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Challenges and Opportunities of Completing Successful Projects Using Earned Value Management

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Abstract

This research proposed analyzing projects from a risk uncertainty perspective by using EVM to predict the systemic (Epistemic Risk) and provisioning (Aleatory risk) uncertainties to achieve project success. The results of the study synthesized empirical findings with theories and concepts. To bridge the gap, this research study focuses on minimizing or alleviating epistemic and aleatory risk uncertainties. The research method included a qualitative exploratory study with thematic analysis. The participants for the study were project managers with a PMP certification and EVM knowledge who worked on government contract requirements and members of the local chapter of the Project Management Institute.

Keywords

Aleatory Risk, Epistemic Risk, Provisioning Issues, Systemic Issues, Risk Uncertainty

1. Introduction

Project managers had challenges implementing earned value management (EVM) during project management. Historically, project success supersedes the failed completion of scope, time, budgets, and delivery of products and services. To assist project managers in reversing this trend of failed projects, the creation of earned value management (EVM), a prediction tool, emerged during the World War II (WWII) era. An estimated 70% of projects failed using EVM (Browning, 2018). EVM includes various metrics that can assist project managers with achieving success with project completion. Officials from the American National Student Institute (ANSI) and Electronic Institute Association (EIA) created 32

criteria for managing projects, which is known as the *gold standard* for project management. With EVM, project managers can identify early warning signs of project failures (Packard & Clark, 2020). The developers created EVM to achieve success; challenges occur with implementation.

Project failures by managers identified stemming from two public sources, which are either systemic or provisional issues (Packard & Clark, 2020). The systemic issues included six potential causes contributing to failure, while provisional issues included 10 behavioral biases. Researchers suggested that provisioning issues better explain project failures than the common excuses of scope change and cost overrun. The results of this study included the opportunity to uncover the underlining issues of project failures through an exploration of various project shortcomings across several industries.

A need exists to continue research on the advantages of how exploratory research can bridge the gap between innovation and project management because the two fields are separate because of their complex and complicated relations. The primary research question was, *what are the procedures project managers need to improve for project success using EVM*? The procedures guide this study in identifying the root cause and concerns for project failures. I explored the project manager's perspective on why projects failed at high rates and developed an analysis and recommendation for change leading to successful project management. The proposed recommendations led to a social impact on sustainable development initiatives in project management.

The paper is divided into three sections: Section 1 includes an introduction, the purpose, significance, limitations, and a literature review. Section 2 includes the methodology and design, and Section 3 includes the final discussion and conclusions.

1.1. Study Purpose

The purpose of this qualitative exploratory study was to explore the procedures Project Managers need to improve a project's success using EVM. This study has benefited project managers who have accepted government contracts and utilized EVM metrics.

Research Question: What procedures do project managers need to improve for project success using EVM?

1.2. Significance of the Study

The study results could reflect that the lack of good and consistent communication and the inability to control risk are major influences on project failures when using EVM metrics. Project managers that can improve the communication process and identify uncertainties before they escalate to uncontrollable risk increase their chances of creating successful projects (Grandage, 2021). Improvements in project management performance have brought significant value to organizations. Project managers using increased project performance can

demonstrate how to utilize the prediction tool effectively. This new body of knowledge assisted organizational managers in working in a socially responsible manner within the communities they served. Earned value management is a powerful performance management and feedback tool for project management (Bilir & Yafez, 2021).

The increase in the volume of projects, changes in the world scenario, and increased competition generated the need for faster results, higher quality, and lower and shorter deadlines (de Souza & de Souza, 2019). With a better understanding of how to utilize EVM metrics when performing project management business, organizational managers can meet the scope requirements, budget, and time constraints of projects. Managers can use EVM to depict the project's progress in terms of scope, cost, and schedule to provide future predictions based on trends and patterns of the past (Efe & Demirors, 2019). Project managers made value-added decisions with the appropriate knowledge of how to utilize the EVM metrics and provide organizations with greater returns on investments (ROI).

1.3. Delimitations and Limitations

I limited the study to project managers with PMP Certifications with at least 5 years of experience and experience managing government contracts using EVM. Furthermore, the participants were only those with a membership with their local chapter of PMI. I did not consider project managers with little or no experience working on government contracts using EVM. EVM consists of mathematical base formulae, and I did not consider whether the project managers were comfortable with performing EVM computations manually.

The study included diverse experiences since the sample was only individuals with membership to the local chapter of PMI and PMP certifications with at least 5 years of experience working on projects and government contracts. Groupthink emerged as a narrow criterion for the study. A sample with a broader diversity of experience could overcome the groupthink limitation. EVM has a significant limitation regarding quality in its method, considering cost and schedule related, but it does not directly include quality outcomes using the metrics (de Souza & de Souza, 2019). The implications of EVM not meeting quality imply that the project failed to meet the criteria for the scope or client's satisfaction. However, EVM does satisfy the quality criteria indirectly. Projects that achieve the scope, cost, and time commitments of a project with interval inspections in the product life cycle ensure quality is present at every level of the project.

1.4. Review of the Literature

The worldwide failure rate of information technology (IT) projects is approximately 65% (Snipes, 2021). With over 70% of projects in certain industries failing with earned value management (EVM), a need exists to uncover the issues by researching the constraints (Bilir & Yafez, 2021). The potential results from

this research could uncover whether systemic or provisional issues exist that prevent project managers from completing successful projects with EVM. A formal introduction is important to conduct the roles and responsibilities of the portfolio program and project managers to educate the reader.

Portfolio management is projects, programs, subsidiary portfolios, and operations managed strategically to achieve an organization's objective (Nunes & Abreu, 2020). Portfolio management includes a process for ensuring that it performs consistently and that the components are optimizing the resource allocation. The standard for program management relates to projects, subsidiary programs, and program activities managed in a coordinated manner to obtain benefits not available from managing them individually (Shao et al., 2012). Projects are temporary endeavors that create a unique product, service, or result for the client organization. Project management is the application of knowledge, skills, tools, and techniques for project activities to meet project requirements across the different projects of the life cycle. Project management is essential in other countries as a useful and efficient tool in planning and organizing processes, crisis management, and time management (Vrchota et al., 2020). I focused on the lowest level in this hierarchy to understand why project managers could not successfully implement EVM to achieve project success.

In a perfect world, project management, when implemented properly, can assist organizational managers with achieving their goals in meeting the needs of the client's expectations (Flyvbjerg, 2016). However, projects regularly fail, particularly in complex situations. The major contributors to project failures are a lack of clear goals, unclear role expectations of the stakeholders, conflict with internal power dynamics, and inappropriate power dynamics (Novy & Peters, 2012). The alignment among partners from past and future projects can also cause failure in the delivery of products, services, and outcomes. Sustainability is an integral part of project management practices that maintains the economic, environmental, and social future benefits (Vrchota et al., 2020).

Project failures lead managers to an opportunity to invoke vicarious learning for future project managers (Hughes et al., 2017). Understanding failed projects create a learning opportunity for managers to improve the success rate of projects. Cost overruns are common in large-scale projects. To improve the success rate of project management, earned value management (EVM) emerged that managers can use to assist with achieving the desired deliverables for the client. EVM emerged years ago, and it is still challenging to implement in projects.

1.4.1. History of EVM

Earned value management (EVM) is a project management approach that can enhance the probability of project success (Aramali et al., 2022). EVM is the most comprehensive method to monitor and control the performance of a project's cost and schedule through the integration of the project's scope, budget, and duration (Dube, 2018). The EVM methodology is acceptable and applies

in military contracts, the space industry, energy, and software, and the application continues to grow (Naizghi, 2021). The continuous search for cost reduction in the manufacturing and production process is an ongoing task for company managers whose impact on their economic management is significant (Villafanez et al., 2020).

The birth of project management materialized during World War II (WWII), which started in 1939 (Webster, 1999). Countries wanted to arm themselves with weapons of defense, which resulted in the atomic bomb and the nuclear power era. With the undertaking of these massive projects, a need came to understand better how to conduct research, perform quality tests, and develop the infrastructure to produce the material needed to bring nuclear power to conceptualization. With the execution of these difficult projects, the need emerged to meet the constraints of the defense departments. The nuclear age leads leaders to generate interest in developing projects to manage better the tasks to complete the work.

By the 1950s, the use of the critical path method (CPM) emerged for managers to develop an understanding of performance appraisal. The project evaluation review technique (PERT) came from the U.S. Navy. PERT was founded similarly to CPM, which paved the way for EVM to resolve the deficiencies of CPM and the PERT technique (Geneste, 2019). In measuring the performance of U.S. government projects, earned value management (EVM) has a parallel history from the 1960s (Nevison & Chichakly, 2021). The formation of the Project Management Institute in 1969 introduced of first major step that emerged in transforming project management into a profession (Kabeyi, 2019). The birth of project management functions allowed managers to find viable solutions to project constraints.

Since the 1960s, the results of project management studies have included a scholarly pedigree that covers empirical contexts, methodological approaches, and theoretical contributions (Lenfle et al., 2019). Exploratory projects are goals or means for achieving defined at the beginning of a project. A need exist for further research on how exploratory projects can bridge the gap between innovation and project management literature, which are two fields of study long separated with complex and conflicting relations (Davies et al., 2018). With the institutionalization of Project Management, three levels exist in the structure.

Kabeyi (2019) identified the three levels of research management as technical, strategic, and institutional. At the technical level (with systemic issues), the use of tools and techniques that develop the work breakdown structure (WBS), earned value (EV), PERT, and value analysis apply. The strategic level (with provisional issues) is the alignment of project strategies with sponsors managing technology, the influence of stakeholders, developing a communication platform, leadership, and teamwork, and integrating governance structure and control mechanisms. At the institutional level, the major concern is organizational issues, which can have a major impact on project performance and delivery, but

are not limited to, any specific project or program requirements.

1.4.2. Earned Value Management

Earned value (EVM) is a management technique that relates resource planning to schedules, costs, and requirements. EVM is appropriate for the early identification of trends and variances from the project plan baseline, and it includes accurate forecasts of project performance problems. Earned value management with an earned schedule (EVM/ES) is a project control method that applies to top-down project schedule control (Nadafi et al., 2019). Managers can use EVM to measure the implementation of a project through management techniques that assess a work in progress to determine what will happen to the project in the future (Al-Fadhli & Al-Bazaz, 2020).

Geneste (2019) indicated that EVM arose from both scheduling and incentive schemes. EVM started in the industrial manufacturing era during the beginning of the 20th century as the principle of *earned time* concentered by Frank and Lillian Gilbreth and later adopted by the U.S. Department of Defense during the 1960s. Later EVM emerged as a project management methodology in the late 1980s and 1990s (Mogaji, 2019). During the 1960s, a 35-criteria draft emerged and was highly encouraged by the U.S. government's contractor management system to follow during project management. The use of EVM materialized by the US Government Accountability Office (GAO) officials and the Office of Management and Budget (OMB) officials that practiced in a variety of industries, such as educational institutions and consulting firms (Geneste, 2019). Later, the 35 standards received a reduction to 32 guidelines by the American National Standard Institute (ANSI) and the Electronic Industries Association (EIA). The five areas of the 32 criteria are essential to the management of projects.

Naizghi (2021) discussed the ANSI/EIA criteria recognized by the 32 guidelines. The first area contains five standards for the organization of the earned value management system (EVMS), which includes the scope of the effort and responsibilities of the work. Within section two, guidelines 6 through 15 include the planning, scheduling, budgeting, and authorizing of the work of projects.

As a result, the ANSI/EIA 748 is the gold standard for project management used in the Department of Defense (DoD) and the National Aeronautics and Space Administration (NASA). EVM is a method that can help project managers resolve their concerns with project failures. Earned value management in project management is a methodology that integrates cost, schedule, and scope to gain a better understanding of how to measure project performance (Bagherpour et al., 2020). Project management includes the planned and actual values that allow managers, who use EVM, to predict the opportunity for projects to complete on time and within budget (Przywara & Rak, 2021).

EVM used at all levels of a projected increase the opportunity for success by allowing the project managers to adjust as necessary to achieve success. Earned value management in short term is a tool that enables project managers to

measure project performance beyond the inspection of cost and scheduled reporting (Mogaji, 2019). The earned value management systems (EVMS) provide the project management team with software, processes, tools, and templates for projects to improve the success rate. EVMS is an earned value management system that complies with the EVMS guidelines of EIA-748.

EVM technique integrates three related components of project performance: scope, schedule, and cost (Geneste, 2019). The assessment technique earned value analysis (EVA) allows the project manager to incorporate a quantitative technique to gather a better understanding of project performance by computing schedule and cost variances during projects. Once the project manager completes 20% of the project, the remaining project performance can lead to a prediction within a 10% plus or minus deviation. Managers can use the data with EVM to predict trends, analysis, and forecasting. With such strong predictability, EVM is a positive approach to project cost control measures for a project manager to utilize in project management.

EVM has benefits for project managers. EVM can include information for stakeholders with clear metrics, visibility, and accountability. The tool can work for managers in providing an unobstructed view of the project performance from the portfolio to program and project levels. The process can allow the project manager to intervene before a crisis occurs by tweaking the project scope and budgets, requesting additional resources, and setting customer expectations. Managers can develop a database for actions to assist with making decisions for future projects and align work with cost and reduce unknown risks. In addition, most importantly, managers can use the tool to provide a comparison and benchmark of the current project status against the project baseline and identify the critical path. Mogaji (2019) stated that a simple application of EVM to a construction project would assist managers with predictive forecasting as early as 20% of the project completion. Quantitative formulas exist that are instrumental in improving project performance.

1.5. Research Themes

1.5.1. Earned Value Metrics

EVM is a quantitative management technique that managers can use to measure project progress and predict early warning detections of budgets or schedule challenges (Elghaish & Abrishami, 2021). Planned value (PV) is the first formula that is critical to the success of project performance. The budgeted cost of work scheduled (BCWS) is the project's baseline planned monthly. The PV will vary based on the scope of the work and at the point of the overall schedule (Zhao & Zi, 2021). The actual cost of work performed (ACWP) is the costs associated with the project, including hidden costs-material, resources, hardware, software, overheads, and other attributes. Earned value (EV), otherwise known as budgeted cost for work performed (BCWP), Is an assessment of the amount of deliverable work accomplished at any point in the project. Managers can use budget

at completion (BAC) to provide the total planned cost of the entire project, which is equal to the summation of the monthly PV. By implementing a variance analysis (VA), the schedule, and cost variance, the project manager can determine how distant they are from the project's baseline. The metrics for EVM are the variance (cost, schedule, at-complete); schedule (SPI, BEI, CPLI); Cost (CPI), and prediction (TCPI, ETC, EAC) (Project Management Institute, 2017a).

1.5.2. Project Management Failure with EVM

Uncertainty, risk, and rework make meeting goals and delivering anticipated values challenging in complex projects. Conventional techniques for planning and tracking earned value do not account for these phenomena (Browning, 2018). Browning (2018) reported that the U.S. Government Accounting Office officials believe that over 70% of projects are poorly planned or underperforming. Inefficient communication between people is a common cause of project failure (Vrchota et al., 2020). A poster child for the employment of EVM is the F-35 fighter aircraft project. The U.S. Department of Defense (DoD) F-35 Lightning II project is the most expensive acquisition ever undertaken by the DoD, estimated at $400 Billion. The intent is to replace fighter and attack aircraft for the U.S. Airforce, Navy, Marine Corps, and ally nations (Powers et al., 2018). The U.S. military officials wanted to reduce the cost of this program but were challenged in achieving this goal using EVM. The employment of EVM resulted in managers identifying significant cost overruns in the F-35 program that would otherwise go unnoticed. The employment of EV metrics is an indicator of what is occurring in a project. Uninformed managers blame the EV metrics when their project indicates a failure concerning budget, schedule, or delivered value. A common excuse is to point at the EV metrics as not representative of the true project conditions. However, the reality is that the EV metrics include real, measurable values of budget planning, budget spent, the time elapsed, and deliverables provided.

1.5.3. Management Reserves

Management reserves (MR) is a calculation of a percentage of the estimate to complete (ETC), which is about 10% - 15%, which aligns with the management control purposes for unforeseen work within the scope of the project (Project Management Institution, 2017b). MR is a mitigation strategy. This strategy should apply in circumstances when an unknown threat can alter or delay a project from completion. MR is not for offset overruns in the project. The most common active mitigation strategy is establishing a contingency reserve, including time, money, or resources to manage a threat (Ortiz et al., 2019). The project manager (PM) should establish complete control of the MR and exercise its usage with care and consideration during the project. The PM should consider using the MR to mitigate risk in the project. The MR is a percentage of the estimate to complete (ETC), which is normally the percentage of 10% to 15% of the contract held in reserves. ETC is the estimate of the value of deliverables re-

maining until the end of a project. AC + ETC = EAC. However, this amount is not in the performance measurement baseline (PMB). The unused amount will apply to the client or customer. The calculation is the probability times the impact on the project times the risk in dollar terms, which is the amount set aside for management reserves.

The elements of management reserves consist of the budget (explained above), schedule, and technical components. The schedule component applies to retaining a buffer or margin for the duration of the project or reducing the risk associated with the project. The MR can apply to complete the task early and improve the total float and slack in the project. Another schedule component could delay the task to occur later in the program; to prevent crashing fast-track task and apply extra resources. The MR should apply when the software project managers are using on the project produces an error. The PM should include the MR, show the schedule, and cost variance. A sign of poor execution in planning is when managers use the PM to rely on the MR as a bailout in the project. Projects with variations in task characteristics should receive governance differently (Kock & Gemunden, 2019). The PM should try to execute their plan with minimal usage of the management reserves.

1.5.4. Integrated Baseline Review

Project failure is evident and noticeable in the volume of failed and abandoned projects (Mogaji, 2019). Project Managers can apply The Project Management Institute (PMI) series of Chaos Studies, in which about 70% of all projects fail across all industry domains, irrespective of size or technical objective. Past performance is an indication of future behaviors. Project managers fail to meet performance expectations by overrunning the budget or the schedule. The problem with project cost overrun and benefit shortfalls is not an error but bias, and trying to solve the problem leads to failure (Flyvbjerg, 2021). Project managers with a positive attitude toward the changes implemented by senior management adopted a positive attitude due to self-regulation, whereas the resisters suffered (Unterhitzenberger, 2021).

As a project unfolds, project managers evaluate the progress by comparing ongoing costs and scope to a baseline plan and consider potential revisions (Baucells et al., 2018). The integrated baseline review (IBR) evaluates the performance baseline measurement to determine if the PM addresses all requirements, whether the risk has accountability, whether corrective action plans are in place, and whether the resources are sufficient to meet the project's needs (Baucells et al., 2018). Integrated Baseline Review is a focal point in the project management process. The IBR should be a part of all projects and programs as an ongoing process that begins approximately six months into the project.

The PM should be well-versed in this process when overseeing a project. The IBR is critical to the success of a project or program. The IBR is a playbook for managing a successful project (Kabeyi, 2019). The PM will need to know the cost

and schedule associated with the project. Without an IBR in place, difficulty can occur in assessing the cost of the project/program, scheduling the activities, and identifying the available resources.

1.5.5. Systemic Epistemic Risk Issues Related to Failed EVM Projects

Sutrisna et al. (2020) argued that inevitable risk is acceptable, although risk excluded from elimination delivers a successful project that relies on how well the PM can manage the uncertainty. The uncertainty surrounding the risk can impact a project by reducing or escalating risk and its impact on decision-making (Popov & Popov, 2022). An epistemic deficiency exists in the knowledge base framework for PM practitioners and researchers (Hosch, 2016). Project risk management (PRM) is the systemic process of identifying, analyzing, and responding to risks (Crispim et al., 2019). Alchammari et al. (2021), and Aramali et al. (2022) asserted that project planning and risk management positively influence project success. However, knowledge management has not proven as a significant factor in project success.

Denicol et al. (2020) indicated 6 major themes that contribute to poor project performances. The six reasons for failed mega projects include 1) poor decision-making behaviors (provisional issue); 2) strategy, governance, and procurement (provisional issues); risk and uncertainty (systemic issues); 3) leadership and capable teams (provisional issues); 4) stakeholder engagement and management (provisional issues); and 5) supply chain integration and coordination (systemic issues). A project manager's behavior at the end of a project and during execution can contribute to inferior performance in decision-making about projects. Inferior performance associated with the sponsor, client, owner, and operator is primarily because of a lack of roles and responsibilities assigned during the project life cycle. Establishing roles early in the process is essential. Unproven technology can lead to increased cost and time, contributing to inferior performance on mega projects. Inappropriate definitions of project culture and a sense of purpose are major contributors to intra, and inter-organizational misalignment designed by leadership teams. Stakeholder engagement and management are essential fragmentation. Priorities in the project and the inability to achieve synchronized alignment can lead to conflicting priorities, goals, and interests. Finally, the inability to coordinate and integrate large network suppliers contributes to failed projects. Improving projects is important for managers implementing process improvement methods.

1.5.6. Provisioning Aleatory Risk Issues Related to Failed EVM Projects

Aleatory uncertainty reflects random variables that cannot receive a prediction with certainty and are unknowable, in other words, the *Unknowable-Unknowns* (Popov & Popov, 2022). Browning (2018) includes theories of why project managers have trouble estimating project costs, durations, and results and measuring progress during the project progression. The reason for failure relates to poor projection and planning of projects directed at wrong targets and goals. The path

to the project goals is complex, novel, dynamic, uncertain, and ambiguous. In addition, failure can emerge with not knowing what to do and when to do a project, poor understanding of risk throughout the project, and how to apply proper techniques for risk management. In experience, project managers may remain with the original plan; consequently, a lack of adjustment creates cost overruns resulting in managers spending unnecessary time (Baucells et al., 2018). Black swan events result from a single cause, which can cascade into catastrophic events (Popov & Popov, 2022). A gray rhino effect is highly probable, and if left unattended, it could prove debilitating to a project's completion. Constant monitoring of the project is critical, and taking corrective actions is critical to the project's success. The PM has the critical job of selecting the most appropriate and experienced personnel for the projects.

In addition, the PM is responsible for selecting the staffing for program control functions. Mogaji (2019) suggested that the relative contributions of the client and contractor are significant reasons for project failures using EVM. The choice of these individuals is crucial to the earned value management (EVM) process. These individuals will assist the project manager with staying on task to complete the project and meet the completion deadline. The client and contractor could help ensure that the scheduled and cost variances are minimal so that the project can meet the client's or customer's expectations. EVM applies to project manager monitoring and includes time and cost forecasts (Narbaev & De Marco, 2017). The PM is the project leader responsible for hiring, team building, supervising, training, leading, delegating, supporting, and motivating the project team members to achieve the project goals (Karlsen et al., 2020). The PM will assign the work to the most qualified individuals; the PM needs to identify a control account manager (CAM) to oversee control accounts at the lowest level. The CAM's role is significant in project management; they create the work and planning packages, which are from the intersection of the organizational breakdown structure (OBS) and the work breakdown structure (WBS), which occurs within the responsibility assignment matrix (RAM).

Flyvbjerg (2021) discussed in his article, *Top Ten Behavioral Biases in Project Management: An Overview*, and their impact to project management. Flyvbjerg indicated that a common mistake equates behavioral bias with cognitive bias; cognitive bias and political bias combine to tell the whole story. The first bias is a strategic misrepresentation, sometimes called political bias. This bias is a deliberate and systemically distortion or misinformation for a strategic purpose. The second bias is optimism bias, a tendency to act overly optimistic about the outcomes and planned actions. The third bias is the uniqueness bias, a tendency for planners and managers to see their projects as unique. The fourth bias is a planning fallacy, which is a tendency to underestimate costs, schedules, and risks for planning actions while overestimating benefits and opportunities. The fifth bias is overconfidence bias, which is having excessive confidence in answering questions and not fully recognizing the world's uncertainty. The sixth bias is hind-

sight bias, which is believing to understand something from the beginning but not in reality. The seventh bias is availability bias, which is the overweigh of whatever comes to mind. The eighth bias is the base rate fallacy, which tends to ignore base rate information and focus on specific information. The ninth bias is anchoring bias, which relies too heavily on one piece of information when deciding. The tenth bias is an escalation of commitment, which reflects the tendency to justify increases in investment decisions that reflect on prior investments despite new evidence suggesting the decision may appear wrong (Flyvbjerg, 2021). These biases present a clearer picture of project shortcomings than the limited explanation of scope changes and cost overruns.

Lee and Rojas (2013) outlined a variety of reasons for project failure, which include 1) severe weather, 2) variability in labor productivity, 3) labor turnover, 4) procurement and delivery delays, 5) design inaccuracies, 6) change orders, 7) contractual disputes, 8) and rework. All these theories can have a severe impact on the performance cycles in the project management life cycle. The PM has a responsibility to make the appropriate adjustments to work orders and notify the appropriate personnel of the changes. After several years, an EVM still shows drawbacks with the interfaces across diverse groups involved in the process between owners and contractors (Olivieri, 2022).

The payment process is a major problem resulting in inferior performance on a project (Olivieri, 2022). Contractors need to have available working capital to provide the deliverables to the client. EVM does not include the payment process to keep a project active and progressing. There is no standardized form for requesting progress payment certificates (PPC) from the client for a claimed period. The PM needs effective communication, accurate accounting processes, and requests for payment for the client to minimize the deterrence from work performance. Proper monitoring and control of the projects are necessary to have routine integration of information for decision-making.

Ibrahim et al. (2019) believed that EVM assessment has a weakness that it does not include several project performance factors resulting from the complexity of projects. Ibrahim et al. indicated the potential risk of factors such as project performance sustainability, requirements of stakeholders, effective communication, and strategies for precise procurement of supplies. In addition, other potential risk includes the delivery of materials and completion of projects, the experience of staff, the condition of project sites, design issues, financing of projects, issues with subcontractors, and government requirements. A strategic effort with EVM metrics should include risk factors that impact measuring and the performance of projects specifically estimate at completion (EAC). The stated risk factors can have a serious impact on the final stages of the project life, minimal knowledge of awareness and EVM metrics, uncertainty with time and cost estimates, and challenges with the integration of EVM and risk management. A concerted effort by the PM to improve these risk factors can improve the efficiency of project management and project performance.

The expectations of the stakeholders have an impact on the goals of a project (Ibrahim et al., 2019). The views, experiences, and interests of stakeholders should serve as a priority when addressing present and future conditions. When stakeholders have several variations and differences of opinions, this leads to a risk factor on projects. Stakeholders will receive the benefits of a good working relationship with efficient communications because of the positive impact on the duration and cost of a project. Project managers desire to improve cost and schedule processes to better inform stakeholders about the projects (Briggs, 2021).

2. Methodology, Design, and Methods

IT project failure rates range between 30% - 70% (Macdougall & Michaelides, 2014). Project failures are primarily attributed to cost overruns and time management. Projects failed because of cost overruns leading to project leaders scaling back their estimates to achieve the client's buy-in to award the projects. The error of not accurately calculating the risk in the projects causes task delays, increasing the time to complete projects overall. The intended use of EVM metrics in project management was to predict project outcomes based on the project inputs of time and resources. The EVM metric relates to (a) variances (cost, schedule, at-completion); (b) schedule (schedule performance index, baseline execution index, critical path length index). In addition, the EVM relates to (a) cost (cost performance index) and (b) predictions (to complete performance index, estimate to complete, estimate at completion). When used properly, EVM gave the consultant a good indication of the project's success. The conceptual framework for this study was to provide the opportunity to explore contextual literature and experience by reviewing other theoretical studies recount of projects using EVM, EVM metrics during the application, and the importance of earned value management. An analysis of the theoretical literature included information on project failure rates and the potential causes associated with systemic (Epistemic Risk) and provisioning (Aleatory Risk) issues. Finally, concluding with the problems and opportunities associated with project failures.

2.1. Research Methodology and Design

The exploratory qualitative research design with thematic analysis aligns with the research question. This design could include the desired results formatted in themes that could align with the conceptual framework. Parker (2021) studied using an exploratory research design allowing researchers to study participants' experiences on a given subject matter and provide a smaller sample size. Parker desired to understand the challenges that school officials experience when providing a safe environment for their students. Parker's study led to five themes that supported the research question. The research method and design chosen by Parker (2021) included similarities and inspiration for implementation in this study. Using a qualitative research method with an exploratory design allowed

me to explore the various challenges project managers experience when they oversee projects. The qualitative exploratory study included three themes related to project management failures, systemic issues, and provisioning issues that align with the research question. An exploratory design or theory influences group sampling to understand experiences for a specific area or topic (Parker, 2021).

2.2. Population, Sample, and Participant Recruitment

The number of individuals chosen for this study was small, which included carefully selected participants who vicariously experienced the desired results of this study. The population consisted of contractors in the public and private sectors. Daniel (2012) recommended 15 to 30 participants in an exploratory qualitative research design with a sample size of 8 to 12. Johnson (2016) suggested that an exploratory method can use 10 or fewer participants. For this study, I interviewed 10 participants. The criteria for the population included the current and former title of project manager, 5 years of project management experience, experience working with government contracts using EVM, PMP certification, and PMI organization affiliation.

The Snowball sampling method was appropriate. Snowballing allowed me to solicit participants with similarities in qualities that met the criteria of the study. The Snowball sampling technique is convenient for researching sensitive and is feasible for smaller samples (Ilyas et al., 2020). The participants have a project management professional (PMP) Certification, and they are a member of a local chapter of the Project Management Institute (PMI).

Using an informed consent form, I reached all the participants with permission from the PMICAC board members, where I have been an active member, participating in chapter meetings for 2 years. I received permission from the chapter's president to engage the members for participation in this study. A copy of the email request with the response from the president of the PMICAC. I created an announcement post that I presented during a chapter meeting to inform the members of this study, requesting their participation, and posted it on the PMICAC website. If additional participants were necessary, then my contingent plan was to recruit from PMI social media page on LinkedIn, where I had joined as an active follower. LinkedIn includes a variety of project management organizations and project managers professionals who potentially meet the criteria for the study. LinkedIn participants would not have restrictions on geographical location because LinkedIn is internet based.

The participants that expressed interest in participating in the study reviewed, signed and returned a letter of consent before the interviews proceeded. The participants signed the letter of consent with the understanding that they were free to exit the study at any time without penalty or adverse actions. Leedy and Ormrod (2018) stated that an informed consent form is common in research studies with the nature of the research described and individual participation.

After each participant responded to the request for participation as an interviewee in the study, I emailed a copy of the informed consent form (ICF) before the scheduled interview. The participants reviewed the consent form before the start of the interview to ensure the participant was aware of the details and all questions. The ICF included information about recording the interviews and storing them on my computer. After receiving the participant's consent to move forward, the participant signed the ICF and sent it back before the start of the interview process. Once I received the ICF, identifiable data aligned to each participant on their consent form. The unique identifier was notable to the participant and me. This process was to ensure the privacy of each participant during the research study.

Scheduling the interviews with the participants occurred on their availability after receiving the signed consent form. The participants received an email invite with a unique password and login link for them to enter the Zoom conference for participation in the interview. Each participant received a separate password and login link for privacy. Once the interviews commenced and data collected, the participants remained anonymous and safeguarded using code names (P1, P2, P3…P10). The participants' real names remained anonymous, and I stored the data on a thumb drive in a fireproof safe for 7 years. After seven years, destroying the data will occur.

2.3. Data Collection Instrumentation and Procedures

For this research study, I used semi-structured interviews with open-ended questions with thematic analysis for this research objective. Semi-structured interviews yielded data that could lead to a problem map (Avlijaš et al., 2015). Semi-structured interviews are a qualitative method of exploration that combines a pre-decided set of open-ended questions, which allows the interviewer to explore themes (Sharma & Sagar, 2018). Data must have easy accessibility and understandable information (Milosevic et al., 2021). Researchers can use thematic analysis to look for emerging themes important to describing the phenomenon (Sharma & Sagar, 2018). Before the interview with the participants, I formally introduced myself, reviewed the ICF, the interview process, and the overall content of the interview questions, and addressed all the questions before the interview started. Most importantly, I ensured that the participants understood that the interview would occur via a Zoom conference audio and that their identities would remain confidential.

I sent the Zoom conference information, link, and password to the participants after receiving the signed consent form. Participants received notification of the date and time of the Zoom Conference interview. The consent form described how the interview recording would occur after the participants signed the form, which gave permission to record the interview. The Zoom conference included tools for audio and video recording; however, only audio recording was appropriate for the additional privacy of the participant. Using the open-ended

interview questions, the participants went into detail about their experiences in managing projects using EVM.

The problem statement, research question, and the criteria for selecting the participants were a major influence in the construction of the interview questions. I tested the interview questions using a pilot study where the participants reflected as the actual participants in the research study. Two subject matter experts that met the criteria for the study were pilot study participants. The participants of the pilot study were not a part of the full study. The pilot study was appropriate to establish both the internal and external validity of the questionnaire instrument. An advantage of performing a pilot study is that it includes warning signs of potential failures in the main research project or whether the proposed protocols, methods, or instruments are not effective (Vaughn-Cooke & Kremer, 2011). The interview questions included the themes of the conceptual framework: systemic issues (Epistemic Risk), provisional issues (Aleatory Risk), or knowledge of the application issues.

2.4. Data Analysis Procedures

For the data analysis of the content from the semi-structured interview, I used HappyScribe to transcribe the data recorded from the Zoom conference interviews. Once the interview concluded, a link was available with the recording, which I mapped and sent to the computer. Before sending the Zoom recorded links to HappyScribe, A preliminary decoding proceeded of the information that could identify the participants. Once receiving the transcription, the participants reviewed their responses for accuracy. When the participants corrected any inaccuracies in the transcripts, this was *member checking* (Parker, 2021). Member checking is when the participants review the transcripts for accuracy and detail before confirming that the interview was complete. I checked for accuracy by using the recordings to validate the transcriptions.

After member checking, I began coding and analyzing the data to generate themes for the interview questions. The coding process was appropriate to summarize and categorize the outcomes. Medelyan (2020) believed that qualitative data analysis was a process for a researcher to understand what the data means through examination and interpretation of the information. Medelyan suggested that four types of qualitative data exist that are 1) analysis content analysis, 2) narrative analysis, 3) discourse, 4) analysis, and framework analysis, which were available for the researcher's usage in coding. I used content analysis because of the inclusion of categorizing the behavioral and verbal data, which aligned with the themes for a clearer perspective.

Trustworthiness

Trustworthiness is an important quality that all researchers in academia should seek. Qualitative researchers speak of trustworthiness, which poses the question of whether the findings are trustworthy (Korstjens & Moser, 2017). Issues in trustworthiness in qualitative research demonstrate techniques of reliability and

validity that are nonexistent, unsubstantial, or unexplained (Rose & Johnson, 2020). Four quality criteria need inclusion for a research study to achieve trustworthiness.

Credibility

Credibility is the equivalent of internal validity in quantitative research and includes truth value (Korstjens & Moser, 2017). Credibility is an essential ingredient to trustworthiness, and I provided this concept in the research study implementing *member checkin*g in the data analysis process. In addition, I reconciled and transcribed the audio recordings to maintain the accuracy of the data, which ensured that the study was dependable. I made sure to document the research procedures and that they were consistent and reliable in the research findings.

Dependability

Dependability was appropriate in the study, using a transparency approach to give the reader a clear step-by-step layout of the research study from the beginning to the conclusion of the findings. I gave the reader a readable guide that can apply in other studies. In addition, conducting a pilot study to test the interview questions assisted me with creating dependability. Credibility is the equivalent of internal validity in quantitative research and aligns with truth-value (Korstjens & Moser, 2017).

Transferability

Transferability is another critical component of ensuring this research study displayed trustworthiness. I wrote this study with careful consideration to exemplify transferability with other researchers. I provided detailed descriptions of the participants, the research method, the design, the analysis, and the findings. I provided explicit details about selecting the participants, collecting, and analyzing the data. The researcher is responsible for providing a rich description of the participants and the research process to ensure that the readers can assess if the findings are transferable to other studies (Korstjens & Moser, 2017).

Confirmability

Confirmability differs from dependability because confirmability includes neutrality, while dependability includes consistency. The findings of this research study could apply to other research. This research study has detailed documentation, and the coding and the analysis process indicate confirmation of the findings. The interpretation needed grounding in the data reflecting preferences and viewpoints (Korstjens & Moser, 2017).

3. Discussion and Conclusion

Browning (2018) indicated that a minimum of 70% of projects failed when using EVM. Yousefi et al. (2019) indicated that a project manager's ability to monitor performance has major implications on whether a project succeeds or fails. The problem addressed in the proposed study was the procedures project managers need to improve, which would create successful projects using EVM. Ahmad et

al. (2020) indicated that 70% to 80% of projects failed to meet the scope with the desired deliverables. The conceptual framework included the literature for the research study that, included the purpose, problem, and research question. The literature review section was purposeful in producing the need for this exploratory research study.

The theoretical literature review included the history of EVM, the critical metrics of the prediction tool, the importance of management reserves, proposed speculation on project failures and successes, and risk factors epistemic and aleatoric. The contextual literature included the social impact of the lack of project success on the industry. The ability to have more project success by completing within the scope, budget, and time constraints could create social change by creating affordable, innovative products and services for the client group. The literature included a knowledge gap that needs addressing. The inability to complete projects using EVM caused concern by managers that was not addressed. The project concerns elevated risk factors, causes of project failures, and issues surrounding the successful implication of EVM in project concepts in the conceptual framework. These concerns led me to produce the research question.

The exploratory qualitative research model was the option for the study considering the need to understand the view from a subject matter expert's (SME) perspective with a wide range of experiences on the causes of project failure. The design was appropriate because the semi-structured interview questions included the purpose of extracting information from the experiences of SMEs in the project management field. The construction of the interview was purposeful to include the concepts identified in the literature review that could include evidence to address the research question and fill the knowledge gap. Data collected from 10 participants was sufficient to achieve saturation in this exploratory research study. The participants provided supporting evidence in 12 interview questions for why projects failed at astounding rates when using EVM, the prediction tool. Participant responses supported the literature review in greater detail and offered a wide range of information concerning the void in knowledge. Project managers and SMEs offered a lower-level analysis of the struggles of project leaders seeking success using EVM metrics in project management. The study had certain limitations.

3.1. Limitations of Study Findings

I limited the study to project managers with PMP Certifications with at least 5 years of experience and experience managing government contracts using EVM. Furthermore, the participants were only those with a membership with their local chapter of PMI. I did not consider project managers with little or no experience working on government contracts using EVM. EVM consists of mathematical base formulae, and I did not consider whether the project managers were comfortable performing EVM computations manually.

Delimitations are the limitations imposed by authors (Theofanidis & Fountouki, 2018). I created the delimitations of the research study to focus on a specific group of subject matter experts that could provide insights into the reasons projects fail at a high rate with the usage of the prediction tool EVM. The study included limits of project managers with a PMP certification, at least 5 years of project management experience, experience working on government projects using EVM, a member of the local chapter of PMI, and a project manager. Project managers with limited experience working on government contracts using EVM were not included in this study. EVM consists of mathematical base formulas used in the prediction model. Therefore, I did not restrict the population of project managers to those that were comfortable with perfuming the computations. Regulating the data collection for this specific group could yield valuable information that would offer viable solutions. The goal was to recruit all the participants from the Project Management Institute Central Arkansas Chapter (PMICAC). Unfortunately, scarce participation interest resulted in the implementation of the snowball technique for data collection. The participants lived in various regions of the country. The participant experiences, as told through storytelling, were vastly similar in the description relating to the failure of projects. Most participants spoke of their experiences as project managers, either working on projects in the private, public, or government sectors. The experiences shared were a mixture of several years as recent as a couple of years ago. None of the participants spoke of outcomes from projects they were working on at the time of the interview. Early data saturation supported the consistency of the participant's beliefs regarding project failure.

The interview discussions presented demographic information; however, none of the questions drew a conclusion regarding years of experience, time zone location, and education level. Limitations of a study represent weaknesses that influence the outcomes and conclusions of the research (Ross & Bibler-Zaidi, 2019). Considering that EVM failed to meet the criteria for the scope and the client's satisfaction, indicating project failure, EVM quality criteria were satisfactory. Projects that achieved the scope, cost, and time commitments of a project with interval monitoring and inspections in the life cycle ensured the achievement of quality at every level of the project.

Qualitative research methods include limitations. Qualitative studies conducted by researchers' observations and recounts of experiences from the participant's memory depend on the honesty and accuracy of recalled information. The interview questions drafted from the literature included the concerns of project management with the aspiration that the responses would generate consistent supporting evidence from the knowledge gained. Some of the interview questions caused the participants to pause and think hard about how the interpretation and how to respond. Even with hesitation, the responses were in harmony with other participants and supported the evidence of scholarly literature.

The sample population was not a representation of the whole project man-

agement industry, which allowed the inclusion of the snowball technique. The snowball is a technique that allowed the participants to recommend others that were in their networking circle that had similar ideas and perspectives on project failures. Other researchers could argue that transferability was missing from the study because of the similarities in the participant's thought processes. The lack of transferability could potentially impact the confirmability of the study when other researchers try to duplicate the findings. A strategic focus existed for this study.

3.2. Interpretation of Study Findings

The study's findings indicated that several reasons contributed to project failure. From the interview questions, various procedures emerged that managers are not following to produce successful projects with EVM. The semi-structured interview questions garnered evidence that supported the scholarly reasons previously delineated. Within the interpretation of the study findings, a relationship emerged against the larger body of knowledge and addressed the knowledge gap. In this section, the findings have produced a parallel relationship with the conceptual framework. Finally, a conclusion presented how the findings could improve the current business practices.

The conceptual framework was appropriate in this research study from ideation to conceptualization. The theoretical literature produced by the conceptual framework systemic and provisioning issues, EVM integration, and causes of project failure. The research questions that supported the themes produced a significant amount of evidence contributing to project failure. During the discussion of systemic issues, the project managers expanded on numerous incidents construed as an epistemic risk in projects. In many harmonious responses, the participants discussed what happened when uncertain results from information available about a given circumstance, the uncertainty variable is vague or inadequate, and the ramifications that have impacted a project. The participants agreed that when project managers fail to monitor and control uncertainties, they can escalate into uncontrollable risk. The participants agreed that epistemic risk factors caused projects to fail. For example, the lack of effective communication and relaying the appropriate information to the right personnel is a root cause of epistemic risk. The participants agreed that a lack of communication was the first reason projects fail when using EVM. Another important discerning factor for epistemic risk was the lack of a management plan, stakeholder engagement plan, corrective action plan, or change order plan, and the fact that management was not using the data properly, which contributed to vague or inadequate information resulting in project failure. Provisioning issues were a derailing to a project's success.

Another interview question included encroachment on provisioning issues. Provisioning issues left unattended during the management of projects escalated to risk factors known as *aleatory risk*, which quantifies the random chance, un-

predictable and unquantifiable uncertainty in project scheduling for several execution alternatives for the same projects. The provisioning issues included mapping the skillset of the right personnel, organizations, and tools selected for alignment with the requirement for completing a project or task. The participants agreed that when people do not have the skills, this problem can create significant issues with project scheduling. The participants indicated that some project managers had not received the proper training to create schedules. The participants agreed that an expert scheduler has significant value to a project when seeking success. At least 40% of the participants believed projects have a higher success rate when the organization has an EVM Champion to pitch and explain the value and benefits of the prediction tool to management. Another 40% of the participants agreed that management reserves use (MR) to alleviate unplanned occurrences that develop during the project. Another issue that resulted in project failure is that the roles and responsibilities were not established on the project. The team members are unclear on their roles and responsibilities. Based on the two questions that garnered information leading to identifying risk as a major concern for project failure, aleatory risk or provisioning risk is the most dominant factor of risk that impacts a project. EVM integration into the project management process created a concern.

During the interview, I asked the participants if they implemented EVM in their projects and, if not, what was the reason for not implementing it. Fifty percent of the respondents felt that the lack of EVM implementation was an issue. The participants discussed management as the reason for not implementing EVM was too costly to implement the full prediction tool schedule. The participants did not see the benefit of using EVM, and they did not understand how to implement a program with EVM metrics. The participants did not know how to use the metrics satisfactorily and did not know how to correct issues with the analysis. However, an astounding response from many of the participants was that management was fearful of the exposure from the transparency in EVM. Most people do not like the unwelcome news that transparency brings from the information divulged from the EVM metrics. The study's results included causes of project failure isolated or crossed over from the other categories.

Communication was a re-occurring issue with project management. A primary issue is that people are unwilling to discuss a problem and find a solution. Politics have been a concern for project failure. Fifty percent of the participants believe politics harmed the process of assigning roles which have caused conflict on projects. Thirty percent of the participants believe that poor planning regarding the scope being out of control, cost, and budget overrunning are causes of project failure. The software outputs did not receive proper distribution to the right personnel. Another issue is that some managers feel that EVM is too difficult to utilize and implement. A rising amount of fear of using the EVM tool exists. Most project managers do not use the EVM metrics because they lack the math skills to make the computation correctly. These issues created causes of

project failure.

The emerging themes in this research study result in the root cause of project failure risk. The specific risk patterns are major factors for failing projects related to aleatory and epistemic risk factors after escalation caused severe damage to a project's scope, time, and budget. Aleatory risk is the most harmful of the two risk factors (Acebes et al., 2021). Project managers choosing to mitigate risk will increase their chances of managing successful projects. This method can bridge the gap between theory and practice. Bridging the gap can produce social change by improving business applications with more innovative products and services and controlling costs through integrating project management software, giving the organization a competitive advantage, allowing the business leaders in the United States to remain competitive through global competition.

Each of the theoretical literature issues includes the evidence discovered in the interview process. The interview questions extracted compelling evidence of why projects fail at alarming rates when using EVM. Aleatory risk and Provisioning issues are the strongest risk factor creating harm to projects (Acebes et al., 2021). The emerging themes aligned well with the contextual literature and the body of knowledge contributing to the business practice of project management.

3.3. Practice Implications of Study Findings

The results from the study showed procedural improvements in the research problem. Exploring the procedures project managers need to improve for successful projects using EVM can lead to greater productivity (Browning, 2018; Yousefi et al., 2019). Participants in the study discussed their experiences with shortcomings in managing projects that paralleled the themes of the conceptual framework. The participants identified shared project failures associated with one or more critical themes contributing to projects not meeting the criteria. Examples of causes of failed projects include poor communication, lack of planning, knowledge to compute the metrics, lack of trust, EVM being too costly for implementation, project over budget, vague roles and responsibilities, and no EVM champion. Combined with the study results and the scholarly literature interpretations, project managers can have a roadmap for success in project management by implementing procedural changes.

The applicable findings further indicate a need to implement procedural changes. Given the scope of practice that prior project managers had to contend with on prior projects, their skills need an alignment for the role of a project manager. The project managers should have the necessary tools to complete the project successfully. The project managers must receive training to utilize and implement EVM. Project managers should have the skills to introduce and educate management on the importance and effectiveness of EVM metrics. Participants mentioned that some project managers were thrust into their roles. The selection of project a manager should transition into new roles with various support channels. As a result, to prepare for such roles and careers, project

managers' training should consist of understanding EVM aligns with EIA-748/32 criteria. The EIA-748/32 criteria refer to as the EVM bible.

The implication is that project managers could develop their soft skills as effective project leaders. The findings support the need for training project managers to become effective consultants on the projects. This implication was apparent early in the interviewing process before saturation. Through participants' sharing of their experiences with failed projects, they agreed that additional training in specific areas related to project management is necessary. A customary practice exists to receive negative feedback from management regarding the implementation of EVM in project management. The lack of training to use EVM to reduce concern areas before they escalate into risk uncertainty impacted the industry with limitations on innovative products and services. Using proper training, managers can create a global change in how business practices proceed.

Organizational managers can become more effective through robust training of their project managers on the proper utilization of EVM (Bafna et al., 2019). Additional training on soft skills can bring about major changes in interpersonal relationships. With communication as the primary problem with project failures, soft skill training should include areas that can significantly improve a project manager's performance. Oral and written communication improvements can ensure that effective channels of communication are transparent and effective. Increasing critical analysis and analytical training can appear complimentary to the planning phase of the project.

Project leaders have similar and different skills. Understanding the skills that every team member brings to a project is a great asset (Bafna et al., 2019). Team members have roles and responsibilities that will allow them to work productively and successfully. The alignment of skills with the roles and responsibilities can improve project performance and efficiency. Increasing project manager's knowledge of the proper planning of a project is instrumental in their success. A training course designed to cover all the major artifacts can increase the reaction time of the project managers. Several participants mentioned that project managers are reluctant to include important documents such as change order requests, stakeholder engagement plans, corrective action plans, communication plans, and schedule management plans at all levels of a project. Proper training for the project manager is essential to a project's performance and completion.

With the appropriate training and adjustments to managing projects, project managers could impact an entire industry in the success of project completion with EVM (Bafna et al., 2019). Impacting all areas of a project with effective training tools and an understanding to utilize EVM effectively could make a project manager capable of seeing where the root cause of concerns is and reacting before it escalates into an uncontrollable risk. A well-trained and knowledgeable project manager can reduce the opportunity that a project will fail because of the scope, budget, and time constraints. Considering the cost savings from failed projects, managers can produce efficient prices, creating social change

in the communities they serve.

3.4. Recommendations for Further Research

Further studies should include a larger scope criterion for the participants. The scope initially limited to the PMICAC yielded a small interest, forcing me to implement the snowballing technique. The snowballing technique allowed the participants to recruit others in their networking circle that met the criteria. Since participants were related through networking circles, critics may think groupthink affected the responses. Opening the geographical boundaries would offer a variety of opinions. Groupthink is a deterioration of mental efficiency, reality testing, and moral judgment that results from in-group pressures (Miller, 2021).

A quantitative research method will produce a statistical analysis creating a viable option for further studies. Adapting the thematic analysis to variables and performing quantitative analysis to see which variables are more significant to project failure would yield great interest in the project management sector. A debate has existed for years by critics questioning which critical success factors contribute to the performance of projects (Browning, 2018).

This study looked at procedural changes needed to improve the success rate of projects with the implementation of earned value management. This research project did not consider comparing the success rate of projects without the use of EVM. A comparison of the two suggests a quantitative methodology producing a statistical analysis. The study included producing procedural changes that could include improving the success and efficiency of projects. Further studies could help researchers understand how to improve project success by quantifying risk factors to determine their impact on a project.

3.5. Conclusion

A lack of understanding exists of projects that fail at alarming rates, with more than 70% using the prediction tool EVM (Browning, 2018). An urgency exists to understand the root cause of project failure because of escalating costs and its impact on the progression of social change. The study incorporated the opinion of subject matter experts for a viable solution.

The conceptual framework constructed the organization of the theoretical literature covering systemic issues, provisioning issues, EVM integration, and causes of project failure. The literature review supported the need for a deeper understanding of the impact of risk on projects using EVM. Research is prevalent concerning the EVM concept. However, a few project managers exercised EVM structures for concurrent investigation of cost, quality, schedule, and risk (Khesal et al., 2019). In addition, the literature review exposed readers to several underpinnings of project failures. For example, epistemic and aleatory risk, misuses of management reserves, and a variety of reasons for the lack of knowledge on how to implement EVM effectively.

The methodology in the research question presented an exploratory study.

The participants consisted of 10 project managers with several years of experience. I interviewed SMEs using semi-structured interview questions. The participant's responses produced insightful qualitative phrases aligned with the coding process to produce a thematic analysis. The research yielded 83 qualitative themes, 21 codes, and four themes, which aligned with the conceptual framework and scholarly articles. The research design included an approach for the use of thematic analysis. The findings produced enough procedural changes to improve project success with EVM. The findings indicated that communication was a major issue in project management. The lack of proper planning for managers created failures in projects maturing to completion. The lack of knowledge to successfully implement EVM is reflected in project shortcomings. Assigning roles and responsibilities to team members not a good fit for the position is just some of the most serious factors in project failures.

Conflicts of Interest

The author declares no conflicts of interest regarding the publication of this paper.

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