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Enhancing Organisational Performance Through Public-Private Partnerships: The Case of the National System of Innovation in South Africa

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Abstract: **Prior work:** Although businesses worldwide are underpinned by networking and fostering strategic partnerships, South African organisations such as the NSI have not fully exploited public-private partnerships (PPPs) to improve their performance, maximise impact and customer value. **Objectives:** This study will address this ‘knowledge gap’ by providing an in-depth understanding of issues and challenges experienced by organisations in the NSI when fostering PPPs and recommending strategies for improved performance and cohesion in the NSI. **Approach:** This qualitative study critically examined the role of PPPs in improving organisational performance. Purposive non-probability sampling was used to select and interview 30 participants in the Gauteng Province of South Africa. A thematic analysis software called Delve was used to organise the qualitative data and generate codes and themes, and a thematic map was used to depict patterns and relationships graphically. **Results:** Limited funding, policy restrictions, systematic fragmentation, internal incompetence, and organisational competence emerged as factors hindering the formation of partnerships. PPPs are likely to be successful if they are formed between organisations that have complementary visions and values. The study’s findings also demonstrate that internal competence is critical to the success of PPPs. **Implications:** The proposed framework could improve the NSI’s performance in achieving national

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goals such as economic growth, job creation, and the attraction of investment. **Value:** A PPP framework was developed to assist National System of Innovation (NSI) organisations in enhancing performance.

Keywords: partnerships; impact; customer value

1. Introduction

While some organisations in the NSI have successfully achieved their broader mandates, there has been a growing need to account for the performance, impact, and advancement of the NSI, as well as the government's fiscal allocation within the broader NSI value chain (Department of Science and Innovation, 2019). The South African Ministerial Review of the NSI followed the adoption of the 1996 White Paper on Science and Innovation (Department of Science and Innovation, 2019). The review highlighted several challenges that needed to be urgently addressed to ensure that the NSI reaches its full potential, plays a critical role in overcoming historical injustices, and helps address socio-economic challenges in the country.

Flores-Amador (2014) reported that the concept of the NSI started gaining popularity in the late 80s and was used as a tool to design and implement European industrial policies. It has been used in academia and by policy development professionals to identify and analyse interactions between private and public agencies to create policies and support innovation. A common feature of the NSI is a combination of private and publicly owned institutions, which include universities, research institutions, funding agencies, private companies, small and medium enterprises (SMEs) and state-owned entities (SoE), that are established to play a critical role in advancing the development of innovative technologies and contribute to the nation's positive economic development (Manzini, 2012).

Manzini (2012) also argued that the NSI should be perceived as the nation's collective effort towards fostering technological innovation. Atkinson (2020) found that no nation has the perfect innovation system, and a few are effective in maximising the potential of their NSI. This study further highlighted that the innovation system in the USA had achieved significant results but declined over the past few years and needed substantial resuscitation, primarily through significant increases in federal funding allocation and a strong support and regulatory framework structure (Atkinson, 2020). The challenges faced by the USA innovation system are not unique since the South African NSI has faced several similar challenges, ranging from the fragmented nature of the system to limited resources,

competing development priorities, and negative economic growth (National Advisory Council on Innovation, 2019).

PPPs have been defined differently by scholars and businesses. Mashwama, Thwala, Keitumetse, and Aigbavboa (2019, p.16) defined PPPs as “long-term contractual agreements between a government-owned entity and a private-sector company, in which the government leverages private-sector skills and assets to execute an agreed-upon project.” The parties involved in a PPP share the associated risks and rewards of the project. A study published by the National Advisory Council on Innovation (2019) has found that the NSI’s contribution to alleviating socio-economic challenges in South Africa has not been effectively achieved, and part of the reason is the lack of cohesion and successful PPPs in the NSI (National Advisory Council on Innovation, 2019). In addition, the White Paper on Science and Innovation Review of the NSI asserted that the minimal impact and escalated organisational failure rate in the NSI was due to the lack of successful long-term partnerships that will play a critical role in attracting investment opportunities and ensure that South Africa increases its Gross Expenditure on Research and Development (GERD) from the current 0,7% to 1,5% in the short and medium term to 2% in the next 20 years. Despite concerted efforts over the years by several organisations in the NSI to encourage collaboration and networking from both the public and private sectors, the South African NSI remains significantly fragmented and incoherent, experiences high levels of failure and has not realised its full potential (National Advisory Council on Innovation, 2019).

The then Minister of Science and Technology, Minister Naledi Pandor, commissioned a national Ministerial committee to review the South African Science, Technology and Innovation landscape in 2010. The Ministerial committee was also mandated to establish if the NSI institutions can optimally assist in achieving the objectives of South Africa’s National Development Plan (NDP) and identify gaps, inefficiencies and opportunities in the current landscape (Department of Science and Technology, 2019).

The Ministerial committee review found that the South African NSI landscape is incoherent and uncoordinated. As a result, the nation’s R&D activities appear to be highly fragmented. The fragmented nature of the system has increased the risk of duplicated and contradictory efforts and the erosion of R&D outputs that may lead to competitive commercial outputs (Department of Science and Innovation, 2019). The review also found insufficient integration between NSI agencies and that the

business sector was insufficiently involved in building the NSI at the levels of both large and small firms.

The complexity and nature of challenges facing the NSI require a coordinated approach to ensure that the NSI functions efficiently and realises its full potential through collaboration, networking, and the fostering of long-term strategic partnerships that enhance performance. To date, a significant amount of money has been invested through fiscal allocation to aid organisations in the NSI to contribute to the nation's economic development goals of job creation, service delivery and improving the lives of South Africans. As such, a growing interest in public-private collaboration has been mainly driven by organisations experiencing great competition and limited market opportunities (National Advisory Council on Innovation, 2019).

Limited studies have been conducted on fostering PPPs within the context of the NSI, and publications like the recent White Paper on Science and Innovation and others related studies done by the National Advisory Committee on Innovation (NACI) have highlighted the need for collaboration, networking and the formation of PPPs. A study by Mashwama et al. (2019) focused primarily on specific PPPs in infrastructure development, and another study by Arimoro and Elgujja (2021) focused on collaboration and networking. Thus, this study will address this 'knowledge gap' by providing an in-depth understanding of issues and challenges experienced by organisations in the NSI when fostering PPPs and recommend strategies for greater collaboration, networking, improved performance and cohesion in the NSI.

2. Research Methodology

A qualitative research approach was adopted, and thematic data analysis was used. Thematic analysis is an analytical method used to identify, organise and generate insight from observed patterns and themes (Braun & Clarke, 2012). Thematic analysis is also used to group large data sets according to similarities, patterns and themes that may be used to derive meaning from the analysed data (Braun et al., 2012).

The sampling approach is purposive nonprobability sampling (Cooper et al., 2012). The population for the study comprises organisations in the NSI, and the target population that will be used for this study comprises six (6) organisations located in

the Gauteng province. These organisations include the Technology Innovation Agency (TIA), The Innovation Hub Management Company (TIHMC), the National Research Foundation (NRF), the National Nuclear Regulator (NNR), the National Intellectual Property Management Office (NIPMO) and Mbula Research and Innovation. Each organisation has an average of 10-70 employees, adding up to a total population of 420. The target population comprised executive managers, middle-level managers and junior staff employees of all six (6) selected organisations in the NSI. A purposively selected sample of thirty (30) participants was chosen, comprising 12 Senior Managers, 11 Middle Managers (1-3 from each organisation), and 7 Junior staff (3 or 4 from each organisation).

3. Research Findings

Coincidentally, the participants comprised 50% males and 50% females and 62.5% were over the age of 36, 16.6% were between the ages of 31-35, and 20.8% were between the ages of 27-30. Regarding their education levels, 16.7% of the participants had undergraduate degrees, 33.3% had honours degrees, 37.5% had master's degrees, and 12.5% were Ph.D. holders. It was also established that 20.8% were senior-level managers, 54.2% were middle managers, and 25% were junior staff members. Concerning racial demographics, 91.5% of the participants were African, 4.25% white, and 4.25% were coloured. It was also ascertained that 16.7% of the participants had more than 15 years of working experience in the NS, 33.3% had between 10-15 years of experience in the NSI, 25% had between 5-10 years of experience, 16.7% had 3-5 years' experience, while 8.3% had 0-2 years of NSI working experience.

Although the researcher scheduled 30 interviews, 24 participants availed themselves for the interviews, giving a response rate of 80%, which can be deemed acceptable for a qualitative study (Morton, Bandara, Robinson & Atatoa, 2012). All the interviews were recorded and transcribed using Microsoft Teams and AI Transcribe for online interviews, and the Apple Voice Record application was used for face-to-face interviews. During the first step of the thematic analysis, the researcher reviewed all the interview transcripts and data sets and carefully repeated some sections for clarity. While reading the transcripts, the information relevant to achieving the research aim and objectives was highlighted, and points of interest were detected and cross-referenced against the research questions. As part of preparing for the second step of thematic analysis, several points of interest were

identified and used as the basis for generating codes. After familiarisation with the collected data, thematic codes were generated from the 24 transcripts collected from the interviews.

The codes generated were used as the building block to create themes to develop a thematic map in the next step of the thematic analysis process. Since the study was exploratory, the researcher had to reread all the transcripts before clustering codes and using them to generate themes, patterns, and a thematic map. The most important aspect that was considered when developing the themes was that there are two main approaches to thematic analysis. The first approach is the inductive approach, which allows the data to determine the themes to establish a relationship between the codes and use the relationship to identify themes (Byrne, 2021). The second approach to generating themes is deductive, which entails analysing the collected data with pre-existing themes that are expected to be found based on theory and existing knowledge (Samanta, 2021). Five main themes emerged from the approaches to forming partnerships, the role of PPPs, barriers to fostering partnerships, advantages of partnerships and enablers, and ideas for the PPP framework. Figure 1 is the thematic map developed from the initial five main themes and 33 codes that emerged

from the data analysis.

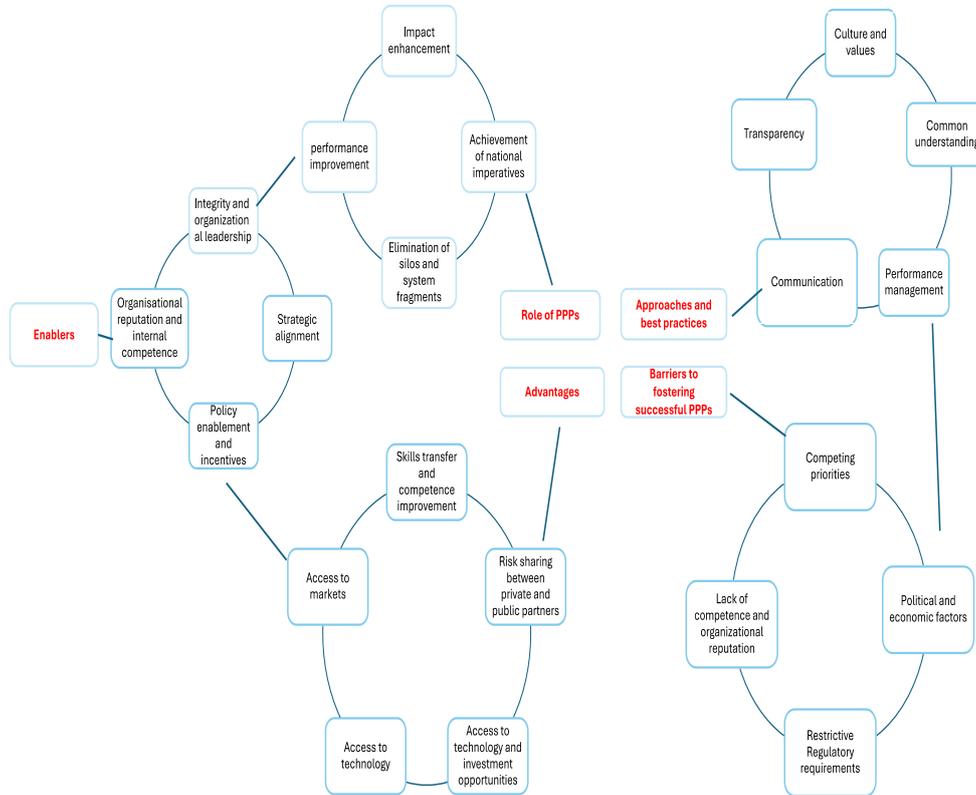


Figure 1. Revised thematic map

Source: Developed by researcher

3.1. Role of PPPs

From Figure 1 above, it may be concluded that the four themes generated under the first code were performance improvement, elimination of silos and system fragments, achievement of national imperatives and impact enhancement. A brief discussion of each follows.

3.1.1. Performance Improvement

Several participants highlighted that one of the roles and benefits of PPPs is that they improve organisational performance and NSI performance. For example, some of the respondents explained as follows:

Respondent 5: *“For me, collaboration is really the main call and I think the organisation that I represent, was meant to drive collaboration. So I believe it’s very necessary to move forward in the NSI and improve performance and right now where I am in my position in the innovation space which has to do with commercialisation, I see the importance of partnerships because you cannot even achieve anything summonable without collaborating with the key organisations that supports us. And I think even the NRF, the DSI, those are really needed for us to ensure that successful commercialisation happens. So I really am a core believer in collaborating and avoiding double dipping and various reasons”.*

Respondent 3: *“No private public private partnership are important in the national system of innovation. I think at this moment we know that there are different players in the NSI and all these different players have a specific role that they are playing and you know you’ve got your government, you’ve got public institutions and universities, you’ve got your science council, private companies and you’ve got funders. All of them are actually trying to partner to achieve something, and all of them have something specific to offer, but not all of them have everything figured out to achieve their goals. Let’s say they one goal would be maybe job creation or better quality of life of South Africans. Not all organisations can actually achieve that as individual institutions. So they need to partner in order to compliment each other and bring resources or pull together resources in order to achieve that particular goal or complement each other’s skills to achieve that particular goal. But alone it might take a bit longer”.*

Respondent 12: *“As a rule I basically think, for things to work well, people need to partner and it’s not always straightforward. And the private sector partners has really a duty to assist where they have expertise and capability to make sure that the system works. So really the partnerships and model should be encouraged going forward so that everybody, everyone may bring their respective benefits so that other parties can gain from the partnership and to make sure that they grow businesses and governments agenda. So we need to really make sure to create a conducive climate for partnership between the two to drive certain initiatives to make sure that an ecosystem like a national system of innovation in South Africa thrives”.*

The findings indicate a direct link between partnerships and improved performance. This also confirms the findings of researchers Feng, Zhao and Chen (2022) and Wanjiku (2017), who reported a positive relationship between partnership strategies and organisational performance. The findings also confirm that PPPs enable access to knowledge transfer, allowing partners to learn from different perspectives, and

this learning engenders the development of competitive advantage and long-term organisational performance (Wang, Zhou, Xiong & Yan, 2019).

3.1.2. Elimination of Silos and System Fragments

A significant number of participants highlighted that it is essential to enable the formation of PPPs in the NSI to enhance cohesion to improve organisational performance and efficiency. For example, some of the respondents explained the following:

Respondent 10: *“I believe that working in silos will not make us achieve what we want to achieve, but if we work together as industry and government, we will definitely alleviate poverty and unemployment rate in our country and thus, a good quality of life achieved”.*

Respondent 8: *“I have been in this space for a reasonable amount of time and from what I have seen this is a space where it is almost impossible to do anything alone. I highly encourage partnerships, especially with partners that can help us to achieve our organisational goals. But what I mainly see is that a lot of organisations are competing instead of working together to achieve common goals. There’s a lot of silos in the system that is why the system is not well organised. These silos in the system are causing a lot of challenges especially because the system is not well funded so the silos are causing a lot of competition for government and private sector funding”.*

The findings of this study suggest that there is a need for the South African NSI to eliminate silos and system fragments so that the NSI can be more coordinated, coherent and function optimally to achieve long-term goals like job creation, economic growth and address socio-economic challenges. These findings are also in line with those of a study conducted by Alexander (2021), who examined the South African NSI’s ability to facilitate the fourth industrial revolution (4IR). Alexander (2021, p. 45) argued that “working in silos is detrimental to getting the best outcomes, to avoid this, multi-stakeholder networks are particularly important for the 4IR

3.1.3. Achievement of National Imperatives

By definition and functionality, the NSI is comprised of a combination of private and publicly owned institutions, which include Universities, research institutions, funding agencies, private companies, small and medium enterprises (SMEs) and state-owned entities (SOEs) that are established to play a critical role in advancing

the development of innovative technologies and contribute to the nation's positive economic development (Manzini, 2012). One of the participants highlighted the following:

Participant 11: *“European countries have managed to grow their economy through enabling innovation. If you look at countries like Sweden who have a very low innovation deficit, those countries managed to build a sustainable economy through innovation. But the reality is that this was not done in isolation or by single companies or organisation. It was firstly enabled by a well-functioning system of innovation that managed to create an enabling environment for innovators to thrive. South Africa has managed to produce jobs for graduates, and the reality is that big companies and government are no longer looked at as creators of jobs. Jobs come from start-ups and this is why it's so important to enable innovation to happen in the country so that national goals like job creation, poverty eradication etc. can be achieved”*.

The findings support the conclusions of Dumpere, Qamar, Allan and Malik (2023), who argued that policymakers and governments have recognised the importance of innovation as a driver of economic growth and development worldwide to recognise innovation performance as a critical component to enable national competitiveness and national progress.

3.1.4. Impact Enhancement

The data collected has demonstrated that there is a correlation between PPPs and improving organisational performance and the overall performance of the NSI. One of the respondents highlighted that *“the NSI is failing to make the expected impact due to systematic fragmentations and poor leadership. There are organisations that seem to be doing well in terms of their individual organisational mandates but from a system point of view every organisation seems to be working in silos and not really contributing to the bigger pool of the national system. What you technically have is organisations fighting to be the best within the system as opposed to organisation working together to make collective impact. So there needs to be a collective paradigm shift from the individualistic way of doing things to a more systems approach so that the NSI can generate collective long-term impact. For this to happen there must be a concerted effort to drive resource sharing, launching of joint activities and programmes that are enabled through strategic partnerships”*.

The findings of this study suggest that there is wide recognition that some organisations are performing well and achieving their respective organisational

goals. However, this may be enhanced by forming partnerships that may help the NSI organisation potentially enhance the impact they are making in the NSI. As such, NSI organisations should consider forming partnerships to jointly contribute resources, launch impactful joint programmes, and positively impact the NSI.

3.2. Barriers to Fostering Successful PPPs

Four themes were generated during the second coding phase were competing priorities, lack of competence and organisational reputation, political and economic factors, and restrictive regulatory requirements.

3.2.1. Competing Priorities

The data suggests that organisations in the NSI are faced with the reality of negative economic growth, global competition and competing governmental priorities. This reality has resulted in an increasing need for partnerships that will mitigate the challenges posed by limited governmental funding allocation as a result of competing governmental priorities and negative economic growth. Among the participants was one senior manager who highlighted that *“partnership would actually add value in in terms of mitigating the challenges we are facing regarding funding as long as those partners will share common objectives. Partnerships unlock a lot of funding which is what is needed to mitigate limited funding from government. Some partners prefer to work with partners that can contribute something towards the partnership so with so much competition for government funds, it may be helpful that NSI organisations look for partners that will unlock investment opportunities”*.

The research findings on the need for fostering PPPs to attract funding opportunities and mitigate the risk associated with competing governmental priorities are aligned with the resource dependency theory. The resource dependency theory identifies organisations as open systems that depend on the contingencies of the external environment (Mentari, Zahroh & Ermayda, 2019).

3.2.2. Lack of Competence and Organisational Reputation

The data suggests that organisational competence and reputation are the most important factors that are needed to form successful PPPs. One of the respondents added that *“PPP’s and other business partnerships are formed on the basis of agreed goals and objectives. It is important to have a team of competent employees to ensure that the partnership goals and achieved are achieved.”* Another participant added that *“one of the most important component of attracting strategic partners and*

investors is investor confidence and investor confidence is actually build from organisational reputation. No investor will want to partner with organisations in the NSI if the organisations reputation is questionable. Getting into a partnership with such an organisation may be detrimental to the partner organisations reputation and public image. For this reason, NSI organisations must prioritise their organisational reputation and image through ethical leadership to ensure that they attract partners. Some organisations in the NSI, especially those in the public sector have failed to build and maintain strong organisational reputation and images and for this reason they have struggled to get into partnership agreements”.

Bass (2019) argued that organisational reputation is an important component for organisational success, and the findings of the study suggest that organisations need to prioritise organisational competence and reputation to ensure the that mitigate the barriers to forming PPPs that may be needed to ensure that NSI organisations achieve their long-term organisational goals.

3.2.3. Political, Economic Factors and Restrictive Regulatory Requirements

Partnerships are fostered not only to attract funding but also for long-term impact and economic growth. One of the participants in the study highlighted that *“it is easy to attract partners that will bring in more funding if you already have a health balance sheet as an organisation. Most partners prefer that each partner must contribute to the partnerships financial commitments. The challenge in the NSI is that most organisations are significantly underfunded and for this reason, they find it difficult to get onto partnerships that require joint payments or co-contribution. So the slow economic growth that has caused a shift in government priorities and limited funding in the NSI is a serious challenge that must be mitigated”.* Another participant highlighted the following: *“there is no company that can partner or even invest in a country that is politically unstable and is known of political wars that may damage infrastructure and cause instability. For this reason, I think political stability, ethical leadership and the rule of law are all critical in ensuring that the NSI mitigates the risk associated with political instability”.*

These findings align with those of Radu (2015), who argued that political stability directly impacts economic growth and that leaders must prioritise it.

3.3. Enablers of PPPs

The findings of this study highlighted four critical enablers needed to ensure the formation of long-term and successful PPPs, namely, organisational leadership and leadership integrity are among the most important enablers of PPPs. Integrity entails displaying honesty, morals and principles (Huberts, 2018). There are a few components that ensure leadership integrity and these are transparency, reliability and ethical behaviour. According to this study's findings, several participants argued that *“organisational leadership and leadership integrity are among the most important enablers of PPPs, especially when financial resources must be invested in the partnership. No organisation wants to partner with an organisation that has questionable leadership and has a history of negative publicity due to unethical leadership.”* Another participant argued that *“organisations that have leaders who have not demonstrated integrity and ethical behavior will struggle to attract partnerships that may be critical for resource mobilisation and help with ensuring financial sustainability. Leaders are normally the face of the organisation, especially with critical stakeholders and because of this reason it is important to ensure that leaders in the NSI must ensure that they maintain high integrity and ethical standards so that they can boost their organisations investor confidence and attract partners that may be critical to achieving organisational goals”*.

Another participant argued that *“every successful partnership is underpinned by some critical aspects which may include trust, ethical leaders, organisational public image etc. the most important thing is that all organisations must ensure that their employees, especially leadership behavior is ethical at all times in order to attract partnerships especially with the private sector”*.

The findings concur with Jakeman's (2023) argument that competency, reliability, transparency, integrity, and care are critical factors needed to enable the formation of business partnerships. Other critical enablers of successful PPPs are compatible company cultures, a common vision, mutual respect, communication, shared vision, and accountability.

One of the participants highlighted that *“private sector companies want to partner with the public sector to support NSI activities. The challenge is that there are no incentives that the government has set up to encourage private sector companies to get into PPPs agreements to support science and innovation. In cases where there are incentives that have been set, the process to access these incentives is too cumbersome leading to the companies thinking that it is not worth it”*.

Another participant highlighted the following: *“Global economies are not performing well, to close the funding gap, countries with advanced innovation systems use partnership incentives to attract investment opportunities to create an enabling environment for PPPs that will fund their science and innovation systems. South Africa has a Tax incentive scheme but it has not been successful in attracting investment from the private sector due to reasons ranging from poor administration, processes that are too long and the incentives has not been adequately advertised so that private sector companies can access it. As it stands, there are very few companies that know about the incentive”*.

These findings suggest that NSI leaders and organisations need to work with the government to develop policies and incentives that are necessary to attract partners that will invest in the NSI, enable economic growth and job creation, and address socio-economic challenges. In addition, the findings also indicate that DSI and the National Treasury must ensure that the incentives are widely advertised and made easy to access so that NSI organisations can pursue PPPs using the tax incentive as leverage to attract partnerships.

The findings revealed that it is important that when partnerships are being formed, the partners be aligned in their cultures, values, long-term objectives, and common vision. Smilevski, Smilevski Galovska and Gjorgjievski (2021) investigated the effect that shared vision has on partnership success and concluded that there is a positive relationship between shared vision and partnership success. Strategic alignment is one of the most important enablers to successful PPPs. The study suggests that NSI organisations should consider partnerships with organisations that are aligned to their long-term objectives, cultures, and vision.

3.4. Approaches and Best Practices

The best practices emerged as five themes, namely, culture and values, transparency, common understanding, communication and performance management. Badgett (2016) highlighted that effective communication in partnerships improves team building, business growth, innovation, efficiency, and productivity. One participant highlighted that: *“I have been in a situation where we were in discussion with a private sector company and the partnership collapsed because there was poor communication from us and this frustrated the other party. From this experience we had to learn that openness and communications are very key if you are serious about concluding partnership agreements and ensuring that the partnership is sustained in*

the long term". Another participant stated that: *"it takes a lot to establish partnerships with the private sector and things that one may think are insignificant can destroy what may come out of the partnership. When the partnership discussions are being initiated, the other party may request a lot of information, meetings and engagements. This is part of the communication that is critical to ensure that the partnership is a success. In addition, failing to be open to the partnership discussion may be taken as lack of transparency and this may literally not lead to the collapse of all discussions. In addition, communication is not only important in the initial stages, it also has to be practiced even after the signing of a partnership agreement. There is constant communication that may be needed in the form of reports, meetings and general dissemination of information"*.

The findings of this study on the importance of communication in PPPs are supported by those of Anonymous (2015), who highlighted that a partnership that has well-established open communication channels is most likely to succeed, primarily if the communication is based on strong feedback, performance measurement and implementing corrective measures.

3.4.1. Performance Management

The data highlights the importance of managing performance to achieve partnership results. Several participants highlighted that this is a critical aspect of forming PPPs and that it should be prioritised. One of the participants highlighted that *"partnerships can be very costly to organisations, especially those that involve projects and programmes. PPPs are generally known of reducing risks and sharing of resources but other aspects are sometimes not taken seriously. One of the things that are sometime not taken seriously is performance management. When getting into a partnership agreement, both parties must report to their principals or their boards and demonstrate return on investment and value for money. This is why the performance of partnerships is very important to ensure that the partnership achieves expected results and justify the investment that was out in the partnership"*. The findings presented above affirm Santhosh (2021), who found that performance management is critical for companies that intend to attain organisational goals and objectives.

3.4.2. Common Understanding, Culture and Vision

Participant 18 highlighted that: *"companies generally look at compatibility as one of the most important criteria for fostering PPPs. The partnership will not work if a company partners with an organisation that is not compatible to or don't share the*

same vision with. It is important to note that during the initial partnership discussions, all partners will share their respective organisations vision, how they work, processes etc. this is an opportunity that organisations can use to assess if the other organisation have common visions, common understanding, compatible cultures and visions. This makes it easy to manage the partnership and ensure that all partnership objectives are met”.

The broad engagement of literature relating to the impact that partnerships have on the performance of organisations and the growth of the economic system indicates that this has been a subject that has been widely researched (Clarke et al., 2019; Feng et al., 2022; Wulandari, 2024). Wulandari (2024) elaborated that PPPs provide several benefits, such as offering government relief from budgetary constraints, as major funding usually comes from the private sector. The findings of the aforementioned studies concur with the findings of this study, and this resulted in the generation of five themes, namely, skills transfer and competence, access to markets, and risk sharing between private and public partners, and access to technology and investments in technology. As became evident from this study, skills and competence are some of the most important enablers of successful PPPs, and as such, organisations that get into PPP agreements should ensure that they have the required skills and competence to execute functions and achieve PPP objectives. Masero (2023) defined skills transfer as the process of effectively applying knowledge and skills acquired in training to real-world job tasks and responsibilities. According to the collected data, one of the most important advantages of PPPs is that PPPs enable skills transfer and improvement of training. One of the participants in the interviews mentioned that *“we have to be honest with our realities within our respective organisations, we do have a shortage of skills and is partly the reason we have a skill gap challenge in our respective organisation and we do not have enough funds to up-skill people. We need to look into getting partners that have the skills we require to improve as organisations and this also means that we should be open and accept that we are lacking in some skills that are critical to our success”.*

Another participant highlighted that *“we are in the space that requires a lot of legal and commercial expertise in order to make impact but the reality is that we have no legal ad commercial skills to make significant commercial impact. We produce a lot of knowledge within our organisation but not enough of what we produce gets to reach commercial market because we do not have skills to drive commercialisation of our research outputs. If you look at what happens in our field you will agree that most organisations and technology transfer offices (TTOs) have outsourced legal and commercial skills but this*

is not sustainable in the long term. The best thing to do is to partner with commercially driven organisations so that they can help manage our IP portfolio and commercialise our research. This will lead to skills transfer and the development of internal colleagues”.

This finding affirms the findings of Wang et al. (2019), who argued that PPPs enable access to knowledge transfer and allow partners to learn from another perspective, which enables the development of competitive advantage. The literature highlights that one of the advantages of PPPs is that the parties that enter into a PPP contract are exposed to less or no risk, which may also enable motivation for more resources into PPP projects and partnerships (Wang et al., 2019). One of the respondents mentioned the aspect of risk adversity, who argued that *“we are in the business of taking risks and risk adversity is one of the things we always look out for when we invest. Some of our partnerships are based on co-funding of projects but because we have limited funding, and we fund projects that are not always guaranteed in terms of return on investment. So, we need to always look for partners that may bring the required skills for assessing the commercial potential of the project and the capital that is needed to start the project. This is one of the ways we use to lessen and mitigate the risk that is associated with funding technology development, especially at pre-commercial stages. Our way of risk management and mitigation involves managing risks in the beginning and throughout the project with our partners”.*

These findings affirm those of USDT (2012) who argued that risk management is a process that begins in the early phases of a project and is conducted throughout the project life cycle and involves consideration of possible outcomes that may impede expected outcomes. Market access is a term that may be used with the term commercialisation of research outputs and may be looked at as the process of introducing new products to the market (Palo, Maaria, Kivijärvi & Aromaa, 2017). One of the respondents highlighted that *“their organisation has been implementing an open innovation programme that enables innovators and SMEs to access markets through partnerships with strategic private sector partners.”* Another participant also highlighted that *“market access is one of the biggest challenges we have in this organisation, but this has been lessened since we launched our open innovation programme. This programme has been the programme that has resulted in a lot of our funded SMEs accessing market opportunities. Open innovation is all about driving and enabling market access through partnerships. What we do in the programme is to match making programme where we match solution developers and solution seekers through strategic partnerships”.* This finding affirms the findings

of (Razwinani, Tshikovhi & Motaung, 2024) who argued that South African organisations could foster partnerships between NSI stakeholders to drive the growth commercialisation of university researchers and foster an innovative environment through adequate funding and strategic partnerships. Moreover, the findings also suggest that PPPs are critical to opening market opportunities in the NSI, and as such, NSI leaders should prioritise partnerships with private sector commercial companies that may provide market access opportunities.

The findings of this study further confirmed the importance of PPPs in attracting investment opportunities that will be critical to closing the funding gaps that are prevalent in the NSI and ensuring that the NSI is not compromised in making the needed impact on job creation, economic development and growth. Participant 20 highlighted the following: *“I have been working in this organisation for more than ten years and I have witnessed how the nation’s financial crisis has affected our fiscal allocation that we get from the DSI. The allocation that we get has been decreased over the years and this has compromised our functionality as an organisation that has the mandate to fund technology development. Technology development is very expensive and if the organisation has no money, then what it means is that it becomes very impossible to execute our mandate and achieve our goals. This has resulted in two things that have put us under severe pressure. The first one has been the need to generate additional income and from what I have seen it is not only our organisation that is in this situation, all organisations in the NSI that have a funding mandate have been put under severe pressure due to the financial pressure that we are facing caused by lower fiscal allocation. So this has resulting in us having to see alternative means for additional income through partnerships within the NSI and even outside. We have then started looking into getting into partnerships that are geared towards bringing the needed financial resources that allow us to fund more technology start-ups that will contribute to job creation and addressing societal challenges”*.

Participant 14 highlighted the following: *“we are a funding agency, the reality that we are facing is that there is no funding to achieve our mandate, this is a challenge that we have been dealing with for the past 3-5 financial years and we have realised that the only way to close this funding gap is to form partnerships with other funding organisations, particularly from the private sector. We are expected to do more with less and realistically, if you don’t find other sources of funding you will fail”*.

“What we have done over the years has produced some good results but we have not reached a stage where we can say we are successful in raising funding through

partnerships. If you look at what is happening across the world, big companies are no longer seen as creators of employment, it is SMEs that actually create jobs and if we don't fund SMEs and start-ups, particularly the youth we will never win against youth unemployment. So we need to partner not just for the sake of funding technology start-ups but also to create jobs through funding youth based businesses”.

“This can only be achieved if we have external funders that will help us close the funding deficit that we are facing. So we have partnered with some companies in the private sector and this has significantly helped us but we are facing an on-going situation of limited funding, hence we consistently have to be on the lookout for partners that can co-fund our initiatives and enable us to be able to play our role in contributing to job creatin and impacting the NSI”.

Based on the findings, the proposed framework to enhance the performance of PPPs is depicted in Figure 2.

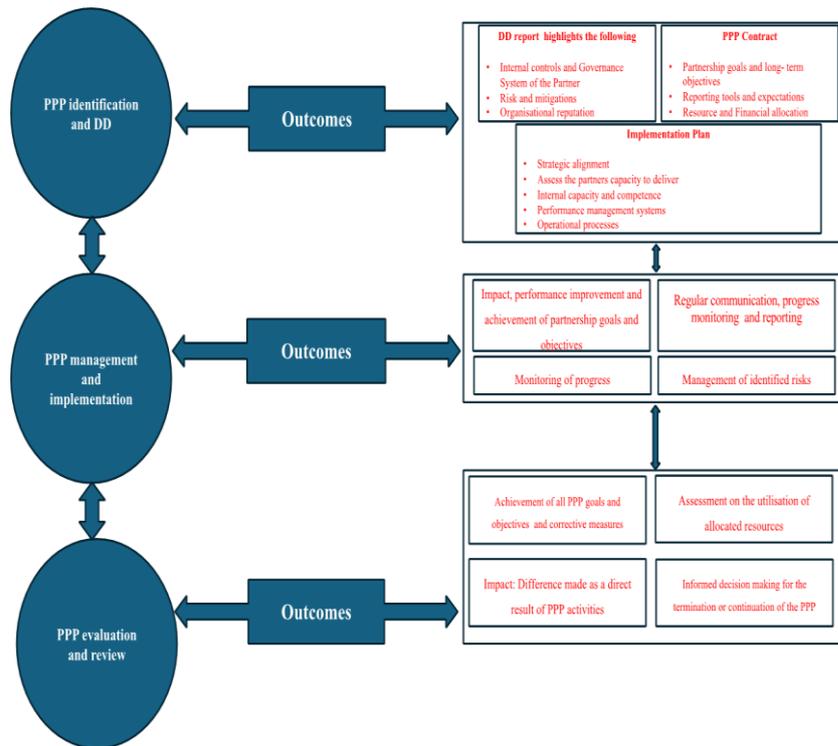


Figure 2. PPP framework to enhance the performance of the South African NSI

Source: Developed by the researchers

According to Uludag (2013), due diligence (DD) can be defined as the process of assessing and investigating opportunity risks and assessing the accuracy of the information related to prospective investment. A report published by the Foreign Commonwealth and Developmental Office (FCDO) provided a definition that is more relevant to this study and defined DD as an approach that forms part of the risk assessment process intended to ascertain if potential partners have the technical capability and financial stability to deliver and achieve agreed goals and provides an opportunity for prospective partners to understand each other's expectations and strategic priorities (FCDO, 2021). The report published by FCDO further highlights that DD has several critical principles of DD, namely, governance and internal control, PPP management and implementation, and PPP evaluation and review.

4. Conclusions and Recommendations

The findings reveal that one of the most important enablers of PPPs is open, honest, and regular communication. NSI managers, leaders, and employees involved in fostering PPPs should foster a culture of open and transparent communication with prospective partners. Partnerships are about strategic intent, and as such, one of the most critical things about partnerships is that both partners must agree on clear partnership goals and objectives that are aligned with their respective organisational values and missions.

Organisations that intend to form PPPs should prioritise identifying partners who share the same vision and have common values. PPPs are likely to be successful if they are formed between organisations that have complementary visions and values. The study's findings also demonstrate that internal competence is critical to ensuring that PPPs are successful. As already highlighted, one of the most critical aspects of PPs is clear goals that partners must agree on. Organisations must have the necessary internal competence to achieve all partnership goals and objectives.

The research findings and reviewed literature indicate that the South African NSI is significantly underfunded, and one of the things that can be used to close the funding gap is partnerships that can unlock investment opportunities. The findings also highlight that one of the things that enables the attraction of investments and increases investor confidence is organisational reputation. Organisational leaders in the NSI are encouraged to build and maintain a strong organisational reputation, thereby enabling partners to invest in the NSI and to support its efforts to drive and enable economic development and address socio-economic challenges. NSI

organisations must prioritise building capacity and training their employees on approaches and best practices for fostering PPPs. The literature revealed that PPPs are not prevalent in the NSI but are rather typical in infrastructure development, even though they have been identified as one of the most critical aspects of success. The findings highlighted that most organisations lack frameworks and guidelines for approaches to fostering PPPs. As such, there should be training aimed at helping NSI organisations initiate partnership discussions and manage partnerships, as well as the regulations governing PPPs and factors that must be considered when fostering PPPs.

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