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Strategies to Improve Project Portfolio Management in the Pharmaceutical Industry

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This is to certify that the doctoral study by

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has been found to be complete and satisfactory in all respects,
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Abstract

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Abstract

Poor management of pharmaceutical project portfolios can negatively impact a pharmaceutical company's product development and profitability. Project portfolio managers must ensure the successful development of new products in the pharmaceutical pipeline as the financial investment in new product development is significant and if not managed effectively can negatively impact profitability and prevent launch of new treatment therapies. Grounded in the project portfolio management framework, the purpose of this qualitative pragmatic inquiry study was to explore successful project portfolio management (PPM) strategies that drug project portfolio managers use to contribute to business success. The participants were six employees that managed portfolios within the top 50 pharmaceutical companies. Data were collected using semistructured interviews. Through thematic analysis, six themes were identified: (a) justification for and use of software tools, (b) identification of key performance indicators (KPI), (c) alignment of business goals across the organization, (d) risk management strategies, (e) leadership behaviors, and (f) budget management. The implications for social change include the potential for leaders in the pharmaceutical industry and health care leaders to advance healthcare by improving the chances of bringing safe and effective therapies to the market quicker, thereby providing the public access to treatments.

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Section 1: Foundation of the Study

Successful project portfolio management (PPM) involves analyzing the current status of an organization and making a series of individual project decisions to ensure that the organization meets its strategic goals. The life cycle of PPM involves several stages including initiation, planning, execution, and optimization (Butler, 2022; Project Management Institute, 2017). This involves balancing an interrelated group of projects by utilizing the principles of project management and PPM. The proposed study will explore PPM strategies within the pharmaceutical industry, and the objective is to improve PPM within this field.

Background of the Problem

PPM helps pharmaceutical companies maximize the value of their investments due to the industry's high investment requirements, long development cycles, and high risk. Pharmaceutical research and development (R&D) portfolio are created by incorporating various assets that can include small molecule drugs that are chemically derived and biologics which are therapeutics extracted from living organisms (Trusheim et al., 2010). These assets can also include small molecules and biologics at various stages in development. Developing, obtaining regulatory and ethics approval, launching, and maintaining pharmaceutical products are massive and complex tasks due to high research costs, time, personnel, facilities, and clinical trials. Generally, the pharmaceutical industry faces unique challenges in the United States (U.S.) because the industry undergoes heavy regulation, and it may cost billions of dollars to bring a single drug to market (Wouters et al., 2020). Ninety percent of clinical drug development fails despite implementation of many successful strategies (Dowden & Munro, 2019). Clinical trial data from 2010 to 2017 showed that lack of commercial needs and poor strategic planning accounted for 10% of the high rate of failure in drug development (Dowden & Munro, 2019). Failed drug candidates can impact a drug portfolio by costing the pharmaceutical company resources, potentially billions of U.S. dollars (Fernald et al., 2024; Wouters et al., 2020) and can possibly decrease company shares. The rising cost of clinical research has significant consequences for public health by impacting a pharmaceutical company's decision to conduct clinical trials (Sertkaya et al., 2016). This may result in limited patient access to novel treatments because of the high cost of R&D. There is a 90% failure rate of clinical drug development (Dowden & Munro, 2019) and rising research and development costs reflect a decline in pharmaceutical R&D efficiency (Fernald et al., 2024). Consequently, there is a need for research on PPM strategies. In this study, I will explore the perspectives of project portfolio managers within the pharmaceutical industry regarding successful portfolio management strategies.

Problem and Purpose

If drug candidates do not make it to market, the median loss is approximately $314 million to $2.8 billion United States dollars (USD) (Wouters et al., 2020). The general business problem is that pharmaceutical companies that do not implement effective PPM strategies compromise the company's profitability by decreasing their competitive advantage and by wasting funds, personnel, and time on projects that do not achieve maximum returns. The specific business problem is that drug project portfolio managers lack successful

PPM strategies to create successful drug portfolios that contribute to business success.

The purpose of this pragmatic inquiry is to explore successful PPM strategies that drug project portfolio managers use to contribute to business success. The target population includes individuals who manage portfolios within the U.S. that are employed at any of the top publicly owned pharmaceutical companies based on the company's 2024 annual revenue (Dunleavy, 2025).

Population and Sampling

The data included a total of six participants within the U.S. that manage project portfolios and are employed at any publicly owned pharmaceutical company with annual revenues of more than $3billion USD based on the company's 2024 annual revenue report. The project portfolio managers have a minimum of 5 years of experience managing a portfolio with at least one product on the market. The participants were interviewed using a semistructured interview process designed to obtain their experience for creating successful portfolios that generate profit for their organization.

Nature of the Study

The research method chosen for this study is qualitative. A qualitative research study attempts to explain the relationship between subjective and socially created meanings about the experience being studied by analyzing non-numerical data (Saunders et al., 2015; Tomaszewski et al., 2020; Yin, 2018). A qualitative method is best suited for this study because I will be exploring PPM strategies that portfolio managers from different companies implement by conducting interviews accompanied by a series of questionnaires.

I did not choose a quantitative method because it involves collecting and analyzing numerical data (Holton & Burnett, 2005). This study will not focus on analyzing numbers, metrics, and variables; therefore, a quantitative study will not be appropriate. I did not choose a mixed methods study method. Mixed methods research incorporates components of quantitative and qualitative data collection methods and analytical processes (Holton & Burnett, 2005; Saunders et al., 2015). Therefore, the mixed method is not appropriate for my research goal.

The research design for this study is a pragmatic inquiry. The goal of a pragmatic inquiry is a study approach that links theory and practice (Kelly & Cordeiro, 2020). Pragmatic inquiry concentrates on practical results. The pragmatic inquiry research design is used to understand the multiple factors involved in people's actions in a given situation (Kelly & Cordeiro, 2020). The pragmatic inquiry is suitable for my study because the goal is to understand a project portfolio manager's decisions, purposes, and intentions when it comes to managing a portfolio. Other research designs were not appropriate. A multiple case study involves in-depth research into several participants in order to understand a real-world subject (Yin, 2018). Therefore, a multiple case study is not appropriate for my research goal since it focuses on multiple cases or a single case. I did not use a phenomenological and narrative research design for my study. Phenomenology explores what individuals experience and focuses on their experience of a phenomenon (Heidegger, 2005; Moustakas, 1994). A narrative inquiry involves understanding the meaning an individual attaches to an experience through the process of storytelling (Esin et al., 2014). Neither of these research designs suit my research goal.

Research Question

What are the PPM strategies used by project portfolio managers to create successful drug portfolios that contribute to business success?

Interview Questions

The following interview questions were asked:

1. What tools and techniques do you use to manage a portfolio in each stage of its life cycle (i.e., initiation, planning, execution, monitoring and control, and optimization)?
2. How do you measure the business value and performance of a portfolio?
3. How do you ensure that the portfolio is aligned with the company's overall objectives and strategy?
4. How do you manage risk within a portfolio?
5. What leadership skills do you use to manage a portfolio?
6. What kind of portfolio governance practices do you or the company implement?
7. How do you develop portfolio strategic objectives?
8. How do you manage the variations between the estimated budget and the actual budget?

9. How do you choose new projects for both short-term cash flow and long-term development?
10. What additional information would you like to share regarding PPM strategies?

Conceptual Framework

The PPM framework was used for this study. PPM has evolved over many years by incorporating several theories but was standardized by the Project Management Institute (PMI) in 2006 (Project Management Insitute, 2006). PPM is part of the project management process and utilizes similar general skills to bring value to the company (Project Management Institute, 2017). PPM is used by project managers and project management organizations (PMOs) to analyze the potential return on a project and ensure that each project is in alignment with company goals (Project Management Institute, 2017). PPM includes five core steps: (a) Clarify business objectives, (b) Capture and research requests and ideas, (c) Select the best projects using defined differentiators that align, maximize, and balance, (d) validate portfolio feasibility and initiate projects, and (e) Manage and monitor the portfolio (Butler, 2022; Project Management Institute, 2017). Successful PPM strategies help portfolio managers oversee their resources efficiently and allocate resources to the most valuable projects to maximize business value and competitive advantage. This is particularly important in the pharmaceutical industry due to the high risk and high-stake nature of the drug development process.

Operational Definitions

Drug Candidate: Drug development encompasses the activities involved in converting a compound from drug candidate, which is the end-product of the discovery phase, to a product approved for marketing by the regulatory authorities (Rang & Hill, 2013).

Project Management Body of Knowledge (PMBOK): The project management body of knowledge is a framework of best practices, processes, and terms that are considered standards within project management (Project Management Institute, 2021).

Project Portfolio Management (PPM): PPM is the management of portfolios using standard portfolio management principles to achieve an organization's strategic objectives and aligning the portfolio with the organizational strategy (Project Management Institute, 2017).

Assumptions, Limitations, and Delimitations

The purpose of this section is to define and identify the assumptions, limitations, and delimitations of this research study. Assumptions, limitations, and delimitations are used to create specified boundaries for research studies (Ormrod, 2023). I provide the details for each of these elements of my proposed research study in the following sections.

Assumptions

Assumptions are statements that are regarded as true even though it cannot be confirmed by the researcher (Ormrod, 2023). To provide accurate and appropriate data for this study, I assumed that the participants were truthful in their interviews. I also assumed that participants were truthful about their backgrounds in PPM such as years of experience and education.

Limitations

Limitations are elements in which the researcher has no control in the study (Terrell, 2023). The main limitation of this study was the small sample size. The small sample size could threaten the validity and generalizability of the study's results (Vasileiou et al., 2018). Another limitation of the study is that the data may be subject to influence by my subjectivity or by the participants' self-presentation, social desirability, or recall. There were processes in place to mitigate the bias.

Delimitations

Delimitations are elements the researcher has control over to help define the boundaries of the study (Coker, 2022). Delimitations result from the specific and conscious choices of the researcher (Coker, 2022). A delimitation of the study was the selection of project portfolio managers in the United States from the top 50 pharmaceutical companies. This delimitation was to understand and focus on the viewpoints and experiences of this specific population.

Significance of the Study

Contribution to Business Practice

The study findings may contribute to business practices by uncovering practices and processes that are useful in creating a successful drug portfolio. The pharmaceutical industry has embraced the concept of portfolio and project management to manage and optimize the returns of drug the development process (Grudzinskas et al., 2022). The results of study could positively impact the project portfolio managers' ability to increase revenues, increase project success, and improve the organization's competitiveness within the industry. It is essential for leaders to establish an understanding of how to manage projects with increased efficiency and outcomes to decrease costs. The ideal financing system for pharmaceuticals balances several objectives: it provides incentives to develop valuable new therapies and encourages competition to drive down prices for patients (Cutler et al., 2020). Therefore, effective PPM strategies are critical to achieving these goals.

The results from this study may reduce the project failure rate and help project portfolio managers identify successful strategies for improved overall efficiency. It can also help project portfolio managers with effective allocation of various resources. These efficiencies can support the organization in bringing new medicines to the market that may treat or cure various medical conditions in a more cost-effective way.

Implications for Social Change

My study results may have positive contributions to social change. The amount of newly launched drugs has been shown to reduce mortality and is therefore crucial to the promotion of public health (Lichtenberg, 2018). Promotion of public health has a positive social impact by safeguarding and improving quality of life and the health of individuals and the communities. In addition, improved PPM may contribute to the company's annual revenue which can allow the company to put more funds towards corporate social responsibility (CSR) efforts. CSR is a business strategy in which companies take an active role in positively impacting the world (Barauskaite & Streimikiene, 2020). CSR includes, but is not limited to, providing grants for human rights groups, and being involved in community services projects such as volunteering for the homeless shelter or food bank (Gavin, 2019). By improving business success through effective PPM, the organization can devote more time and resources towards CSR activities.

A Review of the Professional and Academic Literature

I provided a thorough review of the existing peer-reviewed literature from the year 2019-2025 on the topic of PPM. I performed the literature search using the following databases: Scholarworks, Business Source Complete, Academic Search Complete, IEEE Xplore Digital Library, Computers & Applied Sciences Complete, ScienceDirect, and the Directory of Open Access Journals; and Google Scholar and Thoreau search engines. The search terms used were PPM, drug discovery portfolio, project portfolio, project management, drug development portfolio, portfolio management in the pharmaceutical industry, pharmaceutical portfolio management, and the Project Management Institute. A total of 166 references were cited. Of the total 166 references, 7 (4.2%) were not peer-reviewed, and 159 (95.8%) references were peer-reviewed. The professional and academic literature review was composed of 104 sources. 30 (28.8%) references were published before 2019, and 74 (71.1%) references were published after 2019. Of the 166 total references, 58 (34.9%) references were published from 2021 to 2025. The review of literature pertains to the competencies necessary to achieve PPM success and PPM. The purpose of this section is to offer readers a critical analysis of previous research studies that supports the specific business problem based on the conceptual framework. The categories of the literature review are project portfolio selection, portfolio optimization, portfolio risk management, portfolio governance, artificial intelligence (AI), and strategic approaches.

The purpose of this traditional qualitative, pragmatic inquiry study is to explore the strategies used by portfolio managers in the industry. Project management focuses on delivering individual projects while PPM focuses on the management of all projects in an organization (Patanakul, 2022). PPM is still a rather new area and research methodology in the discipline is still emerging (Hansen & Svejvig, 2022). There are limited PPM studies that have been published between the years 2019-2025 that pertain to the PPM strategies within the pharmaceutical industry.

Conceptual Framework

PPM

The PMI created a standard for portfolio management within the project management framework. PPM (PPM) is a systematic approach used by organizations to manage a collection of projects or programs as a portfolio (Butler, 2022; Project Management Institute, 2017). PPM provides a framework for decision-making, prioritization, and optimization of resources to achieve strategic objectives efficiently and effectively. PPM enables organizations to align their project investments with their overall business goals, maximize returns on investment, and minimize risks (Butler, 2022; Project Management Institute, 2017). The PMI PPM framework will be used as the conceptual framework for my study.

There are other frameworks for the management of portfolios as well. The *Guidebook of Project and Program Management for Enterprise Innovation* (P2M) is a Japanese document written by the Project Management Association of Japan. P2M acts as a reference manual designed to help Japanese organizations managing projects and programs focused on fostering innovation within the enterprise (Siang & Yih, 2012). The Association for Project Management (APM) is a British professional organization for project and program management. APM has created their own foundational resource for practitioners called the *Association for Project Management Body of Knowledge* (APMBOK). The APMBOK is equivalent to the PMI Body of Knowledge. APMBOK is commonly used for sectors like construction and engineering because of its focus on technical project management skills (Association for Project Management, 2019). APM is a set of best practices, while PMI is a standard for project management.

The theory of constraints (TOC) can be applied to PPM. The theory of constraints was published by Goldratt and Cox in 1984 and provides a framework for recognizing and managing the constraints that pose as an obstacle for an organization to achieve its goals and objectives (McCleskey, 2020). Some authors use TOC to increase speed within manufacturing cycle time or the product life cycle (Blocher et al., 2019) or as an approach for problem-solving in a business intelligence system to improve organizational performance (Ciesla & Kolny, 2019). However, TOC does not provide a framework for decision-making, prioritization, and optimization of resources for specifically managing project portfolios.

The contingency theory has been commonly used in PPM. In the contingency theory the effectiveness of management is dependent on the relationship between the application of management behaviors and specific situations (Shala et al., 2021). The contingency theory has several limitations concerning the research on project portfolios such as assuming it can measure project portfolio success in similar ways (Martinsuo &

Geraldi, 2020). Project portfolios with different strategies will have different criteria for success. A researcher using the contingency theory can assume that a certain combination of variables in similar kinds of contexts will result in increased performance. However, different outcomes can result from management in similar contexts (Martinsuo & Geraldi, 2020). For these reasons, this theory was not used in my study.

Portfolio Selection and Optimization

Project portfolio managers are encountering challenges to systematically conduct portfolio reviews, prioritize assets effectively, allocate limited resources efficiently, and terminate projects in a timely fashion due to increasing portfolio complexity. Portfolio selection is an important part of PPM. Portfolio managers employ selection strategies to maximize organizational value by identifying the most optimal portfolio; thus, establishing accurate models for portfolio selection is crucial (Vieira et al., 2024). Portfolio selection and optimization focuses on PPM decisions to find the best combination of projects that maximizes the use of resources and reduces the project portfolio risk (Butler, 2022; Project Management Institute, 2017). PPM selection and optimization literature encompasses several overarching categories based on their approach: strategic management approaches, benefit measurement methods, and mathematical programming approaches. One of the first studies to describe operations approaches for portfolio selection was proposed by Markowitz (1952). In the pharmaceutical industry, PPM is about selecting the right projects to invest in and has been seen as a key source of competitive advantage (Farid et al., 2023; Gupta et al., 2022). Studies have shown that project portfolio selection plays a significant role in achieving an organization’s strategic objectives (Bai, C. & Sarkis, 2013). Because of the pharmaceutical industry’s high risk, high-cost climate, portfolio selection and optimization become critical to selecting the best portfolios that align with the organizational strategy.

Research has been done in mathematical programming-based portfolio selection models to assist with portfolio selection and optimization. Multicriteria decision making (MCDM) methods have been adopted for use in the PPM process. MCDM is a mathematical programming approach used in portfolio selection that includes several methods to allow estimations of various requirements to assist decision makers to select, rank and evaluate different options (Danesh et al., 2018; Kandakoglu et al., 2023). This is useful for project portfolio managers because MCDM assists in achieving high returns while reducing risk at the same time.

Various MCDM methods in recent years have been developed for solving decision problems under multiple and conflicting criteria. The flexible and interactive tradeoff-based portfolio selection framework consists of a MCDM technique proposed by Marques et al. (2022) for project portfolio selection operated through a decision support system. Wu et al. (2022) suggested an integrated MCDM framework to address socially responsible portfolio selection while considering financial and corporate social responsibility performance. Farid et al. (2023) developed a mathematical decision tree that can be used to efficiently evaluate the feasibility of the possible selection sets and how the selected sets can achieve the objectives.

The analytic hierarchy process (AHP) is a type of widely used MCDM method that is a structured technique based on mathematics and psychology for organizing and analyzing complex decisions (Forman & Gass, 2001). AHP is useful in solving complex and unstructured problems in various and diverse decision-making scenarios. AHP reduces the complex decision problems in hierarchical structures of objectives, criteria, sub-criteria, and alternatives and then, uses a fundamental scale to construct pairwise comparisons. AHP use has been studied in the Korean pharmaceutical industry to rank a set of different criteria substantial for establishing a new outsourcing relationship (Song, 2018).

In addition, AHP is continually being expanded and improved upon to develop different AHP variations: the fuzzy analytic hierarchy process (FAHP) (Alyamani & Long, 2020), a combined analytic hierarchy process (AHP) and weighted additive fuzzy goal programming (WAFGP) method (Bellahcene et al., 2020), integrated analytical hierarchy process-goal programming (AHP-GP) (Mogbojuri & Olanrewaju, 2023), and spherical fuzzy AHP (SFAHP) (Jawad et al., 2023). Much of the literature from 2019 to 2023 explores the return and risk assessment methods and various types of MCDM that provide efficient portfolio options, but it does not determine which one should be executed. To address this, Martins and Barucke Marcondes (2020) suggest applying three different MCDM methods for ranking project portfolios: technique for order of preference by similarity to ideal solution (TOPSIS), vlsekriterijumska optimizacija i kompromisno resenje (VIKOR), and preference ranking organization method for enrichment evaluation (PROMETHEE) II combined with a return risk evaluation method

(Mean-Gini). The three MCDM methods allow the portfolio manager to determine the best portfolio of projects to be executed.

Other mathematical models have been developed as well. Abbasi et al. (2020) adopted the balanced score card framework to comprehensively capture all aspects of projects portfolios and developed a new three-objective mathematical model to address project portfolio selection challenges. While there are many developments in mathematical modeling for portfolio selection, there are limited studies within the pharmaceutical industry within the last 5 years. Albano et al. (2019) proposed a mixed-integer nonlinear optimization model to integrate significant four components that include alignment of the strategy, balancing the portfolios, maximization of the value, and future preparedness. Karimi et al. (2022) provided a stochastic optimization model to tackle the project portfolio selection problem under different scenarios. Their model considers the interdependence between revenue and cost of projects, and the appreciation of assets is considered while many other models do not. Their model also tackles the uncertainty of parameters by using a robust possibilistic approach which is one of the first to ever do so. Şahin Zorluoğlu and Kabak (2022) proposed a multi objective programming model in which project scores are presented as belief degrees and projects could be selected and scheduled based on portfolio manager preferences. The multi objective programming model considers conditions and restrictions in management of business development projects such as the complementary and mutual exclusive relations between projects. A nonlinear multi-objective model was proposed by Pishvaei et al. (2025) that would help facilitate the selection of a project portfolio and was developed considering interdependencies between projects in a portfolio. The model aims to minimize portfolio cost and maximize portfolio revenue, the magnitude of the portfolio resilience, and the alignment with organization strategies

A mixed-integer linear programming (MILP) model for R&D portfolio selection and scheduling model proposed by Hesarsorkh et al. (2021) that can be used as a strategic decision-making tool with the pharmaceutical industry to assist managers in analyzing various investment scenarios and selecting a balanced portfolio. However, research into real world application of this model is limited. Han et al. (2023) proposed a two-stage method was adopted to solve the dynamic project portfolio selection problem in highly dynamic environments. The dynamic project portfolio selection problem considers new projects and the overall arrangement of the existing projects and new projects (Huang & Zhao, 2016). These environments can cause significant challenges to decision making. Han et al. (2023) asserted that only considering the selection of new projects in these environments causes a waste of enterprise resources and results in unnecessary costs. The two-stage model proposed by Han et al. (2023) can help managers model various decision-making scenarios in dynamic environments. Shen and Li (2023) also address the dynamic project portfolio selection problem and the synergies within it. They proposed a model to address which existing projects in the early decision-making period should be discontinued, maintained, or upgraded. The adjustment of existing projects can provide benefits by starting more favorable projects earlier and giving up some existing projects to avoid potential losses caused by capital constraints (Shen & Li, 2023). The proposed model to address which existing projects in the early decision-making can be used by managers to simulate different decision situations and can provide better project portfolios for the organization to accomplish its overall strategic goals.

One of the main challenges in project portfolio selection is managing the uncertainty of project evaluation. Projection evaluation involves the assessment and selection of the most appropriate projects for the organization based on a few different parameters (Mavrotas & Makryvelios, 2021). An iterative trichotomic approach (ITA) is proposed as a method to address and control the uncertainty of project evaluation. ITA is a method specially designed for project portfolio selection and works iteratively in rounds (Mavrotas & Makryvelios, 2021). Each round consists of ITA which performs several optimizations and classifies the projects into three sets based on their inclusion or not in the optimal portfolios. Mavrotas and Makryvelios (2021) combined the use of mathematical programming, MCDM, and a Monte Carlo simulation-under the framework of a new version of ITA-to address the uncertainty associated with the subjectivity of the evaluation of the projects. Bai, L. et al. (2021) proposed a method based on complex network theory to address the uncertainty surrounding project portfolio selection. The method involves three phases and selection of a robust project portfolio under strategic goals. The strategic goal of the organization is separated into several sub-goals in the first phase, and in the second phase, the coupling coordination degree of the project portfolio is determined. Finally, the optimal project portfolio is determined by how robust the project portfolio network is when it is challenged. The proposed method by Bai, L. et al. (2021) supports decision-makers in selecting a project portfolio under specific strategic objectives. Despite the various models for portfolio selection, Si et al. (2022) assert that

PPM in companies are ineffective which can be attributed to an overemphasis on project selection which has led to a focus on analytical methods of portfolio evaluation that are applied generically rather than customized to the specific strategy of the organization. Si et al. (2022) suggests that companies focus on portfolio design, followed by portfolio evaluation and management may help mitigate the observed challenges. Namazi et al. (2023) proposed a strategy that assists portfolio managers in the information technology industry with aligning R&D project portfolios with their strategies to combine a strategic view and numerical analysis. The proposed strategy is made of four areas: exploitation zone, challenge zone, desperation zone and discretion zone. Mapping the project into this strategic plane would help portfolio managers align their project portfolio according to the corporate perspectives.

Research from 2019 to 2023 in project portfolio selection and optimization serves to advance selection strategies for an organization. While there were many published studies on portfolio selection, there has not been extensive research of these methods specifically within the pharmaceutical industry.

Risk Management

Risk management is a crucial discipline for pharmaceutical companies. The high cost of development and high risk of failure are reasons for the need for effective portfolio risk management strategies (Schuhmacher et al., 2021). Portfolio risk management involves the process of how decision-makers define the type and level of risks that they consider acceptable for each decision (Butler, 2022; Project Management Institute, 2017). Formal risk management processes that describe the portfolio's goals, status, key stakeholders, critical constraints, and considerations could help portfolio managers mitigate risks to ensure the success of the portfolio. Effective portfolio risk management has been shown to impact project success (Kock et al., 2020; Zhang et al., 2023) and positively impact value creation (Willumsen et al., 2019). Portfolio risk management has been traced back to research done by Markowitz (1952), Hofman et al. (2017), and Sanchez and Robert (2010a), and they have described how it relates to project success. The concept related to portfolio risk and portfolio success is called portfolio health. Portfolio health is defined as the representation of the level of the project portfolio's performance in each evaluation period (Butler, 2022; Project Management Institute, 2017; Sanchez & Robert, 2010a). Several methods have been developed to assess and measure portfolio risk. The modern portfolio theory by Markowitz (1952) includes concepts related to risk and is presented as the basic conceptual factor pertaining to a project portfolio's risk sources. The modern portfolio theory approach establishes a set of projects that minimize the portfolio risk level depending on a defined return or that maximize the project portfolio return according to a set risk level. Project portfolio nonsystematic risk corresponds to the inherent risks of each project, while systematic risk, or interdependence risk, is related to the project portfolio's exposure to environmental and market conditions, corresponding to risks that affect the portfolio globally. Ahmadi-Javid et al. (2020) developed a quantitative method for planning theoretical responses under a proactive approach. The quantitative method method involves eight steps and uses an optimization model to determine a set of risk responses that maximizes the overall expected risk relief subject to different budget constraints.

However, these methods assume a stable environment and do not address nonlinear relationships between risk factors and portfolio risk.

Not only is portfolio risk management important for project success, but it also adds value to projects. The definition of value is defined by the organization or portfolio manager (Laursen & Svejvig, 2016), but overall, studies have shown that portfolio risk management creates an objectively measurable value for project success (Liu et al., 2019; Pimchangthong & Boonjing, 2017). Research on how risk management creates value and what is considered effective practice is still limited.

Project Portfolio Governance

Portfolio governance is an essential element of PPM. Project portfolio governance involves multiple layers and encompasses the governance of the organization and its relationship to the project (Müller et al., 2016; Musawir et al., 2020). Portfolio governance includes framework and guidelines created by the governing body to guide portfolio management activities and make decisions about investments and priorities for the portfolio. Similarly, Müller et al. (2016) state that project governance describes the interactions between project participants and the processes can significantly influence the engagement of the stakeholders and their trust in the project. Interest in project governance has been increasing over the past few years because implementing effective portfolio governance has been shown to define the future success of a project (Müller et al., 2016; Samset & Volden, 2016). Research in project portfolio governance has also shown to maximize project value by establishing structures, roles, and responsibilities within the organization (Riis et al., 2019; Sergeeva, 2019). The recent studies from 2019-2023 have provided evidence for the value of portfolio governance.

Portfolio governance has also shown to be important in the creation of value for the organization and society. Derakhshan et al. (2019) emphasizes the importance of the social aspect of decision making in creating value, suggesting that governance should take a stronger focus on the needs of internal and external stakeholders who can be influential decision makers. It is important for organizations to build a trusting and transparent relationship with both internal and external stakeholders to optimize the decisions made. Despite recent studies, project portfolio governance is still a new field that requires more research.

Sustainability in PPM

Sustainability within PPM has also been studied and the methods have applied sustainable criteria to improve the quality of the scope of the project portfolio. Sustainability principles in PPM include economic, social, and environmental considerations (Mohagheghi et al., 2019). Sustainability within PPM refers to the processes involved in the balancing of social, environmental, and economic aspects of project-based work (Silvius, 2021). Organizations should strategically shape their portfolios by finding a balance between taking proactive steps and maintaining a passive stance toward sustainability. The goal of sustainable PPM is to meet the current needs of stakeholders without compromising or overburdening future generations. PPM involves both individual and organizational responsibility. One of the most important global project management trends includes sustainable project management (Silvius, 2021). A large amount of current literature defines sustainability based on the United Nations' definition (Aghajani et al., 2023). The United Nations defines sustainability as "development that meets the needs of the present without compromising the ability of future generations to meet their own needs" (The United Nations, 1987, p. 41). The United Nations definition of sustainability has been adopted and incorporated in PPM to balance economic, social, and environmental sustainability processes for projects.

The benefits of incorporating sustainability within organizations include improving the organization's ability to withstand challenges and improve the long-term performance in changing markets by aligning strategic sustainability goals with project delivery through PPM (Lotfian Delouyi et al., 2021). There have been several studies published on the implementation of sustainable project management and PPM (Ma et al., 2020; Mohagheghi et al., 2019; RezaHoseini et al., 2020; Villamil & Hallstedt, 2020). Mohagheghi et al. (2019) recommended a project portfolio selection framework for creating project portfolios based on the stainability principles. The project portfolio selection framework included the net present value as the economic principle, life cycle assessment as the environmental principle, and workers' conditions as the social principle.

Ma et al. (2020) proposed a multi-criteria project portfolio (M-CPP) selection approach that involves a fuzzy logic model based on the TOPSIS approach. The M-CPP approach considers profitability, environmental impact, and a set of social indicators to select the most sustainable projects based on the organization's strategic goals. RezaHoseini et al. (2020) proposed a hybrid MCDM approach for ranking, scoring, and calculating the sustainable efficiency of projects. Using the hybrid MCDM allows business leaders to select project portfolios based on sustainability indicators. In PMI PPM governance, there has been an increase in the significance of sustainability integration in strategic planning and PPM decision-making (Villamil & Hallstedt, 2020). The PPM governance process involves organizing the organization's strategy and structure to address the sustainability demands of stakeholders.

Villamil et al., (2022) proposed a novel method for implementing a strategic sustainability perspective in the product portfolio process. They recommended that portfolio managers or decision makers: (a) introduce sustainability early in the product innovation process, (b) applying back casting from a vision of success that is framed by basic principles for sustainability to ensure that a long-term strategic perspective is included in the product portfolio process, (c) use a risk management approach to understand and manage the dynamic interplay between sustainability aspects and business implications, (d) recognize that uncertainty is neither good or bad, (e) ensure that the organization is not too passive or too proactive in relation to sustainability which can result in low threats and high opportunities, and (e) adjust portfolio selection criteria accordingly.

Research on PPM sustainability is still limited. Literature from 2019 to 2025 shows that there is limited guidance on how to operationalize sustainability policies and goals of organizations. There is no standard process for the integration of business sustainability practices within the organization or within the standard of project management (Silvius, 2021). Therefore, it is the responsibility of the project management or portfolio management team to determine how to implement sustainability practices.

AI

Modern innovative technology is used to accelerate a company's growth and to substantially increase their profits. In general, the use of PPM information systems has been beneficial for organizations. AI use in the pharmaceutical industry has improved the overall life cycle of the product (Paul et al., 2021). AI has been positively associated with the quality of the PPM process and with the success of the portfolio (Kock et al., 2020). AI and big data have exploded in the last few years and will transform the field of project management in general. AI is being used in multiple industries to improve profits, to speed up laborious work, and to accelerate business growth (Marchinares & Aguilar-Alonso, 2020). AI is an umbrella term that encompasses many subfields. AI is defined as computers having the overall ability to emulate human thought and perform tasks in real-world environments (Rao et al., 2021). Subfields of AI include machine learning, natural language processing, robotics, computer vision, optimization, automated planning, and scheduling (Rao et al., 2021). AI uses technologies and algorithms that enable systems to identify patterns, make decisions, and improve themselves through experience and data (Jakhar & Kaur, 2019). Classic portfolio optimization approaches, such as the Markowitz (1952) approach and MCDM methods, have challenges that are rooted in their general rigid structure and in estimating return and variance-covariance inputs (Bartram et al., 2019). AI tools can address these challenges by creating more accurate estimates of expected returns and replacing the variance-covariance matrix with more robust structures thereby increasing efficiency, accuracy, and compliance (Bartram et al., 2019; Jakhar & Kaur, 2019; Marchinares & Aguilar-Alonso, 2020). This is especially useful in project management and PPM.

AI has been used within project management including PPM. Use of AI in the field of project management practice can improve the quality of decision-making by providing more insight and support into possible outcomes (Hussain et al., 2023; Ong & Uddin, 2020). This can result in construction of an optimal portfolio through a quantitative and systematic method. AI can provide better selection and prioritization of projects which can result in selection of projects with higher chances of success and an improved balance in the project portfolio (Nieto-Rodriguez & Vargas, 2023). AI can be used to select portfolios based on projects or portfolios that maximize return, reduce risk, and minimize cross-correlation between assets in a portfolio.

Traditional project portfolio governance has often relied on manual oversight, static reporting structures, and routine performance assessments (Ayeni, 2025; Faheem et al., 2022). However, AI has improved the field of project portfolio governance. Project portfolio governance that uses AI introduces real-time monitoring, automated compliance enforcement, and predictive decision-making (Ayeni, 2025). Therefore, AI enhances project execution efficiency. The benefits of using AI governance models are that the models continuously learn from historical project data and refine execution strategies and adapting governance policies based on real-time insights (Ayeni, 2025). AI governance tools have the ability to predict and prevent governance failures by analyzing project execution patterns and flagging potential compliance breaches before they occur which can improve overall performance (Bhasin et al., 2024). Continual advances in AI provide methodological and technological capabilities to solve project portfolio governance challenges.

AI can be used in risk management by using big data predictive analytics methods to study the risks associated with projects (Owolabi et al., 2018). Owolabi et al. (2018) analyzed the risk items in public-private partnership projects to predict the delays and impacts on project completion using five machine learning related techniques: linear regression, decision tree, random forest, support vector machine, and neural network. Okudan et al. (2021) used a machine learning approach via cased based reasoning and developed a project risk management tool that provides risk identification, analysis, response, and monitoring. This tool has the potential to enhance the effectiveness of risk management, however, this study focused only on construction projects. These studies can be implemented by project portfolio managers to potentially improve and enhance risk management plans.

Financial management plays a critical role in managing project portfolios. According to the Standard for Portfolio Management (Project Management Institute, 2017), portfolio financial management encompasses activities such as identifying the portfolio's financial sources and resources, establishing the general portfolio budget, and monitoring and controlling costs throughout the duration of the portfolio. This is important for the portfolio selection and optimization, governance, value management, and risk management process. Several software exists to improve phases of project management such as resource allocation or automating the budget and time for projects to optimize resources (Ahmed et al., 2022; Hussain et al., 2023). In addition, the use of AI allows smart machines to revise and update investment strategies automatically by learning from previous experiences. Machine learning uses experiences such as cost spending patterns and applying it in new situations such as forecasting the final project cost (Willems & Vanhoucke, 2015). Narbaev et al. (2023) used machine learning to enhance the reliability in project cost forecasting by using an A XGBoost forecasting model that they developed. The model resulted in more accurate estimates at the early, middle, and late stages of the project execution. This allows the user to detect early warning signs which results in more effective cost control. Elmousalami (2020) implemented AI, specifically machine learning, to support decision-making at the early stages of projects that mainly involved conceptual cost estimations. Uncertainty factors were incorporated into Elmousalami's proposed models using fuzzy theory. Results showed that machine learning showed performance superiority and improved the overall prediction of performance. The use of AI helps to eliminate unnecessary and redundant information.

While there are many benefits to using AI within PPM, there are also risks and limitations associated with its use. One of the major challenges of AI adoption is the lack of experienced technical staff and training to implement and operate AI systems and processes (Paul et al., 2021; Prifti, 2022). Organizations may need to increase the number of employees to meet the requirements and challenges of this new method of PPM. In addition, implementation of AI technology can be costly and may be costly in order to gain access to data from various database providers (Paul et al., 2021). Even if the implementation of AI technology is successful, AI cannot be a substitute for human creativity. The field of project management involves complex decision-making, strategy, and communication skills which AI cannot currently carry out (Paul et al., 2021). Humans can think and have emotions; therefore, decision making can be creative. Another risk of AI is the potential to introduce bias. AI algorithms can incorporate biases from the data it is trained on which can result in biased decision-making (Paul et al., 2021; Schwartz et al., 2022). This can result in inaccurate resource allocation, biased risk assessments, or distorted decision making in PPM. AI in PPM can also have ethical and legal concerns. These include concerns with privacy, data security, and compliance with regulations (Stahl, B.C. et al., 2021).

Agile PPM

With the ever-evolving landscape of the economic environment, an organization's ability to adapt to the changes has become a critical survival necessity. Traditional PPM frequently fails to achieve an organization's goals, encounters challenges with delayed project portfolio timelines, and lacks effectiveness for an organization's ability to react flexibly at short notice (Hoffmann et al., 2020). An organization's flexibility plays a significant role in unpredictable, dynamic, and competitive environments because flexibility allows organizations to respond quickly to changing regulations, changing market demands, and evolution of technology (Farnese et al., 2016). The need for flexibility led to the integration of agile approaches to project management. Agile Project Management (APM) can be defined as an iterative project management approach throughout a project life cycle that allows organizations to adapt and react to changes

(Rasnacis & Berzisa, 2017). Agile approached in portfolio management has shown to have positive outcomes for achieving fast time-to-market, increasing team productivity, and improving overall communication (Suárez-Gómez & Hoyos-Vallejo, 2023). Kaufmann et al. (2020) showed that agile capabilities through emerging strategy recognition had a positive influence on portfolio success. There has been various recent literature that aims to provide methods, frameworks, and theories to successfully establish agile PPM. Horlach et al. (2019) proposed six design principles for achieving four design goals to establish an effective agile portfolio management system. Agile methods have been successfully implemented in smaller companies (Niederman et al., 2018). Since success was shown in small companies, there was interest in implementing agile PPM strategies in larger organizations and scaling up agile PPM to large project portfolios. However, studies have shown that it is difficult to implement scalable agile frameworks in PPM and achieve successful agile transformations (Conboy & Carroll, 2019; Marinho et al., 2021). The fundamental barriers to scaling agile methods to larger project portfolios include challenges specific agile methods, obstacles with the products and processes, organizational issues, managerial issues, customer issues, and team issues (Santos & de Carvalho., 2021). Factors that contribute to successful implementation of agile approaches in project management include continuous resource monitoring & improvement, flexible workflow, stakeholder participation, facilitated communication, and receiving requirements during the project which accelerate responding to the changes through a repetitive and incremental process based on continuous learning and short-term planning (Arefazar et al., 2019). Suárez-Gómez and Hoyos-Vallejo (2023) proposed a conceptual framework that provides recommendations to transition towards agile PPM for large organizations in Latin America. Agile approaches in PPM can have a positive impact on overall project success.

Organizational and Portfolio Ambidexterity

The successful implementation of PPM strategies has been shown to contribute to the organization's ambidexterity. Organizational ambidexterity was first coined by Tushman and O'Reilly in 1996. Organizational ambidexterity refers to the organization's ability to be efficient while also adapting to future demands (Kassotaki, 2022). The premise of organizational ambidexterity is that it advocates for engagement in exploration and exploitation of projects and portfolios at the same time to drive innovation. Ojiako et al. (2023) show that efficient PPM can enhance organizational ambidexterity to drive project performance and success. Organizational ambidexterity is an important element in enhancing organizational innovation and can be achieved through improved project and portfolio management processes (Si et al., 2022). Ambidextrous capabilities allow organizations to effectively manage projects to enhance performance of an innovative project portfolio.

There is limited literature about how to put organizational ambidexterity into practice and how to balance the exploration and exploitation of project portfolios. Linhart et al. (2020) developed a decision model to assist organizations in selecting and scheduling exploration and exploitation projects. Doing so would allow the organization to become ambidextrous. The proposed decision model by Linhart et al. (2020) is derived from knowledge on PPM and value-based management. In addition, their decision model determines the value of project portfolios based on their contribution to the long-term firm value.

Specifically, alliance portfolio ambidexterity enhances performance to a greater extent than general PPM. Alliance portfolios are portfolios that are managed and engaged by multiple organizations (Micklus & Muntner, 2019). There has been an increase in R&D alliances to establish a diversified portfolio of pharmaceutical products (Micklus & Muntner, 2019). However, greater than 50% of new product alliances do not meet their objectives (Chakravarty et al., 2020). Mani et al. (2022) found that alliance portfolio ambidexterity leads to better outcomes than portfolio exploitation or exploration. Alliance portfolio ambidexterity allows organizations to balance and learn from both portfolio exploitation and exploration. Mani et al. (2022) recommends that managers should maintain a moderate level of alliances within and across product-markets to reduce the risk of excessive alliance portfolio exploitation and exploration.

One of the ways to balance portfolio exploration and exploitation and achieve innovative portfolio ambidexterity is by implementing design thinking for innovation (DTI). Design thinking innovation is the use of design methods and tools to solve innovation challenges (Micheli et al., 2019) and has emerged as a way for organizations to develop innovative portfolios. Adapting portfolios to ambidexterity can be challenging in practice. However, Randhawa et al. (2021) has proposed several steps to achieve an innovative ambidextrous portfolio: (a) creative problem-solving, (b) sprint execution, and (c) creative confidence. These steps enable the organization to drastically transition to an ambidextrous innovation portfolio.

Transition

There are significant positive implications of PPM strategies in the pharmaceutical industry in advancing public health. The results of my study may play a role in contributing further insight into the field of PPM within the pharmaceutical industry. Section 2 will cover details regarding the study methods and data analysis. Section 3 will cover the study findings and its application to professional practice and implications for change.

Section 2: The Project

This section includes details regarding the methodological elements, and the research design used in this study. It describes the approach taken to collect, analyze, and interpret the data.

Purpose Statement

The purpose of this qualitative, pragmatic inquiry study was to explore successful PPM strategies that drug project portfolio managers use to contribute to business success. The target population was drug portfolio managers within the United States that are employed at any of the top 50 pharmaceutical companies. The top 50 pharmaceutical companies are ranked based on the company's reported annual revenue for 2024 (Dunleavy, 2025. This study may contribute to improving drug portfolio management by improving project decision making, reducing risk, and accelerating product development timelines which can shorten the timeline to bring lifesaving treatments to the market.

Role of the Researcher

I performed the role of the researcher in this study and acted as the primary instrument for data collection. In qualitative studies, the role of the researcher involves the uncovering of the thoughts, experiences, and feelings of the study participants and analyzes the findings (Yin, 2018). Data can be collected from observations, interviews, and/or reviews of documents such as surveys or questionnaires (Lobe et al., 2020; Nassaji, 2015). Since the researcher is the primary instrument for data collection in a qualitative study, it is critical to reduce any potential bias. A researcher has the potential to introduce bias into the study by skewing the data and results of a study. The researcher's ideas, knowledge about the topic from the literature review, motives, and expectations can impact the data collected and threaten the study's validity and reliability (Galdas, 2017; Lobe et al., 2020). Therefore, a researcher must monitor and limit their impulse to interpret the data too quickly. I work in the pharmaceutical industry which had the potential to introduce bias into my study since I have prior knowledge of R&D project management and drug development. To reduce bias, I did not include any participants that are employed at my company. Bias can also be introduced during the interview with the participants where I can subconsciously influence the responses of the participants (Qu & Dumay, 2011). Specifically, unstructured interviews may be prone to biased questions due to their free-form nature and are open to multiple biases in answer interpretation (Bergelson et al., 2022). To avoid this, I used a semistructured interview protocol to provide step-by-step instructions to ensure that the interview is conducted properly and consistently.

As a researcher, ethical standards must be observed to ensure the protection of human participants of research studies. I adhered to ethical requirements per the Walden University Institutional Review Board (IRB) and the *Belmont Report*. The *Belmont Report* includes the following basic principles: respect for persons, beneficence, and justice (Office for Human Research Protections, n.d.). By adhering to these standards, unethical practices can be prevented, and preservation of the participant's rights can be maintained.

Participants

The participants that are included in this study were selected using a specific set of criteria. I included individuals in the U.S. who manage project portfolios that include a pharmaceutical product that has been sold on the market. The criterion for participants included: (1) serving in roles designated as project manager, portfolio manager, or individuals in leadership positions, (2) having experience in drug development, and (3) having at least 5 years of experience and (4) being employed at one of the top 50 pharmaceutical companies based on the company's reported annual revenue for 2024. To avoid introducing bias, I will not include any participants that are employed at my company. Participants were recruited through the Healthcare Businesswomen's Association (HBA), PMI Chapters, Linked-In®, and the Walden University participant portal.

Participants will be recruited through the HBA and PMI chapters. Researchers being known or have personal contacts in an organization can act as facilitators to recruitment (Eide & Allen, 2005). The HBA is a global network of female and male professionals that work within the healthcare industry which includes the pharmaceutical industry. The PMI chapters are volunteer-run communities that allow individuals to connect to other project management professionals. The HBA and PMI are sponsored by companies within the industry, have local chapters that meet in person, and have a large online presence. I am a member of the HBA and PMI and posting on the message boards will bring awareness about the study. To reach participants beyond these organizations, I can utilize snowball sampling. Snowball sampling uses already involved individuals to reach out to other potential participants (Saunders et al., 2015). The participants identified from the HBA and PMI can identify more potential participants.

I used the social media platform, Linked-In®, to identify participants for this study. Social media is a promising resource to identify and recruit potential participants for research studies involving humans (Gearhart, 2015). According to a 2024 report by DemandSage (2024), 61% of the global population in 2024 (4.95 billion users) use social media, and social media users are forecasted to continue to increase (Shewale, 2024). Therefore, I was able to reach a wide population of potential participants. Linked-In® was also used as a source to find potential participants.

To build trust and provide transparency with the participant, it is my responsibility as a researcher to fully inform the participants about the study prior to their participation by using an informed consent form (ICF). Several important elements facilitate building rapport between the researcher and the participant. These elements include being respectful, trustworthy, credible, and flexible with scheduling (Negrin et al., 2022) and a thorough ICF process (Eyal, 2012). Once participants agree to join the study, the relationship between the researcher and participant will be important. Obtaining rich data will depend on several factors such as the relationships built and maintained between the researcher and the participant, how the researcher conducts the interviews, and interactions with the study participants (McKenzie, 2019; Saunders et al., 2015). The interview protocol will serve to consistently collect rich data that aligns with the research question and ensure that the interview protocol feels like a conversation while remaining on track.

Research Method and Design

Research Method

Selecting an appropriate research method is a critical element of conducting research studies. A research method describes the researcher's approach to the study to ensure reliable, valid results that address their goals and objectives (Saunders et al., 2015). I chose a qualitative research approach for my doctoral study. The qualitive research method answers the "hows and whys" whereas the quantitative method involves the "how many or how much" (Saunders et al., 2015; Tenny et al., 2022). A qualitative method can involve only qualitative data, or it can also include quantitative data. A qualitative research method that incorporates a quantitative aspect is called a mixed-method approach (Holton & Burnett, 2005; Saunders et al., 2015). Quantitative methods, which include the mixed method, will not be used in my study. Therefore, a qualitative research approach was most appropriate because I will be obtaining the participants' experiences, perspectives, and behavior as it relates to PPM through semistructured interviews.

Qualitative research involves a deductive, inductive, or abductive approach. The deductive approach tests an existing theory using qualitative processes. It involves using theoretical propositions to test their applicability in the study, to build and verify an explanation (Yin, 2018). The desired themes to examine would be linked to existing theory. The process will involve an attempt to build an explanation in increments by testing and refining a predetermined theoretical proposition. For my study, I will be using a deductive qualitative study method since my study is theory driven, and I will adopt a theoretical position that I will test through the collection of data. In contrast, the inductive approach allows meanings to develop from data collected to discover patterns and relationships to build a theory (Saunders et al., 2015; Yin, 2018).

The inductive approach does not prevent the use of existing theories to formulate a research question and to identify concepts in the research process. Therefore, the inductive approach does not fit my research goals and is not appropriate. Lastly, the abductive approach involves collecting data to identify themes, explore a phenomenon, and describe patterns to change an existing theory (Dubois & Gadde, 2002). The modified theory is then tested through additional data collection where inductive conclusions are created, and deductive conclusions are iteratively tested throughout the study (Saunders et al., 2015). I will not be doing this for my study; therefore, the abductive qualitative approach is not an appropriate choice.

Research Design

I conducted a pragmatic inquiry rather than case study, narrative study, or phenomenology research design. Multiple participants who have a minimum of 5 years of experience in portfolio project management in the pharmaceutical industry were invited to participate in my study. The rationale for conducting a pragmatic inquiry is to understand the project portfolio manager's experience, strategies, and decision making when it comes to managing project portfolios. Overall, a pragmatic inquiry approach was the most appropriate way to achieve my study goals.

A case study was not suitable for my research goals. A case study design involves multiple methods of data collection and involves an in-depth study of a phenomenon

(Yin, 2018). A multiple case study is used to assess whether findings are identified across cases. Participants are carefully chosen based on the expectation that similar results are predicted to be produced from each one. A multiple case study results in strong support for the theoretical propositions on which these predictions were based (Yin, 2018). There are different types of case studies such as embedded or holistic. Embedded multiple case studies are defined as research conducted within multiple organizations that examine several logical sub-units within the organization (e.g., departments or work groups) (Yin, 2018). Conversely, holistic case studies are concerned only with organizations as a whole (Yin, 2018).

The phenomenological research design was not appropriate for my study. Phenomenological research involves examining participants' lived experience; the participants' recollections and interpretations of those experiences (Heidegger, 2005; Saunders et al., 2015; Tenny et al., 2022). Phenomenology concentrates on describing and explaining an event or phenomena from their perspective which does not suit my study purpose.

A narrative research design asks participants to provide a complete narrative of their experience. The goal of a narrative research design is to preserve chronological connections and the order of events described by the participant to enhance understanding and help with the analysis (Saunders et al., 2015; Tenny et al., 2022). My research does not focus on understanding how people make sense of their experiences, therefore, a narrative approach is not suitable.

A pragmatic inquiry study requires collecting enough data to ensure data saturation. Data saturation is considered achieved once any additional data collected provides minimal to no new information or suggests new themes (Hennink & Kaiser, 2022; Saunders et al., 2015; Tenny et al., 2022). I analyzed the data once each participant completed the interview. Data saturation was achieved and verified by conducting one confirmatory interview.

Population and Sampling

To answer the research question, I must select the most appropriate sampling technique. In this study, purposive sampling and snowball sampling will be used. Combining snowball and purposive sampling is advantageous because it allows wider access to the target population (Parker et al., 2020). Purposive sampling allows the selection of cases that will best answer the research question and to meet the study objectives (Saunders et al., 2015). Purposive sampling is commonly used when the sample size is small and when the cases that are selected provide the most information (Neuman, 2014). Specifically, a homogenous purposive sampling technique will be employed. Homogeneous sampling concentrates on a specific subgroup in which all the participants are similar (Saunders et al., 2015). In the case of this study, the specific subgroup will include project portfolio managers within the pharmaceutical industry.

In addition, snowball sampling may also be used. Snowball sampling includes contacting a couple of cases within the population and asking these cases to identify more cases (Saunders et al., 2015). Snowball sampling is one of the most common methods of sampling in qualitative research that leverages the characteristics of networking and referrals (Parker et al., 2020). The participants that are identified for this study through social media and the identified organizations will be asked to identify any other potential participants that would be interested in joining the study. By having a wider reach for participants, data saturation should be achieved. Based on recommendations from Creswell and Poth (2016) for research questions that have a wide range, a minimum of five semistructured interviews are appropriate to achieve data saturation. However, I will continue to conduct interviews until data saturation is reached. Data saturation will be verified by conducting one to two confirmatory semistructured interviews.

The participants selected for this study will include project portfolio managers employed at a top 50 publicly owned U.S. pharmaceutical company based on the annual revenue reports for 2024 and has at least one product on the market. Each participant will have at least 5 years of experience managing project portfolios. Project portfolio managers play a crucial goal in determining the success of the project portfolio (Butler, 2022; Project Management Institute, 2017). Therefore, obtaining data from the project portfolio managers will help answer the research question and identify the strategies for PPM that contribute to business success.

Once participants consent to joining the study by signing the informed consent form, then semistructured interviews will take place. The interview will be scheduled at a convenient time for the participant through the Microsoft Teams® or Zoom ® application. The semistructured interview will follow an interview protocol. Traditionally, qualitative studies often utilized in-person interviews with the research participants (Gill & Baillie, 2018). However, with the ongoing evolution of technology and the COVID-19 pandemic thrusting forward the use of remote technology, interviews can be conducted via video conferencing to collect data (Gill & Baillie, 2018; Santhosh et al., 2021). Video conferencing is convenient for both the researcher and participant, is a cost-effective option, is time efficient, reduces geographical obstacles, and can be helpful in accessing 'hard to reach' participants (Gill & Baillie, 2018; Santhosh et al., 2021). As such, semistructured interviews in this study will be conducted via video conference through the Microsoft Teams or Zoom application.

Ethical Research

The protection of study participants is one of the highest priorities when it comes to research. This requires that the researcher obtain the legally effective informed consent of the participant or the participant’s legally authorized representative unless the research study is exempt or it meets specific criteria to be waived (Office for Human Research Protections, n.d.). The informed consent process begins with a discussion with the participant about the study by going through the informed consent form (Appendix A). Time was allotted during the pre-interview communication and during the interview to answer any questions and address concerns from the participant.

This study is purely voluntary and does not include any incentives or direct benefits. Walden University’s ethics approval number for this study is 06-20-24-1106601. Once a participant expressed interest in participating in the study, the informed consent form was emailed to the participant for them to thoroughly review. Informed consent was confirmed through an email from the participant stating, “I consent.”. While they are participating in the study, their privacy is protected throughout the study. I will explain that participants can withdraw at any time from the research without having to provide a reason or experience any consequences. The process for withdrawing from the research study requires a written request via email from the participant that they are longer interested in participating. The identity of participants that withdraw will also be protected.

Governance and security regarding data privacy is essential to protect individuals. The purpose of governance and security regarding data privacy is to prevent misuse and to respect individuals and their rights (Gefenas et al., 2021). The participant's identity was kept confidential within the limits of the law. Their personal information was not used for any purposes outside of this research project. Participant identifiers such as name or address were not included in the study reports. If the dataset needs to be shared with another researcher in the future, then it would contain no identifiers so this would not involve another round of obtaining informed consent. Participant data were kept secure by maintaining data security measures such as using password protection, data encryption, use of codes in place of names, storing names separately from the data, and discarding names where possible. Data will be kept for a period of at least 5 years, as required by Walden University.

Data Collection Instruments

There are multiple methods for qualitative study data collection. For my research study, I will be collecting data through virtual interviews with participants via Microsoft Teams® and Zoom®. I will specifically be conducting semistructured interviews. Semistructured interviews involve a list of themes and key predetermined questions to pose to the participants (Saunders et al., 2015). This method gives the participants the opportunity to provide more detailed information and reflect conversational exchange like that in a real-world setting (Jennings, 2005; Saunders et al., 2015). A semistructured approach helps to prevent inadvertent leading questions and potentially prevent discomfort among the participants from spontaneous questions. Using semistructured interviews was most suitable for my study because it combines both elements of structured and unstructured interviews. Semistructured interviews have the advantages of both structured and unstructured interviews which can provide comparable, reliable data, and the flexibility to ask follow-up questions (Jennings, 2005; Saunders et al., 2015). These follow up questions can provide more detail and richer data.

I completed the semistructured interviews by following an interview protocol. The interview protocol provides guidelines and detailed instructions on how to perform the interview properly (Braaten et al., 2020). This includes preparation of questions, topics to be discussed, what information should be revealed during the interview, etc. The interview protocol is used to help build quality and consistency in data collection. The use of semistructured interviews can also increase the credibility and validity of the study. The interview protocol will contain: (a) instructions for the interviewer, (b) main research questions to be asked, (c) probes to follow the questions, (d) transition scripts for the interviewer, and (e) space for recording the interviewer’s comments and notes (Appendix B).

There are some disadvantages to using a semistructured interview for data collection. The flexibility of semistructured interviews can contribute to a decrease in validity (Jennings, 2005; Saunders et al., 2015). It can be challenging to compare responses due to lack of standardization in semistructured interviews, and data can be challenging to compare between participants depending on how much the researcher deviated from the predetermined list of questions. In addition, there can be concerns about the reliability and dependability in the semistructured interview due to issues of personal bias (Saunders et al., 2015). Bias in semistructured interviews can be introduced by the interviewer through interviewer errors, tone, or non-verbal behavior and by the interviewees' perceptions about the interviewer (Saunders et al., 2015). To mitigate the potential biases, researchers should consider cultural differences that may affect my discussion with the participant, clarify what is important and what is not, and show what should be followed up and explored (Braaten et al., 2020; Sauders et al., 2015). The involvement of participants verifying the accuracy of the transcripts increases the validity of the data (Braaten et al., 2020; Sauders et al., 2015). This verification process is called member checking. Therefore, once interviews were completed, I had participants validate a summary of my interpretation of their interview and allowed them to review, verify, and provide feedback on how I interpreted their input. Once the interview was completed, I prepared a summary of my interpretation of the participant's interview and sent it to them via email for their review, and to make any necessary revisions.

Data Collection Technique

I collected data using the interview protocol (Appendix B). I introduced the study and explained its goals to the participants. I confirmed that each participant had provided consent to be part of the study prior to beginning any study activities. Each participant was asked several questions regarding the PPM strategies they used. Probing questions were used to further explore the participants' experiences in managing project portfolios. Probing questions during semistructured interviews can allow researchers to collect rich and deep data from participants (Robinson, 2023). I concluded the interview by allowing participants to ask any questions, and I expressed my appreciation for their time and involvement in the study.

Data Organization Technique

The data that was collected will be organized to facilitate analysis and discover any meaningful insights. The lack of data organization methods can be an obstacle for the analysis process which can reduce the value of the outcomes (Williams & Moser, 2019). Therefore, all data and documents were securely tracked and maintained using Microsoft Excel. I saved all the video-recorded interview files in one location. The file naming convention for tracking saved interviews and documents included the document name, date, identifier, and source. The raw data (i.e., the recorded interviews and observation notes) were transcribed verbatim so the text could be edited and coded for analysis. A reflective diary and observation notes were captured using Microsoft Word or Microsoft Excel during the interviews. The verbatim transcription method captured every spoken word or sound from the participant and serves as an accurate record of the conversation (Lester et al., 2020). The raw data files are securely stored on a password protected personal computer for 5 years and will be deleted after 5 years. The individual files are also password protected.

Data Analysis

Once the data were collected, it was properly organized and was analyzed using Braun and Clarke's (2006) thematic analysis method. The qualitative data analysis process involves analyzing and interpreting the data that has been collected to uncover themes and patterns (Lester et al., 2020; Saunders et al., 2015). For my study, the data were coded for each participant and thematic analysis was completed using Microsoft Excel®. Coding data is the process of assigning meaning to a short, descriptive word or phrase to the data of interest (Lester et al., 2020). To understand how the codes relate and differentiate from one another, it was organized into categories. Categories are comprised of individual codes that are related to each other analytically or conceptually (Lester et al., 2020). The categories were then brought together to create themes that align with the conceptual or analytic goals of the study.

Data analysis was also done through data triangulation. In qualitative research, data triangulation involves using multiple sources of data to cross-verify findings and strengthen validity (Donkoh, 2023; Tavallaei & Abu Talib, 2020). Data triangulation was achieved through two methods: (a) data from semistructured interviews and (b) comparison of results to the literature review. Different types of participants who are all connected to my research topic were interviewed. All the participants that were included in the study managed project portfolios, but they managed them in various capacities. For example, participants managed project portfolios from a regulatory, chemistry manufacturing and control, and clinical trial perspective and participants had various titles such as director or manager. By interviewing a diverse group of project portfolios managers related to my research topic using the same semistructured interview method, it allows me to cross-compare different perspectives about strategies used in PPM. In addition, the data results were compared to the existing studies on the same topic. Triangulating my semistructured interview findings by comparing them with current literature creates a stronger and more credible study.

Reliability and Validity

Reliability

The credibility of a research study depends on various factors. One of the ways to establish credibility and dependability for a research study is to demonstrate reliability (Saunders et al., 2015; Yin, 1994, 2018). A reliable research study is defined as the study being replicable and producing the same results (Saunders et al., 2015; Yin, 1994, 2018). However, my study used semistructured interviews which are not always meant to be replicated since they reflect the situation at the time they were collected. These situations may change in the future which would prevent replication of the study. Despite the challenge of replicability, I continued to conduct semistructured interviews due to the flexibility that allowed me to explore the complexity of the research topic. There are several ways that I was able to enhance the reliability of my study. I maintained consistency throughout my research study by using an interview protocol to ensure that interviews are conducted the same way each time. In addition, I documented how I coded and analyzed the data. This was to ensure consistency through the coding and analysis phase of my study. Achieving data saturation in a study will confirm that the study results and conclusions are reliable (Saunders et al., 2015). Data saturation was explicitly stated.

Validity

The validity of a research study also contributes to its credibility and authenticity. Validity refers to the appropriateness of the methods used, how accurate the result of the analysis is, and whether the findings are transferable (Saunders et al., 2015). Transferability is defined as the ability for a research study's findings to be applicable in other situations or populations (Stahl & King, 2020). While transferability may be limited in my pragmatic inquiry study, the study can be used to test the existing PPM framework and how the study findings relate to it. I took several steps to enhance the transferability of my study. Transferability can be achieved by providing complete details about the study which includes the research question, design, analysis, results, and conclusions (Saunders et al., 2015; Stahl & King, 2020). This will allow the reader to decide whether the study can be transferred to a different situation in which the reader is interested in.

Another method to enhance the validity of my study was to keep a reflective diary. Using a reflective journal throughout a qualitative study allows documentation and transparency about the researcher’s biases, experiences, perspectives, and feelings which contributes to the credibility of the study (Jasper, 2005; Saunders et al., 2015). The reflective journal also provided an audit trail of the research design. This enhances the transparency of the research process (Jasper, 2005; Saunders et al., 2015).

Additional ways that increased the validity of my study are to follow the interview protocol to ensure consistency in the interview process. Following the interview, I transcribed the discussion using the transcription function on my audio recording mobile application or I used the Microsoft Teams ® transcribing function and allowed the participants to check the transcripts and notes for accuracy. By allowing participants to confirm the accuracy of the interview transcripts and observation notes, the quality of my research was enhanced (Saunders et al., 2015). Once the data collected was verified by the participant, then consistent process for theming and analysis were applied.

Transition and Summary

While there are many extant studies published regarding various aspects of PPM, there are still limited studies that explore the topics that apply to pharmaceutical industry. The next section will go into detail of my research findings and add to the literature of PPM in the pharmaceutical industry.

Section 3: Application to Professional Practice and Implications for Change

Introduction

The purpose of this qualitative, pragmatic inquiry study was to explore successful PPM strategies that drug project portfolio managers use to contribute to business success. Identification of successful strategies may help portfolio project managers manage complex pipelines and accelerate the time it takes for pharmaceutical products to make it to market. Through qualitative data analysis, several key themes emerged that directly address the research questions. In this section, the results are presented in detail, supported by relevant data and observations.

Presentation of the Findings

The purpose of this research study is to identify the PPM strategies used by project portfolio managers to create successful drug portfolios that contribute to business success. A total of six participants were interviewed for the pragmatic inquiry research study. The participants had an average of 17.75 years of experience in managing a project portfolio and all participants were employed at a top 50 pharmaceutical company ranked based on the company's reported annual revenue for 2024. Four participants worked at a global publicly traded pharmaceutical company and two worked for different privately owned global pharmaceutical companies.

All four interviews were conducted using a digital interface using either Teams, Zoom, or MS Chat. Three out of the four semistructured interviews were conducted virtually through Microsoft Teams or Zoom and were audio recorded. Microsoft Teams had a transcription function that simultaneously transcribed the audio. For interviews that used Zoom, the audio was transcribed using a mobile phone application. All semistructured interview transcriptions were reviewed after the interview for accuracy. I conducted one semistructured interview via chat through Microsoft Teams due to the participant's scheduling conflict and availability. The interview was still completed in real time with the ability for me to ask probing questions. All semistructured interviews lasted 30–60 minutes each.

After data analysis, six key themes were identified: (1a) justification for and use of software tools, (b) identification of key performance indicators (KPI), (c) alignment of business goals across the organization, (d) risk management strategies, (e) leadership behaviors, and (f) budget management.

Theme 1: Justification for and Use of Software

The first theme that emerged from all the semistructured interviews is the justification for and use of software tools when managing a project in each stage of its life cycle. The use of software tools is included in the initiation, planning, execution, monitoring, and optimization phase of PPM life cycle. The most common software tool that is used is Microsoft Project. The type of software tool is also dependent on what the company chooses. Some other common software tools that were used are SmartSheets, SAP software tools specifically for portfolio management, Power Business Intelligence (BI), and Microsoft Excel. All participants noted the importance of using software tools in managing their portfolios. Participant 3 emphasized the value of software tools such as Microsoft Project, "From a tools perspective, I cannot stress enough the value of a project plan/WBS [work breakdown structure] tool such as MS [Microsoft] Project or MS [Microsoft] Teams project planning to organize and visualize multiple project dependencies”. Microsoft Project is a critical tool to keep teams on track and to ensure that timelines are met. The use of Microsoft Project was consistent across all areas of portfolio management including the other themes as well. Based on semistructured interviews with all participants, software used for PPM provides real-time overview of all projects in the portfolio. The software used for PPM was used to track and document project statuses, timelines and milestones, budget and financial management, prioritization and strategic alignment, and risk management. Participant 5 noted that systems and technologies are the tools and not the driver,

> Systems and technologies are, at the end of the day, the tools, not the driver. So, a lot of it is really starting with the mindset changes and people kind of understanding the pace of business. And also, being willing to move beyond what's been historically done.

Therefore, overall portfolio management also involves encouraging the acceptance of change by fostering a shared sense of purpose and through leadership behaviors which is another theme identified.

Correlation to Literature

The justification for and use of software tools is consistent with what is found in the literature. Technology plays a critical role in PPM. Specifically, the literature reveals that AI use within PPM information systems has been beneficial for organizations. The use of AI in the pharmaceutical industry has improved the overall life cycle of product development (Paul et al., 2021). Based on the data collected from the semistructured interviews, participants also agree that software tools are an integral part of PPM.

Correlation to Conceptual Framework

The justification for and use of software theme relates to the PPM framework. PPM includes five core steps: (a) clarify business objectives, (b) capture and research requests and ideas, (c) select the best projects using defined differentiators that align, maximize, and balance, (d) validate portfolio feasibility and initiate projects, and (e) manage and monitor the portfolio (Butler, 2022; Project Management Institute, 2017). The justification for and use of software encompasses all areas of PPM since software is a tool used to achieve each of the PPM steps.

Theme 2: Use of Key Performance Indicators (KPIs)

The second theme that emerged is the use of key performance indicators in PPM. KPIs are defined as metrics that measure how effectively a person, team, or organization is achieving a specific objective (Sanchez & Robert, 2010b). KPIs measure business value and performance of a portfolio. In the pharmaceutical industry, KPIs are used to track the health status of a drug portfolio or measurement of performance from a regulatory submission perspective by a variety of indicators such as cost, schedule, people, and scope. Participant 1 said,

> Generally, management requires that you have key performance indicators that you set them up by function for perhaps even for a portfolio. So, there are specific goals, and they are determined, depending on the stage of the project and so forth. So, that's how, in general, it's done.

Not all participants used the specific term “KPI”, however, some participants described its meaning in their responses instead. Participant 4 said,

> Business value and performance is measured through the estimated value of the individual projects which is tracked in either dollar amounts, or time saved, then confirmed with reality. We also track health status by a variety of indicators like cost, schedule, people, scope, etc.

One of the reported benefits of using KPIs is that it allows the project portfolio manager to use the quality metric to identify issues or gaps. This allows the project portfolio manager to weave in process improvement projects into the portfolio and gain measurable efficiencies.

Correlation to Literature

The use of KPIs is consistent with what is found in the literature. A significant challenge in project portfolio selection for portfolio managers is being able to handle the uncertainty associated with project evaluation. This process involves identifying and selecting the most suitable projects for an organization by considering multiple factors, such as strategic fit, available resources, projected benefits, and potential risks (Mavrotas & Makryvelios, 2021). During the project portfolio selection phase, KPIs help decision-makers choose the right mix of projects that align with strategic goals and deliver the highest value to the organization.

Correlation to Conceptual Framework

One of the core PPM steps is the selection of the best projects using defined differentiators that align, maximize, and balance (Butler, 2022; Project Management

Institute, 2017). In order to achieve this, KPIs are utilized all throughout the PPM. KPIs act as measurable values that bring objectivity to the PPM selection process. KPIs help the portfolio manager or decision maker assess how well each project supports organizational goals, maximizes value, and measures the risk, complexity, and resource demands. Based on these KPIs, the portfolio manager or decision maker can select the selection of the best projects.

Theme 3: Alignment of Business Goals Across the Organization

All participants described the significance of the alignment of business goals across the organization for overall success of the organization. The participants described how they ensure that the project portfolio is aligned with the company's overall objectives and strategy. The organizational objectives and strategies are determined by an executive leadership team. The project portfolios are evaluated on a continuous basis and project portfolio plans are determined by focusing on the goals for the organization's future such as their global footprint or future acquisitions. Beneath the executive leadership team are various business areas. Each of those individual business sections has specific objectives that obviously pertain to the one above them. Participant 2 said,

> So, we've got our corporate folks, we've got business areas underneath them, and then we've got lines of business underneath them that all roll up to the business area. So, each of those individual sections have specific objectives that obviously pertain to the one above them.

Participant 5 said,

> "It starts by the corporate with corporate strategy, and then it translates into our individual priorities, and those divisional priorities are what we work off of for that calendar year…we make sure that we're like aligned with the priorities in the beginning of the year, and then that we have sort of like reviews on quarterly or three times a year basis of, you know, making sure that, like what we set out to achieve, is being realized. And that's kind of done across the organization.

Ensuring alignment and strong communication across the entire portfolio of projects and objectives are critical to overall advancement and identifies any issues that affect other projects from progressing as soon as possible.

Correlation to Literature

Alignment of the project portfolio with the organization's overall objectives and strategy is crucial in portfolio management and spans across all areas of portfolio management. This theme is consistent in what is in current literature. Alignment of business goals across the organization ensures that all departments, teams, and initiatives are working toward a common purpose. Current literature reveals several strategies for project portfolio selection and optimization. Alignment of business goals provides a framework for evaluating and selecting projects based on strategic relevance, making it easier to prioritize and allocate resources efficiently. This prevents the organization from getting sidetracked by low-priority or misaligned projects within a portfolio and establishes a clear focus on initiatives that support strategic priorities.

Correlation to Conceptual Framework

One of the core steps of the PPM framework includes clarification of business goals. All participants described the importance of aligning business goals across their functions. This ensures that all projects within the portfolio align with the organization's overall strategic objectives and ensures that resources (e.g., budget, employees, time) are allocated toward projects that contribute the most to the company's long-term goals and competitive advantage (Butler, 2022; Project Management Institute, 2017). The participants' responses coincide with the PPM framework in that alignment processes are important in achieving organizational goals.

Theme 4: Risk Management Strategies

As part of managing their portfolios, all participants described risk management strategies and their significance. Early identification, assessment, and mitigations of risks to their drug portfolio helps prevent financial loss, delays, or project failure. This safeguards the organization's overall investment in the portfolio. Identification of risks for three participants included attempting to predict potential risks by looking at the competing priorities of our stakeholders along with evaluating previous lessons learned from other drug portfolios. Participant 3 said that to manage risks, she attempts "to 'predict' potential risks by looking at the competing priorities of our stakeholders along with evaluating previous lessons learned". Once risks are identified, all the participants reported evaluating the risks on a routine basis and worked with their team members to identify the risk, probability of occurrence, and the level of impact on the project portfolio. Participant 1 said,

> Define the risk. And I think we've all seen those matrixes where you look at the probability versus the impact and, you know, it's a straight grid where you evaluate, whether it's low, medium high. And then from that grid, you know, again this is kind of just the common way of managing it is to focus on the ones that are medium and high and to develop the mitigations for it.

There were differences in how risk management was implemented as well. Participant 6 had specific risk managers that would lead the day-to-day effort and report back while other participants were directly involved in managing risks themselves. Participant 6 said,

> We rely on the product teams to escalate those risks… But when they get to a situation where they're unable to resolve an issue, they can escalate it so that we can look for a cross-functional, often alignment and understand the obstacles to figure out how to remove them. So, it's really relying on bottoms up kind of a risk escalation.

Correlation to Literature

This theme of risk management strategies is consistent with the current literature. Based on the existing literature, there are several different strategies proposed by multiple researchers for managing risk in PPM. My study findings also reveal that risk management is an important part of PPM in the pharmaceutical industry. Effective portfolio risk management strategies are crucial due to the high cost of development and high risk of failure (Schuhmacher et al., 2021). The participants all described risk management as a routine part of their job. The project portfolio managers identify, assess, and tackle potential threats that could negatively impact their operations or objectives.

Correlation to Conceptual Framework

Risk management strategies correlate to the PPM framework. This theme relates to step 5 of the PPM framework: Manage and monitor the portfolio. Managing and monitoring the portfolio involves maintaining control, adapting to changes, and maximizing value while minimizing threats across all active projects and programs (Butler, 2022; Project Management Institute, 2017). Risks can emerge due to a variety of factors such as resource constraints, budget changes, market trends, or regulatory changes. Risk management ensures routine monitoring for potential issues that could impact the portfolio. Risks are then factored into decision-making when managing the portfolio.

Theme 5: Leadership Behaviors

Another theme that emerged was leadership behaviors used to manage a project portfolio. There were several leadership behaviors that were described as the most important when managing a portfolio. Participant 3 said, “Strategic thinking, influence without authority, driving results, communication, collaboration, and emotional intelligence are all critical to managing a portfolio”. The consensus was that emotional intelligence, good listening skills, and an efficient decision-making process are important leadership behaviors.

Participants 3 and 4 stated that influencing without authority as directing and persuading others to take action whether or not the portfolio manager has formal authority over them. It requires using interpersonal skills, credibility, and expertise to guide and motivate others toward a shared goal. In addition, effective portfolio managers focused on leveraging their teams' strengths to drive overall success. Participant 5 said,

> I actually had a team that was split between those who are more of strategic thinkers and would be very good at sort of taking ideas further and making sure that we kind of like, think through the full spectrum of opportunities for an idea as it's being [presented] and created before it officially becomes the product to having people who are very tactical, who are very, you know, metrics driven, like, very good understanding, I think, of metrics and how to use them and apply them…Sometimes you find unicorns, but it's like, knowing an individual's strengths, background, and experiences allows them to allocate tasks more efficiently.

Correlation to Literature

Current literature has shown that key leadership behaviors that positively impact project or portfolio success include clear communication, relationship-building, and collaborative work compared to task-oriented project leaders on successful construction (Cao et al., 2024; Rehan et al., 2024). All the participants reported leadership behaviors consistent with what is found in current literature. Effective leadership behaviors are critical in PPM because they ensure projects align with strategic goals, optimize resource use, and maximize value delivery.

Correlation to Conceptual Framework

The PPM framework involves prioritizing, selecting, balancing, and managing projects to achieve organizational goals. Effective leadership behaviors directly support each stage of this framework. In addition, these behaviors within portfolio managers help guide decision-making, ensure strategic alignment, and promote transparency and adaptability among teams, and overall success of the portfolio.

Theme 6: Budget Management

Budget management was another theme that emerged. Budget management refers to allocating, monitoring, and optimizing financial resources across all projects in a portfolio to ensure the portfolio is maintained within financial limits. It ensures that the organization's investment decisions align with their business priorities, risks, and expected returns. Part of budget management involves managing the variations between the estimated budget and the actual budget within the portfolio. Each participant reported this activity; however, the process was slightly different for each person.

Budget management involves tracking the actual expenditure and comparing it with the original budget. Participants 1 and 2 reported routine tracking and reporting of the financial status. Their goal is to try to stay under the budget, however, if overspending on their portfolios is expected, then it is communicated with the leadership team. When variances are detected for overspend, then several decisions are made to correct it. Participant 4 reported "tradeoffs in other projects [to account for the overspend], stopping projects, or accepting the variance" and re-baseline the project portfolio budget. Some participants reported that they do not directly manage the budget. Participant 5 said,

> We have an operational Excellence team that's really focused on the like budget and financials. The portfolio manager’s role in this instance is to ensure that they are putting the right investments in the right places and track whether there is significant under or overspend.

In conclusion, managing budget variances in portfolio management requires clear communication with the leadership team and stakeholders, early detection through regular financial reviews and reporting, understanding factors that impact the budget, implementing corrective actions, and adjusting the portfolio as needed.

Correlation to Literature

Budget management strategies and techniques within the pharmaceutical industry are consistent with the current literature. To navigate challenges and strengthen project resilience, project portfolio managers should take a proactive approach by incorporating risk management practices with strong budget allocation strategies. By anticipating potential risks, evaluating their impact on the budget, and establishing contingency plans, organizations can minimize negative effects, enhance project outcomes, and successfully complete projects within defined budget limits (Lofti et al., 2024). Budget management is about cost control, and they aim to maximize the portfolio’s overall value and strategic benefit to the organization.

Correlation to Conceptual Framework

Budget management is a critical part of the PPM framework because it ensures that financial resources are effectively allocated, monitored, and optimized to support the organization’s project portfolios. It enables leaders to select the right projects, prioritize the right investments, balance risks, govern portfolio health, and deliver strategic value while considering the overall financial constraints.

Applications to Professional Practice

The success of the portfolio determines the long-term success of a pharmaceutical organization. The pharmaceutical industry faces continual competitive pressure and increased portfolio complexity, but decision-making remains a challenge for portfolio managers (Bieske et al., 2023). This pragmatic inquiry study sheds light on the best practices used by employees who manage portfolios in pharmaceutical companies that are considered profitable according to the 2024 annual revenue reports. In addition, the results are consistent and aligned with current literature, therefore, my study provides real-world validation of other studies. By understanding best practices, organizations can make better-informed decisions about which projects to invest in, prioritize initiatives that align with strategic goals, and manage resources more efficiently.

Implications for Social Change

My study results may have positive contributions to social change. The amount of newly launched drugs has been shown to reduce mortality and is therefore crucial to the promotion of public health (Lichtenberg, 2018). Promotion of public health has a positive social impact by safeguarding and improving quality of life and the health of individuals and the communities. In addition, improved PPM may contribute to the company's annual revenue which can allow the company to put more funds towards corporate social responsibility (CSR) efforts. CSR is a business strategy in which companies take an active role in positively impacting the world (Barauskaite & Streimikiene, 2020). CSR includes, but is not limited to, providing grants for human rights groups, and being involved in community services projects such as volunteering for the homeless shelter or food bank (Gavin, 2019). By improving business success through effective PPM, the organization can devote more time and resources towards CSR activities.

Recommendations for Action

Based on the findings of this study, I propose several actionable recommendations for individuals who manage portfolios within the pharmaceutical industry. Portfolio managers should leverage technology and tools to streamline tracking, collaboration, and reporting in all phases of the portfolio lifecycle. Another recommendation is to ensure that the portfolio aligns with the established strategic goals. This can be accomplished by implementing routine reviews of projects and portfolios to ensure alignment amongst teams. The routine review of projects and portfolios should also include tracking key performance indicators to monitor their performance. Lastly, I recommend that organizations invest in leadership development and training to build skills such as communication, change management, or strategic thinking.

Recommendations for Further Research

The total number of projects in a portfolio and the proportion of high-priority initiatives can critically impact resource requirements and allocation across programs. An excess of backup or low-priority projects can tie up resources, reducing R&D productivity and jeopardizing the overall success of the portfolio (Bieske et al., 2023; Stockstrom & Herstatt, 2019). My pragmatic inquiry study provides general insight into portfolio management strategies in the pharmaceutical industry; however, further research is recommended. I recommend further research into specific areas of portfolio management life cycle such as planning, project selection, risk management, or portfolio governance to better understand the strategies used in each area. In addition, I recommend including a larger sample size which can be more likely to represent the broader population compared to a smaller sample size. This will allow further insight into more detailed strategies and address the limitations of my research study.

Reflections

While conducting the research study, I was cognizant about reducing any potential bias through member checking, keeping detailed documentation of my work, and conducting data triangulation. However, I did notice the tendency to want to deviate from the interview protocol and ask questions that may ultimately influence the participant’s response. One of the methods I employed was to have the probing questions in front of me and force myself to only use the established probing questions.

Conclusion

I conducted this study using a qualitative, pragmatic inquiry approach to identify the strategies used by my portfolio managers in the pharmaceutical industry that contribute to business success. After data analysis, six themes were identified: (a) Justification for and Use of Software Tools, (b) Identification of Key Performance Indicators (KPI), (c) Alignment of Business Goals Across the Organization, (d) Risk Management Strategies, (e) Leadership Behaviors, and (f) Budget Management. Future work should continue to build on these findings by conducting additional research studies with a specific focus in the pharmaceutical industry. PPM is critical in drug development because it helps pharmaceutical companies efficiently select, prioritize, and allocate resources to the most promising drug candidates. PPM can help improve the chances of bringing effective therapies quicker to the market that can improve quality of life or even save lives. In addition, effective portfolio management strategies can help promote the long-term financial health of pharmaceutical companies which operate in a highly competitive and regulated industry.

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Appendix A: Interview Protocol

Interview Protocol	
What you will do	**What you will say—script**
Introduce the interview and set the stage	I am working on my Doctor of Business degree and will be collecting data for my research study. The purpose of this interview is to get your insights on how you manage project portfolios. The data collected for this study will be used to explore the strategies used to create successful drug portfolios that contribute to business success. Now, I will be asking you several questions. Are you ready?
• Watch for nonverbal queues • Paraphrase as needed • Ask follow-up probing questions to get more in depth	1. What tools and techniques do you use to manage a portfolio in each stage of its life cycle (i.e., initiation, planning, execution, monitoring and control, and optimization)? 2. How do you measure the business value and performance of a portfolio? 3. How do you ensure that the portfolio is aligned with the company's overall objectives and strategy? 4. How do you manage risk within a portfolio? 5. What leadership skills do you use to manage a portfolio? 6. What kind of portfolio governance practices do you or the company implement? 7. How do you develop portfolio strategic objectives? 8. How do you manage the variations between the estimated budget and the actual budget? 9. How do you choose new projects for both short-term cash flow and long-term development? 10. What additional information would you like to share regarding PPM strategies?
Probing Questions	1. Could you please tell me more about…? 2. Could you give me some examples? 3. Can you tell me more about that? 4. What makes you feel that way? · 5. What do you mean by that? 6. How do you feel about that? 7. Why is this important?

	8. How did you decide…? 9. What kind of impact do you think…? 10. Why do you think…?
Wrap up interview thanking participant	The interview is now finished. I greatly appreciate your time today. If you have any questions, please do not hesitate to contact me or you may contact the university. The contact information for the university can be found on the consent form.
Next Steps	The next steps will be for me to transcribe our discussion today and send it to you for review via email. You should receive this email in the next couple of days, and it will include instructions on what to do. Once you receive it, please review it as soon as you can for accuracy.