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Business Administration
Master's Programme in Supply Management

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**OPTIMIZING THE VALUE OF HEALTHCARE SECTOR: DEVELOPING A PPP
FRAMEWORK IN PUBLIC PROCUREMENT**

Master's Thesis, 2021

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Abstract

Title:	Optimizing the value of Healthcare Sector: Developing a PPP Framework in Public Procurement
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Faculty:	LUT University School of Business and Management
Degree Program:	Master's Programme in Supply Management (MSM)
Year:	2021
Master's Thesis:	Lappeenranta-Lahti University of Technology, 90 pages, 10 figures, 10 tables
Examiners:	Advisor & Professor, Katrina Lintukangas Postdoctoral Researcher, Elina Karttunen,
Keywords:	Private sector, Public sector, Public-Private Partnership (PPP), Value for money (VFM), Risk, Critical Success Factors (CSF), Social value

Due to the complexity and challenges faced in the healthcare sector in delivering the intended social value towards the right segment of patients, many public buyers are essentially concerned with the different risks involved within public-private partnership (PPP) projects. This requires identifying the most critical success factors (CSF) that contribute towards achieving value for money (VFM), the optimum combination of cost, quality, and sustainability. The purpose of this thesis is to investigate the most important CSF in terms of its contribution to VFM and the degree of risk associated, followed by exploring the possibility of applying those same factors in a conceptual PPP framework. This research will firstly inspect the theoretical approaches related to public procurement and public-private partnership (PPP). It will provide a brief description of governments' and private partners' contributions to PPP projects. Afterward, both risk and VFM concepts are elaborated in detail, which leads that research study towards determining and describing CSF. Exploratory and quantitative methods are adopted, with primary data collected using a questionnaire survey from a list of public buyers residing in Finland. Such data collection process aims to gain insights into the most important CSF from the public buyer's perspective, which offers researchers and public institutions strategic solutions within the explored conceptual framework that improve the success rates of PPP healthcare projects.

Acknowledgments

As my journey as a master's student at LUT university comes to an end, a new path begins with a thrilling and intriguing drive. This thesis has taught me many things; with its challenges and rewarding experiences, I genuinely believe that I developed my knowledge and research skills to a greater extent.

I want to express my most profound appreciation to my supervisors, Katrina Lintukangas and Elina Karttunen, for being a source of inspiration, encouragement and offering me advice and precious feedback on my analysis. I am proud and grateful for the time working with them.

Many thanks to my friends in Lebanon and Finland for their endless cheering and support. I especially want to thank my research colleagues and friends, Iryna and Nikhil, who listened to my updates and guided me as I started this process.

Lastly, I want to thank all my loved ones and parents, who stood behind me whenever I needed them. I appreciate your continuous support, and for teaching me a valuable life lesson, which is "to keep pushing yourself to arrive at your destined goals!"

Jad EL Bizri

21.6.2021

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1. Introduction

In our modern age, the covid-19 outbreak has unprecedentedly affected the lives of millions of people and disrupted the global economy, supply chain activities, government actions, and numerous worldwide industries. The healthcare system is still seriously wounded by the effects caused by COVID-19 as hospitals, clinics, and medical institutions are seeking alternative solutions to the shortages in medical necessities. In addition, COVID-19 distorted the flow of the global supply chain on different levels ranging from manufacturer closures, distribution blocks, trade restrictions, rise in prices, quality issues, international interdependencies, and miscommunication between bundles of buyers-suppliers.

The exceptional rise in demand has created a major obstacle for public buyers. It became nearly impossible to procure critical items needed for treating infected patients, even in emergency states. On top of that, the lack of preparedness of stockpile inventories has positioned small companies in a vulnerable situation, competing in a highly competitive environment and racing to obtain scarce resources. Public buyers, being an integral part of public procurement business, hold the responsibility of developing purchasing activities from identifying the required goods and services, selecting appropriate suppliers, establishing multi-lateral communication lines, negotiating about items prices, and arranging delivery schedules for goods procured (McKevitt, Flynn and Davis, 2014).

As illustrated, this crisis brought significant changes in diverse areas of people's lives. Public procurement, being one of the key components and enablers of the supply chain, is not an exception. With the rise of new challenges, companies must adapt to the changes presented by finding non-standardize solutions. This process will bear additional responsibilities on the public procurement system. Thus, public procurement should not be undervalued and misunderstood; its strategic importance would give rise to novel purchasing patterns and mechanisms for countering the implications and risks involved.

With all these challenges faced by the public sector, it became detrimental to call for an additional player that engages in healthcare procurement projects and assists the government in managing its resources to meet medical demand shortages. Such partnership aims to improve procurement practices by ensuring efficiency, transparency, integrity, and fair opportunities to all stakeholders. Additionally, the value of money (VFM) is optimized through private partners' contributions and access to abundant resources to deliver the intended social healthcare value.

In that respect, this study will focus on two critical parts, which are managing the risk incurred within the public-private partnership (PPP) and harnessing the social value delivered to patients through our analysis of value for money (VFM) and critical success factors (CSF).

1.1 Research objectives

The goal of this master's thesis is to develop a particular framework that identifies the criteria for a successful implementation of public-private Partnerships (PPP) (Zhang, 2006). Thus, this research will be based on exploring the characteristics of PPP to understand the risk associated with each party's investment and their implications on healthcare services. This will allow us to identify the criteria required for mitigating such risk and harnessing the quality of healthcare services. In addition, the current study will provide us with valuable insights on the literature reviews within the academic and industry practices, which are highly related to the public procurement practices in the PPP healthcare domain. In such terms, these sub-objectives must be met:

- Assess the challenges of public-private partnership in terms of risk and value for money (VFM) achieved.
- Determine the critical success factors (CSF) that contribute to VFM improvements.
- Develop a framework that analyzes the contribution of each of those success factors in terms of risk and VFM.
- Provide recommendations and strategic solutions for successfully applying VFM and outline the possibility for future research.

1.2 Research Gap

By looking through the literature review, it appears that the topic of public procurement and its application in PPPs social healthcare projects is instead a novel study that is yet to be deeply discovered in the research community (Kivleniece and Quelin, 2012). This also highlights the need for applying this research in an empirical study as few research cases were conducted that support the theoretical background of our study. This entitles a well-grounded research study in the literature review to provide several insights and a clear interpretation of the research gap, demonstrating the potential of harnessing social value in the healthcare sector with public-private sector contributions. This also refers to the capability of establishing diverse relationships with a significant focus on public procurement.

This thesis narrows the perspective of the study into the Finnish healthcare industry as a public-private partnership (PPP) is a relatively new concept that is not vastly adopted in Finland. For many years, PPP projects were closely connected to the infrastructure and construction models, which are mainly implemented in construction of motorways, educational and entertainment institutions, and water treatment facilities (Tieva and Junnonen, 2009). However, this PPP concept is yet to be fully explored in the healthcare domain. A significant part of healthcare services in Finland is organized, financed, and managed by the public sector (Ministry of Social Affairs and Health, 2021). At the same time, private sectors act as complementary for the municipalities' healthcare services. These private sectors can be categorized as independent practitioners or partial subsidies. Relatively to that notion, it is essential to discover the extent to which the private sector may contribute to the PPP healthcare industry.

Many debates surrounding PPP projects in Finland focus on new changes that embody proactive procurement in PPP contracting (Tieva and Junnonen, 2009). This concept can be analyzed from multiple angles, and its application in the Finnish industry is yet to be examined, especially in the healthcare industry. As it implies, various changes may be applied in PPP healthcare projects whereby public procurement performance is governed by the degree of collaboration between public and private actors.

Thus, different key aspects define the relationship level and successful application of PPP in respect to risks, costs, and profits shared. The Finnish healthcare services are heterogeneous, as different providers exist that offer a sub-optimal service (Tynkkynen and Lehto, 2009). This makes it difficult to operate within this complex healthcare system as public sectors need to handle medical shortage issues and cope with patient's needs. Despite this dilemma, a substantial involvement from the private sector in PPP healthcare models may lessen the pressure on the public sector. Thus, this research study the relationship of public-private partnership regarding "risk" and "VFM" within healthcare PPP procurement to bridge the gap between appropriate PPP contributions and the potential social benefits.

1.3 Research questions

It is crucial to develop a reliable PPP framework that describes a proper implementation of public procurement patterns and provides a theoretical structure of public-private sectors relationship to enhance the value for money (VFM) and reduce the risk affiliated to the healthcare domain. Thus, understanding the effects of PPPs projects and procurement

operations from the public's buyers' perspective provides us with an inclusive idea of the problem statement. Hence, a close examination of the implications of public-private partnership in the healthcare system will help us identify the most critical success factors (CSF) in terms of risk and VFM to give us a clearer indication of the research question. This brings us to the following research question:

“What are the most important critical success factors (CSF) in a PPP’s relationship within the scope of value for money and risk?”

1.4 Research method

This thesis follows an explorative and descriptive approach for which a quantitative statistical method is employed. This research aims to gain a novel perspective of the topic by interpreting the success criteria for achieving VFM and the degree of risk incurred. This allows us to gain new insights into the variables adopted that directly impact the procurement process within PPP healthcare projects. An introduction to the topic is firstly conducted by illustrating the concept of healthcare procurement, and the challenges faced. This is followed by an overall comprehensive analysis of the concepts demonstrated in the literature review to develop the research gap and the entitled research questions. Secondary data were collected from various academic literature reviews, governmental reports, online websites, journal articles, dissertations, and historical data. In comparison, primary data were mainly collected from healthcare and public institutions such as hospitals, publicly owned non-profit companies, central procurement units, governmental agencies, and public buyers in general.

1.5 Conceptual framework and key definitions

In this study, a conceptual framework describes different theories and their relationships towards the main topic. Our core research objective is to analyze the impact of critical success factors (CSF) on the Value for money (VFM) with risk described as a moderator (Fetherston, 1994) that alters the effect of those same factors on VFM. This will allow us to derive a novel theoretical framework that helps public actors allocate the right relationship and procurement strategies within the public-private partnership (PPP) which can optimize the social healthcare value delivered to the intended patients. Different key concepts can be drawn from our analysis of PPPs, with public and private sectors being the essential players in such category. In addition, other terms such as Value for money (VFM), risk, critical success factors (CSF), and social value are closely examined to understand their impact on the healthcare industry. Thus, our research study concentrates on the social value provided in Finnish healthcare services

from professional procurement experts, specifically public buyers. A visual presentation of the framework is presented in the figure below:

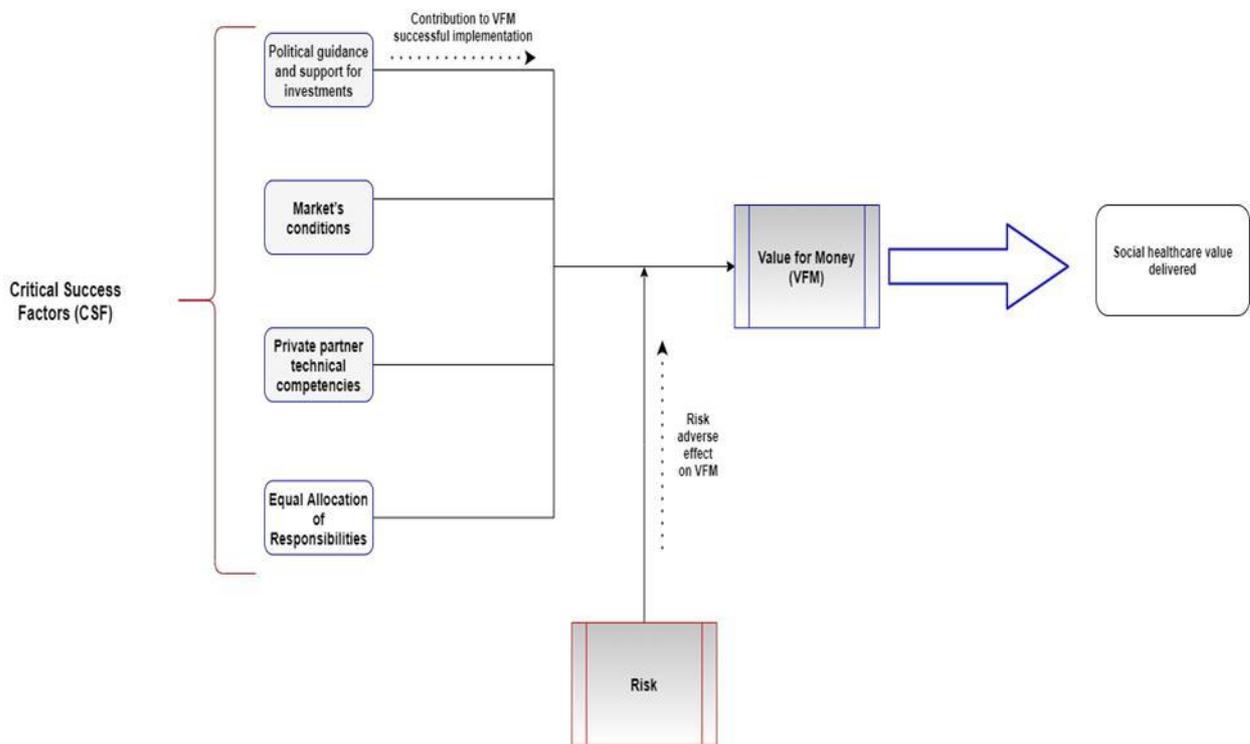


Figure 1. Conceptual Framework of CSF contributions

For explaining the conceptual framework displayed above, this study will firstly explore and describe the key concepts previously identified:

Private sector:

The private sector presents an independent party or entity, commercial or profitable company owned by a specific individual(s) (Raman, 2015).

Public sector:

The public sector can mean a state or government-owned entity rather than an independent or commercial party providing goods/services to the public (Raman, 2015).

Public-Private Partnership (PPP):

A broad definition of PPP is presented as an arrangement between the public sector (government, state, government-owned entity) and a private sector (independent entity) for preserving public assets or services (Raman, 2015). This includes arrangements made in terms of investment, management, the lifecycle of the designated project, clearly defined risk

allocation, pre-determined and expected performances, and standardized measurement assessment.

Value for money (VFM)

In line with World Health Organization (WHO), value for money can be defined at commonly two controversial levels within the healthcare industry (WHO, 2020). First, it is described as the degree of health benefits achieved that is reflected by the value presented in health policies. Second, it is referred to the ability to manage a cost-effective analysis that improves health gain with the given level of spending. In other words, VFM incorporates quality, cost, and sustainability into healthcare service, which are three fundamental factors that will be introduced in detail in the literature.

Risk:

Diverse perspectives exist that define risk. However, for our research study, the risk is considered a moderator variable that influences the success of VFM. In such context, the risk concept is aligned with Maslova and Sokolov's (2017) view as any “factor, event or influence that threatens the successful completion of a project in terms of time, cost or quality” (Maslova and Sokolov, 2017).

Critical Success Factors (CSF):

Critical success factors (CSF) are interpreted as activities that contribute to favorable outcomes to meet the intended PPPs goals (Rockart J., 1982).

Social value

Within the healthcare context, a concrete definition is adopted that interprets the social value as the “public’s preferences for the distribution of healthcare among populations” (Stafinski *et al.*, 2011). The purpose is to prevent/counter any risk factors that might impede a patient’s health status and properly allocate healthcare services among the population of patients.

1.6 Limitations of the study

In brief, this research study explores the feasibility of achieving value for money (VFM) in procurement within PPP healthcare projects. The study aims to give a comprehensive idea of procurement application in healthcare from the public’s buyer or government perspective without delving into detailed descriptions and explanations of PPP contractual types. The focus was mainly on the healthcare sector, and other industries were omitted in our case. In addition,

the supplier's view of PPP procurement was limited. VFM is a new concept that is yet to be discovered in many PPP projects. However, its application in Finland is considered novel, especially since public-private partnerships are not that broadly spread. While risk is interpreted from multiple angles according to the public's buyer view, it is described in general terms and only relates to the procurement PPP project.

As VFM is the end-goal to achieve for optimizing the social healthcare services provided to patients, this research study presents with two degrees of difficulties: First, the concept of PPPs in our case is broad and does not investigate the detailed financial aspects as such data is considered confidential and cannot be readily available. The literature behind such topic "public-private partnership" is enormous, and many definitions exist which invoke "conceptual vagueness and disparate research traditions" (Brinkerhoff and Brinkerhoff, 2011). Second, this research study relies on professional experts' opinions and perspectives, which may lead to the subjectivity of data collected and a special concern for a biased VFM assessment. To adequately analyze VFM achieved, it is essential to study a PPP project from a practical approach, which means directly investigating such project from the point of inception towards its operational phases and completion. By doing so, researchers are to have better accessibility and availability of all data. However, in this thesis, this notion is too broad and time-consuming.

1.7 Structure of the study

In the first chapter, an introduction of the challenges faced in public procurement under the healthcare sector is identified. An elaboration of the research objectives, methods, questions, and reasons behind choosing such a novel topic gives a better perspective of the study.

The forthcoming chapters embody the literature review. They discuss public procurement and PPPs concepts to build our intended analysis and create the novel PPP framework explained through the two dimensions, "risk" and "VFM." These chapters are introduced as below:

- ❖ Chapter 2: A brief description of public procurement and its cycle is introduced
- ❖ Chapter 3: Illustrates the PPPs concept and its theoretical background
- ❖ Chapter 4: A brief description of the actions carried by public and private sectors to offset the risks that appeared in public procurement and PPP.
- ❖ Chapter 5: Includes a detailed analysis of the risks, implications, and proposed recommendations for implementing PPPs healthcare project models.
- ❖ Chapter 6: Explores the value for money concept and its application mainly in healthcare procurement and PPPs projects.



Chapter 7: The final part of this literature will introduce the concept of value for money (VFM) and underlines the most critical success factors.

The final chapters will provide us with the methodology and methods employed to gather and assess the collected data from a committee of professional procurement experts, public buyers, and academics. In the latest chapters, a discussion of the results is conducted that helps us compare our analyzed findings with the one introduced in the literature review. The final part covers the conclusion, limitations, and future research.

2. Public Procurement Process

2.1 Concept of Public Procurement

Public procurement can be used to purchase products and services by the government to fulfill public buyers or customers (OECD, 2019). Some scholars denote the importance of the government's ability to effectively regulate public procurement policies and practices (Sadiq and Kessa, 2020). This is reflected in the purchasing patterns which demand a timely purchase of quality products within the price limits. Thus, a different approach appears to extent public procurement functions to include the overall management of processes from identifying market's needs, selecting tenderers, awarding contracts, acquiring goods or services, and ensuring adequate compliance of the contractual terms from the beginning of an agreement till the end of service (UNDP, 2010). Procurement functions are not only limited to purchasing goods and services. Rather it encompasses a set of sequential and overlapped activities ranging from the decision-making process, stakeholders' engagements, and evaluation of risks and future trends in items procured. The purpose of such public procurement is to achieve the common good by ensuring efficiency, transparency, integrity, and fair opportunities to all stakeholders through optimizing the value of money while diminishing the risks connected with corruption and inequality (Krasniqi, 2012).

In addition, procurement involves making feasible decisions of products purchased by ensuring optimal use of scarce resources. Strategically, a company opts to develop its internal capabilities through exploiting the proper mix of resources to achieve superior performance and long-term success. A company can reconfigure its resources to address the spiral in medical demand rapidly. However, coping with all the demands and needs of a market requires substantial analysis and knowledge of the procurement cycle. It enables us to determine the right combination of strategies, practices, and actions endorsed in public procurement.

2.2 Public Procurement Cycle (PPC)

The public procurement cycle constitutes an integral concept that guarantees successful management and implementation of procurement processes. This strategic tool provides a clear visual framework, knowledge, guidance, and key steps for procuring goods and services. In such scope, the procurement cycle comprises of several phases as illustrated below:

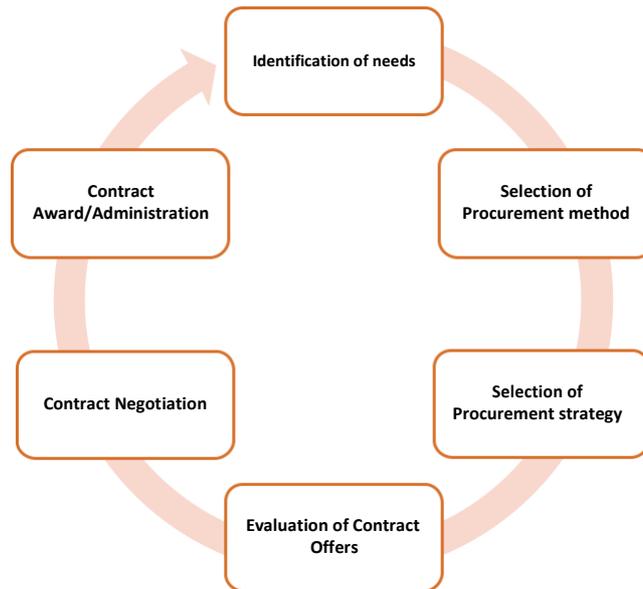


Figure 2. Procurement cycle process

1. Research and identify the company’s needs of procured items:

The cycle begins with exploring a company’s requirements of products and services to specific market segments. In an ideal scenario, the public sector creates a cross-collaborative team to examine medical items’ specifications, determine market eligibility and patient’s needs for medicines, and finally create the required budgetary limits for procuring those items (Khan, 2018). This phase aims at predicting the costs of items for forming suitable contractual packages and purchasing methods. To attain efficient procurement practices, accurate and updated data prices reflecting the current marketplace should be used. Additionally, procured items are combined into distinct categories that contribute to cost-efficacy, reduced risks, and better management of supplier relationships (John Roberts, 2020). Thus, a project requiring thousands of items to purchase can best employ a procurement packaging contract that arranges homogenous items into specialized lots based on the lead time of packaging, place or date of delivery, supplier’s original location, financing sources, and nature items purchased. A contract package should also balance the procurer’s needs with supplier’s interest as to bear profitable results with least amount of expenses.

2. Selection of Procurement method

The procurement method must be recognized at the initial stages of public procurement planning since it determines a realistic approach in tendering, bidders’ selection, and contract award. Overall, procurement methods can be positioned into different categories that depend on a company’s conditions, objectives, and pursued plans as presented below:

Open tendering: Open tendering allows new and incumbent suppliers to participate through a sizeable open competition that gives opportunities to showcase innovative solutions but requires many costs for the examination and screening process (Kozik, 2019).

Dynamic procurement system (DPS): A novel approach to public procurement whereby tenderers participate in open bidding using an integrated electronic platform (Ama, 2017). Such a method promotes flexibility and allows access to a large sum of tenderers during the lifecycle of a project. Additionally, public buyers can efficiently customize their procurement goods and services and streamline public purchases. The idea is to benefit from the tenderer's expertise as well as select the most cost-efficacy offers.

Restricted tendering: This tendering is divided into two stages process. The "screening stage" for which limited qualified candidates with the required financial, technical and capabilities for fulfilling the contract's requirements are selected and a second stage with "tendering invitation" (Schlosser and Batoev, 2013).

Design competition method: This method is mainly used to obtain the best creative solutions in design and architecture. Due to the complexity of design, the public sector can benefit from one competent supplier equipped with all the required resources and construction expertise, thereby reducing the time and costs needed to complete a project (El Sawalhi and El Agha, 2017).

Innovation partnership method: This new method improves public procurement using the supplier's innovation and technological advancement. Public buyers can apply efficient solutions that ultimately diminish cost and enhances the social value transferred to the society (The European Commission, 2017).

Direct procurement method: The process of purchasing direct materials that address core business operations (Tai, 2013). Purchases are either used for manufacturing purposes or promptly delivered to end customers as finished products and services. In tendering, public buyers look for qualified candidates to adhere to their specific requirements.

Bidding with negotiations method: This procurement method engages suppliers in competitive bidding and empowers public buyers with open negotiation processes. During negotiations, contractors opt to persuade the opposing party with their qualifications and price offers, while public buyers seek the most advantageous option.

Request for proposal (RFP): An RFP endorses a collaborative approach for which specialized bidders share their necessary knowledge to draft feasible contractual terms with public buyers. This requires safeguarding the interest of both parties by providing precise specifications for supplier's requirements and strive for flexible tendering policies that enable innovation (Kenton, 2020a). The technical proposal of bidders is examined first, then financial proposal and price comparison are followed. The final score is determined by the best value for money (VFM) offered.

Request for quotation (RFQ): An RFQ distinguishes itself from RFP with its price-oriented strategy. In such a case, procurers seek to purchase a high volume of standardized items with the lowest possible price (Kenton, 2020b).

Single-source procurement: Single sourcing adheres with the same cost-reduction concept. Procures opt for bulk purchases and better negotiation conditions from one experienced supplier (Bhasin, 2019). A downside of this procurement method is the overly reliance on a single sourcing supplier and the consequences resulted from sudden price surges, lower quality, and delayed deliveries (Leenders, Nollet and Ellram, 1994).

3. Selection of Procurement strategy

A strategy is an action plan designed to achieve a company's long-term goals. In procurement, strategies are developed by clearly framing, defining, and scoping a company's objectives and expected results. Two strategical approaches emerge a reactive strategy that seeks to repair existing problems as they arise with a cost-reduction focus (Ostergar, 2019) and a proactive strategy that seeks a forward-thinking approach and a long-term relationship with suppliers (Terán, 2020). The latter dedicate resources towards supplier's development by finding potential solutions rather than merely neglecting procurement issues. Thus, strategic procurement can deliver insights that are otherwise invisible to the company's reactive system, particularly in tendering, negotiating, and purchasing practices with suppliers.

In this respect, proactive strategic procurement derives three sub-strategies that tackle supplier development. This firstly includes an effective risk management plan that focuses on identifying, assessing, and proactively treating those risks to enhance the value of procurement outcomes (Kalvet and Lember, 2013). Supplier optimization is followed, focusing on improving suppliers' competencies and extending the social value provided by suppliers (Erridge and Greer, 2002). It ends with Green purchasing that emphasizes sustainable procurement and realization of environmental goals, which brings product's standard,

supplier's attitude, and collaborative relationship as essential key elements for aligning suppliers' value with procurement's green objectives.

4. Evaluation of Contract Offers

The bid evaluation process consists of opening, examining, and comparing suppliers' bids to determine the most valuable offers which coincide with the buyer's specifications and requirements as written in the solicitation documents (Lynch, 2013). A comparison stage begins with analyzing the supplier's value offered in products and services by assessing the best value of money. In this context, several criteria such as quality and maturity of goods, lead-time of deliveries, compliance to sustainability principles, total costs of ownership, and relationship status with public buyers determine the value delivered in tendering evaluation process.

An unbiased assessment should be carried out by a specialized team of experts who design an evaluation plan and ensure transparency over the whole evaluation process. The team also oversees everyone's actions to preserve confidentiality, impartiality, and integrity. Overall, the evaluation of bidders is based on three essential criteria, which are defined as formal compliance (Cholopray, 2018), technical competencies associated with supplier's skills, and experience in procurement (Cholopray, 2018), and financial standing. That determines the supplier's capability to conform with the buyer's contractual terms, such as pricing items procured, the life cost of the product purchased, and the saving benefits offered (Sataloff, Johns and Kost, 2020).

An evaluation flowchart depicts the necessary procedures for assessing supplier's value, for which it mainly consists of four sequential phases:

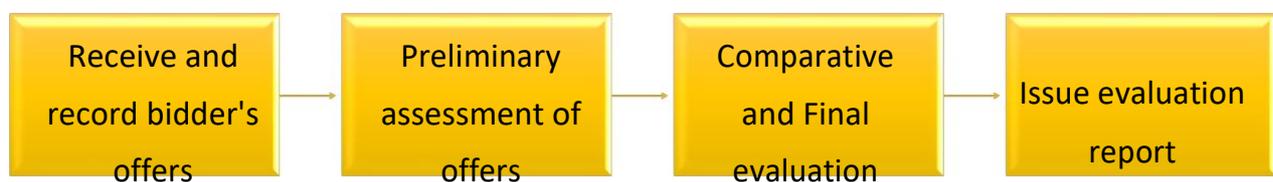


Figure 3. Tenderer's evaluation process flowchart

The first evaluation phase requires receiving and delivering tenderer's offers to the traditional procurement responsible for managing the evaluation procedure. Such offers are assessed based on specific criteria such as asset specifications, quality of products, delivery schedule, technical and maintenance support, budget limitations, and payment policies (Kremers, 2020).

A final examination of offers is carried to compare the value delivered from one bidder to another and select the most qualified ones. Usually, product features are tested against quality specifications, and suppliers' technical competencies are evaluated according to the commercial value, production capacity, and ethical behavior. At the end of this evaluation process, an assessment report is created and used as a reference for monitoring supplier's performance and awarding them when meeting target requirements.

5. Contract Negotiation

Negotiations with suppliers represent a fundamental phase in the procurement process as buyers focus on lowering their overall transactional expenditures while maintaining a steady purchase of quality items and services. Traditionally, suppliers were categorized on the lowest negotiated prices. Nowadays, companies have shifted their purchasing strategies towards a partnership-collaboration method with long-term purposes. The goal is to optimize the social value delivered by suppliers through refining supplier's competencies and negotiating on favorable terms for which both parties shoulder the burden of risks and combine their efforts towards satisfactory and rewarding outcomes (Rogers, 2008). This involves modifying existing terms with incumbent suppliers through contract renewals, finding new innovative suppliers, and drafting contractual terms from scratch (Davies, 2011). Such strategical negotiation procedures aim to determine the lowest overall spending with favorable prices, payment terms, timely delivery schedules, and quality of products and services.

There are several factors' that buyers should consider while setting the objectives for negotiations with suppliers. This may include the criticality and price of items procured and the value of money proposed. Nevertheless, a buyer should select the most important list of factors that satisfy its needs and negotiate with suppliers to agree on contractual terms.

6. Contract Award/Administration

Contract award is the final phase of the public procurement cycle for which proposals are offered to the most preferrable and eligible suppliers. Suppliers are chosen in line with procurement's management proposed methods that vary from price orientation, economic value, and mean value (The European Parliament and the Council, 2004). The price-oriented method awards suppliers with the lowest price offered and within the budget restrictions. As for the economic value, quality makes the difference with contracts awarded based on the price for value. While the mean value method focuses on integrating proposals closest to the market's mean, measured using the weighted criteria method (Cholopray, 2019).

Contract management can be defined as creating, implementing, analyzing, and systematically administrating stakeholders' contracts during the procurement cycle (UN, 2020). In such a management process, procurers must identify the appropriate terms applied to each supplier and assess their performances regarding the market's nature, risks, and complexity of operations (Davis, 2008). An effective procurement plan is usually developed that determines KPI's and results to monitor the progress of contracts in a timely manner. This requires governance of both downstream and upstream public procurement cycle to guarantee an optimal result in the final phase, contract management if all stages of the procurement cycle were successfully examined and managed accordingly.

3. Public-Private Partnership (PPP)

3.1 PPP overall definition

With the increased economic pressure experienced by the public sector, particularly amid covid-19 time, a pragmatic need for delivering public goods and services towards the intended customer segment promoted the engagement of the private sector. Government tends to channel its resources, risks, and other responsibilities for accomplishing public goals, hereby relying on the private's commitment to delivering their part of the bargain in a unison project. This project can be referred to as a public-private partnership (PPP). A government generates a long-term contract with private sectors to achieve its public goals (Yescombe and Farquharson, 2018). Diverse modes of delivering public goods and services exist within a PPP's project, depending on the private's and public's shared efforts. For instance, a typical PPP infrastructure contract involves private partner liability of all project tasks from building, operating, and maintaining the required assets to deliver the intended public goods and services. In such a situation, the government can handle the financial aspects, such as the cost of procuring goods or the reward of the private sector's performance (Alfen, 2010). Another type of contract is applied in management, operations, and maintenance which falls under the service contract category (EPEC, 2014). Others require a combination of both. Regardless of the type of contract applied, different literature offers significant definitions of the entitled PPP concept. These concepts are explored and summarized in the table below:

Table 1. Different conceptual definitions of PPP

<p>Organization for Economic Co-operation and Development (OECD)</p>	<p>PPP is defined as an agreement between one governmental authority with one or a consortium of private partners for which public goals are aligned with private's profit objectives through an effective sharing of risks, responsibilities, and tasks between both end-parties within a project. (OECD, 2012)</p>
<p>International Monetary Fund</p>	<p>PPP refers to the private's full accountability to design, build, operate, and maintain an infrastructure project, including the risk transferred for capital investment and provision of goods and services. These projects usually consist of building and operating schools, hospitals, roads, tunnels, and infrastructure systems. (IMF, 2004)</p>
<p>European Commission</p>	<p>PPP involves the cooperation between public and private sectors on different levels that can be determined from duration of a contractual relationship, funding arrangements, project's structure and requirements, public objectives, and interests, as well as risk and compliance, agreed upon (European Commission, 2018).</p>
<p>European Investment Bank</p>	<p>PPP is used to commonly define a relationship between public and private sectors to engage private's resources, expertise, and innovative solutions for delivering the required public goods and services. Strategic partnerships are incentivized, and design-build-finance-operate (DBFO) contracts are frequently used to support private autonomy and engagement. (European Investment Bank, 2004)</p>
<p>Standard and Poor's</p>	<p>PPP is defined as any relationship, whether it is a short, medium, or long-term relationship, and revolved around sharing of risks, rewards, skills, funds, and project's expertise between private and public bodies to achieve the desired outcomes agreed in the initial stages of PPP (Heydari, Lai and Xiaohu, 2020)</p>
<p>World Bank</p>	<p>PPP is a combination of OECD and IMF views. It refers to a long-term contractual relationship between a government body and the private sector to deliver public goods and services considering private's party bearing for most of the risk, responsibilities, and management of a project. (World Bank, 2019)</p>

PPP is a vast concept that presents with different perspectives as no unified terminology that concretely define a public-private partnership (PPP) exists. A significant difference in shared objectives appears to redirect the private's sector focus into value for money, while the public sector aims to preserve the welfare of its community. Thus, those two opposing objectives

shape the direction of a PPP project for which different PPP contracts emerge. Accordingly, PPP can be separated into two different categories: A purely contractual PPP consisting of a partnership bounded by certain contractual agreements, and institutional PPP that implies a strong collaboration between public and private sectors due to establishing a common and distinct entity (Marques, 2010).

3.2 Government and Suppliers drivers from PPP's procurement

Government drivers and benefits from PPP's procurement

The public authorities widely accept PPP in the healthcare industry, leading to positive financial and social outcomes. One study showed that the financial benefits gained by adopting PPP valued around 20% of total cost savings (Kosycarz, Nowakowska, and Mikołajczyk, 2019). Beyond the added financial value, PPP can provide many other advantages. PPP can be used as a subtle tool for driving innovation and introducing new healthcare solutions that translate fundamental scientific research into long-term treatments serving patients' needs. In this sense, it is used to bridge the gap revealed between discovery and product development through private support, allowing the integration of complex resources and access to new information (Karawajczyk *et al.*, 2016).

Besides benefiting from the private sector's skills and expertise, PPP can improve public resources capacity, allowing the delivery of superior healthcare quality services on time and within budget limitations. A significant advantage of such a partnership is optimizing value for money (VFM) and sustainability in the procurement process. Thus, a government may improve its societal, environmental, and economic pillars to build a new procurement system that looks beyond the traditional financial view and incorporates a long-term strategy with specific incentives on quality, cost, functionality, and added benefits to the society (CIPS, 2011). This allows a fair allocation of risks amongst partners and strengthens investment decisions leading to reduced cost of procurement and increased quality of services.

Analyzing the driving forces behind the government's application of PPP, we can deduce four significant forces that are interrelated according to the below figure.

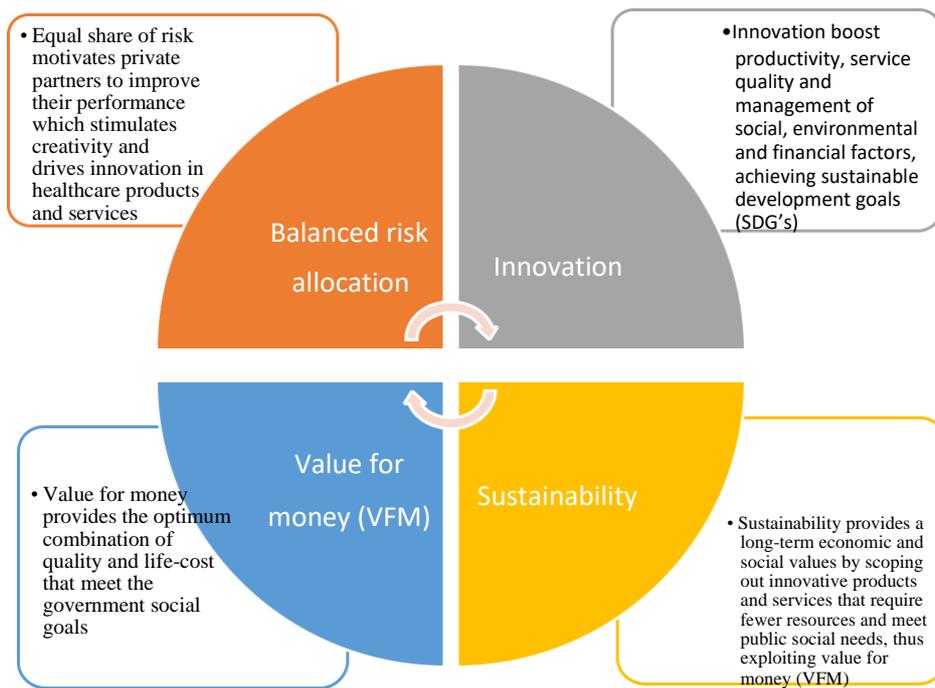


Figure 4. Government's driving forces to PPP application

Suppliers' drivers and benefits from PPP's procurement

A critical aspect of public procurement is the relationship founded with its bundle of suppliers. Effective management of suppliers' relationships can be cultivated across governmental units, enabling the foundation of sourcing strategies fitted to every supplier's category. In this respect, collaborative procurement is a leading solution that transforms public buyer's perspective of suppliers from a transactional entity into a strategic partner, otherwise known as preferred suppliers. According to Rezaei *et al.*, Collaborative procurement can draw many benefits to the cluster of stakeholders involved in the procurement process (Rezaei *et al.*, 2020). This type of procurement delivers value for money with the joint effort of suppliers, clients, contractors, and many related parties for procuring goods and services. Collaborative tendering represents another critical factor in procurement for which it ensures suppliers' cooperation towards mutual benefits by aligning resources to achieve efficiency and effectiveness in public procurement (Roy, 2017).

Besides being promoted to preferred suppliers by the partnered public buyers, suppliers' reputation is enhanced amongst other stakeholders. This enables access to the buyer's network of stakeholders and will help them portray their image as reliable suppliers with the right quality, price, and optimal value for money (Welga, 2015). Another reason for suppliers'

contribution to collaborative tendering is the reduced response time in the bidding process (Tunca and Wu, 2009). Preferred suppliers have the edge over the remaining tenders, improving their opportunity cost, internal resources, and time required to process tendering procedures or receive a contract reward. Streamlining the procurement process can also create efficiencies across the supply chain (Jayaratne, 2018). Equally to public buyers, suppliers can save tremendous transactional costs from locking down few strategic buyers presenting consistent purchasing patterns. Thus, a standardized regulatory framework specifically established to preferred suppliers fosters consistency and centralization of supplies delivered to a limited number of strategic buyers, enabling improved communication and cost reductions (Oy and Furlotti, 2014).

4. Government and Private sectors contribution towards PPPs project

With this unprecedented covid-19 outbreak, the government is faced with the overwhelmed challenge of meeting the surge of medical goods demand. This mandates a well-maintained PPP project that rapidly responds to public health and safety. One solution adopted is to leverage healthcare infrastructure, service management, and supply chain resiliency with the supportive function of public procurement. This requires long-term productivity and proper allocation of financial spending for which it capitalizes on private investment to improve the procurement processes and social value. Thereby, developing an integrated decision-making system with private investors should be at the frontline of a healthcare recovery plan. In this context, a multi-stage strategy based on the combined efforts of public-private units can be created to address the healthcare system's short, medium, and long-term needs (Baxter and Casady, 2020).

The following figure 5 explains public and private contributions for improving the public procurement process. Starting with a short-term strategy, both sectors focus on providing fast-reactive responses towards healthcare risks by deploying private resources ranging from technical, financial, physical, and other necessities (Casady *et al.*, 2020). A transition towards a proactive procurement strategy is seen in a medium-term strategy for which PPP projects are viewed as an opportunity for improving the development of healthcare building blocks and core procurement functions through product development, quality assurance, and international integrations (Nishtar, 2004). While a long-term strategy shapes a global perspective that supports economic growth and society's wellbeing. This creates a global PPP (GPPPs) where different nations collaborate to reinforce resiliency and sustainability across global procurement structures (Schomaker, 2017).

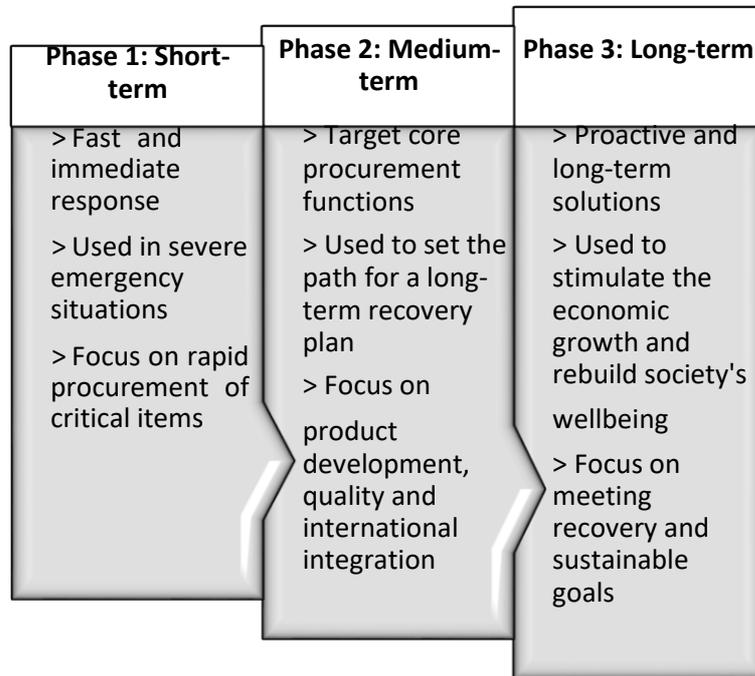


Figure 5. Different stages of covid-19 crisis with policy response. Adapted from *Proactive and strategic healthcare public-private partnerships (PPPs) in the coronavirus (Covid-19) epoch crisis* by Baxter and Casady (2020)

4.1 Phase One: Short-term Reactive Strategy

At this phase, response and speed are of utmost importance as public buyers focus on fast-reactive response to emergency procurement situations to deliver immediate relief items and services to patients with critical conditions.

In practice, the public buyer-supplier relationship is governed by the lead-time required to complete procurement tasks. For instance, buyers would select the closest available suppliers for prompt supply deliveries. Additionally, some administrative tasks are neglected, eliminated, or performed quickly. Given the example of direct procurement practices used mainly in emergency events, public buyers disregard the formal tendering and competitive processes to hastily select a supplier that meets the emergency needs of goods and services. On top of that, informal communication and instant cooperation appear to accelerate the procurement and decision-making process. These changes viewed in buyers' behavior and actions are necessary in a fast-paced and reactive procurement environment to guarantee smooth access to medical necessities.

4.2 Phase Two: Medium-term Strategy

After addressing all the critical challenges of this pandemic, such as a short-rush spike in medical demand, a government can redirect its efforts towards core procurement services. In this scenario, suitable strategies can be framed to urgently tackle the challenges manifested in public procurement to set the ground for a long-term recovery plan. Such solutions can be manifested by private partners' core competencies that support product innovation, expand manufacturing capacity, develop joint R&D solutions, and integrate binding international agreements for quick accessibility to medical resources (Nishtar, 2004).

Collaboration is a key aspect of buyer-supplier relationships. Thus, suppliers are selected based on their pre-qualifications and existed relationships. An immediate need for direct items makes it difficult to establish relationships with new suppliers. Multiple information exchanges are seen amongst buyers and deliver items to the correct location, time, and price. At this stage, formal and informal approaches are exercised when dealing with suppliers, and contracts can be modified and extended over longer periods in line with buyer's needs.

4.3 Phase Three: Long-term Proactive Strategy

A recovery plan is carried out after confining the emergency and normalizing business activities. Policies are adjusted to focus on long-term solutions that effectively address risks in procurement, stimulate economic growth, and rebuild society's wealth. Thus, a proactive response is adopted as most urgent needs are met. All existing procurement activities are revisited, refined, and readjusted to align with the strategic view of meeting recovery goals such as procurement sustainability, green and resilient supply chain, and technological adaptation (Schomaker, 2017). At this stage, the private sector's contribution is essential as public buyers benefit from innovative key solutions that facilitate the procurement process and guarantee a flexible flow of information and medical resources.

The degree of collaboration is at its peak, with strategic suppliers placed at the epicenter of this relationship. Thus, a strong relationship with these same suppliers generates social value and extends buyers' visibility of supply chain networks from end-customers to n-tiers of suppliers. A joint risk management framework can be developed to better measure and assess procurement risks, prioritize the most critical ones, and drive specific actions accordingly. Agility is integral for sustainable procurement as it standardizes and streamlines procurement functions. It also provides an opportunity to eliminate bottlenecks and procurement

complexities. Thus, buyers should emphasize developing a supplier social network and adopting an agile procurement strategy to improve the open flow of information and communication. In return, buyers can strengthen their sourcing capabilities and flexibly respond to customer's demands.

Without a doubt, procurement faces many hazardous obstacles that make it substantially difficult to recover from challenges entirely. However, with private's partner's contributions, procurement processes are enhanced, and risks can be mitigated over a more extended period.

5. Risk Analysis

5.1 Risk definitions and their variations in PPP

Many perspectives from academic literature and industry practices regarding the definition of risk appear to give the term “risk” a multifaceted concept in the PPPs project. Accordingly, the risk is perceived as force majeure, which describes the aftermath effects of unnatural events leading to financial losses (Aziz and Shen, 2016). Others emphasized the role of risk in PPP procurement and its influence across a three-dimensional paradigm: time, cost, and performance (Doloi, 2012). A concrete view of risk within PPP projects shows diverse risk categories that revert into the political, operational, social, financial, and imperative relationship amongst public, private, and third-party units (Effah Ameyaw and Chan, 2013). Alternatively, risk can be inherently borne by the public sector and revolve around government decision-making or the community’s resistance towards the public authority (Song *et al.*, 2013). On the other hand, private partners are involved with different types of risk, mostly integrated with the operational phase of PPP projects. This includes risk associated with construction, design, management, maintenance, cost overruns, and tight deadlines (Ameyaw and Chan, 2015).

Therefore, the risk is instead a broad concept that needs to be interpreted from diverse standpoints. A standard definition of risk aligns with an uncertainty of events (Rousseau and Mazzetti, 2001). It can be described as the probability of adverse events that emerged in certain lifecycle PPP projects (Edwards and Bowen, 1998). Traditionally, risk can be expressed as a possibility of adverse effects that reflect a particular threat or a challenge to meet a project objective (M’Pherson, 1978). Controversially, it can promote opportunities for improvements. A closer investigation of PPP projects gives rise to a novel notion of “risk” based on three pillars: cost, time, and quality (Keçi, 2015). Any threats that impede the realization of these objectives may be categorized as a risk. In such an aspect, risk can be analyzed from multiple angles and explored within PPP healthcare models (infrastructure, clinical service, and integrated). Hence, the following sections will provide us with a general overlook of risk in healthcare field, then it will investigate the risk management in PPP projects. This is followed by an assessment of risk within diverse contractual PPP agreements to understand the relationship position between public buyers and private sectors. The final part will provide with

an explicit description of specific risks categories for each PPP healthcare models along with their key risk mitigation solutions.

5.2 Risk in healthcare

Over the past decade, many businesses suffered from this global pandemic, and the healthcare industry was particularly hit the hardest. Many problems arise due to the increased number and degree of risks, which some presented a particular challenge during the COVID-19 pandemic. This led to a variety of risk consequences that included a significant shortage of critical medical goods and unfavorable PPP project conditions reflecting quality issues, raw materials deficiencies, agency problems, and failure to adhere to patients' demands (Modisakeng et al., 2020). Considering the implications usually presented in hospitals and clinical institutions, the risk is mainly assessed with the health value gained through the proper treatment of patients (Gerard, 2020). A low value indicates a patient's severe health conditions contributed to higher risk. In contrast, a high value refers to adequate treatment of patients whereby risk is significantly limited. In such a view, PPP projects must be redundantly revisited to ensure that risks are controlled and managed.

From Cohen and Der approach, a balanced risk allocation amongst the engaged parties is essential for transferring a portion of risks from the public sector towards the private one in PPP projects (Cohen and Der, 2020). Although risk allocation is a crucial component in any PPP project, identifying and assessing the effects of such risk is conducted first. This action must be succeeded with effective prevention and mitigation measurements. The public and private sectors carry proper management and control over the lifecycle of a project. Thus, risk management, embodying all these identification, assessment, management, and control actions, should be theoretically and practically analyzed in PPP projects (Maslova and Sokolov, 2017).

5.3 Risk Management in PPP healthcare

Risk management is a proactive function that is systematically defined as identifying, assessing, responding, allocating, and controlling risks (Nagawa, 2006). Such risk management may be associated with positive events for which opportunities are maximized, and benefits are gained during PPP projects. Controversially, risk management can be affiliated with mitigation processes for which minimizing the impact of adverse events, or threats is a priority (Keçi, 2015). An explicit theoretical approach to risk management entails assessing risk degree, mitigation measurements, and monitoring controls (Thomas *et al.*, 2003). In line with this view, risk management involves the perception of risk level according to one's intuition and ability

to communicate risk information to other stakeholders or partners. In healthcare, risk management foremostly focuses on the value related to patient's safety and health conditions. This generally requires maintaining a high quality of clinical services while reducing the medical errors and financial burden that emerged from mismanagement of such risks. Thus, hospitals need to adjust their policies and healthcare systems by shifting their traditional mindset into an increasingly proactive one that views risk in a concrete lens by directly tackling the risks emerged in the healthcare ecosystem (Page *et al.*, 2021).

In reality, risk management presents several shortcomings in PPP projects. According to Maslova and Sokolov (2017), risk can be ambiguous in nature and widely misunderstood amongst public and private actors due to the absence of a solid structure that identifies, describes, and measures specific risks (Maslova and Sokolov, 2017). Moreover, the risk may be inherently embedded and appears to change with the structure of PPP projects. The effect of risk is more significant with private partners as changes made in a project's content, such as sudden budget constraints, can ultimately create new risks that did not exist before. Alas, PPP projects bear volatile features that may impede private partners' full contribution and adversely influence the public sector's progress towards its goals (Delmon, 2010).

In that sense, the concept of risk within diverse PPP contractual agreements should be carefully interpreted to acquire a comprehensive understanding of the relationship degree relevant to public buyers and private partners.

5.4 Risk in different types of PPP contracts

PPP contractual agreements define all the terms and conditions arranged by both public and private sectors at the beginning stages of a project. Diverse types of contracts describe the attributes and relationships of public-private sectors that are essentially based on shared tasks, responsibilities, and risks. This section provides a brief description of PPP contractual agreements to gain insights into the risk shared between public-private sectors and the type of relationship governed.

Accordingly, four main types of contractual agreements are identified based on the risk level shouldered by either party. In that respect, "Concessions" are viewed as transactional contracts for which public buyers shoulder minimal risks leaving the private partners with most of PPP's responsibilities. Under such arrangement, the private sector accounts for all project's tasks ranging from constructions, operations, management, maintenance, and delivery of goods or services. While the public sector handles the investment part (da Cruz, Simões, and Marques,

2014). This kind of agreement may cultivate hostility and create constant disputes along with the project's duration. However, such a relationship can be avoided if a suitable governance structure is employed and the project is not bounded by uncertainties, vital economic issues, or asset specificity (Zaremba and Smoleński, 2000).

Additionally, a variety of project models emerged from "Concession" contracts that are directed towards healthcare infrastructure models such as BOOT (build, own, operate, and transfer), BTO (build-transfer-operate), DBOT (design-build-transfer-operate) (Serghini Youssef, 2017). The "Privatization" contract delegates all responsibilities towards the private partner as public buyers highly rely on private investment and expertise. For instance, full divestiture is one aspect of privatization whereby the private sector is liable for all government's responsibilities, including public asset ownership (Radić et al., 2021).

Contradictory to the previously mentioned PPP contracts, the "Service and management" contract restricts most risks towards public sectors and buyers, leading to severe consequences, especially when public buyers are not well-informed with the project's requirements and items purchased. On the other end, private sectors are only responsible for non-core tasks (maintenance, supplementary operations) with limited influence on the PPP project's success (ESCAP, 2008). In such a case, the best option from the public buyers' perspective is to select other competent private suppliers that handle core activities in addition to the supplementary ones. A final type of PPP project is formed with a joint entity for which risks and profits are shared (Cappellaro and Longo, 2011). Such PPP contracts can be beneficial for both parties. A relationship is governed by constant collaboration for which public buyers benefit from private's innovative solutions and long-term commitment towards shared social goals. The below table provides a comprehensive description of the PPP contract arrangements with their respective tasks, risk shared, and types of relationship incurred amongst both parties.

Table 2. Description of risk and relationship in PPP contracts

PPP Contract Types	Core contractual arrangements	Expected risk allocated	Assumed relationship governed
Service and management contract	Maintenance Supplementary operations	Public sector Public sector	The private sector shoulders minimal risks while public units hold all project responsibilities. A minimum interaction is viewed, and the public sector may seek new skilled private relationships.
Concessions	BOOT, BOT, DBOT	Public/Private	Private accounts for most of the project's responsibilities. Relationships may vary according to the level of contribution and risks shared.
Privatization	Full divesture	Private	Private is responsible for all tasks involved in the project. Hostility, disagreements, or lack of commitment may appear with private partners, leading to the default of a project.
Joint Entity	Joint venture or alliances	Public/Private	A high degree of collaboration with an equal allocation of risks and benefits.

After analyzing risk effects within different contractual arrangements, the following part will investigate the concept of risk within the healthcare umbrella. The subsequent section will shed light on specific healthcare risks revealed in most essential PPP healthcare models.

5.5 PPP contribution models in the healthcare industry

Healthcare is a growing industry that constitutes over 9.8% of the world's GDP (The World Bank Group, 2020). Nevertheless, several hospitals and health service facilities are impacted by the covid-19 crisis. Under such circumstances, the government must benefit from the private partner assistance to confront the challenges emitted from this pandemic by adjusting procurement policies and cooperating with its private sector to develop a concrete plan against covid-19.

In this scope, PPP in the healthcare industry allows governments to provide greater stability in capital investments, procurement operations and budget management, and improvements in the quality and access of products (Sekhri, Feachem, and Ni, 2020). Thus, it is vital to understand the different models initiated by a public-private partnership (PPP) to acquire a comprehensive idea of risk allocated to each party and their impact on public-private relationships. This will help us outline potential solutions or specific criteria applied in PPP contracts to mitigate risks and simultaneously increase the value of money (VFM). In this prospect, PPP healthcare contract decisions may be based on those three basic models (infrastructure, clinical services, and integrated), which are described in detail as below:

Risk in the healthcare infrastructure model

PPP is widely used in financing infrastructure projects with the government increased concern of meeting the growing demand for improved infrastructure services. The government uses such infrastructure models to expand its capacity, resources, efficiencies, and access to novel technology by including the private sector's expertise and finances (Robert et al., 2014). Under this model, private partners aim to construct or replace public assets (hospitals, healthcare facilities, clinical units) as specified by contractual conditions. However, many risks arise due to the complex structure of healthcare infrastructure and procurement processes.

Given the complexity, size, budget, and time frame of infrastructure projects, different types of risk exist classified according to three fundamental groups: project, general and specific risks (Ke et al., 2010). Project risks include the effects that emerged from micro environmental events. This ranges from natural events such as weather conditions, earthquakes, fire, or any other similar incident. Other challenges appear in the operational phase of a project reflecting problems associated with designs (errors in facility designs, licenses, and approvals problems), construction (poor quality of materials used, unfavorable geographical site), operations (unqualified employees, unsatisfactory quality services, demand, and tariff risks) (Maslova and Sokolov, 2017). Whereas general risks emerge from the turbulences caused by external events surrounding a PPP project. Such risk may indirectly impact the outcome of a project and are described as political, legislative, economic, market, and other environmental risks which are mainly linked to the community's safety (Roumboutsos and Carbonara, 2013). In line with Grimsey and Lewi's (2002) view, a specific kind of risk attributed to hospital infrastructure is shown to impact the PPP procurement process and is sorted into five categories: public, asset, operating, financial and default risks.

Thus, public buyers must seek suitable risk mitigation strategies by allocating or transferring responsibilities to the party best able to manage them. In that respect, different strategies can be adopted targeting a specific type of risk and promoting mitigation practices. A summary table describing such strategies is further illustrated.

Table 3. Description of risk in healthcare infrastructure model. Adapted from *Managing Risks in Public-Private Partnership Projects: The Case of Izmit Bay Suspension* by Ozorhona and Demirkeseena (2015)

Risk Category	Risk Types	Description	Risk allocation	Risk Mitigation strategy
General	Environment	environmental events impacting the community safety	Shared	A joint environmental assessment framework to evaluate conditions and provide critical solutions
	Economic and Market	economic and market uncertainties (interest, inflation, exchange rate)	Public Sector	Effective financial plans to reduce price volatility
	Political	Political disputes and hostility	Public Sector	Ensure government and support to private's sector actions
Project	Force Majeure	unnatural events and weather conditions	Shared	Cultivate awareness of uncertain events
	Design	Defects in quality design and operations	Private Sector	Plan different design schemes at the beginning of a project
	Construction	Defects in quality of materials procured and construction process	Private Sector	Initiate improvements programs or hire highly skilled labor
Specific	Public	Inadequate governance of public policies	Public Sector	Enhance awareness of laws and regulations
	Sponsor	Resistance of private partner to contractual obligations	Public Sector	Reinforce compliance principles
	Asset	Inappropriate facility conditions	Private Sector	Transfer of risk to the party with the best technical competence
	Operation	Quality of products are incompatible with the project	Shared	Deploy a team of experts to oversee the project's operations
	Financial	Inadequate cost structure and control over the revenue stream	Shared	Establish a solid budget plan to cover the unexpected cost
	Default	A combination of all specific risks	Shared	Effective coordination between private and public units to track changes in project

Risk in Clinical Services model

Other risks related to direct health services, featuring all medical activities rendered by the private partners. Under such a model, the private sector skills are used to operate, manage, and deliver specific clinical services ranging from laboratory, dialysis, diagnostic, and other related services that directly support medical functions (PwC, 2018). Commonly, private partners are rewarded based on their performances which can be measured by the number of services provided or patients treated. Quality of healthcare services constitutes one vital aspect in private's performance assessment. This is reflected through the patient's health conditions, satisfaction level, and life expectancy after discharge (Tucker, 2004), also known as social performance and responsibility.

Nevertheless, a variety of risks emerged in distinct healthcare services, which may be classified in line with Maslova and Sokolov's view. Some of the risks are considered as diagnostic risk (risk of incorrect assessment of patient's conditions, unreliable medical information received), curative risk (risk of complications after surgical treatments), lack of accessibility to medical and supplementary resources (lack of medicines, drugs and medical reserves, electrical failure, water outage), ineffective complementary services (degraded food quality, poor cleaning services, infections outbreak due to ineffective sterilization) (Maslova and Sokolov, 2017). Other risks such as an increase in medical errors appear due to a shortage of qualified practitioners. Technology disruption is another risk facing the hospital's operational activities such as adapting new medical equipment and novel technological solutions towards the dynamic needs of patients' treatments. Thus, clinical models should empower social performance to minimize risk incurred and support the value of money (VFM) endowed by the public sector (Donabedian, 2005).

Risk in Integrated model

Unlike previous healthcare models, an integrated model optimizes and balances the risks amongst the involved stakeholders, particularly between the public and private sectors. In essence, the risk is transferred to the party with the most efficient and practical measurements. Though, value for money (VFM) may be achieved in such conditions if both parties pledged to agree and commit to the project 's success collectively. In other words, effective communication forms the baseline for the successful completion of a PPP project. Drawing from this assumption, a PPP project requires an intensive sharing of information and collaboration for delivering superior performance. However, both key aspects present significant challenges due to the difference in cultural beliefs, interests, and behavior (Rus *et al.*, 2015). Thus, the following part will analyze challenges incurred by ineffective information communication and then propose a set of recommendations to mitigate the risks concerned.

In such respect, various issues influence the efficient use and exchange of information. Such issues mainly result in the risk of deficient information. Concerning Kwofie *et al.* (2019) view, these issues are furtherly illustrated and sorted into five categories:

1. Inaccuracy of information communicated due to inconsistent coordination and exchange problems.
2. Delays in information delivered as the partnership lack a uniform system of means, principles, and standards for an effective communication with clear instructions and guidelines.
3. Excess or lack of information received.
4. Retainment of information due to confidentiality issues and inability to establish a trustful relationship with the counterparty.
5. Improper and robust assignment of roles, responsibilities, and information amongst the engaged participants. (Kwofie *et al.*, 2019)

Many risks emerge from the inadequate collaboration of the project's activities caused by the uneven allocation of responsibilities amongst the respective parties and conflicts of interest. This risk component can be due to information deficiency. Hence, a transparency solution should be embedded that identifies critical information, determines the proper method of conveying such information, and creates an information system that prioritizes effective communication. A broader approach to risk mitigation focuses on the level of commitment to successfully implementing PPP projects. A trustful relationship can be cultivated by primarily agreeing on public objectives, contractual terms, responsibilities assignment, interaction degree, and proper methods of exchanging information and technical competencies to harness such commitment. Thus, an effective communication process may minimize or eliminate risks incorporated in an integrated healthcare model. Interpreting the initial deductions of risk analysis in PPP projects. It is worth noting that the effects of risks vary with the degree of communication in the healthcare models selected. This issue necessitates a careful consideration of risk allocated, technical competencies, and overall objectives amongst the intended stakeholders. The end goal is to effectively use these models to meet the social healthcare value by simultaneously striving for VFM and risk reduction.

6. Value for Money (VFM)

6.1 VFM Conceptual definitions

A predetermined notion of VFM is the relative value assessed by the intended customer for which the product or service value must at least equal to the price paid. A wider view of VFM defines the optimum combination of life cycle cost and quality provision (Jackson, 2012). The aim is to eliminate additional costs that add few values to the product procured without compromising the overall quality of a PPP's project. A whole life cycle may comprise the total ownership cost of procuring the products that include purchasing, tendering, maintenance, consumption, and disposable costs. Quality may refer to the principles, standards, and expectations given across the value chain from its inception by suppliers to its final evaluation by end customers. Another integral component of VFM is illustrated in terms of sustainability which integrates both cost reduction and quality improvements over an extended period. This is shaped by three key factors: quality of healthcare, financial budgeting, and environmental impact (Jameton and McGuire, 2002). For instance, healthcare quality refers to competent humanitarian care that initially meets patient's immediate needs. While financial budgeting requires adequate management of healthcare expenditures and streamline of profits. Environmental concerns can be addressed by solving wastage problems such as pollution from disposable toxic products.

VFM has been a critical aspect of many businesses' success, but its concept is barely understood in public procurement and PPP. One misleading interpretation of VFM is often related to the cheapest cost purchased rather than accommodating the lowest life cycle cost in procurement. Sustainability and quality remain indispensable parts of VFM, yet too many professionals emphasize the cost procured (Baker *et al.*, 2013). Besides, public procurement is not used to its full capacity and social value is impeded by several risks bared by one party. PPP acts as a supportive function and provides an alternative option for risk allocation. The latter facilitates public units' tasks and provides procurement officers with the tools needed to incorporate VFM in procurement practices. Thus, a fundamental analysis of VFM concerning PPP procurement is performed to understand better the concept directly connected to our study.

6.2 VFM in PPP Procurement

In procurement, Value for Money (VFM) constitutes a core principle that enables the procurer to integrate effectiveness, efficiency, and economic resources by balancing the cost of

ownership and quality of products/services delivered. According to Kelly et al. (2004), VFM can be interpreted in two perspectives, objectivity and subjectivity (Kelly, Male and Graham, 2008). Objectivity tends to focus on the financial and economic aspects for which the public body accurately measures the overall cost at every stage of PPP projects (Osei-Kyei and Chan, 2018). The second perspective is concerned with the intangible aspect known as subjectivity, for which social values, benefits, and overall satisfaction of clients remain a top priority. This subjectivity value can be extremely difficult to quantify as stakeholders' perceptions differ and few evidential tools exist for effectively providing a precise measurement.

Mainly, VFM is based on three pillars of Economy, Efficiency, and Effectiveness that form a potential framework for PPP assessment. A fourth dimension describes the unbiased allocation of resources recognized as Equity which coincides with the sustainable development approach (U K Aid, 2019). These 4E's integrated together helps at evaluating the true value of a PPP project with economy relating to the cost of inputs required, efficiency referring to the degree to which inputs are converted into outputs, effectiveness emphasizing on potential outcomes derived from existed outputs, and equity measuring the fair distribution of social value across the intended consumers (DFID, 2011). In procurement practices, the best value of money can be realized when procurers aim for the lowest tender price, better technical skills, improved outcome quality, and social value goals (Atkin and Brooks, 1994). Other procurement activities address products' features, negotiations, contract formation, and purchases. However, a significant trade-off prevails, especially in critical economic conditions for which cost is preferred over quality and performance. This makes it imperative to apply the 4E's concept for optimizing procurement's social objectives.

Beyond the 4E's framework, public buyers opt to maintain an integrated procurement system by coordinating their social goals through two essential pillars: "transparency" and "fairness" (Fourie and Malan, 2020). For instance, transparent public procurement creates a rapid response to the unforeseeable emergencies caused by covid-19, strengthening the flexibility and agility of procurement functions. According to the European Court of Justice, emergency procurement can only be used to obtain critical medical goods immediately, yet it remains crucial to safeguard transparency and prevent corrupted practices (Cavallo Perin and Racca, 2018). At the same time, fairness in procurement practices supports transparency. This translates to the impartiality treatment of all stakeholders, especially in the bidding process, wherein suppliers must be evaluated and judged based on the same criteria. In addition,

suppliers and buyers are to be equally judged for their actions to promote integrity, develop mutual trust, and strengthen transparency across the procurement process.

Despite the benefits derived from VFM in procurement, the extensive depletion of healthcare resources had increased pressure on the government's resources. Public authorities needed to justify the taxpayer's money for achieving the best healthcare outcomes (Smith, 2009). Similarly, patients must be reassured of the government's tendencies to provide transparent and equal treatments (Sorenson *et al.*, 2008). These issues are closely connected with the government's capability of examining VFM and, accordingly, meet its desired goals. This sort of dilemma begs the question of what kind of assessment is best suited to fully benefit from VFM in the scope of healthcare, which entails exploring the challenges incurred and the proper measurements required.

6.3 Challenges of Value for Money (VFM) in the Healthcare Industry

As VFM is viewed as a critical factor for delivering social values, the problem lies with the intended outcome targeted towards patients, the primary beneficiary (I Okol *et al.*, 2014). This dilemma is being judged by healthcare's ability to deliver outcomes with minimal costs regardless of whether the services offered are relevant to the patients or provide optimum quality care. For instance, hospitals may measure outcomes based on the number of patients treated rather than the social benefits delivered to an individual unit of patients (Pennestri, Lippi and Banfi, 2019). Hence, a paradox effect exists for which social value performance is perceived in terms of cost reduction compromising on the quality delivered to patients. Another issue that appeared in hospitals is the mismanagement of scarce resources as public-private capital funds are being mistreated. This is particularly emphasized within post-acute treatments. For instance, hospitals can achieve sustainable results if funds were allocated in primary care by tackling the symptoms during their pre-mature stages. This endeavor helps at reducing complications, wasted resources, and subsequent costs of treatment. Thus, healthcare facilities must shift their traditional approach of cost-savings to a proactive, collaborative one, emphasizing optimizing social value to relevant patients based on "outcomes achieved per money spent" (Pennestri, Lippi and Banfi, 2019). This requires a proper analysis of VFM pillars: "economy, efficiency, effectiveness, and equity" within the healthcare scope.

6.4 Analysis of VFM Pillars in Healthcare Procurement

Efficiency:

VFM strives to achieve the highest value impact on patients with a limited level of resources. Thus, efficiency constitutes a key factor for the VFM concept. According to Okol *et al.*, efficiency can be categorized into two fundamental concepts: technical and allocative efficiencies (I Okol *et al.*, 2014). Technical efficiency concerns maximizing output from a given set of inputs (Dessale, 2018). The latter includes an ideal combination of healthcare resources with minimal costs (financial capital, medical materials, labor, and practitioners) to obtain the best value outcome with maximum efficiency savings (Zere *et al.*, 2006). Thus, measuring the efficiency level in healthcare helps identify procurement issues that range from lack of adequate purchasing consortium, limited number of available bidders, or costly negotiation processes. Whereas allocative efficiency relates to the ability of healthcare industries to use their limited funds for procuring the best combination of health service inputs that meets patient's social value (Gyrd-Hansen, 2014). Healthcare must aim for an equivalent marginal price and cost for one unit of items given the production capacity and related prices.

Economy:

This section represents the cost of inputs incurred, which is mainly associated with acquiring medical purchases. A key factor for strengthening the economic value of procurement is to assert public buyers' abilities to purchase the proper quality of inputs at the required price. This factor can be determined from the effective management of procurement procedures that directly tackle healthcare outcomes' financial and evaluation aspects. For instance, governments with the private sector's support heavily invest in long-term infrastructure projects and procurement processes to mitigate the socio-economic impact caused by the covid-19 outbreak (Conde, 2021). After completing these projects, economical value can be created when adequate healthcare regulations are pursued that safeguard the public's social interests.

Effectiveness:

In healthcare procurement, effectiveness is highly varied by the intervention arisen from clinical practices, internal competencies, and relationships with stakeholders. Thus, effectiveness can be defined with the "quality" of outcome produced, which can be categorized into two essential concepts. The first concept is related to clinical outcomes evaluated according to the health and quality of life gained from treating patients. While the second one is associated with healthcare experience, which can be affiliated to the satisfaction level of

patients received (Smith, 2009). For instance, healthcare facilities can determine the value of effectiveness by assessing the impact of their clinical services on poverty reduction. To clearly offer the most effective social benefits, it is crucial to harness the value of clinical services conveyed to patients. It may vary considerably even with the equivalent use of input resources. Thus, public sectors can use private partner's expertise in clinical services to maximize the effectiveness value delivered to patients.

Equity

To ensure a fair distribution of social healthcare services, public and private stakeholders must collaborate and agree on equity goals targeted towards the poorest segment of patients. However, many challenges arise with optimizing equity value. One challenge observed is the conflict of interest as equity goals are not fully aligned with private's requirements such as profit maximization. In addition, health inequalities appear to discriminate one individual, group, or population from another (The Global Fund, 2019). According to a study carried by Makinen et al., across multiple developing countries, health services were weighted in line with individual income levels wherein the wealthiest group of people reaped most of the social benefits (Makinen et al., 2000). Another challenge associated with equity is the quality of service delivered. For instance, one patient displaying severe effects receives an equivalent or higher value service than patients representing mild or low health issues (Prat, Trémolet, and Ross, 2015). Hence, healthcare institutions must ensure an equal distribution of social services under the public procurement act without discriminatory treatment towards all participants involved in procurement, PPP projects, and patient care (MEAE, 2016).

Clear visualization of the VFM concept is presented in the below framework to properly gain an understanding of core VFM components “Cost, quality and sustainability” and 4E's usage in healthcare procurement.

6.5 VFM Framework

The below figure assesses the relationship between 4E's from its first stage of inputs by acquiring the necessary resources with a special concern for the economic value derived. Then, these inputs are transformed into the designated outputs after undergoing an efficient procurement process. Finally, effective delivery of outcome and impact over a longer period must be ensured to optimize the value of money. Investigating those stages in the healthcare context. Procurers can analyze whether they are economically viable to purchase the required inputs, create the intended output harnessed with the private partners' intervention, assess those

outputs with the desired outcome based upon a patient’s health quality and finally, outline the impact of healthcare social outcomes on the value for money.

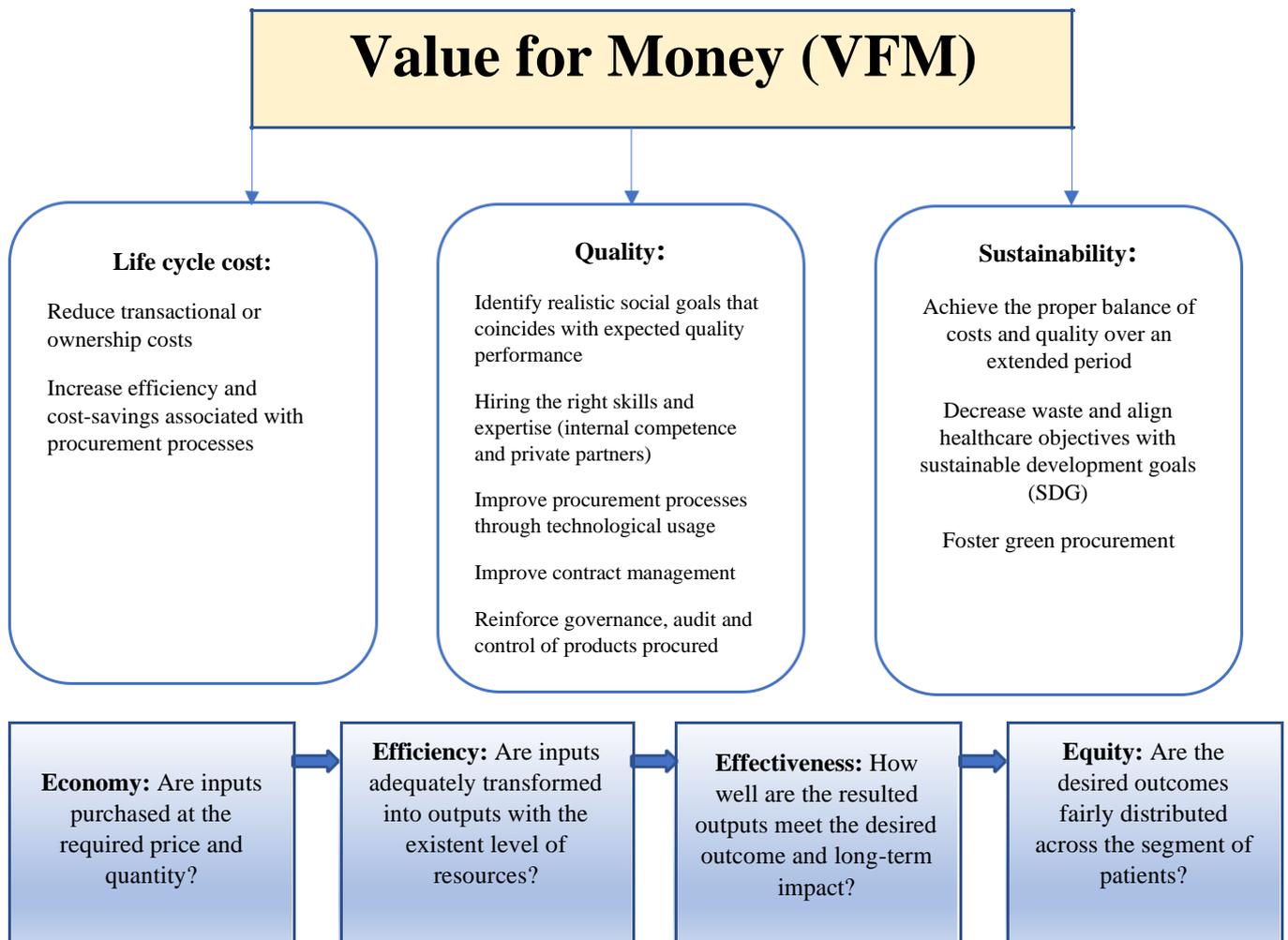


Figure 6. Value for Money framework for healthcare adapted from *DFID’s Approach to Value for Money (VfM)* by Department for International Development (2011)

Looking beyond VfM's contribution to healthcare, one needs to analyze its influence on public and private sector practices.

6.6 Impact of VfM on Public-Private Partnership Projects (PPP)

Value for Money (VfM) has been described as a successful element for strengthening the performance of PPP projects. Different views and studies suggested by Liu et al. refers to VfM as an essential tool for achieving the public objectives set in an integrative public-private

project (Liu *et al.*, 2015). Implementing VFM at the initial stages of PPP projects provides all stakeholders with the required roadmap to identify their objectives, structure their plan, and make appropriate decisions regarding the project's scope, financial cost, returns, and degree of social services offered (Siqueira, 2015). VFM can also serve as a benchmark for comparing the objectives and performance of one PPP project in relation to others (Atkinson, 1999). This introduces us to the concept of Best Value (BV), which can be described as the optimal level of VFM's results achieved in a PPP's project (Gransberg and Ellicott, 1997).

VFM is considered as an integral component of the best value and may be used as a scale for assessing the degree to which the best value can be achieved (Almarri, 2017). This includes attaining the best possible outcome to measure private partners' competencies based on total procurement costs, quality issues, project completion time, and technical innovation. It also cultivates the relationship between public and private sectors from the preparatory stages of a project. In that case, efficiency, effectiveness, economy, and equity encompassing the 4E's pillars of VFM are maximized to ensure the highest performance standards. From a procurement perspective, the best value emphasizes two inter-connected views: "Public client's policy objectives" and "Private sector selection" (Zhang, 2006): Public client's policy objectives point towards public's goals which can be considered within the financial and social aspects. Whereas private sector selection reflects a private sector's ability to meet those goals in a PPP project.

In this line, public objectives can be determined with an ideal balance of cost and non-cost (e.g., social) criteria that translates into prior requirements and attributes of a PPP project (Gransberg and Ellicott, 1997). These attributes should be allied with private's sector contributions in respect to the financial, social, and sustainability aspects (Zhang, 2005). Notably, the best VFM criteria can be viewed as critical success factors (CSF) that optimize the performance of PPP and may be tailored to specific projects that might specialize in infrastructure, management services, or integrated models. Throughout our analysis of the best VFM within the PPP scope, one can conclude its substantial impact on the successful implementation and completion of PPP projects.

7. Introduction to Critical Success Factors

Following that concept, a systematic approach for analyzing CSFs allows us to interpret VFM achievable levels promptly. This research refers to the factors identified by professional academics and institutional studies (Zhang, 2005). A quantitative statistical analysis from international experts is used to demonstrate their relative significance towards the success of VFM. Additionally, these factors can be assessed through a standard evaluation criterion tailored to joint and specific PPP projects regarding scope, type, models carried, and risk distributed amongst the project's stakeholders. From that perspective, four main factors are identified in this research study which includes: "Political guidance and support for investments," "Market's conditions", "Private partner technical competencies," and "Appropriate allocation of risk".

It is vital to distinguish between independent and dependent variables, particularly in the healthcare sector, for designing our research study. One of the most critical aims of our research study is to understand the cause-effect relationships that result from the intended outcomes. Thus, this section will firstly demonstrate the dependent and independent variables to proceed with the quantitative statistical analysis. The four identified factors are illustrated in the independent variable part and a detailed description of their sub-criteria. The latter is explained with the reasons, intended outcomes, and expected performances from the public sector perspectives.

Dependent variable

In this area, the best VFM is viewed as a valuable tool directly linked with the successful performance of a PPP's project. It is hereby perceived as the dependent variable "Y". Thus, this paper will address the project's success based on the successful implementation of VFM that is conducted with the independent variables' analysis.

Independent variables

Independent variables follow the concept of cause-and-effect, for which these variables are assumed to influence the primary variable of our study, "VFM" (dependent variable). In such a case, we assumed four main independent variables with their respective sub-criteria "Political guidance and support for investments", "Market's conditions", "Private partner technical competencies" and "Appropriate allocation of risk" that affect our core dependent variable

“VFM”. Thus, this section will demonstrate all these sub-criteria and describe their importance towards the successful implementation of VFM.

7.1 Political guidance and support for investments

The Private’s sector contribution highly depends on the environment for which it operates. Strong political governance where local authorities preserve a healthy environment and endorse private’s competencies, encourage private’s investment in infrastructure, service management, or other types of PPP’s projects. Whereas a fragile governance system leads to unnecessary interruptions and operational delays (OECD, 2012). To stimulate a stable political environment, the government is perceived as the pinnacle for managing PPP projects. It eliminates all political risks concerned with expropriation, unethical behavior, bribery, opportunism, coercion, and political corruption (Schomaker, 2020). Thus, a well-structured legislative framework must be formed by public sectors in cooperation with private’s partners to preserve the procurement’s safety and ensure flexibility across PPPs procedures (Amović, 2020). However, a strict and over-regulated framework may hinder the project’s progress. Given the example of transparency in the bidding process, an unfair evaluation criterion provokes corruption and low competition level, excluding competent new entries from incorporating innovation and continuous improvements (Søreide, 2002). Hence, a shift in mindset from traditional regulatory framework towards a dynamic and flexible perspective fosters governmental support and allows private’s contributions.

Following that notion, several sub-factors of “Political guidance and support for investments” are identified that revert to the studies made by Zhang (2006). These sub-CSF are derived from a screening process of opinions and comments made by worldwide PPP experts and experienced professionals in the field of public, private, and academics (Zhang, 2005). In that respect, the sub-factors are described in detail with the table below:

Table 4. Sub-factors for the Political guidance and support

Political guidance and support for investments	Explanation and a brief description of the selected sub-variables
Stable political and economic conditions	Analyzing the overall economic conditions and regulatory/legal environments, whether governmental agencies have set a stable environment for private partners to invest in or a balanced partnership between the public and private sectors with realistic expectations.
Government' support and commitment	Analyzing the degree to which the government provides political support and commitment to the private sector through political leadership, risk-bearing, and contributions to the overall PPPs project and assessing the commitment degree towards the PPP project and private's successful performance.
Government's competence	Determining the government's skills level in technical, legal, financial, contract management and monitoring, risk allocation, and mitigation.
Community's support	Analyzing the degree to which the public and private sectors allow the stakeholders and community engagement to PPPs project through receiving and implementing the community's inputs in terms of environmental, legislative, and social impacts.
PPP project addresses public goals	Analyze the degree to which the public-private partnership (PPP) tackles sustainability challenges and addresses sustainability development goals (SDG) tailored to the public community.
Transparency and fairness in procurement	Analyzing the degree to which the PPP procurement process is standardized, flexible, fair, and transparent to avoid delays and illegal attempts such as bidders' favoritism or corruption in procurement.

7.2 Market's conditions

The feasibility of investing in PPP projects dramatically depends on the government's endeavor to pursue a market-oriented view. This is defined through public buyers' tendencies to set realistic goals that are compatible with private sector competencies operating in a certain market's conditions. From that purpose, it is equally important to interpret the key factors that constitute the market's conditions and frame the success of any PPP project. Similar to the study dawn by Zhang (2005), these sub-factors can be evaluated with the table below:

Table 5. Sub-factors for Market conditions

Market conditions	Explanation and a brief description of the selected sub-variables
Long-term demand of product/service delivered from PPP's project	Assess the degree to which the government refine its product and service offerings, invest in innovative practices, and adopt continuous improvements to fulfill customer's current and future demands.
Stable competition level	Analyze the market's competition impact on private contributions towards PPP projects.
Ability to attract new private investors and donors	Analyze the capability of public buyers to attract private sector capital investment through specific consideration of private's interests for profitable outcomes.
Availability of supplier's network and materials requirements	Determine whether the existing network of suppliers is reliable and capable of providing the required materials on time with agreeable quality and cost.

7.3 Private partner technical competencies

The government must form a favorable environmental condition to ensure private's sector commitment. Private partners are paramount players that enable either the success or failure of PPP projects. Hence, it is imperative to choose the right concessionaire equipped with the required skills and expertise. In such a context, public buyers must establish an appropriate evaluation framework that conveys the professionalism needed, technical performance, and financial capacities (Zhang, 2006). In addition to internal competencies, private partners must display leadership traits with complex PPP projects from designing, constructing, managing, and controlling the lifecycle of a project. These traits also include environmental health and safety measurements impacting the community's well-being. Relationship with governmental authorities is another crucial element. A collaborative rather than transactional one may enable opportunities for innovative solutions with significant improvements in procurement operations. Considering these points, we can develop these sub-criteria for the "Private partner technical competencies" as displayed below:

Table 6. Sub-factors for Private partner technical competences

Private partner technical competences	Explanation and a brief description of the selected sub-variables
Management, leadership, and planning of PPP project	The degree to which the private sector can manage and control the required tasks
Technical skills and expertise	The private sector qualifications and internal capabilities to meet the expectations in PPP projects
Relationship with local government	Type of relationship with public sector and its impact on the project's outcomes
Communication and collaborative capabilities	Private sector's capability to cooperate during the life cycle of a project
Innovation and technical background	Private sector's key innovative solutions that cope with the public's demand
Ability to access the know-how	Private sector know-how resources and expertise
Ability to meet public sector's objectives	Alignment of private sector's goals with public sector objectives

7.4 Appropriate allocation of risk

Per our previous analysis of PPPs project with its different principles and resulting outcomes, risk is deemed a key element that co-exists with VFM (Desgrées du Lou, 2012). In essence, different kinds of risks are associated with each stage of a project. Therefore, to ensure a fair distribution of risks amongst the involved stakeholders, it is imperative to allocate the responsibilities fairly. In this respect, it is necessary to balance the amount of risk amongst all players by transferring the appropriate type and portion of risk towards the party that can best manage it. In this context, “best” implies managing the allocated risk at the least possible cost without encountering any severe impact. In other terms, it is suitable to allocate responsibilities to the parties that are ideally able to prevent risk from occurring or that can best tackle the implications of such risk (Karim, 2011). In both circumstances, risk should be managed adequately with the least possible cost realized.

In terms of contractual arrangements, it is for the benefits of both parties, public and private, to appropriately allocate risks at the beginning of the project life cycle (Karim, 2011). This refers to adequately dictating the responsibilities governing the type, content, and specific tasks (Bubshait, 2003). Thus, it is equally vital that all stakeholders clearly understand, allocate and communicate their responsibilities within the PPPs procurement cycle to improve transparency. According to Ezulike *et al.*, a procurement process is deemed to break if

responsibilities were not clearly identified and discussed (Ezulike, Perry and Hawwash, 1997). Hence, PPP's projects' responsibilities should be treated adequately and tested against risk transferred and value for money. This research study will shed light on this aspect by analyzing the sub-factors that constitute the "Equal allocation of Responsibilities" according to the table presented below:

Table 7. Sub-factors for Allocation of risk

Equal Allocation of Responsibilities	Explanation and a brief description of the selected sub-variables
Sharing the risk of financial and economic market's burden	Analyzing the impacts of financial and economic risks on the private sector's operations
Sharing the risk of project core operations	Determining whether either party can manage the entire lifecycle of a PPP's project (design, construction, planning, and management).
Sharing the risk of unpredictable and uncontrollable future events	This determines the degree of allocating responsibilities in complex situations that are beyond one's controllable power.
Sharing the risk of disruptive technology and its impact on PPP project	Assessing the degree of handling quality of innovation provided to prevent the disruption of resources in PPPs operations
Sharing the risk of purchasing processes and communications	Evaluating the degree for which either party are responsible for the whole purchasing activities by constantly monitoring the performances of parties involved in purchasing activities
Sharing environmental and social adverse effects on the local community	Analyzing the degree to which either party is responsible for maintaining a sustainable environment and urban development. From the public's perspective, it relates to the private's capabilities to deliver environmental goals that support healthcare improvements.

After conducting an explicit CSF analysis, a PPP framework can be formed through our survey's findings. A critical interpretation of the survey's results with the intended framework is provided afterward in our thesis study results section. Nevertheless, a brief introduction and explanation of the PPP framework are introduced next.

8. PPP Framework

Using our survey's findings to create the intended framework, data variables were classified in terms of both dimensions "Degree of Risk on CSF" designated as the x-axis and "CSF contribution to VFM" assigned as the y-axis. Thus, the following framework is presented as a matrix divided into four diverse quadrants. A Likert scale of five points was applied on each of these CSF items with their respective sub-factors. Such scale aims to create a statistical measurement that divides, sorts, and groups data variables into two segments: "Low" and "High" for each dimension. In this illustrative matrix, the 2.5 value is considered the median or intersection point of both dimensions, "Degree of Risk on CSF" and "CSF contribution to VFM". Thus, a proportional impact is viewed in the "CSF contribution to VFM" with values less than 2.5 considered as "Low"; otherwise, assigned as a "High" with values exceeding that same value. Likewise, an inverse impact is shown with "Degree of Risk on CSF", demonstrating similar segment categories "Low" and "High" assigned.

Cluster analysis is usually performed in exploratory research. It aims to sort the data set into different segments in line with the degree of risk associated with each CSF and the degree of contributions towards VFM. The purpose behind such analysis is to classify a sample of target variables into separate segments. Each presents unique attributes based on degree of similarities (Hair et. In our case, data collected from the respondents are assessed, and some displaying similar characteristics are inputted into these four identified quadrants in the matrix framework. This method allows researchers to determine the companies' positions, reflecting the type of risky environment those respondents operate in.

Thus, this research study aims to determine the magnitude relationship between the degree of risk and its effects on CSF contribution to VFM. Thus, providing us with the optimum risk management tool and suitable resource allocation strategies that reduce risks and enhance the achievement of VFM amongst the public and private partners. As previously mentioned, four quadrants are identified and explained as below:

- **Quadrant I:** Both degrees of risk and CSF contribution towards VFM are low, referring to transactional PPP projects. A minimal allocation of resources with the least number of efforts from both counterparts is needed in such quadrant. These kinds of projects are affiliated with routine services or non-core business activities such as fast fixes, stationary services, and consumables that require minimal attention and trivial contract

management. From a public procurement perspective, the most suitable strategy for such contract arrangements is to capture the private/suppliers' power by establishing a long-term relationship based on needed consumable purchases. This entitles maximizing the efficiency of procurement procedures and cutting all associated transactional costs.

- **Quadrant II:** The degree of risk impacting CSF is high, and the VFM delivered is low. This requires a contract management plan (Ronald, 2015), for which the focus is on risk mitigation and management. In such a situation, public buyers perform risk analysis impacting each CSF factor and employ the most suitable risk mitigation strategy.

Considering the case of “private partner technical competencies”, a strict audit plan is necessary to monitor the actual performance of private partners against the agreeable expectations. With public buyers operating in a complex and risky supply market, a multi-sourcing strategy is employed to secure a continuous streamline of materials and resources. However, public buyers should aim for a long-term relationship with competent suppliers while adopting a multi-sourcing strategy as an alternative short-term solution.

- **Quadrant III:** This quadrant presents with a high degree of risk and high CSF contribution towards VFM. In PPP procurement, both private and public partners have equal influence and are interdependent. Thus, an increasing interest in collaboration is seen in this complex and risky environment. Both public and private sectors are expected to develop a contractual framework that copes with the market dynamics and stimulates trust in the long-term period (Klakegg *et al.*, 2021). However, the success of such a collaborative contract arrangement is highly dependent on managing risks identified in CSF. For instance, private partners can easily gain political support when acquiring a more profound knowledge of the hosting sector's legal system, political culture, and governance structure. Alternatively, private partner's competencies are vital for dealing with unprecedented situations, which can be defined with their capabilities for handling emergent risks upfront (Mohd Som *et al.*, 2020). In terms of procurement, a collaborative mechanism that provides room for open communication, trust, shared resources, and joint problem solving can be applied in the beginning stages of PPP projects. Such mechanisms identify mutual goals and promote the interchange of information and innovation tendering procedures.

- **Quadrant IV:** As for this quadrant, it describes a high-value contract with minimal risk involved. Leveraging the value offered by private partners through exploiting supplier’s purchasing power is one typical procurement strategy pursued by public buyers. This is followed by short-term sourcing strategies that emphasize cost reductions, discounts, and price concessions (Caniëls and Gelderman, 2007). Despite this leveraged procurement approach, quality should not be neglected. In essence, cost savings is primarily considered due to the availability of a broad set of supplier’s options but relying on cost alone may lead to a paradoxical effect on the quality of items procured. Another strategical view of procurement entails focusing on CSF priorities that yield the best possible results. Such strategy can be referred to as the concept of “low-hanging fruit” (Reh, 2018), defined as the practice of achieving the most attainable and most straightforward goals first, given the insignificant risks perceived in a business environment. Such goals may vary with the type of PPP project models applied. A typical target goal would be promoting supplier’s innovative solutions within all public procurement levels. A relatively collaborative relationship rather than transactional one is chosen for which the least amount of effort and number of resources is allocated from each party.

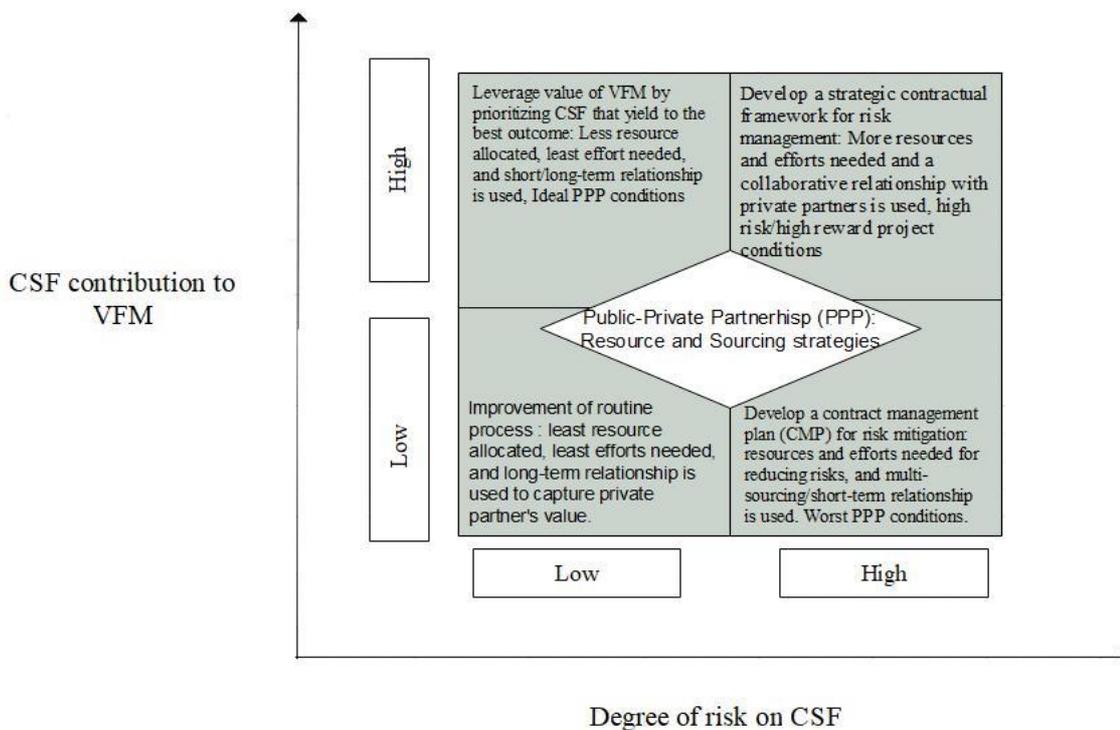


Figure 7. Public-Private Partnership (PPP) framework

9. Research methodology and data collection

This research study will emphasize the explorative and descriptive approach and conduct a quantitative analysis through our survey's findings. Such statistical method is employed to accelerate the collection of data and simultaneously provide an objective view of the research studied (Dudovski, 2020). Whereas a qualitative method is not adopted since it gives a subjective aspect to the conceptual theories. Due to the broad scale of the subject studied, several interviews need to be adopted to fully grasp the theoretical background investigated (Greener, 2008). Also, the methodological choice is based on the research question that demands quantitative data. Thus, a quantitative method is best used to answer our research question. Our primary goal is to assess the degree to which critical success factors (CSF) contribute to value for money (VFM) and whether its effects are influenced by the risks incurred. Overall, CSF is used as common evaluation criteria for any PPP project and in our case, these factors are analyzed from the public buyers' perspective. Both secondary and primary data are deployed in our research study. Secondary data are essentially collected from various academic literatures, governmental principles and guidelines, online websites, journal articles, and historical data. A survey is created to collect our primary data from public healthcare sectors such as hospitals, clinics, central procurement units, governmental agencies, and public buyers.

The survey contains close-ended questions and use two main methods, "multiple choice" and "Likert scale". This type of data collection is employed to fasten the response process and provides an objective perspective of the studied topic (Dudovski, 2020). Afterward, the results are closely examined, and statistical analysis is performed using the Stata system. Factor analysis is carried first to analyze the rating of CSF and establish a clear interpretation of their relationships towards the dependent variable VFM. This method reduces our data variables into fewer dimensions used to define the relationships amongst the set of items. Following this analysis, a Pearson correlation test will measure how well the data variables fit the regression model. A varimax rotation method is used to clarify the relationship presented amongst the factors, and the intended goal is to maximize the variance shared between the variables. With all the data variables presented, it is essential to examine the validity and reliability of our data. The latter refers to the feasibility of our questionnaire survey, which measures the concepts of CSF accurately and consistently.

The Cluster analysis test will finalize the most important test of our statistical analysis. The latter groups the set of variables according to the degree of risk impacting the four main factors:

“Political guidance and support for investments”, “Market conditions”, “Private partner technical competencies,” and “Appropriate allocation of risk”. This will determine the companies’ situation and the type of risky environment operating in, creating the four quadrants presented in the PPP framework. This framework, as previously explained, engenders CSF analysis in terms of both dimensions, “degree of risk on CSF” and “CSF contribution to VFM”. From that purpose, we can derive the type of public-private relationship governed and suggest suitable recommendations and possibilities for future research.

10. Analysis and Results

In this chapter, the analysis of the research results is based on the survey questionnaire conducted in Finland within the healthcare industry. The survey was sent to 67 respondents, only 30 of them returned the questionnaire. This amount constitutes an approximate rate of 45%, which is sufficient for statistical business research. Many of the respondents consist of public buyers and professionals in procurement practices. This makes them suitable for our study as they are perceived to have rich knowledge and experience in PPP projects. The following section will discuss the empirical study related to our research study. The subsequent results will delve into statistical analysis of CSF with their sub-factors and elaborate on the impact of those same sub-factors towards their respective CSF dimensions. This will be conducted through factor analysis, which provides us with a genuine idea of the resulting data's feasibility and reliability to derive the most important critical factors. Such results will be reviewed in detail along with their application in the PPP framework with the discussion section.

In respect to the questions addressed to the respondents. First, they were asked about the PPP's conditions to grasp background information of public and private partnerships fully. These questions range from selecting the best criteria for choosing a private partner, type of relationship used with key suppliers, contractual agreements embedded in such partnership, procurement methods applied and reasons, and limitations of private's partner selection. Other questions explored the importance of 4E's pillars illustrated in the value for money (VFM). The remaining questions guide us towards the importance rate of CSF contribution to the success of PPPs and the degree of risk affecting them. An analysis of sub-factors is also conducted. The latter questions of CSF constitute the basis for this research study.

The results extracted from the questionnaire survey were used to conduct a factor analysis test which will reduce the number of data by combining and grouping them into dimensions or factor segments. These dimensions identify relationships amongst the set of variables and allow researchers to detect hidden patterns. For this study, the factor analysis test is perceived as a confirmatory test for ensuring that the researched variables are adequately grouped into their relative dimensions, leading to tangible results that support our initial theories of critical success factors (CSF). For that purpose, this same test is conducted with each of the identified dimensions that represent the main CSF factors: "Political guidance and support for

investments”, “Market’s conditions”, “Private partner technical competencies,” and “Appropriate allocation of risk”. After such analysis, a cluster test will be performed to determine the different degrees of CSF examined according to the risk and value for money levels. Such results will be assessed based on the theoretical framework described in the literature review.

Factor analysis results

As previously discussed, a factor analysis method is conducted on the chosen sub-criteria within their respective CSF dimensions. All 23 sub-variables used to examine their relative importance towards the success of PPP projects were tested. A validity and reliability test were also applied, which initially confirm the feasibility of factor analysis, adequacy of sampling, and consistency of sub-criteria measuring each CSF dimension. Initially, a spearman correlation test was executed to verify the degree of relationships amongst the existent variables. The latter ensures that sub-criteria assorted in a particular CSF dimension have a significant correlated relationship with one another, collectively explaining their contribution towards PPP projects and VFM. Cronbach alpha is utilized to test the internal consistency of the variables identified. This method justifies whether the variables yield similar results over an extended period, thereby asserting data reliability. One extraction method employed in this study is the principal component, which recognizes the technique of minimizing a large set of data while simultaneously preserving as much information as possible (Jolliffe and Cadima, 2016). This allows for a better interpretation of diverse data types and structures. A varimax rotation method is followed. This technique maximizes the variance of the loadings presented within different factors (Kaiser, 1958). Thus, improving data analysis by estimating the uniqueness of each sub-criteria along with their intended CSF factors.

Spearman Correlation

A correlation method, known as spearman, is performed to assess different patterns from the observed data variables for each CSF factor. In our assumption, variables are viewed as highly correlated, whether they are negative or positive, present a value equal or greater than 0.5. Otherwise, these same variables are regarded as uncorrelated, which can be due to the influence of diverse factors. Before considering the spearman correlation analysis, the table shown in the Appendixes describes the studied sub-factors variables. Considering the below correlation tables for the intended research study:

Table 8. Spearman correlation

Political guidance and support for investments	Q9_1	Q9_2	Q9_3	Q9_4	Q9_5	Q9_6	
Q9_1	1						
Q9_2	0.2066	1					
Q9_3	0.3737	0.2707	1				
Q9_4	0.4468	0.3036	0.3471	1			
Q9_5	0.4138	0.4432	-0.1343	0.6067	1		
Q9_6	0.3398	0.18	0.2268	0.1758	0.254	1	
Market's conditions	Q10_1	Q10_2	Q10_3	Q10_4			
Q10_1	1						
Q10_2	0.3759	1					
Q10_3	0.4198	0.0376	1				
Q10_4	0.1914	-0.1091	0.1531	1			
Private partner technical competencies	Q11_1	Q11_2	Q11_3	Q11_4	Q11_5	Q11_6	Q11_7
Q11_1	1						
Q11_2	0.2774	1					
Q11_3	-0.055	-0.2443	1				
Q11_4	-0.1583	-0.3707	0.1423	1			
Q11_5	0.1362	0.1133	0.3946	-0.1159	1		
Q11_6	0.0351	0.1169	0.2737	-0.1789	0.6739	1	
Q11_7	0.0727	0.1009	-0.032	0.3684	-0.5053	-0.6441	1
Appropriate allocation of risk	Q12_1	Q12_2	Q12_3	Q12_4	Q12_5	Q12_6	
Q12_1	1						
Q12_2	-0.0037	1					
Q12_3	0.2744	0.6481	1				
Q12_4	0.153	0.4666	0.1214	1			
Q12_5	0.0088	0.3393	0.152	0.6537	1		
Q12_6	0.3319	0.0167	0.041	0.4186	0.6095	1	
Degree of risk on CSF	Q13_1	Q13_2	Q13_3	Q13_4			
Q13_1	1						
Q13_2	0.4872	1					
Q13_3	0.5324	0.2886	1				
Q13_4	-0.046	0.1095	0.0355	1			

Based on these findings, there is a strong correlation amongst the following items:

Political guidance and support for investments:

- “PPP project addresses public goals” with “Community’s support” (0.6067). In view of meeting sustainable development goals (SDG), community support is needed). The community’s perception of public-private partnership engagement in the host country can influence the government’s decision to promote PPP projects, thus meeting its sustainability goals. In such a case, both community and political endorsement are required for achieving sustainable public objectives.

Market’s conditions

“Long-term demand of product/service delivered from PPPs project” and “Ability to attract new private investors and donors” (0.4198). Depending on the government’s ability to attract and maintain private partners, the public sector may encourage private’s investment into the market. According to the correlation shown, appropriate market circumstances are necessary for stimulating private’s capital involvement. Thus, the public sector needs to ensure that high demand for products/services exists to draw sufficient private investors. This implies that private partners may not be willing to invest in a market without a sustainable product or service demand.

Private partner technical competencies

- Regarding private partner technical competencies, it is shown that a private partner's “ability to access the know-how” is highly related to its “innovation and technical background” (0.6739). This suggests that private sector innovative capabilities are dependent on the knowledge acquired of PPPs practices.
- A negative relationship is displayed in “Ability to meet public sector’s objectives” with respectively “Innovation and technical background” (-0.5053) and “Ability to access the know-how” (-0.6441). This might entail that private partner know-how, and key innovative solutions may impede a government's ability to meet the objectives requested. This issue may be commonly due to the lack of sufficient communication and willingness of the private party to adhere to the requested objectives.

Appropriate allocation of risk

- Appropriate allocation of risk can bring substantial advantages when the public sector delegates a portion of risk towards the private partner. One aspect of PPP risk may create a similar or more substantial effect on other risks shared. For instance, “disruptive technology risk shared,” defined as the capability of sharing responsibilities to preserve the quality of innovative resources, if neglected, may hinder the ability of both parties to manage the risks that appeared in “purchasing and communication practices” (0.6537).
- A strong correlation appears between “unpredictable and uncontrollable events” with “project core operations” (0.6481). This defines the severity of unpredictable events, such as force majeure or unnatural circumstances, on the advancement of PPP operations.
- In addition, “environmental and social risks shared” for maintaining a sustainable healthcare value, if not managed correctly, can result in the risk of “disruptive technology shared”. This kind of disruption may impede a government’s progress to innovate and improve the quality of its services. Such consequences are recognized in the risk incurred from “disruptive technology-shared” (0.6095). Such impact can highly affect both industry and community practices.

Degree of Risk on CSF:

For the dimension “Degree of risk on CSF”, a moderate correlation appears between “Private partner technical competencies” and “Political guidance and support for investment” (0.5324). This correlation reassures our previous discussion of the value a stable political system brings towards private investors, which eventually breeds public-private partnerships (PPP).

Looking through the analysis of these sub-criteria to their relative dimensions, a principal component method was primarily deployed to reduce datasets into fewer dimensions. According to Kim and Muller (1978), a minimal eigenvalue of 1 can be adopted as a rule-of-thumb for analyzing the factors addressed in the studied sample. Following that approach, several sub-factors with their relative loadings are formed within each of those CSF dimensions. With the analysis of factor loadings, one may determine the relationship of each

sub-criteria to their underlying dimensions (Balasundaram, 2009). In return, a correlation relationship can be detected between existent and hidden data patterns. The varimax orthogonal method was used beforehand to maximize the variances amongst each factor, which concurrently provide us with the highest loadings and disregard the lowest ones (Hair et al., 1998). The identified results are shown in the table below:

Table 9. Rotated loadings for CSF and degree of risk

Variable	Rotated Loadings					Uniqueness
	Political support	Market Conditions	Private competencies	Allocation of risk	Degree of Risk on CSF	
Q9_1	0.4887					0.4602
Q9_2	0.3364					0.6649
Q9_3	0.7519					0.1722
Q9_4	0.5378					0.2962
Q9_5	0.7205					0.06678
Q9_6	0.3249					0.7226
Q10_1		0.7017				0.2133
Q10_2		-0.7024				0.256
Q10_3		0.5628				0.4916
Q10_4		0.6915				0.3427
Q11_1			0.678			0.3238
Q11_2			0.623			0.3315
Q11_3			0.6573			0.302
Q11_4			0.4692			0.3151
Q11_5			0.5468			0.2673
Q11_6			-0.504			0.2129
Q11_7			0.6655			0.1658
Q12_1				0.8827		0.07519
Q12_2				0.6749		0.103
Q12_3				0.6648		0.1597
Q12_4				0.5155		0.3195
Q12_5				0.6283		0.1534
Q12_6				0.5633		0.1881
Q13_1					0.6424	0.2095
Q13_2					0.5112	0.4899
Q13_3					0.571	0.3607
Q13_4					0.973	0.0198
Eigenvalue	2.41824	1.57144	2.30053	2.34509	1.8906	
Cum.var.explained	0.403	0.3929	0.3286	0.3908	0.4726	

Political Support:

During the analysis of the “Political Support” dimension, one factor is retained. This same factor cumulatively explains around 63% of the total variance, regarded as a high value. “Political support” comprises of “government commitment” (0.3623), “Community’s support” (0.5932), “PPP project addresses public goals” (0.6696), “stable political and economic conditions” (0.4127), “government's competences” (0.6713), “transparency and fairness in procurement” (0.5754). The highest loadings were shown to be “government competencies” and “PPP projects address public goals”. This result alleges the importance of having highly skilled public procurement officers, particularly specialized governmental units and public buyers alike. Governmental units act as enablers and are liable for political reforms in public procurement procedures. Such reforms promote new practices that oversee public spending, develop “best-fit” sourcing strategies, and incorporate innovation, digitalization, and automation in procurement operations (Francesco *et al.*, 2018). Compared to public buyers, whose responsibilities revolve around purchasing practices. Public buyers’ activities are confined to selecting the most advantageous suppliers and sourcing quality standards at affordable cost. From a PPP perspective, buyer’s and government responsibilities extend towards meeting public goals. This process starts by identifying the market’s attributes, balancing risks with private suppliers, and managing contract awards (Saussier and Tirole, 2015). Assessing both elements, government competencies, and meeting public goals, it is in the public sector’s best interest to align their skills and effort towards addressing public goals. The latter gives rise to solid political guidance and support for investment, succeeded by value for money (VFM) and social healthcare value. Other sub-criteria such as “community support” emphasizes the community's role in fostering public-private engagement in the host country (0.5932), which basically explains the strong effect a community has on the government’s decision to promote a political environment suitable for PPP projects. “Transparency and fairness in procurement” (0.5754) also presents a significant effect on the government’s capacity to endorse transparent and fair political practices. In view of supporting private’s investment, “stable political and economic conditions” (0.4127) as well as “Government’s commitment” (0.3623) are needed. Both criteria tend to contribute towards the “political support” dimension, however, their effect seems to be weaker than the others as value is less than 0.5.

Market Conditions

Whereas market's conditions present with "stable competition market level" (0.7866), "ability to attract new private investors and donors" (0.5085), "availability of supplier's network and materials requirements" (0.7488), and "long-term demand of product/service delivered from PPPs project" (0.5862). Examining the top-rated loadings, "stable competitive market level" and "availability of supplier's network and materials requirements" are perceived to substantially impact the market's conditions. This illustrates the cruciality of having a stable competitive level for which public buyers incite innovation rather than traditionally bid on price-centric candidates or subdue qualified suppliers from creating procurement solutions. As discussed before, a strong correlation exists between competitive level and availability of supplier's network. This suggests that a well-structured supplier's network is the by-product of a stable competitive market level. By all means, such a network provides public buyers with multiple sourcing options. It relieves them from falling into high "demand pressure", interpreted as purchasing extra goods and services or hiring more labor force to enable timely health care services (Saussier and Tirole, 2015). Value for money (VFM) is improved if both sub-criteria, especially competitive market level, are optimized.

Regarding the two remaining criteria, "ability to attract new private investors and donors" and "long-term demand of product/service delivered from PPPs project" also produce a significant influence on "market's conditions". This clarifies a government's tendencies to encourage private's investment, which additionally support public-private partnership and meet the demand of healthcare market. For instance, adjusting and modifying medical devices through private contributions may greatly serve patients' health status and improve market conditions.

Private partner technical competencies

For private's partner technical competencies, the highest loadings are accounted as technical skills and expertise (0.6222), ability to access the know-how (0.5411) and ability to meet the public sector's objectives (-0.5627). Other loadings included in this dimension relate to management, leadership, and planning of PPP projects (0.4756), relationship with local government (-0.3378), communication and collaborative capabilities (-0.5184), as well as innovation and technical background (0.5326). Both technical skills and access to know-how are incremental for resolving procurement challenges. For the first loading, the public benefit from technical development in products and services. In particular, suppliers assist buyers in

the product's testing and evaluation phase, which bring value to the PPP project's development (van Echtelt et al., 2007). This ranges from responding to emergent technologies, capitalizing on in-house technical capabilities (Wasti and Liker, 1997), and reducing product development delays (Hartley et al., 1997). Based on this analysis, powerful technical resources increase value for money (VFM) and PPP performances.

Regarding the second loading, know-how is practically described as tacit knowledge, which cannot be easily obtained, explained, or transferred to others (Dampney et al., 2002). This notion proposes public buyers' initiatives at securing suppliers who are willing to cooperate and share their information along with the healthcare projects, eventually meeting the public goals. This leads us to the third sub-criteria, "meeting public goals, " which adversely impacts the "Private partner competencies" dimension. For the remaining sub-criteria, "management and leadership" and "innovation and technical background" exhibit positive influence. This means that procurement and PPP's progress are moderately dependent on private's innovative expertise to resolve procurement issues and manage PPP operations. Whilst "relationship with local government" (-0.3378) and "communication and collaborative capabilities" (-0.5184) show a negative impact on private's competencies.

Appropriate allocation of risk

Concerning "Appropriate allocation of risk", Sharing of "financial and economic market's burden" (0.8653) and "project core operations" (0.6778) risks are rated as the highest loadings. This rating highlights public buyers' concern of shouldering capital investment alone. By having a private partner, financial efficiency and significant economic value are brought to the PPP healthcare projects. With that end in view, public buyers must explicitly express their financial burden shared with a private partner. In other words, agreeing on common financial objectives, risks, rewards, and losses shared, is fundamentally integral at the inception stages of a PPP project. Such risk influence may extend beyond the financial scope to include risks shared in "project core operations" (Baldry, 1998). As explained in the literature, operation inefficiencies, unsatisfied service quality, and damages in a project's design, construction, and production are few implications investigated. Thus, "Appropriate allocation of risk" is greatly impacted by mismanagement of the project's financial and operational practices. Other risks emerge from "unpredictable and uncontrollable future events" (0.6475), "purchasing processes and communication" (0.4894), "disruptive technology and its impact on PPP project" (0.6294), and "environmental and social" (0.5919) shows similar influence towards "Appropriate

allocation of risks”. However, risks shared in “purchasing processes and communication” do not significantly impact public-private project’s advancement.

Degree of Risk on CSF:

For this dimension, all CSF factors reflect a strong relationship with the conceptual risk studied. Notably, a highly significant degree of influence is revealed with “Appropriate allocation of risk” (0.973), which proves our key theory of applying risk to the most capable party, that is best able to mitigate and manage them. The main reason for which allocation of risks is heavily perceived as critical for PPPs is its benefits to value for money (VFM). This entitles finding an efficient way to share risks amongst the responsible parties. Both “Private partner technical competencies” (0.6424) and “political guidance and support for investment” (0.571) are followed, which displays a moderate relationship with the degree of risk. On one end, it indicates private’s imperative abilities to innovate and resolve public buyer’s issues. On the other end, it suggests the importance of operating in a steady political ambiance with a supportive legislative system. For the last factor, “Market conditions” (0.5112), it appears that risk has a mediocre effect

Validity and Reliability

As previously mentioned, validity analysis is mainly employed to examine whether the expected findings are adequately measured within the studied sample. While reliability tests for internal consistency of the data variables. In all aspects, Cronbach’s alpha is deployed to assess the reliability of the measuring scale in the survey’s questionnaire. This measurement tests whether the identified data are consistent with the underlying concept studied and is adopted as a universal method (Rosner and Cronbach, 1960). In other words, it measures the strength of internal consistency. Different opinions emerge with setting a threshold value for the alpha measured. According to Nunally (1978), Cronbach alpha can range between 0.7 and 0.8, with the least value of 0.7. However, It can also be set within a range of 0.5-0.7 with a small amount of data (Hundleby and Nunnally, 1968). For this research study, an approximate value of 0.5 is taken as the threshold due to the small sample size. In relevance to the statistical analysis, all studied factors show a value of alpha equal to or greater than 0.5 (See table.). This means that all factors are retained, and there is no need for rejecting any of those variables.

Table 10. Statistical reliability test with alpha value

Variable	Alpha value
Political guidance and support for investment	0.714
Market's condition	0.5310
Private partner technical competencies	0.6132
Appropriate allocation of risk	0.6249
Degree of Risk on CSF	0.577

This concludes the factor analysis section. The extracted results from Stata software match our theoretical approach to the previously identified CSF factors. Also, the analysis indicates the adequacy and reliability of our data despite the small sample size taken. Our subsequent analysis in the discussion section will focus on two main goals. The first goal will answer the research question by determining the most critical success factors (CSF). The second one will elaborate on the statistical cluster analysis method to reach the conceptual PPP framework.

11. Discussion and Conclusion

This final chapter of the master's thesis will discuss the statistical results of CSF. In this research, the theoretical concepts of value for money (VFM), risk, and critical success factors (CSF) were thoroughly investigated. In this empirical section, the concept of CSF in relation to both VFM and risk is examined from public buyers' perspectives in the context of Finnish healthcare. This chapter will also answer the research question and reflect on the most critical factors for achieving social healthcare value. Additionally, an analysis of CSF within the theoretical PPP framework is made, and several strategic solutions are proposed to address or improve such CSF. At the end of this thesis, the limitations of this study, along with future recommendations, are provided.

Part 1: Discussion of most important CSF

Following our research objective, an analysis of the sub-criteria belonging to each CSF is carried. Then, a broader approach is followed with an assessment of CSF rankings.

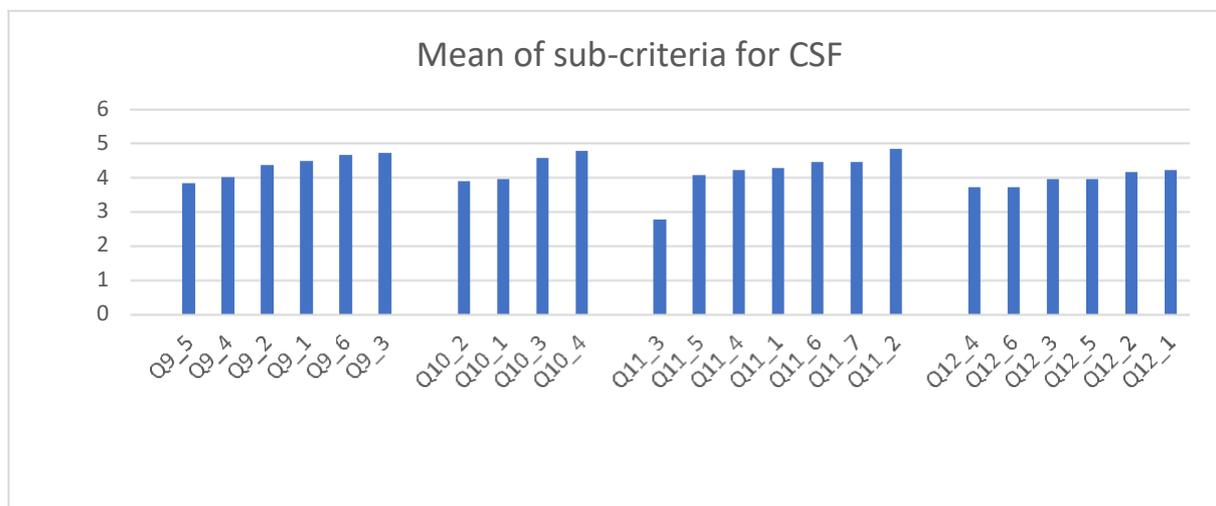


Figure 8. Mean value of sub-factors and their comparison

Based on the analysis of the research study, twenty-three sub-criteria were identified with their relative main CSF. Each of these sub-criteria were ranked according to the mean value determined through the number of observations (frequency of responses). As shown with the bar chart (figure 8.), different sub-criteria are assigned with their respective mean value ranging from 2.78 and 4.89.

Drawing from these findings, “Government's competencies” and “Transparency and fairness in procurement” were ranked the highest in the “Political guidance and support for investments” factor. This elaborates the importance of the government’s expertise in shaping the political culture and environmental conditions for private’s sector investment in PPP healthcare projects. Thus, the government’s abilities are regarded as the greatest asset for maintaining a stable political structure. A second ranking is assigned to “Transparency and fairness in procurement,” which entails the necessity of a standardized legislative system that advocates ethical behavior, regulations, and anti-corruption practices for realizing VFM in a stable political environment. This transparency criterion is followed by other sub-criteria, presented in order of importance: “Stable political and economic conditions” signifying the political ambiance of one market, “Government' support and commitment” defining government’s attempted actions to support PPP projects, “Community’s support” showing the society or end-users perception towards partnering with private and “PPP project addresses public goals” which guide public-private sectors into sustainability objectives.

For market conditions, “Ability to attract new private investors and donors” is ranked first, followed by “Availability of supplier’s network and materials requirements”. “Private’s capital investment” is perceived as a critical element for securing financial resources and lessening the burden of funding from the public sector part. This also creates a vigorous and sustainable economic growth. In addition, “suppliers’ network” is almost equally important. Diversifying suppliers' selection for specific PPPs projects will eventually bring innovation, drive competition level, provide access to multiple sourcing channels, promote job opportunities for local suppliers, and reduce the overall cost (Blumberg, 2015). The remaining sub-criteria are illustrated as “Long-term demand of product/service delivered from PPPs project” and followed by “Stable competition market level”.

Regarding private’s competencies, “Technical skills and expertise” that evaluates private’s capabilities to meet the project’s goals and requirements, followed by “alignment of private’ goals with the public ones”, are highly rated. Such rating is convenient since public buyers need to be reassured those private partners understand and agree on the appointed tasks while being more than capable of accomplishing those same tasks. After those sub-criteria, “Ability to access the know-how” is rated as the third important criteria. While “Management, leadership, and planning of PPP project”, “Communication and collaborative capabilities”, “Innovation and technical background” and “Relationship with local government” are followed.

At last, sharing the risk of “financial and economic burden” and “project’s core operations” are positioned at the top. These ratings similarly reveal the added value of having a financially capable partner that assists the government with its operative endeavor. Other sub-criteria rated in a descended order are considered as risks shared for “disruptive technology impact on PPP project”, “unpredictable and uncontrollable future events “, “environmental and social adverse effects”, “purchasing processes and communication”.

Even with such results, it is crucial to comprehend the wider aspect of the success factors determined. This is demonstrated in the below bar chart:

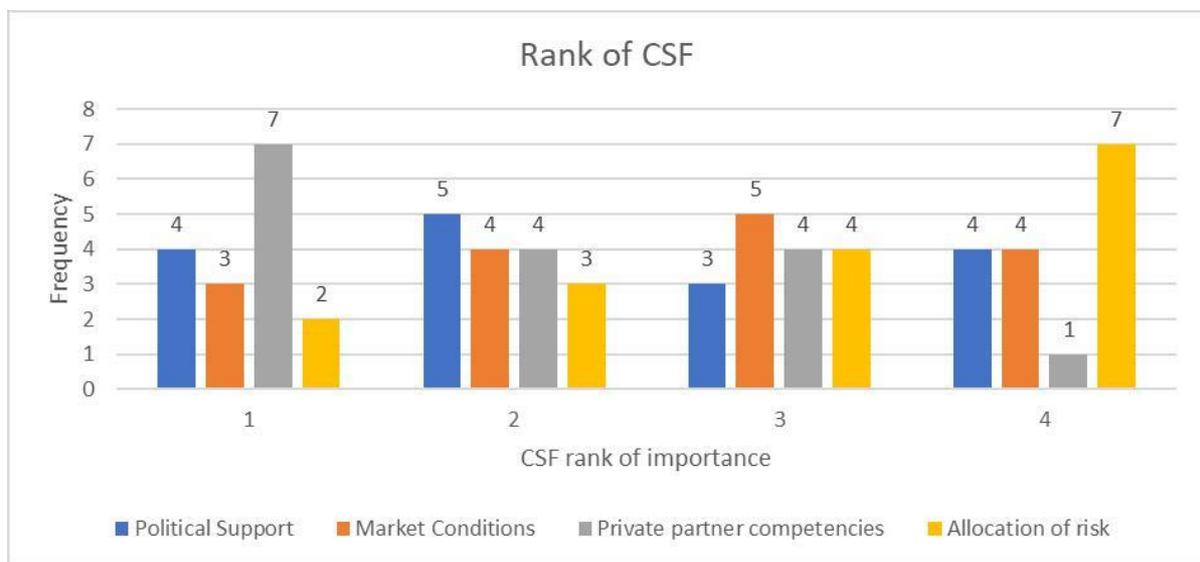


Figure 9. Comparison of CSF ranked by importance

The above bar chart demonstrates the frequency of each CSF rankings. The x-axis displays the ranking numbers, while the y-axis represents the number of responses for each ranking associated with CSF. Interpreting the results found, “private partner competencies” is viewed as the highest in terms of ranking, for which the largest number of respondents assigned it a position of 1st rank. This is followed by market’s conditions and political support; both shows similar pattern of rankings. However, “political support” presents a higher frequency number than the “market’s conditions”. While “allocation of risk” presents the largest frequency in the last ranking 4th with the least one in the 1st, suggesting a ranking position as follows:

- Private’s partner technical competencies: 1st
- Political guidance and support for investment: 2nd
- Market’s conditions: 3rd
- Appropriate allocation of risk: 4th

Combining the results of both sub-factors and their relative main CSF, a consolidated summary of the main factors with their respective sub-factors are described and ranked as shown in the table below:

Table 11. Description and ranking of CSF and sub-factors

CSF	Sub-factors	Ranking of sub factors
Rank #1		
Private partner technical competences	Technical skills and expertise	1
	Ability to meet public sector's objectives	2
	Ability to access the know-how	3
	Management, leadership, and planning of PPP project	4
	Communication and collaborative capabilities	5
	Innovation and technical background	6
	Relationship with local government	7
Rank #2		
Political guidance and support for investments	Government's competences	1
	Transparency and fairness in procurement	2
	Stable political and economic conditions	3
	Government' support and commitment	4
	Community's support	5
	PPP project addresses public goals	6
Rank #3		
Market's conditions	Availability of supplier's network and materials requirements	1
	Ability to attract new private investors and donors	2
	Long-term demand of product/service delivered from PPPs project	3
	Stable competition market level	4
Rank #4		
Appropriate allocation of risk	Sharing the risk of financial and economical market's burden	1
	Sharing the risk of project core operations	2
	Sharing the risk of disruptive technology and its impact on PPP project	3
	Sharing the risk of unpredictable and uncontrollable future events	4
	Sharing environmental and social adverse effects on the local community	5
	Sharing risks related to purchasing processes and communication	6

Drawing from the analysis of CSF with their respective sub-factors as described by the table above, we can answer our main research question:

“What are the most important critical success factors (CSF) in a PPP’s relationship within the scope of value for money and risk?”

According to the findings, public buyers perceive “Private partner’s technical competencies” as the most important critical success factor (CSF) in terms of value for money (VFM) and

within PPPs relationship. Our findings indicate that private's technical skills and expertise constitute the highest significant sub-factor based on all the responses. In this research study, conducted within the scope of the healthcare sector in Finland, private's technical skills play a paramount role in successfully applying PPP projects. Accordingly, selecting suitable suppliers or private partners with the required technical strength enables the better achievement of value for money (VFM) and brings substantial benefits to social healthcare.

After answering the research question, this study will delve into the applicability of the PPP framework. The latter can be utilized as a tool to optimize the allocation of resources and implement fitted sourcing strategies in the procurement field. By analyzing the cluster method, one can clearly locate CSF into the respective quadrant displayed in the PPP matrix framework. Thus, the following section begins with cluster analysis, then explores the feasibility of the PPP framework.

Part 2: Discussion of PPP framework application

Cluster Analysis:

With the cluster approach, respondents are to be classified into different categories, or rather clusters. For this purpose, a clustering test was employed to achieve that end. According to Hair (1998), cluster analysis enables users to categorize a sample of items into fewer groups, which are initially based on similar attributes (Hair et.al, 1998). Following that analogy, a ward test was deployed to indicate the number of clusters required for our research study. Accordingly, the statistical results from Stata software show the possibility of 2 to 15 clusters. The obtained results were synchronized with the conceptual framework applied to preserve the theoretical approach behind this research study. Thus, four clusters were chosen as the cornerstone for this applied research. Also, this value is most likely to provide the intended findings as fewer clusters lead to trivial results.

Similarly, several clusters may randomly generate unnecessary groups of data with negligible information. Both Duda and Calinski stopping rules were employed to confirm our cluster's findings. After retrieving the final clusters, our analysis explored the application of the research's results into the PPP framework.

After considering the feasibility of applying four clusters in our research study, the following analysis focuses on combining different sub-factors that demonstrate similar patterns and attributes into specific clusters. Such variables data are distributed in terms of their critical

contribution's rate towards value for money (VFM) and the degree of risk incurred. However, most of our variables are highly rated in terms of the Likert scale, which is the primary measurement employed to proceed with the cluster analysis test. This is observed by our previous assessment of the important contribution rate for a large set of sub-factors, which initially range between the scale of 3 (neutral) and 5 (most critical). A similar notion applies to the degree of risk impacting CSF. In that case, considering both dimensions, “CSF contribution to VFM” and “degree of risk impacting CSF”, most of the variable data are placed in the upper right quadrant of the PPP framework.

A visual representation of clusters proves our basic assumption of similar attributes revealed amongst the sub-factors belonging to different clusters.

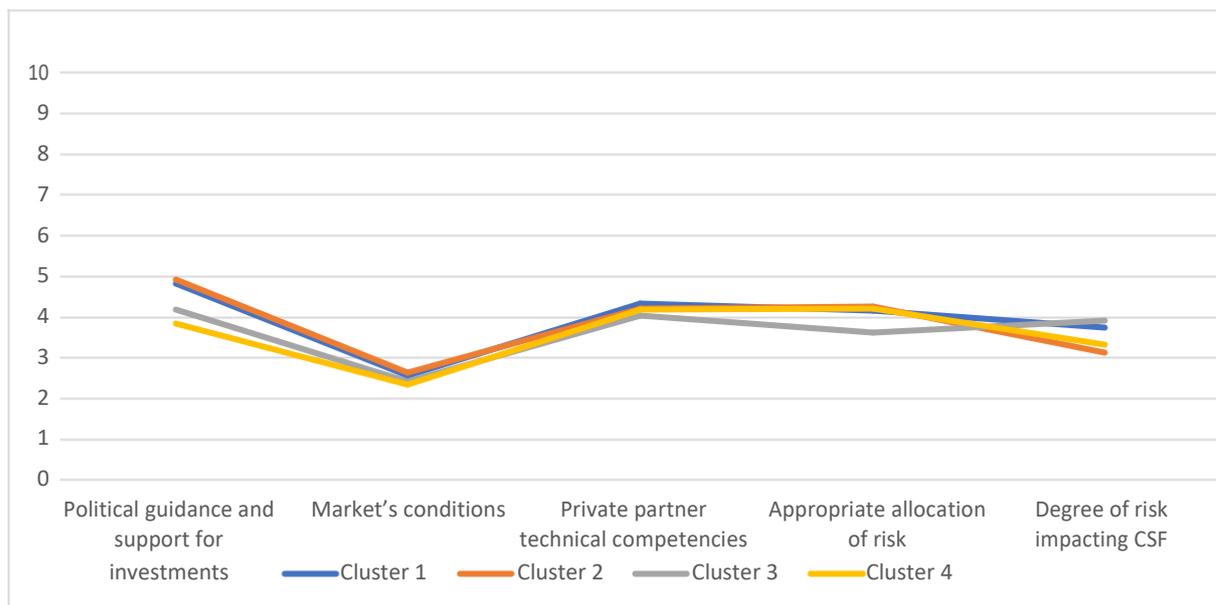


Figure 10. Illustration of cluster patterns for CSF

Even after grouping similar sub-factors into specific clusters, some variables associated with diverse clustered groups show uniform patterns. This is displayed through the strong intersection of cluster curves, and the synchronized direction undertaken. Thus, our statistical analysis reveals the feasibility of adopting one cluster, which may be perceived as a controversial aspect of the theoretical framework created. In practical view, such contradiction might be due to harmonized business conditions, suggesting that healthcare facilities in Finland operate under the same conditions. Meaning, “CSF contribution rate” with “Degree of risk impacting CSF” are viewed with identical lens by healthcare institutions.

Strategic application of CSF in a PPP framework

It is essential to point out that CSF factors fall within the upper right quadrant of the PPP framework, which entails a high risk/high reward block. Such consolidation of variables proposes the criticality of addressing all these CSF in an equivalent and optimized manner. In other words, public buyers must maximize their efforts and resources towards harnessing those factors with adequate strategic solutions. By doing so, none of the CSF factors are neglected, and the likelihood of optimizing value for money (VFM) while mitigating the risks encountered increases. However, due to our previous results in CSF ranking, it is appealing to invest public-private resources in the most important critical factors. In such a case, a private partner's technical competencies must be the primary factor to address. This is followed by "political support", "market's conditions" and "appropriate allocation of risk" per the ranking order. The following part will emphasize the strategic solutions suggested to tackle CSF within the specified quadrant in the PPP framework.

As this quadrant implies a strong competitive supply market with the potential to achieve high returns, public buyers must systematically explore ways to engage with their private partners. This is especially emphasized in Finland, as private's competencies are scored as the highest amongst the CSF. Thus, a collaborative relationship with a long-term view for both public and private interests promotes communication beyond the traditional boundaries, which allows for a broader scale of investment, innovation, and meeting public goals. For instance, the public sector may resort to specialized financial packages with private investors sharing and mitigating risks. For instance, improving the credit of PPP projects through suitable public funds targeted to private partners (World Bank, 2016). The latter helps at mobilizing private's technical resources and reduces risks in complex projects. Other actions may be relevant to direct capital investment in PPP projects, which can be in the form of funds or financial expert services. This can range from financial consultation, partial loan guarantees, and contingent grants (Soumaré and Lai, 2016). Thus, public partners can better attract private donors. Alternatively, the public sector may support greater investment in innovative technologies that stimulate economic and sustainable growth. One proposition is to create a multilateral platform that combines all supply chain actors from suppliers, bidders, procurement officers, and responsible governmental authorities into an integrated network (Tolstolesova *et al.*, 2021). Through that method, public buyers can acquire better access to private's know-how and improves communication and collaborative capabilities. This also encourages fair and transparent competition, which improves the relationship with local government.

A lower importance score is attributed to the political support and market conditions in relation to value for money and risk. This conventionally indicates that Finland's studied region operates within an appealing market's conditions with adequate political support towards private's partner contribution. Under such circumstances, political guidance and commitment can be amplified with clear fundamental policies targeting PPPs' success. To achieve that end, a congruent legal framework that directs public and private actions may be created. Some of the binding terms are to form PPP units that support policy and technical development, ultimately improving governments' competencies. The same PPP units may enhance ethical behavior by creating a well-maintained reporting system for legal practices to different governmental layers. Transparency and fairness in procurement are preserved, thus driving political stability and spurring economic growth. Other strategical approaches that the public sector endorses are the effective governance structure that strengthens management capabilities and stimulates stakeholders and the community's support. All the above political solutions offer public-private sectors the incentives to address public goals effectively.

The availability of suppliers and network conditions is a critical criterion for public buyers to fulfill their requirements in market conditions. Thus, building a multi-sourcing network of suppliers is one sourcing strategy that empowers public buyers, which guarantees various suppliers' options, accessibility to critical items, and a constant streamline to cope with the demand. While ensuring open and fair market access to new bidders in the procurement process is another solution to safeguard the competitive level. Clear and transparent tendering rules, a fine selection of private partners, and a profitable awarding system pave the way to such a favorable open market. In return, the public sector may attract new private partners.

Despite being the last ranked amongst CSF, appropriate allocation of risk is commonly believed as the most critical aspect of PPPs. This rate proposes that public sectors are either confident with their capacities to shoulder most of the risks and deliver optimized social healthcare services or are not fully aware of the private's benefits with bearing a portion of that risks. The first statement can be justified with the desirable market conditions and solid political support received in PPPs, for which both CSF are rated higher than risk allocation. However, the second one cannot be adequately conceived as private's partner technical competencies is rated the highest. One assumption derived from such results reimposes our key strategical approach towards risk allocation, transferring risks to the party best managing them. Thus, public buyers in Finland can be perceived as the best party for managing risks in PPP projects

and accordingly are pursuing a befitting risk allocation plan that achieves value for money (VFM) and success of PPPs projects.

11.1 Conclusion

Summarizing the main points of the theoretical analysis and results obtained from the healthcare industry. A wide range of factors was closely examined, and the most critical ones were selected from the public buyers. This is followed by an analysis of CSF within the PPP framework, which addresses the feasibility of applying strategic solutions to improve CSF and their sub-factors. As this thesis highlights, a different combination of factors exists that public-buyers may identify and use in PPPs to deliver the intended social healthcare value. VFM is shown as the key element for achieving that objective, but it is driven by these CSF and the degree of risk incurred. Thus, studying the most important CSF allows the public sector to determine the best strategic approach to satisfy and improve the success rates of PPP. As indicated from this research study, these factors are further analyzed and listed in ranking order based on importance rate. “Private partner technical competencies” claims the first position. This is followed by the “political support”, “market conditions” and “appropriate allocation of risks”. Therefore, an adequate mechanism and strategic procurement practices must be established in PPP to benefit from private’s partner technical competencies. Strategic collaborative partnership with a long-term commitment is one procurement method prompted by academia and professional experts. As quoted by Zhang (2005), “in which private sector funds, managerial skills, and operational efficiencies will be brought into full play for enhanced values that benefit both public and private interests.” (Zhang, 2005)

11.2 Limitations and Future Research

As this research study is restricted within one region, Finland, similar perspectives are shown with ratings of CSF importance and the degree of risks associated with them. Thus, a one perspective of CSF appears to highlight synchronized healthcare conditions, which may be stated in terms of the supportive, functional, and practical health system. Other challenges emerged in the statistical analysis due to the limited availability of data extracted from a small sample size. A larger sample size is needed to provide broader insights of this research study. Additionally, data was not easily accessible due to the nature and complexity of healthcare business. Other critical information such as detailed financial aspects in public procurement are considered confidential but may constitute an important element for value for money (VFM) analysis. Moreover, widening the target audience to include additional developed and developing countries may provide this research with better tangible results. These results can also be adopted in the developed PPP theoretical framework. Overall, this research study depends on public buyers' perspectives, representing only the public part of a public-private partnership (PPP). Therefore, future research can be observed from the supplier's or private partner's perspective. Such research may also be studied from a practical approach, implying a direct engagement in PPP projects from the beginning stages towards their completion. This kind of method will provide researchers with a wide range of real-time data. PPP framework is yet to be fully endorsed and practiced by distinct businesses. With an abductive and explanatory future research, this framework can be tested again in different countries and regions to verify its feasibility and practical implementation.

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Appendices

Appendix 1. Description of sub-factors

CSF	Sub-factors	Description of sub-factors
Political guidance and support for investment	Q9_1	Stable political and economic conditions
	Q9_2	Government' support and commitment
	Q9_3	Government's competences
	Q9_4	Community's support
	Q9_5	PPP project addresses public goals
	Q9_6	Transparency and fairness in procurement
Market's conditions	Q10_1	Long-term demand of product/service delivered from PPPs project
	Q10_2	Stable competition market level
	Q10_3	Ability to attract new private investors and donors
	Q10_4	Availability of supplier's network and materials requirements
Private partner technical competencies	Q11_1	Management, leadership, and planning of PPP project
	Q11_2	Technical skills and expertise
	Q11_3	Relationship with local government
	Q11_4	Communication and collaborative capabilities
	Q11_5	Innovation and technical background
	Q11_6	Ability to access the know-how
	Q11_7	Ability to meet public sector's objectives
Appropriate allocation of risk	Q12_1	Sharing the risk of financial and economical market's burden
	Q12_2	Sharing the risk of project core operations
	Q12_3	Sharing the risk of unpredictable and uncontrollable future events
	Q12_4	Sharing risks related to purchasing processes and communication
	Q12_5	Sharing the risk of disruptive technology and its impact on PPP project
	Q12_6	Sharing environmental and social adverse effects on the local community
Degree of Risk on CSF	Q13_1	Political guidance and support for investments
	Q13_2	Market conditions
	Q13_3	Private partner technical competences
	Q13_4	Appropriate allocation of risk