

Exploring the Perspectives of Private Sector Project Managers as to Project Portfolio Management Practices^{1, 2}

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ABSTRACT

The general business problem is that private sector project managers continue to deliver IT megaprojects that fail to meet the desired outcomes. The specific business problem is that private sector project managers have been unable to deliver federal government financial system megaprojects on time, within budget, and within scope, which delays the expected benefits from these megaprojects. The gap in practice is the lack of proven project portfolio management practices used to deliver financial systems megaprojects on time, within budget, and within scope.

The scope of the capstone project was the exploration of perspectives of private sector project management practitioners regarding the successful strategies used to deliver financial systems megaprojects to the executive branch of the US federal government on time, within budget, and within scope. The data collection method consisted of semi-structured interviews using open-ended interview questions. The interviews were conducted using the Zoom platform with private sector project managers who delivered financial systems for executive branch agencies of the federal government from January 2016 to December 2021. Nine participants were able to participate during the interview process.

Five sets of results emerged from the analysis of interview data. Forty-two PPM standards and three themes emerged from the interview question focusing on recommended PPM standards. Forty roles and three themes emerged from the interview question focusing on recommended PPM roles. Thirty-one PPM tools/technologies and three themes emerged from the interview question focusing on recommended PPM tools/technologies. Thirty-six PPM skills/competencies and two themes emerged from the interview question focusing on recommended PPM skills/competencies. Twenty-nine additional PPM practices and four themes emerged from the interview question focusing on additional PPM practices.

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SECTION 1. BUSINESS PROBLEM AND PROJECT SCOPE

1.1. Introduction

The delivery of information technology (IT) megaprojects is costly and time-consuming for the private and public sectors (Bloch et al., 2020; Zurong & Feng, 2018). CIO Magazine reported in 2019 that 70% of IT megaprojects were either late, over budget, or failed to meet their customer's requirements (Cisco, 2019). Megaprojects are defined as those project activities that span over several years that cost over \$1B (Flyvbjerg, 2014; Larson & Gray, 2018). The technology used and how information technology systems are implemented are similar in the private and public sectors (Wood, 2017). The common theme of project delays includes cost overruns and scope creep that resulted from the lack of proper project portfolio management techniques (Hines & Carrington, n.d.; Oostuizen et al., 2018; Pratt, 2021).

The risk for failing to deliver information technology (IT) projects to the federal government on time, within budget, and within scope remains high (Adams, 2016; Clark, 2013; Mares, 2020). Marinaro (2019) revealed that over 50% of federal government IT projects were deemed medium or high risk. A government report in 2019 noted that \$87.8B was spent on information technology (Office of Management and Budget, n.d.-b). The risk for failure led the General Accountability Office to evaluate over 100 IT projects to identify high-profile projects that needed to be watched closely (Boyd, 2020). One focus area of high-profile IT projects was the delays, cost overruns, and scope creep with financial system projects (General Accountability Office, 2018, 2020; Office of Management and Budget, 2013). Financial systems projects involve the modernization of systems used to process accounting, budget, payroll, and purchasing transactions, mandated by the CFO Act (General Accountability Office, 2005). Miller (2021) noted that 56 federal financial systems are nearly the end of their useful life; thus, the pressure to modernize is high.

The need for effective project portfolio management revealed a more significant problem. The program/project managers were not using proper project portfolio management techniques in managing their megaprojects (Project Management Institute, 2017). Since 2013, research conducted by the Project Management Institute (PMI), the leading global project management association, provided similar results in the private and public sectors. PMI noted in its 2013 Pulse of the Profession that for every \$1B spent on projects, \$135M is lost and not recoverable (Project Management Institute, 2013). The 2015 Pulse of the Profession survey from PMI revealed that 34% of projects, in general, failed to reach their goals (Project Management Institute, 2015). The 2016 Pulse of the Profession survey noted that over 30% of government strategic initiatives failed to achieve their goals while wasting \$101M for every \$1B spent on projects and programs (Langley, 2016). PMI reported in 2018 that project managers identified over \$99M in losses for every \$1B per the use of poor project management techniques and tools (Project Management Institute, 2018). The surveys from PMI showed that IT megaprojects have similar problems in the private and public sectors. Burtseva et al. (2019) noted that project managers and sponsors need to pay close attention to risks, especially financial ones.

1.2. Capstone Topic

This project is being completed as part of the Capella University Doctorate in Business Administration (DBA) program specialization project management. The project topic explores the perspectives of private sector project managers in the Mid-Atlantic region of the United States regarding the successful project portfolio management practices used to deliver financial systems megaprojects to executive branch agencies of the federal government time, within budget, and within scope.

The DBA project management specialization at Capella University allowed learners to advance their project portfolio management background by exploring current and emerging methodologies, techniques, theories, and practices, to solve real-life project portfolio management problems (Capella University, n.d.-b). Learners can improve their knowledge and skills, develop new tools, and techniques to research and evaluate project portfolio management improvement practices. The DBA project management specialization improves learners' abilities to effectively lead programs and portfolios and infuse knowledge about project portfolio management missing in the business world.

The proposed project aligned with the DBA project management specialization, where learners research and evaluate project portfolio management practices to solve general/specific business problems via a series of course projects (Capella University, n.d.-a). The first two specialization classes, BMGT8430 and BMGT432, focused on the phases of a project. Marinaro (2019) noted that failed projects do not start correctly, which indicates a lack of understanding regarding what is needed to plan and initiate the project. BMGT8434 focused on the risks with projects, while BMGT8436 examined the dynamics with project portfolio management. The proposed project fell within one of the perspective areas for applied/practitioner research (Capella University, 2021). The capstone project explored the successful project portfolio management practices used by private sector project managers to deliver financial systems megaprojects to executive branch agencies of the federal government on time, within budget, and within scope.

The private sector has been a leader in project portfolio management for many years (Mares, 2020). Institutions like the Project Management Institute (PMI) and Gartner (Gartner, n.d.-b) continue to provide insights into proven project portfolio management practices for consumption and adoption by all. PMI is the leading authority group for the project management profession that practitioners and scholars rely on (Project Management Institute, n.d.-a). Gartner is one of the world's leading IT research and advisory services firm (Fortune, n.d.; Gartner, n.d.-a; Hoover's Inc., 2021; Market Line, 2021). Private sector firms like Booz Allen, IBM, and others involved in project portfolio management practices with the federal government will be a valuable source of information for federal agencies to meet the mandate of the Program Management Improvement and Accountability Act (PMIAA) to improve the management of programs and projects within the federal government to improve desired outcomes (U.S. Congress, 2016; Weiss, 2019).

1.2.1. Problem of Practice

The general business problem is that private sector project managers continue to deliver IT megaprojects that fail to meet the desired outcomes (Boulton, 2021; General Accountability Office, 2018; Langley, 2016). CIO Magazine reported in 2019 that 70% of IT projects were either late, over budget, or failed to meet their customer's requirements (Cisco, 2019). The Project Management Institute noted that between 2013 and 2014, over \$244M was lost for every \$2B invested in projects (Project Management Institute, 2013, 2014). From 2016 to 2018, organizations lost \$318M for every \$3B invested in projects (Project Management Institute, 2016, 2017, 2018). Abu-Hussein et al. (2016) noted that tight timelines and broad project scope, typical in project management, will lead to difficulty reaching expected and desired results. Managing projects is already a difficult task, so adding the challenges of tight lines and broad scope will lead to mistakes being made (Wysocki, 2019). The challenges will lead to project managers skipping proven project management strategies deemed critical, such as post-project phase reviews (Doskočil & Lacko, 2018). Ignoring proven strategies, such as phase reviews, will trigger project delays, unfilled objectives, and cost overruns.

The specific business problem is that private sector project managers have been unable to deliver federal government financial system megaprojects on time, within budget, and within scope, which delays the expected benefits from these megaprojects (Burmistrov et al., 2018; Hines & Carrington, n.d.; Weigelt, 2010). The classic example of this was the failure of the Healthcare.gov deployment, which led to delays in consumers registering for healthcare coverage (Thibodeau, 2013). While managers may possess general management practices, they lack vital project portfolio management best practices in planning and managing megaprojects (Project Management Institute, 2017b; Welde & Odeck, 2017). Several project portfolio management areas from the PMI Body of Knowledge (PMBOK), such as project communications management, project human resource management, project time management, and project risk management, are overlooked by managers (Project Management Institute, 2017a). These areas are critical to effective project portfolio management. The literature shows that effective project portfolio management can only occur when resources are equipped with the right skills, such as project management (Project Management Institute, 2017b; Shinde & Govender, 2017; Whitby et al., 2020).

The evidence supported the general and specific business problems as found in scholarly research and practitioner-based analysis. Burmistrov et al. (2018) concluded that many project managers lack the necessary financial and project management skills to initiate and plan programs and portfolios. The inability to initiate and plan will impact the execution, monitoring/controlling, and closure phases. Organizations rely on inefficient strategies, such as relying on schedule and cost variances for measuring program and portfolio performance, which led to programs that were not effective (Jugdev et al., 2013). The selection of inefficient strategies was developed from a lack of skills that contributed to an inability to measure success (Project Management Institute, 2017).

Weiss (2019) noted that organizations should take no one-size-fits-all project portfolio management methodology, for the methodology should be one that the organization can embrace and benefit. The Boston Consulting Group noted the importance of project portfolio management processes and tools and the involvement of leadership and sponsorship in any project portfolio management

methodology (Keenan et al., 2021). Gartner (n.d.-b) noted that organizations must reinvent the project portfolio management processes to support the change of a digital world. Gartner is one of the world's leading IT research and advisory services firm (Fortune, n.d.; Hoover's Inc., 2021; Market Line, 2021).

1.3. Purpose of the Project

The purpose of this qualitative inquiry project was to explore the perspectives of private sector project managers in the Mid-Atlantic region of the United States regarding the successful strategies used to deliver financial systems to executive branch agencies federal government agencies on time, within budget, and within scope.

1.3.1. Project Need

Industry project managers need to understand how to improve the delivery of financial systems megaprojects to the federal government (Langley, 2016). Organizations continue to assign managers to lead and manage megaprojects without clear expectations of project portfolio management roles and responsibilities (Nijhuis et al., 2018). Senior leaders may not be involved in project portfolio management, for they delegate management responsibilities and oversight to others within the firm who lack project portfolio management knowledge (Blair, 2015). The lack of expectations and senior management involvement has added more burden to managers (Zwikael & Meredith, 2018). For example, megaproject managers may not have full ownership over obtaining funding for their programs. While still responsible for managing the funding, project managers may need to rely on senior leaders as stakeholders, such as CFOs and budget managers, to locate the financing of their programs (Breese et al., 2020; Eskerod et al., 2015). The lack of project funding has contributed to the issues of general and specific business problems.

The federal government attempted to address the general and specific business problems posed in the project. First, Congress passed the Program Management Improvement and Accountability Act (PMIAA) to address the general and business problem noted above (U.S. Congress, 2016). Another action taken by Congress was the passage of the Federal Information Technology Acquisition Reform Act (FITARA) of 2017, which required each agency to review and approve all IT project expenditures and performance (U.S. Congress, 2017). The White House followed this action by updating the President's Management Agenda (PMA) to include a new goal to improve the management of government programs (White House, 2018a). The PMA serves as the foundation for improving the business of government. Government agencies are measured by their ability to meet the goals established by the PMA. The Office of Personnel Management followed this attempt by updating its five-year strategic plan to implement PMIAA with the federal government (Office of Personnel Management, 2019). These attempts are a small start to address the general and specific business problems, but the pressing question remains unanswered.

These practices can be used to improve project portfolio management practices for cabinet-level agencies, like the Department of Justice. The Department of Justice, a law-enforcement agency within the federal government, is responsible for over \$3 billion in information technology programs

and portfolios (Justice Department, n.d.-b; Office of Management and Budget, n.d.-a). Another beneficiary of this project will be government agencies responsible for complying with the PMIAA mandate covering project portfolio management practices (Office of Personnel Management, 2019; White House, 2018b).

The project was very feasible. First, I have over 20 years of project portfolio management with public sector and private sector organizations that deliver financial systems megaprojects. Second, my current role as a financial systems program manager for an executive branch agency afforded me insight into understanding financial systems megaprojects' challenges. My position allowed me to contact other executive branch agencies who recommended participants (private sector project managers that they work with) for this project. The contacts in these agencies were informed that I needed private sector project managers who shared their perspectives of successful project portfolio management practices for this project. The qualitative inquiry project technique provided me with the data from interviews that revealed successful project portfolio management practices. The collection of perspectives regarding successful project portfolio management practices regarding the delivery of financial system projects may address the proposed project question once analyzed. The presentation produced from the analysis included outcomes, findings, and recommendations regarding the delivery of financial system projects by private sector project managers that may be useful to others. Finally, I and the participants understood that we could not disclose non-public government information for this project (Federal Acquisition Regulations, n.d.; Justice Department, n.d.-a; U.S. Office of Government Ethics, 2017).

1.3.2. Project question

What are the perspectives of private sector project managers regarding the successful strategies used to deliver financial systems megaprojects to executive branch federal government agencies on time, within budget, and within scope?

1.3.3. Project Justification

The gap in practice is the lack of proven project portfolio management practices used to deliver financial systems megaprojects on time, within budget, and within scope (General Accountability Office, 2018; Hines & Carrington, n.d.; Project Management Institute, 2018). Koppmann et al. (2017) and Pettey (2019) noted that historically, program management offices (PMOs) were responsible for overseeing programs and portfolios, but they have not updated their standards or tools to reflect the profession's changes. Nijhuis et al. (2018) conducted a study where participants believed that project management and management skills were the same, but they were not. PMI developed a guide on project management competencies but is not widely referred to (Project Management Institute, 2017b). In general, managers rely on too much what they have been done in the past to manage their programs (Allahar, 2019). Project managers continue to over-rely on past techniques, such as earned value management. Past techniques need to be updated to improve the delivery and management of complex programs.

Effective program and portfolio management occur when project managers are equipped with the right tools and standards to reduce waste (Project Management Institute, 2018). Selecting the correct project management tools and project management standards will lead to continuous improvement. Continuous improvement will provide program and project managers with the dynamic capability to ensure that their programs and projects achieve their organizational goals and objectives while dealing with time and cost constraints (Galeazzo et al., 2017). The outcome and improvements can only be achieved by equipping managers with the proper project portfolio management best practices to be the best stewards of their organizational resources for their company or industry.

The justification for this qualitative inquiry project promoted project portfolio management's desired state, where project managers rely on technology and project standards. Computer simulation, combined with organizational strategy and performance information, can improve project portfolio management (Vacik et al., 2018). PMI has produced standards, such as the Standard for Program Management (Project Management Institute, 2017d) and the Standard for Portfolio Management (Project Management Institute, 2017b), to provide project portfolio management guidance. Adopting technology and standards may address managers' gaps in project portfolio management (Langley, 2016).

The belief is that a one-size-fits-all approach taken by organizations contributes to the gap in practice (Abdelmoniem, 2016). Project portfolio management managers continue to rely too much on past practices to manage their programs and portfolios (Allahar, 2019). An example of this is the over-reliance on earned value management (EVM) tools. Research has been conducted that resulted in pinpoints using tools like that EVM only provides an analytical view of project performance for management (Rajagopalan & Srivastava, 2018; Vacik et al., 2018).

Private sector IT project managers lack prescribed, mandated project portfolio management practices to deliver financial systems projects to the federal government (Alexander, 2017; Blair, 2015; General Accountability Office, 2020). The lack of guidelines leads to confusion regarding the roles and responsibilities of project resources, such as managers and sponsors, in their use of project portfolio management (Breese et al., 2020; Kloppenborg et al., 2014). The result establishes a current state of project portfolio management usage that has contributed to programs and portfolios not achieving their desired goals via project portfolio management.

1.3.4. Project Context: Company or Industry

The context of this project is CFO Act agencies, who are required to maintain updated financial systems (General Accountability Office, 2005). The delivery of these systems by private sector project managers continued to be delayed, over-budgeted, and experienced scope creep. In 2010, the Office of Management and Budget (OMB) suspended the deployment of financial system projects until they had reassurances from agencies for successful project delivery (Weigelt, 2010). Later, OMB issued a memo that directed agencies needing new financial systems to consider migrating to a shared services center operated by the public and private sectors (Office of Management and Budget, 2013). Quantitative data from the Office of Management and Budget's Information Technology Dashboard (Office of Management and Budget, n.d.-b) and the Department of

Treasury's Data Accountability and Transparency Act dashboard (Treasury Department, n.d.-b; U.S. Congress, 2014) provides schedule and cost data regarding financial system megaprojects. Unfortunately, the General Accountability Office continues to issue reports highlighting delivery issues (schedule, scope, and costs) with financial system projects (General Accountability Office, 2017, 2018, 2021b).

Delivery issues with IT projects have relied on the traditional measurement tool of earned value management (Jugdev et al., 2013). Earned value management is a performance indicator that measures a project's performance via its value of work performed in terms of dollars earned or lost (Wysocki, 2019). Earned value management is a series of metrics (e.g., actual costs, cost variance, schedule variance) available to project managers for managing performance (Larson & Gray, 2018). While these are the minimum set of metrics for measuring performance, the Federal Government has narrowed its view of the performance of portfolios to cost and schedule variances (Office of Management and Budget, n.d.-b). The decision to narrow the use of performance measures, combined with constraints of shrinking resources, increased mandates, and technology changes, has led to the need for improvement in project portfolio management. The General Accountability Office (2017, 2018) noted that these portfolios are expensive. More emphasis must be placed on project portfolio management to reduce mistake that impacts success (Larson & Gray, 2018; Wysocki, 2019).

The capstone project supported the federal government's mandate for project portfolio management oversight and management of projects, programs, and portfolios per the passing of the Program Management Improvement and Accountability Act (Office of Management and Budget, n.d.-b). Within each cabinet-level agency, the Chief Information Officer (OCIO) serves as the primary program management office (PMO) for the project portfolio management of IT activities (Office of Management and Budget, n.d.-b). Tshuma et al. (2018) noted that a PMO function serves as a medium for sharing and exchanging information that will benefit the management of projects, programs, and portfolios. A review of publicly accessible documents shows that updates are needed in the areas of project portfolio management standards, competencies, and best practices (Justice Department, 2018, 2019).

1.3.5. Terms and Definitions

Actual costs (AC). Actual costs are defined as the actual money that has been spent on a project to date (Larson & Gray, 2018).

Budget at Completion (BAC). Budget at completion is defined as the project's cost when the project was planned (Wysocki, 2019).

Cost Variance (CV). Cost variance is defined as the difference between Earned Value and Actual Cost, where a positive cost variance means the project is spending more money than planned (Wysocki, 2019).

Earned Value (PV). Earned value is defined as the value in terms of costs that should have been earned during the work that has been completed on the project (Larson & Gray, 2018).

Earned Value Management (EVM). Earned value management (EVM) is defined as the performance indicator that measures a project's performance via its value of work performed in terms of dollars earned or lost (Wysocki, 2019).

Estimate at Completion (EAC). Estimate at completion is defined as the estimated cost of the project at completion, based upon current progress (Larson & Gray, 2018).

Estimate to Complete (ETC). The estimate to complete the remaining work of the project is defined as the amount of money it will take to complete the project from a given point in time (Wysocki, 2019).

Financial Systems. Financial systems are IT systems that handle the collection and processing of financial management transactions for the federal government (General Accountability Office, 2005)

Megaprojects. Megaprojects are project management activities with technical and organizational complexities (Deng et al., 2021; Larson & Gray, 2018).

Planned Value (PV). Planned value is defined as the costs that should have been spent on a project to date, based on the project's budget and what should have been completed (Larson & Gray, 2018).

Project Management Body of Knowledge (PMBOK). The Project Management Body of Knowledge (PMBOK) is defined as the set of standards, practices, and procedures used in the project management profession, as defined by the Project Management Institute (Project Management Institute, 2017a).

Schedule Variance (SV). Schedule variance is the difference between Earned Value and Planned Value, where a positive schedule variance means the project is ahead of schedule (Larson & Gray, 2018).

Victim Compensation Fund (VCF). Congress established the 9/11 Victim Compensation Fund to compensate individuals or representatives of a deceased individual injured or killed due to the 9/11 attacks, including those who removed debris from those attacks. The fund will accept and process claims through December 31, 2020 (Victim Compensation Fund, n.d.).

1.4. Doctor of Business Project Specifications

The project met the core specifications for a capstone project in the Doctor of Business program. Exploring successful perspectives from private practitioners is important to evaluating project

portfolio management practices. The qualitative inquiry collected the necessary data to support the project.

1.4.1. Importance of the Project

The importance of this project was to explore the perspectives of private sector project managers in the MidAtlantic region of the United States regarding the successful strategies used to deliver financial systems megaprojects to executive branch federal government agencies on time, within budget, and within scope (Project Management Institute, n.d.-a, 2017b, 2018). These project portfolio management practices were not limited to the technical aspects of project portfolio management, for they alone cannot address the general and specific business problem presented (Alexander, 2020; Shinde & Govender, 2017; Takey & Carvalho, 2015). Once the practices are established, they can serve as a starting point for identifying project portfolio management best practices that will improve the delivery of financial systems projects. These practices must be able to overcome the challenges faced by managers.

The project technique used for this capstone project was the qualitative inquiry technique. Qualitative inquiry allowed learners to make recommendations for improvement based on exploring knowledge from experts regarding successful and unsuccessful practices from the past (Capella University, 2020; Hughes et al., 2007). Other project techniques (consulting, critical incident, modified Delphi, and quantitative) do not support this focus because of the need to explore successful practices from participants that will be used to improve performance (Schindler, 2019).

Despite the efforts of private sector project managers, the gap in practice of using proven project portfolio management practices for delivering financial systems megaprojects on time, within budget, and within scope exists (General Accountability Office, 2018; Hines & Carrington, n.d.; Project Management Institute, 2018). PMI has taken a few actions to address the gap in practice. The PMI Talent Triangle and Project Manager Competency Development Framework identifies the necessary skills (e.g., leadership, technical project management, strategic/business management) expected in resources involved in project portfolio management (Cartwright & Yinger, 2007; Project Management Institute, n.d.-c). PMI updated its standards in 2017 to reflect changes to address problems in program and portfolio management (Project Management Institute, n.d.-b, 2017c, 2017d). In 2017, PMI updated its competency framework that focused on core competencies for managers leading and managing programs and portfolios (Project Management Institute, 2017b). PMI released a new set of standards to improve program and portfolio delivery and management (DePrisco, 2020; Project Management Institute, 2021b).

The private sector has improved project portfolio management practices by embracing the need for change, while the public sector has not (Picciotto, 2020). Practically, every private sector firm has created its project portfolio management methodology that takes advantage of the latest changes to PMBOK and other frameworks. The federal government is looking to its Program Management Improvement and Accountability Act (PMIAA) as a way to establish standards and policies that govern program/project management practices in the federal government by relying on best and proven practices from the private sector (Adams, 2016; Alexander, 2017; Tereso et al., 2019).

The Federal Government continues to trail the private sector in improving project portfolio management practices (Clark, 2013; Wood, 2017). Proven practices, such as agile project management, were slow to be used across the federal government while widely adopted and used by the private sector for several years (Jarvis, 2018). Government agencies, such as the U.S Department of Energy, have been cited by the General Accountability Office for failing to provide adequate training in the areas of program management while private sector firms have been encouraging training for years (General Accountability Office, 2017; Langley, 2017; Overby, 2006). In their empirical study, Bueno and Gallego (2017) noted that training and communications are the foundation for successful project delivery. While Congress has mandated agencies comply with PMIAA no later than 2023, there is no roadmap to meet this mandate. An example of this is seen where OMB and OPM have deferred the implementation of PMIAA to the Program Management Policy Council (National Academy of Public Administration, 2017). The Program Management Policy Council is part of the General Services Administration that works with the Office of Management and Budget and other federal agencies regarding matters related to PMIAA (General Services Administration, n.d.).

1.4.1.1. Challenges. The project was essential to address the project portfolio management challenges of shrinking resources, increased mandates, and technology that led to the general and specific business problems with delivering IT projects to the federal government (Allahar, 2019; Koppmann et al., 2017). These challenges, combined with the core project portfolio management challenge in dealing with triple constraints, demand more focus on competencies and best practices in project portfolio management (Larson & Gray, 2018). The lack of focus will significantly impact managers' ability to deliver and manage IT projects according to budget, scope, and cost expectations (Wysocki, 2019).

1.4.1.2. Practices. The project was important to address the lack of proven project portfolio management practices. In the past, the preferred project portfolio management tool for success or failure has been via earned value management (Jugdev et al., 2013). Robinson et al. (2007) recommended a three-phase approach to identify and develop competencies needed in the future to meet upcoming needs. Government agencies have minimal standards related to project portfolio management oversight. An example can be seen as the Federal Government has focused its performance review on costing and scheduling variances of projects and programs within portfolios (Office of Management and Budget, n.d.-b).

1.4.2. Approach for the Project

The approach used for this project is the qualitative inquiry technique to collect and analyze data to formulate recommendations to address the project questions (Capella University, n.d.-a). The data collected via interviews focused on successful project portfolio management practices. The project was limited to private sector project managers who deliver financial systems to the US federal government executive branch agencies. These resources had insight into successful practices since they served in lead roles regarding financial systems megaprojects. The use of non-public government information was prohibited for this project (Federal Acquisition Regulations, n.d.;

Justice Department, n.d.-a; U.S. Office of Government Ethics, 2017). Other project techniques, such as consulting, critical incident, modified Delphi, and quantitative techniques, were not appropriate for this project because of the need to develop themes based upon successful experiences various data types that can be collected to recommend improvements (Capella University, 2020).

1.4.2.1. Sources of Data. The primary data sources used in the project were qualitative data related to the general and specific business problems. Qualitative data were obtained from interviews with private sector practitioners who provide project portfolio management services to the federal government regarding the delivery of financial systems. The data collected was based on the participants' perspectives (Merriam & Tisdell, 2016). The experiences covered successful project portfolio management practices used in delivering financial systems.

1.4.2.2. Sample Size. The sample size for this qualitative inquiry is planned for seven to ten while recruiting 12 to 15 participants to account for attrition (Mayan, 2016). The participants were private sector program/project managers who delivered financial systems projects to the federal government. The participants were limited to managers who worked performed this service for executive branch agencies of the US federal government. The plan solicited participants who have completed financial systems projects within the last five years. A 5-year window allowed exploring project portfolio management practices perspectives before and after the PPMIA mandate. The final pool of nine participants met the requirements to provide a sufficient number of perspectives (Mayan, 2016).

1.4.2.3. Data Collection Techniques. The data collection was manageable over 10 weeks because of access. First, the interviews were tailored to collect successful practices. The interview was semistructured that contained nine open-ended questions. Two Capella professors reviewed the interview questions to align with the project questions and the proposed applied framework. A test run of the interview questions was performed to ensure the interview could be done in the allotted amount of time and ensure that the right amount of data can be collected for analysis (Capella University, 2020; Gray, 2016). The interview was set for a 60-minute time limit to allow in-depth exploration regarding these experiences. Secondly, the transcripts from interviews were analyzed to identify initial codes, which were further refined via Goodall's Verbal Exchange Coding method to classify the codes as practices (Saldaña, 2016). The themes were later developed from the codes. The result addressed the project question (successful project portfolio management practices regarding the delivery of financial system megaprojects) and concepts presented in the proposed P2MI applied framework (Leech & Onwuegbuzie, 2011; Merriam & Tisdell, 2016).

SECTION 2. LITERATURE REVIEW AND PROJECT PLAN

2.1. Introduction

The partnership between the Federal Government and the private sector is strong in technology. The Federal Government spends billions on contracts with the private sector for IT projects (Gianfortune & Butler, 2021). Extensive technology projects such as the international space station rely upon a strong partnership from private sector firms like Boeing (Boeing, n.d.; National Aeronautics Space

Administration, n.d.). Another example of relying on the private sector is being played out as agencies modernize their financial systems against the backdrop of new Department of Treasury initiatives, such as G-Invoicing. The G-Invoicing mandate will require agencies to modernize their financial systems to improve the process of buying goods and services between government agencies (Treasury Department, n.d.-a). A key reason for partnering with the private sector is that the federal government can move the risk to the private sector since they have already invested in proven technologies (Ahmadi-Javid et al., 2019; Wood, 2019).

Despite this partnership, problems exist in the delivery of IT megaprojects. CIO Magazine reported in 2019 that 70% of IT projects were either late, over budget, or failed to meet their customer's requirements (Cisco, 2019). Since 2013, PMI has conducted surveys to solicit feedback on this pressing issue. PMI noted in the 2013 Pulse of the Profession that for every \$1B spent on projects, \$135M is lost and not recoverable (Project Management Institute, 2015). The 2015 Pulse of the Profession survey from PMI revealed that 34% of projects, in general, failed to reach their goals (Project Management Institute, 2015). In 2018, a survey of project managers identified over \$99M in losses for every \$1B per the use of poor project management techniques and tools (Project Management Institute, 2018). In 2016, PMI noted that over 30 percent of government strategic initiatives failed to achieve their goals while wasting \$101 million for every \$1 billion spent on projects and programs (Langley, 2016). The underlying problem is that private sector project managers have been pressured to increase the costs and the time it takes to deliver IT megaprojects (General Accountability Office, 2017, 2018; Langley, 2016; Project Management Institute, 2017, 2018).

The best way to address the problem was to work with the private sector. History has shown that the private sector can be a problem-solver for the federal government (Bain, 2009; GNC Staff, 2005; Nisar, 2007; Wood, 2019). From forming the space program to developing a vaccine for COVID-19, the private sector has been counted on to solve some of the government's most significant problems (General Accountability Office, 2021a; History Channel, n.d.). The purpose of this capstone was to explore the project portfolio management practices of private sector project managers in the Mid-Atlantic region of the United States who deliver financial system megaprojects to executive branch agencies of the federal government on time, within budget, and within scope. Other project techniques (critical incident, modified Delphi, quantitative, and consulting) did not support this focus because of the need to explore successful practices from participants to improve performance.

The need for this project is great. It has been noted that the federal government continues to lag the private sector in developing standards and training its workforce regarding program/project management (Brantley, 2017, 2019). In their empirical study, Bueno and Gallego (2017) noted that training and communications are the foundation for projects. By considering the perspectives, whether they are good or bad, information can be shared with the federal government to assist it with its plans from the private sector. The start of this plan begins with the formation of an applied framework.

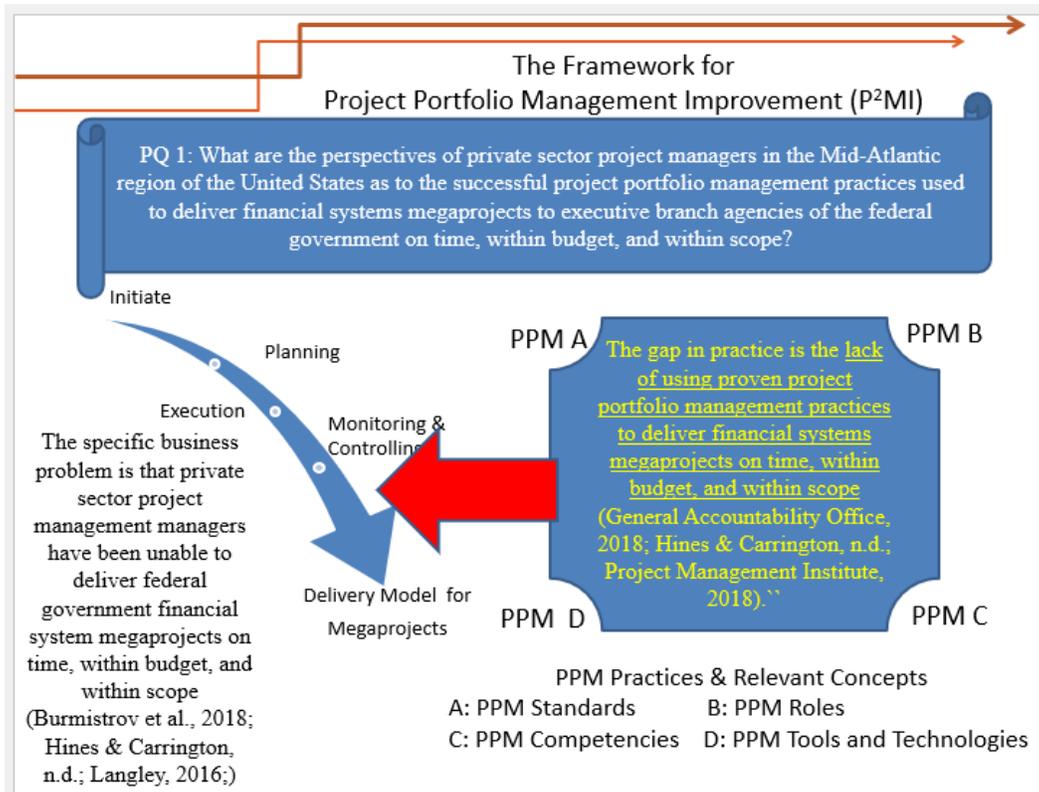
2.1.1. Applied Framework

The purpose of an applied framework is to develop an argument that links business problems and gaps in practices with core concepts that will be used to address the project questions. The arguments presented served as the basis to justify the project. The justification was clear and straightforward enough to understand that it can be defended as support for the project. The concepts explored in the project must relate to the problem, gap in practice, and project questions. Lastly, an applied framework must link all the elements together to form a cohesive project. The applied framework is similar to a theoretical framework where it is essential; they have the right blueprint for constructing your framework (Osanloo & Grant, 2016).

2.1.1.1. Developing an Applied Framework. The choice for developing an applied framework is quite simple. First, locating an existing applied framework to solve the business problem is rare. Existing frameworks like the 7S McKenzie framework or the Project Manager Competency framework are great but may not fully apply to the problem. Other reasons for developing an applied framework are that theoretical and conceptual theories do not help solve specific business problems. Yamauchi et al. (2016) noted that theoretical frameworks focus on theories that have already been tested, while conceptual frameworks focus on examining the progression of a phenomenon. In the case of existing applied frameworks, theoretical frameworks, or conceptual frameworks, they are not specific enough to solve a specific business problem. East and Peters (2019) noted how important selecting the proper framework is to support your research; thus, developing a unique framework is the best course of action.

2.1.1.2. Proposed Applied Framework. The proposed framework for this capstone project was project portfolio management improvement (P2MI). The P2MI framework, as seen in Figure 1, focuses on the need to address the project question related to the delivery of financial systems megaprojects by private sector project managers. The framework starts with the problem where private sector project managers cannot deliver financial system megaprojects on time, within budget, and within scope. The specific business problem fed the gap in practice in using proven project portfolio management practices by private sector project managers for delivering financial systems megaprojects on time, within budget, and within scope (General Accountability Office, 2018; Hines & Carrington, n.d.; Project Management Institute, 2018). The results from this project answered the project question.

Figure 1. *The Framework for Project Portfolio Management Improvement*



Note. Based partially on the research conducted and discussed in Section 2.1.1.5 (Costantino et al., 2015; GSA, n.d.; Project Management Institute, n.d.-c, 2017b; see also Kock & Gemunden, 2021; Seelhofer & Graf, 2018).

The proposed applied framework was developed partially based on the research I conducted regarding frameworks, models, and theories involving project portfolio management as discussed in Section 2.1.1.5 since no existing framework could cover the specific business problem, gaps in practice, and project questions. Traditional project management life cycles (PMLCs) helped frame the specific business problem where PMLCs do not guarantee that cost overruns and delays will not occur. Project management practitioners such as Larson and Gray (2018) and Kerzner (2017) identified five phases (initiation, planning, execution, monitoring/controlling, and closeout) that every project follows. I found that the PMI Talent Triangle and the Project Manager Competency helped identify some relevant concepts (standards, skills, competencies) that are part of the proposed framework (Project Management Institute, n.d.-c, 2017b). The Artificial Neural Network was used to identify the skills and competencies construct of the framework (Costantino et al., 2015). The M3 Framework, Innovation Project Portfolio Management Framework, and National Project Maturity Model provided additional concepts (standards, roles, tools) in finalizing the framework (GSA, n.d.; Kock & Gemunden, 2021; Seelhofer & Graf, 2018).

At the top of the framework is the project question. The project question focused on the perspectives of private sector project managers in the Mid-Atlantic region of the United States regarding the successful project portfolio management practices used to deliver financial systems megaprojects to executive branch agencies of the federal government on time, within budget, and within scope. The General Accountability Office (2017) recommended that the government look towards the private sector for guidance as improving how best to address the requirements of PMIAA. One of the reasons for consulting the private sector is the variety of PPM expertise they can provide. The question follows the model that supports the qualitative inquiry project technique where it is focused on collecting perspectives from participants regarding their lived experiences as private sector project managers.

The specific business problem is highlighted on the right side of the framework. The specific business problem is how private sector project managers cannot deliver financial system megaprojects on time, within budget, and within scope (Burmistrov et al., 2018; Hines & Carrington, n.d.; Langley, 2016). Doskočil and Lacko (2018) noted that when pressed to deliver their projects, project managers will skip activities that can contribute to cost overruns and schedule delays, leading to unfilled objectives and cost overruns. The specific business problem is caused by the gap in practice

The gap in practice is highlighted on the right side of the framework. The gap in practice exists in using proven project portfolio management practices by private sector project managers for delivering financial system megaprojects on time, within budget, and within scope to the federal government. The gap may be related to the lack of core competencies, as noted by PMI (2017b).

2.1.1.3. Relevant Concepts. There are four relevant project portfolio management concepts presented in the P2MI framework that anchored this project: standards, roles, and responsibilities; skills and competencies; and tools and technologies. While each concept is separate and distinct, they provided the construct for the framework. The first concept, project portfolio management standards, explored academic/practitioner project portfolio management standards that may be useful for improving the delivery of financial systems megaprojects. One set of standards will include proposed updates to the PMBOK in 2021 and the proposed standards by the Program Management Improvement & Accountability Act (DePrisco, 2020). The second concept, project portfolio management roles/responsibilities, examined critical roles and responsibilities desired in project management resources to improve the delivery of megaprojects. Project roles and responsibilities must be clearly defined initially; otherwise, problems will arise and not contribute to bringing value and improving delivery (Chandler & Thomas, 2015). The third concept, project portfolio management skills/competencies, was important for the lack of skills and competencies feeds the gaps in practice in delivering megaprojects (Joslin & Muller, 2016; Kock & Gemunden, 2021). Robinson et al. (2007) recommended a three-phase approach to identify and develop competencies needed in the future to meet upcoming needs. The final concept is project portfolio management tools/technologies. In their study, Khumalo and Mearns (2019) noted that such tools like Microsoft Project could improve the sharing of knowledge to improve program management when integrated with project management practices.

2.1.1.4. Relevance to Project. The P2MI framework was relevant to this capstone project for it provided a roadmap that shaped how the rest of the project unfolded. The framework provided a mechanism to identify key concepts that drove the literature search for the project. In this case, the P2MI framework helped me identify core PPM that deliver IT megaprojects and core concepts related to PMIAA.

The literature search allowed me to determine trends related to the business problem and what was done to address the problem. In this case, I focused my search on scholarly and practitioner-based literature covering my general/specific business problem and gap in practice. Some of the sources that I used include the *Project Management Journal*. Lastly, the framework established the game plan for collecting and analyzing the data to support the project. As identified above, my project technique used the qualitative inquiry project technique. This technique explored success and unsuccessful perspectives from private sector IT project managers.

2.1.1.5. Review of Existing Theories, Models, and Frameworks. As part of the P2MI Applied framework development, several existing models, theories, and frameworks were reviewed. Over ten theories, models, and frameworks were found during a framework discovery session, and the final list of candidates was narrowed down to five. Three candidates were models/theories/frameworks developed by researchers, while practitioners developed the rest. The proposed candidates are discussed below.

2.1.1.5.1. The Artificial Neural Network (ANN) Model. Costantino et al. (2015) developed a theoretical model that relies on an artificial neural network model that uses critical success factors as a mechanism for assessing and measuring projects. Critical success factors would be developed to drive project selection, initiation, and planning activities. The study showed how this would lead to poor delivery and management of projects. Reitsma and Hilletoft (2018) noted the importance of user-centric critical success factors (CSFs) to improve project delivery and management. The foundation of the ANN model is that if by selecting the right projects initially, success will more likely happen. The backbone of the model looks at components of project portfolio management to develop a selection model.

The ANN model was not selected as a framework for this capstone project. First, the model was theoretically based; thus, it was not considered. Second, the model is quantitative; thus, it does not align with the qualitative inquiry project technique. While the model is very logical, it does not address the gap in practice or problem-solving. Unfortunately, the model only covers the initiation and planning phases of a project, limiting the perspectives that could be explored.

Despite its flaws, the ANN model provided insights into the need for project portfolio management standards and tools that would compromise a proposed framework. First, the model provides invaluable information on concepts, such as key performance indicators (KPIs) and critical success factors (CSFs), that should be considered for measuring project performance. A study completed by Abdelmoniem (2016) concluded that when managers rely on the right critical success factors (CSFs), their organization's value will increase. Second, the model definition of project success expands on the focus of project success for the capstone. Costantino et al. (2015) looked beyond completing a

project's budget/schedule to include factors such as quality and stakeholder satisfaction. The inclusion of other factors is an essential consideration since cost and schedule information provides only an analytical view of performance where management needs to look at more than just analytics (Rajagopalan & Srivastava, 2018).

Lastly, the ANN model identified ten factors attributed to measuring project performance that will help me develop the probing questions. One of the factors Costantino et al. (2015) identified, personnel, is an essential aspect of project performance in terms of cost and schedule, but the model's focus was on the selection and training of personnel involved in initiating planning projects. This factor falls in line with the competencies construct of the P2MI framework (Skills & Competencies). It will be interesting to hear perspectives from private sector project managers in this area.

2.1.1.5.2. The General Services Administration (GSA) M3 Framework. In 2016, the General Services Administration developed the Moderation and Migration Management (M3) framework to assist private sector project managers involved with IT modernization projects, such as financial systems projects, for the federal government (GSA, n.d.). The M3 framework provides a step-by-step approach for delivering IT projects in the federal government. The M3 framework consists of 6 phases, starting with the assessment phase of a project to the project's delivery phase. The M3 framework includes tools and templates to help project managers deliver IT projects within the federal government. These tools and templates were based on recommendations from government agencies and private sector firms (Wood, 2019).

The M3 framework was not selected for this capstone project. While the framework is applied-based, only one of the framework's phases (engagement) covers project costs and schedule, and it is limited to finalizing the costs and schedule. The challenge is having the correct information to correctly estimate the cost and duration of a given project in the beginning. Once the project manager has the correct information, they can move forward with the proper financial control of the project (Tervala et al., 2017). The M3 framework does address the financial control of projects. While the model is very logical, it does not address the gap in practice or the specific business problem that needs to be solved.

Despite its flaws, the M3 framework does provide much value for this project. First, the M3 framework comes with templates that can be considered tools for the P2Mi framework. Second, the M3 framework is the only government-wide framework available for delivering IT projects. Each private sector firm that delivers IT projects for the federal government has its firm-based framework, and many have updated theirs to incorporate features of the M3 framework. Lastly, three of the four M3's focus areas (program management, workforce, and technology) align with the fundamental concepts of the P2MI framework.

2.1.1.5.3. The Innovation Project Portfolio Management Framework. Kock and Gemunden (2021) developed a conceptual framework model that measures the success of projects based upon the ability to screen, select, and prioritize projects and allocate resources based upon their prioritization. Confido et al. (2018) emphasized the need for a developing selection method that will aid in choosing the right set of initiatives that bring the most value to the organizations. The

foundation for this model is taking an entrepreneurial view toward measuring project performance where performance is linked toward the ability to create competitive advantage through the firm's purpose and vision and ensuring that purpose and vision are intertwined into the project. The basis for this model is that higher priority projects will be given the necessary resources to ensure success. The challenge lies in determining the various factors in a selection method.

The Kock framework was not selected as a framework for this capstone project. First, the model is conceptually based; thus, it is not considered. Second, a model is quantitative; thus, it does not align with the qualitative inquiry technique. More importantly, the framework focuses on project portfolios and not individual projects. Measuring the success of a portfolio will leave out the ability to isolate underperforming projects. For example, if a portfolio has ten projects and eight perform well in delivering on time and within budget, the underperforming projects may not be securitized. Lastly, the framework focuses more on the initiation and planning phases of a portfolio, limiting the perspectives that could be explored.

Despite its flaws, the model does provide some value for this capstone project. First, the model provides invaluable information on PPM's roles and responsibilities. One example was the role and responsibility of stakeholders and executives in delivering projects. Kock and Gemunden (2021) concluded that higher stakeholder involvement translates to better performance. The rationale for this is that project managers will perform better when stakeholders are involved (Eskerod et al., 2015). Another area of discussion that I found interesting was the influence of risk management on project performance. Kock and Gemunden (2021) noted that risk management positively influenced performance. Burtseva et al. (2019) noted that project managers and sponsors need to pay close attention to risks, especially financial ones.

2.1.1.5.4. *The National Project Maturity Model (NPMM)*. Seelhofer and Graf (2018) developed a conceptual framework for measuring project performance. The National Project Maturity Model (NPMM) framework consolidates several organizational project maturity models, such as PMI's Organizational Project Management Maturity (OPM3) model and Humphrey's Capability Maturity Model Integration (CMMI) model, into a 3-dimensional model. The National Project Maturity Model has three core domains: project maturity levels, project maturity drivers, and perspectives. The model identified ten key performance indicators that can predict project performance in terms of schedule and cost. Dolata (2019) proposed that when the skills needed to manage project costs are improved, an increase in the maturity level of management will occur, which will improve project delivery.

The National Project Maturity Model was not selected as a framework for this capstone project. First, the model is conceptually based; thus, it is not being considered. Second, the model is a mixture of qualitative and quantitative; thus, it does not align with the qualitative inquiry technique. While the model is very logical, it does not address the gap in practice or the problem to be solved. The three-dimensional model makes it challenging for alignment.

Despite its flaws, the model does provide some value to me as part of this capstone project. First, the model's perspectives and drivers link the learners to the core concepts being explored. Each of

the perspectives and drivers will align itself with one or more concept areas. For example, Seelhofer and Graf (2018) identified a KPI regarding the number of projects completed on time and within budget under its Resource Management perspective. This KPI is the foundation of the project.

Another example can be seen with the model's application support driver in evaluating government initiatives to identify and mitigate risks (Seelhofer & Graf, 2018). Doskočil and Lacko (2018) developed a RIsk PROject ANalysis (RIPAN) empirical model for managing risks. There is an additional need to see how it can be adopted as a best practice by the PMIAA and the project management profession. Secondly, and just as important, the model provides a framework for developing probing questions. For example, when engaging with private sector project managers regarding their perspectives on successful practices, the influence of stakeholder involvement can be probed. Seelhofer and Graf (2018) noted that it is vital to know the stakeholder's influences and contributions to a project and see how that impacts performance.

2.1.1.5.5. Project Management Institute Standards and Frameworks. The Project Management Institute has many standards and frameworks to use regarding the delivery of IT projects. PMI's Project Management Body of Knowledge is considered the bible for all things project management (Project Management Institute, 2017a). PMI has even created supplement guides for PMBOK that focus on program management, portfolio management, and competencies. The Standard for Organizational Project Management provides a framework that aligns organization strategy with PPM practices (Project Management Institute, n.d.-b). The Standard for Program Management focuses on program management activities, while the Standard for Portfolio Management focuses on portfolio management practices (Project Management Institute, 2017d). The Project Manager Competency Development Framework focuses on the skills and competencies needed for project managers (Project Management Institute, 2017b). The Governance of Portfolios, Programs and Projects focuses on core governance aspects of portfolios, programs, and projects (Project Management Institute, n.d.-b).

The decision not to use any of the frameworks available via PMI was quite simple. First, none of the frameworks cover everything needed to address the problem and gap in practice. Second, a consolidation of components from the various standards and guidelines would create a complex framework that would explain the framework difficult.

2.2. Method for Discovering Literature

The method for discovering literature, including using Cappella-based and non-Cappella resources, focused on project portfolio management. Some resources, such as the ACM Digital Library, were excluded due to their limited focus on project management. An iterative search strategy was used to find the most significant number of resources that could be used for this study. I will discuss the inclusion and exclusion strategies utilized.

2.2.1. Inclusion and Exclusion Criteria

The inclusion criteria used for the capstone project included scholarly/practitioner articles and material from the Project Management Institute, government websites, and academic textbooks. References were selected that focused on various portfolio project management topics that cover the gaps in practice while supporting the general/specific business problems to answer the project questions. The date used for inclusion ranged from 2007 to 2021 to ensure that historical and current trends could be identified

In terms of scholarly and practitioner articles, the primary focus was to select peer-reviewed ones. Peer-reviewed articles undergo a review and acceptance process to provide credibility (Gray, 2016). Two of the most used journals were the *International Journal of Project Management* and the *Project Management Journal*. The *International Journal of Project Management* works with the Association of Project Management and the Internal Project Management Association to promote research in leading trends in Project Management (Science Direct, n.d.). The *Project Management Journal* is the academic research group within the Project Management Institute that focuses on techniques, trends, theories, and applications in the project management field (Sage Journals, n.d.).

The criteria for excluding articles focused on several areas. First, articles older than December 2000 were excluded for they were too old to cover the general/specific business problems and gaps in practice. Second, articles that were focused on narrow project management concepts such as risk management that were not relevant concepts related to the framework were excluded. The exclusion of these articles will not support the literature review needed for this capstone project.

2.2.2. Search Strategy

The search strategy for locating articles involved repetitive searches using various keywords. The primary keywords for searching for articles included *project portfolio management*, *project management*, and *megaproject*. Additional keywords included *frameworks*, *models*, *theories*, *megaproject*, *ERP*, and *financial systems* were used to locate articles. Table 1 provides a breakdown of each of the keywords and how they were used to search for articles.

Table 1. *Keywords Usage*

Keywords	Usage of keywords
Project management	Narrow search criteria for articles that cover the specialization for the capstone
Project portfolio management	Narrow search criteria for articles that cover an area of research for the project management specialization
Framework, models, theories	Narrow search criteria for articles that cover project management and/or project portfolio management frameworks, models, and theories

Keywords	Usage of keywords
Megaprojects	Narrow search criteria for articles that cover megaprojects involving project management and/or project portfolio management
ERP, Financial systems	Narrow search criteria for articles that cover ERP and/or financial systems involving project management and/or project portfolio management

Note. The table provides an overview of how each keyword was used to locate potential articles. Table developed by J. Pullen, 2021.

Several databases and search engines were used to develop a listing of potential articles. The initial database used was the Summons database. Summons was used to provide a general listing of sources that were to be considered. In order to perform a more focused search, the following databases were used Business Source Complete, Google Scholar, and Sage Journal Online. These databases allowed me to perform more precise searches, but more importantly, they provided the best scholarly and practitioner sources. Some of the best sources I found were the Project Management Journal and the International Journal of Project Management. These two journals provided focused topics around project management. In terms of practitioner resources, information from websites such as CIO and PMI provided valuable insight.

An example of this was using the keywords *project portfolio management*, which revealed a potential framework resource that was used. Another example was using the keywords of *project portfolio management*, and *best practices* provided me with resources on best practices as stated by Kharat and Naik (2018). This article provided insight into the best practices and benefits of using project portfolio management practices.

2.3. Review of Scholarly and Practitioner Literature

The search strategy used for this project provided scholarly and practitioner literature that provided evidence to support the general and specific business problem that has been prevalent for more than 5 years. The literature highlighted trends that reinforced the problems and gaps in practice. The trends discussed will fall into PPM standards, competencies, tools, and roles.

2.3.1. Historic and Current Business Problem Trends

Since 2006, scholars and practitioners have authored project delays, cost overruns, and scope creep. While the articles generally cover the project management profession, they apply to financial system megaprojects. Megaprojects are defined as those project activities that span for several years that cost over \$1B (Flyvbjerg, 2014; Larson & Gray, 2018). Financial systems projects involve the modernization of systems used to process accounting, budget, payroll, and purchasing transactions, mandated by the CFO Act (General Accountability Office, 2005). Miller (2021) noted that 56 federal financial systems are nearly the end of their useful life; thus, the pressure to modernize is high. This

pressure has led to a renewed focus on delays, cost overruns, and scope creep with financial system projects (General Accountability Office, 2018, 2020; Office of Management and Budget, 2013)

2.3.1.1. Trends From Practitioners. Since 2013, practitioners from PMI, LinkedIn, and Forbes have quantified the impact of project delays, cost overruns, and scope creep. PMI has conducted yearly surveys to solicit feedback on this pressing issue. PMI noted in its 2013 Pulse of the Profession that for every \$1B spent on projects, \$135M is lost and not recoverable (Project Management Institute, 2013). The trend continued with the 2014 Pulse of the Profession survey, where another \$109M was lost (Project Management Institute, 2014). The 2015 Pulse of the Profession survey from PMI revealed that 34% of projects, in general, failed to reach their goals (Project Management Institute, 2015). In 2016, PMI noted that over 30% of government strategic initiatives failed to achieve their goals while wasting \$101M for every \$1B spent on projects and programs (Langley, 2016). Marr (2016) noted that most projects fail (e.g., not delivered on time) because of poor management during the same year. Between 2017 and 2018, a survey of project managers identified over \$98M in losses for every \$1B per the use of poor project management techniques and tools (Project Management Institute, 2017, 2018). Mishra (2017) and Nieto-Rodriguez (2017) reported several high-profile project failures. Sisco (2019) reported that 70% of IT projects were late, over budget, or failed to meet their customer's requirements (Sisco, 2019). The underlying problem is that this is a failure of people, processes, and communications to address the threats of problem failure (Discenza & Forman, 2007). The result is that private sector project managers have been pressured to increase the costs and the time it takes to deliver IT megaprojects (Langley, 2016; Project Management Institute, 2017, 2018).

Since 2009, the federal government has been concerned about delivering financial systems projects. In 2009, OMB created the Information Technology Dashboard, which tracks information technology spending across the government (Office of Management and Budget, n.d.-b). In 2010, OMB suspended financial system modernization projects across the federal government so that a review of projects could be performed (Weigelt, 2010). Later, OMB reported that \$1.6B in savings was realized in the delay, postponement, or cancellation of modernization projects (General Accountability Office, 2012; Tuutti, 2012). An external review of the OMB mandate conducted by the GAO highlights key contributors to project delays: lack of funding, lack of standards, and lack of management oversight (General Accountability Office, 2012). Congress later passed the Digital Accountability and Transparency Act to provide insight into federal spending on contract activities (U.S. Congress, 2014). To address the lack of standards and management oversight, Congress passed the Program Management Improvement and Accountability Act (PMIAA) (U.S. Congress, 2016). Another action taken by Congress was the passage of the Federal Information Technology Acquisition Reform Act (FITARA) of 2017, which required each agency to review and approve all IT project expenditures and performance (U.S. Congress, 2017). The White House followed this action by updating the President's Management Agenda (PMA) to include a new goal to improve the management of government programs (White House, 2018a). None of the actions dealt with the core problem of the ability of private sector project management to deliver financial system projects on time, on budget, and within scope.

2.3.1.2. Problems Reported by Scholars. The research that I conducted revealed various factors that have contributed to the problem of delivering financial systems projects on time, on budget, and within scope. The factors discussed below fall into various gaps in practices that support the four relevant concepts (standards, roles, competencies, and tools) of the P2MI framework. The factors may fall into more than one concept.

2.3.1.2.1. Skills. Scholars have differing opinions regarding the right set of skills and competencies needed in project portfolio management (Suikki et al., 2006; Welde & Odeck, 2017). Suikki et al. (2006) noted that project managers need to adjust from the ‘old world’ of managing projects to the ‘new world.’ Nijhuis et al. (2018) conducted a study where participants believed that project portfolio management and management skills were the same, but they were not. The study completed by Welde and Odeck (2017) confirmed that project managers lack the skills in planning and managing project costs. Cost overruns will occur when the estimates are too low (Langley, 2016). Sang et al. (2018) concluded that while project managers may possess core technical program management skills, they lack other important competencies such as leadership, financial management, and emotional intelligence needed for monitoring, controlling, and executing the successful delivery and management of projects.

2.3.1.2.2. Project Approvals. Scholars have discussed cases where project approvals were granted when they should not have been. Confido et al. (2018) discussed how some projects were approved and should have been disapproved because of financial considerations. A study completed by Vacik et al. (2018) revealed a lack of automated tools to review and approve projects. Allahar (2019) promoted the use of innovation in the approval process. Traditionally, the proposed selection process follows traditional processes that began with listing projects for consideration and selecting the optimal projects that align with the firm (Milosevic & Srivannaboon, 2006). Guest et al. (2013) recommended inductive probing as a method where the additional questions regarding the specifics of projects will result in a more incredible richness of data to serve as a basis for validation. The problem is that related projects that bring the most value to the organizations should be approved together; thus, related projects that do not bring the most value will be disapproved together

2.3.1.2.3. Managing Costs. The inability to manage project costs during the project life cycle remains a concern. Welde and Odeck (2017) conducted a study where there were signs of cost overruns missed in the early stages. Ali and Miller (2017) detailed the challenges with managing costs involving ERP projects where technology changes and new mandates are constraints. These constraints are also present in financial systems projects undertaken by the federal government in order to modernize them (Office of Management and Budget, 2019). Dolata (2019) and Galeazzo et al. (2017) noted that a key component of managing projects involves managing project costs. Project delays and scope creep will occur when project costs are not effectively managed.

2.3.1.2.4. Project Roles. The success or failure does not rely solely on the project manager. Breese et al. (2020) noted that the project sponsor role is an essential factor regarding the success or failure of projects. While the project manager is responsible for managing the project, the project sponsor has significant influence over a project. The sponsor provides financial resources for the project, and they must be appropriately managed (Breese et al., 2020; Clarke, 2010; Ilin et al., 2018;

Zwikael & Meredith, 2018). The project sponsor provides guidance and support to the project manager and the team (Breese et al., 2020). The role and expectations of the project manager, project sponsor, and other roles need to be clearly defined at the beginning of the project so that everyone feels empowered (Jonas, 2010). The key is making sure that the project manager and project sponsor has the right competencies to succeed in all phases of the project (Breese et al., 2020; Kloppenborg et al., 2014; Suikki et al., 2006).

2.3.1.2.5. Critical Success Factors. The traditional measurement of project success has been via earned value management and other general tools, which does not address the need for critical success factors (Hartman & Ashrafi, 2002; Jugdev et al., 2013). Reitsma and Hilletoft (2018) proposed that project managers should consider identifying critical success factors that are more user-centric instead of technical-centric or project-centric. Even when using critical success factors, project managers may not perform a proper risk assessment of which factors should be used or excluded (Jenko & Roblek, 2016). The choice of success factors would be an innovative way to identify and manage critical success factors (Gunduz & Almuajebh, 2020; Hartman & Ashrafi, 2002). Some notable missing factors included the involvement of top management and the importance of change management.

2.3.1.2.6. Impact of Culture. Liu et al. (2015) concluded that culture has a definite impact on a contractor's ability to manage risks to projects. Risks are identified, assessed, managed, and controlled differently when dealing with cultural differences. Cultural differences will be impacted by political, economic, cultural, technological, legislative, and environmental (PESTLE) factors (Hussey et al., 2017; Rodríguez-Rivero et al., 2018). These factors can affect the delivery of financial system projects if the project manager does not understand the client's culture beforehand; thus, managers may not know how to address the differences.

2.3.1.2.7. Importance of Risk Management. While risk management is one of the ten knowledge areas, many project managers consider this activity a simple exercise that underestimates risks for projects (Doskočil & Lacko, 2018; Shishodia et al., 2018). Traditionally, project managers would identify risks at the beginning of a project and manage them as they come up. Burtseva et al. (2019) noted that project managers and sponsors need to pay close attention to risks, especially those with a financial nature. Doskočil and Lacko (2018) noted how risk management activities were not being done at the end of each project phase or even using advanced risk management techniques. The use of reviews at each phase of the project may provide crucial information that can be shared with that team or across similar projects that span a portfolio, which will reduce risks, as noted by Tshuma et al. (2018). The goal is to provide timely data so that decisions can be made promptly to reduce risk (Romano, 2017).

2.3.2. Previous Efforts to Address the Problem

Scholars and practitioners have provided recommendations to address the problems with project delays, cost overruns, and scope creep (Eskerod et al., 2015; Williams et al., 2012; Wysocki, 2019). Their recommendations have generated mixed results. PMI noted in its 2013 Pulse of the Profession that for every \$1B spent on projects, \$135M is lost and not recoverable; however, the losses dropped

to \$98M in 2018 (Project Management Institute, 2013). The following sections summarize some of the recommendations that may apply to improving the delivery of financial systems projects by private sector project managers.

2.3.2.1. Early Warning Systems. Resources responsible for managing complex financial system programs/projects must quickly determine when their program/project is in trouble. If they react too slowly, the program/project will become distressed. Wysocki (2019) defines a distress project or program as performing outside nominal values. One of the easiest ways to look at nominal values is assessing values related to earned value management, such as schedule or cost variances (Williams et al., 2012). These values will indicate a high degree that the project will never achieve its purpose.

The early warning system must be established in the beginning phase of a project (Williams et al., 2012). Once the system is in place, managers must use it on a routine basis. Williams et al. (2012) proposed that an early warning system consists of conducting project reviews, performing project health checks, establishing benchmarks, implementing project audits, and performing evaluations of a project once they are completed. The proposed early warning systems will help managers limit project crises but provide a playbook for managing and resolving the crises if they do arise.

2.3.2.2. Project Portfolio Management Governance. Governance is an especially important aspect of managing programs and portfolios with my firms. Most programs/portfolios will have two sets of governance models: one that is financial-based and one that the project management-based. These governance models will report to different executives who have a different focus. The financial-based model may report to a CEO, COO, CFO, or Controller, while the project management based-model will report to a CIO or PMO group. Each group will require some sort of status of the program and portfolio; thus, the information presented will vary. The consolidated information does paint a clear picture of the program/portfolio; however, the information presented varied by the audience.

Establishing the right governance model is a recommended best practice. As noted above, portfolio managers must respond to financial and non-financial pressures for performance. The portfolio manager is required to design a governance structure that can respond appropriately to these pressures while keeping all their stakeholders updated (Eskerod et al., 2015). When this is done, Lehnert et al. (2016) and Milosevic and Srivannaboon (2006) emphasized that improvement to organizational performance can be linked to improvement in business processes.

2.3.2.3. Innovative Metrics. Program/project managers need a different way to measure success or failure. Traditionally, project performance dictated if a project was successful or not. The traditional measurement of project success has been via earned value management and other general tools (Jugdev et al., 2013). Innovative metrics, such as the project health index, as Rajagopalan and Srivastava (2018) proposed, should be used as a performance measurement for projects. These metrics must go beyond factoring in the triple constraint. Abu-Hussein et al. (2016) noted how important it is to consider the triple constraints as part of planning for a project; therefore, a metric like this will be required as part of a project's initiation and planning phase.

Innovative metrics, such as the project health index, are imperative for managing portfolios. Managers will be able to use innovative metrics to identify access to the performance of their portfolios. Innovative metrics can be used as an early warning system in this manner. From an organizational viewpoint, the firm must be prepared to take the necessary action when performance is not optimal (Ward & Chapman, 2011). Organizations that embrace using metrics to address performance will increase their overall value. The challenge is reducing the barriers to using them, as Dandage et al. (2018) noted.

2.3.2.4. Project/Risk Management Lifecycle Selection. The choice of a project (PMLC) and risk (RMLC) management life cycle must withstand the challenge of project delays and failures. Burmistrov et al. (2018) noted that 25% of all projects fall within 10% of their stated deadlines. While most projects are well-defined, some projects are not. The lack of a well-defined PMLC / RMLC leads to managers dealing with many aspects of uncertainty. The selection of the right PMLC / RMLC will provide program and project managers with the dynamic capability to ensure that their programs and projects achieve their organizational goals and objectives while dealing with time and cost constraints (Galeazzo et al., 2017).

Wysocki (2019) proposed five PMLCs that can be used by project and program managers. The traditional/linear PMLC is the classical waterfall model that has been used for years and serves as the conventional model for project management. A variation of the traditional/linear model, the traditional/iterative model, was devised to account for supporting a phase/increment deployment of projects. The agile/iterative and agile/adaptive was born out of the need to consider deploying projects via an agile flavor that focuses on cycles or iterations. The final PMLC, the extreme PMLC, takes the best from both the agile and traditional PMLC models. Each of these PMLCs has its strengths and weakness. The successful project manager will know which PMLC is best for their project (Laufer et al., 2015).

Two RMLC models would be used within a PMLC. The first RMLC model, the Performance Uncertainty Management Process (PUMP), assigns responsibility via their ‘clarify ownership’ activity (Ward & Chapman, 2011). The second RMLC model, the Project Management Institute’s Risk Management Process (RMP), identifies responsibilities within the Project Management Body of Knowledge and the Standard for Risk Management in Portfolios, Programs, and Projects (Project Management Institute, 2017a, 2017b).

2.5. Recruitment

The recruitment of participants for this qualitative inquiry study focused on identifying and selecting private sector project managers who have delivered financial systems projects for executive branch agencies of the federal government from January 2016 to the present. There were several reasons for focusing on executive branch agencies. First, all executive branch agencies (e.g., Department of Justice, Department of State) must comply with the CFO Act. CFO Act agencies must keep their financial systems updated to handle federal financial management reporting requirements (Jones & McCaffery, 1992). Secondly, my role as a financial systems program manager will afford me easy

access to candidates for interviews. These candidates will share perspectives regarding successful deliveries of financial system megaprojects. Lastly, these agencies are located in the Mid-Atlantic region of the United States, which makes it easier to contact participants.

The process for recruiting potential participants was the purposeful sampling method. The method relied on recruiting candidates who know the area of interest related to the study who are able and willing to participate (Gray, 2016; Schindler, 2019). First, I have a working relationship with the various CFOs and CIOs within the federal government. Instead of sending them a message to ask for assistance, I will contact them via phone. During the call, I will explain to them the purpose of my project and if they know of any private sectors project managers in their organization who may be candidates to help me with my project. If they have referrals, I will ask them to contact the referrals in advance of me contacting them via email. Once I confirm a possible participant, a recruitment message (see Appendix B) with the corresponding consent form (see Appendix G) will be provided to them. I will have a follow-up phone call with each participant to gauge their interest and to confirm their eligibility. All participants' eligibility will be determined via completing an eligibility checker during a phone call with prospective candidates (see Appendix H). During the phone call, eligible participants would be requested to send the completed form to me via email; otherwise, they would be requested to delete the form simply. At the end of the call, I will ask them if they know of additional private sector project managers interested or eligible to refer them to me via email.

The purposeful sampling method provided a reduced population that was used to establish an appropriate sample size. Study participants met the eligibility criteria. All study participants were information technology private sector project managers who had delivered at least two financial systems projects for a US federal government executive branch agency. Participants who did not meet this criterion were excluded. The key is getting experienced project managers who can share their perspectives. The targeted sample included seven to 10 private sector project managers who have delivered financial systems projects for executive branch agencies within the US federal government.

2.6. Project Study Protocol

The importance of this project was to explore the perspectives of private sector project managers in the Mid-Atlantic region of the United States regarding the successful project portfolio management practices for delivering financial systems megaprojects on time, within budget, and within scope to executive branch agencies of the federal government (Project Management Institute, n.d.-a, 2017b, 2018). The protocol that I followed for this project was to explore project portfolio management practices presented by approved participants that addressed the general and specific business problems with delivering IT projects to the federal government (Alexander, 2020; Shinde & Govender, 2017; Takey & Carvalho, 2015). Once the practices are established, they can serve as a starting point for identifying project portfolio management best practices that will improve the delivery of financial systems projects. These practices must be able to overcome the challenges faced by managers.

The foundation for collecting, analyzing, and presenting the data for this qualitative inquiry study was based upon thematic analysis using an inductive approach. Thematic analysis is standard in qualitative inquiry studies, for it helps in identifying and interpreting themes from data provided by participants (Gray, 2016; Merriam & Tisdell, 2016)]. The inductive approach focused on a bottom-up approach that reviewed the data to see what patterns can be used to confirm the constructs of the applied framework, gaps in practice, and answers to the project question.

The inductive analysis answered these questions, which fell into the four constructs of the proposed applied framework, the Framework for Project Portfolio Management Improvements. The constructs for this applied framework included project management standards, competencies, tools and techniques, and skills.

The data collection requirements were solid to support answering the project questions. The project questions focused on exploring the perspectives of participants. The requirements to support this were broken down by the who, what, when, and how. The *who* requirement required identifying and using participants who can answer the project questions. The *what* requirement involved developing an interview guide that guided the interviewer to get the participants to share their perspectives. The *how* requirement was the actual interview, a semistructured interview that allowed probing questions to the done. The *when* requirement focused on when the interview will be done.

2.6.1. Data Sources

The qualitative inquiry project technique required that interviews of participants be conducted to explore the project questions being addressed. The interviews served as a basis to establish a preliminary set of data analyzed to report findings. An interview guide was developed to guide the interview to ensure that the necessary data was collected. Tests of the interview guides were performed before any final interviews were conducted.

2.6.1.1. Preliminary Sources of Data Expected. There were two preliminary data sources used for this project. The first data sources were practitioner and scholarly articles used in Sections 1 and 2 of this project. These articles were important to develop the general/specific business problems, gaps in practice, and project questions (Langley, 2016; Sang et al., 2018; Weigelt, 2010). Once this was done, additional articles were used to develop the proposed applied framework and literature review (Gunduz & Almuajebh, 2020; Hartman & Ashrafi, 2002; Jenko & Roblek, 2016). Additional articles were used to support the recruitment of participants and other aspects of this project (Gray, 2016; Merriam & Tisdell, 2016; Schindler, 2019). The foundation of this capstone project would not exist without these articles. The second set of data sources came via semistructured virtual interviews via Zoom. Zoom allowed me to collect data from participants safely and efficiently. First, due to the current state of COVID-19, neither the participants nor I needed to be in the room to conduct the interview. Second, the use of Zoom captured the commentary of the interview so that I could focus on the tasks of answering questions. Finally, Zoom provided a record of the interview that the participants could review to ensure the accuracy of their comments.

An interview guide (see Appendix E) was created to list the questions asked during the interview. A series of questions was posed to the participants to solicit their perspective of project portfolio management practices used to deliver financial system megaprojects per the triple constraint. The questions supported the applied framework exploring participants' perspectives related to successful project portfolio management practices (Merriam & Tisdell, 2016). The data collected during the interview was analyzed and presented per the data collection and presentation plan presented in Section 2.6.

2.6.1.2. Instrumentation and Data Collection Tools. The essential tools to collect data were the interview guide and an audio conference call tool (Zoom). The interview guide provided the questions asked of each participant. The conference call tool (Zoom) recorded and transcribed each interview.

2.6.1.2.1. Interview Guide. The interview guide focused on the core project questions. The questions supported the need for collecting participants' perspectives related to their field of expertise (Gray, 2016; Merriam & Tisdell, 2016). The first three questions will focus on the demographics of the participants. These questions will allow the researcher to analyze the data collected by years of experience, professional/academic background, and the number of projects led as a manager. A series of four pinpointed questions solicited from the participants their perspectives regarding successful project portfolio management practices used to deliver financial system megaprojects. The pinpointed questions were supported by probing questions that may reveal additional details regarding the practices. In the end, the participant was asked if they had any additional information to share and final reminders regarding the interview. The interview guide is provided in Appendix E.

2.6.1.2.2. Audio Conference Call Tool. The interview was conducted via Zoom online audio conference call tool to capture the interviews. Zoom is a leader in cloud-based audio/video conference calls. Zoom is used in many Fortune 500 firms and within the federal government. The platform is very secure as the Biden administration uses it for some of its cabinet meetings. Also, Capella University provides free use of Zoom for all its learners. The IRB approved my use of Zoom as long as an audio recording was done.

Zoom allows the interviewer to record the interview and automatically transcribe the content or transfer the recording to another tool for transcribing. The transcribed content can be exported to a file loaded into other tools, such as Nvivo or Microsoft Excel, to code the data. These tools allowed me to analyze the data to present findings.

2.6.1.2.3. Expert Review. Expert reviews were necessary for interview guides to ensure that the interviews will be credible (Capella University, 2020). In order to perform an expert review of an interview guide, feedback from experts was needed. The use of experts to review the interview guide will bring credibility to the research, plus much more. Expert reviewers from Capella University's School of Business, Technology, and Health Care Administration were used. Experts ensured a direct alignment between the interview, interview questions, project questions, and research problems to ensure that they were unambiguous. The interview was semi-structured.

The expert review process began with the selection of two expert reviewers. Once the reviewers were selected, they were sent the Expert Panel Participant Form (see Appendix L) to review and complete. The reviewers were provided no more than two weeks to complete the form. Based on the expert review feedback, consultation with my mentor determined what changes would be made. The expert review was completed on August 16, 2021, and August 19, 2021. The feedback from their reviews was discussed with my mentor, and a few changes were required.

2.6.1.2.4. Test Run. Conducting a test run allowed me to test the interview questions before conducting the study (Capella University, 2020; Gray, 2016). There were several benefits and risks to performing a test run. The first benefit was to practice interviewing to ensure plenty of time was allotted to the interview. It is essential to ensure that the respondents have sufficient time to answer the question. The second benefit was to collect the right amount of data per question. The questions cannot be so narrow that insufficient data is being collected. The first risk with a field test is that it takes time to coordinate and complete the interview. A second risk with the test run is getting people to participate. A final risk with a test run is the desire for perfection. It may be necessary to tweak the questions and conduct another test run. In general, a test run takes time and effort. It is important to maximize the benefits of performing a test run while reducing the risks.

The test run was conducted with one participant. The participant was a private sector project manager responsible for managing IT projects with the federal government. The participant was prescreened to ensure that they had the background for answering the questions.

The test run will be conducted no differently than the actual data collection process. The protocol would ask all of the questions listed in the interview guide (see Appendix L). The interview would be recorded. Once the test was done, the recording and the interview transcript were sent to the mentor for review. The test run was evaluated by completing the test run form by my mentor and I to evaluate the interview (see Appendix F). If the mentor approves the field test, I can proceed with actual interviews; otherwise, the process is repeated until a successful test run has been done.

2.6.2. Data Collection

The first phase of data collection involved preparing for the interview. No interviews were performed until IRB approval had been obtained and a successful test run of the data collection protocol. Section 2.5 described the recruitment process that was followed to obtain the seven to 10 participants. The date and time for the interview were during the participants' non-working hours. Once an agreement had been made, the interview was scheduled in Zoom using a calendar invite via Google Calendar. The calendar invitation, which contained the link to the interview, was sent to each participant. Each interview contained a passcode for security purposes. Zoom generated the passcode that the participant and I know. The interview was set to be recorded to the cloud until they were removed for safekeeping. Recording the interviews to the cloud will reduce space and technical problems if recorded on a PC. Zoom has many protocols in place to ensure the security of these recordings (Zoom, n.d.)

The second phase of data collection was the interview. The participants and I needed to understand the expectations of the interview. Before the Zoom interview was conducted, both the interviewer and the participants tested their internet / mobile connection with Zoom to reduce the possibility of technical problems. The Zoom interview session was expected to last 60 minutes and may last longer or shorter based on the conversations. When it was time to begin the interview, the participant and I clicked on the link provided in the calendar invitation. Only the participant and interviewer were present online in Zoom during the interview. The interview was recorded via Zoom; however, if the participant wanted to say something that should not be recorded, the recording was paused. The interview proceeded using questions from the interview guide. Finally, after the interview was conducted, the participants were offered a recording transcript to confirm what was said. I reviewed the recording to ensure that the audio quality was clear and that the transcript was readable. Participants who wanted an audio recording were given 5 business days to review the transcript. A non-response from the participants will mean that the participants have no feedback to the transcript, and the transcript was used as-is for analysis. None of the participants requested a copy of the recording or transcript.

2.6.3. Data Analysis Plan and Presentation

The proposed data analysis plan and presentation for this qualitative inquiry study were to address the proposed project questions. The data analysis plan and presentation were broken down into two segments to achieve this goal. The first segment focused on how the data will be analyzed. Since the preliminary data source came via interviews, the data was transcribed before being analyzed. The second segment of the data analysis and presentation involved describing how the data will be presented. Tables were the primary method of presenting the data. The use of tables served as the foundation for developing the narrative finding. The findings may be valuable to practitioners interested in the perspectives of private sector project managers who deliver financial systems projects for the federal government.

2.6.3.1. Data Analysis Plan. The first step of the data analysis plan involved becoming familiarized with the data. Once the data was transcribed, I performed several transcript reviews to make sure I understood what was said during the interview. I may need to make some edits based upon the quality of the transcription but will note any edits via tracked changes. Also, I recorded some initial notes during the review as comments. These comments will be noted as ‘author notes’ to ensure that they are separate from other notes.

The second step of the data analysis plan involved the generation of initial codes. As I browsed through the transcript, I highlighted portions of the transcript that were of value/importance to the study and assigned a code to them. The highlighting was done via the Comments features in MS Word and assigning an appropriate code to the text. The challenge was deciding what phrase would represent the text to consolidate codes.

The third step of the data analysis plan involved using Goodall’s Verbal Exchange Coding method to assign a descriptive to those initial codes that are either practice-based or cultural-based performed (Saldaña, 2016). The method involves categorizing codes as routine, surprises; risk-taking; crises;

or rites of passage. Codes categorized as routine would be project management practices one would expect to experience/perform in the project management profession. In some cases, codes that are generally not experienced as practices in the project management profession will be classified as surprises. The third and fourth categorizations of codes would be classified as risk-taking or crisis management practices experienced/performed in the project management profession. The fifth categorization would be classifying codes as practices that could be considered as rites of passage where they could advance the project management profession.

The final step of the data analysis plan involved an initial development of themes based upon the initial codes. During this step, similar or related codes were grouped together to form an initial theme. As I go through this process, I may develop major and minor themes. The formation of major and minor themes may help present the data as part of my data presentation plan. Themes were formed via the constant comparison data analysis method to determine themes applicable to the project question (successful project portfolio management practices regarding the delivery of financial system megaprojects) and the proposed P2MI applied framework (Leech & Onwuegbuzie, 2011; Merriam & Tisdell, 2016).

2.6.3.2. Data Analysis Presentation. The analysis of data involving a qualitative inquiry study required a presentation that can present outcomes, findings, and recommendations. Since the preliminary data were recordings from interviews, the data was coded in a format that allowed the ability to generate outcomes, findings, and recommendations linked to the project questions. Determining the format for the outcomes, findings, recommendations was a challenge because I did not know what could be presented until I had conducted the proper analysis.

Bazeley and Jackson (2013) provided a three-phase approach for presenting qualitative data: describe, compare, and relate. The description phase involved looking at the significant themes that arise from the data and seeing what similarities and differences were presented by the participants. During the description phase, it will be essential to see what themes are more significant than others. The compare phase will involve presenting the data based on some of the established demographics that are presented in the interview guide. In this case, a comparison can be made based upon years of experience, the number of projects delivered, academic and professional background. The relate phase involves looking at the themes and seeing what additional questions could be posed. An example of this would be how can the same theme be present in successful deliveries of financial system projects. The goal would be to link the themes to the constructs of the P2MI applied framework.

Tables served as the primary measure for presenting summary data from the analysis that has been completed. Tables were in a particular format that supported the narrative analysis required. In general, the narrative analysis and the corresponding tables were linked together so that an accurate picture was painted for the readers of the study. The challenge here was that generating too many tables may distort the presentation of outcomes, findings, and recommendations.

2.6.4. Trustworthiness

The use of the qualitative inquiry project technique for exploring the perspectives of private sector project managers requires that the information provided is trustworthy, dependable, credible, confirmable, and transferable. Trustworthiness occurs when the information is sensed as honest and truthful (Gray, 2016; Smith, 2017). Dependability occurs when the findings from this study will be seen in future studies (Gray, 2016; Smith, 2017). Credibility exists when the author and readers of the study have confidence in the results and the process (Gray, 2016; Smith, 2017). The findings must be confirmed by the author, the participants, and others who review the study.

Trustworthiness occurs when others have confidence in how a study was completed (Connelly, 2016; Polit & Beck, 2014). The confidence level will determine how well the findings will be accepted. Carcary (2009) recommended having an audit trail to support your findings. One way to accomplish both would be to record all of your interviews and a detailed, repeatable process that interviews contents into findings. As participants explain their perspectives of project portfolio management practices, they must be accurate.

Dependability will be seen when the data collected/analyzed stands over time (Connelly, 2016; Polit & Beck, 2014). Like trustworthiness, the use of audit trails will improve dependability. The best audit trail occurs when proper care and handling of the data from the studies. Capella's IRB provides guidelines for proper care and handling of the data.

Credibility occurs when others have the highest confidence in the study's findings beyond any other factor (Connelly, 2016; Polit & Beck, 2014). One way to ensure credibility can be done via the selection of participants for the study. Baxter and Eyles (1997) recommend the use of purposeful sampling as a way to ensure credibility among the participants. Purposeful sampling will be used in this study to select participants. Another method for ensuring credibility is completing expert reviews and a test run. The completion of these activities will provide the readers of this report with confidence in the perspectives of the project managers regarding the delivery of financial systems megaprojects. Credibility is also improved through transcription verification.

Confirmability is seen when the study is objective; thus, future studies can duplicate the finding. Transparency has to exist with the data in order to enforce confirmability. Baxter and Eyles (1997) recommended using audit trails to support confirmability. This will allow readers to link the findings to the literature and the project questions. A detailed interview guide provided the linkage.

Transferability occurs when the study's findings can be applied to other studies different from the current study (Connelly, 2016; Polit & Beck, 2014). Carcary (2009) noted that sufficient details regarding the project are provided to establish transferability. The details include but not limited to project questions, sample size, data collection techniques, and data analysis plans are documented. With the exploration of project portfolio management practices regarding financial system projects, transferability will occur if the practices are applied to other types of projects, including but not limited to IT and construction projects.

The combination of trustworthiness, dependability, credibility, confirmability, and transferability are essential to presenting findings that will be acceptable to the audience of a project. The challenge to making the results acceptable to a reader will be dependent on the data collection instrument, the analysis of the data, and the generation of the results. The instruments will be designed to ensure that the participants' perspectives are adequately collected. The data analysis has to be done to facilitate the generation of findings that can be produced.

2.6.5. Ethical Considerations

The exploration of perspectives of private sector project managers will pose ethical challenges that must be managed. Challenges in privacy, confidentiality, and data security may risk the validity of the project. The challenge will be present because of the nature of the project technique used. The qualitative inquiry technique requires participants to express their perspectives regarding situations that they have experienced. All participants in this study will be required to complete the informed consent form as provided in Appendix G. Informed consent provides potential participants with information about the project to decide whether to participate or not (Crow et al., 2006; Gray, 2016). When participants complete the informed consent form, they have agreed to participate in the interview and agree to the risks associated with the interview and the measures to protect their privacy and confidentiality. The informed consent form must be completed and returned via email. The informed consent forms will be stored on a secured flash drive for seven years.

The privacy and confidentiality of the participants; the organizations that they work for; and the projects discussed must be protected. The use of the qualitative inquiry will allow participants to discuss their perspectives regarding the delivery of financial system projects to the federal government. The use of non-public government information is prohibited for this project (Federal Acquisition Regulations, n.d.; Justice Department, n.d.-a; U.S. Office of Government Ethics, 2017). Any disclosure may pose professional and personal harm to them, so measures need to be taken to protect the participants (Department of Health and Human Services, n.d.). In order to protect the identity of the participants, crosswalks will be used to reference participants (see Appendix I), organizations (see Appendix J), and projects (Appendix K) by codes in the results of the capstone project. The crosswalks will be stored in a password-protected file on a secured flash drive located in a fire-proof safe.

All data collected must be adequately secured. Capella requires that data be protected at least for seven years. Data from Zoom interviews will be stored on secured flash drives and removed from Zoom within 30 minutes of the interview's conclusion. All crosswalks' documents will be stored on secured flash drives. As noted above, all data will be stored on secured flash drives. The flash drives will be stored in a fire-proof safe. Once the 7-year period is up, the flash drives will be broken with a hammer, and the contents disposed to the Charles County Maryland landfill. These actions will ensure that no one can access the data.

The actions taken here will reduce the threat of privacy, confidentiality, and data security compromise. While no one method or set of methods is foolproof, the actions taken are a start.

Participants must feel comfortable about sharing their perspectives without worrying about what they have disclosed being compromised.

SECTION 3. RESULTS, DISCUSSION, AND IMPLICATIONS

3.1. Introduction

The purpose of this qualitative inquiry project is to explore the perspectives of private sector project managers in the Mid-Atlantic region of the United States regarding the successful strategies used to deliver financial systems to executive branch federal government agencies on time, within budget, and within scope. The completed study supported the proposed applied framework where the gap in practice feeds the specific business problem. The specific business problem is that private sector project managers have been unable to deliver federal government financial system megaprojects on time, within budget, and within scope, which delays the expected benefits from these megaprojects (Burmistrov et al., 2018; Hines & Carrington, n.d.; Weigelt, 2010). The gap in practice is the lack of using proven project portfolio management practices used to deliver financial systems megaprojects on time, within budget, and within scope (General Accountability Office, 2018; Hines & Carrington, n.d.; Project Management Institute, 2018).

The findings of this project were discussed in several sections leading up to this section. First, a review of the results from the data collected was presented. Next, an analysis of the data was performed, and the results were presented, including their contribution to the literature, knowledge base, and theory related to project management. The discussion concluded with the application of the results to the profession.

3.2. Data Collection Results

Participants were recruited using the purposeful sampling method that relied on candidates who have knowledge in delivering financial system megaprojects to the federal government. The population base for recruitment was based upon my professional relationship with various CFOs and CIOs within the federal government. The recruitment process used the recruitment message that was presented in Section 2.5. The recruitment resulted in an initial population of 15 candidates, of which nine candidates agreed to participate in interviews.

Interviews were conducted with the participants between November 6, 2021, and December 16, 2021. The date and time for each interview were agreed in advance by the participants. By spreading the interviews over this period of time allowed me to spend time reviewing and evaluating the data.

Each interview began with a conversation with the participant thanking them for their participation and walking them through the interview process. At that point, the interview recording began with me asking each participant if I had permission to record the interview, followed by an icebreaker opening statement. After the opening, four demographical and informational questions were asked. These questions provided demographic and experience information from each participant. Once this was done, four interview questions were asked related to the key concepts from the applied

framework. Follow-up questions were asked when necessary. The interview concluded with a question to see if the participant wanted to add anything else and a closing statement. The questions asked are the same as noted in the interview guide from Appendix E.

There were no issues encountered during the interviews. In order to protect the identity of the participants, only an audio recording of the interview was performed. Once the interview was concluded, the Zoom audio recording was downloaded to my computer for evaluation. The quality of the audio recording and transcription of the interview was clear.

Each interview was transcribed separately by Otter AI. After the audio files were transcribed, I updated each transcript to correctly identify each speaker; assigned each participant and any organization/project references by their own code as referenced by the codes in Appendix I, J, and K to maintain privacy. The transcription performed by Otter AI took anywhere from 15 to 20 minutes, depending on the size of the audio recording. After this, Otter AI created a text-based version of the transcription, which was imported in Microsoft Excel to review and support the generation of tables for reporting. Each transcript was reviewed to ensure that the transcription was done correctly. The Excel document was saved and was used to serve as a source for coding purposes.

3.2.1. Interview Results

The interviews were scheduled for a 60-minute time limit. None of the interviews exceeded the time limit. The interview varied from 25 minutes to 58 minutes, with an average interview length of 37 minutes. Every question from the interview guide was asked during the interview, and the participants provided detailed responses to the questions asked. Table 2 summarizes the interviews that were conducted and when they were transcribed.

Table 2. *Interview Summary*

Participant Code	Date of Interview	Length of Interview	Date of Otter AI Transcription
PM#1	November 6, 2021	25	November 8, 2021
PM#2	November 20, 2021	42	November 25, 2021
PM#3	November 20, 2021	25	November 26, 2021
PM#4	November 20, 2021	43	November 27 2021
PM#5	December 1, 2021	39	December 3, 2021
PM#6	December 1, 2021	36	December 5, 2021
PM#7	December 4, 2021	42	December 8, 2021
PM#8	December 4, 2021	20	December 9, 2021
PM#9	December 16, 2021	58	December 17, 2021

Note. The table represents the dates that interviews and transcriptions were done. Table developed J. Pullen, 2022.

3.2.1.1. Demographics Results. The demographics of the participants were pretty divided. The sample includes participants from six organizations. Forty-four percent of the participants were either female or minorities. These numbers are higher than what is reported by Zippia (2021) that 30% of project managers were either minorities or were female. Table 3 provides a demographical summary of the participants.

Table 3. Demographical Summary

Participant Code	Race	Sex	Organization Code
PM#1	Black	F	Org#1
PM#2	White	M	Org#2
PM#3	White	M	Org#2
PM#4	White	M	Org#3
PM#5	White	M	Org#4
PM#6	White	F	Org#5
PM#7	Black	F	Org#6
PM#8	Black	F	Org#4
PM#9	White	M	Org#5

Note. The table represents a demographical recap of the interview participants. Table developed J. Pullen, 2022.

3.2.1.2. Experience Results. The experience of the participants varied but experienced. Thirty-three percent of the sample held a master’s degree. Fifty-six percent of the sample had more than 20 years of experience. The sample's average number of years of experience was 23 years, which is higher than the 2021 study from PMI (Project Management Institute, 2021b). Seventy-eight percent of the sample hold an active project management certification from PMI. Forty-four percent of the sample led twenty or more financial systems projects during their professional career. Table 4 provides a summary of the participants’ experiences.

Table 4. Experience Summary

Participant Code	Degree Code	Years of Experience	PM Certification	Number of Projects Led
PM#1	BS	18	Y	35
PM#2	BS	18	N	5
PM#3	BS	40	Y	50

Participant Code	Degree Code	Years of Experience	PM Certification	Number of Projects Led
PM#4	MBA	26	Y	20
PM#5	MS	30	Y	20
PM#6	BA	20	Y	5
PM#7	BS	22	Y	5
PM#8	MA	13	N	5
PM#9	MS	18	Y	16

Note. The table represents a summary of the participant’s PM experience. Table developed J. Pullen, 2022.

3.3. Data Analysis

The purpose of this qualitative inquiry project was to explore the perspectives of private sector project managers in the Mid-Atlantic region of the United States regarding the successful strategies used to deliver financial systems to executive branch agencies federal government agencies on time, within budget, and within scope. The specific business problem is that private sector project managers have been unable to deliver federal government financial system megaprojects on time, within budget, and within scope, which delays the expected benefits from these megaprojects (Burmistrov et al., 2018; Hines & Carrington, n.d.; Weigelt, 2010). The need for effective project portfolio management revealed a more significant problem that program/project managers were not using proper project portfolio management techniques in managing their megaprojects (Project Management Institute, 2017).

The approach to analyzing the data from the interviews involved a four-step approach. The first step of the data analysis plan involves becoming familiarized with the data through reviews and editing of each transcript. The second step of the data analysis plan involved the generation of initial codes by highlighting portions of the transcript that are of value/importance to the study and assigning a code to them. The third step involved using Goodall’s Verbal Exchange Coding method to assign a descriptive perspective (routine, surprises; risk-taking; crises; or rites of passage) to each code (Saldaña, 2016). The final step involved the development of themes based upon related codes. Themes will be formed via the constant comparison data analysis method to determine themes applicable to the project question (successful project portfolio management practices regarding the delivery of financial system megaprojects) and the proposed P2MI applied framework (Leech & Onwuegbuzie, 2011; Merriam & Tisdell, 2016).

3.3.1. Familiarization with the Data

The first step of familiarizing myself with the data was a review of the actual audio recording. After each interview, the recordings were downloaded from Zoom and saved on my laptop. I reviewed each audio recording twice to ensure I had a clear understanding of the responses from the

participants. What I was listening for was to ensure that participants answered each question and make sure that the recording was clear. This review took roughly 1-3 hours per interview to complete. There were no issues with the recording. The recordings were removed from my computer and stored on a secured flash drive. The flash drive is stored in my home office's SentrySafe HD4100 Fireproof Safe.

The second step involved transcribing the audio recording. Each interview was transcribed separately by Otter AI. After the audio files were transcribed, I updated each transcript to correctly identify each speaker; assigned each participant and any organization/project references by their own code as referenced by the codes in Appendices I, J, and K to maintain privacy. Otter AI took anywhere to 15-20 minutes to perform the transcription. At the conclusion of this, Otter AI created a text-based version of the transcription, which was imported in Microsoft Excel for review and to support the generation of tables for reporting. Each transcript was reviewed to ensure that the transcription was done correctly. There were no significant errors with the transcription. There was no removal of data per the transcription. Otter AI transcribed a phrase incorrectly in a few cases, such as PMBOK (the PMI Project Management Body of Knowledge). There were no cases where the candidates had their names, their organization's name, or any other project-specific names that were not publicly known. The Excel document was saved and was used to serve as a source for coding purposes. The Excel document will be stored on the flash drive and moved to the Sentry Safe once I am done with the capstone project.

3.3.2. Generation of Initial Codes

An inductive probing technique was used to generate an initial set of codes. Guest et al. (2013) recommended this approach to produce an increase in data provided by the respondents (Guest et al., 2013). The probing was done to generate codes that were in alignment with the P2MI applied framework that addressed the project question of this study.

3.3.2.1. Coding for Project Portfolio Management Standards. The first set of coding focuses on recommendations for project portfolio management (PPM) standards to support the delivery of financial system projects on time, on budget, and within scope. The project management profession lives by many standards, so it was interesting to evaluate practitioners' feedback regarding standards. A total of 42 codes were generated from the analysis of the respondent's comments to Interview Question #1. The most frequently recommended standard from the respondents was establishing a set of robust policies and procedures. Deng et al. (2021) and El Khatib et al. (2020) recommended using policies and procedures to reduce project risk. Table 5 provides a listing of the project portfolio management (PPM) standards code assigned, a description of each code, and the number of participants who responded to each code.

Table 5. *Coding of PPM Standards per Interview Question 1*

PPM Standards Coding	Description of PPM Standards Coding	Number of Respondents
Accurate delivery	Setting a standard for accurate delivery of the project	1

PPM Standards Coding	Description of PPM Standards Coding	Number of Respondents
Agile	Relying on agile project management as a standard	2
Change management	Incorporating change management to project portfolio management (PPM) practices	1
Client Partnership Management Framework	Contractor processes for managing and engaging their clients as part of the PPM practices	1
CMMI	Adoption of the Capability Maturity Model Integration as a standard	2
Communications	Ensuring proper communications (e.g., oral, written) occurs during the project	1
Comprehensive plans	Ensuring that as part of any project, we have detailed, comprehensive plans	1
Consistency	Ensuring consistency across the project	1
Contractor standards	Relying on private sector contractors to have standards in place to support PPM	2
Decide on what is important	The project team needs to establish standards to determine what is important	3
Deliverables	Establishing processes to manage deliverables related to the project	1
Earned value management	Adoption of Earned Value Management to manage financial system megaprojects	1
Enterprise Project Portfolio Management	Adoption of Enterprise Project Portfolio Management (EPPM) practices for managing financial system megaprojects	2
Escalation path	The project team needs to establish standards for escalating issues	1
Evidence-based decision making	Updating the decision-making process to rely more on evidence	1
Functional team	Establishing a functional (non-technical) team to support the financial system megaproject	1

PPM Standards Coding	Description of PPM Standards Coding	Number of Respondents
Government standards	Relying on government standards to support PPM	1
Internal tools and templates	Incorporating the use of internal tools and templates to aid in the creation of deliverables	1
Leading indicators	Relying on the use of key indicators to support decision making	1
Lessons learn	Using feedback from lessons learned to incorporate improvements for delivering financial system megaprojects	1
Managing to an end-date (ribbon cutting)	Move away from managing the project from a delivery date	1
Measuring success	Establishing criteria success factors for measuring success	3
Monitoring issues	Establishing standards in place for monitoring issues	1
Performance metrics	Incorporating performance metrics into managing financial systems megaprojects	1
Personal experiences	Relying on personal experience	1
PMBOK	Incorporating Project Management Body of Knowledge (PMBOK) standards into managing financial systems megaprojects	1
Policies and procedures	Establishing a set of robust policies and procedures in place for managing financial systems megaprojects	5
Project plan	Ensuring that a detailed project plan is developed	3
Quality measures	Establishing quality measures into the process of managing financial system megaprojects	1
Requirements management	Establishing requirements management into the process of managing financial systems megaprojects	1
Response flexibility	Maintaining the ability to respond timely	1

PPM Standards Coding	Description of PPM Standards Coding	Number of Respondents
Responsibility matrix	Developing a matrix that identifies roles and responsibilities	1
Review and approval process	Establishing review and approval process for managing financial systems megaprojects	1
Risk management	Establishing risk review and approval process for managing financial systems megaprojects	1
Scope creep	Having a process to control scope creep in the management of financial system megaprojects	1
Scope determines team Size	Understanding how scope drives the size of a team	1
Stakeholder management	Ensuring that there is a plan to identify and manage stakeholders	2
Staying on budget	Ensuring that there are standards in place to manage the budget to ensure that the financial system will be delivered within budget	1
Staying on schedule	Ensuring that there are standards in place to manage the schedule to ensure that the financial system will be delivered on-time	1
Technical team	Establishing a technical (non-functional) team to support the financial system megaproject	1
Training	Ensuring that proper training is included as part of any financial system megaprojects	2
Waterfall methodology	Using the standard waterfall methodology for managing financial system megaprojects	2

Note. PPM Standards codes were identified from transcribed data collected from interviews. Table developed J. Pullen, 2022.

3.3.2.2. Coding for Project Portfolio Management Roles. The second set of coding focuses on recommendations for project portfolio management (PPM) roles to support the delivery of financial system projects on time, on budget, and within scope. Many roles are needed to

successfully deliver projects on time, on schedule, and within scope. The practitioners who were interviewed discussed a variety of roles. A total of 40 codes were generated from the respondent’s comments. As expected, the project manager role was the most frequently recommended, while the testing lead role was the next most recommended. Wilkin and Chenhall (2020) emphasized the importance of project management roles concerning the governance of information technology activities. Kashiwagi (2018) noted how testing could reduce organizational resistance. Table 6 provides a listing of the project portfolio management (PPM) roles code assigned, a description of each code, and the number of participants who provided responses for each code.

Table 6. *Coding of PPM Roles per Interview Question 2*

PPM Roles Coding	Description of PPM Roles Coding	Number of Respondents
Analysts	Analysts are used to provide analysis support to the project team that is responsible for delivering financial system projects	1
CAM Manager	Control Account Manager (CAM) tracks the budget on behalf of the project/program manager	1
Central person to press the button	The person, either on the government or contract side, who is considered the point person for all issues	1
Client Relationship Management	Client Relationship Management (CRM) is a process in which the contractor uses to manage his government client	1
Cloud Lead	Cloud Lead is the lead technical person involving any cloud-based project	1
Communication Staff	Communications staff supports the projects by handling all internal and external communications on behalf of the project team	1
Configuration Lead	Configuration Lead is the lead technical person who controls the configuration of the financial system	4
Configuration Staff	The Configuration Staff are responsible for configuring the financial system	1
Conversion Lead	The Conversion Lead is the lead technical person who is responsible for all data conversion activities	2
Coordinator	The Coordinator works with the Project/Program Manager to coordinate meetings and other activities	1

PPM Roles Coding	Description of PPM Roles Coding	Number of Respondents
Data Architect	The Data Architect is the lead technical resource who is responsible for developing the data architecture of the proposed financial system	1
Data Scientists	Data Scientists are technical resources who analyze data patterns in existing systems that will be helpful in the development of a new financial system	1
Delivery Manager	The Delivery Manager is an oversight role that provides support to the Project/Program Manager by engaging corporate resources in support of the financial system project	1
Deputy Program Manager	The Deputy Program Manager is the right-hand person who supports the Program Manager and will serve as the de facto Program Manager when the Program Manager is not available	2
Designers	Designers are technical resources who work with technical and functional staff in designing the proposed financial system	1
Development Lead	The Development Lead is the lead technical person responsible for any software development changes needed to support the financial system project	3
Development Staff	The Development Staff are technical resources who work under the guidance of the Development Lead in addressing software changes to support the financial system project	1
Engagement Manager	The Engagement Manager is an oversight role that provides support to the Project/Program Manager by engaging corporate resources in support of the financial system project	1
Executive Management	Executive Management are leaders from the Government and Contract teams who provide executive support to the financial systems project team	4
Financial Manager Lead		1

PPM Roles Coding	Description of PPM Roles Coding	Number of Respondents
	The Financials Manager Lead is responsible for tracking and managing all of the financials related to the financial system project	
Functional Lead	The Functional Lead is the lead functional resource who oversees all of functional (non-technical) activities related to the financial systems project	3
Functional Staff	The Functional Staff are resources who perform functional activities (e.g., training) related to the financial systems project	1
Implementation Lead	The Implementation Lead is a resource who is responsible for the implementation of a financial systems project	1
Leadership team	The Leadership team are leaders from the Government and Contract teams who provide executive support to the financial systems project team	1
Program/Project Management Office	The Program/Project Management Office (PMO) is a group of resources that provide program/project management oversight.	1
Product Owner	The Product Owner is the person who oversees the functionality changes in agile projects related to financial systems project	1
Program Manager	The Program Manager is the lead resource who oversees the program-related activities regarding the financial systems project	1
Project Manager	The Project Manager is the lead resource who oversees the project-related activities regarding the financial systems project	8
Project Scheduler	The Project Scheduler works with the Program/Project Manager in developing the project schedule	3
Quality Assurance Staff	The Quality Assurance Staff are resources that review project deliverables and artifacts to ensure that they meet the	1

PPM Roles Coding	Description of PPM Roles Coding	Number of Respondents
	quality standards required by the Government and Contractor	
Scrum Master	The Scrum Master is the de facto project manager for agile-related activities involving financial system projects	1
Scrum Team	The Scrum Team are project resources who are using agile project management techniques in financial system projects	1
Sprint Teams	The Sprint Team are project resources who are assigned to a sprint as part of their financial system project. A sprint involves a set of focused activities to be completed over a specific period of time.	1
System Administrators	System Administrators are resources who oversee the administration (e.g., account management) functions in a financial system project.	1
System Architecture	System Architecture resources are responsible for developing the information system architecture needed to support financial systems	1
Technical Lead	Technical leads are resources who are responsible for managing the technical aspects (e.g., development, testing) of a financial system project	4
Testers	Testers are technical and functional resources who will validate the various functions and features of a financial system	1
Testing Lead	The testing lead is responsible for leading a set of testers who will validate the various functions and features of a financial system	5
Training Team	The Training Team are functional resources responsible for training end-users in their use of a financial system. They are also responsible for developing the materials used in training classes.	3
Training Lead	The Training Lead is responsible for leading the training team to develop	4

PPM Roles Coding	Description of PPM Roles Coding	Number of Respondents
	training materials and deliver training end-users using a financial system.	

Note. PPM Roles codes were identified from transcribed data collected from interviews. Table developed J. Pullen, 2022.

3.3.2.3. Coding for Project Portfolio Management Tools and Technologies. The third set of coding focused on recommendations for portfolio management (PPM) tools and technologies needed project roles to support the delivery of financial system projects on time, on budget, and within scope. The interviewed practitioners identified a variety of tools and technologies besides the Microsoft Project. A total of 31 codes were generated from the respondent’s comments. The profession relies on a core set of tools, namely Microsoft Project and Primavera (Pellerin & Perrier, 2019). Table 7 provides a listing of the project portfolio management (PPM) tools/technologies assigned, a description of each code, and the number of participants who responded to each code.

Table 7. *Coding of PPM Tools/Technologies per Interview Question 3*

PPM Tools and Technologies Coding	Description of PPM Tools and Technologies Coding	Number of Respondents
Action item list	Action Item Lists are used to track financial system project issues.	2
Adobe Captivate	Adobe Captivate is a tool to develop computer-based training materials used in financial system projects.	1
Checklists	Checklists are used to track and manage financial system project issues.	1
Confluence	Confluence is a JIRA tool used by teams to collaborate and share documents regarding a financial system project.	2
Deliverables	Deliverables are formal project artifacts generated by the financial system project team and reviewed/approved by the customer.	1
Design documents	Design documents are deliverables focused on the design of the proposed financial system.	1
Earned Value Management (EVM)	Earned Value Management (EVM) is a tool to measure financial system project performance in terms of costs and schedule.	1
JIRA	JIRA is a software tool that supports agile development for financial system projects.	4
Kanban	Kanban is a software tool that supports agile development for financial system projects.	1

PPM Tools and Technologies Coding	Description of PPM Tools and Technologies Coding	Number of Respondents
Lector Software	Lector Software is a software tool used to develop computer-based training materials for financial systems.	1
MS Office	MS Office is a suite of office automation tools that includes Access, Excel, Outlook, PowerPoint, and Word used to develop financial system project deliverables and artifacts.	9
MS Project	MS Project is the leading project management tool used to manage financial system projects.	8
MS SharePoint	MS SharePoint is a document management/collaboration tool used in financial system projects.	5
MS Visio	MS Visio is a software tool used to develop business processes and systems flows for financial system projects.	2
Mural	Mural is a software tool used to develop business processes in a graphical mode for financial systems.	1
Primavera	Primavera is a project management system used for complex financial system projects.	2
Project Server	Project Server is a server-based project management system used with MS Project for complex financial system projects.	1
Rational	Rational is an application suite that includes tools for managing the configuration of a financial system and testing a financial system	3
Remedy	Remedy is an application tool (e.g., incident tracking) used to track and manage issues in a financial system.	1
Requirements Traceability Matrix (RTM)	Requirements Traceability Matrix (RTM) is used to track and manage system requirements associated with a financial system.	1
Review boards	Review Boards are used to review and approve financial system requirements	1
Risk logs	Risk Logs are simplified versions of risk registers to track and manage financial system program/project risks	1
Risk register	Risk Register is a tool to track and manage financial system program/project risks	1

PPM Tools and Technologies Coding	Description of PPM Tools and Technologies Coding	Number of Respondents
ServiceNow	Service Now develops cloud-based products that focus on workflows to improve financial system operations.	1
Survey Monkey	Survey Monkey is a web-based tool used to develop and collect survey data.	1
Tableau	Tableau is a data analysis software product used by the project team.	1
Team calendars	Team calendars are used to track critical dates associated with team (e.g., training team, functional team, technical team) activities.	2
Tool awareness	Tool awareness is vital in program/project management, for the more familiar the team is with tools being used in a project, the more effective they will be.	1
Training logs	Training logs are used to track comments, issues, decisions, etc., that occurred during a training class.	1
Training materials	Training materials are developed to train users in their use (e.g., step-by-step process) of a financial system.	1
WebSphere	WebSphere is a cloud-based solution that supports the development of web-based applications.	1

Note. PPM Tools and Technologies codes were identified from transcribed interview data. Table developed J. Pullen, 2022.

3.3.2.4. Coding for Project Portfolio Management Skills and Competencies. The next set of coding focused on recommendations for skills in portfolio management (PPM) to support the delivery of financial system projects on time, on budget, and within scope. The practitioners who were interviewed identified a variety of preferred skills needed. A total of 36 codes were generated from the respondent’s comments. The respondents’ communication skills were the most frequently recommended skill set, followed by people management skills. Obwegeser et al. (2019) recommended various skills needed in ERP projects, including communications and people management. Table 8 provides a listing of the project portfolio management (PPM) skills/competencies code assigned, a description of each code, and the number of participants who provided responses for each code.

Table 8. Coding of PPM Skills/Competencies per Interview Question 4

PPM Skills and Competencies Coding	Description of PPM Skills and Competencies Coding	Number of Respondents
Ability to sift through things	The ability to sift through things occurs when the project team can sort through many things and remain focused.	1

PPM Skills and Competencies Coding	Description of PPM Skills and Competencies Coding	Number of Respondents
Active listening	Active listening occurs when the financial system project team is engaged in listening with their customer.	1
Adaptive to technology advances	The financial system project team and its customer needs to be open to technological advances that will benefit both sides.	1
Agile training	Agile training is required for any financial system project team that plans to use agile project management methodologies in the delivery of financial system projects.	1
Attention to detail	Attention to detail requires that the financial system project team focus on details to ensure the proper delivery of financial system projects.	3
Backup plan	Financial system project managers need to have alternative plans in case the primary plan has issues.	1
Certifications	Certifications, such as the Project Management Professional, are important to hold. Certifications show that the license holders have the requisite knowledge to plan, manage, and deliver projects.	1
Change management	The project team needs to be effective in handling change management as part of the financial system project.	3
Collaboration skills	Collaboration skills allow the project team and the customer to work together to ensure that they will deliver the financial system project on time, on budget, and within scope.	1
Committed to outcomes	Committed to outcomes require the financial system project team and its customer to be focused on the same outcomes, which eventually leads to the successful delivery of the financial system for the customer.	1
Communication skills	Communication skills include the project team's oral and written communication skills in their interactions with their customer.	9

PPM Skills and Competencies Coding	Description of PPM Skills and Competencies Coding	Number of Respondents
Conflict management skills	Conflict management skills are used to reduce conflict that arises in many projects. One example of a conflict management skill is using tradeoffs to move forward.	1
Corrective actions	Correction actions involve the project team taking actions to ensure the successful delivery of the financial system project.	1
Customer focus	The focus of the financial system project needs to be on the customer, the ultimate user of the system that will be delivered for them.	1
Do not expect perfection	The financial system project team and its customer needs to understand that issues will come up that were not foreseen, so do not expect perfection. be open to technological advances that will benefit both sides.	1
Do not expect things to be static	The successful delivery of a financial system project will evolve, so the financial system project team and its customer should not expect things to be static	1
Federal financial management	The financial management concepts for financial systems in the federal government are much different from the private sector; thus, the financial system project team needs to understand concepts related to federal financial management.	3
Federal government regulations	Operating in the public (federal government) sector is different from operating in the private sector; thus, the financial system project team needs to understand the regulations associated with the federal government.	1
Flexibility	Flexibility is important for the financial system project team has to be flexible for things will come up that must be addressed	1
Follow-through	Project members, including project leaders and customers, must follow through on what they say that they will do. Stay the course regarding their guiding principles.	1
Functional skills		1

PPM Skills and Competencies Coding	Description of PPM Skills and Competencies Coding	Number of Respondents
	Functional skills, such as communications, are important skills needed to successfully deliver financial system projects.	
I/T background	A background in information technology is needed since this involves an information system.	1
Managing risks	It is important to have a process for managing the risks related to financial systems megaprojects	1
Middle management involvement	In order to successfully deliver financial systems, it requires the involvement of all levels of management. Sometimes we are more focused on senior management involvement, but middle management involvement is just as important.	1
People management	People are the cornerstone of a project; thus, the ability to manage people is crucial	4
Resource allocation	Resource allocation involves allocating human and non-human resources appropriately so that the team can deliver the financial system project on time, on budget, and within budget.	1
Skills transferability	There will be times when the skills of one set of resources assigned to a set of tasks will need to be transferred to other tasks in the project to address the needs of the financial system project.	1
Stakeholder management	Stakeholder management occurs when the project team has identified key stakeholders and has a process for managing them.	1
Strategic thinkers	Strategic thinkers tend to focus on the medium and long-range goals of the financial system project.	1
System development life cycle	The tasks to complete the delivery of a financial system will follow a system development life cycle that begins with planning activities that conclude with deployment activities	1
Tactical thinkers	Tactical thinkers tend to focus on the short-range goals of the financial system project.	1

PPM Skills and Competencies Coding	Description of PPM Skills and Competencies Coding	Number of Respondents
Technical skills	Technical skills involve skills in such areas as information systems needed for a financial systems project.	1
Time management	Time management skills allow the financial system project team to handle multiple priorities simultaneously and be able to deliver them.	1
Trust	Trust occurs when the project team and/or customers trust each other to do their part to ensure project success.	1
Visionary	The successful delivery of financial systems requires the key leaders on the project team to be visionary	1
Work experience	The work experience that the financial system project team must include experience supporting the public sector, namely, the federal government so that they understand the unique needs of the federal government as it relates to financial systems.	1

Note. PPM Skills/Competencies codes were identified from transcribed interview data. Table developed J. Pullen, 2022.

3.3.2.5. Coding for Additional Project Portfolio Management Practices. The final set of coding focused on additional project portfolio management practices from the respondents to support the delivery of financial system projects on time, on budget, and within scope. A total of 29 codes were generated from the respondent’s comments. Constant communications, partnerships, and the use of program/project management methods were the highly recommended additional practices. Table 9 provides a listing of the additional project portfolio management (PPM) practices code assigned, a description of each code, and the number of participants who responded to each code.

Table 9. Coding of Additional PPM Practices per Interview Question 5

Additional PPM Practices Coding	Description of Additional PPM Practices Coding	Number of Respondents
Achieving milestones	In order to stay on schedule, within scope, and on budget, the financial systems project team must not only establish milestones (e.g., key deadlines) but meet them consistently.	1
Agile coaching		1

Additional PPM Practices Coding	Description of Additional PPM Practices Coding	Number of Respondents
Being true to your standards	The Agile coach is a key member of the agile project management team who guides the team on agile concepts and methodologies.	1
Change management usage	Project members, including project leaders and customers, must stay the course regarding their guiding principles.	1
Constant communications	The project team needs to be effective in handling change management as part of the financial system project.	3
Corrective actions	You must have ongoing and constant communication within the project team as well as outside of your project team with your customers and stakeholders	2
Do not make assumptions	The project team needs to have a way to take corrective actions to keep the financial system project on time, on budget, and within scope.	1
Expecting things to go well	Do not make assumptions regarding things you do not have knowledge of	1
Focus on success outcomes	Things will not go well during a financial system project, so do not expect everything to go well.	2
Get to the end-users	By focusing on successful outcomes, the team will focus on the key outcomes that the customer is focused on.	1
Hybrid approach of agile and waterfall	The project team needs to focus on the end-user, who is the ultimate user of the financial system.	1
Keep it under budget	A proposed method for delivering financial system projects involves an approach that includes agile and waterfall project management methodologies.	1
	One of the key aspects to the successful delivery of financial system projects is the ability to deliver the project under budget.	1

Additional PPM Practices Coding	Description of Additional PPM Practices Coding	Number of Respondents
Legal skillset	Due to the complexity of financial system projects, the project team needs to add resources that have some legal skillset to support legal-related matters.	1
Manage the activities	Managing project activities (tasks) is especially important to ensure that the project team can deliver the financial system project on time, on budget, and within budget.	1
Managing the team	Managing the team (project resources) is especially important to ensure that the project team can deliver the financial system project on time, on budget, and within budget.	1
Managing the schedule	Managing the project schedule (people, activities, and budget) is especially important to ensure that the project team can deliver the financial system project on time, on budget, and within budget.	1
Nothing perfect	The project team and its customers will strive for perfection but will realize that nothing is perfect, so there has to be a realization of this.	1
Paralysis via analysis	Do not spend too much time analyzing issues and problems, for it will paralyze the team	2
Partnership	The key ingredient to delivering financial system projects on time, on schedule, and within scope requires a partnership between the project team, its customers, and its stakeholders.	3
Policy skillset	Due to the complexity of financial system projects, the project team needs to add resources with some policy skillset to support financial management policy-related matters.	1
Problem-solving	Problem-solving skills are needed to address key issues and problems during the financial system project.	2

Additional PPM Practices Coding	Description of Additional PPM Practices Coding	Number of Respondents
Program and project management methods	Program and project management methods are the foundation that project teams rely on to deliver financial systems projects successfully.	3
Realignment	The project team needs to have a way to keep the financial system project on time, on budget, and within scope.	1
Relying on your processes	Relying on your processes requires the project team to rely on the proven project management practice it has experience in.	1
Resource management	Resource management (human and capital resources) is especially important to ensure that the project team can deliver the financial system project on time, on budget, and within budget.	2
Scope creep	Scope creep occurs when the project team and/or customer fail to identify those items that are needed to deliver financial system projects successfully	1
Stakeholder management	Stakeholder management occurs when the project team has identified key stakeholders and has a process for managing them.	2
Training	For a financial system project to be successful, the right set and amount of training have to be provided to the financial system users.	1
Trust	Trust occurs when the project team and/or customers trust each other to do their part to ensure project success.	2

Note. Additional PPM Practices codes were identified from transcribed interview data. Table developed J. Pullen, 2022.

3.3.3. Transition of Initial Codes to Goodall’s Verbal Exchange Coding

Once codes have been developed, the next step is to assign them a code from Goodall’s Verbal Exchange Coding scheme. Goodall’s Verbal Exchange Coding method relies on assigning perspectives as routine, surprises, risk-taking, crises, or rites of passage (Saldaña, 2016). Perspectives will be categorized as routine project management practices that one would expect to

experience/perform in the project management profession. In some cases, perspectives that are generally not experienced as practices in the project management profession will be classified as ‘surprises. Other categories that can be used include risk-taking, crisis management, or rites of passage.

3.3.3.1. Goodall Coding for Project Portfolio Management Standards. The first set of Goodall coding was assigned to the initial codes regarding recommended project portfolio management (PPM) standards. In Section 3.3.2, 42 recommended PPM standards were identified. These codes were translated into three Goodall codes (routine, rites of passage, and risk-taking). Thirty of the PPM standards were assigned the routine coding, which means these PPM standards are expected to be used routinely in the successful deployment of financial system megaprojects. Table 10 summarizes the Goodall coding related to the PPM standards identified during the first interview question.

Table 10. *Goodall Coding of PPM Standards per Interview Question 1*

Goodall Coding	Description of Coding	PPM Standards Coding
Risk-Taking (3)	Standards used to reduce risks associated with the successfully delivery of financial system megaprojects	Agile CMMI Enterprise Project Portfolio Management
Rites of Passage (9)	Standards that have evolved with the successfully delivery of financial system megaprojects	Client Partnership Management Framework Escalation path Evidence-based decision making Leading indicators PMBOK Requirements Management Response Flexibility Responsibility Matrix Risk management
Routine (30)	Standards that have been used routinely with the successfully delivery of financial system megaprojects	Accurate delivery Change Management Communications Comprehensive plans Consistency Contractor Standards Decide on what is important Deliverables
Routine (30)	Standards that have been used routinely with the successfully delivery of financial system megaprojects	Earned value management Functional team Government Standards Internal tools and templates Lessons learn Managing to an end-date (ribbon cutting)

Goodall Coding	Description of Coding	PPM Standards Coding
		Measuring Success Monitoring issues Performance metrics Personal Experiences Policies and Procedures Project plan Quality measures Review and approval process Scope creep Scope determines team size Stakeholder Management Staying on budget Staying on schedule Technical team Training Waterfall Methodology

Note. Goodall codes were identified from coded PPM Standards data. Table developed J. Pullen, 2022.

3.3.3.2. Goodall Coding for Project Portfolio Management Roles. The second set of Goodall coding was assigned to the initial codes regarding recommended project portfolio management (PPM) roles. In Section 3.3.2, 40 recommended PPM roles were identified. These codes were translated into three Goodall codes (routine, rites of passage, and risk-taking). Twenty-seven of the recommended PPM roles were assigned the routine coding, which means these PPM roles are expected to be used routinely in the successful deployment of financial system megaprojects. Table 11 summarizes the Goodall coding related to the PPM roles identified during the second interview question.

Table 11. *Goodall Coding of PPM Roles per Interview Question 2*

Goodall Coding	Description of Coding	PPM Roles Coding
Risk-Taking (8)	PPM Roles are used in reducing risks associated with the successfully delivery of financial system megaprojects	Coordinator Data Architect Data Scientists Delivery Manager Designers Engagement Manager Leadership team Scrum Master
Rites of Passage (5)	PPM Roles that have evolved with the successfully delivery of financial system megaprojects	Cloud Lead Program Manager Quality Assurance Staff Scrum Team Sprint Teams

Goodall Coding	Description of Coding	PPM Roles Coding
Routine (27)	PPM Roles that have been used routinely with the successful delivery of financial system megaprojects	Analysts CAM Manager Central person to press the button Client Relationship Management Communication Staff Configuration Lead Configuration Staff Conversion Lead Deputy Program Manager Development Lead Development Staff Executive Management Financial Manager Lead Functional Lead Functional Staff Implementation Lead Product Owner Program/Project Management Office Project Manager Project Scheduler System Administrators System Architecture Technical Lead Testers Testing Lead Training Lead Training Team

Note. Goodall codes were identified from coded PPM Roles data. Table developed J. Pullen, 2022.

3.3.3.3. Goodall Coding for Project Portfolio Management Tools and Technologies.

The third set of Goodall coding was assigned to the initial codes regarding recommended project portfolio management (PPM) tools and technologies. The initial coding generated 31 recommended PPM tools/technologies were identified. These codes were translated into three Goodall codes (routine, rites of passage, and risk-taking). Twenty-six of the recommended PPM tools/technologies were assigned the routine coding, which means these PPM tools/technologies are expected to be used routinely in the successful deployment of financial system megaprojects. Table 12 recaps Goodall coding related to the PPM tools/technologies identified during the third interview question.

Table 12. *Goodall Coding of PPM Tools/Technologies per Interview Question 3*

Goodall Coding	Description of Coding	PPM Tools and Technologies Coding
Risk-Taking (1)	PPM Tools and Technologies are used to reduce risks associated with the successful delivery of financial system megaprojects.	Confluences

Goodall Coding	Description of Coding	PPM Tools and Technologies Coding
Rites of Passage (4)	PPM Tools and Technologies usage has evolved with the successful delivery of financial system megaprojects.	JIRA Kanban MS Visio
Rites of Passage (4)	PPM Tools and Technologies usage has evolved over time with the successful delivery of financial system megaprojects.	Tableau
Routine (26)	PPM Tools and Technologies usage is routinely used with the successful delivery of financial system megaprojects.	Action Item List Adobe Captivate Checklists Deliverables Design documents
Routine (26)	PPM Tools and Technologies usage is routinely used with the successful delivery of financial system megaprojects.	Earned Value Management (EVM) Lector Software MS Office MS Project MS SharePoint Mural Primavera Project Server Rational Remedy Requirements Traceability Matrix (RTM) Review Boards Risk logs Risk Register ServiceNow Survey Monkey Team calendars Tool Awareness Training Logs Training materials WebSphere

Note. Goodall codes were identified from coded PPM Tools/Technologies data. Table developed J. Pullen, 2022.

3.3.3.4. Goodall Coding for Project Portfolio Management Skills and Competencies.

The fourth set of Goodall coding was assigned to the initial codes regarding recommended project portfolio management (PPM) skills/competencies. The initial coding generated 36 recommended PPM skills/competencies were identified. These codes were translated into two Goodall codes (routine and rites of passage). Twenty-four of the recommended PPM skills/competencies were assigned the routine coding, which means these PPM skills/competencies are expected to be used routinely in the successful deployment of financial system megaprojects. Table 13 recaps the Goodall coding related to the PPM skills/competencies identified during the fourth interview question.

Table 13. *Goodall Coding of PPM Skills/Competencies per Interview Question 4*

Goodall Coding	Description of Coding	PPM Skills and Competencies
Rites of Passage (12)	PPM Skills and Competencies that have evolved over time with the successfully delivery of financial system megaprojects	Adaptive to Technology Advances Agile Training Certifications Change Management Committed to outcomes Communication Skills I/T Background Managing risks Strategic Thinkers System Development Life Cycle Tactical Thinkers Technical Skills
Routine (24)	PPM Skills and Competencies that are used routinely with the successfully delivery of financial system megaprojects	Ability to sift through things Active Listening Attention to Detail Backup Plan Collaboration Skills Conflict Management Skills Corrective Actions Customer Focus Do not expect perfection Do not expect things to be static Federal Financial Management Federal Government Regulations Flexibility Follow-through Functional Skills Middle management involvement People Management Resource Allocation Skills Transferability Stakeholder Management Time Management Trust Visionary Work experience

Note. Goodall codes were identified from coded PPM Skills/Competencies data. Table developed J. Pullen, 2022.

3.3.3.5. Goodall Coding for Additional Project Portfolio Management Practices. The final set of Goodall coding was assigned to the initial codes regarding additional recommended project portfolio management (PPM) practices. The initial coding generated 29 additional recommended PPM practices. These codes were translated into four Goodall codes (crisis, routine, risk-taking, and rites of passage). Nineteen of the additional recommended PPM practices were assigned the routine coding, which means these additional PPM practices are expected to be used routinely in the

successful deployment of financial system megaprojects. Table 14 summarizes the Goodall coding related to additional PPM practices identified during the fifth interview question.

Table 14. *Goodall Coding of Additional PPM Practices per Interview Question 5*

Goodall Coding	Description of Coding	Additional PPM Practices
Crisis (1)	Additional PPM considerations that are used in crisis moments with the successfully delivery of financial system megaprojects	Paralysis via Analysis
Risk-Taking (3)	Additional PPM considerations that are used to reduce risks with the successfully delivery of financial system megaprojects	Agile Coaching Legal Skillset Policy Skillset
Rites of Passage (6)	Additional PPM considerations that have been evolved over time with the successfully delivery of financial system megaprojects	Achieving Milestones Focus on Success Outcomes Get to the end-users Hybrid Approach of Agile and Waterfall Partnership Program and Project Management Methods
Routine (19)	Additional PPM considerations that are used routinely with the successfully delivery of financial system megaprojects	Being true to your standards Change Management Usage Constant Communications
Routine (19)	Additional PPM considerations that are used routinely with the successfully delivery of financial system megaprojects	Corrective Action Do not make assumptions Expecting things to go well Keep it under budget Manage the activities Managing the schedule Managing the team Nothing Perfect Problem Solving Realignment Relying on your processes Resource Management Scope Creep Stakeholder Management Training Trust

Note. Goodall codes were identified from coded Additional PPM Practices data. Table developed J. Pullen, 2022.

3.3.4. Assignment of Themes

The next step of the data analysis plan is to use thematic analysis with an inductive approach to assigning themes to the initial codes generated. Thematic analysis is standard in qualitative inquiry

studies, for it helps in identifying and interpreting themes from data provided by participants (Gray, 2016; Merriam and Tisdell, 2016). The inductive approach focuses on a bottom-up approach that will review the data to see what patterns can be used to confirm the constructs of the applied framework, gaps in practice, and answers to the project question. Once themes were assigned to each code, they were consolidated to generate a listing of themes with similar, related codes.

3.3.4.1. Themes for Project Portfolio Management Standards. The first set of themes was created against the initial codes assigned from practitioners’ comments regarding recommended project portfolio management (PPM) standards. The initial coding generated 42 codes. These codes were translated into four themes. Practical Project Management Standards was the dominant theme, with twenty-three of the PPM standards being assigned. Table 15 lists each theme, a general description, and the associated PPM standards.

Table 15. *Thematic Coding of PPM Standards per Interview Question 1*

General Theme	Description of Theme	PPM Standards Coding
Management Standards (12)	Management Standards are common practices associated with the successfully delivery of financial system megaprojects	Change management Communications Consistency Decide on what is important Escalation path Evidence-based decision making Measuring success Monitoring issues Policies and Procedures Response Flexibility Staying on schedule Training
Other Standards (4)	Other Standards are unique practices associated with the successfully delivery of financial system megaprojects	Client Partnership Management Framework Contractor standards Government standards Personal Experiences
Practical Project Management Standards (23)	Practical Project Management Standards are general project management practices associated with the successfully delivery of financial system megaprojects	Accurate delivery Agile Comprehensive plans Deliverables Earned value management Enterprise Project Portfolio Management Functional team Internal tools and templates Leading indicators Lessons learn Managing to an end-date (ribbon cutting) Performance metrics PMBOK Project plan Requirements management

General Theme	Description of Theme	PPM Standards Coding
Practical Project Management Standards (23)	Practical Project Management Standards are general project management practices associated with the successfully delivery of financial system megaprojects	Responsibility matrix Review and approval process Risk management Scope creep Scope determines team size Stakeholder management Staying on budget Technical team Waterfall methodology
Quality Standards (2)	Quality Standards are general quality management practices associated with the successfully delivery of financial system megaprojects	CMMI Quality measures

Note. Themes were identified from coded PPM Standards data. Table developed J. Pullen, 2022.

3.3.4.2. Themes for Project Portfolio Management Roles. The second set of themes was created against the initial codes assigned from practitioners’ comments regarding recommended project portfolio management (PPM) role. The initial coding generated 40 unique codes. These codes were translated into three themes. Project Management – Leads was the dominant theme, with twenty-two of the PPM roles being assigned. Table 16 lists each theme, a general description, and the associated PPM roles.

Table 16. *Thematic Coding of PPM Roles per Interview Question 2*

General Theme	Description of Theme	PPM Roles Coding
Project Management – Leads (22)	Project Management – Leads are roles that serve as lead/management roles associated with the successful delivery of financial systems megaprojects.	CAM Manager Cloud Lead Configuration Lead Conversion Lead Delivery Manager Deputy Program Manager Development Lead Engagement Manager Executive Management Financial Manager Lead Functional Lead Implementation Lead Product Owner Program Manager Program/Project Management Office Project Manager Project Scheduler Scrum Team System Architecture

General Theme	Description of Theme	PPM Roles Coding
		Technical Lead Testing Lead, Training Lead
Project Management – Others (2)	Project Management – Others are additional roles associated with the successful delivery of financial systems megaprojects.	Central person to press the button Leadership team
Project Management – Staff (16)	Project Management – Staff is non-lead/management roles associated with the successful delivery of financial systems megaprojects.	Analysts Client Relationship Management Communication Staff Configuration Staff Coordinator Data Architect Data Scientists Designers Development Staff Functional Staff Quality Assurance Staff Scrum Master Sprint Teams System Administrators Testers Training Team

Note. Themes were identified from coded PPM Roles data. Table developed J. Pullen, 2022.

3.3.4.3. Themes for Project Portfolio Management Tools and Technologies. The third set of themes was created against the initial codes assigned from practitioners’ comments regarding recommended project portfolio management (PPM) tools/technologies. The initial coding generated 31 unique codes. These codes were translated into three themes. Specific Project Management Tools was the dominant theme, with twenty of the PPM tools/technologies being assigned. Table 17 provides a listing of each theme, a general description of the theme, and the associated PPM tools/technologies.

Table 17. *Thematic Coding of PPM Tools/Technologies per Interview Question 3*

General Theme	Description of Theme	PPM Tools/Technologies Coding
Office Admin Tools (3)	Office Admin Tools are general software programs used to deliver financial system megaprojects successfully.	MS Office MS SharePoint MS Visio
Other Tools (8)	Other Tools are specialty software programs used to deliver financial system megaprojects successfully.	Adobe Captivate Lector Software Rational Remedy Review Boards ServiceNow Survey Monkey

General Theme	Description of Theme	PPM Tools/Technologies Coding
Specific Project Management Tools (20)	Specific Project Management Tools are project management software programs and practices used to successfully deliver financial system megaprojects.	Tableau Action Item List Checklists Confluences Deliverables Design documents Earned Value Management (EVM) JIRA Kanban MS Project Mural Primavera Project Server Requirements Traceability Matrix (RTM) Risk logs Risk Register Team calendars Tool Awareness Training Logs
Specific Project Management Tools (20)	Specific Project Management Tools are project management software programs and practices used to successfully deliver financial system megaprojects.	Training materials WebSphere

Note. Themes were identified from coded PPM Tools/Technologies data. Table developed J. Pullen, 2022.

3.3.4.5. Themes for Project Portfolio Management Skills and Competencies. The fourth set of themes was created against the initial codes assigned from practitioners’ comments regarding recommended project portfolio management (PPM) skills/ competencies. The initial coding generated 36 unique codes. These codes were translated into two themes. Management Skills were the dominant theme, with twenty-two of the PPM skills/competencies being assigned. Table 18 provides a listing of each theme, a general description of the theme, and the associated PPM skills/competencies.

Table 18. *Thematic Coding of PPM Skills/Competencies per Interview Question 4*

General Theme	Description of Theme	PPM Skills/Competencies Coding
Management skills (22)	Management skills are general skills and practices used to successfully deliver financial system megaprojects.	Ability to sift through things Active listening Attention to Detail Backup Plan Collaboration Skills Committed to outcomes Communication skills Conflict Management skills Corrective actions

General Theme	Description of Theme	PPM Skills/Competencies Coding
		Customer focus Do not expect perfection
Management skills (22)	Management skills are general skills and practices used to deliver financial system megaprojects successfully.	Do not expect things to be static Flexibility Follow-through Managing risks Middle management involvement People management Strategic thinkers Tactical thinkers Time management Trust Visionary
Technical skills (14)	Technical skills are specialized skills, including project management and technology, used to deliver financial system megaprojects successfully.	Adaptive to technology advances Agile training Certifications Change management Federal financial management Federal government regulations Functional skills I/T background Resource allocation Skills transferability Stakeholder management System development life cycle Technical skills Work experience

Note. Themes were identified from coded PPM Skills/Competencies per data. Table developed J. Pullen, 2022.

3.3.4.5. Themes for Additional Project Portfolio Management Practices. The final set of themes was created against the initial codes assigned from practitioners’ comments regarding additional recommended project portfolio management (PPM) practices. The initial coding generated 29 unique codes. These codes were translated into four themes. Leadership practices were the dominant theme, with twelve of the additional PPM practices being assigned. Table 19 lists each theme, a general description of the theme, and the associated additional PPM practices.

Table 19. *Thematic Coding of Additional PPM Practices per Interview Question 5*

General Theme	Description of Theme	Additional PPM Practices Coding
Leadership Practices (5)	These are additional leadership practices used to successfully deliver financial system megaprojects.	Being true to your standards Constant Communications Corrective Action Nothing Perfect Trust
		Change Management Usage

General Theme	Description of Theme	Additional PPM Practices Coding
Management Practices (12)	These are additional management practices used to successfully deliver financial system megaprojects.	Do not make assumptions Expecting things to go well Focus on Success Outcomes Get to the end-users Keep it under budget Managing the team Paralysis via Analysis Partnership Problem Solving Realignment Relying on your processes Scope Creep
Other Practices (2)	These are additional other practices used to successfully deliver financial system megaprojects.	Legal Skillset Policy Skillset
Technical Practices (9)	These are additional technical practices used to successfully deliver financial system megaprojects.	Achieving Milestones Agile Coaching Hybrid Approach of Agile and Waterfall Manage the activities Managing the schedule Program and Project Management Methods Resource Management Stakeholder Management Training

Note. Themes were identified from coded Additional PPM Practices data. Table developed J. Pullen, 2022.

3.4. Contribution to Theory, the Literature, and the Practitioner Knowledge Base

The framework for project portfolio management improvement (P2MI) was developed to address the project question of this capstone project. The project question explored the perspectives of private sector project managers regarding the successful strategies used to deliver financial systems megaprojects to executive branch federal government agencies on time, within budget, and within scope through a series of interview questions. The information shared by private sector practitioners contributed to the theory, literature, and practitioner knowledge aspect by reinforcing what is needed to successfully deliver financial system megaprojects on time, within budget, and within scope.

3.4.1. Contribution to Theory

The findings from the capstone supported the basis of the P2MI applied framework. The foundation of the P2MI applied framework is based upon identifying project portfolio management standards, roles, tools/technologies, and skills. PPM Standards generated the highest number of codes, followed closely by PPM Roles. Table 20 shows a breakdown of the coding of each of the four relevant concepts.

Table 20. *Summary of Applied Framework Key Concepts Coding*

Applied Framework Key Concept	PPM Coding Generated	Goodall Coding Generated	Themes Generated From PPM Coding
PPM Standards	42	3	3
PPM Roles	40	3	3
PPM Tools and Technologies	31	3	3
PPM Skill and Competencies	36	2	2

Note. A summary of the coding (PPM, Goodall, themes) for each applied framework concept. Table developed J. Pullen, 2022.

On the other hand, the findings extended the P2MI framework to include one additional key concept/element – Additional Practices. Table 21 shows a breakdown of the coding derived beyond the four relevant concepts.

Table 21. *Summary of Additional Applied Framework Key Concepts Coding*

Applied Framework Key Concept	PPM Coding Generated	Goodall Coding Generated	Themes Generated From PPM Coding
Additional Practices	29	4	4

Note. A summary of the coding (PPM, Goodall, themes) extended the applied framework. Table developed J. Pullen, 2022.

As you can see, many PPM codes were generated across the core concepts of the P2MI framework. In general, the average number of PPM codes generated was 36. When applying this against the number of respondents, an average of four unique codes were generated from each respondent. These 36 codes represented diversity in what is considered a success factor for successfully ensuring the delivery of financial system megaprojects.

3.4.2. Contribution to the Literature

The data collected from the participants supported the literature reviewed for this study. The literature in this study covered each of the four concepts (standards, roles, tools/technologies, and skills/competencies) that comprised the applied framework and the participants’ feedback validated this. The data collected from the participants was remarkable since participants came from 9 different firms. Each of these participants brought various perspectives regarding what is needed to successfully deliver financial system megaprojects on time, within budget, and within scope.

The first area of contribution can be seen in identifying recommended PPM standards the findings. Twenty-three of the recommended 42 PPM standards are related to PMI standards. PMI’s Project Management Body of Knowledge is considered the bible for all things project management (Project

Management Institute, 2017a). PMI has even created supplement guides for PMBOK that focus on program management, portfolio management, and competencies. The Standard for Organizational Project Management provides a framework that aligns organization strategy with PPM practices (Project Management Institute, n.d.-b). The Standard for Program Management focuses on program management activities, while the Standard for Portfolio Management focuses on portfolio management practices (Project Management Institute, 2017d). The Project Manager Competency Development Framework focuses on the skills and competencies needed in today's project managers (Project Management Institute, 2017b). The Governance of Portfolios, Programs, and Projects focuses on core governance aspects of portfolios, programs, and projects (Project Management Institute, n.d.-b).

The second area of contribution focuses on the importance of the right roles when delivering projects. The findings from this study identified 40 specific project management roles needed for projects of this sort. These findings showed the variety of roles needed for financial system megaprojects. The result of this means that organizations must assign project managers and project staff with clear expectations of project portfolio management roles and responsibilities (Nijhuis et al., 2018). Executive management, including senior and middle-level management, must reduce the team's burden of delivering successful projects (Breese et al., 2020; Zwikael & Meredith, 2018). Kock and Gemunden (2021) concluded that higher stakeholder involvement translates to better performance. The lack of clarity of role definitions contributed to this study's general and specific business problems.

There are many project management tools used in the project management profession. The findings identified 31 specific tools for use. The dominant tool recommended was Microsoft Project, and the literature supported that. The profession relies on a core set of tools, namely Microsoft Project and Primavera (Pellerin & Perrier, 2019). When integrated with project management practices, Khumalo and Mearns (2019) noted that such tools like Microsoft Project can improve the sharing of knowledge to improve program management. PMI noted that executive leaders listed acquiring the right technologies as a key driver for success (Project Management Institute, 2019, 2020). Ayyagari and Atoum (2019) concluded that using PPM tools would reduce project failures and delays by 59%.

The fourth area of contribution focused on the necessary skills and competencies to successfully deliver financial system megaprojects. Thirty-six recommended skills are competencies were identified by the respondents. These skills are aligned with skills and competencies, such as communication skills, conflict management, people management, noted in The Project Manager Competency Development Framework (Project Management Institute, 2017b). PMI noted that executive leaders listed securing the right skills is a key driver for success (Project Management Institute, 2020). Sang et al. (2018) concluded that while project managers may possess core technical program management skills, they lack other important competencies such as leadership, financial management, and emotional intelligence needed for monitoring, controlling, and executing the successful delivery and management of projects.

3.4.3. Contribution to Practitioner Knowledge

The data collected from practitioners represented a variety of perspectives. The practitioners came from six different firms in the greater Washington DC area. Fifty-six percent of the practitioners had more than 20 years of experience delivering financial system megaprojects. Forty-four percent of the sample led twenty or more financial systems projects during their professional career. Forty-four percent of the participants were either female or minorities.

Despite the diversity of the practitioners, they share similar perspectives. Regarding the successful perspective regarding project portfolio management standards, six of the nine respondents identified measuring success as a key standard. In terms of roles, lead roles in configuration, technical, testing, and training were identified as important roles to have on the financial system megaproject team, besides traditional roles of executive management and project management. While software programs such as Microsoft Project and Office were the dominant recommended tools by practitioners, other tools such as Microsoft SharePoint (a document and collaboration management application) and JIRA (a software suite that focuses on agile project management practices) were mentioned by at least four respondents. JIRA is important due to the move to agile project management practices. While everyone noted the importance of communication skills as a key skill/competency, four respondents noted the importance of people management as a recommended skill/competency. Finally, in the areas of other recommended practices, three of the respondents noted the importance of constant communications and partnership for ensuring the successful delivery of financial systems projects.

3.5. Project Application and Recommendations

The findings presented in this capstone project are applicable to the successful delivery of financial systems megaprojects. The risk for delivery failure remains high (Adams, 2016; Clark, 2013; Mares, 2020). Between 2017 and 2018, a survey of project managers identified over \$98M in losses for every \$1B per the use of poor project management techniques and tools (Project Management Institute, 2017, 2018). Mishra (2017) and Nieto-Rodriguez (2017) reported several high-profile project failures. CIO Magazine reported in 2019 that 70% of IT projects were either late, over budget, or failed to meet their customer's requirements (Cisco, 2019). These findings may aid firms in reducing the risk of delivery failure.

The ability to reduce the risk of delivery failure will depend on organizations' ability to focus their efforts on the four constructs of the applied framework presented in this capstone. First, organizations need to determine which project portfolio management (PPM) practices are applicable. Reducing risk will require them to change and adapt new PPM practices to meet the changing landscape (Project Management Institute, 2020). Second, organizations need to determine the right roles and skills needed by their project teams required by new PPM practices, such as agile project management (Project Management Institute, 2021a). Lastly, organizations need to make the right investment in tools and technologies that not only reduce delivery failure but increase customer value (Project Management Institute, 2019, 2020)

The findings were focused on the successful delivery of financial system megaprojects for the executive branch agencies federal government agencies. It will be important to share the findings with many stakeholders so that they can consider the implementation of these findings. There will be two methods for sharing the findings with stakeholders. First, I am an active member of the Project Management Institute and the Association of Government Accountants. The first method will be to share my findings at conventions held by both associations. I have conducted presentations at both associations, so performing a presentation at associations will allow me to disseminate the findings to many. The second method for sharing my findings is to submit a paper to a PMI-sponsored event.

An example is submitting a paper to the University of Maryland Project Management Symposium (UMDPM), the largest project management event in the Washington, DC, area. The event focuses on sharing best practices, trending topics, and research related to the project management profession, including special sessions focused on the federal government (Project Management Center for Excellence, n.d.). Any paper submitted will be available for review for current and past attendees. Also, *PM World Journal*, the media sponsor of UMDPM, selects 6-12 papers each year to publish on its website.

3.6. Conclusion

The DBA program has improved my appreciation and understanding of the critical issues facing the project management profession. Each of the project specialization courses provided me with the necessary knowledge to support this project. BMGT8430 and BMGT 8432 introduced me to key project management concepts that are the cornerstone to the successful delivery of information technology projects that applied to financial system megaprojects. BMGT8434 enlightened me on the various risk management approaches needed to reduce project delays and failures. BMGT8436 expanded my knowledge of project portfolio management practices.

The core DBA classes were instrumental in developing my doctoral skills. Each research class (DB8002, DB8008, and DB8015) provided me with the necessary skills to conduct doctoral research. DB8006 provided the opportunity to decide between a qualitative or quantitative approach to the project. The two residencies (DB-8960 and DB-8962) and mentoring classroom (DD9940) provide me with a laboratory to develop and refine my capstone topic to focus on completing my project during my capstone classes.

The purpose of this qualitative inquiry project was to explore the project portfolio management practices being used by private sector project managers in the Mid-Atlantic region of the United States regarding the successful project portfolio management practices used to deliver financial systems megaprojects to executive branch agencies of the federal government. The findings produced by the project may improve the delivery of financial system megaprojects. The perspectives shared by private sector project practitioners were based upon an average of 22 years of experience in project portfolio management. The practitioners shared 178 unique concepts that formed the P2MI applied framework. The challenge will be deciding which concepts apply to the organization.

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