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Research Article

Prospect of Reliability in Project Management Process using Life Cycle Approach. A Case Study of Oil and Gas Project

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Abstract

The oil and gas industry remains a powerful entity in the economic development of many nations. The practical Project Management approach in this industry has become a significant challenge for most Project Managers. Deploying Project Management best practices will solve many of the challenges associated with this industry because it serves as a link between Processes, People, and Technology. According to Project Management success road maps, the primary factor is the assumptions, criteria, and approaches employed to control and conduct projects. This review aims to achieve reliability in the Project Management process using the life cycle approach, a case study of oil and gas projects with a critical focus on configuration management, change management, quality management, requirement management, and risk management. Adopting the Project Management life cycle approach has proven to be an effective tool for reliability.

Five Phases of the Project Management Life Cycle include the initiation, planning, execution, control, and closure phases. With this approach sequentially, the project undertaken will be delivered successfully from the review carried out. Each phase focuses on a given facet involved in managing a project from the start through finish. Today, it is well-known that employing skilled and experienced project managers will deliver critical success or benefit in the oil and gas industry without ensuring the reliability of key project management processes at each phase of the project. Simultaneously, ensuring the defined approach and its business case will rely on a reliable project management process to achieve the project's rationale.

Keywords: Project Management, Life Cycle, Project Manager, Methodology

Introduction

Tailoring Project management to suit specific industries is a principal problem-changer approach. Organizations are face to face with numerous competitors. Surviving this requires the organization to embrace change facilitating project, as noted by Pinto [1]. Projects are one of the most critical processes to effect a change in our world, and the means to get this done remains the same: project management Biggins [2], Pinto [1]. Therefore, it is imperative to note that the success of any project is an anchor of the Project Management method Wells [3]. Project management (PM) applies process, method, skill, knowledge, and experience to accomplish a particular project objective concerning the project's agreed deliverables. The PM works within the scheduled and budgetary to achieve the deliverables. The time factor is peculiar within the concept of PM; it distinguishes the PM from just management; hence the deliverables are time dependent,

unlike management which is an ongoing process. Therefore, the project manager must be skillful in technical, people, financial, time and resources management Barnes [4]. This review, however, focuses on achieving the PM process's reliability using the project lifecycle approach in the oil and gas industry with a critical focus on configuration management, change management, quality management, requirement management, and risk management.

Reliability in the PM context can be defined as ensuring that the PM process involved in every phase of the project is practical and consistence for improving performance through more extensive or better use. Reliability of the PM process can be perceived as the link between the PM process and project success. Prioritizing the project manager and team members effort to achieve all requirements is challenging. It is not usual for a few processes at each project life cycle phase. Not all project life cycle has the potential to contribute to increased performance to be under-utilized or using inexperience personal in decision making. Hence, ensure a project meeting schedule and budget yet considered a failed successful project. Ensuring the reliability of the PM process at each phase will not only deliver a successful project to the project manager and team members but to the operating team, whose primary duty is to achieve an acceptable level of benefits realization. Thus, ensuring reliability has the potential to contribute to benefits management processes.

Currently, practitioners in the oil and gas industry consider the reliability of equipment, compliance to standards, and inspection during project execution most valuable than ensuring the reliability of the PM process involved at every phase during execution. Thus, less emphasis on the benefits of ensuring the reliability of the PM process, which has the potential for increased project performance at every phase of the project? Reliability in PM should be a superior technique in the oil and gas industry. Considering the benefit of effective and consistent configuration management, change management, quality management, requirement management, and risk management possess the most significant potential for improving performance through more extensive or better use. Reliability will help ensure that PM processes are adhered to, and a series of tests, reviews, and acceptance is adequately documented at each project phase.

The project life cycle approach

The term life cycle originated from the biological life cycles of birth, growth, maturity, and death. Over time, this has been translated into different disciplines ranging from organizations, products, software development, information technology, and processes Cao & Zhao [5], Biggins [2]. The life cycle approach gives a structural view of an entire entity by giving room to a systematic assessment of the stages involved. Each stage/phase in the life cycle is separated by time. It is worthy of note that the phases are affected by different factors affecting the entire system. A life cycle can be used to understand and control operational planning and forecasting/predicting Biggins [2], Kotler & Keller [6].

The Association of Project Management (APM) defines the project life cycle as a series of distinct sequential phases that provide the structure and approach for progressively delivering the required outputs Murray-Webster & Dalcher [7]. Figure 1 presents a schematic representation of the project life cycle consisting of the initiation, planning, execution, and close-out phases, each with its deliverables. Project Management Institute (PMI) sees project deliverables as including both the outputs that comprise the product or service of the project as well as ancillary results such as PM reports and documentation PMI [8]. Applying the project lifecycle approach to managing a project will enhance the project manager's probability of not missing any significant aspect of the project. Each phase is considered distinctly, and the end products are clearly defined.

The life cycle method establishes a realistic representation of linearity and predictability, hence setting targets on the phases and activities defined in the system. In other words, an incorrect model application will yield a negative outcome. It is therefore essential to apply caution while employing the life cycle approach. Defining the life cycle approach in terms of PM implies different organizational phases involved in managing a project. These are introducing the adopted approach, executing the project with the adopted approach, and maintaining and enhancing the adopted approach. It is imperative to state that the PM life cycle operates a limited life; at every phase, different challenges and opportunities are presented to the organization Biggins [2].

Review of Literature

PM processes are generic processes that apply to each project life cycle phase. It includes starting or initiating the process, defining, and planning, monitoring and controlling, and learning or closing Lock [9]. However, PMI considers this process in a different approach, which is in four stages: initiating, planning, executing, and closing PMI [8]. There is no chapter devoted to reliability in the PMI Project Management process in their current syllabus. Conversely, every project comprises a different team consisting of the project team and operating team Nigel J. Smith [10]. The project team is responsible for carrying out all the PM processes to achieve the project's objective.

In contrast, the operational teams are responsible for the day-to-day operation of the project with the ultimate aim of benefits realization and end user satisfaction. Failure due to the project management process during operation is traceable to the operating team; however, there is a need to involve the operating team during the project management process, which can only be achieved by ensuring the reliability of the project management process. Teamwork, leadership, and organizational structure play a significant role in ensuring reliability in the PM process.

Figure 1: Project management life cycle.

Strong leadership can only be achieved from the encouragement and commitment of management Ghauri & Gronhaug [11]. Thus, top management must explicitly state the philosophy, priority, and long-term goals and communicate it to everybody involved in the project constantly and openly from initiation to operation. Hence, finding an appropriate time slot for all participants involved in the project to ensure the reliability of the process is achieved. The documentation of necessary project experience at every phase of the project will help achieve effective and consistent risk management, change management, configuration management, and scope management, and reduce uncertainties at every phase of the project. Thus, improving project performance and considering reliability as a series of testing, review, acceptance, and documentation of lessons learned. The process will involve defining, planning, implementing, and feedback element at every phase of the project life cycle, which will help pass on experience, secure relevant insights, and document project failures and their reason. The PM process's reliability aims to improve the PM process and project performance achieved through the reliability process.

The process set out in Figure 2 guides implementing adequate PM process reliability, which should be integrated throughout the life cycle and operation. The bottom line is that this process should result in increases in the quality and reliability of the PM process. The choice of activities and resources to be expended during the reliability process should be based on the experience of a similar project Ke & Hwang [12]. In order to ensure the effectiveness of reliability in the PM process, the following factors must be managed (i.e., Success factor):

I. The project manager responsible for the reliability process must be identified and account for PM process reliability.

II. The resources required for ensuring the reliability of the process must be identified as input, including experience of personnel, experience from the past project including information, and resources needed to produce the output must be identified.

III. The procedures and tasks needed to be followed should be identified.

IV. Evaluation of the reliability of the process must be carried out and documented to ascertain its effectiveness.

Since managing a project is success-oriented, which cannot be achieved by quality management alone, it is essential to establish links that will prove a need to consider reliability in project management practice.

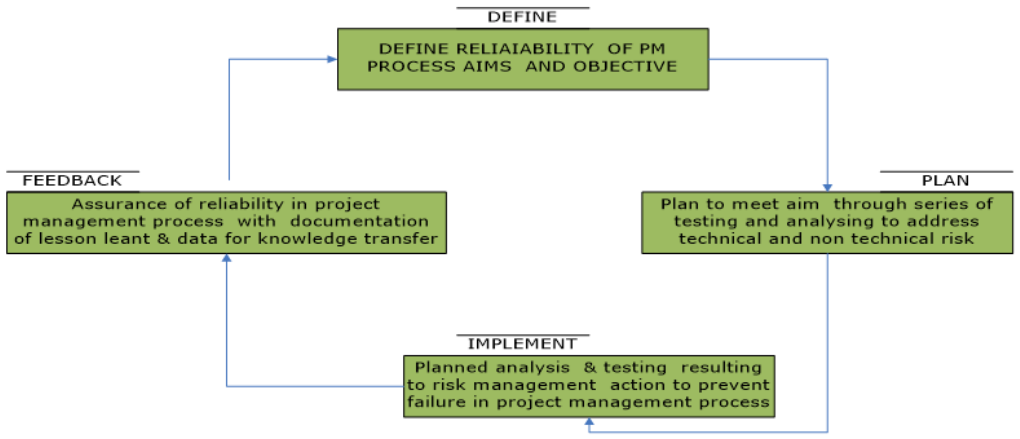

Figure 2: Reliability process of define-plan-implement-feedback cycle.

The link between Reliability in PM processes & Quality Management

Much emphasis in the oil industry is on total quality management, which does not consider the project management process at every phase of the project Russel Darnall [13], Brown [14]. However, achieving certifications like ISO 9001-2000 or ISO14000 or QS 9000, or any other awards is not guaranteed to improve the PM process or project performance. However, reliability assurance is the point of emphasis of this standard Ke & Hwang [12]. Thus, achieving reliability throughout the project's life cycle will define and refine the requirement as the project progresses from one phase to another. This is important to ensure the achievement of the overall objective in terms of required quality Russel Darnall [13], Brown [14]. In general, the difference between reliability and quality is often unclear, and there is a tendency to believe that focusing on quality alone will achieve reliability Strutt et al. [14]. However, both reliability and quality are related to different objectives. Quality objectives aim to meet specific requirements like zero defects for a specific project/ product or a response time (SQ, 2004).

On the other hand, reliability aims to improve the PM process and project performance. It could be suggested that quality management practice is all about meeting standards. The only way it can be achieved is by ensuring reliability in the PM process.

The link between Reliability in PM Process & Planning

Since the origin of project management, planning has been considered the primary cornerstone of success Dvir & Lechler, [16]. Establishing a different body of knowledge has further strengthened this notion Murray-Webster & Dalcher [7], PMI [8]. However, there is limited evidence about the relationship between achieving reliability in planning and project performance González, et al., [17]. Thus, there is limited research evidence that ensuring reliability in planning will improve project performance Thomas, et al., [18], Thomas, et al., [19]. Achieving reliability during the planning process improves the traditional management approach. (i.e., "plan is to define activities and schedule work that will be done, prior to starting that work in terms of what should be done from a master plan" González, et al., [17]. Ensuring reliability during planning will help overcome the limitations of traditional planning by carryout a reliability process planning to derive maximum project benefits. Reliability achieved during the planning process and then implemented will ensure that the planning will meet the specified requirements during execution.

The link between Reliability in PM Process & Project Success

Taherdoost and Keshavarzsaleh [20], Cristóbal, et al., [21] Recognized that some improvement has been made in project success, and there has been a relatively high number of project failures, which is also noted by Montequín, et al., [22], Zwikael & Meredith [23]. However, none of their research has considered how reliable is the project management process or the link between the project management process resulting from projecting success or failure of the project. Ensuring reliability in the project management process is linked to project success, according to Pinto & Mantel, 1990. The three distinct aspects of project performance: are the implementation process, the client's perceived value, and client satisfaction. This can be achieved by ensuring reliability in the project management process. From research carried out by Zwikael & Meredith [24], three criteria for assessment of project success are meeting design goals, benefit to commercial customer success, and future potential, which are achieved by ensuring reliability in the project management process. Lipovetsky, et al., [24], This research used four dimensions for measuring project success and concluded that customer satisfaction is the most crucial criterion, twice as important as efficiency. Maylor's proposal suggests non-reliance on the Gantt chart alone but on how decisive and efficient the Gantt chart is Maylor [25]. There is a need for the Gantt Chart to be reliable

to deliver the work packages within time, scope & budget, i.e., efficiency is strongly related to customer satisfaction. It is a known fact that the critical goal of reliability is customer satisfaction and efficiency, which can be achieved through the reliability of the PM process. There is a need for the project manager to consider reliability in all their process to achieve a successful project.

The link between Reliability in PM Process & Harvesting Project knowledge

Knowledge management is a systematic and organized means to use knowledge within the organization, which will transform the ability to store and make available that knowledge to improve performance Udeaja, et al., [26], Tan; et al., [27]. Suppose knowledge management experience from the project during the reliability process can improve performance. In that case, there is a need to integrate reliability into the project management process, which will help to capture the required knowledge at every phase of the project, thereby creating an atmosphere of knowledge transfer in the project environment. According to Carrillo et al., [28], knowledge management creates value and productivity and sustains competitive advantage. Suppose knowledge can be captured by ensuring reliability in the project management process at every phase through a series of reviews and documentation. In that case, there is a need to integrate reliability into the project management process through lessons learned at every project phase. Cease reliance on tools used to capture knowledge classified by Tan, et al., [29] as IT knowledge management techniques and non-IT knowledge management techniques. To a great extent, the risk of knowledge loss could be solved by knowledge capture through a reliability process at every phase of the project life cycle. From this perspective, ensuring reliability in the project management process will prevent the risk of knowledge lost at every process in each project phase rather than depending on the final lesson learned alone.

The link between Reliability in PM Process and PM Practice

White and Fortune [30] in their study of current practice in project management in the real world, using a survey of people active in project management, they find out that there are some limitations and draw back on current practices despite best practices being put in place. Limitations with the method, methodology, tools, and techniques used by the project manager with project management software were reported the highest number of times White and Fortune [30]. Earlier research by White and Fortune [30] and further research carried out by Sauter & Tongwan [31] applied similar empirical studies to project management practices, and a conclusion was made that an essential aspect of project management is frequently used. However, ensuring reliability will help prevent this limitation and ensure that the critical aspect of project management is used regularly by establishing the relation between improved process and project performance about that particular aspect of PM [32.33].

Methodology

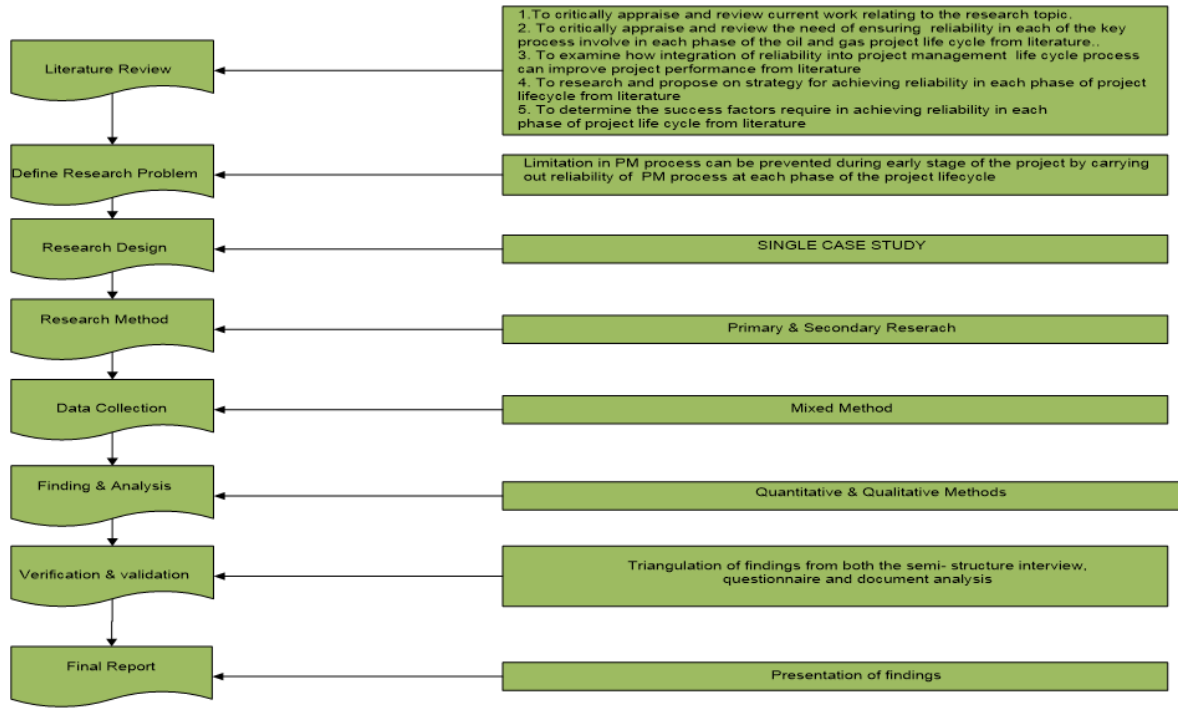

Figure 3: Illustrating the proposed research sequence.

Several methods have been explored and identified for this research with a proposed preliminary research plan (PRP). Figure 3 presents the rationale for adopting any suitable approach to validate why reliability must be considered in the PM process, thereby establishing the relationship between reliability in the PM process, improving performance, and project success. Research Design is the aspect of the research process which provides answers to the questions of what, why, how, where, when, and who.

Figure 3 illustrate various research method, techniques, and approach with a view of adopting the most suitable approach.

Conclusion

Based on these findings, we can base our judgment on the fact that it is not the Method/ methodology/ tool/ techniques with limitations. The reliability of the process involved when using methods, tools, or techniques that are used to achieve the result, which White and Fortune (2002) failed to capture in their study. Ensuring reliability in project management has been shown to address some of the limitations in the project management process. There is a necessity to change organizational perspectives across all levels to redefine the essence of reliability in a project's lifecycle. This process will require a more proactive approach to reliability and its closer integration into project management processes. In conclusion, the benefit of integrating reliability into the project management process outweighs the disadvantages due to the time spent at each phase of the reliability process. Therefore, achieving reliability in the project management process should be the best practice.

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Conflicts of Interest

The authors declare no conflict of interest.

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