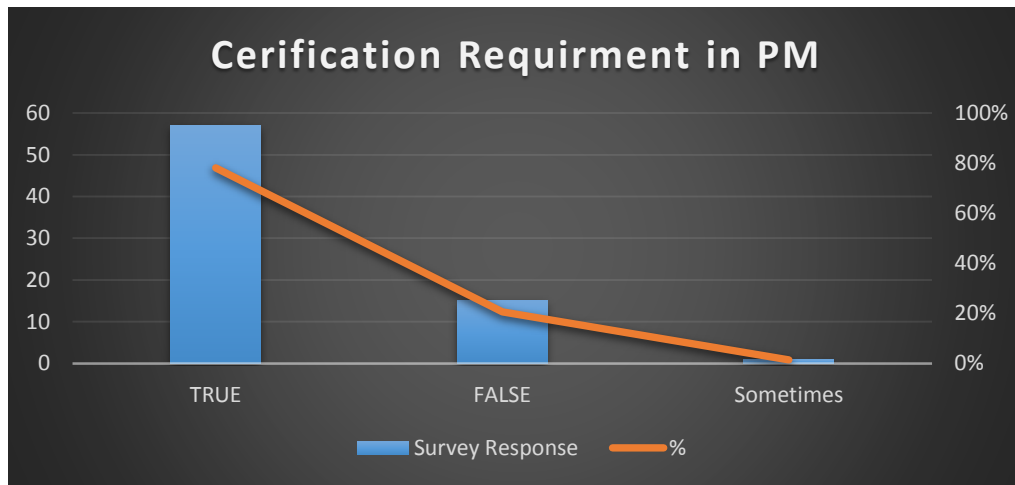


Figure 4: Relevance of PM Certification

## PM Support Frameworks– Manufacturing

The data identified that 53% of the PM professionals enjoy more extensive support of PM tools in the manufacturing sector while 44% enjoyed a form of support in utilizing PM frameworks from their organisation. Only 2% had no support. This tells us that the responses from the survey sufficiently capture the objective of this research in revealing the critical success framework PM has on the manufacturing industry.

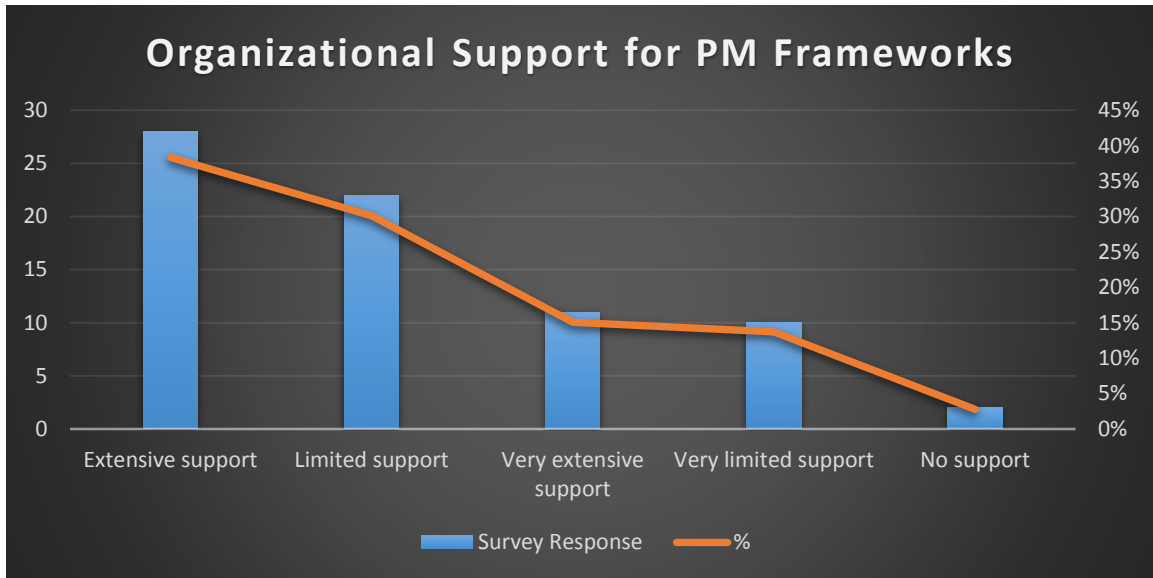


Figure 5: Organizational Support for PM Frameworks

## PM Frameworks – Choice by Professionals

### Most Utilized PM Frameworks - Manufacturing (First Choice)

Project charter, stakeholder analysis and cost/benefit analysis tools accounted for 71% of the most preferred PM frameworks utilized by PM professionals as first choice. Project Charter stands out as the most common and applied frameworks among the options with 37% PM professional making it their first choice of call. While the use of stakeholder analysis and cost/benefit analysis tools combined was 34%.

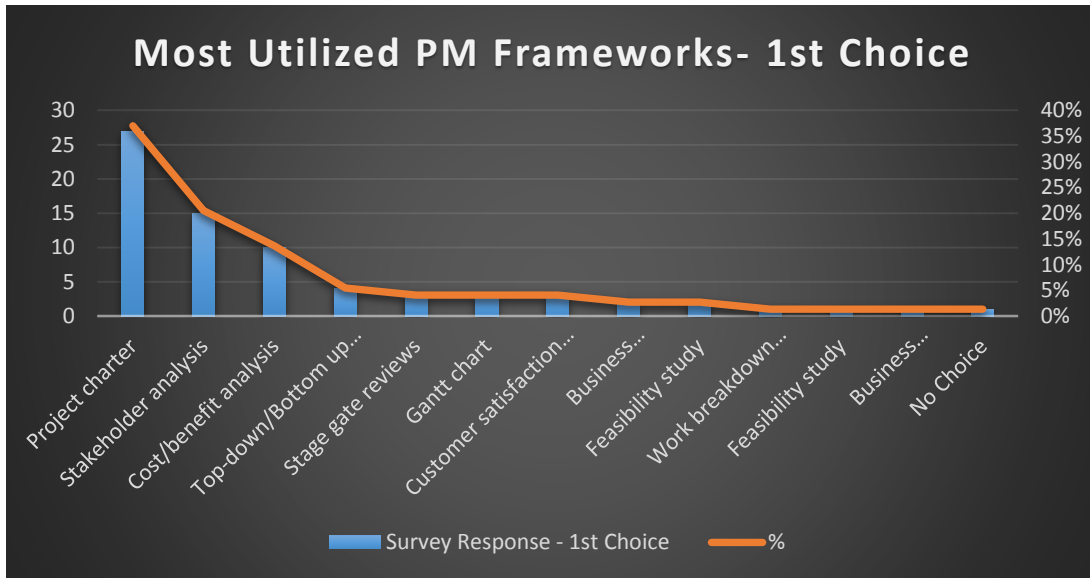


Figure 6: PM Frameworks mostly used by PM Professionals (First Choice)

### Most Utilized PM Frameworks - Manufacturing (Second Choice)

A second option was given to all 73 PM professionals in manufacturing who took the survey but only 58 responded in selecting a second choice of PM framework used the most. Nonetheless, need analysis, stakeholder analysis and cost/benefit analysis tools accounted for 50% of the most preferred PM frameworks for the second choice. Based on this result, need analysis accounted for 17% however, use of stakeholder analysis and cost/benefit analysis tools combined was 33% for second choice.

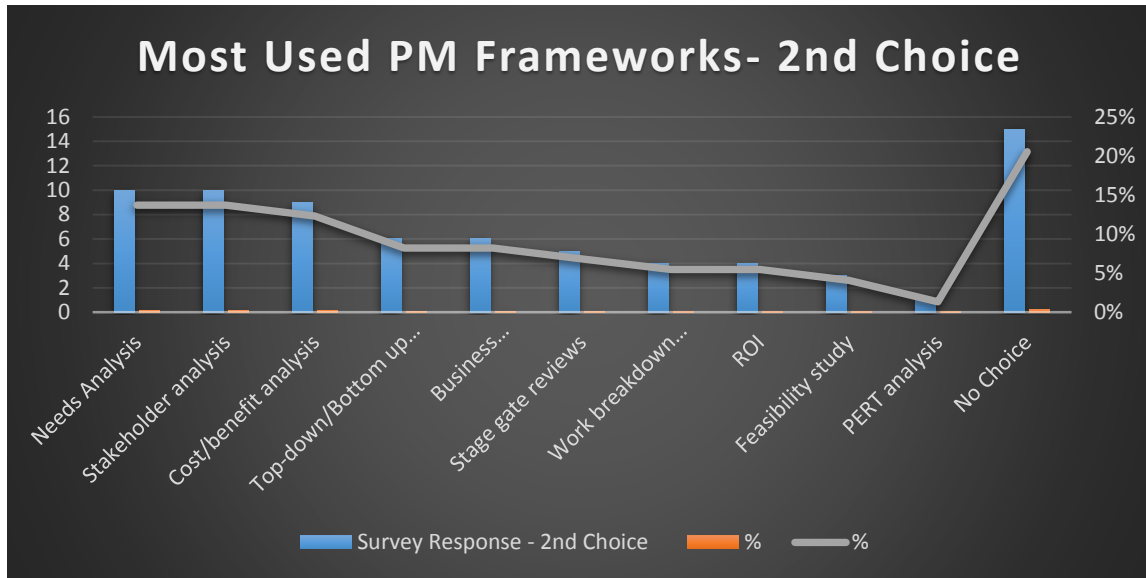
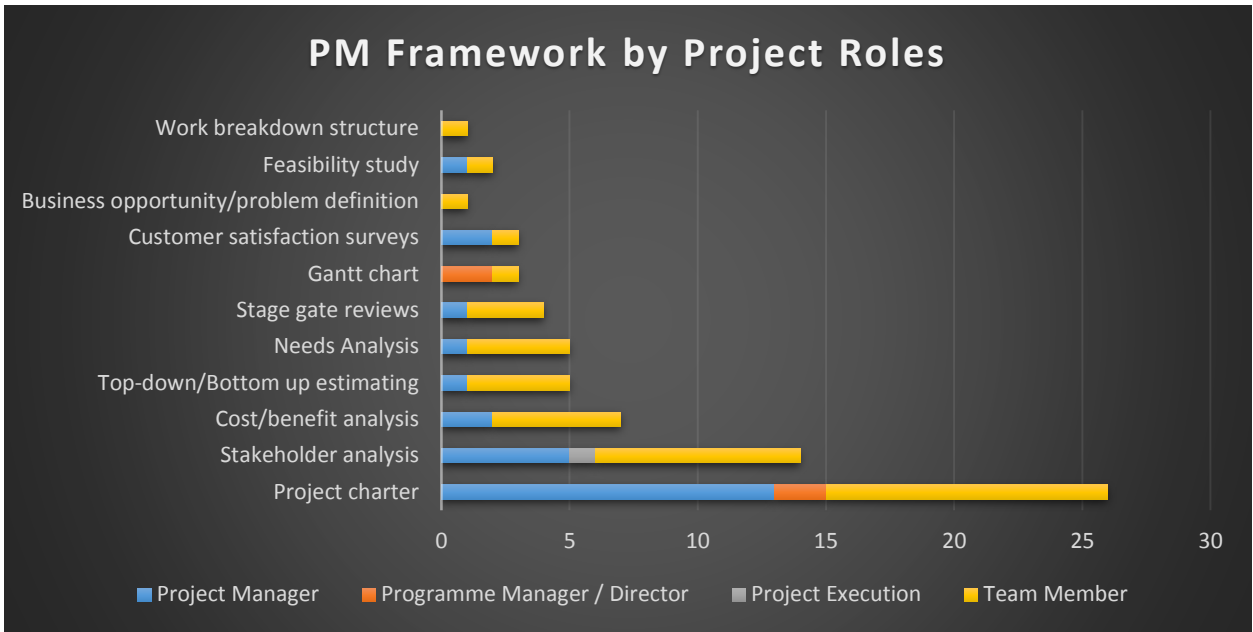


Figure 7: PM Framework mostly used by PM Professionals (Second Choice)

## PM Framework by Project Roles

### PM Frameworks mostly used by Manufacturing Project Roles

The analysis of the PM frameworks based on the survey responses proves that project charter, stakeholder analysis and cost/benefit analysis frameworks stood out distinctively as the three major critical success frameworks employed by PM professionals irrespective of the project roles.



*Figure 8: PM Framework by Project Roles*



## CHAPTER 5

### Conclusion

Project management has a significant impact on the success and efficiency of projects and organizational objectives in the industry particularly the manufacturing sector. Using project management frameworks in manufacturing organizations can improve processes, increase productivity, reduce waste, and improve the overall sustainability of projects or programmes.

Project management frameworks provide a common language and set of tools for everyone involved in the project. This shared understanding helps to ensure that all team members are working towards the same goals and objectives, and that everyone understands their role in the project.

Furthermore, Project management frameworks are essential to completing projects successfully. They provide a structured approach to planning, executing, monitoring, and controlling projects, and help to ensure that everyone involved in the project is working towards the same goals and objectives. By identifying and managing risks, managing resources effectively, improving communication, and providing a framework for continuous improvement, project management frameworks help to ensure that projects get completed on time, within budget, and to the satisfaction of stakeholders.

By recognizing that critical success frameworks are vital to the successful completion of projects, project stakeholders in the manufacturing sector can ensure that they remain competitive in an ever-changing business environment and ultimately achieve better business results by utilizing these frameworks.

This research has been able to identify cost management as the most impacted project management knowledge area engaged by PM professionals based on the outcome of the data result. 23% of PM professionals confirmed cost management knowledge area as the most implemented. Schedule and scope management were identified to follow suite with 18% and 15% respectively. Therefore, it is safe to conclude that cost, schedule and scope management accounted for the most PM impacted knowledge area combined of over 55%

Secondly, based on the analysis of the survey data, the outcome of this research reveals that stakeholder analysis and cost/benefit analysis were most preferred among the first and second choice survey data combined. This means that among the critical success factors viz-a-viz PM tools, stakeholder analysis and cost/benefit analysis are the two most applied combined tools used by PM professionals in the manufacturing industry. Nonetheless, when PM frameworks are considered independently Project Charter is the most utilized PM framework in the manufacturing industry while Needs Analysis framework was observed to be the second-best choice utilized by PM professionals in the manufacturing sector.

Finally, this research has demonstrated that project charter, stakeholder analysis and cost/benefit analysis frameworks stood out distinctively as the three major critical success frameworks employed by PM professionals across all project roles combined as they accounted for over 65% among the framework options considered. Therefore, this paper demonstrates the significance of project management as a critical success framework for development in the manufacturing industry. The findings of this paper can be used as a guide for manufacturing companies to develop effective project management strategies to achieve successful development outcomes.

## Appendix

### Question 1: Which Industry are you in?

1. Manufacturing
2. Services
3. Financial Services
4. It & Media
5. Construction
6. Utility Services
7. Education
8. Construction & Services
9. Health & Care Services
10. Education & Services

### Question 2: What is the size of your organization staff?

1. 1001 to 5000
2. 201 to 1000
3. 51 to 200
4. 1 to 10
5. 5001 to 20000
6. 11 to 50
7. Above 20000

### Question 3: Which of these is your organizational PM categories?

1. Managed Level - stable and measured processes against organizational goals; variations are identified and addressed.
2. Optimising Level - the entire organization is focused on continuous improvement.
3. Defined Level - common, organization wide understanding of project management activities, roles and responsibilities.
4. Recurrence Level - there is a project management system and plans are based on previous experience.
5. Base Level - ad hoc and chaotic; relies on the competence of individuals not the organizations.

### Question 4: What is your project management Level?

1. Team Member
2. Project Manager
3. Other roles in Project Management
4. Programme Manager / Director
5. Project Execution
6. Support service

**Question 5:** What is your Organizational Department?

1. Engineering/maintenance
2. Production/operations
3. Sales/Marketing
4. Finance
5. Human Resource
6. Supply Chain/logistics
7. Operations/supply chain
8. Strategy
9. Management
10. PMO
11. Quality Assurance
12. Freelance

**Question 6:** How many years of experience in project management do you have?

1. 2
2. 5
3. 8
4. 9
5. 14
6. 16+

**Question 7:** What is your education level?

1. Graduate degree
2. Master's certificate or equivalent
3. Technical qualification
4. Undergraduate Degree

**Question 8:** Which knowledge area is most impacted in your project management experience?

1. Cost Management
2. Schedule Management
3. Scope Management
4. Quality Management
5. Stakeholder Management
6. Procurement Management
7. Resource Management
8. Risk Management
9. Communications Management
10. NA

**Question 9:** Is project management certification necessary to implement project management techniques or tools?

1. True
2. False
3. Sometimes

**Question 10:** What level of organizational support do you get in using project management tools or techniques?

1. Extensive support
2. Limited support
3. Very extensive support
4. Very limited support
5. No support

**Question 11:** Which of these project management frameworks do you mostly use? (Choice 1)

- |                                   |   |
|-----------------------------------|---|
| 1. Project charter                | 8. Business opportunity/problem definition  |
| 2. Stakeholder analysis           | 9. Feasibility study                        |
| 3. Cost/benefit analysis          | 10. Work breakdown structure                |
| 4. Top-down/Bottom up estimating. | 11. Feasibility study                       |
| 5. Stage gate reviews             | 12. Business opportunity/problem definition |
| 6. Gantt chart                    |   |
| 7. Customer satisfaction surveys  |   |
| 13.                               |   |

**Question 12:** Which of these project management frameworks do you mostly use? (Choice 2)

- |  |                             |
|--|-----------------------------|
| 1. Needs Analysis                          | 6. Stage gate reviews       |
| 2. Stakeholder analysis                    | 7. Work breakdown structure |
| 3. Cost/benefit analysis                   | 8. ROI                      |
| 4. Top-down/Bottom up estimating.          | 9. Feasibility study        |
| 5. Business opportunity/problem definition | 10. PERT analysis           |
|  | 11. No Choice               |

## Appreciation

My profound gratitude goes to my supervisor Prof. Salvatore Fava PhD for his valuable guidance, and support. I deeply appreciate Irelioluwa Adenigba, Oluwafarahanmi Adenigba and Oluwafifehanmi Adenigba whose support came in handy when I needed them the most during such immense research work. Thanks to my parents Chief and Mrs. Adenigba with Mrs. Olawunmi Oyinloye-Obaoye who stood by me in many areas to ensure that I progress in the project. Dr. Akin Akinpelu's kind words served as a moral support during this period. Mr. and Mrs. Osunuyi's consistent support is well acknowledged. I specially appreciate the various project management professionals who responded to the research survey questions and my siblings Mrs. Arigbolo and Mr. Ayo Adenigba. Qudos to my senior professional colleagues in the persons of Mr. Rafiu Abatan and Mr. Abduljelil Adeshina whose words encouraged me to advance in the midst of challenges. Thanks to my colleagues Bimbo Adejare, Radiance Tochukwu, Olatunji Emmanuel, Samuel Iyiola, Seyi Akinseesin whose continuous moral support was helpful, thank you. To Sydniq Akhanene and Blessing Okafor of CHI limited who shared their resource of time in answering questions towards the progress of this work, thank you. Gratitude to Engr. Olufunmilade Akingbagbohun, Oludare Akinlaja and Engr., Dr. Omolola Adetona for their motivation.

I would like to thank the entire staff of Business and Media Department of the prestigious Selinus University, for their academic contribution.

Finally, immense appreciation goes to King Emmanuel of Nazareth who provided relevant inspiration and resources to make this work profitable.