

KEY SUCCESS INDICATORS OF A RISK MANAGEMENT FRAMEWORK FOR PUBLIC-PRIVATE PARTNERSHIPS PROJECTS

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ABSTRACT

Public-private partnerships are joint ventures between a private sector organisation and a government with the aim of providing socio-economic infrastructures and services. These partnerships are not risk-free and require an effective risk management framework to ensure the achievement of objectives. However, it appears that the embedding of an adequate risk management framework by some partnerships still requires attention, especially in developing markets. In addition, what constitutes a successful partnership remains contentious. As such, this study aims to determine Key Success Indicators for a risk management framework for these partnerships. A literature review was used to serve as a platform to identify relevant Key Success Indicators for a risk management framework with the aim to assist the stakeholders to determine the success of a partnership. Descriptive analysis of the response of a survey confirmed the Key Success Indicators for a risk management framework for these partnerships. It is envisaged that these Key Success Indicators could assist in addressing latent gaps between current and finest practices of managing and measuring risks and ensuring successful public-private partnerships projects.

Keywords: Risk Management, Risk Management Framework, Public-Private Partnerships, Project Management, Key Success Indicators.

INTRODUCTION

Risk management discipline is ever-growing in many fields globally, as a result of various incidents, which contribute to project and organisational failures. These failures have been linked to ineffective risk management practices. For instance, the Dar es Salaam Water Project (regarded as a public-private partnership (PPP) failed due to inadequate risk management (Ikon et al., 2015). Similarly, Yescombe (2017) mentioned that the geotechnical risks in the Uganda's Bujagali Hydropower project materialised and engendered a cost overrun of \$50m. Also, Yescombe (2017) indicated that there was a risk management failure in addressing risks associated with the Mbombela PPP Water project in South Africa, hence the project partially failed in the early stages of the concession. Otairu et al., (2014), and Farlam (2005) affirmed that constant streams of scandals and poor performance in PPPs can also be linked to poor risk management practices. Based on the foregoing views, it is perspicuous that haphazard risk management activities are one of the major causes of PPPs failures. A haphazard approach to risk management can be linked to a lack of an effective risk management framework. Therefore, Young (2018) recommended that organisations should develop a risk management framework and embed it into their facets for identifying and mitigating risks in a structured manner for successful project delivery.

However, there seems to be a bold contention among academicians and practitioners regarding what a successful project could be. As such, indicators for measuring successful projects will play a significant role in addressing the contention (Osei-Kyei et al. 2017). Therefore, the purpose of this research paper is to identify the Key Success Indicators (KSIs) of a risk management framework, which could serve as a tool for managing and measuring successful PPPs in a structured manner. Therefore, the research question is: what are the KSIs of a risk management framework for PPPs, and what is the germaneness and current practice of these KSIs in public and private sector organisations? Addressing the research questions requires this article to deal with a literature review, which can be used to derive the potential KSIs. These KSIs will be tested empirically to confirm their significance and practice in PPPs. The next section briefly deals with the conceptual explanation of the KSIs, where-after the literature on KSIs of a risk management framework will be discussed.

CONCEPTUAL EXPOSITIONS OF KSIs

Brown & Adams (2000); Ahadzie et al. (2008) indicated that project success has been contentious among stakeholders due to the unstructured ways organisations use to measure successful projects. As such, KSIs are becoming an emerging discourse in managing and measuring a successful project. Liang & Jia (2018) affirmed that KSIs can be considered as tools for measuring and determining the success of an organisation's projects. Velimirović, Velimirović & Stank (2010) espoused that KSIs can be classified as financial and non-financial indicators that organisations use to determine how successful they are in achieving their strategic and projects goals. Yuan et al. (2012) affirmed that projects are risk-inherent; therefore, to improve their success, indicators should be used to manage and measure their success. Velimirović et al. (2010) expatiated that the KSIs assist to control the cognitive bias that may surround the project implementation, hence aid organisations to focus on the project deliverables. Based on the foregoing, it can be concluded that using KSIs to manage and measure successful projects could assist organisations to improve their processes and performance to guarantee successful project delivery. Conversely, Velimirović et al. (2010) contended that determining the appropriate indicators for measuring successful projects is crucial to project stakeholders. Therefore, the next section discusses and determines the KSIs of a risk management framework, which can be used as a tool to manage and measure successful PPPs.

A RISK MANAGEMENT FRAMEWORK

Rouse (2005) mentioned that a framework can be considered as a conceptual structure purported to guide a process. Young (2018) affirmed that a risk management framework can be deemed as a conceptual structure consisting of a set of components to ensure effective risk management for supporting safe and sound business decision-making. Based on the above explanations, it can be deduced that a risk management framework is an integrated metaphysical structure that encapsulates an organisation's management processes, principles, and policies for managing risks. Therefore, Young (2014:37) recommended that a risk management framework should be embedded in the organisational management facets to promote effective enterprise risk management to improve organisational performance. Conversely, Alvarez (2005:227) contended that determining the components of a typical risk management framework can pose a daunting challenge. However, Young (2018) enunciated that the components of a typical risk management framework include risk governance, risk culture, and risk management process. Jackson (2015:2)

contended that a risk management framework component consists of risk management processes, risk management principles, risk governance, values, and culture. Chapman (2011:5) also claimed that risk management standards and guides are critical components of a risk management framework. Each of the above-mentioned components is dealt with in detail to identify the KSIs of a risk management framework for managing and measuring successful projects.

Risk Management Governance

King IV (2016) indicated that the governing bodies of organisations should steer risk in such a way that it supports the organisational overall strategic and project objectives. Risk governance can be divided into three lines of defence; the first line of defence is business management, the second line of defence is risk management, and the third line of defence is internal audit (Young, 2020). These three lines of defence support the implementation of the internal policies, structures, and control measures for addressing project risks. Briefly, Mabwe, Ring & Webb (2017) espoused that the first line of defence comprises frontline staff who are responsible and accountable for identifying, assessing, and controlling risk-exposures associated with project quality, cost, schedule, scope, and resources. For instance, the first line of defence can be responsible for identifying and addressing risks connected with project scope schedules, and resources to ensure that the project is delivered within the prescribed risk appetite statements. Girling (2013) explained that the second line of defence, is responsible for monitoring and reporting on risk issues to the top management for risk-informed decision making. Bryce, Cheevers & Webb (2013) affirmed that the second line of defense inspects and promotes the risk compliance measures regarding security, quality, financial, and non-financial discipline of the organisation to ensure successful project delivery.

In addition, the second line of defence monitors the risk policies, risk appetite statement, and risk control and mitigation measures that the first line of defence must follow. As such, the risk monitoring and reporting function of the second line of defence can be considered as critical in the risk management process in ensuring successful project delivery. Bin Ibrahim (2016) and Chartered Institute of Internal Auditors (CIIA) (2017) explained that the third line of defence is built around resilient and independent internal audit structures to control operational and financial losses. The Chartered Institute of Internal Auditors (CIIA) (2017) affirmed that the internal audit structures ensure that risk management systems of internal controls and corporate governance processes are followed to the core to ensure end-user affordability of the project is not missed to avoid revenue losses. The third line of defence helps to audit, evaluate and measure the quality of the risk management processes, and report directly to the top management for informed decisions (Bin Ibrahim, 2016; and Chartered Institute of Internal Auditors (CIIA) 2017). Briefly, auditing and reporting are integral parts of the risk management process-steps that aid in managing and measuring the effectiveness of the risk response strategies. Based on the foregoing explanations, it can be deduced that successful project delivery is a function of effective risk management (ERM). As such, the three lines of defence should recognise ERM as a critical tool for managing and measuring successful projects.

The British Standard of the International Standard Organisation 31000 (2018) indicated that the project governing body should demonstrate leadership and commitment in providing resources to complete every task of the project. In that regard, Berssaneti & Carvalho (2014:1) explained that resource availability is critical to ensure success, since, without resources, the

project cannot be completed. In addition, the Project Management Institute (2013:198) affirmed that the crux of providing the required resources just in time (JIT) is to prevent project delays and its ripple effect of cost overruns. Marrewijk, Clegg, Pitsis & Veenswijk (2008:5) contended that the project governing body should demonstrate commitment in managing the project costs, schedule, and scope to influence the success of the project. Briefly, Duncan & Gorsha (1983:23) expressed that project costing is a significant factor that influences the success of a project, since under-costing can halt the project progress. Bloch, Blumberg & Laartz (2012) and Couture (2013:4) explicated that a project schedule is a critical factor that influences a successful project. For instance, time overrun alone is identified as the fundamental cause of 11% of overall project failures (Bloch et al., 2012).

Therefore, it is crucial for the project governing body to manage the project schedule to avoid project delays and cost overrun to guarantee successful project delivery. Lano & Singh (2014) also contended that project scope is one of the hypercritical factors that influence successful project delivery. However, an inaccurate scope of work and forecasting can trigger project budget overruns and cause project failure. Therefore, the project governing body should show commitment towards accurate project scoping to guarantee successful project delivery. King IV (2016) indicated that the project governing body should also safeguard the environmental, social-cultural, and economic sustainability of the project. When organisations fail to apply the concept of sustainability, they are likely to face regulators' sanctions, or customers are likely to stop patronising their products and services (Burke, 2011). Therefore, organisations should promote the sustainability of PPP projects, thus ensuring that they do not jeopardise the ability of future generations or the next government to meet their needs. Based on the above-explanations, it can be deduced that the project governance body (risk management governance) uses risk management, quality, resource availability, cost, schedules, scope, and sustainability as key indicators for managing and measuring successful PPP projects. However, to guarantee successful risk governance in PPPs, risk management culture plays a significant role, as discussed in the next section.

Risk Management Culture

Jackson (2015) mentioned that a risk management culture is an integral component of a risk management framework. Young (2015) confirmed that risk management culture is a component of a risk management framework. Yates (2011) and Levy et al. (2010) explained that risk culture entails the dominant attitudes, shared beliefs, and values of an organisation about risk. Risk culture influences how people in an organisation perceive, understand, describe, prioritise, and manage risks (Meiring, 2016). Based on the foregoing explanations, it can be deduced that an organisation's risk culture encapsulates the general risk awareness, attitude, and behaviour of its employees, and top management towards the management of risk. As such, risk management should be an enterprise-wide activity imbedded in the business culture of the PPP organisations. In view of the above-mentioned expositions, Ludwig (2015), and Walker et al. (2015), and Meiring (2016) concluded that without a risk culture, the risk management framework will prove ineffective to the level that the project governance board may not be able to guarantee project quality and success.

A risk management culture allows effective identification, prioritisation, allocation, and management of risks in project quality. The International Standard Organisation 8402 (1994) explained that quality represents the degree of excellence in terms of competitiveness, project

reliability, project usability, project serviceability, and maintainability. As such, stakeholders use quality as one of the critical criteria for judging and accepting a successful project. Based on the forgoing explanations, it is eminent that a risk management culture is an important component of a risk management framework that aids in managing project quality. A risk management process-steps are discussed in the next section as another crucial component of a risk management framework.

Risk Management Process-Steps

Chapman (2011) mentioned that the risk management process is the most critical component of a risk management framework that should be embedded in the management facets of the organisation. The British Standard of the International Standard Organisation 31000 (2018) indicated that the risk management process is a systematic application of processes, procedures, and practices of communicating, establishing the context, identifying, analysing, evaluating, treating, monitoring, and reviewing risks. Chapman & Ward (2003), the Project Management Institute (2000), and Vasvári (2015) affirmed that the risk management process involves risk management planning, risk identification, assessment and evaluation, prioritisation, risk response, monitoring and controlling communication and feedback, and risk financing. Based on the above definitions, it is salient that there is a common view regarding the steps in a risk management process. A brief description of each of these steps will be dealt with in the next section to derive the indicators for managing and measuring successful PPPs.

Strategic Planning of Risk Management Activities

Caltrans Office of Statewide Project Management (2007) posited that the first step in the risk management process is the strategic planning of risk management activities. The Committee of Sponsoring Organizations of the Treadway Commission (2013) indicated that strategic objectives are high-level goals that are aligned with the organisation's mission, vision, and objectives. Therefore, the risk management plan should be aligned with the organisation's missions, visions, values and goals. Young (2020) mentioned that throughout the deliberation of the risk management plan, the top management should identify risks and their potential impact on the strategic vision of the PPP project. The first level of action in strategic risk management planning is to state the risk management objectives, risk appetite statement, policies, protocols, guidelines, and parameters for identifying, addressing, and reporting on the project risks. As such, the top management should also identify the resources; financial and non-financial, and responsibilities that will be required to conduct successful risk management activities. The second level of action is to apply the above-mentioned philosophies to enhance the positive events and minimise the probability and consequences of adverse events on the KSIs (Hillson & Murray-Webster, 2011).

Risk Identification

Chapman (2011) contended that risk identification is the second step in the risk management process; it consists of the procedure of involving experienced staff to generate a series of risks and opportunities that could be included in the project risk register. He (2011:159) affirmed that risk identification is an iterative process of identifying and recording a series of

threats and opportunities by interacting with people and analysing systems. Young (2018) concluded that the sources of risk, events or sets of circumstances, and their potential consequences should be identified to generate a comprehensive list of risk exposures that could impact the accomplishment of business objectives. Therefore, risks and their potential consequences on the project scope, cost, quality, schedule, and resources should be identified, registered, and managed to ensure successful project delivery. For instance, identifying and managing the sources of risk associated with the project cost and schedule can help to avoid cost overrun and delays, hence, guaranteeing successful project delivery. After risks have been identified, the next step is to assess and analyse the risks, as discussed in the next section.

Assessing, Evaluating, and Analyzing

Croitoru (2014) claimed that the purpose of assessing risks is to ascertain the likelihood of risk occurrences and their potential financial consequence on the project. Chapman (2011:197) considered risk assessment, analysis, and evaluation, as the process of examining the quantity and quality of the impact of risks on any of the project objectives. For instance, a qualitative risk assessment can help to predict that poor contractor performance could lead to compromised quality, hence, project failure. In addition, a quantitative risk assessment could also be used to predict that a 15-day project delay, could cause 5% of cost overrun which possibly will cause project failure, since there may not be additional funding. Based on the foregoing explanations, it can be deduced that assessing the quantitative and qualitative impact of project delays and poor quality is critical for risk prioritisation and mitigation for a successful project delivery. Therefore, project schedule and quality should be recognised as key indicators that influence successful project delivery.

Prioritising Risk

Mayo (2009) and KPMG (2014:2) indicated that risks should be prioritised based on their assessed impact on the PPP's objectives. Prioritising risks associated with project schedule ensures that high-risk events that could cause project delays are prevented from occurring or controlled to minimise their impact if they do occur to ensure successful project delivery (Banaitiene & Banaitis (2012). Risk prioritisation also helps organisations to prioritise their resources according to their risk appetite. As such, it can be deduced that risk prioritisation in PPPs helps project owners to prioritise and make resources available since without resources the project cannot be completed. Therefore, project schedule and resource availability can be regarded as crucial indicators for managing and measuring successful projects.

Risk Response or Treatment Strategies

Caltrans Risk Management Task Group (2012) mentioned that developing strategic options, and determining actions to enhance upside and reduce downside risks in PPPs, can be considered as a risk response in PPPs. Young (2018) posited that these risk treatment strategies can be reactive; that is controls will be put in place after an incident had occurred or proactive where resources are made available to deal with incidents before they occur. Chapman (2011:294) contended that financial and operational risk controls should be timeous, to grab adequate space and time to act before the negative events become irrepressible. The negative

events could be revenue loss, delays in project delivery, and poor performance. Based on the foregoing, it is eminent that risk responses such as insurance policies can assist to minimise the impact of revenue loss, and cost overrun. As such, proactive response to financial and operational risks, can guarantee a successful project delivery.

Monitoring, Evaluation, Auditing, and Reporting on Risk Response Strategies

British Standard International Standard Organisation 31000 (2018) indicated that monitoring, evaluating, and auditing the risk treatment strategies are non-negotiable actions in the risk management process since risk treatment strategies can be counterproductive. As such, Young (2009:6) confirmed that risk monitoring helps to improve and achieve the effectiveness of the risk treatment plan. Monitoring, evaluation, and auditing could assist in addressing the shortage of resource supply, schedule overrun, budget over-run, and poor quality. For instance, Berssaneti & Carvalho (2014:3) mentioned that organisations should monitor and audit project resources to ensure that resources are supplied just in time (JIT) to guarantee project success. As such, monitoring and auditing the risk response strategies can assist to take remedial actions to control project delay, cost overrun, and poor performance. Based on the foregoing explanations, it is eminent that monitoring, evaluating, and auditing project schedule, cost, quality, scope, and resource supply play a critical role in reinforcing successful project delivery.

Communicate and Consult

Cleary & Malleret (2006) mentioned that risk communication can be regarded as the process of exchanging risk intelligence among the appropriate stakeholders for risk-informed decisions. Risk consulting comprises obtaining feedback and information on the risk response strategies to support decision-making (British Standard of International Standard Organisation 31000, 2018). Therefore, it can be deduced that risk communication could ensure that variance in the project cost; scope, schedule, and quality are communicated timeously to top management for corrective actions, to guarantee successful completion of the project.

Risk Finance

Financial preparedness is a core element of a comprehensive approach towards a successful project delivery (Global Humanitarian Assistance Report, 2014). Poole (2014) mentioned that risk financing strategies support organisations' ability to react quickly with resilience to the risks if the risks occur. According to Poole (2014), risk financing ensures that there are adequate funds to be expended on the risk management activities of the project to safeguard a successful project delivery. For instance, there should be adequate funds to purchase insurance policies against force majeure risks to reduce the impact of financial losses if the risk event, such as COVID-19, hurricanes, and earthquakes does occur. Based on the foregoing, it is eminent that without risk financing, (funds to support the risk management activities), the project could fail. As such, it is imperative that risk financing is considered a critical indicator that can be used to manage and measure a successful project. Based on the above explanations, the risk management process-steps can be regarded as distinct and all-important component of a typical risk management framework, for managing and measuring successful PPP projects.

Risk Management Principles

The International Finance Corporation (2013) and Institute of Directors in Southern Africa, (2016:37), indicated that the nature of many risks is complex, uncertain, and even ambiguous; hence, it requires the application of risk management principles to reinforce the risk management the risk management process-steps for successful project delivery. Therefore, ISO 31000:(2018), recommended that the risk management activities should: be integrated, be structured and comprehensive, be tailored, be inclusive, be dynamic, use the best available information, consider human and cultural factors, and be continuously improved to support successful project delivery.

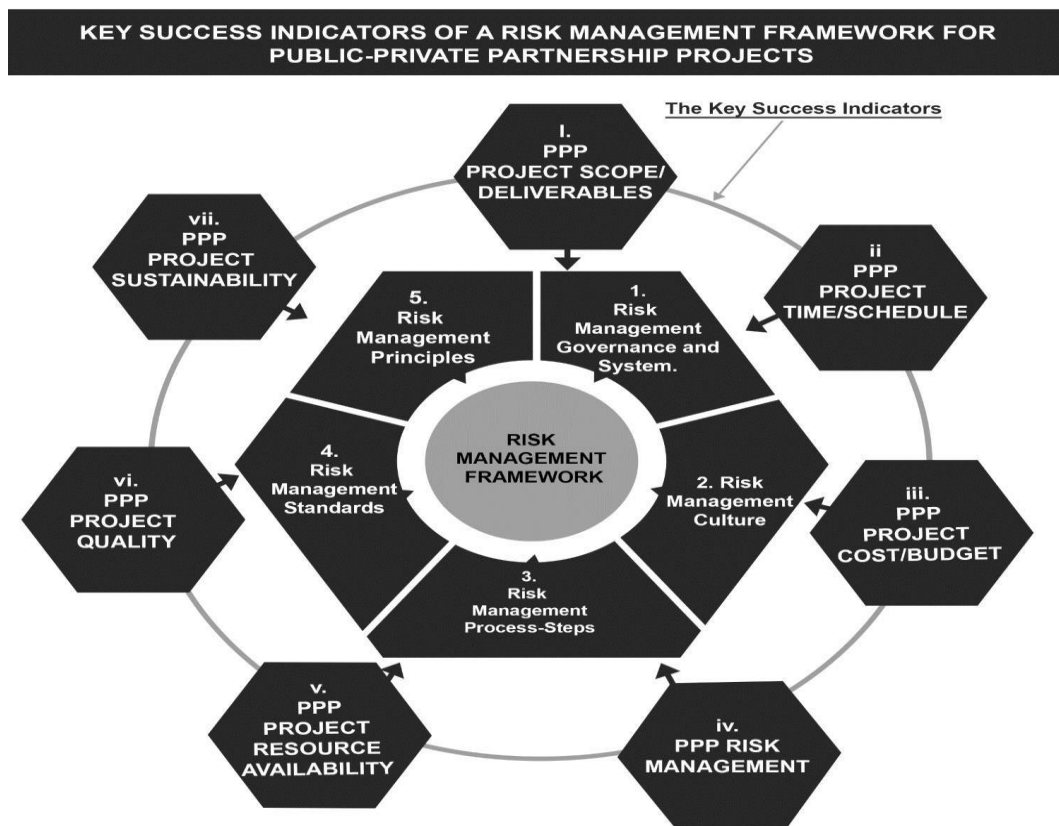
The above-mentioned principles should be applied by the organisation's three-lines of defence in identifying and treating risks associated with the project cost, scope, schedule, quality, and sustainability. For instance, the best available information should be used to guide the preparation of the budget to ensure that adequate funds are procured to complete the project. Besides, tailoring, integrating, and comprehensively conducting the risk management activities in a structured manner across every facet of the organisation aid to deal with project risks, and enhance the supply of resources just in time (JIT). As such, helps to complete the project within the prescribed budget, schedule, scope, and quality in a sustainable manner, hence the project can be considered as successful (Murphy, 2009). The Institute of Directors in Southern Africa, (2016) also indicated that a governing body should apply the principles of leading ethically with proactiveness to guarantee project sustainability (economic, environmental, and socio-cultural), whilst dealing with other risks associated with the project. Based, on the foregoing- explanations, it is clear that applying the risk management principles to support the risk management process steps can reinforce in managing risks associated with the project budget, schedule, scope, quality, resources, and sustainability. As such, it can be concluded that project budget, schedule, scope, quality, resources, and sustainability can be considered as critical indicators for managing and measuring successful PPP projects.

Risk Management Standards and Guide

Applying the industry risk management standards and guides such as the International Standard Organisation's (ISOs) reinforce the organisation's ability to effectively address project risks (Gjerdrum & Salen, 2010). For instance, the Combined Code and Turnbull Guidance, the King IV, the Federation of European Risk Management Association (FERMA), and Committee of Sponsoring Organisation (COSO) all address governance and enterprise risk management issues to guarantee project quality and sustainability. For instance, the ISO 14001 and ISO 9001 focus on the management of project environmental and quality risks respectively, since, stakeholders often accept projects which are of good quality and environmentally friendly. Based on the foregoing explanations, it is eminent that project quality and sustainability are critical indicators for managing and measuring successful projects. Therefore, it can further be deduced that risk management standards and guides are crucial components of a typical risk management framework that promise project quality and sustainability. Based on the aforementioned, it can be concluded that a typical risk management framework has the following fundamental components, risk governance and system, risk culture, risk management process, risk management principles, and risk management standards and guides. Furthermore, the following KSIs can be derived from the discussion on the above-mentioned components:

- a. Completing the project within the acceptable scope and deliverables.
- b. Completing the project within the prescribed schedule or time.
- c. Finishing the project within the allocated budget.
- d. Completing the project within the prescribed quality.
- e. Ensuring that the project is sustainable.
- f. Providing resources to complete the project.
- g. Conducting effective risk management activities.

The above-mentioned KSIs should be subjected to the components of the risk management framework to ensure that the risks associated with the KSIs are identified and mitigated, as such, for managing and measuring successful PPPs, as illustrated in Figure 1 below:



Source: the authors

Figure 1 Key Success Indicators of a risk management framework for public and private projects. The components of risk management are numbered from 1 to 6. The KSIs are the roman numerals from I to VII. The arrows of the KSIs indicate that each KSI should be subjected to the components of the risk management framework to ensure effective risk management. The KSIs

are embedded in the risk management framework for managing and measuring successful projects. For instance, the project schedule should be subjected to the components of the risk management framework to ensure that project delays are prevented.

THE KEY SUCCESS INDICATORS

The key success indicators and their respective criteria and constituents are briefly explained as follows:

Completing the Project within the Acceptable Scope and Deliverables

Ogunberu et al. (2018) contended that the top management and the project technical team should properly define the project scope, else the project could fail. To buttress this view, Lampa et al. (2017) empirically affirmed that 48% of public and private sector project failures are connected to poorly defined scope and risks. As such, it is crucial to properly define and manage the project scope. Therefore, Henjewe et al. (2011); and Kulatunga et al., (2011) confirmed that meeting project owner's requirements, functional and technical requirements, end-users benefits, and efficiency are criteria that form the project scope. Villalba-Romero & Liyanage (2016); and Helmy (2011) affirmed that project functional purpose, technical output, and scope of work are critical criteria for defining the project scope. That is completing the project within the required scope is an indicator for managing and measuring a successful project.

Completing The Project Within The Prescribed Schedule or Time

Villalba-Romero & Liyanage (2016) confirmed that completing the PPP project on time/schedule and within a pre-specified budget, with a financial return could influence stakeholders to accept the project. The Project Management Body of Knowledge (PMBOK) (2004:138) suggested that when the project schedule is managed appropriately, it assists to prevent project delays and avoid cost overrun, which guarantee successful project delivery. Therefore, a project schedule can be considered as an indicator for managing and measuring a successful project. Conversely, a project schedule is associated with risks that can cause project delays, cost overrun, and project failure. For instance, the COVID-19 lockdown caused delays in completing some PPP projects in many countries. Therefore, it is imperative to identify and manage the risk associated with the project schedule to complete the project on time.

Finishing the Project within the Allocated Budget

Lichtenberg (2016) explained that project failures are also exacerbated by cost over-run as a result of poor project cost management. In addition, unforeseen economic turmoil such as unfavorable inflation, exchange rate, and interest rate can also cause affordability challenges and subsequently low value for money, and low financial return, leading to project failure (Yuan et al., 2012). Therefore, it is imperative to effectively identify and manage these economic and financial risks to promote value for money and safeguard successful project delivery.

Completing the Project within the Prescribed Quality

Bing et al. (2004) mentioned that project quality is a key factor to measure stakeholders' satisfaction and ensures project acceptability by its owners. Bao et al. (2018); and the International Standard Organisation's 8402 (1994) defined quality as the extent of excellence that can be attached to a project. For instance, if a project is fit for purpose, and meets the prescribed deliverables and technical requirements, the project can be considered to be of good quality. Ashokkumar (2014:9) and Besterfield (2004:5) mentioned that if stakeholders receive greater satisfaction from the project or service rendered, they will accept the project as successful. Therefore, project quality should be used as an indicator to manage and measure a successful project.

Ensuring That the Project Is Sustainable

Nawawia et al. (2015) claimed that the concept of sustainability encapsulates the global aim to balance the swift growth of human needs and the fast deterioration of resources. Project sustainability aims at achieving an outcome that meets the present economic, environmental, and socio-cultural needs of people without jeopardizing the future generation's ability to meet their own needs (Couture 2013; Goyal et al., 2013; Delai & Takahashi, 2011). Burke (2011) contended that the concept that underpins sustainability is parallel to the "triple bottom line" (TBL), namely; profit-making, the protection of people (community support and safety); and the planet (3Ps). Kucukvar et al. (2014) elucidated that the profit is related to economic risks, people refer to social risks, and the planet refers to environmental risks. Shenhar (2011), and Shenhar et al. (2001) attested that sustainability is critical to a successful project; however, it is an emerging risk that should be managed and used to measure a successful project.

Providing Resources to Complete the Project

Li et al. (2017) explained that managing and making resources available help to complete the project within the prescribed schedule and scope. Inadequate resources contribute to project delays and poor quality which causes projects to fail (Berssaneti & Carvalho (2014:3). Therefore, there should be transparency in the procurement process to ensure that contracts are awarded to a competent bidder that can supply resources. As such, the contractor will be responsible and accountable for the project quality within the prescribed deliverables. Berssaneti & Carvalho (2014) explained that managing project resources; making them available just in time is salient for project success. As such, it can be deduced that project resources are critical for project successful delivery.

Conducting Effective Risk Management

No project is risk-free, therefore all the PPP projects should be subjected to risk management. Johnson and Johnson (2013) defined risk as any event that has both negative and positive impacts on project objectives. The Project Management Institute (PMI) (2004) defined risk as an uncertain event or condition, which, if it occurs, will have a positive or negative impact on at least one of the KSIs. Therefore, it is imperative to address the risks associated with KSIs to deliver successful projects. For instance, an enterprise-wide approach to identifying and analysing risks creates risk awareness, and aids in matching risks to the organisation's risk appetite statements for optimal risk allocation and sharing for successful project delivery. Managing the risk associated with the KSIs requires that the KSIs should be subjected to the

components of the risk management framework, by identifying, assessing, and treating the risks in the KSIs to ensure successful project delivery. Based on the foregoing explanations, the risk management components, KSIs, the derived criteria for the KSIs, are summarized in Table 1 below:

Table 1		
RISK MANAGEMENT COMPONENTS AND KEY SUCCESS INDICATORS' GUIDING CRITERIA		
Risk management components	Key Success Indicators	Guiding Criteria
• Risk governance	Project scope	<ul style="list-style-type: none"> • Output specifications should be determined and adhered to • The functional requirement should be determined and adhered to • Guaranteeing efficiency, and meeting users' expectations.
• Risk governance	Project time/schedule	<ul style="list-style-type: none"> • No project delays and no cost overrun.
• Risk governance	Project cost/budget	<ul style="list-style-type: none"> • Guaranteeing value for money and financial return • Ensuring reduced project life cycle cost, and no cost overrun • Guaranteeing affordability
<ul style="list-style-type: none"> • Risk governance and system • Risk culture • Risk management standards 	Project quality	<ul style="list-style-type: none"> • Define functional and technical requirements and adhere to them • Ensuring efficiency and fit for purpose • Accepted by stakeholders
<ul style="list-style-type: none"> • Risk governance • Risk management principles 	Project resource availability	<ul style="list-style-type: none"> • Guaranteeing transparency in the procurement process • Promoting accountability and quality of work.
<ul style="list-style-type: none"> • Risk governance • Risk management principles • Risk management standards 	Project sustainability	<ul style="list-style-type: none"> • Ensure positive environmental, economic and social impact • Community support and safety
• Risk management	Effective risk management	<ul style="list-style-type: none"> • Efficient risk management • Guaranteeing political will, optimal risk allocation and sharing

Source: Authors' deductions

Briefly, this research focuses on confirming the KSIs, by means of testing them empirically to determine their applicability in managing and measuring successful PPPs. As such, the next section deals with the research methodology for testing and analysing the results.

RESEARCH METHODOLOGY AND RESULTS

A list of seven generic KSIs was identified to ensure the implementation of a risk management framework in PPPs. The identified indicators aim at forming an integral part of the proposed risk management framework. The indicators were subjected to a survey by means of a close-ended questionnaire to ascertain their germaneness and practice in managing and measuring PPPs. Respondents of various public and private sector organizations in Ghana and South Africa participated in the survey. The survey aimed at determining their views on the importance of the KSIs for a risk management framework and, to also indicate the current applicability of the KSIs within their organisations. The questionnaire was distributed to 140 practitioners in the fields of risk management, PPPs, project management, procurement, internal audit, insurance, and financial management, and sustainable development managers. Based on the respondent's experience and knowledge, they were requested to indicate their views on a 5-point Likert scale. Descriptive analysis was used to explain the responses according to the following scale: "1= Strongly Disagree (SD), 2=Disagree (D), 3= Indifferent (I), 4= Agree (A) and 5= Strongly Agree (SA). Based on the 5-point Likert scale, a response rate of 78% was achieved, including top

management (CEOs, and senior management) 30.9%, Risk managers/officers 15.45%, Financial managers/officers 26.4%, department unit managers, 5.5%, Project managers/supervisors, 17.3%, risks and project management consultants 4.54%. It was also observed that the majority of participants (representing 66.4%) had more than 11 years' experience in PPPs. 17%, and 14.5% of respondents respectively, had 2-3 years and 6-10 years' experience respectively. The response also indicated that 70% of the respondents have more than 10 years' experience in risk management. Based on the above statistical presentations, it can be concluded that the participants have a high level of experience in both risk management and PPPs, leading to an assumption that the responses can be used to derive acceptable conclusions and recommendations. Descriptive statistics were used to analyse the primary data by means of a Statistical Product and Service Solutions (SPSS), using the averages, variances, mean and standard deviation. The collated and analysed data sets (Table 2) were used to affirm the conclusions regarding the significance of the KSIs and their current application in terms of managing and measuring successful PPPs. These conclusions were then integrated with the assumptions and recommendations regarding the KSIs of a risk management framework for PPPs.

Table 2 COLLATED AND ANALYSED DATA SET							
Key Success Indicators	Average rating of agreeing to a "disagree" and to a "fully agree"		Variance	Mean rating		Standard Deviation	
	Germaneness	Practice		Germaneness	Practic	Germaneness	Practic
Complete project within the scope of work	86%	80.8%	5.2%	4.3	4.04	0.8433	0.7443
Complete project within the schedule frame	90%	74%	16%	4.5	3.7	1.62	1.0952
No cost/budget overruns	96%	76%	20%	4.8	3.8	2.0607	1.2915
Complete project within required quality	92%	84%	8%	4.6	4.3	1.1999	1.02163
Ensure resources availability	88%	84%	4%	4.4	4.2	0.7744	0.7056
Ensuring project sustainability	96%	88%	8%	4.8	4.4	1.3033	1.0951
Conducting effective Risk management	90%	78%	12%	4.5	3.9	1.4029	1.0537

RESULTS AND ANALYSIS

Based on the above-illustrated Table 2, the results and analysis of the key success indicators are presented in the next section.

Project Scope

Based on the literature review on risk management governance, the project scope was derived as a KSI for managing and measuring successful PPPs. Most organisations confirmed the application of the concept and its practice that is 86% and 80.8% respectively for managing and determining a successful project. The mean static score of the application of the concept and its practice (4.3) and (4.04) respectively, exceeded the 'disagreed' position towards the 'agreed' zone (between 4 and 5) for this KSI. As such, it explains that this KSI (scope) can be regarded as

a component of the proposed risk management framework for managing and measuring successful PPPs. However, the variance of 5.2% (86% and 80.8% respectively) between its applicability and practice is an indicator of inadequate use of project scope as a KSI to manage and determine a successful project; hence a potential cause of a project failure. Therefore, organisations should give adequate attention to the project scope to enhance managing and measuring successful projects.

Project Schedules

Organisations rated the germaneness of project schedule at (90%), as a critical KSI for managing and determining success for their projects; signifying the current level of acceptability of the above- mentioned KSI. However, the practice of this KSI is rated at (74%), leading to a variance of 16% (90% and 74% respectively) between the applicability and practice of this KSI. The variance suggests that the current adoption (practice) of the project schedule as a KSI is inadequate; explaining the reason why PPP project failures are commonly found with project delays. Therefore, organisations should recognise the project schedule as a critical indicator that can help them to manage and measure a successful project.

Project Budget/Cost

The response indicated that most organisations (96%) agreed to the germaneness of using this indicator; project cost or budget for managing and measuring successful PPPs. However, (76%) of organizations applied this indicator in managing and measuring the success of their PPPs. Conversely, the mean static score of its germaneness and practice are (4.8) and (3.8) respectively, indicating that most organisations agreed to both the concept and practice for this KSI. As such, it indicates that project budget/cost can be regarded as a component of the proposed risk management framework for managing and measuring successful PPPs. However, a variance of 20% (96% and 76% respectively) exists between the germaneness and practice of this KSI, suggesting that the practice of this indicator is inadequate; which requires increased attention to avoid PPP failures.

Project Quality

Project quality was derived as a KSI for managing and measuring successful PPPs, according to deductions made from the literature review. It was concluded that the project governing body should ensure that the project is completed within the required quality to ensure that the stakeholders can accept the project, as successful. The response indicated that organisations (92%) agreed to the germaneness of using this indicator (quality) for managing and measuring successful projects. The rating for its practice (84%), is lower than its application, leading to a variance of 8% (92% and 84% respectively). As such, showing the current level of its acceptability for managing and measuring successful projects. Based on the foregoing statistics, it is clear that the adoption of project quality as KSI is inadequate, hence, a potential cause of PPPs failure. Therefore, organisations should adopt project quality as an indicator for managing and measuring successful projects.

Resource Availability

Based on the literature review on risk management, it was deduced that the project governing body should be proactive and use the best available information to supply resources just in time (JIT) to complete the project within the prescribed schedule. The response indicated a relatively low variance between the germaneness and practice of 4% (88% and 84% respectively) of the above-mentioned KSI. Spurring the presupposition that resource availability is relevant in managing and measuring successful projects, it still requires additional attention by organisations to adhere to its practice. Based on the acceptable mean average rating (4.4) and (4.2) of its germaneness and practice respectively, it can be established that the resource availability can be recognized as a component of a KSIs of a risk management framework for managing and measuring successful PPPs.

Project Sustainability

Most of the organisations rated the germaneness of project sustainability at (96%) indicating that organisations should strive to ensure that the project outcome meets the present economic, environmental, and socio-cultural needs of people without jeopardizing the future generation's ability to meet their own needs. The rating of the current practice is (88%) indicating that organisations apply this indicator to manage and measure successful projects. The variance of 8% (96% and 88% respectively) between its applicability and practice suggests that the application of this indicator is relatively inadequate, as such an organisation should give additional attention to utilise and optimise it for managing and measuring successful projects.

Risk Management Process-Steps

The risk management process was derived from the literature as a KSI for effective managing and measuring successful PPPs. Based on the literature review, eight risk management process steps were identified, namely; strategic risk management planning, risk identification, risk assessment, risk prioritisation, risk response strategies, monitoring, controlling, and auditing, risk communication, and feedback, and risk financing. The response confirmed the germaneness (90%) and practice (78%) of the risk management process as KSI for accomplishing and measuring successful projects. The mean static score of its relevance and practice are (4.5) and (3.9) respectively, indicating that organisations exceeded the 'disagreed' position towards the 'agreed' zone (between 4 and 5) for both germaneness and practice of this KSI. As such, it indicates that this KSI was regarded as a component of the proposed risk management framework for managing and measuring successful PPPs. Conversely, a variance of 12% (90% and 78% respectively) exists between the germaneness and practice of this KSI, suggesting that the practice of this indicator is inadequate; as such a potential cause of project failure. Therefore, organisations should widely adopt this KSI to enhance managing and measuring successful PPPs. The above-mentioned KSIs have a relatively high average rating for their germaneness, hence, it is eminent that the KSIs can be regarded as components of a risk management framework for managing and measuring successful PPPs. However, the above-mentioned KSIs have relatively low average ratings for their practice as compared to their germaneness. Therefore, the variances suggest that the practice of all the KSIs for managing and measuring successful PPPs are mostly inadequate. As such, organisations should adopt KSIs to improve their efficiency in managing

and measuring successful PPPs. The variance analysis between the level of germaneness and practice for the top 3 KSIs exceeded the total average variance of all the KSIs. As such, these top 3 KSIs as illustrated in Figure 2 require the most critical attention to reduce the gap.

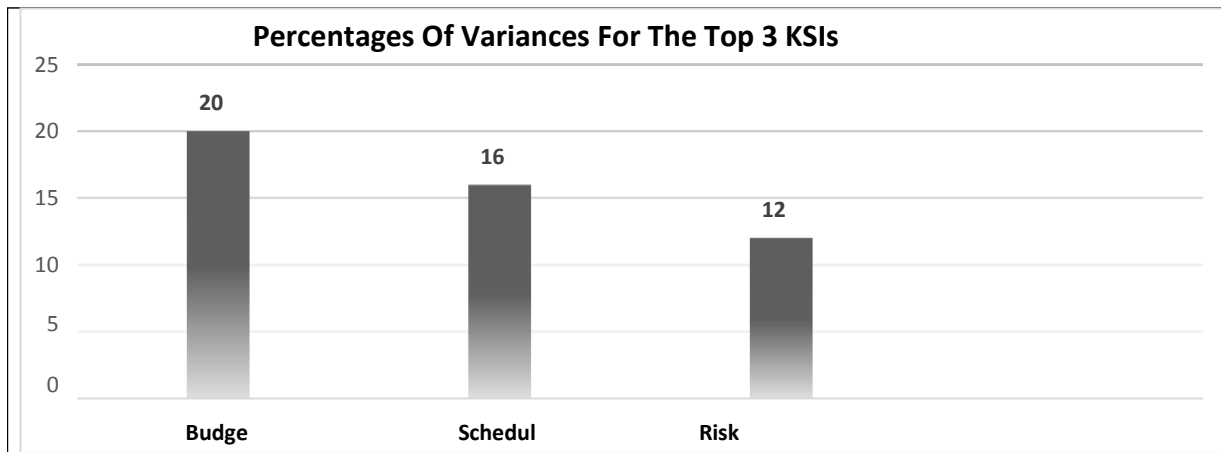


FIGURE 2
PERCENTAGE OF VARIANCES FOR THE GERMANENESS AND PRACTICE OF TOP 3 KSIS

Project budget indicates the highest variance between the rating of germaneness and practice, which deals with managing and measuring successful projects, followed by project schedule and risk management respectively. The next section deals with the conclusion and recommendations based on the literature review, and responses on the germaneness and applicability of the KSIs.

CONCLUSION AND RECOMMENDATIONS

The study aimed at identifying KSIs of a risk management framework that could serve as a device for managing and measuring successful projects. The main components of a typical risk management framework for PPPs were identified as risk governance and system, risk culture, risk management process-steps, risk management principles, risk management standards, and guides. Based on the literature review on the above-mentioned components, seven KSIs were identified, and their germaneness and practice in PPPs were tested by means of a survey. Organisations rated some of the KSIs at low concerning their current applicability and practice, however, the organisations accepted the germaneness of all the KSIs to some degree, to serve as tools for managing and measuring successful PPPs. An investigation into some of the PPP failures revealed that an inadequate and unstructured approach in risk management activities caused the failure of the project. For instance, the geotechnical risks in Uganda's Bujagali Hydropower project materialised and caused a cost overrun of \$50m due to risk management failure. Similarly, the Mbombela PPP Water project in South Africa partially failed in the early stages of the concession due to inadequate and unstructured risk management activities. It is foreseen that if the project activities were centred on risk management process-steps, risk governance and system, risk culture, risk management principles, and risk management standards and guide, and the KSIs, these projects' failures could have been averted or managed successfully. For instance, by adhering to the risk management process-steps and KSIs, the following could have been achieved:

- a. Adequate identification of risks associated with the project cost or budget risks. As such project cost overrun could have been prevented.
- b. Adequate risk governance and culture practices would have ensured effective enterprise risk management activities by the three lines of defence. As such, risk management failure and project delays could have been prevented to ensure successful project delivery.
- c. Application of the risk management process, principles, and standards through a risk management framework would have ensured that management makes adequate risk-informed decisions that could guarantee successful project delivery.

Based on the identified gaps between the germaneness and the current practice of the KSIs, it is clear that KSIs of a risk management framework is critical for managing and measuring successful PPP projects, however, it seems this concept is still not exploited to its fullest level. In addition, it is recommended that in general, organisations should strive to improve the following: Project schedules, cost/budget, and risk management

- a. Subject all PPPs to the risk management process, standards, and principles, risk governance and culture
- b. Involve all employees in the risk management activities
- c. The risk management activities should be structured, through the adoption of the KSIs of a risk management framework.

The identified KSIs of a risk management framework is generic and applicable to all private and public projects and can be used by organisations as a guide towards a structured approach to risk management and measuring successful projects. Also, the rated level of applicability of the KSIs could serve as a yardstick for organisations to measure their level of adherence to the KSIs and to identify potential gaps and address them to ensure successful project delivery. It is also envisaged that the components or criteria of the KSIs could be further researched and expanded.

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