

A management tool towards the development of healthcare innovation platforms

Annica Marais



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Supervisor: Prof SS Grobbelaar

Co-supervisor: Dr D Kennon

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DECLARATION

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ABSTRACT

The healthcare sector is constantly under pressure given rising patient demands, an increasing population and a lack of infrastructure and resources available in South Africa (SA). These trends result in mounting pressures and demands, which calls for renewed efforts in improving service delivery and access to basic healthcare.

Healthcare systems are expected to deliver high quality services whilst simultaneously addressing complex challenges within resource constrained environments. The impetus of improved access to quality care, has seen healthcare organisations adopt diverse top-down approaches. These efforts have led to islands of success, but have had a disappointing impact on a larger scale.

A key challenge that SA faces, pertains to the difficulty of achieving integration across healthcare value chains (VC). This study investigates innovation platforms (IP) as an approach towards addressing some of the shortcomings of previously implemented solutions. IPs are mechanisms that bring together different stakeholders to diagnose common problems, identify opportunities and find ways to better achieve their goals.

IPs are a solution to addressing healthcare challenges in a sustainable manner and are theorised to assist in the integration of VC actors. The proposed value of IPs is its ability to introduce a gateway to all healthcare VC actors to contribute towards creating a better functioning healthcare system that serves to benefit the broader society and economy. The IP perspective creates an opportunity for the development of appropriate innovations that can efficiently be scaled across the sector.

There is however a lack of evidence of appropriate methods regarding the development and operation of healthcare IPs in SA. This study proceeds to develop a framework and a tool that provides a guideline towards the formation and functioning of IPs that aim to solve challenges within healthcare VCs. This allows for the integration and consideration of opinions of all VC actors during decision-making and policy development.

The research follows a constructivist perspective, which seeks to aid better understanding of phenomena. A systematic review is conducted to identify the core IP concepts from extant literature. The study identified 24 types of IPs and provides a brief overview of these platforms. This thesis identifies and investigates two major trends, seven IP dimensions and 39 core IP concepts. The prevalence of these concepts differs with respect to the type of IP that is investigated.

Guided by the tenets of Jabareen's Conceptual Framework Analysis, that consist of eight phases, the framework is iteratively developed through synthesising the IP concepts with the major trends in literature, validating the preliminary framework, and incorporating the validation findings in the final tool design.

To address the lack of empirical research in this field, the framework and the identified areas of literature were tested. This was done by adopting a mixed methodology approach comprising of four progressive stages: (1) qualitative semi-structured interviews, (2) a quantitative framework-ranking exercise, (3) a qualitative case study and (4) qualitative case study supporting interviews.

Finally, the validated framework and supporting typologies are assembled to create an IP management tool that enables: 1) building IPs; 2) facilitating improvement efforts of existing platforms; and 3) providing platforms with tools to address commonly experienced challenges. This tool's main aim is to provide guidelines on how to interact in and with IPs. The tool adopts a VC approach and enables the development of IPs that align with the WHO's health system building blocks.

The unique contribution that this study introduces is the tool's novelty. The developed conceptual framework guides the formation and functioning of healthcare IPs and is embedded within the management tool. The framework is validated as needed, reliable, relevant and useful within the healthcare domain. The efficiency, effectiveness and applicability of the framework is also confirmed prior to the development of the IP management tool.

The systematic approach followed lends itself to future development and expansion. The validation results indicate a positive response, however, further study is required with implementation, tracking the tool through its implementation and the critical issues that arise from this.

UITTREKSEL

Die gesondheidsorg sektor is voortdurend onder druk gegewe toenemende pasiënt-eise, 'n groeiende bevolking en die gebrek aan infrastruktuur en hulpbronbesikbaarheid in Suid-Afrika (SA). Hierdie tendense lei tot toenemende druk en vereis hernieude pogings in die verbetering van dienslewering en toegang tot basiese gesondheidsorg.

Daar word van 'n gesondheidsorgstelsels verwag om hoë gehalte dienste te lewer en om gelyktydig komplekse uitdagings binne beperkte hulpbron-omgewings aan te spreek. Gesondheidsorg-organisasies het diverse benaderings tot voorsiening van gehalte gesondheidsorg aangeneem. Hierdie pogings het gelei tot eilande van sukses, maar het 'n teleurstellende impak op die wyer veld gehad.

'n Sleuteluitdaging wat SA in die gesig staar, is die ingewikkelde probleem om suksesvolle integrasie in die gesondheidsorg-waardeketting (VC) te behaal. Hierdie studie ondersoek innovasie-platforms (IP) as 'n benadering om sommige van die tekortkominge van voorheen-geïmplementeerde oplossings aan te spreek. IPs is meganismes wat verskillende rolspelers saam bring om algemene probleme te diagnoseer, geleenthede te identifiseer en maniere te vind om hulle doelwitte beter te bereik.

Die voorgestelde waarde van IPs is die vermoë om 'n toegangspoort aan alle VC-rolspelers van gesondheidsorg te bied om by te dra tot die ontwikkeling van 'n verbeterde gesondheidsorgstelsel wat die breër samelewing en ekonomie bevoordeel. Die IP-perspektief skep 'n geleentheid vir die ontwikkeling van toepaslike innovasies wat effektief oor die sektor geïmplementeer kan word.

Daar is egter gebrek aan bewyse van toepaslike metodes met betrekking tot die ontwikkeling en uitvoering van gesondheidsorg-IPs in SA. Hierdie studie gaan voort om 'n raamwerk en 'n instrument te ontwikkel wat 'n riglyn bied vir die ontwikkeling van IPs wat daarop gemik is om uitdagings binne gesondheidsorg-VCs op te los. Dit maak voorsiening vir die integrasie en oorweging van menings van alle VC-rolspelers tydens besluitneming en beleidsontwikkeling.

Die navorsing is voltooi deur 'n konstruktivistiese perspektief wat daarop gemik is om die verskynsels beter te verstaan. 'n Sistematiese oorsig is voltooi om die kern-IP-konsepte uit bestaande literatuur te identifiseer. Die studie het 24 tipes IP geïdentifiseer en bied 'n kort oorsig van hierdie platforms. Hierdie tesis identifiseer en ondersoek twee hoof tendense, sewe IP-dimensies en 40 kern IP-konsepte. Die voorkoms van hierdie konsepte verskil met betrekking tot die tipe IP wat ondersoek word.

Deur die beginsels van Jabareen se konseptuele raamwerk-analise te volg, wat bestaan uit agt fases, is die raamwerk iteratief ontwikkel deur die IP-konsepte te sintetiseer met die belangrikste tendense in die letterkunde, die voorlopige raamwerk te valideer en die validerings-bevindings in die finale instrument ontwerp in te sluit.

Die raamwerk asook die geïdentifiseerde literatuurareas is getoets om die gebrek aan empiriese navorsing in hierdie veld aan te spreek. Dit is gedoen deur 'n gemengde metodologie-benadering wat uit vier vorderingsfases bestaan: (1) kwalitatiewe semi-gestruktureerde onderhoude, (2) 'n kwantitatiewe raamwerk-gradering oefening, (3) 'n kwalitatiewe gevallestudie en (4) kwalitatiewe gevallestudie ondersteunings-onderhoude.

Ten slotte word die gevalideerde raamwerk en ondersteunende tipologieë saamgestel om 'n IP-bestuursinstrument te skep wat die volgende moontlik maak: 1) die bou van IPs; 2) die fasilitering van verbetering pogings van bestaande platforms; en 3) die verskaffing van instrumente om algemene platform-uitdagings aan te spreek. Dit is nie 'n padkaart om IPs suksesvol te ontwikkel nie, maar dit verskaf riglyne oor hoe om wisselwerking in en met IPs te bevorder. Die instrument neem 'n VC-benadering aan en stel die ontwikkeling van IPs in staat wat in lyn is met die WHO se boustone vir 'n gesondheidstelsel.

Die unieke bydrae wat hierdie studie bied, is die instrument se nuutheid. Die sistematiese benadering wat gevolg word, maak voorsiening vir toekomstige ontwikkeling en uitbreiding. Die resultate dui op 'n positiewe reaksie, maar verdere studie word benodig met die implementering daarvan, 'n opvolgverslag van die vordering van die instrument tydens die implementering daarvan en die kritiese probleme wat hieruit voortspruit.

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It has been said that a river cuts through a rock not because of its power, but because of its persistence.

I would like to dedicate this project to my parents, Johan and Liana Marais, who continue to inspire me and without whom I would not be the person I am today. Thank you for providing me with a perspective on life that focuses on seeing opportunities when the rest of the world sees a dead-end. I will always cherish that.

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“Chance favours only the prepared mind”

~ Louis Pasteur

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LIST OF ACRONYMS AND ABBREVIATIONS

| | |
|------|--------------------------------------|
| BoP | Base of the Pyramid |
| CFA | Conceptual Framework Analysis |
| DHS | District Health System |
| GSH | Groote Schuur Hospital |
| GPS | Groote Schuur Performance System |
| GT | Grounded Theory |
| HCW | Healthcare Worker |
| ICT | Information Communication Technology |
| IP | Innovation Platform |
| IS | Innovation System |
| I4ID | Innovation for Inclusive Development |
| M&E | Monitoring and Evaluation |
| PH | Primary Healthcare |
| PHS | Public Healthcare System |
| R&D | Research and Development |
| SA | South Africa |
| SSA | Sub-Saharan Africa |
| UCT | University of Cape Town |
| VC | Value Chain |
| WHO | World Health Organisation |

CHAPTER 1 - Introduction

Chapter 1 serves as the introduction to the study by providing a background on the problem landscape as well as by defining the research objectives. The research scope and limitations are discussed along with a brief introduction to the research methodology. The chapter concludes with an overview of the document layout.

| | |
|-----------------------|--|
| Key objectives | Explain the rationale of the research |
| | State the problem to be addressed |
| | Establish the research scope and limitations |
| | Introduce the research methodology |
| | Provide the structure of the document |

1.1 Rationale of research

“If you want to know your past, look into your present conditions. If you want to know your future, look into your present actions.”

~ Buddhist Saying

There is convincing evidence in literature that supports the notion that healthcare systems across the globe are under pressure and are struggling to meet patient needs and demands [1]–[3]. The prevalence of disease is especially high in developing countries [4]–[6]. Controversy exists around what qualifies as an acceptable level of healthcare service delivery as the resources, infrastructure and access to care which is available differs immensely across the globe [7], [8].

According to the World Health Report [9], “Africa has 24% of the [World’s] burden [of disease]¹ but only 3% of health workers commanding less than 1% of world health expenditure.” The devastating effect that the lack of access to basic healthcare has on Africa is not only evident in the reduced life expectancy for Africans (60 years in comparison to 71.4 years for the global population [10]), but also adversely influences the number of people contributing towards the development of the countries’ economy [11].

Thakur *et al.* [12] states that if developing countries aim to escape the cycle of poverty; quality healthcare needs to be achieved. With the upsurge of the population in Africa, forecasted to more than double in the next 40 years, along with the current limited reach that healthcare delivery has, a change in the modern healthcare landscape is necessary [13].

¹ The World Health Organisation (WHO) measures the burden of disease using the disability-adjusted-life-year. This time-based measure combines years of life lost due to premature mortality and years of life lost due to time lived in states of less than full health.

Chapter 1 • Introduction

The public healthcare system (PHS) in South Africa (SA) is predominantly tax funded and partially funded by service fees² [14]. Contrary to this, the private healthcare system is financed through medical aid schemes and privately insured people, governmental subsidiaries and public grants [14].

SA's PHS consists of a countrywide network of care facilities that is encompassed of rural and mobile clinics as well as numerous academic hospitals [14]. Out of the 376 public hospitals in the country, 233 are in rural areas, while 143 are in urban areas. The service offered, within this system ranges from the most basic primary healthcare services to highly developed and advanced technological health services.

People living in rural communities and informal settlements in SA face multiple challenges in their right to receive healthcare services [15]. According to Jobson [16], 2.5 million South Africans need to travel an excess of five kilometres to reach their nearest clinic. With the nearest hospital or clinic being hours away, their ability to receive instant and effective diagnosis and treatment is left impending. Beyond this, the care facilities that are at their disposal are often ill equipped and regularly face medication stock outages [17]. This scenario exhibits the current healthcare disengagements and the catastrophic conditions pertaining to the rural health infrastructure. The system perpetuates inequality in the care provided to citizens, based on their economic situation and geographic location.

Apart from the already discussed challenges, there are numerous factors that hinder the ability of PHSs to meet the continuously changing, diverse and multifaceted healthcare needs and wants of the population [16], [18]. Some of the factors that add to the decline in the quality of PHS services are supply chain constraints, diminished funds as well as limited healthcare delivery channels. Figure 1 lists the most commonly faced challenges as described in literature [16], [19]–[24]. The result of these challenges not being overcome is limited access to preventative care services. This lack of adequate healthcare has far reaching consequences, and is portrayed in Figure 1.

² Within the South African Health System, patients are classified as: 1) full paying patients; 2) subsidised patients; or 3) free services. The National Department of Health has a classification policy according to which the service fees of subsidised patients are determined. This is based on a consideration of individual as well as household income (www.health.gov.za).

Chapter 1 • Introduction

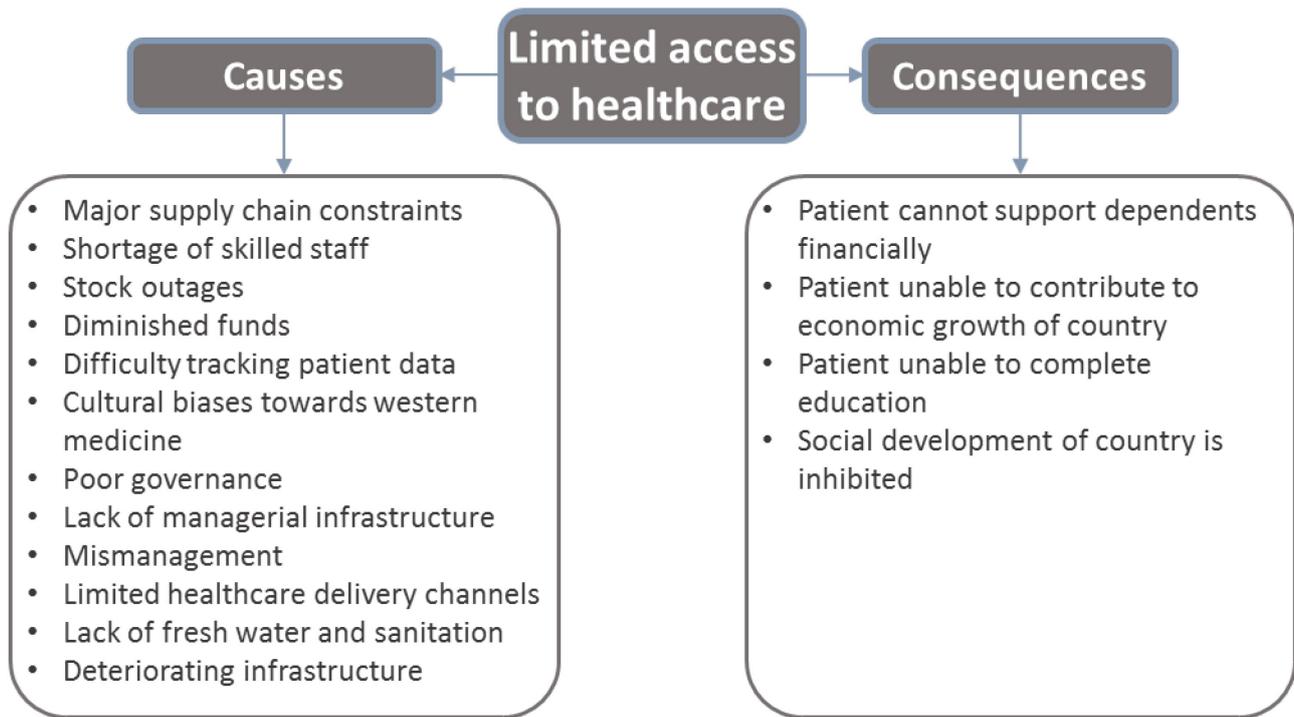


Figure 1: Limited access to healthcare, an overview (Adapted from Jobson; Gray *et al.*; Salicrup and Fedorková; Amann *et al.*; Keeton; World Health Organisation; McIntyre *et al.* [16], [19]–[24])

There are unfortunate conditions that directly affect a single sector, which then ripples down to the rest of the sectors. Healthcare is one such sector [16]. Improved access to healthcare is a challenge that various organisations and institutions continuously address as its impact has far-reaching consequences [25]–[27].

Several traditional problem-solving approaches have been adopted to address the challenges faced within the healthcare system, but unfortunately they have yielded limited success. The adopted approaches are fundamentally top-down in nature. An example of such an approach is the formation of teams of experts that develop plans to address these challenges [28].

In Sub-Saharan Africa (SSA), the interaction between the value chain (VC) participants and the stakeholders in pursuit of solutions to common issues and challenges is often limited. The actors in the VC are focused on the silo in which they operate, disregarding the importance of integration amongst VC actors [16]. This disregard results in a lack of shared responsibility across the VC, making it susceptible to miscommunication and inefficient functioning. This inaction between the actors becomes a major issue.

Essentially, this means that challenges within and across the VC are left unaddressed, regardless of the completion of VC actors' tasks. The aftermath of these overlooked challenges may present themselves externally or internally with respect to the VC.

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Therefore, it can be concluded that an opportunity exists to provide a way to address these inadequacies more competently. This requires a better understanding of the various functioning levels of healthcare as well as an alternative approach to sustainable problem solving. The existing innovative problem solving approaches within healthcare are not implemented effectively across the board. Therefore, a method to aid in bridging the implementation gap is required.

As the importance of the adoption of innovation has increased, the approaches towards innovative problem solving has also evolved. Katz [29] defines innovation as, "the successful generation, development and implementation of new and novel ideas, which introduce new products, processes and/or strategies to a company or enhances the current products, processes and/or strategies leading to commercial success and possible market leadership while creating value for stakeholders, driving economic growth and improving the standards of living." Figure 2 provides a graphical representation of innovation, as defined by Schumpeter [30]. The different types of innovation, introduced in Figure 2, are adopted based on the resources available and the desired objective.

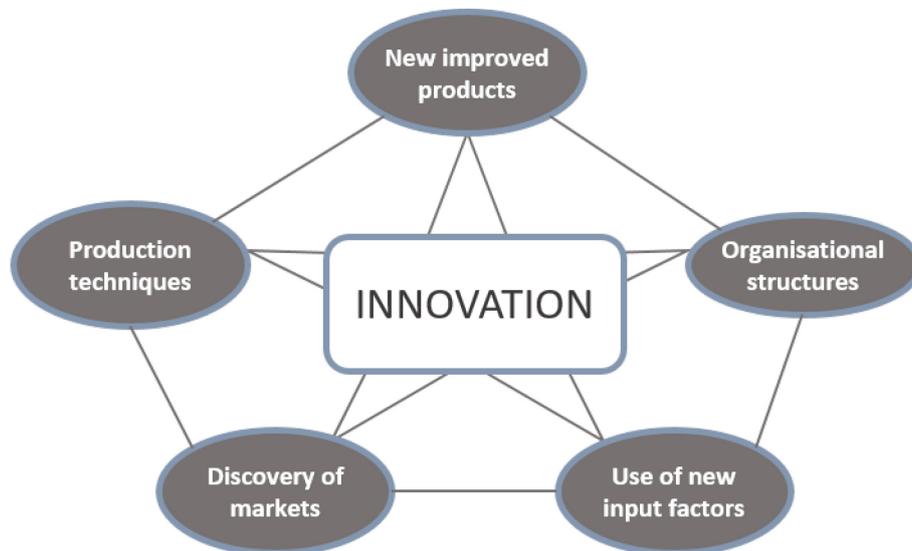


Figure 2: Definition of innovation (Schumpeter [30])

The drivers, benefits and consequences of innovation gain traction as advancements in research have led to change in areas that once seemed unassailable [31]. According to Kuenne *et al.* [32], the healthcare sector is rich in innovation in treatments and drugs, chronic disease management as well as in health systems. Omachonu and Einspruch [33] explain that innovation is critical to enhance the current quality of care provided, given the labour shortages and the need to respond to a more informed and demanding end-user [34].

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An innovation system (IS) is defined as a broad network of dynamically linked actors whose primary focus is on developing and introducing new processes, products and forms of organisation [35]. These networks consider the institutional context, policies and additional factors that may influence the innovation's behaviour as well as its performance [36].

Innovations are not necessarily always inclusive and poor people are often excluded from innovations. This negatively influences the rate of adoption of such innovations. It has been concluded that traditional models of healthcare innovation in which individual departments attempt to introduce innovations separately are not effective [37]. Berwick [38] argues that although the healthcare sector is constantly characterised by innovations, the lack of dissemination of these innovations from one location to another is a major challenge. A new approach to the development and diffusion of innovation is therefore required. Such an approach will be founded on an innovation model that embraces marginalised groups and provides them with new entry pathways into the IS [39].

Innovation for inclusive development (I4ID) includes stakeholders from different sectors and across various levels. It leverages the diversity in stakeholder capacity towards the development of innovation that addresses the needs of the marginalised [35], [40], [41]. The development of linkages amongst this new constellation of actors leads to the advancement of solutions that raise the standard of living and economically benefits a wide range of actors across a VC [42].

Innovation platforms (IP) introduce a way to operationalise IS approaches towards I4ID. IPs are adopted as the new lenses of strategy and addresses the lack of informal demand-side actors and intermediaries in the traditional IS approaches [39].

Homann-Kee Tui *et al.* [43] defines an IP as a forum for shared learning, collaborative planning, scalable action and change. IPs are mechanisms employed in an attempt to pull together stakeholders from different backgrounds driven to address an issue of common interest [35], [44].

IPs are categorised as multi-stakeholder processes because they fundamentally drive the participatory involvement of stakeholders in the decision-making process in iterative steps. The stakeholders come together to diagnose problems, identify opportunities and to find ways to attain the goals. IPs develop an environment that is conducive to interaction amongst actors which in turn leads to knowledge sharing and co-creation. This allows the intended beneficiaries to be included throughout the development of a solution [45].

The application of IPs in the healthcare context is still relatively poorly understood within a developing country context. The extant literature predominantly pertains to applications within more developed countries [8]. The hurdles that arise in the process of adoption of IPs are to be addressed, if their full potential is to be reached [8]. Beyond the barriers to adoption, the context in which the IPs are to function present their own set of challenges.

1.2 Research problem statement and research objectives

“We cannot solve our problems with the same thinking we used when we created them.”

~ Albert Einstein

1.2.1 PROBLEM STATEMENT

The key to unlocking the potential capacity of citizens to contribute to the social and economic well-being of society, is a healthy community [19]. Healthcare in SA faces various challenges, including a growing patient load and limited resources (e.g. funding, staff, equipment and bed space). Patients are required to spend many hours waiting for medical care, whether it's to see a healthcare professional, for special investigations or to receive medication [46].

The tools that are currently employed to manage access to healthcare have failed to implement scalable solutions to address healthcare challenges. To address the lack of access to healthcare in Africa, a new approach to the adoption of innovation across the VC is requisite. This calls for actors to abandon fragmented approaches to problem solving and to adopt an approach of inclusive coalitions [19].

The goal of IPs implies a shift away from the traditional linear approaches of problem solving to include the additional complexities of the interrelatedness amongst VC actors. The desired approach should allow for collaborative investigation that draws on the expertise from a wide range of actors, including non-traditional actors. To create an open dialogue that promotes transparency and builds trust, the existing silos within the healthcare sector must be broken down.

Currently, there is a gap in the literature regarding the formation and functioning of IPs and their capabilities in improving the integration amongst VC actors, especially in the healthcare sector. The conceptual framework is developed to review areas of practice and to provide design guidelines that will facilitate improved problem solving in the healthcare domain.

1.2.2 RESEARCH OBJECTIVES

This section highlights the crucial questions pertaining to the research study and in doing so identifies the significance of the study. The field of healthcare IPs lack empirical research and is under conceptualised. This study aims to add to the body of knowledge (BOK) of IPs by delving into its application within the healthcare system as well as addressing the role of IPs in the integration of the VC actors.

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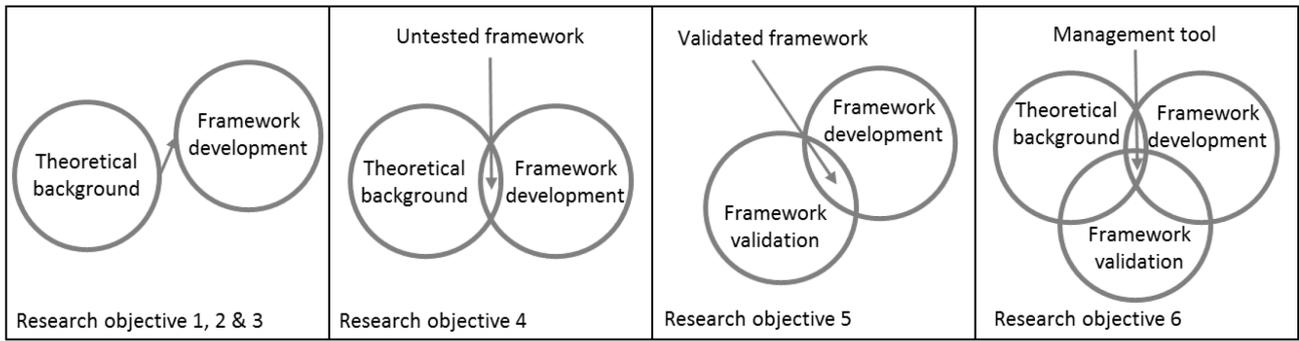


Figure 3: Approach to achieve research objectives

Figure 3 provides a graphical representation of the approach adopted so as to achieve the research objectives listed in Table 1. The thesis consists of three spheres namely: 1) theoretical background; 2) framework development; and 3) validation through interviews with industry practitioners and field experts, and a practical case study analysis. The culmination of these spheres leads to the development of the management tool. The theoretical background is satisfied by the literature that is discussed in Chapter 3, as well as the systematic literature review completed in Chapter 4. The interviews aim to validate the theoretical findings as they pertain to IPs at different levels of functioning as well as providing feedback on the proposed conceptual framework, developed in Chapter 5. The case study is pursued in partnership with Groote Schuur Hospital’s (GSH) Innovation Hub in an attempt to validate the final conceptual framework. The management tool presented in Chapter 7 encompasses the findings from the preceding chapters.

Table 1: Research objectives

| | | |
|--------------------|--|-----------|
| Objective 1 | Determine the current state of the healthcare VC and the challenges faced within healthcare. | Chapter 3 |
| Objective 2 | Form an understanding of the role of IPs as it pertains to healthcare. | Chapter 3 |
| Objective 3 | Identify the core concepts and processes upon which IPs are developed and operate. | Chapter 4 |
| Objective 4 | Develop the conceptual framework. | Chapter 5 |
| Objective 5 | Validate the conceptual framework. | Chapter 6 |
| Objective 6 | Develop a management tool from the validated framework. | Chapter 7 |

The key research questions are qualitative in nature and focuses on theories and conceptual models.

The following questions may aid in the process towards reaching the discussed objectives:

- What are the different functioning types of IPs?
- What are the roles and activities played by the actors and how is the engagement and continued participation ensured on the platform?

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- What are the core concepts and processes required for the formation and functioning of successful IPs in healthcare?
- What mechanisms or tools are available to assist during the formation and functioning of the IPs?

1.3 Theory and literature analysis

The preliminary literature review helps to demarcate the field of study by breaking down the research question. To form a foundation of knowledge regarding the problem at hand, three fields of study are introduced namely: 1) healthcare; 2) VCs; and 3) IPs.

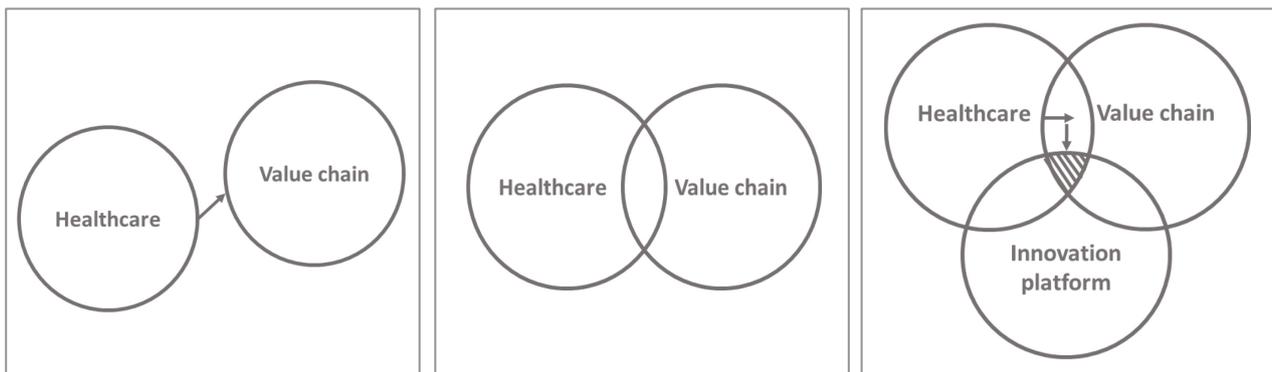


Figure 4: Overview of required literature

Figure 4 is a graphical representation of the proposed literature analysis. The scope of the project is narrowed down to forming a basic understanding of the healthcare challenges in SA. The focus of the investigation then gradually shifts onto identifying the integral parts that healthcare VCs are composed of. Finally, the application of the field of IPs within the healthcare context is considered. Chapter 3 further elaborates on these three fields of study as briefly unpacked below.

1.3.1 HEALTHCARE CHALLENGES IN SOUTH AFRICA

There are various factors to consider when assessing the growing problem of access to healthcare. The limiting factors may range from lack of transport and poverty to poor quality care that often leads to the formation of long waiting lines [12], [19], [47]. In some cases patients are too ill to travel while many patients pass away due to the lack of access to the required basic care [17]. The development and implementation of new technologies to overcome the issues faced within informal settlements are often stalled as a result of inadequate infrastructure [12].

Healthcare interventions require further exploration with respect to the direct impact that they have on healthcare institutions and actors. To overcome the healthcare challenges faced, the root cause of the challenges needs to be identified and fully understood. The various parties involved must be considered and the necessary policies must be put into place to ensure cooperation. The network amongst health institutions must be harnessed if the true value of the proposed interventions are to be realised [48].

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Some of the benefits that may arise from investing into improved healthcare includes, but is not limited to, an increase in opportunities for job creation in rural areas, improved patient and staff experience as well as a decrease in the amount of paperwork involved [16]. The provision of and access to healthcare has economic, social and political implications, but above all, it remains a human right [49].

1.3.2 HEALTHCARE VALUE CHAINS

The term VC was popularised by Michael Porter [50]. VC refers to the production process in its entirety, from the input of raw materials through to the final product output [51]. It is suggested that each linkage in the process adds value as the product proceeds to the end-user.

Robert Burns [52] stated that, the VC approach has yet to prove successful in the healthcare domain. Burns [52] noted that healthcare VCs are often victim to the lack of coordination, information and communication. The cost/value at each link is difficult to estimate and knowledge sharing along the VC is limited [51].

An understanding of the presence, role, nature, capabilities and competences of the actors within the VC is required to identify the major challenges in the healthcare domain. The dynamic processes across the VC and the relationships amongst the actors provides a foundation from which healthcare VCs can be analysed.

1.3.3 INNOVATION PLATFORMS

“Innovation is the art of transforming knowledge into progress and prosperity.”

~ L. Rafael Reif

There is a global shift towards the adoption of a platform approach to problem solving. This shift is evident in organisations' decision to move towards structures that are more inclusive and multi-disciplinary in nature [16].

IPs provide an infrastructure to stimulate innovation and stakeholder interaction towards the development of sustainable solutions to common problems. Emphasis is placed on developing solutions that are realistic, timely and context appropriate [49]. This is achieved through the inclusion of multiple perspectives across the VC. Collaboration during innovation projects results in the co-production of knowledge and increased capabilities which may address both the economic as well as the societal challenges.

Although literature has provided evidence that IPs have the ability to support innovation, the process behind its development and functioning still requires investigation [53]–[55].

1.4 Research methodology

A combination of theory development, framework building and validation is adopted in this research study. The problem landscape is articulated in Chapter 1 in order to form the foundation of the study. A systematic review is completed to identify and extract the concepts that form the basis for the development of IPs. Jabareen's conceptual framework analysis (CFA), which is a grounded theory (GT) technique, is adopted towards the development of a framework [56]. A reductionist approach is adopted towards the construction of the management tool.

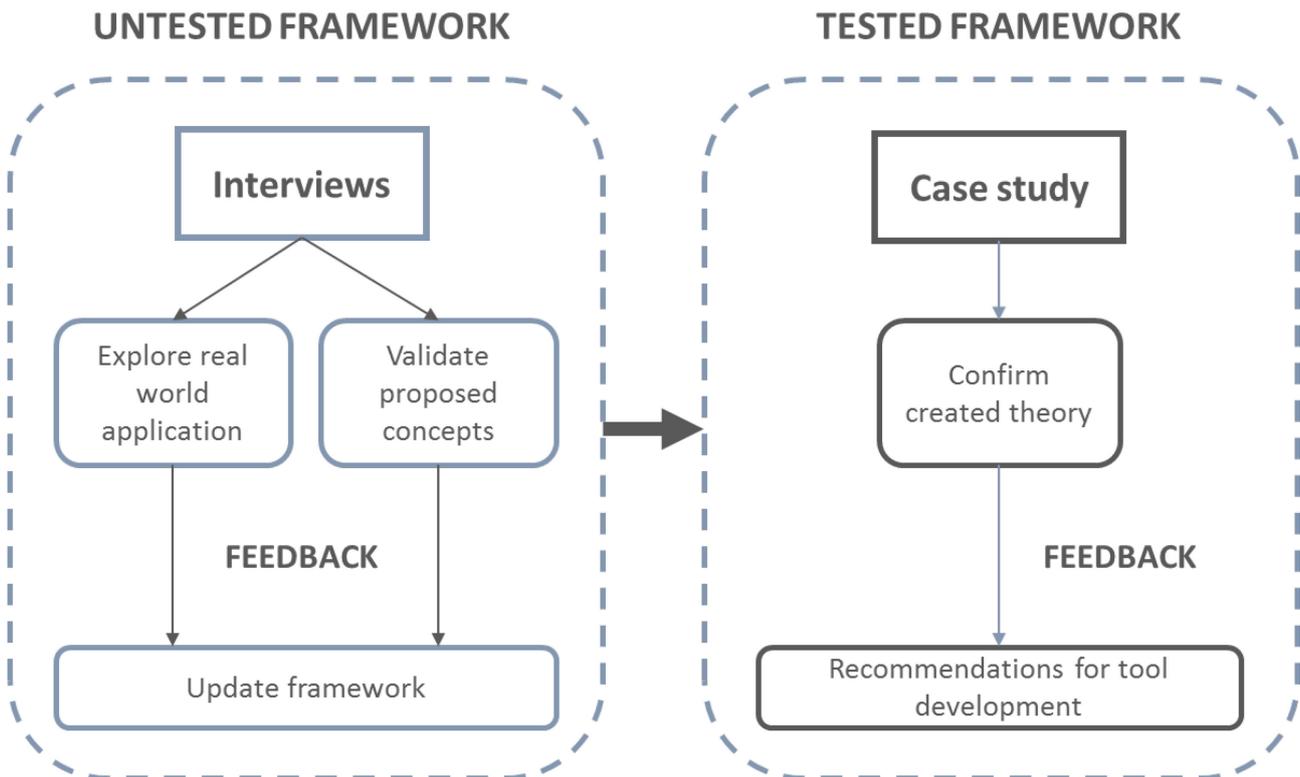


Figure 5: Validation process for framework and management tool

Figure 5 explains the logic of the validation process that is employed in this study. A series of interviews are conducted for exploration and validation purposes. The proposed framework is adapted taking into account the feedback from the interviews to provide a more realistic and useful framework. The framework is then transformed with the addition of auxiliary functions and tools. The improved framework is tested through its application on a case study to confirm the theory and the framework's effectiveness. The feedback from this process is pivotal in the development of the management tool.

Chapter 2 provides a more detailed research methodology in which the GT methodology is described as well as the motivation behind its adoption. The tools, which are used during the study and the stage during which they are used, is also discussed in more depth in Chapter 2.

1.5 Research scope and limitations

Figure 4, in Section 1.3, is indicative of the scope of the project as focus is placed on healthcare, VCs and IPs. The rationale for this approach is further explored in Chapter 3.

The systematic review, completed in Chapter 4, introduces limitations to the study through the inclusion criteria that is applied during the data collection stage. The inclusion criteria ensures that the literature that is included in the study is within the scope of the study in terms of its language and area of application.

An IP management tool is developed from the conceptual framework presented in Chapter 5. The application of this tool is limited as it is not applied practically and will not undergo a series of iterations towards improvement.

1.5.1 DELIMITATIONS

- The research focusses on the application of IPs in healthcare;
- the application focus is placed on SA, but the literature that is consulted is from diverse backgrounds;
- it will propose a framework that will aid in the development of an IP;
- the framework will guide users to customise the design of the IP according to their needs and the resources at their avail; and
- it provides a potential pathway into new problem solving approaches within healthcare.

1.5.2 LIMITATIONS

- The research will not address all of the challenges faced within healthcare VCs, but rather provide a solution to the problem of integration across the VC;
- the systematic review provides great insight into IPs, but it aims to answer a set of specific questions only;
- it will only be focused on investigating healthcare VCs, based on the requirements identified through the adopted literature approach;
- the framework is conceptual and requires additional research regarding the specific environment prior to its use;
- this study will not provide detailed research into monitoring and evaluation (M&E) tools that are used in the field of IS;
- the management tool will not be implemented in the development of an IP; and
- the execution and operation of the features that form part of the management tool will not be explored.

Chapter 1 • Introduction

1.6 Ethical implication of study

Ethical clearance is required for this study as it involves human participation. There are no significant ethical implications anticipated for this study, but an ethical clearance process was undergone to ensure that all the guidelines on ethical aspects of scholarly and scientific research in accordance to Stellenbosch University is adhered to. The researcher will ensure that any confidential information is not disclosed. The Research Development Division at Stellenbosch University provided ethical clearance for interviews as well as the case study.

The following guidelines were followed to ensure that the ethical aspect of the study is considered at all times:

- The researcher will obtain informed consent from the participants prior to collecting any data.
- The researcher will ensure that participants participate voluntarily and that they know that they do not have to answer any questions that they feel uncomfortable with.
- The researcher will ensure that all collected data is handled confidentially.
- The researcher will at all times remain objective and respect the integrity and dignity of participants.
- The researcher will at all times conduct the study in a transparent manor as well as placing the interests of the participants first.

1.7 Document structure

The layout of this thesis reflects the logic followed during the completion of the study. The author aims to provide the reader with sufficient background information and terminology regarding the field of IPs and its functioning in the healthcare sector. Figure 6 is a graphical representation of the adopted approach to complete the study. The impetus behind each chapter is summarised below.

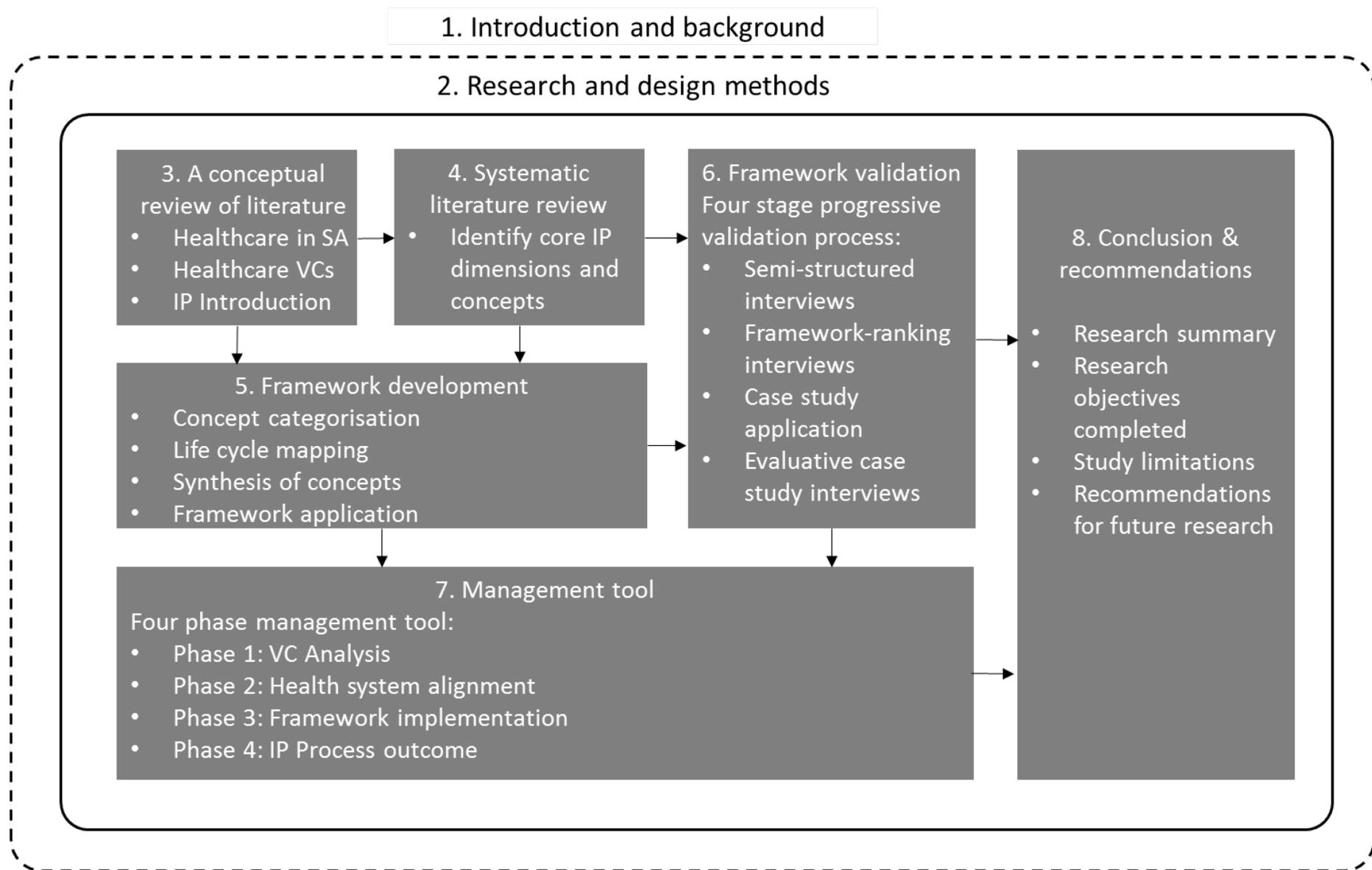


Figure 6: Document layout

Chapter 1 • Introduction

Chapter 1: Introduction

This chapter highlights the need for the project. It shows what the motivation behind the study is as well as highlighting the significance of the study. The multiple aspects of the problem statement and the breakdown of the research objectives are discussed. It aims to provide the reader with a foundation from which the value and importance of the study is understood.

Chapter 2: Research and design methods

This chapter presents the research methodology implemented during the completion of this study. An overview of the systematic literature review approach and CFA is provided here.

Chapter 3: A conceptual review of the literature

Each dimension of the project is investigated and discussed individually in this chapter. This is necessary to understand the distinctiveness of each aspect as well as the interconnectedness thereof.

Chapter 4: Systematic review of innovation platforms

As the chosen vehicle for collaboration towards solving healthcare challenges, the focus of this chapter is on comprehensively defining IPs. To effectively deploy IPs, a clear understanding of the various dimensions required for their establishment and functioning is required. This chapter provides a review of the theory that is central to core concepts woven into the framework in Chapter 5.

Chapter 5: Towards the development of a conceptual framework

This chapter provides an overview of the practical application of Jabareen's CFA. Chapter 5 highlights the conceptual framework developed from the research compiled in Chapter 3 and Chapter 4. The logic adopted towards the development of the framework is discussed, as well as the considerations for the practical implementation of the framework.

Chapter 6: Framework validation

This chapter shows the conceptual framework's progressive four stage validation process. This includes analysis of industry expert interviews and discussing the case study application. It outlines how the specific participants were identified within the project realm as well as the specific themes discussed during the interviews.

Chapter 1 • Introduction

Chapter 7: Management tool

This chapter displays the final validated framework aimed at facilitating the formation and functioning of healthcare IPs. The management tool in which the framework is embedded is assembled in this chapter.

Chapter 8: Conclusion and recommendations

The concluding chapter provides a concise summary of the research completed and the results of the study at hand. The recommendations for future work are discussed and the limitations of the study are noted.

1.8 Chapter 1: Conclusion

This introductory chapter aims to familiarise the reader with the research study and the proposed approach to the project. The phenomenon of IPs is introduced and its capabilities are briefly referred to. This is followed by highlighting the gap in the literature and listing the objectives that are explored in the remainder of the document. The project scope, limitations, research methodology and ethical implications are also discussed. The chapter is concluded with a description of the structure of the document. The research design and methodologies employed in this study are described in detail in the next chapter.

CHAPTER 2 - Research and design methods

Chapter 1 elucidates the need for empirical evidence on the development of IPs in the healthcare domain. This chapter provides an overview of the methods employed in order to successively develop a conceptual framework and a management tool.

The chapter introduces the GT approach and Jabareen's CFA methodology. It provides a description of how Jabareen's approach is adjusted for the study and how it provides guidance to the process solution.

| | |
|-----------------------|--|
| Key objectives | Introduce and explain GT methodology |
| | Introduce and explain CFA methodology |
| | Discuss the conceptual framework development phases employed during this study |
| | Briefly introduce and explain the systematic literature review process |
| | Discuss tools utilised during the construction of the management tool |

2.1 Research methods

The research outcomes are established by breaking the problem statement down into research questions. To answer the research questions, a thorough understanding of the literature is required. This is supplemented by fieldwork to validate the identified and conceptualised theory. This research study developed a framework and management tool for an empirical study that identifies and explores the guidelines that are required for the implementation and operation of IPs in healthcare. Understanding and documenting the results throughout the process plays a pivotal role in the quality of research that is produced. This iterative process is followed by the dissemination of research findings through publications. Figure 7 provides an overview of the research process.

Chapter 2 • Research and design methods

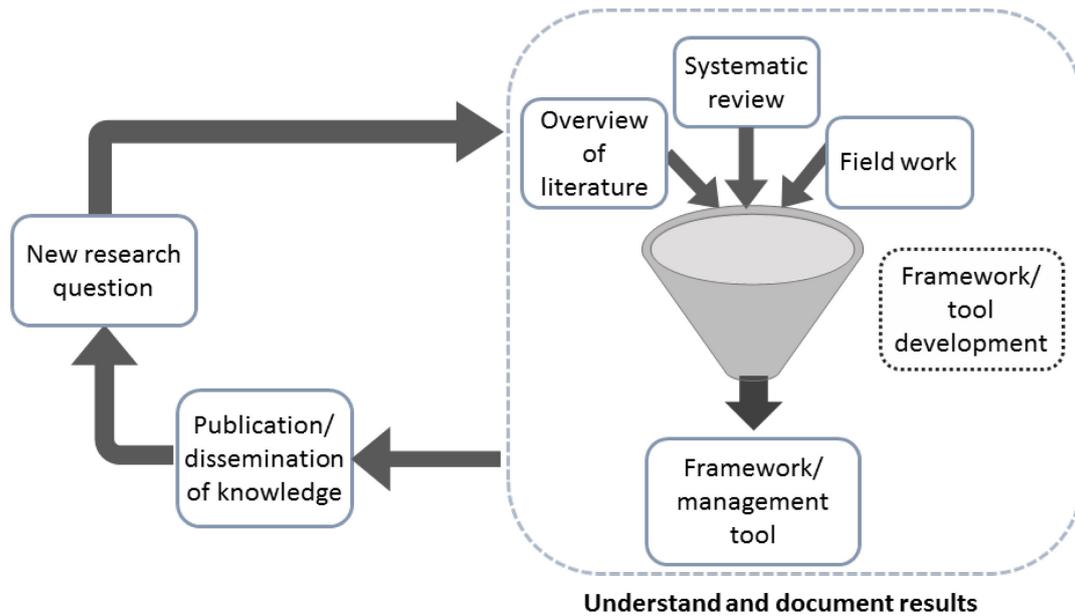


Figure 7: Research process

2.1.1 GROUNDED THEORY METHODOLOGY

Charmaz [57] states that GT methodology is comprised of flexible, yet systematic guidelines towards the collection and analysis of qualitative data to discover and construct theory. Glaser and Strauss [58] first introduced the phenomenon of GT in 1967, and this laid the foundation for Corbin [59] to later expand on this field of study.

As with most qualitative research approaches, a wide array of sources are referred to in an attempt to accumulate relevant data. The GT approach requires all data to be coded in a consistent manner [59]. GT has been hailed as the foundation for all major conceptual framework development [56], [60], [61]. The primary GT method adopted in this study is Jabareen's CFA. It should be noted that the GT approach is used as a guiding principle and that the key methodological focus is on Jabareen's CFA.

Jabareen's CFA provides an interpretive approach to social reality through building on data from multiple disciplines [56]. The CFA is an inductive method that fosters creativity through drawing on the richness and depth of data as opposed to merely declaring a theoretical explanation [56], [62], [63].

A conceptual framework provides 'soft interpretation of intention' rather than the hard facts [64]. The advantages of CFA include the approach's flexibility, its capacity for modification, and its emphasis on understanding a phenomenon instead of prediction [56].

Chapter 2 • Research and design methods

The CFA method provides structured guidelines that assist researchers in conducting qualitative research towards conceptualising new theories or populating frameworks. As literature in the field of healthcare IPs is limited, this methodology is well suited.

2.1.1.1 OVERVIEW OF THE CONCEPTUAL FRAMEWORK ANALYSIS METHOD

Table 2 summarises the eight phases of the CFA methodology and highlights the objectives of each phase. This eight-phase configuration forms the core of the research design discussed in the remainder of this chapter.

Table 2: Overview of conceptual framework analysis method (Adapted from Jabareen [56])

| Phase | Objectives |
|--|---|
| Phase 1: Mapping the selected data sources | <ul style="list-style-type: none"> • Extensive review of multidisciplinary literature • Need for the review identified • Gap in literature identified • Data sources chosen • Search terms defined • IP literature identified • Studies selected through filtering process |
| Phase 2: Extensive reading and categorising of the selected data | <ul style="list-style-type: none"> • Read through the identified studies to gain better understanding • Data categories and empirical aspects identified • Data organised according to categories |
| Phase 3: Identifying and naming concepts | <ul style="list-style-type: none"> • Concepts identified and further developed from extensive reading • Identified concepts are 'coded' • Core principles and processes identified |
| Phase 4: Deconstructing and categorising the concepts | <ul style="list-style-type: none"> • Each concept is deconstructed according to its main attributes, characteristics, assumptions, limitations, distinct perspectives |
| Phase 5: Integrating concepts | <ul style="list-style-type: none"> • Similar concepts are grouped together to form new concepts based on similarities, done iteratively |
| Phase 6: Synthesise concepts into a theoretical framework | <ul style="list-style-type: none"> • Develop a conceptual framework through an iterative process building on integrated concepts |
| Phase 7: Validate framework | <ul style="list-style-type: none"> • Include quantitative as well as qualitative elements for validation • Conduct fieldwork based on questions pertaining to the developed framework • Validate the framework through feedback |

Chapter 2 • Research and design methods

| Phase | Objectives |
|----------------------------|--|
| Phase 8: Rethink framework | <ul style="list-style-type: none"> • Make necessary adjustments to the framework based on feedback from fieldwork |

2.2 Research approach

There are three common approaches to conduct research: 1) qualitative; 2) quantitative; and 3) mixed methods. Due to the complexity of this study, a mixed approach is adopted in which both quantitative and qualitative elements are included. The completed qualitative research refers to fieldwork in the form of semi-structured interviews, a case study application and framework-ranking interviews. The quantitative research refers to certain aspects of the systematic review, the framework-concept ranking completed during the interviews and the analysis of the respective results.

2.2.1 QUALITATIVE RESEARCH

Research following a qualitative approach is primarily exploratory and seeks to understand the underlying motivation of a phenomenon within the particular context it operates in [59]. Qualitative research often focuses on a limited number of respondents who have purposefully been selected to participate because it is believed that they have in-depth knowledge of an area that lacks literature. As such, qualitative research generally investigates: 1) the local knowledge and understanding of a given issue; 2) people's experiences; and 3) social processes and contextual factors [51]. Qualitative research is often foundational to quantitative studies as it provides insights into problems and seeks to identify inherent patterns [54]. Data collection methods in the qualitative research space includes individual interviews, group discussions as well as multi-case studies that involve analysis and observations amongst others [49].

2.2.2 QUANTITATIVE RESEARCH

Figure 8 graphically displays the quantitative research process towards the quantification of the research problem. To generalise results from a population sample, the quantification of attitudes, opinions, behaviours and other pre-determined variables is required [65]. The recognition of patterns within research often relies on measureable data. The collection of measurable data is dependent on structured data collection methods such as paper surveys, online surveys, face-to-face surveys, telephone surveys as well as systematic observations amongst others [66]. CHAPTER 6 further elucidates the details of the fieldwork methodology employed in this study.

Chapter 2 • Research and design methods

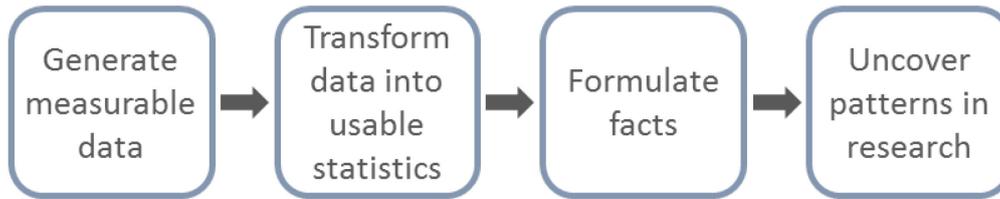


Figure 8: Quantitative research process

2.3 Research design

This section discusses the CFA process as presented in this document. Four distinct parts to the process are identified and the remainder of the chapter describes the steps followed during each part. Figure 9 provides an overview of the research design structure followed and it indicates where in the document each phase, or part thereof, is addressed.

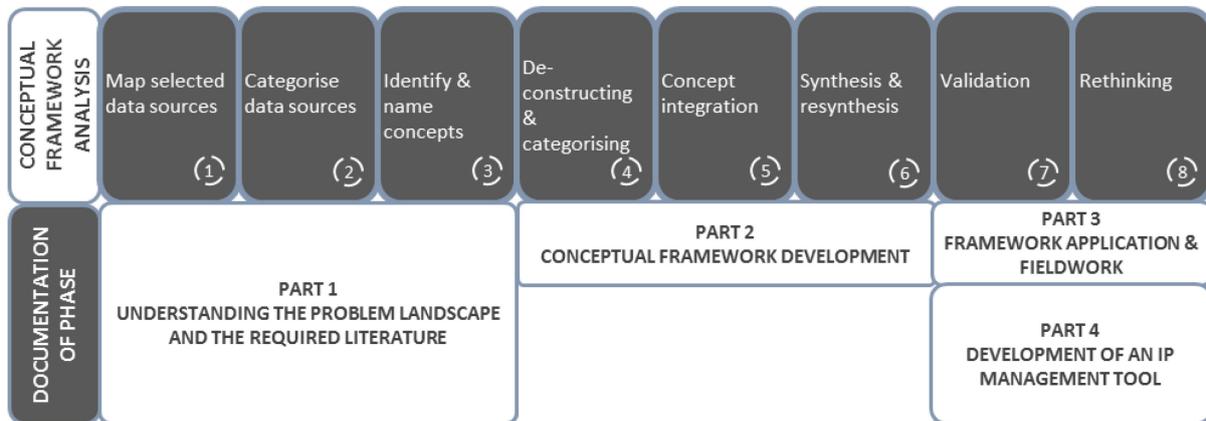


Figure 9: Research design structure

2.3.1 PART 1 UNDERSTANDING THE PROBLEM LANDSCAPE AND THE REQUIRED LITERATURE

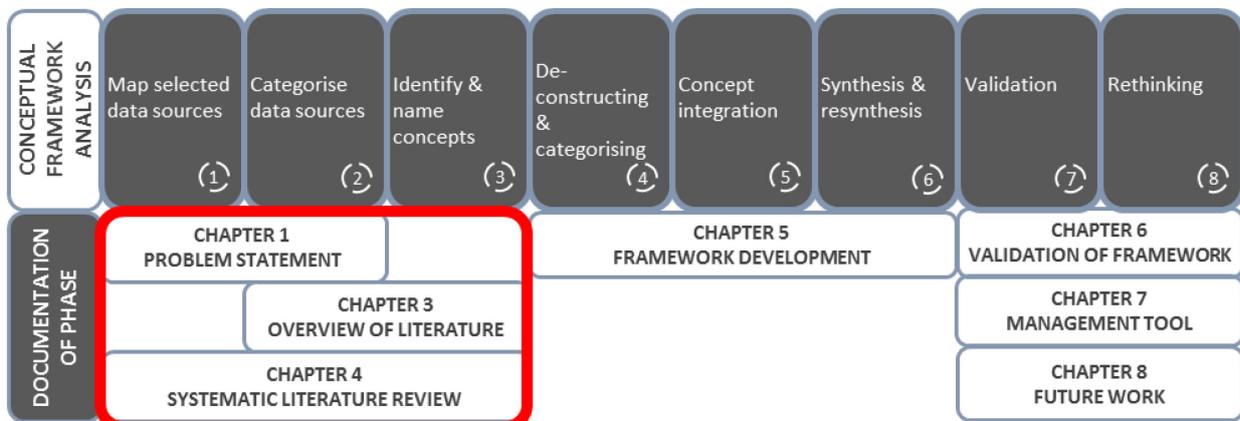


Figure 10: Research design part 1

During Part 1 of the research design, the problem landscape is investigated to form the problem statement and to determine the respective research questions. Literature on

Chapter 2 • Research and design methods

healthcare VCs is consulted to form a better understanding of the study domain and IP literature is analysed to identify IP concepts and the different types of IPs that exist. Figure 10 indicates which chapters contribute towards part 1 of the research design process.

Chapter 1: The rationale of the research, the problem statement as well as the research questions and the project scope are discussed in Chapter 1. This lays the foundation for the remainder of the systematic review in terms of the inclusion criteria of the proposed studies.

Chapter 2: This chapter discusses the adopted research methodology and the research design. The tools used in the framework development are described and the motivation behind their selection is explained. The importance of each CFA phase is also highlighted.

Chapter 3: Chapter 3 provides a comprehensive overview of the theory by addressing the concerns identified in the problem statement. This review is a useful tool for discovering central themes across wide-ranging areas, as identified through the research questions. Various BOK are considered to ensure that a complete picture of the current literature is gained. This allows for a better understanding of the various concepts and categories that are coded during the review process.

Chapter 4: The systematic review process that is conducted, along with the results, are discussed in Chapter 4. The aim of the systematic review is to explore the formation and functioning of IPs by investigating IPs' core concepts and processes. The systematic literature review focuses on a spectrum of multidisciplinary literature relating to IPs.

The systematic literature review process is composed of Phase 1-3 of the CFA process. Systematic literature reviews are completed in an effort to answer predefined research questions by collecting and analysing specific documented literature [67]. Petticrew and Roberts [62], highlight that a key reason to complete a systematic literature review, is based on its capability to lead to the identification of gaps in the literature where insufficient research has been done and opportunities for future work can be explored.

In order to gain a better understanding of IPs, an extensive review of empirical data and practices is completed [68]. Patterns within the information emerge during this part of the process. Atlas.ti³, a qualitative data analysis and research software, is used to review the selected studies. Atlas.ti enables the reviewer to extract specific data. Through coding the studies, the reviewer has the ability to recognise trends within the studies and to form a robust understanding of the underlying foundational concepts of the field of IPs.

³ www.atlasti.com

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Coding refers to the assignment of a specific code or category component to a piece of literature within a publication.

Chapter 4 provides a more in-depth description of the systematic review process, including the inclusion criteria, the observations and the analysis of the results.

2.3.2 PART 2 CONCEPTUAL FRAMEWORK DEVELOPMENT

Part 2 of the process has the framework development at its core, Figure 11. The framework is constructed from the results of Part 1. Each concept is deconstructed to identify its main attributes, assumptions, characteristics and role. This is done through the organisation and categorisation of the concepts according to their features and epistemological, ontological, and methodological role [56].

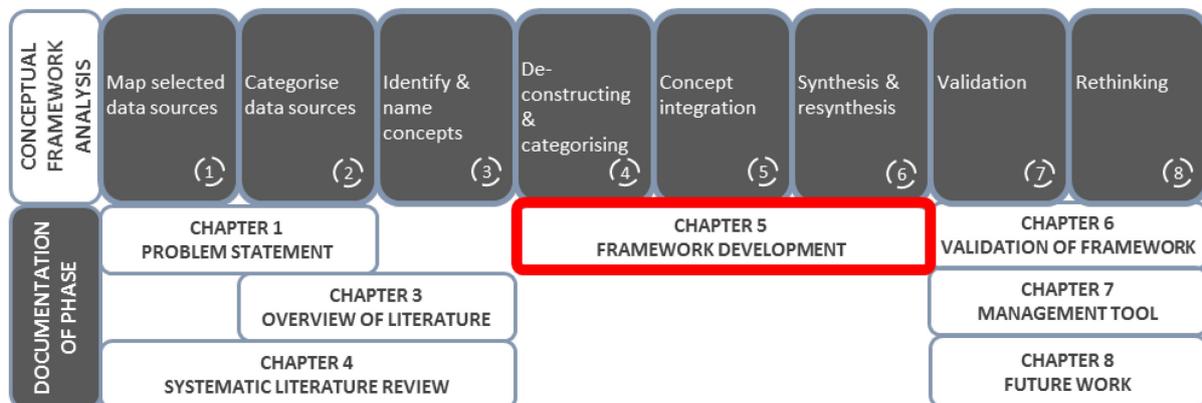


Figure 11: Research design part 2

Concepts that have similarities or supplement one another to form a new concept are grouped together. Based on the results of the systematic literature review, Chapter 4, the concepts are categorised according to 1) core capabilities and 2) structural components. This process substantially reduces the number of concepts to include in the framework. The concepts are then mapped based on the life cycle phase, which they are most prevalent in, either formation or functioning. This is followed by an iterative process in which concepts are synthesised and resynthesised until a logical theoretical framework is recognised. The links between the core capabilities and the structural components, with reference to the formation and functioning of a platform are established. Chapter 5 provides more insight into the deduction of the concepts.

2.3.3 PART 3 FRAMEWORK APPLICATION & FIELDWORK

In part 3 of the research design process the outcomes and applicability of the framework is tested through fieldwork, as shown in Figure 12. It provides a space in which the framework is validated through a mixed methods approach.

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A more detailed process of the conducted fieldwork, reported results and the interpretation and analysis of the results is documented in Chapter 6.

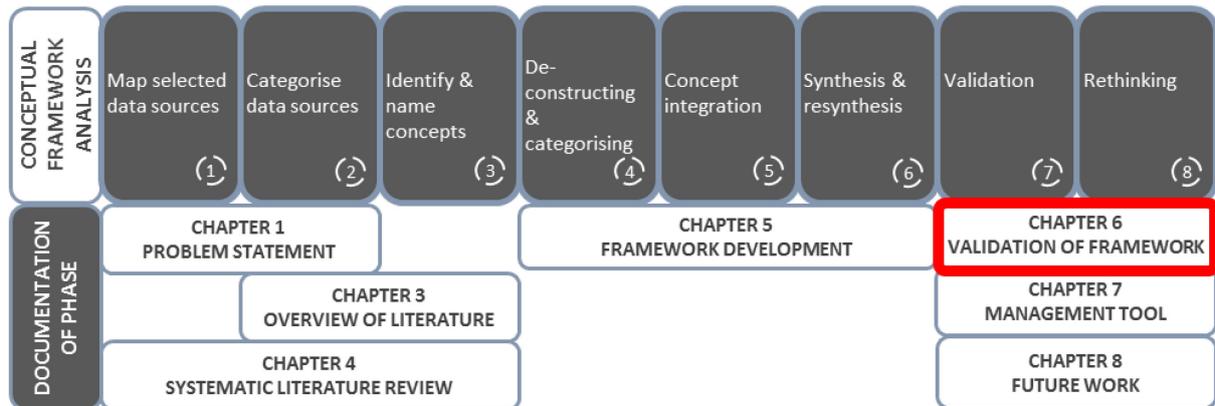


Figure 12: Research design part 3

New concepts regarding IPs and their setup and operation are identified through the fieldwork. The necessary adjustments are made to the original framework based on new insights, recommendations and literature obtained during the validation process. These concepts are synthesised into the final conceptual framework.

2.3.4 PART 4 DEVELOPMENT OF AN IP MANAGEMENT TOOL

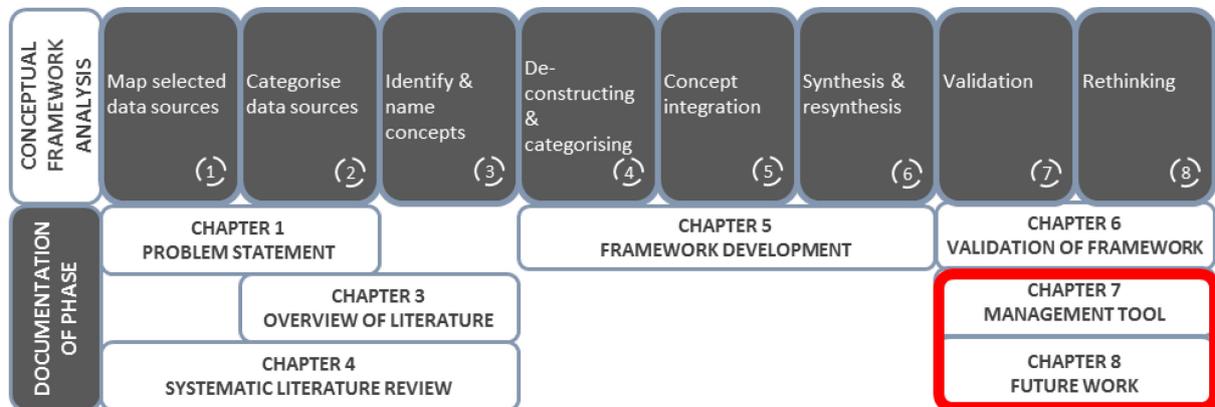


Figure 13: Research design part 4

Part 4 of the research design is focused on the development of the management tool. The management tool is conceptualised from three elements namely: 1) the theoretical literature review; 2) the validated conceptual framework; and 3) the fieldwork feedback. Findings from the various interviews and case study are synthesised with existing theoretical typologies towards the development of an IP management tool found in Chapter 7. The outcome of the management tool is aligned with the World Health Organisation’s (WHO) six building blocks of health systems.

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The future work and recommendations of the study (Chapter 8) addresses the need for continuous revision and improvement of the tool as new literature and opinions emerge.

2.4 Chapter 2: Conclusion

The research design and research methodology utilised in this study is explained in this chapter. The chapter provides a detailed summary of GT and CFA in an attempt to illustrate the relationship amongst these adopted methodologies together with an introduction to the systematic literature review process. Finally, the design adopted to develop the conceptual framework and management tool is presented. Table 3 provides an overview of each CFA phase which is completed as well as stating the outcome thereof.

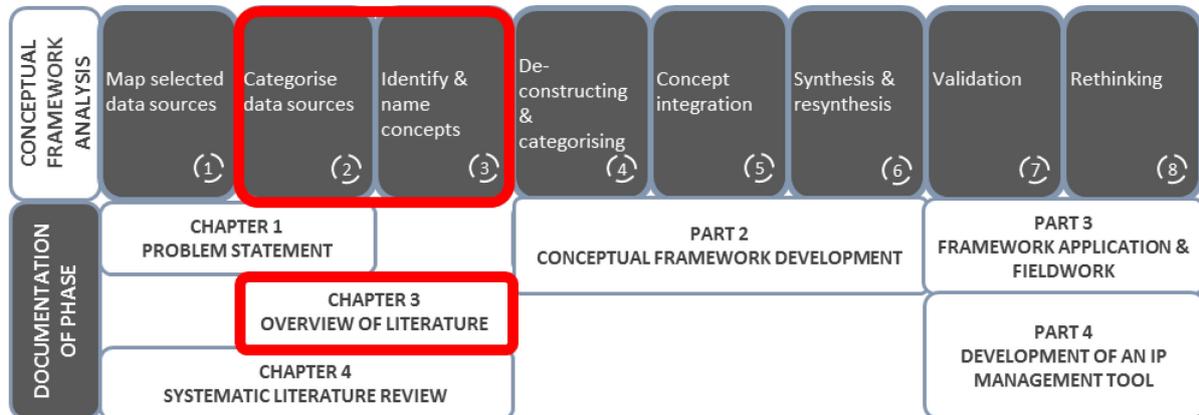
Table 3: Research methodology layout of document

| Phase | Significance of this phase |
|---|---|
| Phase 1: Mapping the selected data sources | CHAPTER 1 |
| | <ul style="list-style-type: none"> • Background to study • The total yield of the combined searches, using the databases and search terms, after duplicates are removed, is over 1 000 references |
| | CHAPTER 4 |
| | <ul style="list-style-type: none"> • Data collection • Forms foundational understanding of phenomenon taking various perspectives into account • Data selection |
| Phase 2: Extensive reading and categorising of the selected data | CHAPTER 1 |
| | <ul style="list-style-type: none"> • Problem statement • Research questions |
| | CHAPTER 2 |
| | <ul style="list-style-type: none"> • Research methodology • Research design |
| | CHAPTER 3 |
| | <ul style="list-style-type: none"> • Healthcare • Value chains • Innovation platforms • Preparation and initiation of systematic review |
| | CHAPTER 4 |
| <ul style="list-style-type: none"> • 44 studies are identified after non-relevant studies are excluded • Ensures effective representation of each discipline • Holistic mapping of data to ensure validity • The coding process is repeated iteratively as the reviewer starts recognising similarities between the concepts that allow for integration | |
| | CHAPTER 3 |
| | <ul style="list-style-type: none"> • Extensive reading provides insight into naming concepts |
| | CHAPTER 4 |

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| Phase | Significance of this phase |
|--|--|
| Phase 3: Identifying and naming concepts | <ul style="list-style-type: none"> • Contradictory and competing concepts often emerge • IP concepts identified • IP types listed • Supporting mechanisms/tools identified |
| Phase 4: Deconstructing and categorising the concepts | <p>CHAPTER 5</p> <ul style="list-style-type: none"> • Complex nature of concepts are considered and this ensures that a holistic understanding of each concept is developed • Core concepts of IP are identified along with enabling activities and barriers to adoption • Concepts are divided into two categories to create the conceptual framework |
| Phase 5: Integrating concepts | <p>CHAPTER 5</p> <ul style="list-style-type: none"> • Number of concepts is reduced to allow for manipulation of manageable number of concepts` • Concepts are integrated based on results and trends from Phase 1 through to Phase 4 • Core concepts and structural components are grouped together |
| Phase 6: Synthesise concepts into a theoretical framework | <p>CHAPTER 5</p> <ul style="list-style-type: none"> • Integrated concepts are synthesised in a logical manner • Necessary data is mapped across the integrated framework |
| Phase 7: Validate framework | <p>CHAPTER 6</p> <ul style="list-style-type: none"> • Validation of the framework to ensure that the framework makes sense to the researcher, practitioners and other scholars • Fieldwork: Interviews, case study application • Resynthesise concepts based on interview feedback <p>CHAPTER 7</p> <ul style="list-style-type: none"> • Assemble the management tool • The final IP management tool <p>CHAPTER 8</p> <ul style="list-style-type: none"> • Limitations of study |
| Phase 8: Rethink framework | <p>CHAPTER 6</p> <ul style="list-style-type: none"> • Necessary adjustments are made to the framework based on feedback <p>CHAPTER 7</p> <ul style="list-style-type: none"> • Culmination of findings from preceding chapters towards tool improvement <p>CHAPTER 8</p> <ul style="list-style-type: none"> • Recommendations for future work |

CHAPTER 3 - A conceptual review of the literature



This chapter embodies an overview of the literature on the different fields of study pertaining to the research objectives discussed in Chapter 1.

The typical progression in the development of a scientific field follows the exploration of the following generic concepts: 1) definitions and typologies; 2) models; and 3) theories [69]. Through investigating existing definitions and typologies of the subject matter, the distinction between phenomena and dimensions of phenomena can be determined. Further investigation into relevant models and theories are documented in Section 3.3.1.2.

The study is positioned within three different strands of literature: 1) healthcare; 2) healthcare VCs; and 3) IPs. The formation of a theoretical base of knowledge for each field is imperative as it removes the ambiguities that exist in the terminology and definitions and it forms part of the development of theory.

Section 3.2 provides insight into the dimensions of IPs and the interplay amongst these dimensions. In the chapters that follow, the integration of these topics are discussed in more detail.

| | |
|-----------------------|---|
| Key objectives | Investigate and discuss the healthcare landscape in SA Provide an overview of healthcare VCs Identify healthcare stakeholders and their respective responsibilities Define IPs Investigate the VC approach to IPs |
|-----------------------|---|

3.1 Understanding the healthcare landscape

Efforts to improve the quality of healthcare can be traced back to 1854 when Florence Nightingale introduced quality improvement documentation. This was done in an attempt to decrease the mortality rate from disease amongst British troops [70]. 1895 to 1955 saw the progression of technology, education and pharmaceuticals in the healthcare industry.

In a South African context, the Health Act that was introduced in 1977 perpetuated the fragmentation with curative services being a provincial responsibility and prevention a local government responsibility. 1980, saw 40% of doctors working in the private sector which increased to over 60% by 1990. By the end of the 1990's, almost 75% of generalist doctors worked in the private sector [71].

In the 1990's the patient perspective emerged, aimed at understanding the constraints faced by the patients, while the scientific input was interdisciplinary. Patients were consulted, but doctors remained as the key sources of knowledge and innovation.

In 2004, the National Health Act legislated for a national health system incorporating public and private sectors and the provision of equitable healthcare services. This led to the establishment of the district health system (DHS) to implement primary healthcare (PH) throughout SA [71].

The 21st century has introduced a new focus on improving patient and staff experience of healthcare services and environments, pertaining to research as well as policy [72]–[74]. Advancements in technology has impacted the rate at which healthcare services are delivered, as well as increasing the potential reach that healthcare workers (HCW) have.

3.1.1 HEALTHCARE IN SOUTH AFRICA

The PHS in SA, like in other nations in Africa, is under immense pressure as it is under-resourced, over-subscribed and carries the burden of disease management and treatment [75]. This is reflected in the government's allocation of approximately 11% of its total budget to public healthcare, exceeding the 5% of the GDP to be invested, as suggested by the WHO. The dependency of the public sector on government aid is largely attributable to the high level of unemployment and poverty [16].

The lack of resources in SA's healthcare system is not only impairing the delivery of care to vulnerable citizens, but it's also placing immense pressure on the available pool of HCWs. To reduce the impact of limited access to care, the root causes undermining timely and effective care need to be investigated.

Chapter 3 • A conceptual view of the literature

Figure 14 shows the spectrum of delivery pathways and application areas that the South African healthcare system encompasses. These gateways to healthcare access aim to improve patient satisfaction through providing high quality care that is easily accessible. There are various metrics according to which patient satisfaction can be measured. In this context value is elucidated as the cost of delivering the health outcomes that influence patient approval [76].

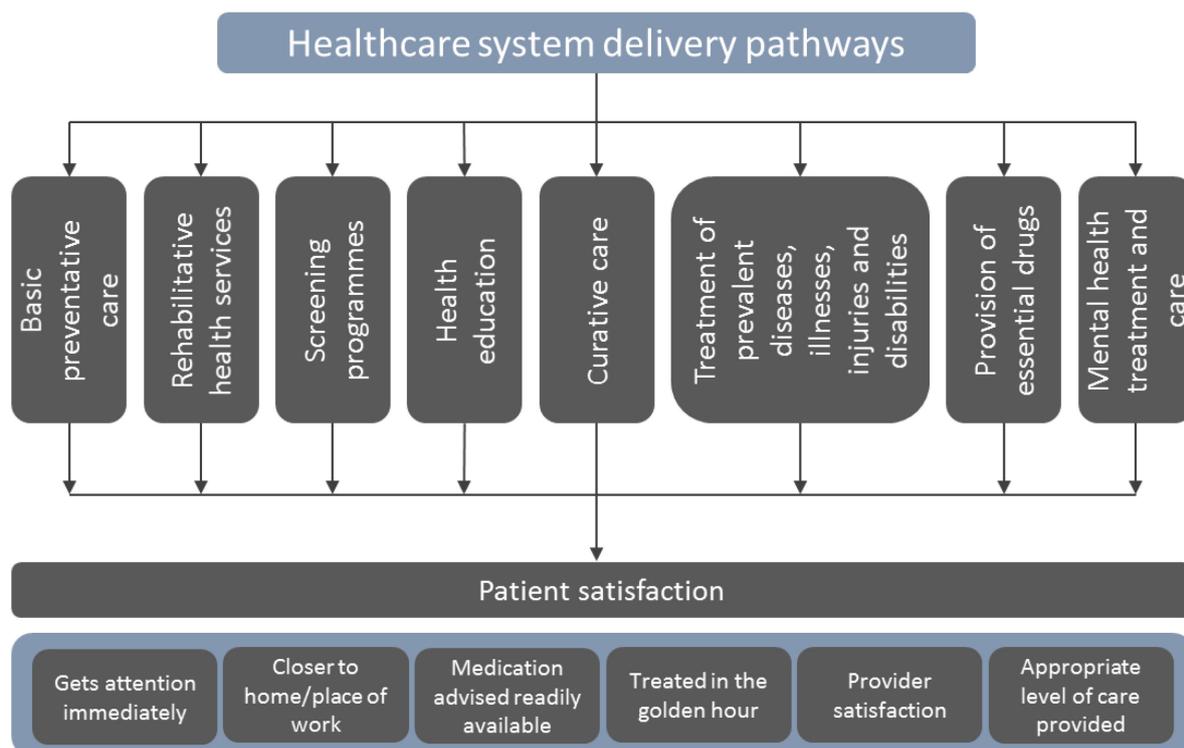


Figure 14: Healthcare delivery pathways (Jobson; Eashwari [16] [76])

Figure 14 elucidates that patient satisfaction is not centred on a single metric but rather considers the combination of various elements. This speaks to the need for integrated action amongst the various delivery pathways.

The lack of visibility across distribution channels contribute towards the inefficiencies experienced within the healthcare infrastructure [16]. To enhance human health, the environment and the economy, a shift away from vertical and fragmented approaches is required. This creates the need for an inclusive coalition of actors that focus on making advances in healthcare that benefit the society in its entirety.

To understand what this inclusive approach must encompass and take into consideration, an exploration of the disconnections between health policies and the implementation thereof, in SA, is required [77].

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During the analysis of the health sector transformation in SA, Rispel [77] identified three fault lines:

- 1) Tolerance of ineptitude as well as leadership, management and governance failures;
- 2) A lack of a fully functional health system, which is the main vehicle for the delivery of PHC (Figure 14); and
- 3) The inability or failure to deal decisively with the health workforce crisis.

These fault lines have far-reaching negative consequences for patients and health professionals alike, which subsequently affects policy implementation. The crisis of ineptitude, ineffective management and failure of leadership and governance across all levels of the health system, is exacerbated by a general lack of accountability [77]. This can be seen by the lack of communication between actors.

Patients are subjected to sub-optimal care and are exposed to negative experiences. Healthcare providers who strive to uphold their professional code of ethics through providing high quality care, face difficulties in the form of an unsupportive management environment, staff shortages and health system deficiencies [77].

The lack of skilled resources can partially be accounted for due to the vacuum created from the public- to the private sector. The private sector of care not only provides medical personnel with better payment and better working conditions, but it also has a better infrastructure to introduce the latest high-tech equipment [78].

The amalgamation of a few critical factors address the identified challenges and give rise to good health. These necessary conditions include food, sanitation, water and education as well as the availability of health services. There is an inherent interconnectedness amongst these components that needs to be addressed holistically if sustainable change is to be achieved [16].

Literature supports the notion that improved population health leads to “sustainable economic growth, social stability, and the realisation of human potential” [19]. This creates the necessary caveat for various untapped healthcare opportunities in SA to be explored. It is however not an easy market to access or expand. Ciriello and Kulatilaka [79] suggest redefining traditional boundaries as to enable the development of new markets and business models.

To ease the financial burden of healthcare on the public system, government has encouraged South Africans to take out private medical cover [78]. In an attempt to guide patients away from hospitals and towards community healthcare centres and public clinics, government only subsidises a portion of the consultation and medication fees at hospitals [80].

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Despite the recognition of improvements within the healthcare space, there is still limited understanding regarding the approaches that can be used to combat inefficiencies [12]. This study aims to ameliorate the standard of care experienced through identifying health service priorities and implementing effective delivery strategies.

Improvements with regards to the functioning of the healthcare system will translate into enhancements in terms of the system's ability to respond to emerging and reemerging infectious diseases [81]. To this end, Stoltz and Wolvaardt [81] highlights the need for better integration between PHSs and private healthcare systems.

3.1.2 APPROACHES TO SOLVING THE PROBLEM

The available approaches to healthcare research predominantly follow a linear approach in which new knowledge and technology is created by experts and transferred to end users. This traditional approach assumes that expert knowledge, which is pushed down the chain, will be adopted. The lack of acceptance of these interventions is not unique to SA. The absence of appropriate problem solving techniques within healthcare is a ubiquitous challenge across the globe [82].

Today, the implementation and delivery of solutions to problems within healthcare in SA is guided by the Health Strategic Framework (HSF) and executed through the DHS. The HSF concentrates on the delivery of crucial PH services. Some of the ventures included in the HSF are improved mobilisation and management of human and financial resources, augmenting communication amongst health system users and providers, improved quality of care, introducing legislative transformation and solidifying co-operation amongst global partners [16].

Some of the innovation avenues within healthcare that have been explored, include new treatment and drug development, hospital systems optimisation and new approaches to disease management [18].

Leadbeater [83] reports that present-day approaches to healthcare reform are reaching their limits, as prominent issues within healthcare are not sufficiently addressed by traditional services. There is an opportunity to spread the knowledge net much wider, mobilising the experiences and creativity of diverse players towards reaching unique and sustainable solutions [84]. It is evident that solutions addressing challenges within the VC are on the horizon, but none of these are systematically deployed and scaled in the healthcare system.

Chapter 3 • A conceptual view of the literature

Schut *et al.* [85] defines complex problems as: “problems (1) that have multiple dimensions; (2) that are embedded in interactions across different levels; and (3) where multiplicity of actors and stakeholders are involved.” The challenges faced within the healthcare space are therefore considered complex. The complexity referred to supports the notion of a need for engaging constructively with stakeholders representing a vast set of actors [84].

Health is primarily defined as a medical problem, but the roots of many health issues are environmental or social factors which are often not visible within the doctor’s office leading to numerous factors being overlooked during the quest towards a healthier population. A radical transformation is required in which new norms of behaviour move towards co-created services in which those using the services are involved in the design and delivery thereof [84]. The problem solving approach that is required needs to explicitly identify and take into consideration existing system boundaries.

A new focus needs to be placed on adopting approaches that emphasise the importance of capacity development through scientific as well as human investment. To inspire new innovations in healthcare delivery, the introduction of new paradigms that focus on user participation are required. The possibility of meeting the user’s needs are increased through the inclusion of a wider range of voices to speak to a more diverse group of people. Scalable health innovations addressing technology development and business model concepts are expected as a means to depart from the classical ideas about healthcare delivery [86].

There is a need to facilitate conversations across sectors, to educate and to capacitate the local community with knowledge and skills with the goal of achieving the healthcare imperative of increasing the access to high quality care at a reduced cost, Figure 15.

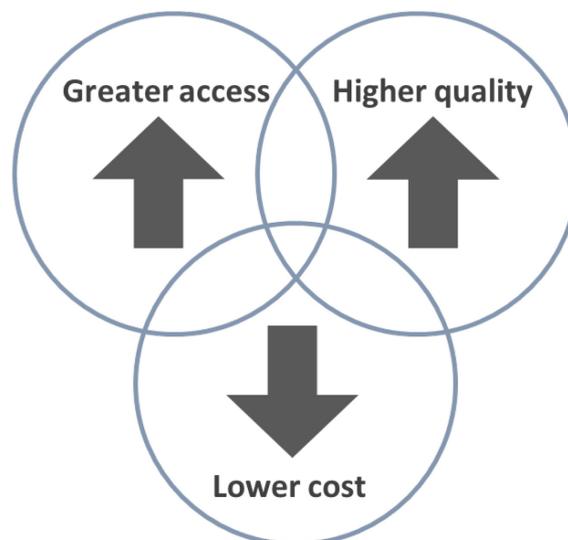


Figure 15: Healthcare imperative

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Advancements in healthcare that focus on addressing challenges faced within poor communities need to continuously be developed. These innovations include technological solutions that introduce new delivery avenues as well as low cost treatments that aim to increase the reach of the PHS. Firms are still faced with the challenge of reaching scale without which the impact and benefit associated with the developed innovation is constrained [12], [87]. In this context, a number of factors for this market failure have been identified, including but not limited to: an insufficient business case; a lack of interoperability; and duplication of funding efforts leading to “pilotitis”⁴.

To address these challenges, collaborative interaction is required. The future of healthcare requires people to become fully engaged in their own health. One avenue along which engagement is encouraged is interactive platforms. Bessant *et al.* [84] state that the potential of such platforms have been established, but the realisation of the platform’s success is dependent on bottom-up community organisations and top-down support, recognition and user education. Traditional top-down approaches need to be revised to include the bottom-up approaches that have proven successful. Through harnessing network effects and the current trends towards openness, collaborative approaches support co-creation of new healthcare services and products [84].

Historically, the adoption of collaboration networks within healthcare have been focused on connecting medical professionals with one another to discuss and solve problems pertaining to a specific disease [15].

The desired approach should consider the risks and economic challenges associated with delivering high quality care. One such a risk is that innovations will be subject to cost-quality trade-offs. In some cases radical solutions are required to achieve the desired outcome, these solutions draw on the engagement of multiple users to develop workable options [84].

This section concludes that there is a distinct need for developing an IP approach to understand healthcare VCs that perpetuate healthcare challenges/opportunities based on the current terms of problem solving and functioning. This novel approach recognises the importance of stakeholder engagement in the knowledge development process.

⁴ Described as the existence of numerous pilot projects.

3.2 Why value chains?

Over the past decade, there has been an exponential increase in the rate at which change emerged in healthcare [88]. This has led to the need for new approaches to streamline efforts towards reaching comprehensive goals within healthcare. To achieve large scale change, an approach which considers the various dynamic relationships in the healthcare system is required. With increased interaction and integration amongst healthcare actors as motivation, the VC approach is selected as the analytical lens for this study. This is supported by the notion that a holistic VC approach focuses on improving customer satisfaction through delivering high quality care.

This section introduces the VC concept and focusses on healthcare VCs, some of the key actors within them as well as their capabilities. This is followed by a brief documentation of how the healthcare VC currently operates.

Section 3.3.3 aims to outline how VCs act as an analytical lens for IPs and finally the future prospect of improved integration between VC players is elucidated. This will have implications for actors and components as well as the dynamics between them.

Porter popularised the term VC as the entire production chain from the input of raw materials to the output of final products consumed by the end user [89]. Each link in the process adds some value before the service is delivered to the ultimate customer and thus it is referred to as a VC.

VCS are collaborative partnerships between adjacent players engaged in economic or knowledge exchange. Such activities draw on coordinated planning to reduce uncertainty across the VC and to prevent delays in service availability. It is also designed to generate the lowest-total-cost solution for the end customer [52].

The traditional VC approach is characterised by its focus on the geography and linkages between firms as well as the mechanisms that are adopted to exert and distribute power. A VC approach can prove to be beneficial during the development of economies of emerging countries as it has the ability to introduce products and services to new markets.

A VC is concerned with several theorised objectives, including:

- Optimising the overall activities of the actors working together to create products and services;
- Managing and coordinating the whole chain from raw material suppliers to end customers, rather than focusing on maximizing the interests of one player;

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- Managing the knowledge and the flow of knowledge amongst different actors; and
- Developing highly competitive chains and positive outcomes for all parties involved.

According to Walters and Jones [90], the convergence of quality and value within healthcare is a prominent theme within the investigation of healthcare VCs. This is partially due to the fact that VCs provide a lens through which the operations within the healthcare sector may be viewed and potentially deliver a means to better understand the context of the challenges and the required design criteria. In order to improve the integration and participation across the VCs, the functions and responsibilities of these links need to be understood and augmented as required. Such interventions lead to deep rooted change through leveraging actor capabilities in a sustainable and inclusive manner.

3.2.1 THE HEALTHCARE VALUE CHAIN

VCs involve different groups of stakeholders with different backgrounds and perspectives [89]. Stakeholders are defined as anyone who can affect or is affected by the problem associated with the need and/or its resolution [91]. Stakeholders are not all perceived as equal in terms of their power and concern regarding a matter [91], [92]. The stakeholders that are generally considered along a VC include: suppliers, processors, producers, environmentalists, companies⁵, knowledge institutes⁶, government, healthcare providers, insurers, labour union representatives, financial organisations, intermediaries, non-profit organisations and public sector players [52], [89], [91]. Figure 16 offers a graphical depiction of the healthcare VC [52].

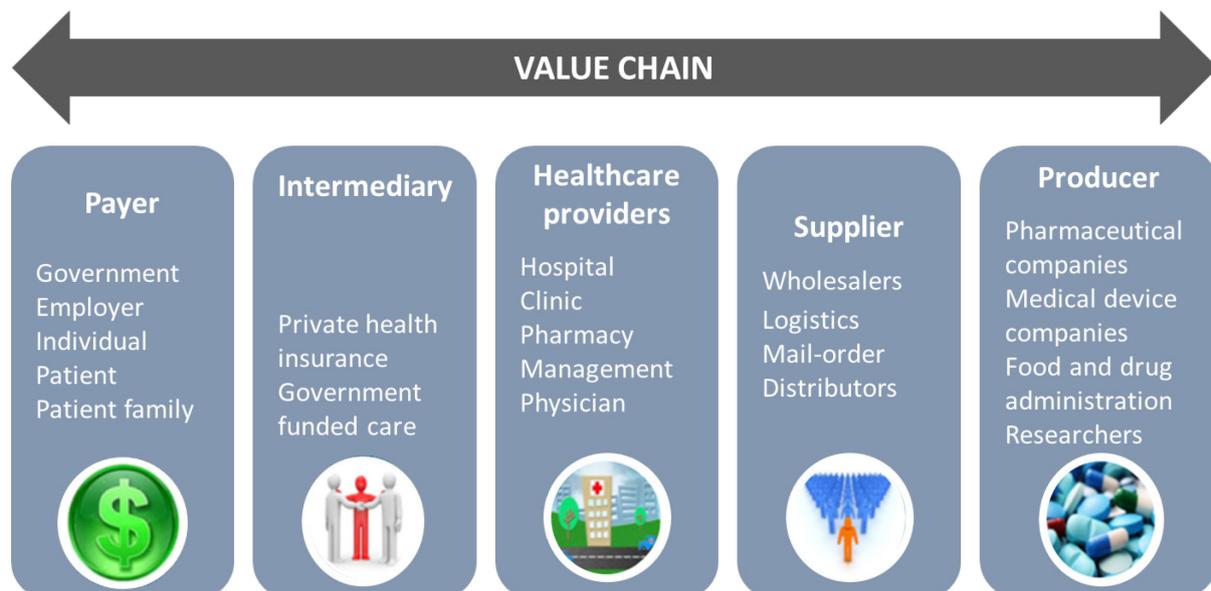


Figure 16: Healthcare Value Chain (Adapted from Burns et al. [52])

⁵ Start-ups, SMEs, large firms, multinational companies.

⁶ Universities, research centers, schools.

Chapter 3 • A conceptual view of the literature

Healthcare providers are required to constantly meet high demand through streamlining operations and enhancing the services provided to patients. In order to attain the public healthcare mandate, they rely on the support from the other VC actors.

The healthcare industry is comprised of a set of diverse stakeholders each with their own interests, Figure 16. These stakeholders are categorised into five major groups, Figure 17. Table 4 provides examples of each of these categories [84].

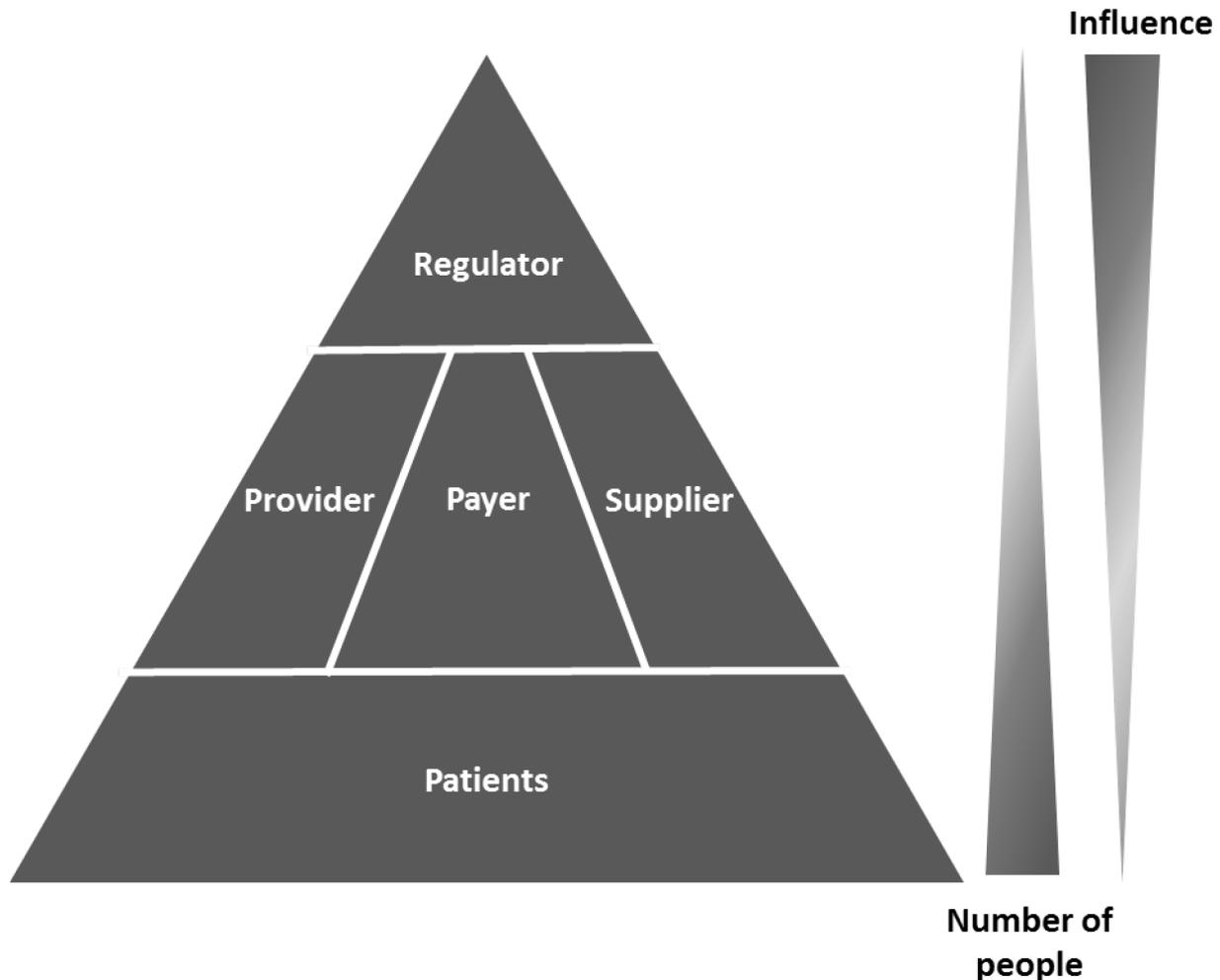


Figure 17: Five dominating actor segments in healthcare (Adapted from Bessant *et al.* [84])

The difference between the grouping of stakeholders in Figure 16 as opposed to Figure 17, is the acknowledgement of patients as their own group as well as amalgamation of producers and suppliers represented by supplier only in Figure 17.

Of the five major groups in Figure 17, patients form the largest group. This needs to be considered during the innovation process as they have accumulated experience, either directly through their own experiences, or indirectly through the experiences of relatives [84].

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Figure 17 clarifies the relationship between providers, payers and suppliers in correlation with regulators. The regulatory body within healthcare has the greatest sphere of influence even though this segment consists of the smallest number of people.

Table 4 provides a breakdown of the major groups within the VC as well as highlighting their specific role within the functioning of the VC.

Table 4: Breakdown of major groups within healthcare value chain and innovation process, Omachonu & Einspruch; Eashwari; Bessant *et al.* [33], [76], [84]

| Group | Set of actors | Role | Need, Wants & Expectations |
|--------------|--|--|---|
| Regulators | <ul style="list-style-type: none"> • Ministry of health • National/regional committees | Determine and set regulatory guidelines | <ul style="list-style-type: none"> • Reduced risk • Improved patient safety • Cost containment |
| Providers | <ul style="list-style-type: none"> • Doctors • Nurses • Other health professional • Medical experts | Provide care in hospitals, doctors surgeries, nursing homes, and others | <ul style="list-style-type: none"> • Improved clinical outcomes, improved diagnosis and treatment |
| Payers | <ul style="list-style-type: none"> • Statutory health insurance • Private health insurance • Government agencies • Employer | Subsidise a significant segment of healthcare expenditure | <ul style="list-style-type: none"> • Reduced risk • Improved patient safety • Increased productivity • Quality and outcomes improved |
| Suppliers | <ul style="list-style-type: none"> • Scientific institutions • Pharmaceutical companies • Technology companies • Pharmacies • Wholesalers • Manufacturers of capital equipment and information systems | Develop new products and treatments and heavily invest in R&D. Mostly do resale. | <ul style="list-style-type: none"> • Enhanced efficiency of internal operations • Profitability • Cost containment • Outcomes improved |
| Patients | <ul style="list-style-type: none"> • Patients requiring attendance from various healthcare delivery paths | Beneficiaries of care Knowledge base for disorder | <ul style="list-style-type: none"> • Improved patients' experience • Improved physiological well-being • Reduced waiting time • Reduced delay |

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Due to numerous developments within the healthcare industry in the 1990's, the healthcare VC gained traction. These developments include vertical integration, horizontal integration and the rise in the application of e-commerce [52].

Integrated delivery networks were birthed from the vertical integration of provider organisations⁷, health insurance businesses⁸ and ambulatory care businesses [52]. E-commerce introduced a paradigm shift in the manner in which partners conducted business. Industry problems and inefficiencies were addressed through web technology as it was sold as a tool to speed up transactions, provide product and information visibility along the entire chain and to remove paperwork, duplication as well as processing errors [52].

Through recognising healthcare as a market, the concept of value within this realm is more easily defined and analysed. Healthcare is composed of market sectors that include customers in the form of patients and experiences similar management problems present in other markets [90]. These challenges include dealing with increasingly discerning customers regarding revenue, cost and ultimately profit.

Aspects such as cooperative agreements, regulatory policies and institutional agreements greatly influence the quality, cost and variety of services available in the public sector. According to Kahan and Testa [51]; “an inability to create and coordinate strategic alliances, a lack of information regarding value/cost at each link, and an insufficient sharing of knowledge in healthcare”, are some reasons why VC approaches have not been successful.

3.2.2 CONSIDERATIONS WITHIN THE HEALTHCARE VALUE CHAIN

Despite all the attempts towards consolidation, healthcare is still a fragmented industry that lacks leadership at the various links within the VC. The presence of fragmentation negatively affects the attempts to connect the various parties involved at each stage in the chain [52].

To address this fragmentation and to improve communication amongst different parties, feedback loops can be implemented. Feedback regarding patients' satisfaction and demands should be analysed in order to better gauge the range of improvement spaces for healthcare services. Patient satisfaction can be used as a guiding tool for the improvement of healthcare personnel performance, enhanced service training programs as well as to gain insight into strategic management strategies.

⁷ Hospitals, hospital systems.

⁸ Health maintenance organization.

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Currently, the only feedback received within the VC is from patients, which is not sufficient [93]. In the future, researchers may need to consider how to engage multiple parties in the feedback model to promote value creation of each link in the chain

The consideration of all the links in the VC allows for the identification of areas that increasingly add value as well as the links with decreasing returns [42]. This is needed for the development of policies that promote appropriate decision-making. Through forming an understanding of the core processes and barriers to entry in each link, a platform is created to allow for further investigation into the desired inclusion processes. VC approaches inherently emphasise the development of market-based approaches to pro-poor development, which promotes I4ID. However, mechanisms are needed to support the poor to participate in VC processes.

Kaplinsky and Morris [94] argue that although the VC has mostly been employed as a heuristic device, it also has some value as an analytical structure. VC analysis has generated some utility as a means to identify and unpack the relationships between linkages in the chain. VC analysis provides the prospect of alternative methods and structures to meeting objectives. This is done through rigorously reviewing resource applications across and within an organisation. It enables the identification of blockages towards the design of robust and effective policies. As such it serves to formulate and establish interventions [42]. Through an improved understanding, regarding the nature of returns and the linkages throughout the VC, policy makers may be better positioned to address the question of appropriate VC interventions.

Attention can then deliberately be focused on these areas with input from non-traditional actors. Through this process the root cause of inequalities can be addressed. The introduction of products and services to new markets has been identified as a key to developing economies of emerging countries. A VC approach can prove to be very beneficial in this regard, as the functions of each actor can be mapped and investigated for potential development opportunities.

This requires the consideration of healthcare systems' complexity and interconnectedness. One change along the VC is likely to affect various other divisions of the process. The necessary reflection and understanding of each VC element is required prior to implementing major process and product changes.

Table 5 exhibits the various VC elements accompanied by a breakdown of each element. These elements are important considerations during a VC analysis.

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Table 5: A breakdown of value chain elements

| Value chain element | Breakdown |
|-------------------------------|--|
| Resource flow | <ul style="list-style-type: none"> • Flow of goods (volume, value) • Number of jobs • Exports |
| Barriers to entry | <ul style="list-style-type: none"> • Technology • Human resource capabilities • Organisational skills |
| Governance and power dynamics | <ul style="list-style-type: none"> • Policy • Infrastructure |
| Geographical location | <ul style="list-style-type: none"> • Geography |
| Distribution of income | <ul style="list-style-type: none"> • Gender • Tier • Skill level |
| Knowledge focus | <ul style="list-style-type: none"> • Knowledge producers • Universities • Skilled workers • Mobility workers |

3.3 Towards the advancement of innovation

“Exploration is the engine that drives innovation. Innovation drives economic growth. So let’s go exploring.”

~ Edith Widder

3.3.1 WHAT IS INNOVATION?

Innovation is defined as the development or application of new processes, services or products to provide improved solutions that address new market, government or social needs, applied in a specific institutional and cultural context [95], [96]. It relies on incorporating existing or novel knowledge in unique means to do something better. Innovation can manifest in the form of incremental or radical changes to products, processes or services.

Innovation is pivotal in value co-creation through the use of new ideas and knowledge across social, commercial and organisational boundaries [97]. The innovation process allows for the transformation of ideas into outputs under a set of management processes including managing ideas, defining goals, prioritising projects, improving communications, and motivating teams.

3.3.1.1 THE EVOLUTION OF INNOVATION MODELS AND APPROACHES

The linear approach to innovation was dominant between the 1960s and 1970s. This approach segregated knowledge and technology development, by researchers, with the application and adoption of the knowledge [98]. During this time, users were only considered beneficiaries of the proposed innovations.

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The unrealistic depiction of the innovation approach has been transplanted by the realisation that stakeholder engagement and contributions are pivotal to problem identification and appropriate solution generation [99]. Soon after this, the IS approach was developed in the 1990s and 2000s.

Systems approaches consider a wider range of factors influencing the innovation development process including institutional (the rules of the game) and organisational innovation along with the impact of policy [100]. IS thinking believes that interactions help to create connections amongst stakeholders that result in improved communication and knowledge exchange and thus introduce novel ways to address common challenges.

This leads to an increase in the complexity of the study of innovation as the behaviour of a system needs to be investigated in terms of the dynamic relationships amongst actors [101].

Traditionally, products were developed internally through R&D activities. The limiting assumptions that closed innovation is subject to, are 1) complete independent discovery, development and marketing of a new product; 2) reliance on internal talent to provide innovation; and 3) the need for restrictive intellectual property management to protect its technologies [102].

The traditional approach to innovation has had its success, but it has some serious deficiencies. The lack of shared cost and risk bearing associated to new product development is one of its shortcomings [103]. The short survival period of internally organised innovation can be due to the pipeline focus in which current business strategies trump innovation opportunities [104].

The integration of feedback from both upstream and downstream partners during the early stages of the innovative process, allows for solutions to better address R&D needs. Historically, the early integration of suppliers into the innovation process significantly enhanced the innovation performance of the industry [105].

Recent years has seen the external environment for innovation change dramatically. Several factors have led to the evolution of innovative approaches. Globalisation, increased product complexity, industry convergence, advancements in information and communications technology (ICT), increasing tradability of intellectual property rights and growth in private venture capital, highlight the need to adopt open innovation tactics [106]. The advancements in devices and technology in the internet-era has facilitated the development of communities, which bring together people around a shared identity, common interest, or a social movement.

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The perceived distance between actors is reduced through advancements in ICT, thus allowing for integration of new actors into development processes [107]. Improved connectivity across borders has enabled the development of new approaches such as innovation challenges and crowdsourcing [108]. The impact of the increasing tradability of intellectual property rights needs to be discussed in its own right as it has influenced the ease with which innovative knowledge and investments are shared [109].

The present-day interconnected innovation environment is well suited for collaborative development as these types of engagements hold several advantages [106]. The benefits associated with collaborative approaches include an increase in the quality of products and services, the exploitation of new market opportunities, increased flexibility as well as a shortened time to market with less risk and costs.

Generic approaches to innovative problem solving are being met by customised solutions that address context specific needs. This is achieved through employing high levels of user-engagement. Von Hippel [110] refers to this as the democratisation of innovation. There is an opportunity to spread the knowledge net much wider. This is achieved through mobilising the experiences and creativity of diverse actors towards reaching unique and sustainable solutions [84].

Modern innovation theory recognises the importance of institutions in enabling, constraining and shaping behaviours and practices. The understanding of both hard and soft institutions plays a critical role in enabling sustainable change. Hard institutions are explicit in nature and include rules, laws, regulations and instructions. Soft institutions, on the other hand, refer to habits, customs, established practices, routines, ways of conduct, traditions, norms and expectations [111].

3.3.1.2 CLASSIFICATIONS AND TYPES OF INNOVATION

Literature introduces many dimensions along which innovation can be categorised. Two of the most prominent terms used for distinction are incremental- and radical innovation [112].

The classification of the innovation is based on one or a combination of the criteria discussed in Table 6.

Incremental innovations are more common than radical innovations. This can be due to the very nature of radical innovations, as it creates new potential for innovation through challenging system boundaries and the existing rules of the industry [84]. Radical innovation is known for its ability to introduce transformative change that can potentially transform the basis of society and is therefore less prevalent.

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The ability of incremental innovation to bring about major transformative change should not be underestimated as the significance of cumulative, incremental innovation has revealed its value in innovation clusters or aggregation of innovations [113]. Radical innovation such as the development of the airplane relied on a series of auxiliary incremental improvements [114], [115].

Table 6: Innovation categorisation

| Category | Incremental innovation | Radical innovation |
|---|--|--|
| Scale and significance of economic consequences | Incremental innovations are not typically disruptive in nature and thus their impact on other sectors are limited in comparison to that of radical innovations. They typically introduce a stepwise improvement of a system. | This introduces a fundamental change to the system. The impact and effect that radical innovation has is large and often categorised as disruptive. |
| Novelty of underlying knowledge base | Incremental innovation draws on a greater continuity in the type of knowledge employed. | Typically, radical innovation involves a considerable discontinuity in knowledge base underlying the technical system. This applies to product, production, process etc. |

The degree of innovation refers to the novelty of the innovation. This refers to the difference between merely 'upgrading' details of a product or service, as opposed to finding a cure to a rare disease. The classification of the innovation can also be in terms of the potential impact that the innovation is going to achieve [111]. The collective gains accompanied by continuous incremental change often have a greater impact than sporadic radical innovations. There is a distinction between the types of innovation with respect to its location in the VC. The management requirements for these two types of innovation are vastly different. This is based on differences in their objectives [84].

In order to leverage the potential of the innovation process, a set of management functions are required. Figure 18 provides a graphical representation of the functions that play a critical role in the present-day innovation processes [116], [117]. Innovation processes must provide a platform for learning and experimenting through incentives, benefits and appropriate conditions. These mechanisms are foundational to IP development and management.

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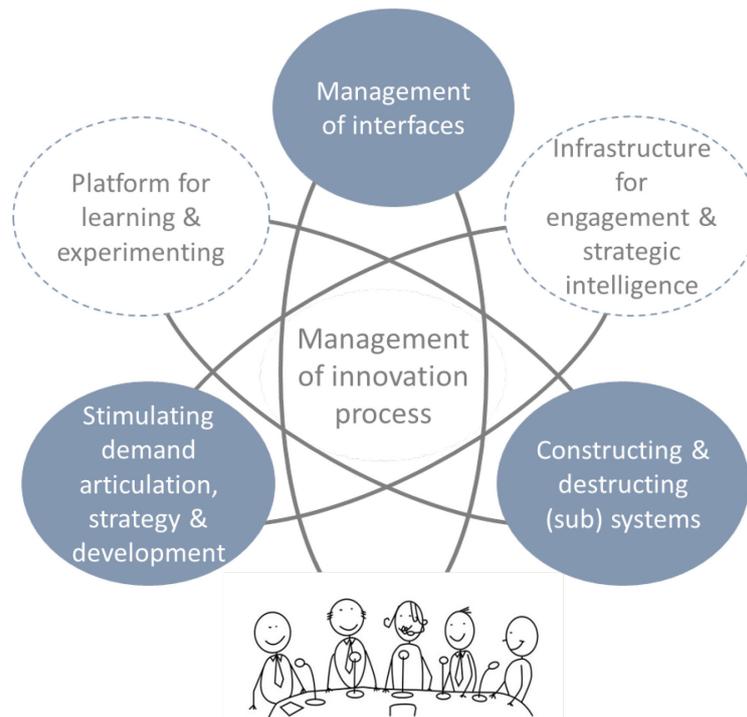


Figure 18: Management of innovation processes (Adapted from Smits & Kuhlman; Mierlo *et al.* [116], [117])

3.3.1.3 DRIVERS OF INNOVATION

In order to maintain a competitive edge in global markets, businesses innovate both in terms of their products as well as their processes. There are various factors that have induced business to gradually engage with innovation collaborations.

The traditional, closed, approach to innovation relies on the integration of R&D solely within the organisation's boundaries. Contrasting to this, the open approach facilitates organisations in the process of external knowledge integration into their innovative process [106]. This approach is partially enabled by advancements in ICT, emergent technological complexity as well as globalisation [106], [110], [118].

The drivers of innovation can be classified as internal or external. The internal drivers include; time, cost, quality and revenue. Internal drivers are drivers over which the organisation has more control. Internal processes search for ways to solve existing problems [119], [120].

This can be achieved through introducing new deals to the market that reduce the lead-time as well as addressing the quality management aspect of production processes.

The external factors include; customer needs, technological change, the socio-economic environment as well as legislation or regulation.

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These factors drive innovation through continuous R&D as well as abiding by laws set out by the government and regulatory bodies [119], [120]. External processes ensure that current market share is maintained as well as exploring new capabilities.

3.3.1.4 THE NEED FOR INNOVATION FOR INCLUSIVE DEVELOPMENT

One of the major drivers of innovation is the quest towards an improved civilisation and this can be achieved through addressing grand societal challenges [45]. The innovation landscape is shaped by institutional contexts and public policy. It occurs in uncertainty and builds on the actors' learning capabilities [121]. In an attempt to remove the prejudice that the innovation economy is solely shaped by entrepreneurs, modern innovation theory recognises that innovation involves multiple actors working together.

The traditional actors involved in the process are no longer restricted to formal institutions, but there exists a drive towards searching, engaging and employing a wide range of additional actors that hold supplementary knowledge [84]. These actors typically have differing interests, perceptions, capabilities and roles that they embody in the innovation process [111]. For this reason, collaboration plays a vital role in nurturing innovation as innovation embodies the integration of art and science [122].

The process and implementation of innovation does not occur in isolation and must take into account the socio-cultural context in which it is created [41]. A shift in the involvement of Base of Pyramid (BoP) individuals is required, from merely viewing them as potential end-users, to including them in the innovation process as potential partners.

I4ID actively includes a population sector that had formerly been marginalised from participating in economic development activities [39]. It attempts to transform the marginalised from merely embodying the role of potential customers to being seen as knowledge producers. Such processes include the absorption or adoption of innovation, socio-economic inclusion, the innovation process as well as the problem definition [35], [40], [94], [123]–[125]. Furthermore, I4ID focuses on creating innovation that seeks to improve the livelihood of marginalised populations [39].

Literature supports the need for pro-poor, or I4ID, but also highlights that this fundamentally requires broad support from governments, companies and other organisations globally. This view requires the development of new infrastructures to induce responsiveness and meet identified needs [39], [40], [126]. It is not only about making products and services for the poor, but also about enhancing innovative capacity at the BoP [41].

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There are various types of innovation that exist. These different models of innovation that have recently been developed are briefly summarised in Table 7. These models have a specific focus on promoting I4ID with added insight into their applicability being presented.

Table 7: Taxonomy of inclusive innovations (Adapted from Heeks *et al.* [40])

| Innovation model | Description |
|-----------------------|---|
| Frugal innovation | <i>Frugal innovation</i> is a broad term encompassing heterogeneous activities providing effective functional solutions to common problems encountered by “the many”. This is done while minimising resources, usage, cost, and complexity. Products that are the outcome of <i>frugal innovation</i> are generally less expensive for new market segments [40], [127]. |
| Catalytic innovation | <i>Catalytic innovations</i> challenge organisational incumbents by offering simpler, good-enough solutions aimed at underserved groups. <i>Catalytic innovations</i> are focused on creating social change [128]. |
| Cost innovation | <i>Cost innovation</i> refers to the strategy of deploying the cost advantages that are enjoyed by players based in emerging economies that are finding radical new ways to offer customers around the world dramatically more utility for less expenditure [129]. |
| Jugaad innovation | <i>Jugaad innovation</i> argues the West must look to places like India, Brazil, and China for a new approach to frugal and flexible innovation. In these emerging markets, <i>jugaad</i> ⁹ is leading to dramatic growth and can aid organisations in the hypercompetitive world [130]. |
| Grassroots innovation | <i>Grassroots innovation</i> is defined as sustainable innovative product or process created at the BoP, usually due to necessity, hardship and challenges. They often struggle to scale up and spread beyond small niches [127], [131]. |
| Cluster innovation | <i>Cluster innovation</i> takes place within a co-located group, wherein each individual plays a crucial role in providing knowledge for developing an innovation [132]. |
| BoP innovation | <i>BoP innovation</i> focuses on producer-consumer related learning and innovation [133]. Affordability constraints need to be considered in <i>BoP innovation</i> processes. The inclusion of design thinking plays a pivotal role in this social innovation. |

Through explicitly including poor communities into a VC, it seeks to benefit a wider audience with the intent of influencing the type and form of learning that takes place. The nature and dimensions of inclusion differ across the various I4ID models.

The deliberate inclusion of the poor in the innovation process is achieved through mechanisms that promote engagement and that create access to entrepreneurial activities [134].

⁹ A Hindi word meaning an improvised solution born from ingenuity and cleverness.

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These mechanisms must transcend a traditional technology-push paradigm to provide an approach in which actors act around a 'pull' force to address societal challenges [45]. This novel view of innovation has led to shifts in perspective.

3.3.1.5 INNOVATION IN HEALTHCARE

Steered by Omachonu and Einspruch's [33] definition of healthcare innovation, we consider the healthcare innovation process to be concerned with the identification and introduction of new concepts and ideas related to services, processes or products that seek to improve treatment, diagnosis, education, outreach, prevention, and research with the ultimate goal of improving health outcomes, quality, safety, efficiency, and cost-effectiveness [21].

The last century has produced a propagation of innovations in the care industry aimed at enhancing quality of life, increasing life expectancy, diagnostic and treatment options [33]. Some innovations have also focused on the efficiency and cost effectiveness of the healthcare system in its entirety [33].

Healthcare innovation is characterised as a complex organisational process that entails co-operative and collective activities, which are shaped by the individual intentions, preferences, and the interests of the different stakeholders involved in and affected by the process and its outcomes [21].

Eashwari [76] proposes that healthcare innovation processes should follow the logic expressed in Figure 19. This logic highlights the interplay amongst stakeholders towards the development and marketing of new innovations. The identification of consumer needs provides a starting point for the process, thereafter industry academia investigate various interventions with the assistance of R&D teams. Inputs from a range of stakeholders are considered prior to the development and marketing of an innovation.

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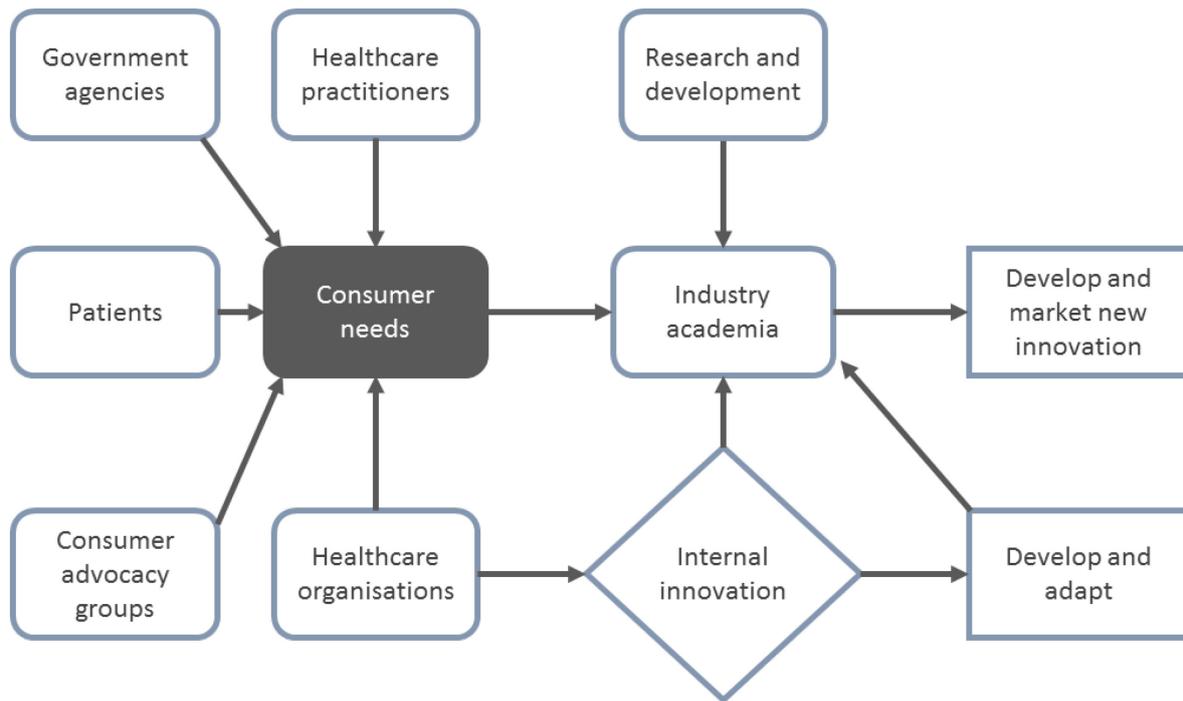


Figure 19: Healthcare innovation flow diagram (Adaped from Omachonu and Einspruch; Eashwari [33], [76])

The lag of healthcare advancements result in mounting pressures in areas in which traditional problem solving approaches have not been successful [135]. This reiterates the need for an alternative approach to address the challenges faced in healthcare whilst simultaneously promoting integration amongst VC actors.

3.3.2 INNOVATION PLATFORMS

IPs, as introduced in Chapter 1, are mechanisms that are capable of attracting a diverse set of stakeholders motivated to solving a specific issue of common interest or investigating potential growth opportunities [35], [44]. An IP is therefore a specific type of intermediary with the key goal of creating an environment for learning and change where groups that have different interests work together towards defining problems and redefining problems as expressed by stakeholder groups [43], [136]. IPs aim to foster collaborative innovation spaces, create innovation impact groups, and scale the knowledge of the groups using pertinent activities. The benefit of adopting a platform approach is its ability to build a far richer suite of resources that are tailored to the specific needs of society.

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3.3.2.1 INNOVATION PLATFORM BACKGROUND

According to Homann-Kee Tui *et al.* [43], IPs¹⁰ were first employed by the private sector as a mechanism to collect information and improve networking amongst key stakeholders in a specific economic sector.

Development agencies caught wind of the potential of IPs towards the end of the 1980's [43]. They are now increasingly common in R&D initiatives across various sectors.

IPs predominantly follow a bottom-up approach, but it is important to remain strategy driven if the IP is to deliver value. This is achieved through adopting a goal-orientated approach that ensures alignment with strategic objectives as well as guiding stakeholders to work towards a common goal.

The focus of IPs should be on developing participatory visions that harness technological solutions only when required. IPs do more than merely connecting the right stakeholders, it connects communities to solve everyday problems.

This is achieved through facilitating dialogue amongst stakeholders to enable them to identify bottlenecks that are hindering innovation [137]. The involvement of diverse perspectives throughout the innovation process leads to better-informed decision making thus enhancing the impact of final innovation. This allows for more effective consultation with stakeholders and alignment with their value propositions.

Platforms also enable diverging interests to come to the fore so that compromises can be developed [21]. Within an IP, stakeholders complete different but complementary roles in the development, dissemination and adoption of knowledge for socio-economic benefit [43]. Stakeholders can participate in the development of novel ideas, methodologies, procedures, concepts or technologies.

IPs continuously innovate and replace existing products, processes, and services with more effective ones to sustain its mission [138]. Dubé *et al.* [36] explains that what sets IPs apart from other collaborative innovation models, is that it is not confined in the traditional paradigm of problem solving in which narrow and specific problems are addressed. IPs are formed within a specific sector, but are not bound to specific problems. They evolve through undergoing continuous iterations and addressing the challenges that necessitate urgent attention.

¹⁰ Throughout the document the term 'innovation platform' (IP) is used. Other terms are: Innovation network, Innovation coalition, Innovation configuration, Multi-stakeholder platform, Learning platform, Learning Alliance, Concentration group, Association interprofessionnelle (French), Plataforma de inovação (Portuguese) [43], [191], [229].

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A research component also has the ability to improve the relationship amongst interdependent stakeholders through providing inspiring and eye-opening information, which is pivotal towards fostering significant change, development and ultimately innovation [139]. IPs create opportunities for demand driven research, the identification of critical issues and the dissemination of research outputs.

IPs exist in different shapes and forms dependent on the environment in which it functions as well as the objective that the platform aims to achieve [45]. Further investigation into existing IPs is completed in detail in Section 4.4.

In order to M&E the effectiveness of an IP, certain impact indicators need to be determined. The outcomes of any actions that are implemented need to be recorded and revised regularly. By properly monitoring the functioning of the IP, the evaluation of the IP is more attainable [52], [98], [140].

Concepts pertaining to IPs are firmly rooted in IS theories and as such it implicitly has the ability to lead to diverse changes. These changes include, but are not limited to the examples in Table 8. The application areas of IPs are vast and it can be customised to operate in almost any field requiring multi-stakeholder processes [141].

Table 8: IP change landscape (Adapted from Nederlof *et al.*; Boogaard *et al.*; Neef and Neubert; Lundy *et al.* [53], [55], [142], [143])

| IP component | Potential change |
|--------------------|---|
| Stakeholders | <ul style="list-style-type: none"> • Improved knowledge • Improved attitudes • Improved practices • Improved skills • Improved innovation capacity |
| Innovation process | <ul style="list-style-type: none"> • Increased coordination • Complementary and collective action |
| Society | <ul style="list-style-type: none"> • Improved livelihoods |

IPs provide a vehicle for strategic research and capacity development. The underlying aim of an IP is to develop a strategy that delivers a sustainable impact for the community, while providing individual stakeholders with differentiated benefits as highlighted in Table 8.

3.3.2.2 INNOVATION PLATFORMS IN HEALTHCARE

The use of platform approaches in healthcare is starting to gain traction as it provides a mechanism through which to stimulate growth by drawing on the knowledge of stakeholders across the VC [144].

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The platform approach potentially transforms patients from passive recipients of healthcare to active contributors. IPs are important in healthcare as they introduce an approach towards the development and dissemination of innovative solutions that speak to a wider stakeholder network [49].

There are many examples where patients have played a key role in developing solutions to their healthcare challenges – and there is evidence that this process is accelerating [145]. One powerful route is opened up via interactive online platforms which build and mobilise communities with common interests [32].

The medical care providers listed in Table 4, in Section 3.2.1, are considered core inside innovators. Their knowledge regarding patient health and their relationship with patients qualifies them as health issue - problem solvers [84]. They rely on the expertise and support of chain supporters¹¹ to function optimally.

Three clusters of patient-related innovator groups within health communities have been determined with relationships exhibited in Figure 20. The interaction between these clusters is based on a shell model in which, for example, patient-to-patient relationships are consecutively based on expert-to-patient relationship. The existing relationships amongst the different shells are enhanced within virtual communities [84].

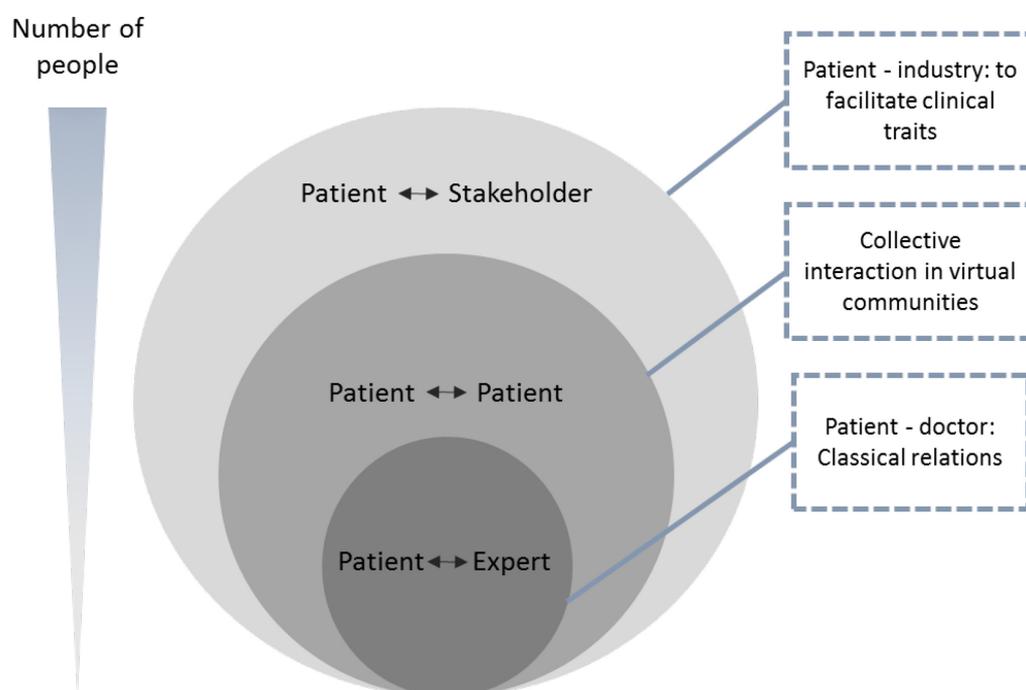


Figure 20: Relationships amongst classical innovator groups, Bessant *et al.* [84]

¹¹ Support from financial institutions, research, extension and transporters

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The consideration of these innovator groups and their interconnectedness is required to form a holistic understanding of what innovation within healthcare currently looks like and how the actors interact with one another.

3.3.3 ADOPTING THE VALUE CHAIN APPROACH

There are three main approaches that exist in IP literature namely: 1) IS; 2) Eco-system; and 3) VC. The IS approach allows for functional analysis to identify the range of functions that an effective IS supports towards its goal of developing and diffusing innovations. Furthermore, this approach allows for the analysis of components in the system, their role and the quality of these components. The eco-system perspective goes beyond the VC to integrate a more extensive analysis of actors driving and shaping industry. The VC approach allows for the consideration of inclusivity amongst actors across the VC and assists in identifying the places where biggest benefit may be gained for the poor.

The remainder of the section highlights the reasoning for the adoption of the VC approach and discusses some practical implications thereof for IPs.

The VC approach creates access to growth pathways as it allows for mechanisms through which one may have a structured approach to identify opportunities to engage the disenfranchised in IP practices [100]. The VC places competitiveness, economic viability and suitability at its core and has a predominantly market-based focus to strengthen chains.

Literature has shown that significant change takes place in networks of interdependent actors, who cannot change if other actors do not change simultaneously. This eludes to the fact that innovation hinges on a diverse set of stakeholders, such as those highlighted in Figure 16 of the healthcare VC, embracing different practices that align to meet mutual expectations.

There is increased awareness of the benefit of combining the IP and VC approach towards more comprehensively identifying opportunities, strengthening development planning and creating an innovative solution space [146]. Through adopting this approach, the framework aims to aid in understanding bottlenecks and identifying opportunities for enhancing the innovation capacity of healthcare systems. The VC can assist in locating the biggest and most costly weaknesses, addressing dysfunctional links and eliminating the most costly inputs.

By breaking down the siloes that exist within the sectors of healthcare delivery, an open dialogue can be created that will promote transparency, build trust, and ensure the recognition that across the sectors there exists similar agendas; focused on providing healthcare to all members of the national population.

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IPs offer a practical way to deal with the complex issues and multiple stakeholders involved in VCs [147]. The traditional VC approach focuses on value creation, market opportunity identification and linkages across a chain.

The IP approach looks to augment specific stages of a VC by focusing on knowledge creation through the integration of diverse stakeholders [94], [148]–[150]. Through encouraging engagement amongst stakeholders, IPs aim to facilitate joint learning, synchronise innovation activities and to provide a platform for policy transformation advocacy.

Furthermore, the VC approach places much emphasis on developing market-based approaches to pro-poor development which arguably may be a core consideration should one want to ensure sustainable mechanisms for I4ID.

There is, however, resistance towards adopting a VC approach. Integration and communication amongst VC actors towards the realisation of change inherently includes tension and chaos. This is based on the conflict, which arises amongst competing actors. This issue may arise if actors are focused on their personal agenda as opposed to the common goal. The likelihood that disagreements regarding the direction of development will take place are high, as actors are motivated by their personal agenda. Section 3.3.4 elucidates the pitfalls that exist within this space.

3.3.4 BARRIERS/CHALLENGES THAT INNOVATION PLATFORMS FACE

The challenges that IPs face have been categorised into internal and external challenges. Internal challenges refer to challenges that directly impact the formation and functioning of an IP and they are often more controllable than their counterpart, external challenges. External challenges speak the issues regarding formal institutions and the role of the government within this space.

3.3.4.1 INTERNAL CHALLENGES

The failure of platforms is often afforded to their lack of network effects. IP without members, facilitation or the necessary buy in from communities find it difficult to reach scale. Reaching the minimal critical requirements, after which members find increasing value in the platform as it grows, is imperative. Achieving such minimum requirements are an indication that the platform can deliver value to its members and the community in which it operates.

Once a platform has achieved network effects, it must ensure that its objective aligns with those across the platform. Facilitators are required to elucidate all platform needs and find a compromise that is acceptable to all parties.

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The majority of the platform members innovate in ways that are complementary to the platform's objective, while a few will start to innovate in ways that compete with the platform's objective. In an attempt to control the emergence of competition amongst members, collaborative governance is required.

Members will thus be incentivised to innovate in platform-enhancing ways [151]. Platforms can turn evil as well. As platforms grow bigger and begin to dominate a market, they can extract value from their market participants.

To prevent this from happening and to enhance the environment for successful collaboration to take place, trust must be developed. This is a requirement to create an environment in which actors feel comfortable to share their most valuable knowledge and skills. A culture shift towards openness must be fostered from the onset of the IP. Some actors may be reluctant towards adopting collaborative approaches at first. Issues of this nature must be addressed in the early stages of the IP formation to ensure that an supportive collaboration environment is created [152]. If there are any conflicts between members this should be dealt with swiftly.

These conflicts are often difficult to spot. Leeuwis [153, p. 946] suggests that there are three major areas that resistance are experienced. These include: 1) maintaining agreement or compromise after the fact; 2) difficulty securing agreement amongst members; and 3) not addressing the most important problem at the onset. The effect of these weaknesses can be reduced or prevented through proper problem identification.

Once conflicts of such nature occur, negotiations are required to settle them, but without the necessary mediation, the negative impact can be immense and cripple to the platform's functioning.

The problems that IPs strive to resolve are complex in nature. The development of a solution may be time-consuming as research takes several years, and persuading government to augment policy is even more complex [141], [154]. This is especially prevalent with the inclusion of big networks [155]. IPs rely on high financial as well as human resource inputs [53], [138], [156].

Unpredictable and sudden changes within an IP can potentially derail the progress. This includes the unexpected death of a key participant or the abrupt change of the agenda. This can also be due to changing political forces, or because someone decides to pull the plug on it, it is therefore wise to construct a movement that is independent. To surmount such challenges, the core operations of the IP should be diversified. This is achieved through reducing the risk of overloading a single platform member by creating sub-committees [138].

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A platform should thus be constructed as a movement that operates like a swarm that cannot be deactivated by external forces.

A problem, which is often faced in the realm of healthcare transformation in Africa, is a lack of the required infrastructure to support change.

Although the connectivity gap is closing across the world, there are still areas within Africa that experience low to no technology readiness. Mars [13] states that in Africa the number of households that have internet access at home is limited to only 6.7% and this limits the technological solutions that can be introduced and adopted.

If suitable M&E processes are not adopted in the IP through an appropriate facilitator, the necessary reflection on both failures and successes will not take place. This is needed for underlying causes to be assessed and findings to be shared collectively [138].

3.3.4.2 EXTERNAL CHALLENGES

The involvement of external donors introduces another element of complexity as the ownership of the IP can easily be seized or platforms are only viewed as spaces from which to extract resources [55].

Researchers tend to view platforms as mechanisms through which they can disseminate their research findings. This needs to be prevented through strong facilitation that addresses the powerful voice of the researcher in the platform domain [144].

Another crucial aspect to consider when engaging with external parties, is issues regarding intellectual property management [106]. Avoiding knowledge leakage is especially important during the formation stage of the IP. Thorough evaluation of the intellectual property positioning of members needs to be completed prior to joining to determine how knowledge will be shared, managed and owned by the platform across its lifespan.

The lifespan of an IP depends on the level and nature of the participation and ownership by members [138].

3.4 Chapter 3: Conclusion

SA is facing a multi-faceted healthcare challenge, which, if not addressed effectively, has the potential to dramatically limit the economic growth prospective of the country. It is evident from Section 3.3, that novel approaches to address this are required.

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Overall, IPs provide a promising model to stimulate I4ID and stakeholder interaction, but IPs are resource intensive and require a careful assessment of the institutional context within which it functions. With the integration of: 1) healthcare-; 2) VCs-; and 3) IPs literature, different perspectives and value-contributions are introduced to address the healthcare challenges.

The conclusions that are drawn from the literature overview focus on the ability of IPs to transform the health system to provide efficient and high quality care.

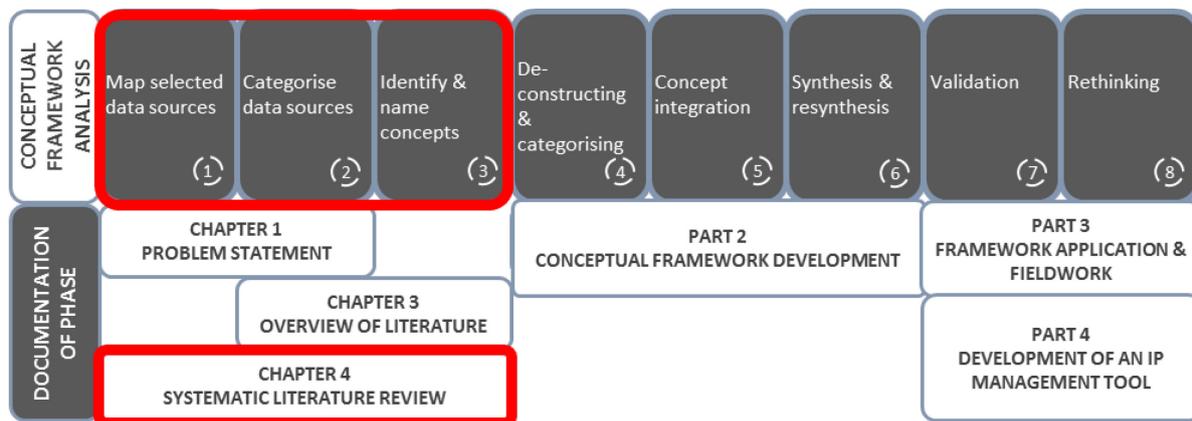
In order to ensure the successful design, implementation and operation of an IP, further investigation into its formation and functioning is required.

In the next chapter, the systematic literature review process and its results are discussed.

CHAPTER 4 - Systematic literature review on innovation platforms

“Life can only be understood backwards; but it must be lived forwards.”

~ Soren Kierkegaard



Literature has shown that the field of IPs is confined by vague definitions, a lack of practical implementation models as well as limited M&E mechanisms [44], [157], [158]. The aim of the systematic literature review is to create a solid theoretical base from which the framework is constructed.

Chapter 4 presents the findings of the systematic literature review. It aims to present the reader with insight pertaining to IP's core characteristics, the existing IP types and their respective operating difficulties. The fundamental IP knowledge identified from the rigorous systematic review is synthesised towards the development of the conceptual framework in Chapter 5.

The conceptual framework is developed to review and extract key success factors, areas of practice, design guidelines and criteria that will facilitate the integration and management of IPs in the healthcare VC.

Key objectives

Conduct a systematic literature review to:

- Describe the statistical landscape of IP publications
- Identify the types of IPs that exist
- Identify the key concepts of IPs
- Identify the core principles and processes of IPs

4.1 The need for a systematic literature review

The decision to complete a systematic review is three-fold in its nature.

1. It allows for the thorough evaluation and interpretation of all research that is relevant to IPs, specifically as they pertain to healthcare. Since there is limited literature available within this field, this robust approach to literature identification ensures that necessary literature is not overlooked and that bias does not play a major role in literature identification.
2. The systematic review assists in the eventual design of a framework for the development and implementation of healthcare IPs.
3. Finally, this is based on the fact that the review summarises existing evidence within a field of study as well as identifying gaps in the research that exists.

Baumeister and Leary [159], explain that a systematic review is a piece of seminal research in itself as it is inherently capable of addressing a much broader set of questions than a single study is able to. A powerful aspect of a systematic literature review is its high level of replicability and transparency. The analysis of the review's results are discussed in Section 4.3.

4.2 Conducting the systematic literature review

4.2.1.1 PHASE 1: DATA COLLECTION

The first step of Phase 1 of Jabareen's research method is searching and selecting relevant literature works. The web-based search engines that are consulted include Scopus¹², Google Scholar¹³ and Researchgate¹⁴. These databases consist of large collections of business- and science-related proceedings, articles, briefs and notes. To perform a thorough primary search and to avoid excluding important literary works, alternative keywords are examined. The keywords utilised in the search are assigned to two domains: 1) sector (healthcare, medicine, medical); and 2) innovation systems model (innovation platform). Various combinations and variations of these terms are investigated. The search focuses on the title, abstract and keywords of the publication.

Table 9 displays the initial search results of the respective web-based search engines. The literature items included published journal articles, research briefs, conference papers as well as a note. The primary search returned over 1 000 publications.

¹² www.scopus.com

¹³ www.scholar.google.co.za

¹⁴ www.researchgate.net

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Table 9: Initial search results

| Search terms | Scopus | Google Scholar | Researchgate |
|--------------------------------------|--------|----------------|--------------|
| “Healthcare” “innovation platform” | 10 | 1 180 | 100+ |
| “Medicine” “innovation” “platform” | 252 | 238 000 | 50+ |
| “Medical” “innovation” a “platform” | 553 | 293 000 | 25+ |
| “Healthcare” “innovation” “platform” | 255 | 120 000 | 100+ |

4.2.1.2 PHASE 1: DATA SELECTION

Figure 21 illustrates the data selection process. The green blocks show the publications that passed the initial vetting process as well as met the inclusion criteria. The red blocks reveal the number of eliminated publications supplemented by the motivation for their exclusion.

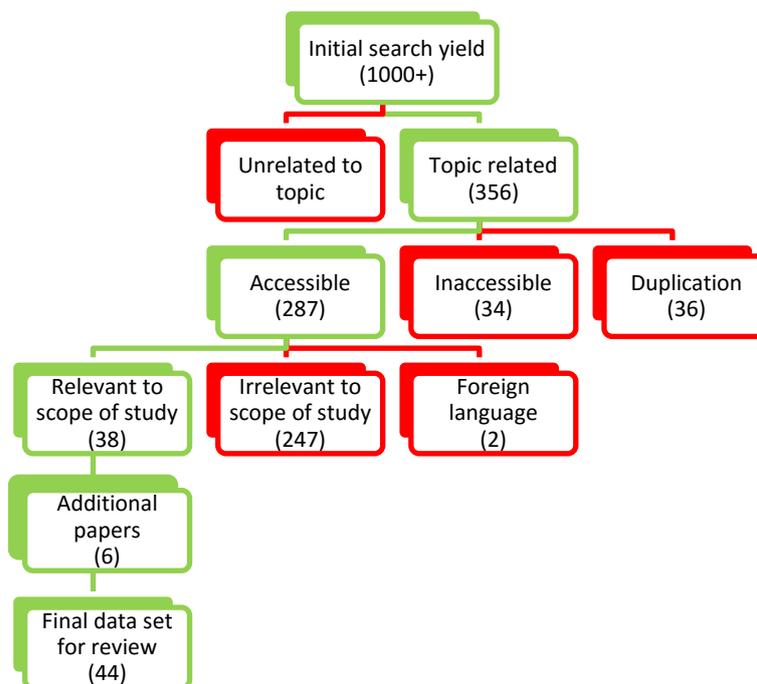


Figure 21: Data selection approach

Using the title of the documents, a preliminary vetting process reduced the number of publications from over 1 000 to 356. This is achieved through investigating the relevance of the title of the publication to the topic of interest. A further 36 publications are eliminated due to duplications. The majority of the excluded papers did not refer to IPs, but rather to specific innovations within healthcare or to platforms that enable tele-medicine.

The remainder of the documents are systematically filtered according to the pre-defined inclusion criteria in Table 10. For the remaining 320 publications, a rigorous examination of the abstracts and main headings is conducted. Two publications are eliminated as they are in

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a foreign language and could not be decoded. An additional 34 publications are eliminated as they are inaccessible and 246 publications are irrelevant to the research scope.

Table 10: Inclusion criteria

| Criteria | Description |
|----------------------------|---|
| Empirical relevance | Basic methodology and validation of research |
| Relevance to project scope | Studies pertaining to IPs and not to innovative products or services that exist within healthcare |
| Language | Documents that were not scripted in English were excluded from the study |

A comprehensive literature database is compiled by adding additional papers through the use of the ancestry approach¹⁵. The selected papers are logged for further investigation. Literature pertaining to agricultural IPs are also included as the BOK of theoretical foundations upon which IPs are built is predominantly discussed in terms of its application in the agricultural domain and a multidisciplinary approach is suggested by Jabareen [56]. The final data set is reduced to 44 academic papers.

4.2.1.3 PHASE 2: EXTENSIVE READING AND CATEGORISING OF THE SELECTED DATA

While the author could explore unlimited topics, an analytical approach is imperative for creating a useful study. Analytical questions allow for the consideration of sophisticated insights. The literature sources are reviewed and coded according to five main categories. A standard representation of the information allowed for trends within the literature to emerge. Table 11 illustrates the categories and their attributes.

Table 11: Data collection categories and components

| Main categories | Components |
|--------------------------|--|
| 1. Paper characteristics | <ul style="list-style-type: none"> • Title of document • Author(s) • Year published • Document type • Document source • Citations • Geographic focus of study • Focus of paper |
| 2. Empirical elements | <ul style="list-style-type: none"> • Domain (Sector) • Validation techniques employed • Distinctive contribution made by publication |

¹⁵ The tracking of research cited in already obtained research.

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| Main categories | Components |
|---|--|
| 3. Innovation platform foundation | <ul style="list-style-type: none"> • Challenges/barriers to adoption • Driving force behind formation • IP initiation • Operation of IP • Platform limitations • Purpose of the IP • Successful project execution • Type of IP |
| 4. Theoretical innovation platform concepts | <ul style="list-style-type: none"> • Actors & responsibilities • Approach to funding • Approaches to change management • Capacity development • Conflict resolution & power dynamics • Construction and deconstruction of sub-systems • Context of emergence • Demand articulation & strategy development • Dynamic processes within IP • Engagement infrastructure • Hard & soft infrastructure requirements • Incentives & rewards • Knowledge management & transfer • Level of inclusivity • Mechanisms towards scaling • Monitoring and evaluation • Role of government and policy-making • Termination of IP or members |
| 5. Observations | <ul style="list-style-type: none"> • Conclusion drawn by authors of paper • Oversights in paper |

4.3 Descriptive statistics

Figure 22 shows the timeline and the type of publications included in the review. The majority of the publications consist of journal articles, representing 59% followed by research briefs with 25%.

4.3.1 TIMELINE OF PUBLICATIONS

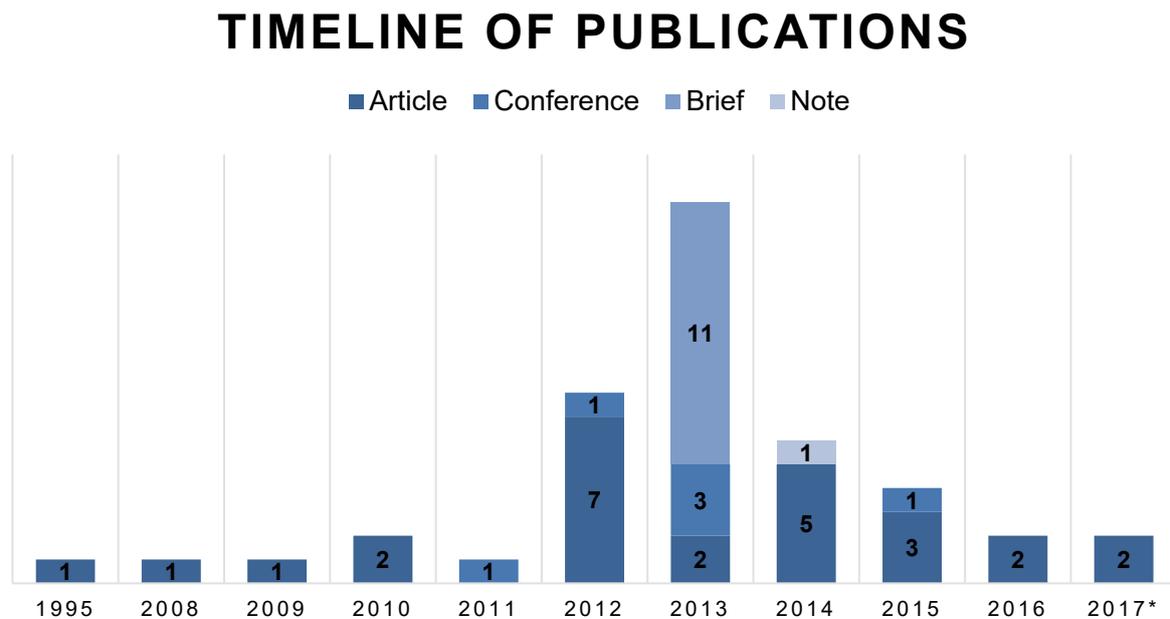


Figure 22: Timeline and type of papers included in study

As the study of innovation and the various approaches towards improved innovation increase, the awareness of IPs and their potential innovative capabilities grow. Figure 22 supports this notion as there is an increase in the number of publications between 1995 and 2013.

The journals in which the articles are published are investigated further to identify whether there is a correlation between a specific journal and IP publications. Appendix C displays the journals corresponding to the number of included articles published therein as well as the number publications in conference proceedings, briefs and notes, respectively.

4.3.2 CITATIONS BREAKDOWN PER PUBLICATION TYPE

The publication type with the highest number of citations¹⁶ are journal articles, Figure 23. The BOK regarding IPs is still in its infancy as indicated by the limited citations.

¹⁶ The citation statistics included are gleaned from the respective web-based search engines that are utilised in the study.

CITATIONS BREAKDOWN PER PUBLICATION TYPE

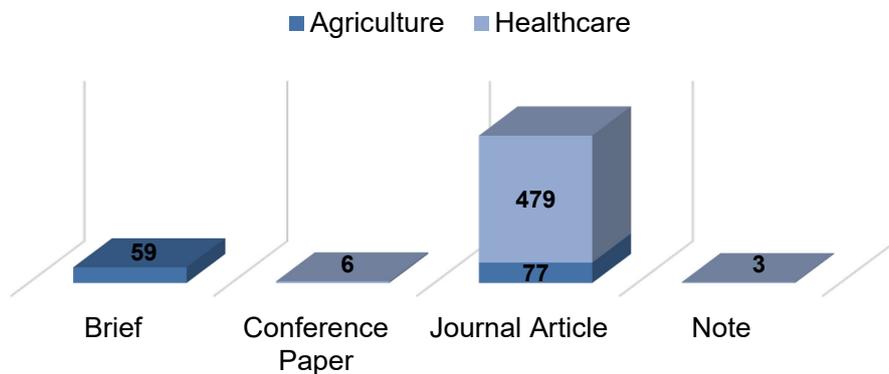


Figure 23: Citations of publications

4.3.3 GEOGRAPHIC AREA OF FOCUS

Figure 24 provides a summary of the geographic area of focus of the publications included in the study. These areas are used as practical examples to highlight specific aspects of an IP. Africa accounts for 51% of the publications reviewed in this study followed by Asia with 19% and Europe with 13%. The majority of the papers refer to the African context, but the inclusion of publications from other geographic areas is done to ensure that the theory identified from the publications include various perspectives as well as the most recent findings within the field of study.

GEOGRAPHIC AREA OF FOCUS

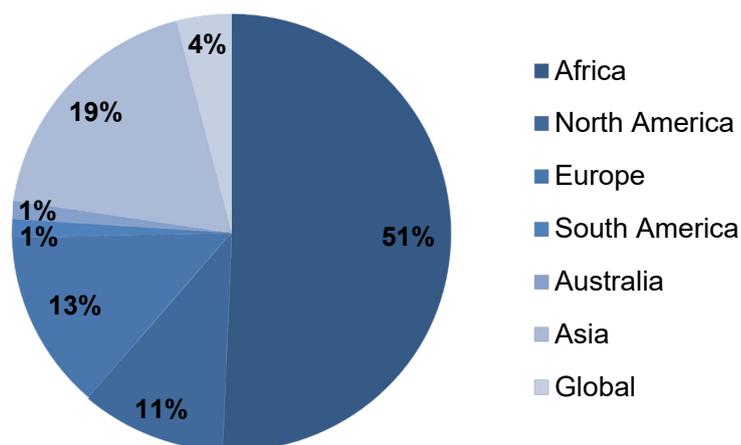


Figure 24: Geographic area of focus of publications

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4.3.4 FOCUS AREA OF PUBLICATION

The four focus area categories according to which the studies are categorised are: 1) platform development; 2) platform review; 3) platform evaluation; and 4) theoretical review.

Figure 25 illustrates that the majority of the publications (50%) focus on a theoretical review, 27% of the publications are platform reviews followed by 12% and 11% respectively focussing on platform development and platform evaluation. The culmination of the information gathered from the different focus areas provides a holistic insight into IP literature.

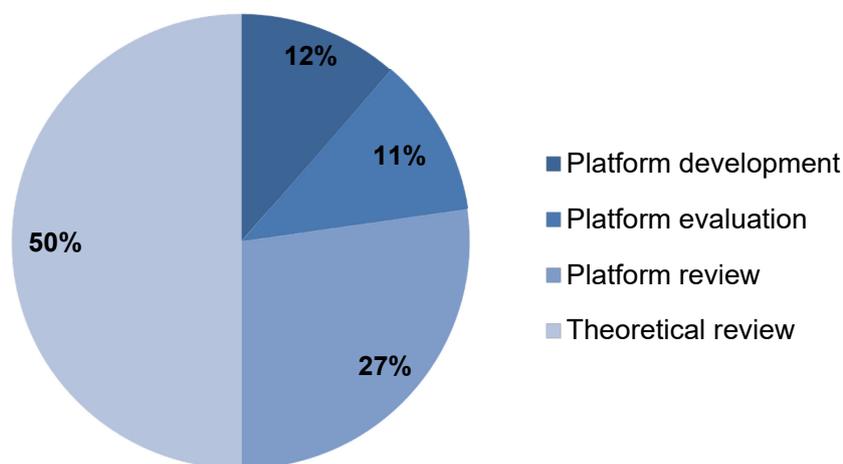
FOCUS AREA OF PUBLICATION

Figure 25: Focus area of publication

Table 12 provides a definition for each of these categories and highlights their distinct differences.

Table 12: Focus area categorisation

| Category | Definition |
|----------------------|---|
| Platform development | These publications provide insight into the formation of an IP and the initiation processes that are required. The development process of an IP is based on the type of IP as well as several factors including the context of emergence and the resources available. |
| Platform evaluation | Focus is placed on investigating the effectiveness of the IP in meeting the objectives as determined at the onset of the project. Evaluation refers to a rigorous breakdown of IP functions that are effective and the characteristics that performed poorly. |
| Platform review | Platform reviews highlight why the IP is initiated as well how the IP addressed the various challenges and opportunities within the given context. The review also emphasises the mechanisms adopted in the platform towards achieving outcomes. |

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| Category | Definition |
|--------------------|---|
| Theoretical review | Theoretical reviews address key concepts within IP literature. It provides an understanding of these concepts and emphasises their importance. There are various theoretical concepts that need further investigation to understand their role within the IP landscape. |

4.4 Types of innovation platforms

A key dimension of IPs is their ability to take on various forms and adapt their functioning in accordance to the desired outcome/objective. The functionality of the IP is influenced by an array of factors.

The different platform models influence the selection of appropriate business models and analytical approaches to develop, in an attempt to better understand and address society's challenges. The context of emergence of the IP is viewed as a key driver for innovation as well as the foundation from which to develop the IP [160].

The development pathways of platforms follow unique trajectories and are dependent on the infrastructure that is available. Configurations of IPs vary according to the theme, sector or disease landscape covered. In some cases IPs function by organising regular formal meetings with a steering body while in other cases platforms use less formal communication channels and operate at irregular frequency [53].

Figure 26 provides an overview of the different functioning types of IPs that are identified through the review. This highlights the various forms in which IPs can appear and their popularity in adoption.

TYPES OF INNOVATION PLATFORMS

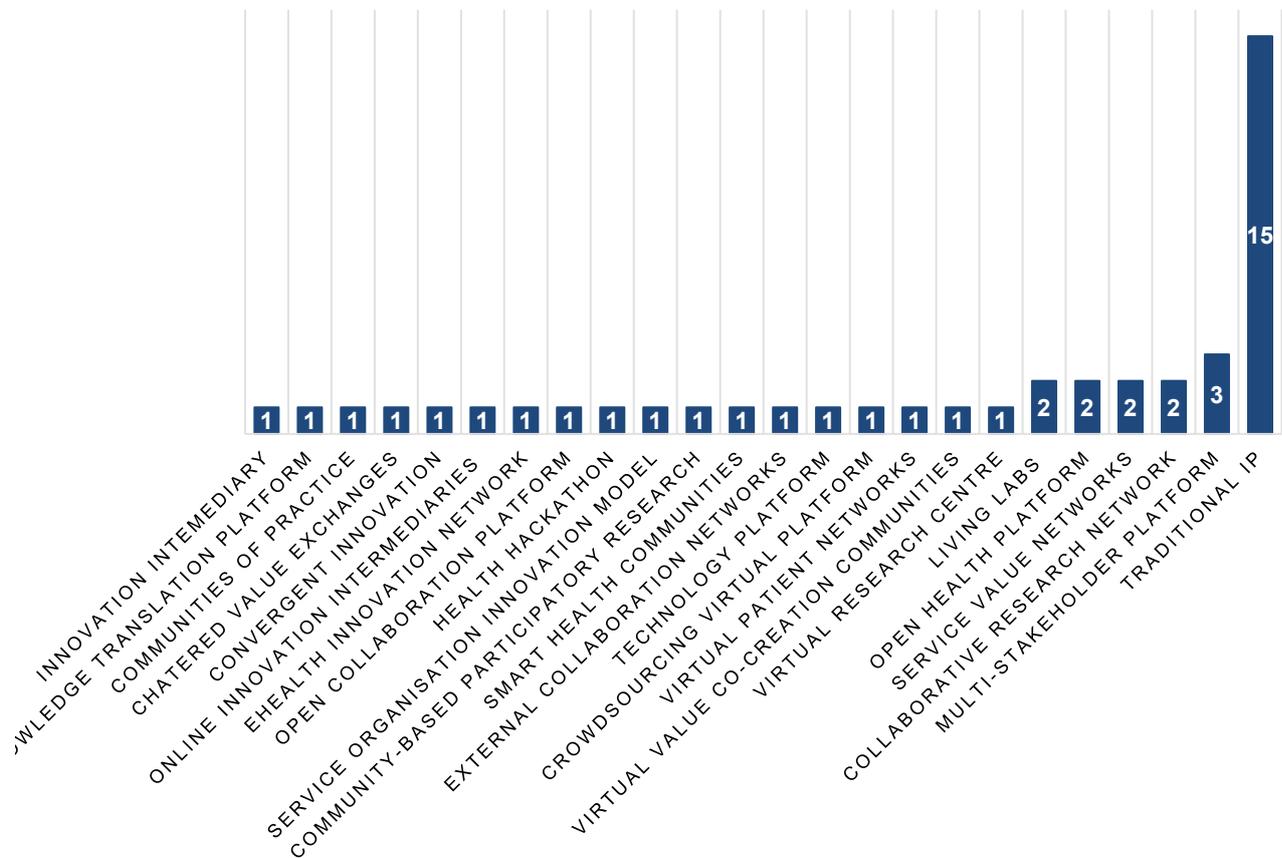


Figure 26: Types of innovation platforms

The application areas of IPs are vast [141]. IPs can be customised to operate in almost any field requiring multi-stakeholder approaches towards innovative solutions [161]. The purpose of the IP also influences the platform’s building blocks, e.g. the initiation of a living lab as opposed to a technology platform is very different [99], [162]. Although their fundamental practices are the same, the way in which different types of IPs achieve their prospective objectives and the combination of IP concepts that they draw on, differ greatly. The 24 different types of IPs identified from literature, as illustrated in Figure 26, are defined in Table 13.

Table 13: Type of IPs

| Type of IP | Brief description of IP |
|--------------------------------|---|
| Chartered value exchange | These local entities promote consumer engagement in community-level multi-stakeholder organisations [163]. |
| Collaborative research network | Collaborative innovation networks involve both technology and market stakeholders and are extended to include industry, research and technology producers. These clusters enable public policy makers to identify complementarities between generation, |

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| Type of IP | Brief description of IP |
|--|---|
| | acquisition and diffusion of knowledge across a range of innovations rather than a single innovation [15], [132]. |
| Communities of practice | Communities of practice bridge different health market actors to help share experience-based knowledge amongst different actors and across countries. These IPs create networks across formal and informal healthcare providers [164]. |
| Community-based participatory research | Community-based participatory research is a model that focuses on eliminating health disparities and using research for social action and change. The key stakeholders are community representatives who act as full partners with researchers to design, implement and evaluate research for the benefit of the community [165]. |
| Convergent innovation platform | Convergent IPs are focused on the integration of social and technological innovation. It takes a modular approach that convenes around roadmaps towards real world change [36]. |
| Crowdsourcing virtual platform | Crowdsourcing virtual platforms are built on a combination of crowdsourcing principles and virtual world simulation modelling. It is an open IP that allows a third party to “crowdsource” suggestions and feedback on challenges [93]. |
| External collaboration network | New innovative networks emerge as partnerships and collaborations are established across hospitals and other organisations. The success of hospitals will be less reliant on technology and more reliant on the integrated approaches in delivering hospital services centred on the user. Results of such networks include improved knowledge management, trust building, communication and focus on the user as the major mechanisms for opening up innovation [8]. |
| eHealth innovation network | eHealth networks are built on partnerships among health, education, industry and government. Focus is placed on R&D [166]. |
| Health hackathon | Healthcare-focused hackathons are time-limited platforms intended to accelerate novel medical technology. Hackathons champion the process of ‘co-creation’, in which serendipitous meetings of people across geographies and disciplines such as healthcare, design, engineering and business enable diverse teams to develop potential solutions [167]. |
| Innovation intermediary | Innovation intermediaries are multi-actor arrangements that have been captured using different concepts and terminology, such as coalitions; innovation configurations; innovation networks; public-private partnerships; and IPs. As an IP they focus on intervention approaches through research collaboration and address challenges and opportunities at different levels within a system [122]. |

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| Type of IP | Brief description of IP |
|---------------------------------------|--|
| Knowledge translation platform | Knowledge translation platforms are partnerships between policymakers, researchers, civil society groups, and other key health system stakeholders to facilitate the process of translating research evidence into policy and action [168]. |
| Living labs | Living labs move research from laboratories to in vivo settings. They are practical environments for innovation co-development and they reduce the time-to-market of innovations through early involvement of user groups [99], [162]. |
| Multi-stakeholder platform | Multi-stakeholder platforms are aimed at developing innovation capacity for a range of actors that are market-oriented [49], [139], [169]. |
| Online innovation intermediaries | Online innovation intermediaries are birthed from health 2.0 platforms. These online platforms enable increased information exchange between lay users, social networking and collective knowledge production. The following points are common to such IPs: (1) lay users are important producers of content; (2) users interact with themselves or the online platform; (3) facilitation of social opportunities such as community building and collaboration [32]. |
| Open collaboration platform | This platform is a grassroots model for collaboration amongst universities, national labs and global collaboration institutes. This involves collaborating with new and different kinds of external partners in the hopes of scaling faster [170]. |
| Open health platform | An open health platform is an online community platform for innovation which aims to activate and link diverse representatives of the public and enable them to cooperatively develop new products and services [161], [171]. |
| Service organisation innovation model | The service organisation innovation model is birthed from the need of services to meet services goals, as well as innovate and devise new customer related services [33]. |
| Service value networks | Service value networks is an ecosystem approach for co-creation, collective intelligence and open innovation. Such networks are flexible and dynamic webs of final customers and enterprises who jointly establish relationships amongst one another to deliver an value-added service to a final customer [157], [172]. |
| Smart health communities | The rise in digitisation of medicine requires new work processes, governance structures and relationships to address challenges. Smart health communities can be adopted to address these |

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| Type of IP | Brief description of IP |
|---------------------------------------|--|
| | challenges through drawing on end users as catalysts for co-evolution [79]. |
| Technology innovation platform | Technology IPs are been conceptualised as the result of the exploitation and reutilisation of knowledge and experience accumulated by the institutions in a sector. This is supplemented by the generation of new knowledge and distinctive technological competencies that are be shared [173]. |
| Traditional IP | Traditional IPs provide an infrastructure to put an inclusive innovation system approach into practice by bringing diverse stakeholders, with a specific focus on marginalised populations, together to address issues of mutual interest and concern. IPs put a strong emphasis on a iterative process of learning through reflection [35], [43], [141], [144], [147], [148], [160], [174]–[180]. |
| Virtual patient networks | Virtual patient networks identify and introduce new concepts and ideas related to services, processes or products that seek to ultimately improve health outcomes, safety, quality, cost-effectiveness and efficiency. Networks initiate co-operative and collective activities [21]. |
| Virtual research centre | A virtual research centre is a collaboration platform that uses the power of social networking to enhance the capabilities of content creation, sharing and storage [181]. Virtual research centres place great emphasis on the importance of audio and visual communication. |
| Virtual value co-creation communities | Virtual value co-creation communities are online support communities that enable value co-creation between peers, providing advantages for patients and for healthcare organisations [182]. |

4.5 Fundamental theoretical concepts

Theoretical foundations are abstract principles that describe the architecture of the platform from which theoretical concepts emanate. One may argue that the establishment of an IP will build on these concepts. The concepts discussed here form the basis of knowledge upon which the framework is developed.

The 44 publications included in the review highlight 16 fundamental theoretical concepts. These concepts are illustrated in Figure 27. Table 14 provides a definition of each of the identified concepts, as it pertains to IPs. It is evident that the consideration of the context of emergence is of crucial importance in this field of study as 34 publications addressed this concept. This is followed by capacity development and M&E that is addressed in 32 publications respectively.

INNOVATION PLATFORM CONCEPTS



Figure 27: Innovation platform concepts

IPs are widely used to postulate a system infrastructure that addresses the interdependencies amongst stakeholders to allow them to operate effectively [36]. This system infrastructure is built on a set of fundamental concepts defined in Table 14.

Table 14: Innovation platform concepts

| IP Concept | Role in IP | References |
|----------------------|--|--|
| Capacity development | Innovation capacity is the invisible glue that ties successful IPs together. Key elements of innovation capacity include: self-organisation, changing mindsets, valuing others' roles in innovation, skill learning, having a holistic view, adapting to changing situations, creating new ideas, being proactive, recognising opportunities, using indigenous ideas, and looking to the future. | [8], [15], [32], [35], [36], [43], [79], [93], [122], [132], [139], [141], [144], [147], [148], [157], [160], [161], [163], [164], [166], [167], [169], [172]–[174], [177], [178], [180], [183], [184] |

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| IP Concept | Role in IP | References |
|---|---|---|
| Change management | The resolution of bottlenecks often requires change. Change is frequently met with resistance as it introduces alienation and commotion. Change is a continuous process and requires creative adaptation and sustained reflection. Combining theories of change with practice through the application of IPs in development initiatives, increases the options for effective intervention and adoption. | [8], [15], [32], [35], [36], [43], [49], [122], [139], [141], [144], [161], [173], [174], [177], [178], [180] |
| Conflict resolution & dealing with power dynamics | Power relations between people and organisations within the platform can bias the discussions and influence decision-making. This can impair relationships and destroy trust between members. Structural power inequalities amongst stakeholders should be investigated and addressed. | [32], [36], [157], [162], [163], [165], [168], [172], [174], [178], [180] |
| Construction & deconstruction of sub-systems | Innovation intermediaries engage in coordinating and brokering relations at several interfaces in complex multi-actor configurations. This leads to the construction & deconstruction of sub-systems to create a suitable innovation climate in which stakeholders are empowered to join forces across different levels. | [43], [122], [132], [160], [162], [174], [184] |
| Context of emergence | The context of emergence of the IP is viewed as a driver for innovation as well as the foundation from which to develop the IP. IPs require deep contextual knowledge to foster engagement in a sustainable manner. This aligns stakeholder goals and determines the activities to proceed with. It also provides insight into the landscape in which the IP will function. | [8], [15], [21], [32], [33], [79], [93], [99], [122], [132], [139], [141], [144], [147], [148], [157], [160]–[164], [166], [168]–[170], [172], [173], [177], [178], [180], [181], [183] |
| Demand articulation | Prior to getting members on-board with the IP, it is important to ensure that the IP's goals are well communicated. Demand articulation can be used for consumer engagement towards developing a common vision. | [36], [122], [163], [169], [173], [175] |

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| IP Concept | Role in IP | References |
|--------------------------------|---|---|
| Dynamics processes | IPs operate in dynamic environments. Each stakeholder needs to feel valued within the IP and support each other towards attaining the IP goals. A clear understanding of the expectations of all stakeholders will promote open communication and foster trust amongst one another. | [8], [21], [33], [35], [122], [139], [162], [165], [169], [172]–[174], [176], [177], [180] |
| Informal & formal institutions | Informal and formal institutions are acknowledged as important structural elements providing constraints to inclusive innovation. IPs see it as an important task to identify these with relevant stakeholders and try to change them over time. | [35], [122], [162], [184] |
| Incentives & reward systems | The relative importance of incentives is influenced by the type of IP and the infrastructure that is available. Monetary incentives are commonly adopted. This attracts diverse stakeholders and motivates them to stay involved in the platform activities. Alternatively, the potential for stakeholders to influence policy making processes or to achieve a specific objective is often incentive enough. | [8], [21], [43], [49], [122], [141], [147], [164], [171], [181] |
| Infrastructure | When considering the phenomenon of IPs, they can be defined in terms of their physical requirements or in terms of their social interactions. The infrastructure merely provides structure to allow for the required processes to take place. | [8], [21], [32], [35], [91], [122], [132], [148], [162], [163], [165], [167]–[169], [171], [173], [177], [178], [182] |
| Knowledge management | Knowledge management and exchange are central to the operation of IPs. The dissemination of knowledge is not only key to the functioning of an IP, but it also has a major impact on the capacity development potential of an IP. There are various enabling mechanisms and tools that can be adopted by IPs to enhance their knowledge transfer capabilities. | [8], [15], [21], [32], [36], [79], [93], [99], [122], [132], [139], [148], [157], [161], [162], [164]–[166], [169], [171]–[173], [175]–[178], [180]–[183] |

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| IP Concept | Role in IP | References |
|--|--|---|
| Knowledge management, transfer & co-creation | <p>The ability of the stakeholders to interact in a constructive manner that promotes participatory learning is a vital element in IPs. By increasing the stakeholders' capacity to learn from the perspectives of others, the likelihood of the IP succeeding and reaching its goals also increases. Knowledge transfer should be a dyadic communication process. With any knowledge transfer activities, M&E of the processes is key.</p> | <p>[8], [15], [32], [35], [79], [93], [99], [122], [132], [139], [148], [157], [161], [162], [164], [166], [169], [171]–[173], [175], [177], [178], [180]–[184]</p> |
| Required architecture for development | <p>Although adaptability is encouraged for all IPs, there are a few structures that need to be in place for its existence. Human resources, financial resources as well as physical resources are required to allow for optimal functioning of the platform.</p> | <p>[8], [15], [21], [32], [36], [43], [79], [132], [144], [148], [160], [162], [163], [166], [168], [169], [173], [174], [178], [181], [182]</p> |
| Scaling up & scaling out | <p>IPs can be viewed as a vehicle that overcomes the traditional boundaries between stakeholders, as it pertains to finding innovative solutions.</p> <p>The scaling up and scaling out of platforms refers to the sustainable dissemination of knowledge across different levels of functioning and the approaches adopted towards piloting similar IPs in alternative areas.</p> | <p>[15], [21], [32], [33], [36], [43], [79], [99], [122], [132], [144], [148], [157], [160], [162], [163], [166]–[169], [173], [174], [177], [178], [181]–[184]</p> |
| Termination of IP/members | <p>IPs are developed with a strategic aim and thus require an evolving membership from which relevant expertise can be drawn, depending on the problem at hand. An IP can be dismantled, once the initial problem has been resolved and the objectives have been achieved. The most sustainable outcome for an IP is to achieve increased innovation capacity. Once capacity for innovation is established in a system, the platform itself may not be required.</p> | <p>[43], [139], [144], [178]</p> |

4.6 Gap identification analysis

This section introduces the research gap identification of the study. There are certain aspects of the 16 concepts identified in the systematic review that necessitate further investigation towards clarification. This is required prior to building on these concepts in the framework.

These concepts are further investigated to clarify their level of functioning within the IP. The concepts are categorised as activities, processes or dimensions. Thereafter, concepts are investigated to identify additional concepts that need to be included within the framework.

4.6.1 INNOVATION PLATFORM ACTIVITIES

4.6.1.1 STAKEHOLDER REPRESENTATIVE DEMAND ARTICULATION

IPs aim to achieve realistic, timely and context specific objectives. The purpose of an IP can range from creating monetary wealth through market development to the development of solutions that address social challenges [184]. IPs can be viewed as a vehicle that transcends the traditional boundaries between stakeholders in the innovation process.

Visioning and foresight exercises are often used to establish an IPs common objective [53], [180]. Since interest amongst stakeholders vary and is often described as divergent, agreeing upon a common objective requires negotiation [55]. The conflict sparked during this process can potentially act as a catalyst for change. It is however not advised to push stakeholders to achieve consensus as this may lead to the exclusion of stakeholders with less of a voice [55].

Deliberate focus is placed on orientating **visioning and planning** towards local needs. This enables actors to identify bottlenecks hindering innovation and to agree on the issues to address. The innovation imperative is communicated early on to determine the activities to proceed with and to **guide the search** towards appropriate interventions [45]. The value of a goal-orientated approach is that it ensures alignment with strategic objectives as well as ensuring that stakeholders work towards a common goal.

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4.6.1.2 POWER DYNAMICS AND CONFLICT RESOLUTION

“Everyone wants to grow; most people are just unwilling to change in order to do so.”

~ Anonymous

The consideration of power relations amongst IP members and the conflict that may arise from it needs to be acknowledged. These power-relations can play a role in every phase of the platform process in different forms [55]. If these relations are not addressed from the inception of the IP they have the ability to muddle the opinions of actors as well as breaking the trust amongst the group. The dynamics within the group and sub-sequently the effectiveness of the IP in achieving it's goal can greatly be prejudiced by this. The visibility or influence of these relations can differ, but it remains an imperative to recognise these power dynamics and their influence to ensure the effectiveness of the platform [174].

The local context should be investigated thoroughly before establishing a platform. A baseline analysis provides initial information, and makes it possible to assess the impact and equitability of interventions. Investigating the broader economic, political and cultural context may reveal reasons for power or status imbalances [174].

If such relations are not dealt with explicitly, there is a risk of reinforcing power structures through IPs, e.g. hierarchical top-down government structures [178]. The power dynamism presents itself in a range of ways, from members imposing ideas or controlling decision-making to less apparent forms of resistance such as withdrawal and passive participation in the process [178].

Leeuwis [153] suggests that three conditions are to be satisfied to allow for negotiations to take place. These circumstances include: 1) mutual interdependence amongst members; 2) avenues for clear communication; and 3) the availability of institutional space to use negotiation results. Publishing the results from the negotiations will enable government and policy makers to reflect on findings and to integrate suggested solutions where they deem fit [55]. Through ensuring the **inclusion & representation of all stakeholder** groups the power dynamics may be addressed.

It is also relevant to consider where resources come from and who controls them as this inherently influences power dynamics [174]. A steering body¹⁷ of the IP can be elected to assist in the allocation of resources as a measure to broaden decision making beyond implementing partners and research centres [55].

¹⁷ President, secretary and treasurer.

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4.6.1.3 MONITORING AND EVALUATION

IPs pose a good way to get to the root of problems and can bring about real, durable change for many people. However, the impact of IPs is often difficult to M&E since they are complex in nature, their costs are high early on and effects may take time to develop, hidden under the surface, and hard to predict, measure and attribute.

Numerous impacts of IPs, including 'innovation capacity' are intangible and are therefore difficult to quantify and measure. Changes often emerge as the unintended outcome of numerous intentional actions which interact and interfere with each other in complex ways [53], [55], [174]. Innovation processes rely on the interplay of several factors, making it challenging to attribute changes to a specific source [141]. This increases the difficulty of measuring IPs as their outcomes remain largely unintentional, despite planning efforts [176], [185]. These challenges infer that traditional indicators and conventional frameworks are too narrow.

M&E processes require an analysis of system weaknesses and failures. These include identifying cost drivers, risk, opportunities, sustainability, resilience, competitive advantage, localisation issues, strength of the knowledge base and delivery pathways to healthcare.

Impacts take time to emerge, but donors need evidence in the short term. Measuring too early can erroneously show an absence of impact. Therefore, a new unique/customised approach is needed. Monitoring and reflection is a good way to iteratively improve design & solution.

The aim of the IP approach is not only to have a positive financial impact. These measurements should be augmented to include any changes in the way decision makers think, non-governmental organisations interact or HCWs function. An evidence-based approach to effectively measure these changes is required [186].

Monitoring aims to assess the functioning and effectiveness of IPs to improve policy and practice, develop capacity and improve links among actors. The information it gathers can be used to improve the management of the platform and its activities, change policies, and promote larger scale changes.

Three aspects of an IP can be monitored:

1. Activities that aim to resolve a problem or take advantage of an opportunity. They may include technologies, methods and approaches, policies, empirical evidences or other tangible products. Monitoring activities makes it possible to track progress, provide feedback and improve performance.

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2. Process outputs include changes in knowledge, attitudes and practices of the platform members and the organizations or groups they represent, and the relationships among them. Monitoring process outcomes gives an understanding of how the IP changes the knowledge, attitudes and practices of individuals and the links between them.
3. Results are the impacts on the marginalised populations (and on other target beneficiaries). Monitoring results provides quantitative and qualitative evidence of the platform's work and allows it to be compared with other approaches.

Activity monitoring involves IP members who are directly involved in the activity [176]. Evaluation is a more complete, cumulative, and thorough process and a less frequent form of reflection takes place at certain points in time for fundamental decision-making.

Evaluation is important as it provides accountability to the funder for expected benefit; it allows for a deeper understanding of the change theory to increase practical utility; it assists in making adjustments in funding strategy to better align evolving theory and conditions; as well as determining how to sustain the beneficial aspects beyond the period of funding. Evaluation also provides project leaders with perspective, to see their work within the bigger picture.

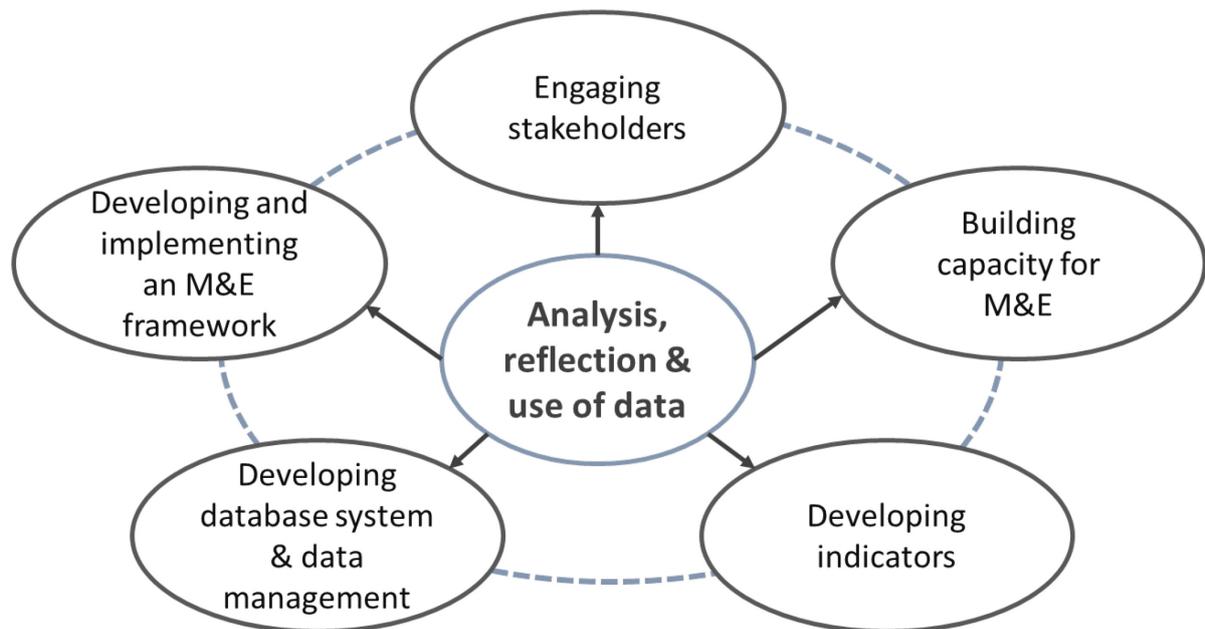


Figure 28: Key steps to integrating monitoring and evaluation into innovation platforms (Adapted from Makini *et al.* [138])

The first step in Figure 28, engaging stakeholders, refers to establishing an understanding of the need for continuous learning within the IP. Building stakeholders' capacity for M&E is based on members understanding of how to monitor and learn from platform activities and outcomes [138]. To guarantee a sustainable M&E system, continuous coaching to enhance learning by doing, use of tools and reflection on the process is required.

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The development of a database and data management framework relies on the involvement of key partners during the course of the IP season.

The initial assessment of the context always starts with a set of clear targets and questions. This participatory assessment is conducted to capture opinions of a diverse set of stakeholders. Areas that require attention are identified from the assessment results and are continually adjusted to enhance performance. Scheduled meetings, constant communication and intentional focus on relationship-development are crucial in creating an atmosphere of open communication. This is essential to identifying opportunities for improvement [55].

To ensure that the M&E processes implemented in the platform are relevant and responsive, it must be developed in a participatory manner in which platform members engage in planning and visioning at the commencement of a project.

Participatory M&E is beneficial as it provides stakeholders with the opportunity to learn from others and to provide feedback on the process from their perspective [187]. Furthermore, reflection on platform activities allow for the creation of feedback loops that provide valuable insights into innovation processes [117]. These feedback channels should not be restricted to a single phase of the IP development, but should be incorporated across the IP life cycle in different formats [98].

The M&E methods that form part of IPs recognise that failure is a learning opportunity and is merely part of the elimination process of unsuccessful options [141]. Continuous M&E is required to identify barriers to innovation in a timely manner and to take the necessary corrective action.

As stakeholders experience first-hand the impact of interventions or changes in strategies, it is in their interest to adapt, improve and re-evaluate. The iterative nature of the IP provides an ideal opportunity to M&E impact and share successes [188]. Figure 29 illustrates the internal and external actors involved in IP M&E.

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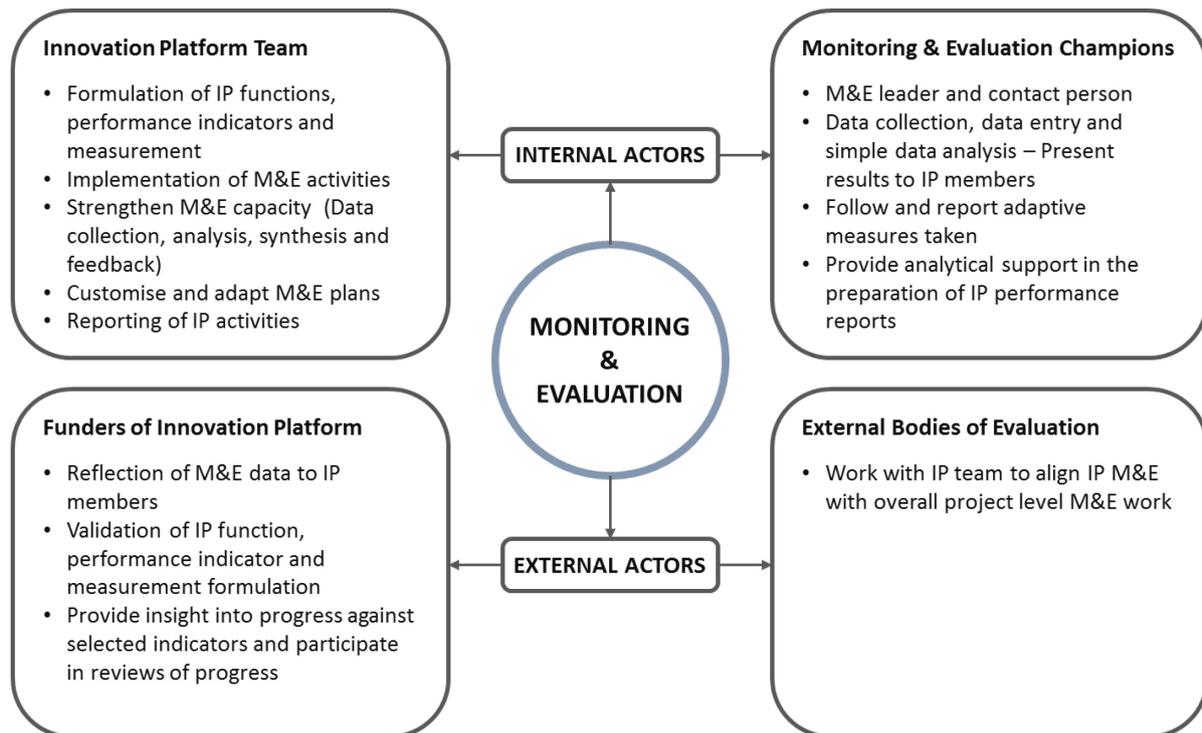


Figure 29: Roles & responsibilities in monitoring and evaluation (Adapted from Damtew [140])

M&E procedures support transparent and efficient relationships amongst stakeholder and are a necessity in IP management. The inclusion of M&E assists platform members in their quest towards learning and allows learning facilitators to shift their focus to global learning for the IP [55]. M&E allow for the monitoring of IPs' ability to improve communication, coordination, information and knowledge sharing, facilitation and delivery of agreed upon outputs and outcomes [55], [140]. This project has not endeavoured into this sphere since an expert understanding on M&E is required.

4.6.2 INNOVATION PLATFORM PROCESSES

4.6.2.1 INCENTIVES & REWARD SYSTEMS

For the required extent of transformation to take place within an IP, all actors must be on-board and willing to work towards the established goal. To actively keep stakeholders involved and engaged in the IP over time is challenging [53]. Motivation is crucial to IP success as members need to take ownership of the suggested solution space. One way to achieve this is through introducing incentives.

Incentives are essential at the commencement of a project. It is a well-established notion that platform projects only continue to operate if there is a mutual benefit for all stages of the platform's activities. It is however important to highlight that incentives must speak to member satisfaction to be successful. With such a diverse set of stakeholders involved in a platform, a range of different incentives have to be introduced [155].

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The benefits of participation in the project needs to be clear. External motivators such as material inputs are often employed to motivate stakeholders to join an IP. This type of motivation is not sustainable and internally motivated members are more likely to make noteworthy contributions to the innovation process [55]. This pattern is afforded to members' difficulty in identifying intangible objectives set at the onset of the platform.

There are both external and internal considerations when determining the incentives that will best motivate the members involved. Through creating opportunities for further training/capacity development members are likely to invest more into attaining the goal determined by the platform.

The nature and power of incentives is also partially dependent on the platform's area of application [55]. Incentives do not always have to be monetary, but they must be valuable to the intended user-group. The determinants of the drivers of human behaviour are used to identify appropriate incentives.

Dominant solutions are unlikely to emerge until these issues are worked out at the community level, where incentives are being tested before scale is exploited [79]. Early wins in implementation of solutions motivates stakeholders and it builds the confidence of the members [189], [190]. This can also aid in **driving participation, commitment, ownership** of projects.

Stakeholders' long-term as well as short-term concerns and interests should be included in the platform's activity planning. Accomplishing short-term objectives can potentially maintain participant motivation and engagement in the innovation process [155].

4.6.2.2 FACILITATION AND COORDINATION

Paramount to the success of an IP is the facilitator [180]. IPs require good facilitation to produce significant innovations [53], [100], [155], [180]. This person will be involved from the initiation of the platform and may additionally fulfil the role of project champion. The facilitator is crucial in ensuring engagement amongst the IP members and resolving power dynamics that might lead to conflict. Within developing countries it has been proposed that the facilitator be someone who understands the entire industry landscape, especially the role of the government. Having the financial support from the government as well as their support in terms of policy making can prove to be a determining factor in the establishment of solutions [160].

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Facilitators should consciously embody a neutral position, recognising the interests of all of the stakeholders [180]. On occasion it is required that the facilitator depart from their neutral position to advocate on behalf of a less powerful group. Facilitators may originate from various organisations [191]. A facilitator ensures that the IP remains operationally alive [138]. This will rely on the facilitator's networking skills and their ability to conduct the role of a connector.

The IP champion has the ability to influence the overarching direction in which the IP develops over its lifespan [53], [103]. They may champion a cause and coordinate the process for that particular intervention based on high levels of self-motivation and knowledge. The role of the project champion also encompasses the responsibility of ensuring continuity between projects by transferring knowledge between consecutive project members [138].

Additionally, IPs may be established by an innovation initiator or an innovation broker. An innovation initiator is characterised as the “person or organisation that brings together and mediates between stakeholders within the context of an IP” [138]. Innovation brokers are defined as “people or organisations that, from a moderately impartial third-party position, intentionally catalyse innovation through bringing together actors and facilitating their interaction” [187, p. 221].

Creating and fostering effective coalitions among actors is frequently hindered by an incomplete understanding about what potential partners can offer [184]. People who act as brokers in networks connect stakeholders that are not familiar with each other but may provide “new combinations” essential to innovation. They are responsible for connecting the different levels and for providing guidance for a period before leaving these roles to the local stakeholders. Such brokers are required to forge many-to-many relationships.

Knowledge brokers play a crucial role in the functioning of IPs. They mediate the collaboration between platform members, are able to understand innovation problems and can translate innovation problems into a structured project. Knowledge brokers understand the necessary capabilities, skills and knowledge required to solve problems are able to identify the best equipped actors to address the problem [192]. They are key in enabling the exchange of relevant ‘external’ knowledge within the social network of the IP as they are capable of transferring knowledge from where it is abundant to where necessary [193].

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4.6.2.3 COMMUNICATION

Communication has been identified as a focus area as it is crucial that stakeholders have transparent relationships to avoid misunderstandings and conflict.

Effective communication has a direct impact on the level of engagement amongst platform members and as such members who display effective communication skills are assigned specific roles as communicators [138]. The development of sub-groups and committees are essential to transcend any biases that might be at play.

Members should come to an agreement on a practical communication strategy. This will ensure that IP functions, member tasks and overall progress is shared across the platform [138]. The sharing of findings allows for lessons to be instilled amongst members. This aids in creating accountability amongst members and allows for flexibility in decision-making.

Effective measures of communication are important to avoid information overload. This can cause information to change from being useful to causing confusion. The level of communication in terms of the information that is shared needs to be determined early on. An assessment should be completed to determine what information is needed for whom, when and in what format. [138].

Both formal and informal channels of communication play an important role within IPs. Such channels should be incorporated early on and continuously, but they should not be employed excessively. Effective communication lays the foundation for improved response times, clarifications and feedback within a platform [138].

The incorporation of ICT should be investigated and exploited to harness information flow and communication. ICTs are a diverse set of technological tools and resources used to communicate and to create, disseminate, store and manage information.

Victor *et al.* [183] argues that communication is vital to IPs as it serves three purposes. 1) It supports learning amongst members of the platform; 2) it promotes engagement and dialogue; and 3) it is needed for the documentation of IPs.

4.6.2.3.1 SUPPORTING LEARNING

Learning breeds innovation & sharpens the capacity to innovate over time. Formal learning opportunities to attain skills such as negotiation and communication can act as an incentive and also offsets power differences amongst stakeholders.

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4.6.2.3.2 PROMOTING ENGAGEMENT AND DIALOGUE

Communication has the ability to bring diverse perspectives to light and thus assists in developing trust to share knowledge & views. The resolution to bottlenecks often require change which is met with resistance. This can be afforded to the fact that change leads to alienation and commotion. Open and honest communication is encouraged within the IP.

Each stakeholder needs to value the role that they play within the IP as well as supporting each other as they work towards attaining their goals. A clear understanding of the expectations of all stakeholders will promote open communication. It is important for the stakeholders to foster trust amongst one another and to resolve any conflict that may arise [180].

4.6.2.3.3 DOCUMENTATION OF ACTIVITIES

The activities, findings & events hosted by the platform must be documented as well as any research, which is performed. Platform stakeholders should easily have access to this information. Documenting platform activities & changes in stakeholder activities & perceptions is an important part of the monitoring & learning activities that are so critical for the successful functioning of the platform.

Platform members should periodically reflect on platform activities & outcomes of the events. This aids in building a learning portfolio of the IP to support how it has brought about changed attitudes and addressed challenges. Such experiences should be organised, synthesised and shared towards improved IP evolution in the future [138]. Documentation allows for outreach to take place. This is important for scaling up¹⁸ and scaling out¹⁹.

4.6.2.4 SCALING UP & SCALING OUT

Hendrickx *et al.* [194] states that prior to scaling IPs, an evaluation of the context is needed. The possibility to form networks between IPs working at the same level is one that could prove to be beneficial.

To improve the success prospects of an IP, the members that can be relied on for execution of the scaling up and out strategy should be identified at the commencement of the IP. The strategy should include a detailed overview of the who, what, when, how and why. Prior to implementing the strategy, the potential to scale-out and up needs to be investigated in terms of the benefits and the institutional arrangements of the IP [138]. Through designing for scalability, the potential for **entrepreneurial endeavours** is supported.

¹⁸ Influence policy makers to bring about change.

¹⁹ Show others in community what can be achieved.

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4.6.2.5 CONSTRUCTION & DECONSTRUCTION OF SUBSYSTEMS

Subgroups can give extra focus on the needs of specific groups. They can give marginalized members more power or build their capacities, for example, by providing training in negotiation and leadership skills or by facilitating collective action [116]. These sub-systems ease the means by which participants may **seek opportunities** for engagement.

4.6.2.6 KNOWLEDGE MANAGEMENT, TRANSFER & CO-CREATION

This function describes the processes of knowledge development and learning. It can take place within organisations, networks, specialised knowledge institutes or individuals. Knowledge can be developed through formal R&D activities, public research or less formal and specialised activities [41].

Knowledge creation, knowledge sharing, knowledge exchange and knowledge transfer are some of the knowledge processes that are outlined in the literature on knowledge in management research [193]. An issue of critical importance in the innovation process is the access and elicitation of knowledge embedded within one community or organisational group.

Innovation is often defined as the process of making changes to something established by introducing something new, this definition needs to be redefined to include the importance of the addition of value for IP members as well as the need to contribute to the knowledge store of the IP [138]. Bessant *et al.* [84], encourages the dissemination of ideas and shared learning through reports, publications, workshops and events.

An overarching theme in literature is the importance of knowledge as a resource towards innovation, while learning is classified as the most fundamental process [195], [196]. The understanding of the different forms and kinds of knowledge and learning that has evolved, expands the perception of the processes needed in the development and diffusion of innovations [111].

The reality of Africa's underdeveloped infrastructure – specifically in rural areas – means traditional methods of information sharing are not adequate. IPs have the ability to effectively deploy knowledge and skills in areas that lack resources. Knowledge creation and collaborative learning amongst members are central functions of an IP as they are enablers of inclusive innovation [42] [183].

4.6.2.6.1 RESEARCH AND DEVELOPMENT

Research and IPs contribute to one another. Research strengthens IPs: their work is better informed, more systematic and more credible. Platforms can also strengthen research through making it more applied, more realistic, more acceptable, and more likely to be adopted [175].

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A critical principle is that the members' needs must inform the research objectives and the goals to be achieved.

Studies have shown that healthcare professionals often have a poor understanding of patients and do not necessarily represent patients' views [161]. Policy-makers, social entrepreneurs and the corporate sector all need better evidence regarding health markets [164].

Innovation networks enable collaborative creation and sharing of ideas [197]. The development of social ties assist in the development of a mutual understanding and respect for each others' agenda. The building of ties may be encouraged through the use of incentives and effective communication [193]. A shift away from linear collaborative research approaches is required to accommodate these tendencies [198]. The institutional, cultural and power dynamics that are inherent to healthcare practices also need to be considered [193].

4.6.2.6.2 CO-CREATION

Knowledge co-creation is an important consideration of an IP as it is pivotal to enabling inclusive innovation processes. This process does however have intellectual property implications that need to be addressed [20].

From a value network perspective, all actors collaborate and integrate resources to create value for themselves and for others [172]. Value creation goes beyond an organisation's boundaries as the interactions between actors introduces new opportunities to facilitate improvements across the board [172].

McCull-Kennedy *et al.* [199, p. 1] defined customer value co-creation in the healthcare context as "benefit realised from integration of resources through activities and interactions with collaborators in the customer's service network." Within healthcare, emphasis is placed on understanding the value creation process from the perspective of different actors to improve access to healthcare [172].

Co-created services of this kind require mobilisation of knowledge and resources, which are distributed across communities and an active engagement of members of those communities—rather than central and unilateral supply driven solutions. Co-design also helps deal with the customisation argument – rather than trying to design one size fits all, work with diverse users allows configurations which bring their particular set of needs and wishes into the equation [84]. The inclusion of local knowledge is paramount to the effectiveness of innovations [142], [200]. Local knowledge is often implicit or tacit, making it difficult to articulate and elicit.

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Marginalised stakeholders often struggle to share their knowledge within the platform as the value that is associated with their knowledge in comparison to the importance of research driven knowledge is palpable [178]. Scientific knowledge is frequently affiliated with authority, status and legitimacy [55], [201]. Participatory methods towards the elicitation of local knowledge amongst all platform members is thus required [142].

Social learning is defined as “collective learning whereby different stakeholders generate new knowledge, skills, confidence, resources, insight and perspectives on which action can be based” [153, p. 936]. This is a key aspect of knowledge co-creation as it seeks to assist stakeholders in understanding one another’s perspectives. This greatly aids in the development of joint solutions and agreements.

4.6.2.6.3 KNOWLEDGE MANAGEMENT

Knowledge management makes research more accessible and interprets it so people can understand and use it. There are many ways to do this: identifying shared objectives, producing knowledge jointly, learning together, documenting innovation processes and best practices and communicating results [175].

Platforms that continuously learn and adapt their behaviour to external stimuli continuously add to their collective knowledge store and thus increase their novelty and originality [138]. Further investigation is required into the timing of the establishment of suitable linkages to develop and access knowledge and learning [117]. Some of the enabling mechanisms that can be adopted by IPs to enhance their knowledge transfer capabilities are listed in Section 6.4.1.5.

The rise of interactive capabilities in the online sphere promises to be an effective source of jointly created and shared knowledge through patient, caregiver, health professional and researcher participation [84].

4.6.2.7 DYNAMICS THROUGH PROCESSES

“A system is not the sum of its parts, but the product of its interactions.”

~ Russel Ackoff

Change is required in order to meet the demands of today’s environment. This change can be effected through appropriate leadership and the driving of innovation with a view to improving the quality of care provided. For these transformational processes to take place, people are required.

Innovation processes are defined as being dynamic, diverse, context-specific and characterised by uncertainty, coincidence and unpredictability [53], [55], [100], [144], [200].

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Consequently, IPs require constant adaptations to changing conditions. While there tends to be a core team that actively facilitates interactions among its members, those members interact more or less closely as the problem definition changes and different skill sets are required.

IPs are developed with a specific strategic aim and thus require an evolving membership from which relevant expertise can be drawn, depending on the problem at hand. The role of the R&D organisations changes from initial leadership to providing backstopping when and as required. The natural propensity of a researcher is to speak, and this can inhibit the other platform members to share their views. It is important that actors acknowledge that the different types of knowledge do not differ in importance.

Figure 30 highlights some of dynamism within IPs [55]. Adherence to rigid structures and resistance to change often stifle innovation. These changes are often indicative of healthy platforms.

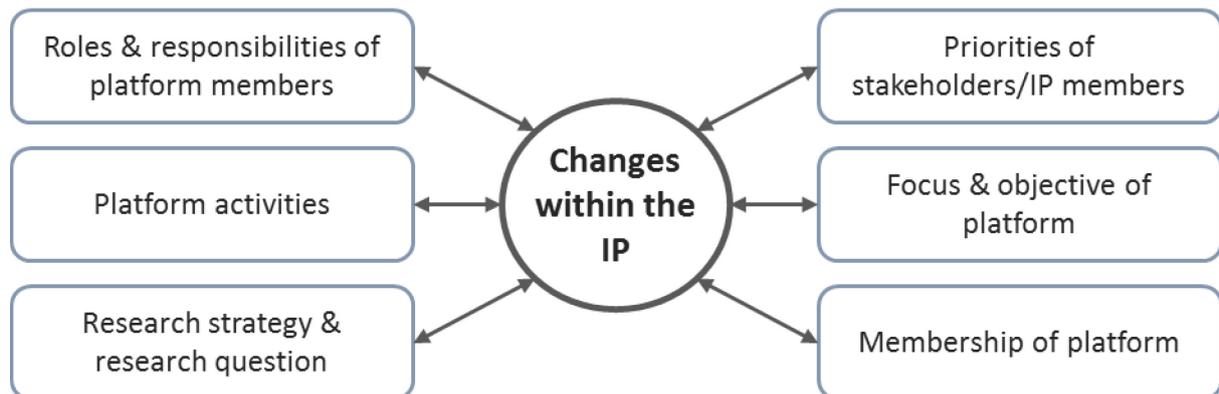


Figure 30: Changes that occur within IPs (Adapted from Boogaard *et al.* [55])

To embrace such changes, an open and flexible research strategy should be adopted from the establishment of the platform [142]. Platform members need to join the project knowing that IP objectives are subject to change and as such their role and responsibility within the IP may be augmented. Adaptive management measures, such as the creation of spaces for unexpected activities, can be incorporated in the running of the IP. Innovation occurs at an unpredictable pace and thus relies on a prompt response to opportunities when they arise [55].

The sustainability of IPs is often questioned as innovation processes take a long time to return benefits and they are resource intensive [53], [138]. The sustainability of a platform is a multi-dimensional issue that considers the IP's ability to "continue to innovate, consolidate its gains, change its focus when necessary, renew its membership to address new issues and thereby continue to generate benefits for its members over time with relative stability" [138].

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The impact of a platform is not always a direct effect of the IP activities, but it can also be achieved through linkages and an innovation culture among a group of stakeholders that are no longer members of the IP.

Boogaard *et al.* [144] state that once an IP has resolved the problem identified at the outset of the project, it should not be kept alive artificially. Not all IPs need to be self-sustaining to be considered a success. It depends on the goal of the IP. In order to ensure the survival of an IP over time, the responsibility of the functioning of the IP needs to shift from being project driven to becoming more stakeholder driven. The most sustainable outcome that an IP can hope to achieve is increased innovation capacity.

IPs may be temporary: they exist only as long as necessary to solve a problem. Or they may be extended as new issues and opportunities emerge. If so, it is necessary to find ways to fund the platform and its activities after initial project funding ends.

4.6.2.8 FORMAL AND INFORMAL INSTITUTIONS

An IP's boundaries may be geographic, thematic, sectoral or VC related [138]. IPs must always possess clear ground rules to define how decision-making takes place, how conflicts are dealt with and how new members or organisations join [138]. The presence of ground rules supports the dynamic nature of the IP as it allows for an evolving membership that attracts appropriate expertise as required by the IP objective. Both the focus of the platform and the roles of the members change over time [53].

Institutions can be defined as the written and unwritten rules of the game, including for example laws, regulations, attitudes, habits, practices, norms, values, culture, and incentives [191].

Furthermore, local institutions embedded in norms and values are crucial to understand people's decisions. Public consultation and participation are valuable tools to draw on in support of the successful implementation of new policies and in order to reduce any disparities between intended policies and everyday lived reality. The advantages of involving public stakeholders in decision making are to promote the goals, bind individuals and groups together, support civic and political identity, and create competence and responsibility [14].

IPs can support the development and harmonisation of national policies by setting agreed standards for a sector. Such standards can define the quality of products being traded on national and international markets, so reinforcing the confidence of consumers in the products [160]. The bottom-up processes that need to be stimulated means a whole new range of instruments and mechanisms to drive this behaviour [202].

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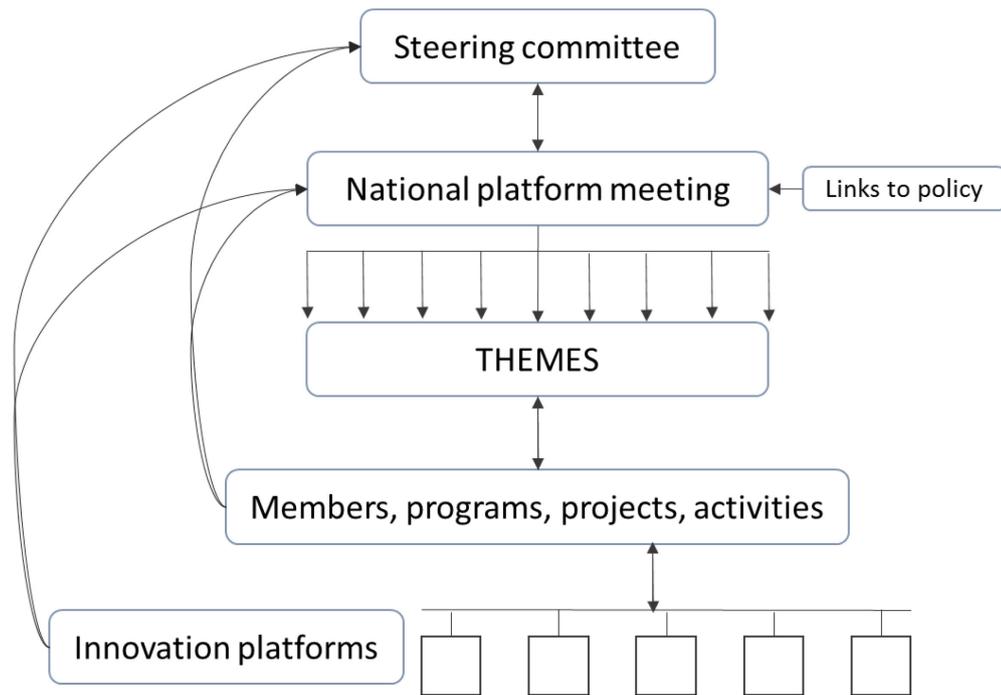


Figure 31: Innovation platform flow

Figure 31 displays the flow of information and communication amongst the different levels of institutions involved in the IP domain. There is continuous feedback from the bottom-up to ensure transparency amongst all stakeholders involved.

The inclusion of a steering committee and the proposed structure is to address problems of institutional design. This refers to the consideration of the hard and soft rules of the game, laws and regulation and the environment within which people engage and interact.

Some problems cannot be addressed at one level: a district-level platform may identify a policy that needs to be changed at a national level. It may be useful to form IPs at several levels (community, district, national) to address problems at each one [184].

Through this consideration, the IP aims to influence policy-making through focusing on local, grassroots community empowerment, regional allocation of resources and nationally, investigate the policy implementation process and funding structures. IPs lobby for changes in physical, financial & political infrastructure to support their work.

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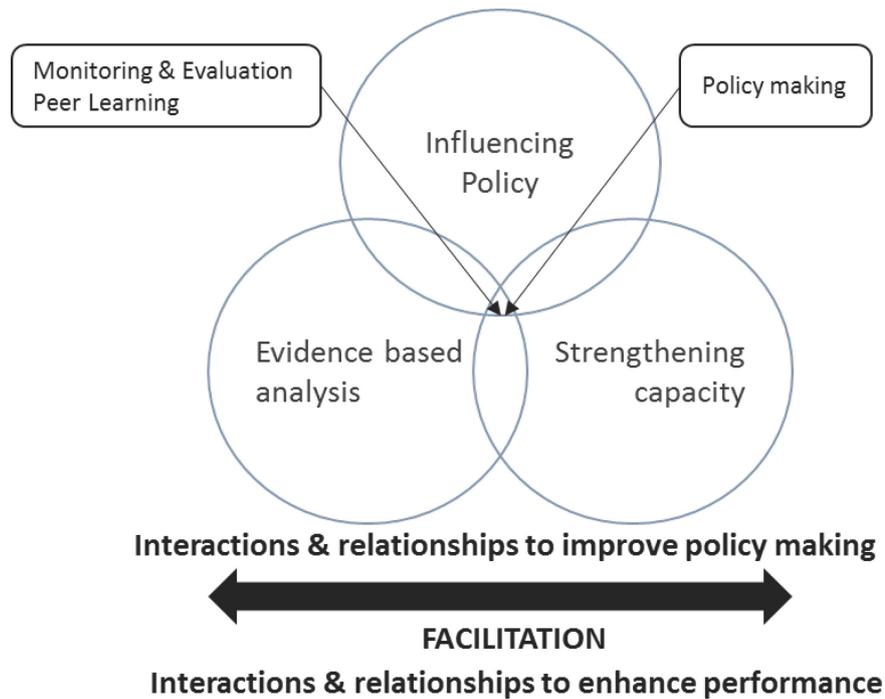


Figure 32: Policy dialogue in IPs (Adapted from Sanyang *et al.* [177])

Policy choices could be improved through more systematic, transparent, and wide-ranging consideration of their impacts on environment and health. Any time a policy is being considered, impacts are weighed, informally if not formally [203]. Figure 32 presents the policy dialogues within IPs. Here the importance of facilitation is highlighted in strengthening capacity constructed on evidence based analysis towards influencing policy [177].

Policy-makers play an important role in supporting the creation of innovation clusters and networks [106]. They should support the integration of public research institutions in innovation networks through the use of policies [204].

In the world of policymaking it is crucial to consider all of the sectors interests' during the policy processes [160]. It creates spaces of openness, probing and learning instead of trying to limit options for actors, institutions and processes.

By bringing together the expertise, experience and interests of different members, IPs can provide a valuable contribution to the development, implementation, M&E of policies. Such joint policymaking processes can enable rapid adoption of policies or widespread implementation of new policies [160].

Even though healthcare organisations should promote and encourage interaction between users, they should also have clear policies and actively moderate discussions not only to engage individuals, but also to reduce the dissemination of potentially harmful ideas [205].

4.6.3 INNOVATION PLATFORM DIMENSIONS

4.6.3.1 REQUIRED ARCHITECTURE FOR DEVELOPMENT: RESOURCES

In order to optimise the functioning of the platform, the required resources, their sources, and mechanisms towards sustainability need to be identified [138]. The resources required to complete such tasks consist of finance, knowledge, time, transport and a space. Platforms require spaces to allow for experimentation, engagement as well as capacity development. Neutral spaces in which actors feel comfortable voicing their opinions without experiencing pressure from the external environment is essential.

4.6.3.1.1 FUNDING

Finance has been ranked as the most critical resource in maintaining IPs. The novelty surrounding the solutions that are proposed by platforms are often finance-intensive [138]. As such, funds are needed to administer joint activities such as workshops and exchange visits, to promote learning [53]. The efficiency of an IP is also influenced by the availability of IP operating funds.

4.6.3.1.2 RESEARCHER

Research organisations play a major role in the success of IPs. The role of researchers in the composition and initiation of a platform is multi-fold:

- Support stakeholder mapping.
- Make choices and the underlying assumptions of selection of power and equity explicit.
- Undertake capacity development to ensure a common understanding on IPs.
- Platform objectives are often defined within a project proposal, before stakeholders have been consulted. This bears risk of dominance by researchers and project management, unless they make underlying project assumptions explicit to platform members.
- Supporting stakeholders in expressing their needs and translating these needs into relevant research questions.
- What to do when the platform objective differs from the (initial) project vision and research agenda?

4.6.3.1.3 TECHNOLOGY

Technology has always played an important role in driving innovation, and it will continue to do so in the future. However, for many hospitals, technology is gradually shifting from being a driver to becoming an enabler of innovation. Many hospitals look to technology as an opportunity to streamline processes and reduce costs. The effective diffusion of best practices and wide collaboration networks are crucial for optimal use of technology [8].

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4.6.3.2 STAKEHOLDER PARTICIPATION PROCESS AND PRACTICAL FRAMEWORKS

“People need to feel the discomfort of a problem to truly take ownership of the problem and invest in sustainable solutions.”

~ Unknown

The IP approach is built on the integration and cooperation of a diverse set of stakeholders and as such, people play a crucial role in determining the success of an IP. van Rooyen *et al.* [180] notes that the integration amongst stakeholders is not always smooth at the onset of a project. Effective interaction amongst stakeholders, that do not normally interact directly, does not occur spontaneously [155], [180]. Skilled facilitators help mediate between the different agendas of platform members to reach a compromise acceptable to all [138].

Adopting collaborative interdependence provides the foundation needed to facilitate interaction in building an IP. Collaborative interdependence is a partnership model whereby each party recognises that, on a fundamental level, their goals and strategies intersect and overlap [36].

4.6.3.2.1 STAKEHOLDER ENGAGEMENT PRACTICES

As discussed in Section 3.2.1, stakeholders include groups that have pivotal expert knowledge, that are essential to the implementation of policies, and that are interested in the outcome of the project [206]. Stakeholders have a self-interest in the issue at hand, their involvement in a topic is therefore both rational and likely to contribute to the quality and the legitimacy of the required actions [165]. The case has also been made that patient involvement has a positive impact on the accountability and transparency of research organisations [165], [207]. The inclusion of stakeholders in the research and decision-making processes is important as it encompasses both ethical and practical rationales [92].

It is important to explicitly state why individuals were selected, the type of information to be exchanged and that the process was intended to lead to a decision while also creating new insights or a different experience because of group interactions [165].

A predominant theme within literature on stakeholder engagement is that patients with personal experience of a condition introduce a unique perception and experiential knowledge that can potentially lead to more translatable and relevant research [65], [165], [207]. Engagement processes are characterised by their iterative approach that draw on dialogue and reciprocal learning towards forming a shared understanding and improved decision making [165], [208]. Additionally, the definition of platform membership, either as formal or informal, inherently discount the participation of certain stakeholders from the innovation process [178].

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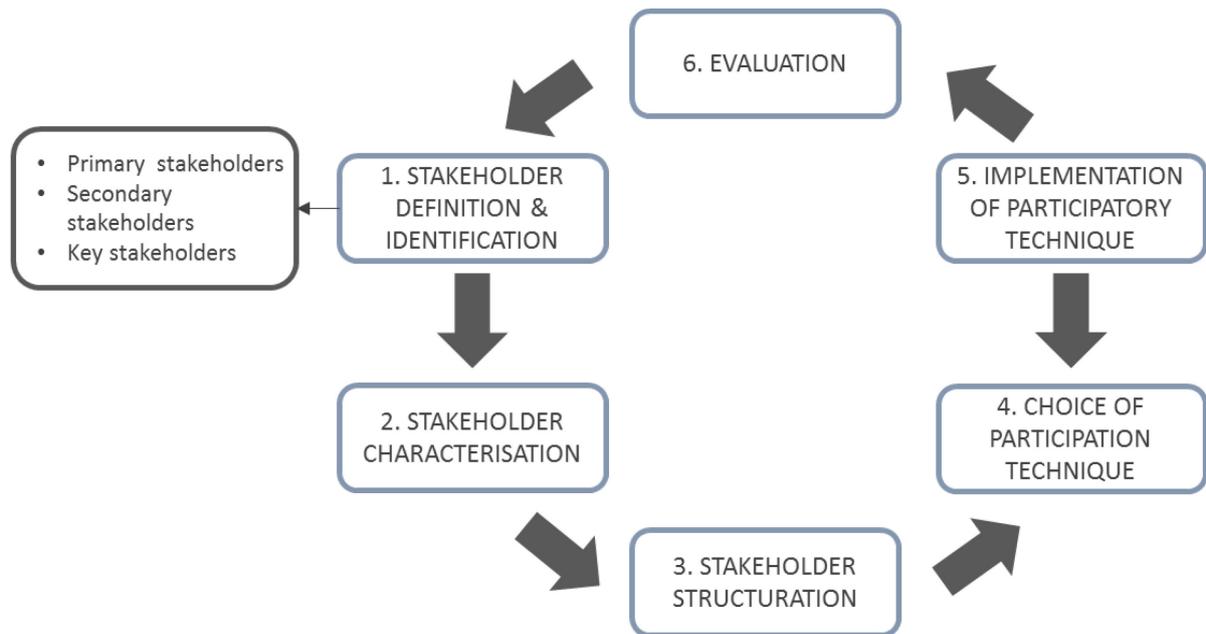


Figure 33: The stakeholder participation progression (Adapted from Luyet [209])

Figure 33 is a graphical representation of the process framework for guiding stakeholder participation [209]. The discussion regarding the stakeholder participation process is limited to step one to three as the remaining steps are platform specific.

4.6.3.2.2 STAKEHOLDER DEFINITION AND IDENTIFICATION

Burton *et al.* [206] defined stakeholders to include groups who have expert knowledge that should be taken into account, will be essential to the implementation of resulting policies, and/or have an interest in the outcome of the work [206].

The dynamism of the stakeholder roles are further explored in Section 4.6.2.7. Relevant actors are selected based on the nature of the objectives [165]. The diversity amongst the stakeholders involved reinforces a virtuous circle of capacity development through learning from others' perspectives.

The identification of relevant stakeholders is one of the fundamental pillars to successful participation as it prevent bias from being introduced into the process [53], [100], [138], [209]. This draws on the careful deliberation of potential stakeholders and those who are critical in achieving the project objectives. The trade-off between the benefit of including more stakeholders and the complexity and high costs that are associated with this need to be considered [209].

The stakeholders that are included in the IP act as representatives as it is impossible to include each stakeholder individually. Additionally, this ensures that different stakeholder perspectives are voiced and considered.

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Representatives also take on the role of negotiation and decision making on behalf of their constituencies, which greatly impacts the innovation process and the effectiveness of the IP [131].

Typically, stakeholder nature is defined according to the stakeholders and their relationship to the project in question. Stakeholders are classified as primary, secondary or key stakeholders. Appendix D provides an extensive overview of the broad stakeholder categories.

4.6.3.2.3 STAKEHOLDER CHARACTERISATION

A great deal of literature is available regarding the characterisation of stakeholders. A few of these characteristics are listed in Figure 34.

Stakeholder classes can be divided into groups: direct and indirect, primary and secondary, internal and external [210], [211]. Karlsen [211] proposes classifying stakeholders according to two dimensions. The potential that stakeholders have to collaborate with project staff and their potential to affect the project are considered. The mechanisms that are employed for stakeholder analysis are discussed in Section 6.4.1.4.

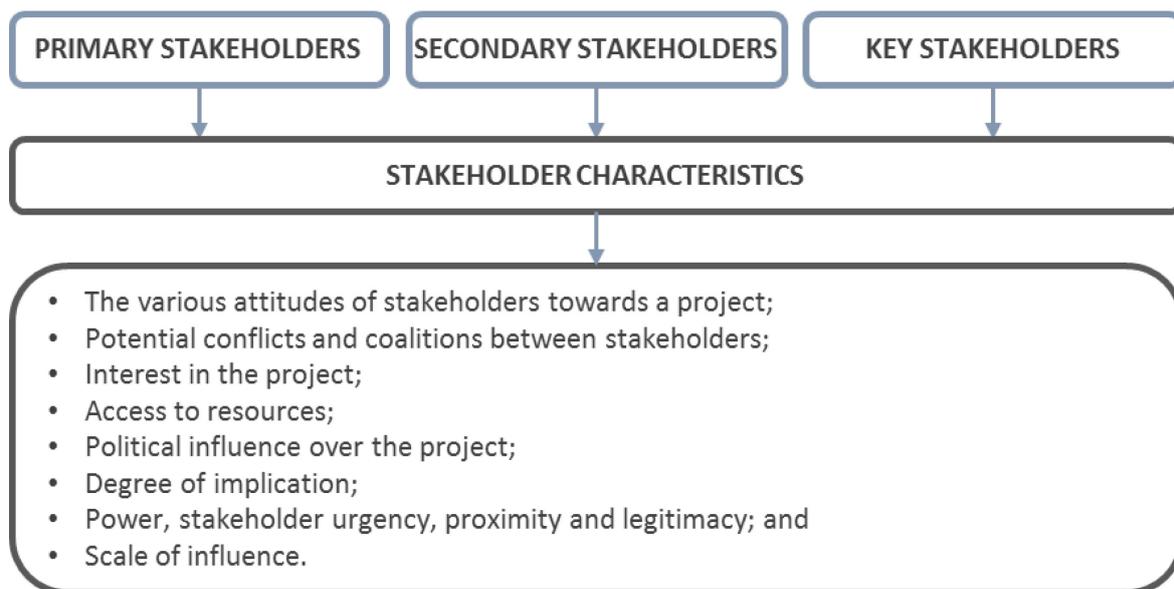


Figure 34: Stakeholder characterisation (Adapted from Luyet [209])

4.6.3.2.4 STAKEHOLDER STRUCTURING AND THE DEGREE OF INVOLVEMENT

During this step stakeholders are assigned to groups which are allocated a planned level of involvement. The degree of involvement may differ across the board as shown in Figure 35.

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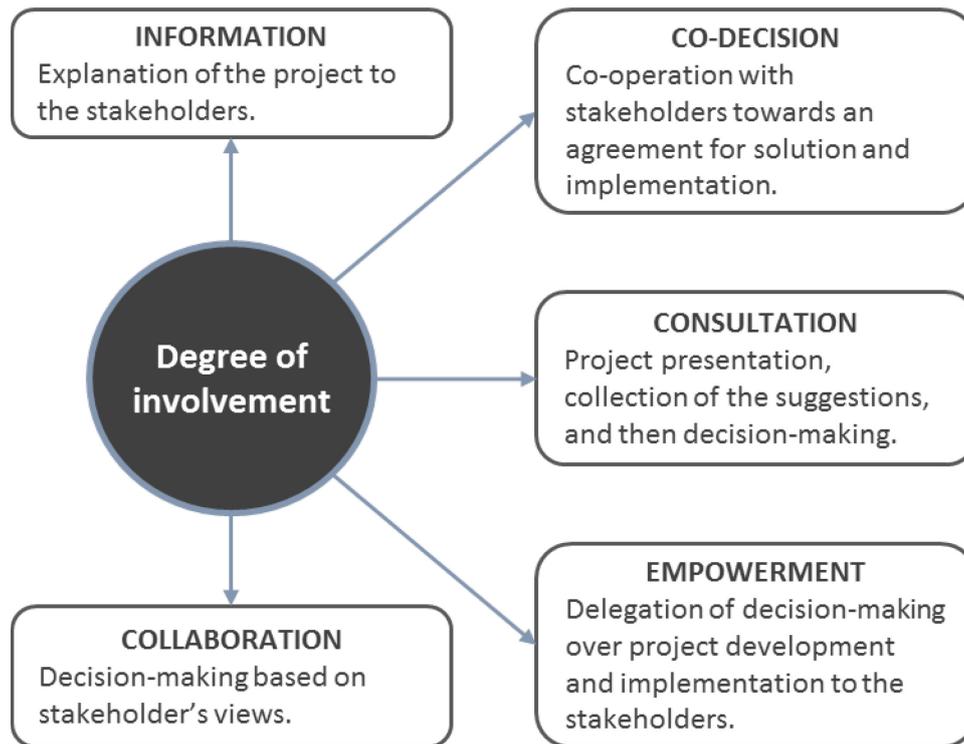


Figure 35: Degree of involvement for each stakeholder group for their process (Adapted from Luyet [209])

4.6.3.3 INNOVATION CAPACITY DEVELOPMENT

Innovation capacity is the ability for individual platform members, and the platform as a whole, to find solutions to problems and to respond to opportunities. There is no single way to develop this capacity. It may seem effortless to an outsider. Outcomes suddenly emerge from an unruly mess of diverse stakeholder opinions, but there are a few essentials requirements. The participants have to interact well and pay attention to the process; the facilitation has to be suitable and allow for learning and all those involved must have the patience to let the process unfold [183].

Innovation capacity enables groups of people to shape their own future by taking advantage of opportunities and dealing with changing situations. Some key elements of innovation capacity include: self-organization, learning new skills, changing mindsets, valuing others' roles in innovation, having a holistic view, being able to adapt to changing situations, creating new ideas, recognizing opportunities, being proactive, using indigenous ideas, and looking to the future [144].

This implies that platforms should not be seen as a development tool for executing a preconceived plan in a blueprint fashion, but they should rather be arenas for strengthening capacities to better deal with the complex and dynamic nature of innovation [122].

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Table 15 provides an overview of the concepts identified through the systematic review. Additionally, the supplementary concepts identified through further concept investigation are presented. 39 concepts in are identified in total.

Table 15: Concepts identified through review

| Concept | Supplementary concepts |
|---|---|
| Change management | <ul style="list-style-type: none"> • Evolving roles and responsibilities |
| Knowledge management | <ul style="list-style-type: none"> • Knowledge, skills & interest exploration • Establish knowledge sharing platforms & machinery |
| Knowledge transfer | <ul style="list-style-type: none"> • Knowledge transfer, learning & diffusion • Dissemination & diffusion of knowledge |
| Capacity development | <ul style="list-style-type: none"> • Drawing on existing capacity & developing new ones • Focus on inclusivity within process • Celebrating successful idea execution |
| Conflict resolution & dealing with power dynamics | <ul style="list-style-type: none"> • Inclusion & representation of all stakeholders |
| Consideration of context of emergence | <ul style="list-style-type: none"> • Level of access to resources & facilities • Addressing physical, socioeconomic & political factors |
| Demand articulation | <ul style="list-style-type: none"> • Visioning & planning • Search guidance |
| Dynamic processes, engagement & facilitation | <ul style="list-style-type: none"> • Facilitation & coordination • Continued guidance of search activities • Facilitation, management & interaction • Shift in focus level of IP • Supporting development of technology services |
| Monitoring & Evaluation | <ul style="list-style-type: none"> • Continuous monitoring & evaluation |
| Incentives & reward systems | <ul style="list-style-type: none"> • Driving participation, commitment, ownership |
| Required architecture for development | <ul style="list-style-type: none"> • Supporting development of technology services • Required setup ,foundation • Mobilising resources |
| Formal & informal institutions | <ul style="list-style-type: none"> • Setting up formal and informal institutions • Maintaining & strengthening formal & informal institutions |
| Construction & deconstruction of sub-systems | <ul style="list-style-type: none"> • Seek opportunities for participation • Overcome barriers to functioning |
| Scaling up & scaling out | <ul style="list-style-type: none"> • Supporting entrepreneurial activities |
| Termination of IP | <ul style="list-style-type: none"> • Evolving membership |

4.7 Benefits of innovation platforms

A platform approach is beneficial in cases where multiple stakeholders deal with complex issues that require harmonised action. [141]. Figure 36 presents the three overachieving

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benefits that IPs encompass. Each benefit directly influences one another during the IP's lifetime and they collectively enhance the IPs functioning.

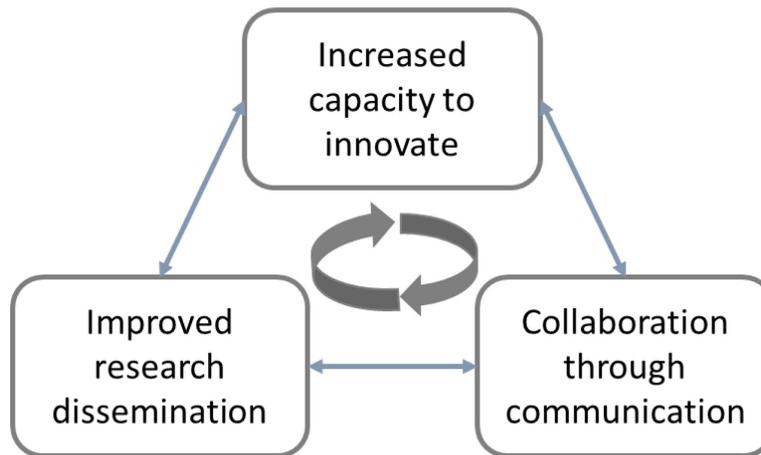


Figure 36: Benefits of IPs

4.7.1 COLLABORATION THROUGH COMMUNICATION

An IP enables upward communication amongst VC actors to build a network that promotes collaboration and facilitates the identification of challenges and opportunities [212]. This space encourages diverse stakeholders to identify areas of intervention and to voice their needs leading to the development of solutions that would be infeasible for an individual actor to achieve [43].

By acting on the needs within the VC, transaction costs along the chain are reduced [43]. This is due to actors' ability to collectively identify the bottlenecks hindering innovation. This is enhanced through making use of existing networks that extend the mobility of knowledge, tools and approaches.

The IP acts as a negotiating platform for members to find and agree on an acceptable compromise to all. Lobbying and advocacy are required when a third party is targeted for change. The platform collects evidence on the challenge and presents possible solutions [141]. This creates a platform from which stakeholders can press for change and influence government policy-making [213].

4.7.2 IMPROVED RESEARCH DISSEMINATION

IPs support ongoing dialogue between R&D actors on lessons learned, innovations, adaptation and emerging demands for new research. Through putting resources into the hands of stakeholders, it enables them to steer the R&D agendas and to implement activities that no other projects or business are able to support.

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Members have the ability to improve productivity, profitability and the overall management of resources. This ensures greater relevance of research as it is defined by stakeholder needs.

IPs monitor the results of the research and provides feedback to members thus allowing for the organic dissemination of the findings. Ultimately, IPs provide a foundation to streamline development as it creates opportunities for demand driven research, the identification of critical issues and the dissemination of research outputs [45].

4.7.3 INCREASED CAPACITY TO INNOVATE

A deliberate effort is made towards innovation capacity development, critical situation assessment and more informed decision-making. Victor *et al.* [183], highlights that with improved innovation capacity one is able to better embrace changes whilst simultaneously discovering innovative solutions. This is achieved through exposing members to new people and novel ideas. Members must organise themselves to ensure that they can adapt to the unforeseen changes and new opportunities [43].

The IP approach creates a sense of ownership of solutions amongst members since members are involved in the entire innovation process. Constant interaction amongst members ensures that interventions are appropriate for the particular situation. Members are also more likely to adopt solutions that they understand and helped to conceive [43], [206], which can lead to better dissemination and implementation of innovations.

4.8 Framework design criteria

Upon concluding the literature study, some notions are formulated that require consideration during the framework development.

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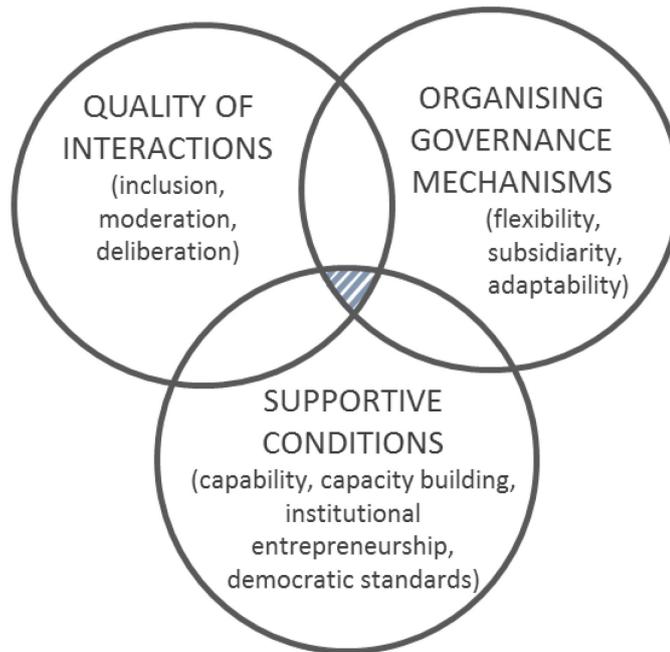


Figure 37: Key design areas (Adapted from Kuhlmann [214])

The framework needs to attend to the three key areas in Figure 37.

1. Organising governance mechanisms (Strategic alignment towards formation):
The mechanisms incorporated into the framework is designed to create strategic alignment towards the development of an IP. This is the internal support required to galvanise the platform around shared visions, goals and actions.
2. Quality of interactions (Stakeholder insight to ensure engagement):
Understanding articulated and unarticulated needs from the “bottom-up” perspective, a deep understanding of both the articulated (explicitly stated) and unarticulated (latent or unrecognised) needs of existing and potential IP members. This speaks to the framework’s ability to provide support towards the operation of the IP. The engagement of VC actors is often reiterated, particularly the need for close and intensive interaction. This requires a match between the research issues and the actors’ abilities and experiences.
3. Supportive conditions (Disciplined implementation):
Support the identification of interventions to guide the development and continued functioning of more inclusive IPs. Success will be enabled or limited by an IP’s capacity for effective intervention execution.

Essentially the goal is to develop a framework that meets the criteria specified in Table 16. The validation outcomes are discussed further in Chapter 6.

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Table 16: Framework validation outcomes

| Validation stage | Outcome | Overview |
|------------------|-------------|--|
| Stage 1 | Credible | The framework needs to be developed on credible and confirmable literature findings. |
| | Confirmable | |
| Stage 2 | Needed | It must speak to the need of IP members and it must provide reliable guidance during the formation process. For the framework to be deemed relevant and useful it must meet the specific needs of IPs and it must provide structure and insight that was previously not available. |
| | Reliable | |
| | Relevant | |
| | Useful | |
| Stage 3 | Efficient | The efficiency and effectiveness of the framework hinges on its ability to guide the IP formation process in practice. |
| | Effective | |
| Stage 4 | Applicable | The framework needs to be easy to apply and must be valid under a range of conditions. |
| | Valid | |

4.9 Chapter 4: Conclusion

The objective of this chapter is to identify the different types of IPs as well as the core IP principles. To this end a systematic review of the extant IP literature is conducted. Section 4.1 presents the methodological approach that is followed during the review and it describes the search strategy and analytical procedure.

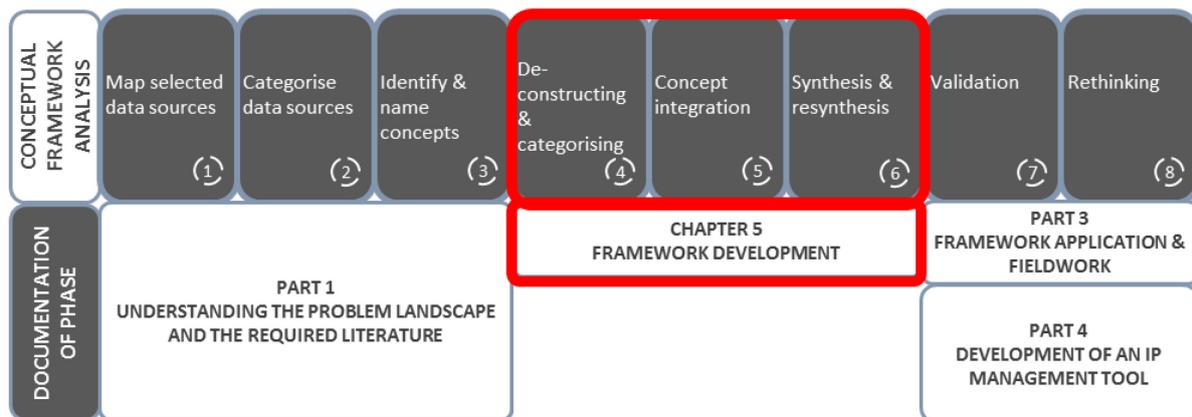
The review identified 24 different types of IPs and 16 core theoretical concepts. In total 39 concepts were identified in this chapter.

From this chapter it is evident that several views are needed to appreciate a topic's complexity. It is recognised that IPs are built on different combinations of concepts and that there is currently no single approach available to ensure the successful IP development and operation in varying contexts. The findings in this chapter are synthesised to add to the BOK on IPs. In the next chapter these findings culminate towards the development of a conceptual framework.

CHAPTER 5 - Towards the development of a conceptual framework

“We need approaches to the solutions that aren’t just arithmetic and additive, but are in some sense logarithmic. This will require us to reach across historic boundaries and unlock the potential of collaboration across the usual disciplines.”

~ Jeffrey S. Flier



IPs offer a means to introduce accelerated development, but there is a lack of literature that provides guidance on how to ensure good quality implementation [138]. The findings from literature are deduced into a framework following the CFA process as proposed by Jabareen. The outcomes from each step in this process is discussed as well as the outline for the reasoning of the decisions made by the author. The intermediate goal is to identify the building blocks supporting the creation and successful operation of IPs.

The purpose of this chapter is to illustrate the development of a conceptual framework to achieve the research objectives in Section 1.2.2. The framework is founded on the design criteria as discussed in Section 4.8. The framework presents the structure of the research and how it is conceptualised. The framework is primarily developed to guide the decision-making process rather than to generate scientific knowledge.

| | |
|-----------------------|---|
| Key objectives | Present the framework development process |
| | Present the constructed conceptual framework |
| | Discuss the proposed application of the framework |

Chapter 5 • Towards the development of a conceptual framework

Figure 38 illustrates a very brief overview of the process that is adopted towards the development of the framework. An important consideration during the framework development process is the theoretical enquiry away from strictly formal structures, towards organisational processes, relationship and their respective limitations.

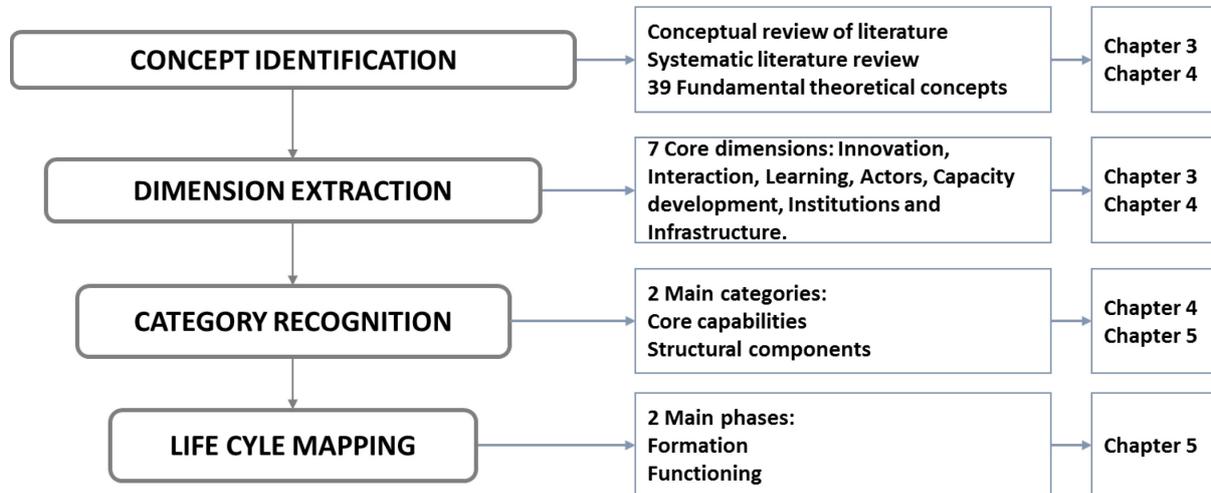


Figure 38: Overview of process adopted

The previous chapters have introduced IPs as ways of bringing together key stakeholders towards solving common problems. The inclusion of various groups of stakeholders is to consider multiple perspectives in an attempt to form a holistic understanding of the solution space. This approach to innovation is characterised as time-consuming and may be difficult to develop and manage. As such the framework aims to alleviate some of the uncertainties that are faced during IP development. The foundation of the framework is built on the results of a rigorous analysis IP literature.

The problem statement clearly identifies a lack of integration amongst healthcare actors as a major hurdle towards improved healthcare. The VC approach is adopted as it provides a lens through which to position the IP and to identify prominent healthcare challenges as experienced by healthcare stakeholders.

The main point of departure for the development of the conceptual framework is the organisation of the concepts identified in the systematic review. Seven core dimensions are extracted from the IP definition. The identified concepts are categorised according to the most appropriate dimension.

Chapter 5 • Towards the development of a conceptual framework

During the completion of the systematic review, two trends emerged: 1) core capabilities and 2) structural components. The seven dimensions are categorised according to these categories. It became apparent that these concepts could further be organised according to their position within the IP life cycle. This leads to the concept categorisation into formation and functioning.

5.1 Phase 4: Deconstructing and categorising the concepts

Jabareen [56] explains that the aim of Phase 4 is to map each concept along with a description including its main attributes, characteristics, assumptions and role. This is to be followed by a categorisation of the concepts based on their features and goals.

From the literature it is evident that IPs are a way of operationalising inclusive **innovation** through facilitating **interaction** and **learning** amongst different **actors**, which leads to increased **innovation capacity** and enables the reshaping of **institutions**, within a specific **infrastructure**.

Beyond the IP concepts identified in the systematic review, these seven dimensions form the core principles upon which IPs function. Table 17 elucidates the categorisation of the identified concepts according to the seven dimensions.

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Table 17: Phase 4 - Deconstructing and categorising concepts

| Dimension | Concept | Guiding questions |
|--|---|---|
| Interaction/ Engagement – Concertation | Visioning & planning | <p>Visioning: Why are we coming together? What are we going to call our group? What is success going to look like? What is our timeline? Have stakeholders' ideas been included in the vision?</p> <p>Planning: Who is going to do what? Who is going to play what role? Who is going to facilitate? Who is going to be the treasurer? Do we need a program manager? IPs can be set up in different ways. However, for it to be functional and effective, it must have cohesion, unite stakeholders in the system in which there is mutual interest, and with demonstrated or well-articulated potential to meet the interests of individuals on board.</p> |
| | Incentives & reward systems | <p>Did you use a technique to promote participation and engagement? How did you determine the type of incentive to utilise?</p> <p>Incentives and reward systems ensure a demand driven and contextualised innovation process.</p> |
| | Facilitation & coordination | <p>Who selects representation? And how? How and by whom is the objective of the platform defined? Are stakeholders sufficiently empowered to articulate their demands?</p> <p>Facilitation of innovation is a flexible and adaptive process during which facilitator(s) manage dialogue and stimulate collective problem analysis by multiple stakeholders to overcome challenges or make use of opportunities.</p> <p>It is very important to have a leader who understands the community in which the IP functions. It needs to be someone who understands the different dynamics amongst the stakeholders and who is aware of the stakeholder conflicts.</p> |
| | Conflict resolution & dealing with power dynamics | <p>Stakeholders do not naturally want to cooperate or share information. They have divergent interests, or even compete with each other. Addressing power and representation during the setting up stage helps make engagement platforms more equitable and effective.</p> <p>Power dynamics in terms of the funding need further consideration. External funder may come in and try to solve their specific problems.</p> |

Chapter 5 • Towards the development of a conceptual framework

| Dimension | Concept | Guiding questions |
|----------------------------------|--|---|
| | Facilitation & management | <p>How can continued participation and engagement be ensured? How can interactions amongst stakeholders be facilitated to achieve appropriate solutions?</p> <p>This refers to how the platform interacts further. Here it is important to ensure that there is engagement that is continued and once you have buy-in that the engagement doesn't disseminate.</p> |
| | Termination of Innovation platform/members | <p>How are platform members removed? How will the platform be terminated should it not meet the desired objective?</p> <p>This occurs when a stakeholder is involved but their skills are no longer required as the platform has evolved.</p> |
| Knowledge development & learning | Knowledge, skills & interests exploration | <p>Explore the knowledge, skills and interests of participants to understand and identify potential areas of interest. This will also aid in understanding the capabilities of various actors and what they bring to the environment.</p> <p>Within stakeholders, what is available to work with? What needs to be developed? What is lacking? How and by whom are research questions identified? Is local knowledge recognised within the platform as an important contributor to innovations? What participatory methods are used to elicit local knowledge? When and how are research findings made available?</p> |
| | Monitoring & Evaluation | <p>M&E is a crucial element of the process. It is critical to M&E the effectiveness of IPs' mechanisms to achieve the intended outcomes of the project and learn which strategies work and which do not.</p> <p>How do you reflect on that learnt from the previous platform? How are findings documented? How is reflection stimulated within the platform? What metrics have you used to assess your success as an IP?</p> |

Chapter 5 • Towards the development of a conceptual framework

| Dimension | Concept | Guiding questions |
|-------------------|--|---|
| | Knowledge transfer & type of learning | How is knowledge transferred via sub-systems and what can be done to promote this? IPs put a stronger emphasis on a systematic and iterative process of learning through reflection; learning revolves around interaction, information exchange, and learning by doing. Co-creation knowledge, collective action feed into one another, need the different types of knowledge, experiences, skills, resources and attitudes to bring about collective action. |
| | Disseminate & diffuse knowledge | The role of the IP is to support the diffusion of ideas and technologies or new processes. This process is crucial to scaling up and out. |
| | Draw on existing capacity & develop new ones | This is a very important consideration in achieving the overall success of the platform. The contextualised (supply and demand) learning through interaction, creates a solid foundation from which to develop increased innovation capacity. |
| | Approaches to change management | Is there reluctance to buy into a idea when introducing new ideas? Resistance to change need to be addressed. Specific effort is made to address and prepare for resistance to change. What measures can be made to make transitioning smooth? |
| | Focus on inclusivity within process | Inclusivity has process focus more than an output focus for IPs, they look to address development challenges of excluded groups, rather than orient innovation towards profit maximisation. |
| | Design for scalability (Scaling up/out) | How do you position the platform? How do you link the different spaces that experience similar challenges across different regions? Action at local, regional & national levels is required. Horizontal links refer to cooperation between platforms situated at the same level (e.g. at district level). Vertical links refer to cooperation from local levels (e.g. a village, a community) to district, regional, national and sometimes international level. Does the IP build on existing networks or will new networks be created? How are you seeking to expand? What is your timeline for this? |
| Capacity building | Consideration of process dynamics | The most successful IPs are self-reliant, demand driven, evolve over time, and embrace multiple perspectives. Different stakeholders can be involved at different times, depending upon the issues to be discussed. Platforms may experience a change in focus, in membership as well as an associated change in member responsibilities. |

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| Dimension | Concept | Guiding questions |
|------------|--|---|
| | Driving participation, commitment, ownership | Tangible outputs are needed to sustain the members' interest and commitment. Are there specific drives to achieve this? Initially, incentive may be used to get buy-in, but what else makes stakeholders want to stay involved in the process? Originally focus areas may align, but as you narrow down scope, the IP may not address stakeholders' focus area. |
| | Celebrate successful idea execution | Mechanism to further ensure participation is required. Is this needed, is it valid and do you have a space for this? How is it done within the space that you function in? Does it occur organically, or is it needed to introduce further structure? |
| | Address physical, socio-economic & political factors | Refers to the specific space in which platform functions. How do you ensure that people actually understand the different challenges across the VC? |
| | Search guidance | Stimulate demand and context driven innovation through joint problem solving, making use of the diversity among IP members. Some of the guiding principles include harnessing the different kinds of stakeholder knowledge, creating motivation and a feeling of ownership. |
| | Shift in focus level of IP | The purpose of formation of IPs at the site level is to empower local communities and actors to analyse their own constraints and opportunities and to strengthen their capacity to innovate through better access and use of existing and new knowledge. A shift in the level of focus refers to a shift from a local context to a larger regional area. |
| | Supporting development of technology services | How do you introduce the right technology to implement? Is focus placed on the technology development within the platform? Does the platform require advancements within technology to move forward? It must be applicable to the space that you're working in. |
| Innovation | Supporting entrepreneurial activity | How do you scale something birthed from the IP to commercial viability? The consideration of appropriate business models and business appropriation ²⁰ is required. Furthermore, how are members equipped or encouraged to follow in an entrepreneurial direction? |
| | Continued guidance of search activities | How can we branch from this? Are there specific sub-platforms to look at other challenges and how they feed into each other? Flexible, dynamic process guidance is required. Stay focused on the overall vision and objective, but allow for platform evolution. This refers to |

²⁰ The direct or indirect means to capture monetary value from the innovation outputs.

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| Dimension | Concept | Guiding questions |
|-----------|--|---|
| | | guiding the process and changing the direction when required as proposed by the entire team/sub-committee involved. |
| | Inclusion & representation of all stakeholders | What has been done previously and how does this influence the actors' view of change and new innovation interventions? Ensuring that one stakeholder group is not dominant. This often refers to researchers that have specific set of outcomes and objectives to achieve. Inclusivity is more a process than an output focus for IPs, they look to address development challenges of excluded groups, rather than to orient innovation towards profit maximization. The process is inclusive and participative, and thus driven by an understanding of user needs and context, as inclusive innovation requires. |
| | Seek opportunities for participation | Specifically look at the evolving roles of members. If the platform is already functioning how do you introduce the new expertise required? How do you find the right people? This can be specific to looking for new expertise when you get to a certain point within a project. |
| | Evolving roles & responsibilities with introduction of new ideas | Follows on the previous concept. How does the introduction of new actors in platform influence role of other members? How do you build trust? Within the development of the project. What are the process specific entry pathways and required infrastructure to prevent complete divergence from goal? |
| Actors | Stakeholder-representative demand articulation | It is important to not have issues once the platform is actually functioning as it is much more difficult to try to change it then. Relevant actors are invited based on scoping and analysis; membership is not fixed, but dynamic, based on the need; usually intermediaries facilitate and coordinate the platform. IPs emphasise the dynamics of actor involvement based on need, but generally, they are about linking demand and supply, emphasizing the role of intermediaries to facilitate the platforms. |
| | Setting up formal & informal institutions | Key institutional constraints and opportunities are jointly identified and addressed; institutions can be informal and formal. Forming an understanding of the local institutions embedded in norms and values is required. This can be used as a mechanism to reduce risk and uncertainty. Informal and formal institutions are acknowledged as important structural elements providing constraints to inclusive innovation. |

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| Dimension | Concept | Guiding questions |
|----------------|--|--|
| | Maintaining & strengthening formal & informal institutions | Formal and informal institutions are acknowledged as important structural elements providing constraints to inclusive innovation. IPs see it as an important task to identify these with relevant actors and try to change them over time. What is required within space that you work? How do you take the local context into consideration? How can the structure of platform link to government and influence policy making? Are there specific rules and regulations in place for this to take place? |
| | Support and influence policy-making | Is this part of the objective of the platform? Do you have the necessary linkages and entry paths to achieve this? |
| Institutions | Construction & deconstruction of sub-systems | How do you construct and deconstruct your platform to ensure that everyone with a different view is represented and considered fairly? Sub-systems establish linkages that allow for interactions between members of the platform and other informal/formal actors necessary to achieve the overall objective. Key institutional constraints and opportunities are jointly identified and addressed across sub-systems. |
| | Consideration of context of emergence | What is your relationship with government? How are you able to interact with policy makers, on a local and national level? The context and environment within which the problem occurs needs to be considered. This stimulates demand- and context-driven innovation through joint problem solving. |
| | Level of access to resources & facilities | Is there a physical space that the IP has available? Is a physical space required to meet the identified objectives? Exploring resources and infrastructure available through the IP and to secure the resources as required. |
| | Overcome barriers to functioning | With an IP there are multiple factors to consider; the actors, physical space and the finances required. Is a deliberate effort made to continuously search the landscape for barriers to functioning and to proactively address these? |
| Infrastructure | Establish knowledge sharing platforms | Are specific spaces, places and times provided for inter committee/team knowledge sharing? This could be in the form of an internal platform newsletter or a blog or feedback meetings. |

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| Dimension | Concept | Guiding questions |
|------------------|---------------------------|--|
| | | Infrastructure aids in the creation of institutionalised and more permanent structures of engagement. Shared physical and/or virtual infrastructures creates connections, facilitating the diffusion of knowledge. |
| | Mobilise resources | Mobilising resources includes the human, financial and physical resources required to successfully engage and sustain platforms. |
| | Required setup foundation | What are the resources that are available? How are they utilised? What is required to start with the innovation process and to meet the determined objectives? |

5.2 Phase 5: Concept integration

“It is not the beauty of a building you should look at; its the construction of the foundation that will stand the test of time.”

~ David Allan Coe

To reduce the number of concepts, Phase 5 iteratively integrates similar concepts into one higher level concept [56]. The integration of the concepts is supported by the author’s recognition of trends within the coded publications as well as the findings in Section 5.1.

The IP aims to analyse complex healthcare problems, which address multiple dimensions, from a VC perspective. As such the VC in which the problem is embedded is investigated and the elements that support or constrain innovation across the VC are identified.

The identified trends and themes were used to identify two strategic categories: 1) core capabilities; and 2) the structural components.

The resulting taxonomy in Figure 39 provides a new lexicon for researchers, policymakers, and HCWs for characterising key strategic features of evolving IPs. The taxonomy also provides a key element in the framework for future inquiry regarding the relationships between organisational strategy, structure, and performance, and for assessing policy issues.

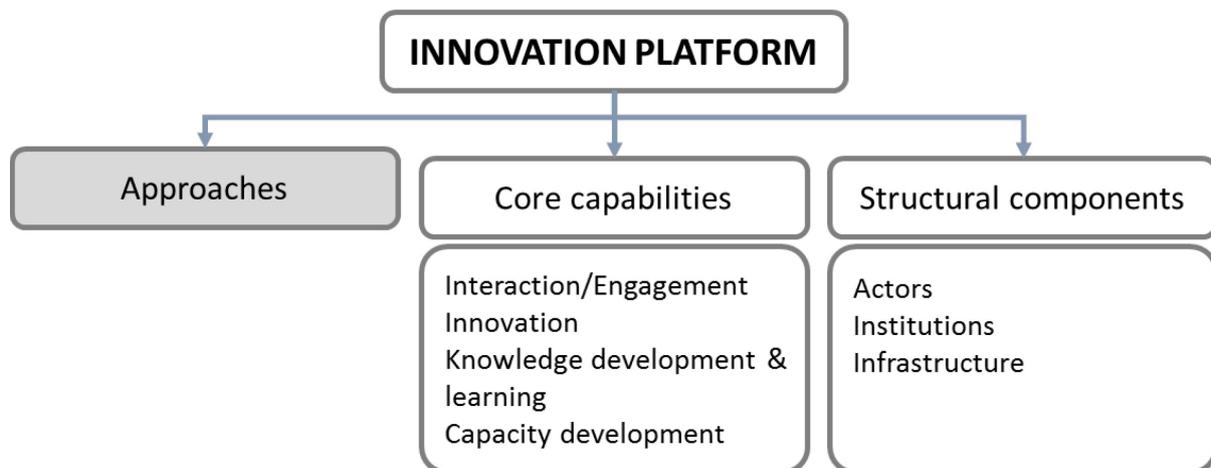


Figure 39: Concept taxonomy

These concepts are combined to build a conceptual framework that better interprets the dynamics of inclusion and co-evolution of the innovation process. The range of components and how they perform functions that need to be supported through the platform are identified.

The proposed overarching categorisation presented in Figure 39 is one way in which the theoretical concepts pertaining to IPs can be organised.

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Although Jabareen's approach is followed, the author also deductively checked the logic of the categorisation based on the understanding formed through the conceptual literature review and the systematic review as well as the results of the statistical analysis completed in Section 4.3.

5.2.1 INNOVATION PLATFORM LIFE CYCLE

The life cycle of an IP covers the sequence of activities from initiation to implementation. The life cycle phases provide a structured way of addressing the development of an IP. This allows for accountable deliverables through addressing the requirements at each phase with the inputs received from the previous phase.

Swaans *et al.* [35] propose that the development of an IP follows two phases namely "Formation" and "Functioning". The various different phases that can be followed to describe the development and management of platforms is highly covered in literature. Table 18 presents an overview of the different IP life cycle phases discussed in literature.

Table 18: Overview of innovation platform phases according to various authors (Adapted from Boogaard *et al.* [55])

| Platform phases | Authors |
|---|---------|
| 2 phases: Formation; Functioning. | [35] |
| 4 phases: Scoping and preparation; Process management; Learning and restructuring; Renegotiating. | [215] |
| 6 phases: Initiation; Establishment; Management; Sustainability; Innovation; Learning and knowledge. | [138] |
| 6 phases: Identify stakeholders; Establish learning alliance; Assessment, knowledge sharing and consensus building; Visioning and prioritising; Planning and implementation; M&E. | [156] |
| 6 phases: Identification of R&D challenges; Site selection; Consultative and scoping study; Visioning and stakeholder analysis; Development of action plans; Implementation of action plans. | [200] |
| 7 phases: Initiate; Decide on focus; Identify options; Test and refine solutions; Develop capacity; Implement and scale up; Analyse and learn. | [43] |
| 10 phases: Location of sites; Identification of commodity or system; Identification of stakeholder; Engagement of researchers; Development of governance and management guidelines; Facilitation of interaction with stakeholders; Development of business plan; Establishment of participatory M&E measures; Review of implementation; and Lessons learnt. | [216] |

Figure 40 provides a graphical depiction of the alignment of the various platform phases according to formation and functioning. The diagram clearly shows that the IP life cycle does not follow a linear process and that some phases are repeated during the lifetime of an IP.

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| FORMATION | | | | | FUNCTIONING | | | | | | |
|---|---------------------------------------|-------------------------------|---------------------------|--|---|------------------------------------|---|-----------------------------|----------------|--------------------------------|-------------------|
| Initiation and visioning | | Establishment | | | Management | | | Sustainability | | | |
| Scoping and preparation | | Process management | | | Learning and restructuring | | | Renegotiating | | | |
| Initiation | | Establishment | | Management | | Sustainability | | Innovation | | Learning and knowledge | |
| Identify stakeholder | | Establish learning alliance | | Assessment, knowledge sharing and consensus building | | Visioning and prioritising | | Planning and implementation | | Monitoring and evaluation | |
| Identification of research and development challenges | | Site selection | | Consultative and scoping study | | Visioning and stakeholder analysis | | Development of action plans | | Implementation of action plans | |
| Initiate | | Decide on focus | | Identify options | | Test and refine solutions | | Develop capacity | | Implement and scale up | Analyse and learn |
| Location of sites | Identification of commodity or system | Identification of stakeholder | Engagement of researchers | Development of governance and management guidelines | Facilitation of interaction with stakeholders | Development of business plan | Establishment of participatory M&E measures | Review of implementation | Lessons learnt | | |

Figure 40: Platform phases aligned with Formation and Functioning

There are common elements that are present across the different life cycle phases in Table 18 and Figure 40. These include:

- The level at which the IP functions must be decided at the onset of the project. This will either be local, sub-national, national or international.
- The focus area within healthcare must be determined by the platforms members. Specific disease areas, process layout, management and device development are all areas of potential interest. VC analysis may introduce a viable platform focus area.
- All the different approaches highlight the need for multiple perspectives from actors with diverse backgrounds.
- A prerequisite for an IP to operate is cohesion. United stakeholders across the VC along which there is mutual interest and potential to meet the interest of individuals on board.
- The operation of the life cycle phases are built on a strong infrastructure that improves access to a spectrum of data and knowledge.
- Contingency plans are always required when addressing the entire scope of a life cycle. It is thus required to include/develop procedures for monitoring threats to critical infrastructure.

Chapter 5 • Towards the development of a conceptual framework

Table 19: Innovation platform phases

| Phase | Phase | Activities | Overview | Actors | Outputs |
|-----------|--------------------------|--|---|--|--|
| Formation | Initiation and visioning | <ul style="list-style-type: none"> • Scoping study • Vision determination • Site selection • Agenda determination • Entry points • Social Network Analysis • Stakeholder mapping & engagement | <p>This first step comprises of a scoping study or process to determine and understand the major challenges of the VC. The process is accomplished by an initiator or broker who convenes a meeting of diverse stakeholders to discuss and articulate the challenges that limit performance of the healthcare system. This usually follows the process of stakeholder scanning. Site selection can precede the determination of the agenda depending on the objective of initiating the IP.</p> | <p>The initiator here could be an individual or a team or even an organisation in either the public or private sector.</p> | <p>During this stage there is determination and articulation of the challenges constraining the access to care along the VC. The product from this phase may include a general description of the VCs coupled with identified IP project entry points. Emphasis is placed on moving actors towards working at achieving collective goals as opposed to individual interests.</p> |

Chapter 5 • Towards the development of a conceptual framework

| Phase | Phase | Activities | Overview | Actors | Outputs |
|-------------|---------------|---|---|---|---|
| | Establishment | <ul style="list-style-type: none"> • Planning • Stakeholder analysis • Stakeholder engagement • Narrowing platform topic • Understanding context • Action planning • Elucidation of stakeholder incentives | <p>Selected entry points influence this phase particularly the kind of stakeholders to be engaged. Stakeholder analysis is conducted to enable the initiator to identify stakeholders willing to join the platform and their capacities to embody expected roles on the platform. After gaining the general understanding of the challenges during the initiation phase, stakeholders relevant to the topic are selected and engaged. The agenda developed by the platform may take different forms and may address different portions of the VC with different demands made on different actors.</p> | <p>The stakeholders identified by the facilitator need to meet in a workshop setting for the fine-tuning of the agenda. Trust is a pre-requisite to achieving this.</p> | <p>A deeper understanding of the system, constraints, and opportunities occur leading to finer action planning towards implementation. The role of the participants evolve from interest to active collaboration and finally to ownership and leadership.</p> |
| Functioning | Management | <ul style="list-style-type: none"> • Facilitation • Learning • Innovation • Assessing | <p>At this stage the social capital is built and strengthened as the stakeholders manage the processes and are equally focussed on the agenda. There is allowance for the evolution of the IP and dynamics of stakeholders as issues in the original compelling agenda are solved and new ones arise.</p> | <p>Facilitate the acceptance of both successes and failures as learning points and clarify what benefits accrue to whom, where, when and how. Schedule meetings to follow logical sequence of targets and avoid pushing for regularity.</p> | <p>Ensure that the IP stakeholders focus on the same vision and uphold values that make for an all-inclusive and transparent process with reciprocal benefits.</p> |

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| Phase | Phase | Activities | Overview | Actors | Outputs |
|-------|----------------|---|--|---|--|
| | Sustainability | <ul style="list-style-type: none"> • Stakeholder dynamism • Corrective action • Learning • Innovation | Application of lessons from assessment in developing sustainability measures. Issues are solved and new issues arise, old stakeholders leave and new ones join as need arises. | These new issues can be championed by an individual or institution with the expertise in the new area or has knowledge to introduce relevant interventions to solve the new challenges. | Learning and innovation continues in this stage. |

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There is some logical order in the phases discussed in Table 19, but this does not mean that a phase is ‘closed’. For example, it is important to start with the stakeholder analysis, but over time it can be necessary to find new stakeholders to invite to the IP. The linearity of the representation of the process in phases is far from the way in which innovation works [153]. Innovation processes are iterative and characterised by joint learning, reflection, experimentation and adaptation. As such, phases are repeated over time and can occur simultaneously.

During each of these phases, the role of each category of actors can change [138]. The role of a stakeholder can evolve from merely showing interest to active collaboration followed by ownership and eventually leadership of a platform.

Figure 41 highlights the relationship between the stakeholder dynamics and the overarching life cycle phases discussed in Table 19.

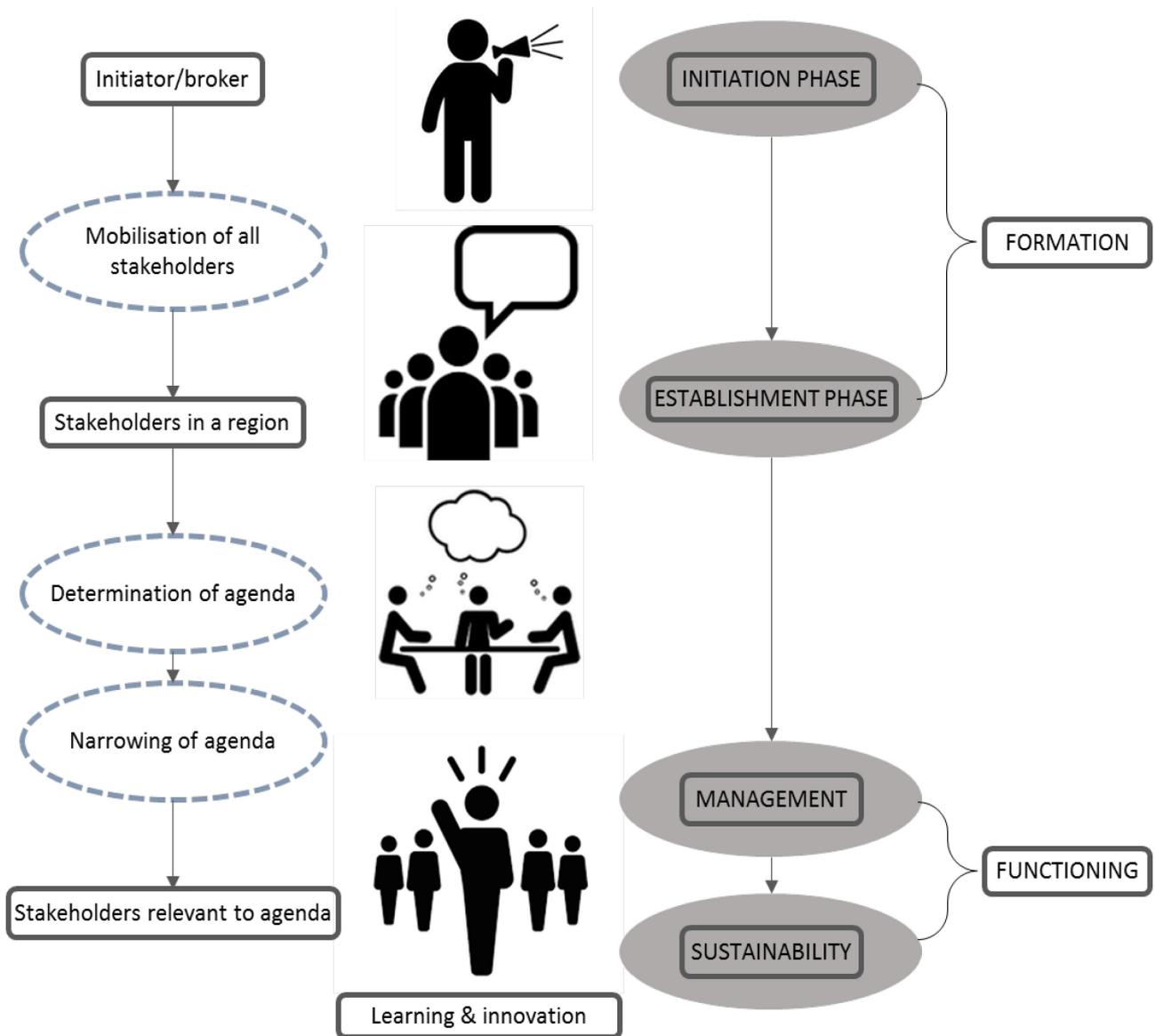


Figure 41: Innovation platform processes and stakeholder dynamism (Adapted from Makini *et al.* [138])

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The main objective for the formation phase is to narrow down the focus of the platform while gaining a deeper understanding of the context. Emphasis is also placed on finding the correct resources for the IP and determining the needs of the IP members. During the start-up period of the platform, it is important to spend sufficient time, because this period entails crucial decisions, which influences the innovation process in the course of time.

The functioning phase focuses on facilitating and providing opportunities for co-production of knowledge and continued engagement.

5.3 Phase 6: Synthesise concepts into a theoretical framework

The activities adopted by the IP aim to create a shared vision for growth, to define realistic plans to overcome bottlenecks and to align the VC around the requirements for success. The framework weaves together different concepts identified in Phase 4 and Phase 5 to produce an assortment of results that drive the development of growth pathways.

During this CFA phase, the existing categorised concepts are synthesised into an integrated framework as shown in Table 20. This is achieved through an iterative process in which similar grouped concepts are strategically positioned to adhere to the design criteria discussed in Section 4.8.

Table 20: Untested theoretical framework

| | | FORMATION | FUNCTIONING |
|------------------------------------|--|---|--|
| Categories | Dimensions | Concepts | Concepts |
| CORE CAPABILITIES | Interaction/ Engagement – Concertation | Incentives & reward systems | Facilitation & management of interactions within innovation platform |
| | | Visioning & planning | |
| | | Conflict resolution & dealing with power dynamics | Termination of innovation platform/members |
| | | Facilitation & coordination | |
| | Knowledge development & learning | Knowledge, skills & interests exploration | Knowledge transfer & type of learning |
| | | Approaches to change management | Draw on existing capacity and develop new one |
| | | | Consideration of approaches to knowledge management |
| | | Monitoring & evaluation | Disseminate & diffuse knowledge |
| Continuous monitoring & evaluation | | | |

Chapter 5 • Towards the development of a conceptual framework

| | | FORMATION | FUNCTIONING |
|-----------------------|-------------------|--|--|
| Categories | Dimensions | Concepts | Concepts |
| | Capacity building | Focus on inclusivity within process | Driving participation, commitment, ownership |
| | | Designed for scalability (Scaling up/out) | Celebrate successful idea execution |
| | | Consideration of dynamic processes | |
| | | Dealing with resistance to change | Address physical, socio-economic & political factors |
| | Innovation | Search guidance | Supporting development of technology services |
| | | Shift in focus level of IP | Supporting entrepreneurial activity |
| | | | Continued guidance of search activities |
| STRUCTURAL COMPONENTS | Actors | Inclusion & representation of all stakeholders | Seek opportunities for participation |
| | | Stakeholder-representative demand articulation | Evolving roles & responsibilities with introduction of new ideas |
| | Institutions | Setting up formal & informal institutions | Maintaining & strengthening formal & informal institutions |
| | | Construction & deconstruction of sub-systems | Support and influence policy-making |
| | Infrastructure | Consideration of context of emergence | Overcome barriers to functioning |
| | | Level of access to resources & facilities | Establish knowledge sharing platforms |
| | | Required setup foundation | Mobilise resources |

5.4 Framework application

In this section the author addresses the fourth research objective by providing a narrative account of the application of the developed framework. The framework attempts to support IP members, specifically platform facilitators.

Facilitating interplay amongst external perspectives and internal capabilities/practices allows one to explore beyond that which is apparent and to discover a diverse array of new possibilities. It blends non-traditional and traditional approaches to innovation, deploying the practices as a foundation and supplementing them with more conventional approaches and models. The IP framework combines two contradictory mindsets: expansive thinking that explores long-term possibilities and pragmatic implementation activities that lead to shorter term impacts.

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The framework consists of a cohesive set of concepts and processes that allow for the development and operation of IPs. It aims to inspire IP members to look beyond the established boundaries and mental models and to explore a broad range of possibilities; to identify noteworthy opportunities; and to make informed decisions regarding the most promising pathways to pursue.

The framework provides a space in which each phase and the various concepts its based on can interact dynamically and flexibly. Each IP is birthed from within a different context and has a different set of resources and infrastructure at its disposal. The framework guides IPs to optimise the formation of synergies amongst VC actors to solve the specific problems experienced in their environment. It provides high-level phases with requirements and is not rigid in nature, as there is no formula to ensure the success of an IP.

The high degree of flexibility within the predetermined boundaries of the platform, allow for numerous combinations of the identified concepts that all lead to different outcomes and growth pathways. The interface design presented, offers a modular structure that is easy to interpret and adapt to the specific context in which the platform exists.

The entry points for innovation to address healthcare problems can be specific to a disease or area of burden, or it may be a generic point of entry not focused on one aspect, but rather an entire area of operation.

The successful implementation of a framework, model or methodology does not occur without facing a set of obstacles. Some of the challenges to successful implementation are introduced through interviews and general discussions. These inhibitors are listed in Section 6.7.

5.5 Chapter 5: Conclusion

This chapter presents the design and development of the conceptual framework. The prevailing literature forms the foundation of the framework as it is developed from the culmination of findings in the preceding chapters. Phase 4 through to Phase 6 of Jabareen's CFA is completed in this chapter.

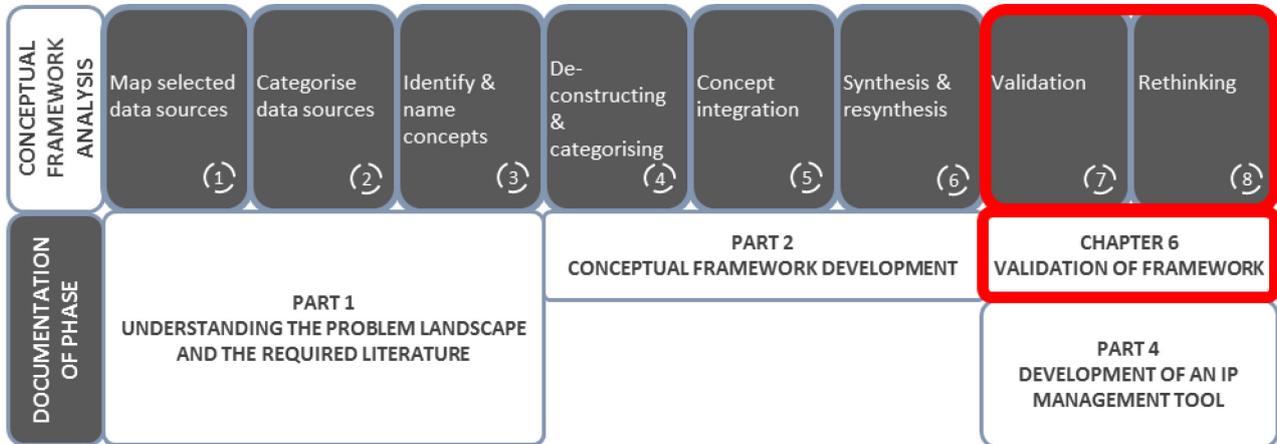
There is no formal and coherent approach to setting up IPs, because of the diversity, complexity, and dynamic nature of conditions, contexts and resources. The framework makes it easier to comprehend how the various IP concepts relate to and affect each other. It seeks to simplify the visualisation of key concepts and processes required for the development of an IP.

The product of this chapter is an untested framework. In the next chapter, the conceptual framework is validated. The fieldwork provides insight into the practical adoption of the framework as well as highlighting areas that require further investigation and improvement.

CHAPTER 6 - Framework validation

“In theory there is no difference between theory and practice. In practice there is.”

~ Yogi Berra



This chapter aims to present the validation of the research findings, highlight shortcomings and test the usefulness of the framework as specified by various industry experts. Furthermore, this chapter shows how the framework has been iteratively improved through additional information that was gained during the completion of the case study along with the supporting interviews.

Prior to proceeding to the next stage in the progressive validation process, the framework's validity was tested against a set of outcomes as discussed in Section 4.8, which displays the framework design criteria. This chapter presents Phase 7 and Phase 8 of Jabareen's CFA through the validation of the existing framework and rethinking of the framework's structural architecture.

Key objectives

- Discuss semi-structured interview procedure
 - Gain practical insight into the world of IPs
- Discuss framework-ranking interviews results
 - Validate concepts upon which framework is built
- Identify appropriate auxiliary tools
- Discuss case study findings
 - Test framework through application
- Discuss supplementary case study interview results
 - Support case findings and provide recommendations for final tool

This chapter reports on the findings of four semi-structured interviews, ten framework-ranking interviews, a case study application and three supplementary case interviews. Wherein the participants shared their views on the perceived purpose, benefits and difficulties of using the developed framework.

6.1 The approach towards validation

"When obstacles arise, you change your direction to reach your goal; you do not change your decision to get there."

~ Zig Ziglar

This research study aims to formulate a framework that would foreground various guidelines towards the development and operation of IPs in healthcare. In order to achieve this framework, external validation is required. The focus of this section is on the completed empirical field research. This section makes use of the theoretical knowledge, which has been accumulated throughout the course of the research, and tests it through the means of fieldwork.

Framework validation is an act of advancing and clarifying arguments, deducing reasons and evidence in order to reach certain conclusions. It elucidates the hard truths discovered in the course of practice and further attempts to address the following difficult questions: Is it worth all the effort and resources? How do we develop an IP? How do we ensure the ongoing functioning of an IP? What is emerging from the IP? Are there any tangible benefits?

The validation process has been designed in such a manner that the collected data is analysed using both quantitative and qualitative approaches. This mixed-method approach is expected to generate a better understanding of the phenomenon by building on the high availability of collected data. Section 2.2, the research approach, discusses this choice in greater detail.

This thesis identifies three types of validation namely: 1) interviews with experts; 2) implementation; and 3) the application of case studies. Each of these forms of validation exhibits its own set of advantages and disadvantages. Table 21 provides an overview of the various types of validation used as well as indicating whether they have been adopted in this study.

Table 21: Types of validation

| | Interviews with experts | Implementation | Case study application |
|-------------------------------------|--|--|---|
| Definition | Interviews are meetings conducted to obtain information from the interviewee in order to negate or confirm the researcher's findings. | Implementation denotes the review and validation of the correctness of a framework based on the practical application thereof in an appropriate area. | A case study is an up-close, in-depth and detailed examination of an already existing case. A case study aims to provide explanatory, exploratory and descriptive findings. |
| Utilised | Yes | No | Yes |
| Advantages and disadvantages | It provides a space to obtain knowledge from experts that either contest or support the research findings under consideration. A disadvantage of this however, is that the interviewee can only answer based on their personal experience and the knowledge that has been imparted to them. The data that is gained from self-reporting often only covers an isolated portion of the overall population. Therefore data coverage requires special consideration during the selection of the interviewees. | The advantages are clear, as the results from the implementation of the framework are definitive. The disadvantages are however also evident. The implementation of the framework is a resource intensive process and requires repetition in various domains for the results to be deemed trustworthy. | A case study introduces a different perspective from which practical challenges and requirements are better understood. This is due to the similarities between case studies and reality. Case studies are however susceptible to manipulation and they are very strongly rooted in the setting in which they take place. The combination of these factors makes it increasingly difficult to validate the framework's applicability across a wide range of different contexts. |
| Application | Interviews with experts are conducted in three different formats; each comes with its own desired outcome. Semi-structured interviews The one-on-one semi structured interview is a process that allows an authentic opinion to be recorded in the | The length of the study does not allow for the amount of time required to implement and analyse the effectiveness of the framework. The section that incorporates the validation of the framework through implementation forms part of recommendations for future work. | The case study highlights how an IP avoids certain undesirable situations by adhering to the particular guidelines provided by the framework. The case study also validates the need and usage of the identified tools to address common challenges faced in the IP domain. |

Chapter 6 • Validation

| | Interviews with experts | Implementation | Case study application |
|--|---|-----------------------|---|
| | <p>case of open-ended questions. This provides an overview of the study area of interest.</p> <p>Framework-ranking interviews The framework-ranking interviews provide a quantitative approach to validate the framework, and requires the framework's concepts to be deemed necessary and useful by those who would have experience in the IP space and who may potentially benefit from the framework's successful development. This is just an acclimatised version of a structured self-administered questionnaire interview.</p> <p>Case study interviews The case study interviews are based on supplementary interviewing methods as it allows participants to speak freely and share their experiences towards clarification of the findings from the case study.</p> | | <p>To address the concerns associated with case study validation, evaluative interviews with key actors are also conducted.</p> |

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The validation pathway selected for this study includes expert analysis via semi-structured interviews, framework-ranking interviews as well as case study focused interviews. This is supplemented by performing a case study to obtain practical insight.

The semi-structured interviews, case study application and the case study focused interviews are all qualitative research approaches. As such they provide great insight into the field of IPs, but they are open to interpretation and the participant inclusion is determined solely by the researcher. The need to include a quantitative method is thus highlighted. The framework-ranking interviews provide a quantitative basis to support the qualitative findings.

Figure 42 provides a roadmap of the logic supporting the validation process adopted in the course of this study. The preliminary framework is developed out of the culmination of findings from preceding chapters. Semi-structured interviews were conducted to validate that the concepts on which the framework is developed are credible and confirmable. Based on the new knowledge gained, the framework is amended before conducting every interview.

The first iteration of interviews introduced a refined framework that is suitable for quantitative analysis. The framework-ranking instrument is designed to quantitatively validate the framework's relevance, reliability and usefulness in an empirical manner. Ten framework-ranking interviews are conducted with experts operating in the healthcare platform space. Upon receiving the interviewees' individual feedback, a few minor adjustments were made in order to enhance the framework's reliability.

The need for specific tools to address key IP concepts is highlighted through the framework-ranking interviews. Prior to the commencement of the case study, supplementary tools are added to the framework in order to improve its relevance and usefulness.

The case study aims to establish the framework's efficiency and effectiveness in practice. To finalise the validation process, supporting interviews were conducted with key actors from the selected case study. This was done to accurately interpret the case study findings and to further validate the framework-tools' application.

To adhere to the guidelines provided by Stellenbosch University's Research Ethics Committee, consent for audio-recording was obtained prior to proceeding with interviews. The primary data recordings as well as the participants' names for all interviews are omitted.

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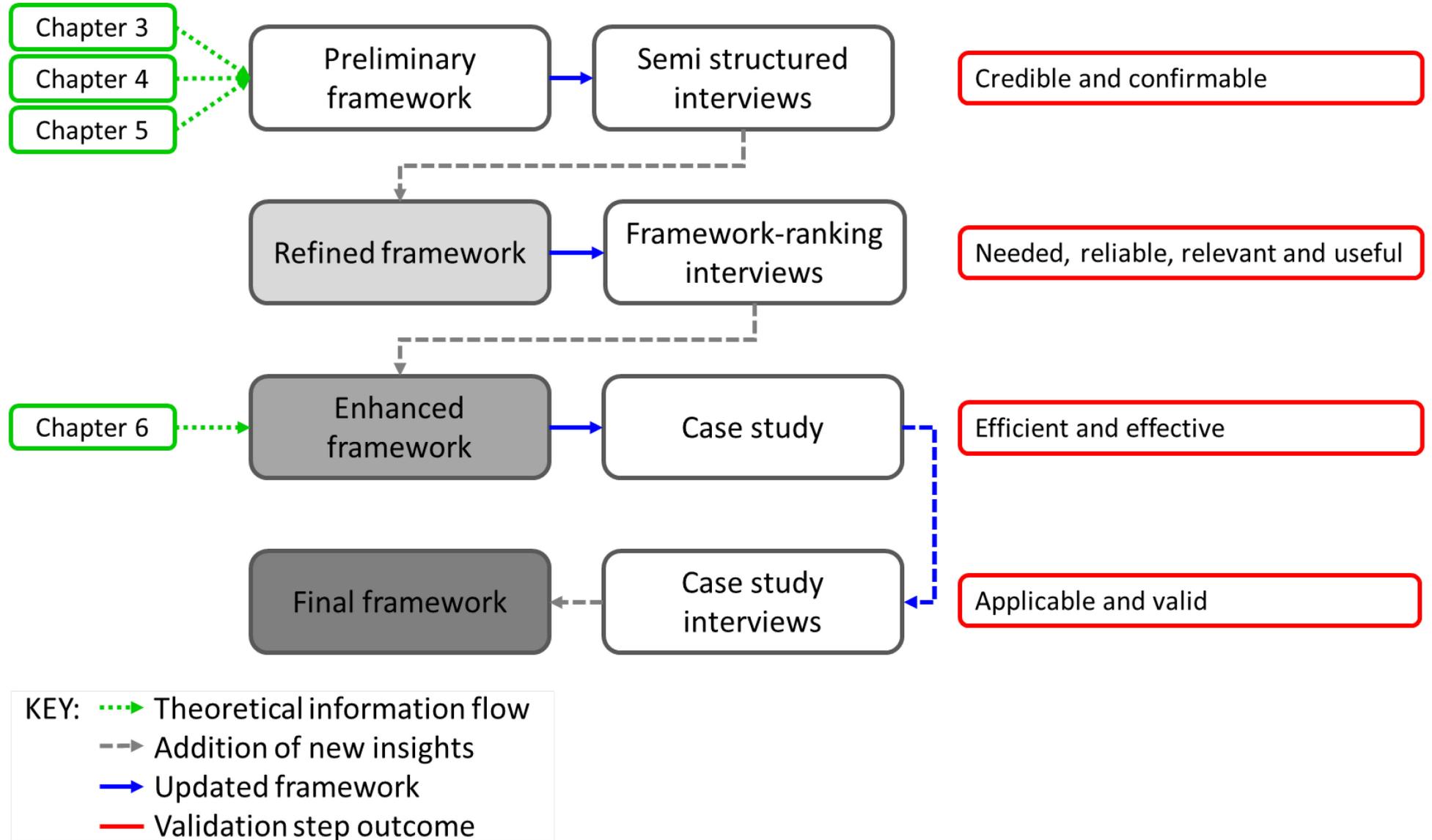


Figure 42: Validation process

6.2 Semi structured interviews

Essentially, the aim of this section is to show how the semi-structured interview validation stage has been employed in order to gain insight into the credibility of the preliminary framework and to identify the framework's shortcomings. The framework under consideration is preliminary in nature and is founded on the outcomes of Chapter 3, Chapter 4 and Chapter 5, as displayed in Figure 43.

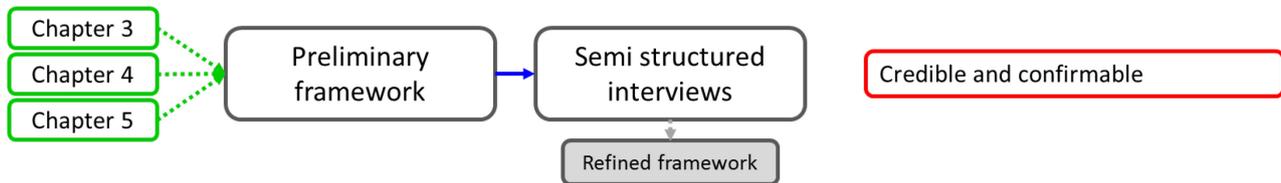


Figure 43: Semi structured interview validation

The first stage of validation is achieved through expert analysis. Face-to-face, semi-structured interviews were conducted over a timespan of one month. An interview guideline was developed for conducting the interviews to ensure the coverage of the following themes: the need for a collaborative approach towards solving healthcare challenges, addressing the lack of a guiding tool towards the development of multi-stakeholder innovation processes in healthcare and the validity of the concepts upon which the framework is developed. Beyond this, an open-ended question oriented approach was adopted and the individual interviews lasted between one and two hours.

These set of interviews focused on the interplay of concepts that are related to the formation and functioning of the IPs. The semi-structured nature of the interviews allowed for an active engagement regarding the novelty of IPs in the South African healthcare industry as well as proposals on the evolution of the identified concepts. The objective of the semi-structured interviews conducted was to determine where the proposed theory and the practical application are different, in principal. This created a platform from which a strategy to decrease the gap between theory and reality was formulated.

6.2.1 INTERVIEW METHODOLOGY AND GUIDELINE

With the design of a new interview schedule, a pre-testing or piloting space is needed to ensure that the fieldwork reciprocates valid and useful data. This was achieved by confirming that the items included in the instrument were not too vague or undefined. The interview schedule therefore provided a structure within which to work, but it was still quite flexible enough to allow for the participant to control the narrative, to a certain extent.

The semi-structured interviews consists of two main components. The first part entails an introductory overview presentation of the research which was followed by the process of talking the interviewee through the proposed framework of the study in an excel format.

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The interviewer presented a short presentation, included in Appendix E, in order to familiarise the participants with the context of the study. The goal of this was to minimise any uncertainty that might exist regarding the framework and the approach followed towards its development. Participants were encouraged to ask questions regarding any areas of ambiguity or concern that may have arisen during the course of the presentation.

The validation questions asked to the expert participants were developed and framed to establish the validity of the identified concepts and consequently the foundation of the conceptual framework.

The following probing questions form the basis of the interview schedule:

1. Is there a need for a collaborative approach towards solving healthcare challenges?
2. Do you recognise the lack of integration amongst VC actors? If yes, does this have a great impact on effectively addressing healthcare challenges?
3. Do you make use of any specific framework or tool to run the platform?
4. Do you agree that the identified categories are necessary for developing and operating healthcare IPs?
5. Do the concepts that we discussed make sense within your context of functioning?

The interviewees were identified through various avenues. Their selection was based upon their experience and their expertise within the healthcare industry and healthcare IPs. The interviewees embodied different roles and responsibilities within the healthcare VC.

Theoretical saturation was assessed after every interview on the basis of the coding of the collected data. The point where no new information was acquired from reviewing data and where newly collected data no longer provided any new interpretation of a concept or category, theoretical saturation is reached.

Quality was maintained throughout the fieldwork process by keeping a close track of the work completed and by efficiently mapping the process that was followed. The dates when emails were sent and received was recorded along with the dates when interviews were conducted. The length of the interviews and the background information of each participant was also systematically recorded. Lastly, the interviewee refusals, responses and the reason for their refusals were also documented.

6.2.2 RESULTS AND DISCUSSION

Upon completion of the interview process, the recordings of the interviews were deductively analysed towards identifying prominent opinions, shortcomings and useful recommendations for the improvement of the framework. Industry experience relevant to the framework were also extracted.

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1. All the interviewees agreed that a collaborative approach towards addressing healthcare challenges is desperately needed.

“When you’re an external person coming in trying to effectuate change, that is very difficult. Change is hard anyways. When you’re trying to change a culture, you have to find internal sponsors who will drive it, so your role as a researcher is to support that person.” ~ KB²¹

“Most people know that something is not quite right here, but they don’t necessarily know how. And they don’t understand how what they’re doing impacts, especially down the line.” ~ KB

“That would be the ideal goal. To not only drive it here, but also regionally and even nationally.” ~ EG

“Some people ask me what management is doing about this, but then I remind them that it is everyone’s responsibility. There is a need to collaborate with stakeholders and not only focus on your area.” ~ EG

“If you don’t get the feedback from the people from the onset of the project and you try and implement a solution that does not make sense in their context, they won’t consider it. They need to see the purpose, or worth, to consider it.” ~ GG

“Now we need to get past the burning field which is the people. They are resistance.” ~ HH

2. There seems to be an overwhelming agreement that the VC analytical lens is an appropriate perspective to adopt and that it would provide useful insights for all members involved in the innovation process.

“The issue with that was that any kind of referral they were doing would have to link into what province was doing and that was where it stopped. And that was frustrating.” ~ KB

“It’s all about understanding you pull a lever here. What are the dynamics towards creating an optimal system? Is there an optimal system?” ~ KB

“Everyone was asking: how do we even access government? We cannot access government and policies. We are trying to scale, but how do we do this?” ~ KB

“The input was coming from a bunch of different people which was really quite nice and different. It changed from a more exclusive to a more inclusive approach.” ~ EG

“You need participation. This lack of participation is a huge problem in SA, as you mentioned.” ~ HH

²¹ To ensure anonymity of participants their names are not included.

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“You cannot only have certain set of players involved. There are always new things that are becoming more relevant and that needs a new focus area.” ~ HH

“I quickly started to realise that one singular solution is in fact not the solution. It works in a chain where everything affects each other. For example; by only improving one aspect you may still not have an impact at the bottom-line of the chain.”~ HH

“If we just say okay guys, let’s all sit around a table and discuss this. It will lead to a much better solution. To take a common decision to create a common vision for the movement. There is a need for different skills and a multidisciplinary approach. You need doctors, you need engineers, policy makers and lawyers. You need them all to really make a change.” ~ HH

- 3. The interviewees all expressed a keen interest in the final outcome of the framework as they observed the need for a documented approach towards IP development. It was evident that participants make use of processes to run their respective platforms, but none of them explicitly makes use of a framework or tool.**

“Your subject is very topical. People are interested in figuring out the diffusion of ideas.” ~ KB

“I think there should be [a framework]. You have to learn from your experiences. I think it’s difficult because this is so new and in a way very rare.” ~ EG

“It’s a very interesting study and it can help us build in the areas that are relevant but have not yet fully been explored.”~ GG

““This sounds extremely interesting to me. The things that you have found within literature we have come across in a non-academic space.” ~ HH

To identify the changes required to the preliminary framework, the analysis categorised the participant’s responses into validation, additions and modifications per dimension. Table 22 presents the summarised findings. This provides an abridged response to question four and five of the interview schedule.

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Table 22: Semi-structured interview results

| Dimension | Validation | Additions | Modifications |
|---|---|---|--|
| Interaction/ Engagement- concertation | The use of context specific incentives is vital to ensure active engagement of members. | Clear clarification of members' roles and responsibility is a crucial aspect from the commencement of the platform. | Consideration that for-profit companies are not always ready to share information or collaborate. |
| | It is important to address conflict head on by creating a neutral space for interaction. | It is very difficult to get external parties involved in the innovation process. Therefore, there is a need to consider how to approach collaborative partnerships. | Understanding that the living conditions of patients is a crucial factor in the determination of appropriate interventions. |
| | Good intentions won't have any impact unless they are disseminated through an engaged platform, which ought to be created, based on mutual respect. | Engaging with people takes time, this process of interactions is influenced by the different roles that the included parties play. | |
| | Visioning & brainstorming are essential components, regardless of the final outcome of the process. | The facilitator of the platform requires experience in negotiations and dealing with multiple diverse stakeholder desires. | |
| Knowledge development & learning | It is important to promote education and knowledge sharing amongst different actors. | Knowledge management and subsequently, data security are especially important in the healthcare context. | The dissemination of the results should be wide-spread to create awareness across geographical and disciplinary boundaries. |
| | Knowledge translation needs to transpire across different levels of education and multiple different cultural backgrounds. | M&E is difficult to track, but it is crucial to show how these interventions can lead to specific positive/desired outcomes. | To optimise the usability of the data, interoperability functions need to be considered during the design of data storage facilities. |
| | | Knowledge management processes should be customised to suit the environment in which the IP functions. | The creation of a definite link between the policy-makers and IPs are required to provide policy-makers with the latest research findings. |
| Capacity development | Inculcating local ownership of solutions is an absolutely vital | Designing for scalability is important, but within the context in which there is limited | Elaborate the consideration of the capacity development versus capability |

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| Dimension | Validation | Additions | Modifications |
|------------|---|--|---|
| | element to their implementation and long-term acceptance. | collaboration amongst public and private healthcare organisations, this is very difficult to achieve. | development is required. M&E indicators are required to track capacity development. |
| | People cannot be forced to alter their stand. If they do not buy into the solution then they will eventually default to old patterns. | With the VC approach, it is very important to invite input from across the VC, even when an actor may not be directly involved in a project. | |
| | To create trust amongst the platform members, transparency across all platform activities is needed. | | |
| Innovation | Expertise and continued improvement is crucial to the success of any intervention. | The consideration of intellectual property rights with respect to the development of unique innovations that can be commercialised, is required. | Driving innovation is difficult in the public space when money needs to be considered. With limited resources, accountability and transparency of finances are important components |
| | Innovation is stimulated amongst members by acknowledging the distinct input that each actor introduces. | The consideration of a mindset and culture change amongst actors is needed. Without Regardless of the proposed solution, without a willing workforce the intervention is destined to fail. | |
| Actors | It is important and required to distribute as much information as possible amongst all the stakeholders. | The approach should not purely be bottom-up, but it should rather consider both ends of the spectrum. | The human element is embedded in any design within healthcare is crucial. People have the potential to discontinue a project before it has truly commenced. |
| | It is through the inclusion of multiple stakeholder groups, the ownership and a united perspective is created. | | |

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| Dimension | Validation | Additions | Modifications |
|------------------|---|---|---|
| Institutions | Inspection of cultural norms in which the IP is embedded, is required. | There is major issue with the communication amongst VC actors that often impedes the implementation of plausible ideas. | Collaboration amongst national-level institutions is required to spur on cooperation amongst regional and local institutions. |
| | Consideration of the institution that owns the IP and the consequences thereof should be determined before the commencement of platform activities. | There is a need for a contractual agreement amongst the IP members. This agreement should address all the potential concerns that members may have regarding the operation of the platform. | |
| Infrastructure | A neutral meeting space is required as it provides members with a fresh perspective and it resembles the equality amongst members. | Funding plays a major role during the platform's lifetime and it is an important determinant of success. | Business models are a major challenge, as they don't allow for inter-operability and integration. |
| | Consideration of projects that can and cannot be supported in terms of the availability of the resources is needed. | With the creation of an entirely new set of producers, some quality control issues may arise. Therefore platforms should include robust quality control mechanisms. | |

6.3 Framework-ranking interviews

The refined framework forms the foundation from which this stage of the validation process is initiated. This section presents the framework-ranking procedure as well as its outcomes. This stage of the validation process attempts to show the need, reliability, relevance and usefulness of the refined framework as highlighted in Figure 44.

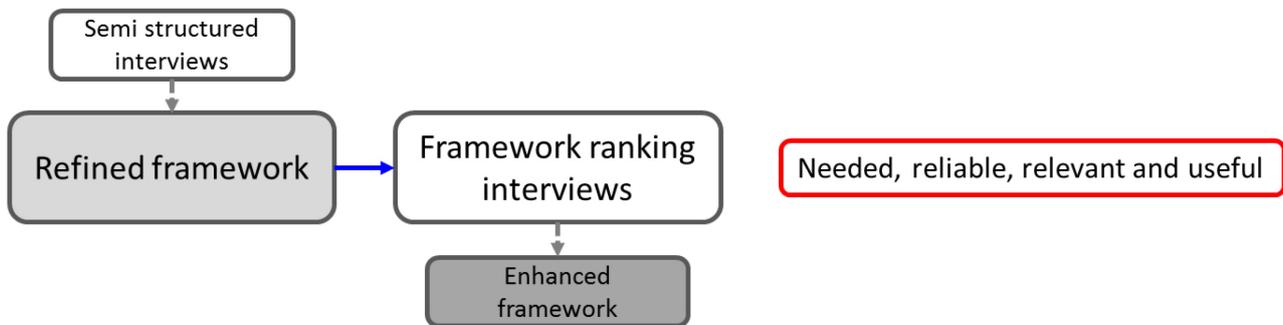


Figure 44: Framework-ranking interview validation

6.3.1 INTERVIEW METHODOLOGY AND DATA COLLECTION

The goal is to identify and include as many projects as possible that meet the pre-defined criteria, as outlined in Figure 45. It became evident that healthcare IPs are relatively scarce in SA. Nineteen potential healthcare IPs were initially identified online.

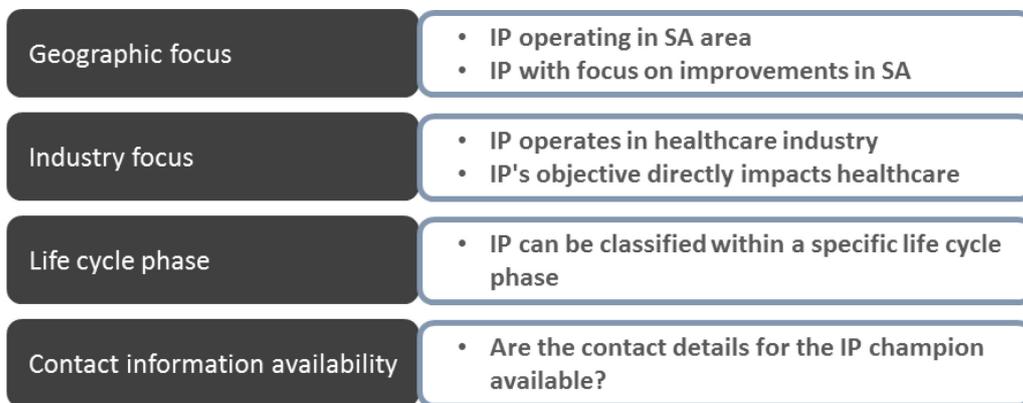


Figure 45: Interviewee selection criteria

Respondents were purposefully selected based on the criteria, or through snowball sampling where interviewed key-informants further identify other people that could be relevant to the study. In total eleven candidates participated in this exercise, with the results from only one interview being excluded from the findings.

It became apparent during the ranking exercise that one particular participant did not have the required level of knowledge to be able to provide necessary insights. The participant therefore did not meet the pre-determined requirements.

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After meeting with this particular respondent it was mutually agreed that their inclusion within the study was not appropriate and that their feedback would not aid in validating the framework. The remaining 10 participants all possessed considerable experience in healthcare platforms in SA.

Only two types of IPs were investigated, namely multi-stakeholder platforms²² and technology IPs²³. The decision to focus on multi-stakeholder platforms is based on the fact that it aligns particularly well with the VC approach. The inclusion of technology IPs was supported by their geographical location in SA.

The interview discussions predominantly focused on ranking the concepts upon which the framework is founded and further validating the construction of the proposed framework. The ranking instrument was established on concepts of a deductively developed and refined framework, which has been validated as credible. This reduced the possibility of including any irrelevant concepts being in the exercise.

Similar to the semi-structured interview methodology, the framework-ranking interviews also adopted a two-pronged approach. Firstly, the interviewer completed an introductory presentation to create the needed context and to remove any ambiguity regarding the study. The proposed framework was then presented in excel format and the objective of the interview was re-explained. The excel sheet that was used and distributed to participants is included in Appendix F.

Interviewees were asked to rank the concepts identified in the framework according to their relevance, degree of impact as well as the associated degree of effort required to address them, as presented in Figure 46.

| LIFE CYCLE PHASE | | | | | | |
|------------------|------------|----------|-----------------|-------------------------------------|---|--|
| Categories | Dimensions | Concepts | Applicable (sv) | Impact of applying the concept (sv) | Effort required to address the concept (sv) | Mechanism/Tool(s) employed to assist in process (mv) |

Figure 46: Structure of the framework-ranking exercise

Figure 47 displays a graphical representation of the refined framework and the elements it embodies. The refined framework incorporates the additional concepts introduced in stage one of the validation process.

²² Multi-stakeholder platforms are aimed at developing innovation capacity for a range of actors that are market-oriented [49], [139], [169].

²³ Technology IPs are conceptualised as the result of the exploitation and reutilisation of knowledge and experience accumulated by the institutions in a sector. This is supplemented by the generation of new knowledge and distinctive technological competencies that can be shared [173].

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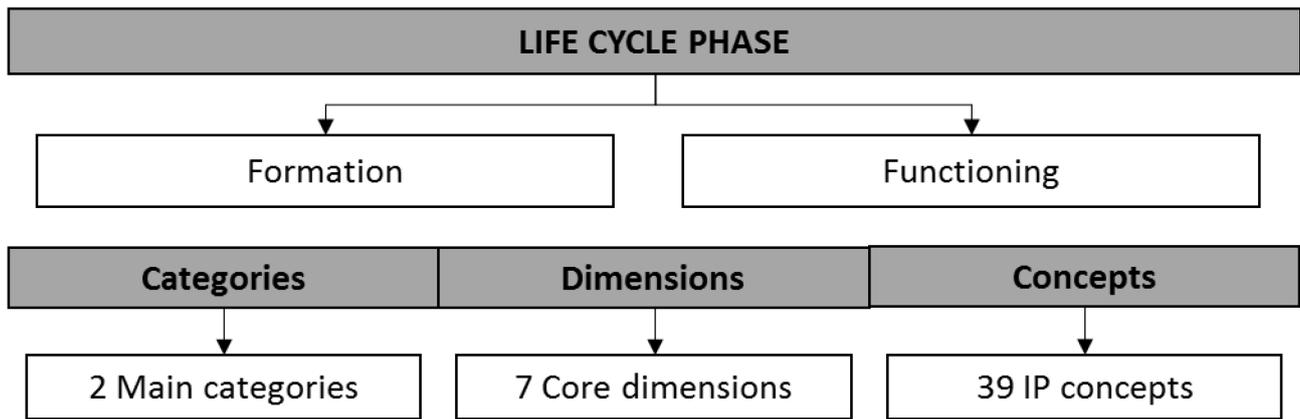


Figure 47: Breakdown of refined framework

Figure 48 presents a breakdown of the ranking criteria used in the framework-ranking exercise. Participants indicated the applicability of a concept based on its relevance and usage within their platform. Interviewees were given five mutually exclusive options to select from with regards to the impact of applying the concept. The effort required to address the concept was then ranked based on another five mutually exclusive options. Additionally, participants were provided with a space to list the tools that they currently employ to address the respective concepts.

| Applicable | Impact of applying the concept | Effort required to address concept | Mechanism/ Tool employed to assist in process |
|------------------------|--------------------------------|------------------------------------|---|
| Relevant, but not used | 1. Extremely negative impact | 1. Negligible degree of effort | Provide any relevant mechanisms/tools that you employed to address the concept. |
| Relevant, used | 2. Negative impact | 2. Minor degree of effort | |
| Irrelevant, not used | 3. No impact | 3. Moderate degree of effort | |
| Irrelevant, used | 4. Positive impact | 4. High degree of effort | |
| | 5. Extremely positive impact | 5. Extremely high degree of effort | |

Figure 48: Breakdown of ranking criteria

This forms the quantitative part of the research because it incorporates the results that provide insight into the perceived importance of activities within the applied world. The need for the framework-ranking exercise was explained to participants so that they could provide transparent answers.

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The correlation between the impact of a concept and the associated degree of effort required to implement it is powerful as it highlights the areas of IPs that require further investigation. Auxiliary tools that address the identified concepts were investigated to provide assistance in addressing specific challenges.

After the completion of the framework-ranking interviews, participants were invited to review their responses and to pose any additional questions regarding the sections of the work that is unclear. Follow-up interviews were conducted to confirm or clarify the responses from the initial interview process on a necessity only basis.

6.3.2 RESULTS AND DISCUSSION

The results from the ranking exercise are discussed in this section. The interviewee conducted informal discussions with the experts to express their opinion on the framework's reliability, relevance, usefulness as well as the need for the framework. Table 23 discusses each validation outcome and how it is addressed during this stage of the validation process.

Table 23: Ranking validation outcomes

| Outcome | Explanation | Application |
|------------|--|--|
| Reliable | Confirmation that no redundant factors are incorporated that make the framework ineffective. | This is discussed after the completion of the ranking exercise as participants have then been exposed to the concepts that are incorporated into the framework. Table 39 presents these insights. |
| Usefulness | Ensure that relationships between the concepts reveal that the framework is useful in guiding the development and operation of an IP. | Participants indicate whether or not they currently use each concept. Furthermore, they may indicate that a concept is relevant but not currently addressed. Additionally, the usefulness of the framework is validated through the personal feedback questions presented in Table 39. |
| Need | Recognition of the fact that there exists a need for a framework towards the formation and functioning of healthcare IPs that promote integration amongst VC actors. | The need for the framework is established through probing questions prior to the ranking exercise as well as a final question regarding the need for such a framework. The identification of concepts that require further investigation and supportive tools also validates the need for the framework. |
| Relevance | The inclusion of these specific concepts present a novel approach to thinking about IPs. Establish that there exists a correlation between the performance of IPs that consider and exhibit elements from the framework's guideline. | This is achieved through ranking the relevance of each concept during the formation and functioning phase, respectively. |

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Analysis of the interviews’ content was performed with particular focus on the different themes and context units. After the qualitative analysis of the interviews’ content, statistical treatment was performed to determine the correlation between the impact and the associated degree of effort of each concept.

Figure 49 displays the feedback received regarding the relevance of each concept that is included in the IP formation phase. It is clear that the majority of the concepts were deemed relevant and used. There are 13 concepts that are identified as relevant, but that are not currently used. After enquiring why these concepts are not addressed, it became evident that a lack of knowledge and deficiency of the required resources, constrained the implementation of these concepts. The eight concepts that were ranked as, irrelevant and not used, were investigated.

RELEVANCE - FORMATION

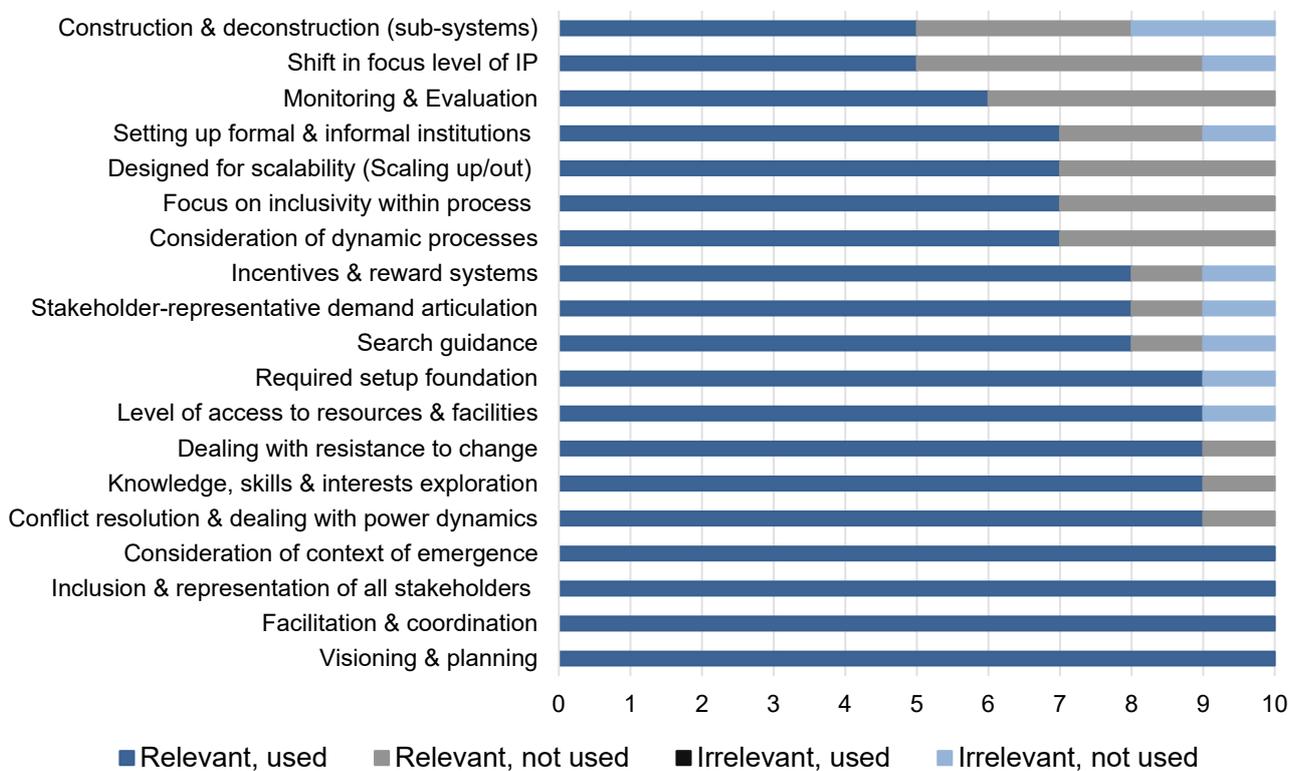


Figure 49: Relevance of concepts addressed during IP formation

Figure 50 presents the outcome of the relevance-ranking of the IP functioning concepts. The majority of the concepts were ranked as relevant and used, while 16 concepts were highlighted as relevant but not used. Nine concepts were ranked as irrelevant and not used with two concepts being ranked as irrelevant and used.

RELEVANCE - FUNCTIONING

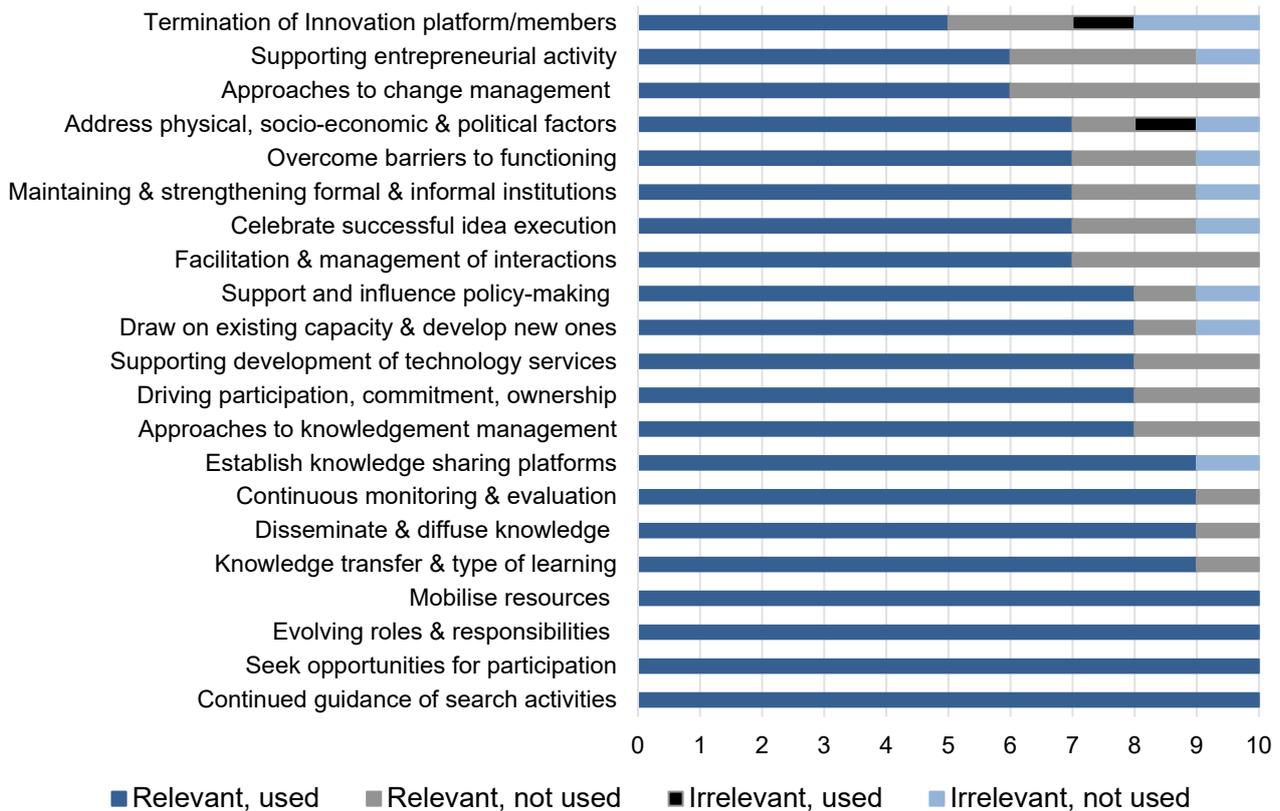


Figure 50: Relevance of concepts addressed during IP functioning

As stated in Section 6.3.1, the fundamental motivation behind the framework-ranking exercise was to identify concepts that exhibit a positive impact but that also require a great degree of effort to address. The concept identification criteria adopted, extracted rankings that exhibited a positive or extremely positive impact, but that require a moderate, high or extremely high degree of effort to address or implement. Table 24 presents the findings from the framework’s formation phase. The colour pallet utilised indicates the cumulative frequency of a specific outcome. Table 25 illustrates the same conditions for the framework’s functioning phase.

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Table 24: IP formation - Impact vs Degree of effort

| | I = Impact of concept, E =Degree of effort to address concept | | | | |
|--|--|------------|-----------------|------------|-----------------|
| | I=5, E=5 | I=4:5, E=5 | I=4:5, E=4:5 | I=5, E=3:5 | I=4:5, E=3:5 |
| Design for scalability (Scaling up/out) | 4 | 6 | 8 | 6 | 8 |
| Monitoring & Evaluation | 3 | 4 | 8 | 3 | 9 |
| Inclusion & representation of all stakeholders | 3 | 3 | 8 | 4 | 10 |
| Facilitation & coordination | 2 | 3 | 8 | 4 | 10 |
| Level of access to resources & facilities | 2 | 3 | 7 | 2 | 9 |
| Consideration of context of emergence | 2 | 2 | 9 | 4 | 10 |
| Focus on inclusivity within process | 2 | 2 | 5 | 2 | 9 |
| Visioning & planning | 1 | 2 | 6 | 4 | 8 |
| Search guidance | 1 | 2 | 3 | 1 | 5 |
| Incentives & reward systems | 1 | 1 | 5 | 2 | 7 |
| Conflict resolution & dealing with power dynamics | 0 | 2 | 3 | 1 | 6 |
| Dealing with resistance to change | 0 | 1 | 8 | 4 | 8 |
| Stakeholder- representative demand articulation | 0 | 1 | 6 | 3 | 9 |
| Required setup foundation | 0 | 1 | 5 | 3 | 10 |
| Knowledge, skills & interests exploration | 0 | 0 | 5 | 5 | 10 |
| Consideration of dynamic processes | 0 | 0 | 4 | 1 | 7 |
| Construction & de- construction (sub- systems) | 0 | 0 | 4 | 1 | 6 |
| Shift in focus level of IP | 0 | 0 | 3 | 1 | 5 |
| Setting up formal & informal institutions | 0 | 0 | 3 | 1 | 6 |

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Table 25: IP functioning - Impact vs Degree of effort

| | I = Impact of concept, E =Degree of effort to address concept | | | | |
|---|--|------------|--------------|------------|--------------|
| | I=5, E=5 | I=4:5, E=5 | I=4:5, E=4:5 | I=5, E=3:5 | I=4:5, E=3:5 |
| Mobilise resources | 3 | 4 | 6 | 4 | 10 |
| Facilitation & management | 2 | 3 | 6 | 4 | 9 |
| Knowledge transfer & type of learning | 2 | 2 | 8 | 4 | 10 |
| Continuous monitoring & evaluation | 2 | 2 | 8 | 4 | 10 |
| Supporting development of technology services | 2 | 2 | 7 | 4 | 8 |
| Support and influence policy-making | 1 | 4 | 6 | 1 | 7 |
| Disseminate & diffuse knowledge | 1 | 3 | 6 | 4 | 9 |
| Driving participation, commitment, ownership | 1 | 1 | 8 | 2 | 10 |
| Maintaining formal & informal institutions | 1 | 1 | 6 | 2 | 8 |
| Overcome barriers to functioning | 1 | 1 | 6 | 2 | 10 |
| Approaches to knowledge management | 1 | 1 | 5 | 1 | 10 |
| Supporting entrepreneurial activity | 1 | 1 | 5 | 2 | 8 |
| Draw on existing capacity & develop new ones | 1 | 1 | 4 | 5 | 10 |
| Establish knowledge sharing platforms | 0 | 2 | 6 | 1 | 9 |
| Seek opportunities for participation | 0 | 2 | 5 | 0 | 9 |
| Approaches to change management | 0 | 1 | 7 | 2 | 9 |
| Continued guidance of search activities | 0 | 1 | 5 | 1 | 9 |
| Physical, socio-economic & political factors | 0 | 1 | 4 | 0 | 10 |
| Evolving roles & responsibilities | 0 | 0 | 4 | 1 | 10 |
| Celebrate successful idea execution | 0 | 0 | 3 | 3 | 8 |
| Termination of innovation platform/members | 0 | 0 | 1 | 0 | 2 |

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The selection of the concepts that require further investigation was based on the frequency of the occurrence of a rating that indicated the fact that the concept has a positive impact, but that it is difficult to implement. As shown in Figure 48, an impact rating of five symbolises that the concept has an extremely positive impact and a degree of effort rating of five indicates that the degree of effort required to address the concept is extremely high. Concepts that displayed an occurrence of $I = 5$ and $E = 5$ were investigated first. The cumulative frequency of the identified concepts had to be higher than eight to be included. Only five concepts were identified for further investigation to remain within the scope of the study.

Table 24 identifies (1) Designed for scalability, (2) M&E and (3) Inclusion and representation of all stakeholders as the top ranked concepts. Figure 49 supports their selection as all three concepts are ranked as relevant, used or relevant, not used.

Table 25 identifies (1) Mobilise resources, (2) Facilitation and management, (3) Knowledge transfer and type of learning, (4) Continuous M&E and (5) Supporting development of technology services as the highest ranked concepts during the functioning of IPs. To determine the concepts to select for further investigation, Figure 50 was consulted. (1) Mobilise resources and (2) Knowledge transfer and type learning was selected based on their high relevance and used-ranking.

The concepts identified from Table 24 and Table 25 are:

1. Design for scalability;
2. Mobilising resources;
3. Monitoring and evaluation;
4. Inclusion and representation of all stakeholders; and
5. Knowledge transfer and type of learning.

Additionally, the ranking exercise identified concepts that were deemed as having a negative or no impact at all but that require a moderate, high or an extremely high degree of effort. The outcome of this analysis has been shown in Appendix G1. However, the discussion on these concepts is beyond the scope of this project.

Each participant completed a personal feedback section in which they provided an overall impression of the framework and its validity. Table 39, in Appendix H summarises each participant's response. The participants rated the potential benefits of healthcare IPs as superior to its implementation and maintenance difficulties. They perceived the framework to be beneficial for the functioning of their healthcare platforms.

The author extracted recommendations for improvement from the personal feedback. Table 26 presents a summary of the findings. This contributed towards the development of the enhanced framework used in the case study application in Section 6.5.

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Table 26: Recommendations for improvement

| Identified concept | Recommendation |
|--|---|
| Context of emergence | <ul style="list-style-type: none"> • Consideration of measures to prevent extrapolation of solutions between conflicting contexts. |
| Driving participation, commitment and ownership | <ul style="list-style-type: none"> • Consideration of incorporating collaboration tools. |
| Facilitation & coordination | <ul style="list-style-type: none"> • The framework needs an explicit process to select the platform facilitator. Additionally, a checklist with basic requirements may be useful to identify a facilitator. |
| Facilitation & coordination, Visioning & planning | <ul style="list-style-type: none"> • Getting out of the starting blocks is a challenge. Initially, there is a need to ensure that members see the potential value of the platform. Members should however not be placed under too much pressure at the onset of the platform. |
| Facilitation & management | <ul style="list-style-type: none"> • Create a central driving force to identify, analyse, promote and track relationships, partnerships, outcomes and outputs generated by these over time. |
| Incentives & reward systems | <ul style="list-style-type: none"> • Promote platform sustainability by preventing a rapid decline in platform members after the initial sign-up. Ensure that engagement is constantly pursued by the platform through making use of context appropriate incentives. |
| Inclusion & representation of all stakeholders | <ul style="list-style-type: none"> • Pivotal to platform success is the involvement of the various stakeholders and maintaining neutrality. There is a need for tools to assist in maintaining neutrality. |
| Knowledge transfer & type of learning | <ul style="list-style-type: none"> • There is a need for a clear understanding of intellectual property protection. • Local and indigenous knowledge needs to be considered to ensure that temporary solutions are not proposed to meet major problems. Consider how to introduce indigenous knowledge into the IP. |
| Maintaining & strengthening formal & informal institutions | <ul style="list-style-type: none"> • Greater focus on data interoperability and creating back-end communication. One of the major issues with this is the lack of available standards for these platforms. |
| Monitoring & Evaluation | <ul style="list-style-type: none"> • To create a platform/ process for innovation, continuous interaction of practice, implementation, design, documentation and learning is required. This also allows for ongoing projects to be more visible. |

6.4 Tool identification and inclusion

It is evident from the results presented in Section 6.3.2 that there are areas within the IP space that have a great impact on the platform's functioning, but that also require a high degree of effort to be addressed. This section introduces various tools that are utilised within IP literature to address the specific concepts, based on the distributed correlation findings of the quantitative validation.

The selection of the concepts from Table 24 and Table 25 is supported by basic statistics on the received feedback. Although the author appreciates that this is an incredibly small sample size, the exploratory analytics of the selected concepts is included in Appendix G2.

6.4.1 TOOLS IDENTIFIED IN LITERATURE

The concepts identified in Section 6.3 are discussed in this section. The various mechanisms/tools that support their implementation are introduced and explained. Table 27 provides an overview of the identified tools and their desired impact.

6.4.1.1 DESIGN FOR SCALABILITY (SCALING UP/OUT)

In order to promote scaling out of platform findings, participatory workshops are encouraged [217]. Such workshops are frequently used to identify the greatest barriers to addressing challenges. Stakeholders analyse how challenges relate to one another and this allows for the realisation of collective goals across different VC links. Collective action across links is needed to enable scalable change to occur [177].

Field visits are also a useful tool to engage multi-stakeholder focus group discussions towards identifying entry themes to establish improved access to healthcare. These visits allow for an understanding of the available infrastructure in different geographical regions and within different cultural environments. This provides key insight into design criteria and constraints during the scaling of an IP [217].

Successful outreach strategies that enable scaling out, are founded on context specific campaigns. It is important that the IP addresses the audience in a manner that is comprehensible to them. The following avenues can be used to distribute IP findings:

- Print media: newsletters, newspapers, publications and posters
- Digital media: video, photographs and photo films
- Media roundtable: Radio (provides a good means of drawing attention of various parties)
- Social media: Mobile messaging (Whatsapp groups for quick communication)
- Internet and web-based tools (web sites, blogs, social media that share platform activities and stories of impact that the platform has had)
- Briefs to provide feedback, research reports, region specific, parties & contact person
- Organise field days for engagement between people experiencing common problems

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Through the distribution of findings, awareness is created within local communities and this provides a basic foundation from which the IP has wider access to resources and buy-in from communities. The use of social media provides a powerful way to establish new relationships through maintaining a steady flow of information regarding platform activities and providing contact details if someone desires more information. This creates a sense of common identity and a way to hear stakeholder voices outside of platform meetings.

6.4.1.2 MOBILISE RESOURCES

To establish how to best mobilise resource, a problem tree analysis can be utilised. This allows for the breakdown of the current infrastructure utilisation towards identifying the root cause of sub-optimal usage of resources. This will assist in breaking down an intervention in terms of the resources it requires.

To generate revenue, members can be asked to pay a membership fee to form part of the IP. The model of payment should be designed bearing in mind the context in which it functions. Alternatively, funds can be sourced through partnering with NGOs or certain government institutions or through making an income from activities that are unrelated to the IPs objective [138]. It is collectively the members' responsibility to ensure that the necessary funds are available throughout a project's lifespan [181]. The sharing of resources amongst and across platforms is encouraged towards generating income.

Training can help to equip potential members with the necessary platform skills. The training can be in the form of pre-recorded videos or e-learning platforms in an attempt to alleviate the required costs and manpower.

6.4.1.3 MONITORING & EVALUATION

The activities, findings and events hosted by the platform must be documented as well as any research, which is performed. Platform stakeholders should easily have access to this information. Documenting platform activities and changes in stakeholder activities and perceptions is an important part of the monitoring and learning activities that are so critical for the successful functioning of the platform [143].

Platform members should periodically reflect on platform activities & outcomes of the events. This aids in building a learning portfolio of the IP to support how it has brought about changed attitudes and addressed challenges. Such experiences should be organised, synthesised and shared towards improved IP evolution in the future [122], [138]. Documentation allows for outreach to take place. This is important for scaling up²⁴ and scaling out²⁵.

²⁴ Influence policy makers to bring about change.

²⁵ Show others in community what can be achieved.

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Additional M&E methods and indicators specific to IPs in the VC context have been explored [54], [160]. In order to have a baseline from which changes can be determined at the completion of a project, an analytical study of the institutional context at the commencement of the project is required [53], [55]. It is important to develop novel indicators that capture innovation capacity. Examples of such indicators include a variety socio-technical experiments, a change in discourse in policy networks and autonomously continuing innovation networks.

Continuous learning is an important factor during the M&E process and as such the inclusion of a learning framework can be prove valuable. This will explicitly allow for reflection that acknowledges failures and finds ways to learn from it [138]. Figure 51 is a graphical representation of an M&E process with proposed tools for usage. This can be utilised as a guideline during IP formation and functioning.

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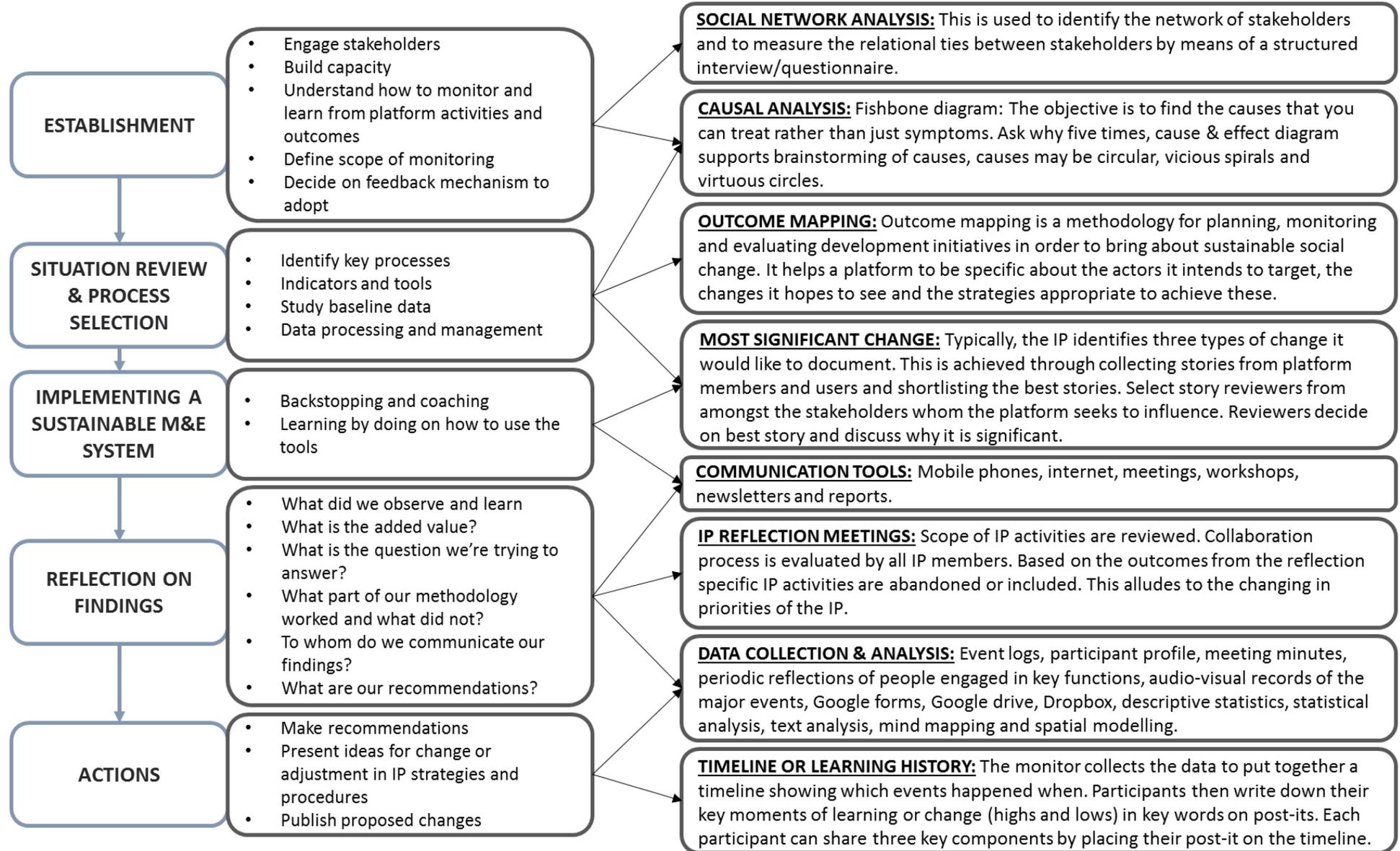


Figure 51: M&E process with proposed tools (Adapted from Makini *et al.*; Lundy *et al.*; Schut *et al.* [138], [176], [217])

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6.4.1.4 INCLUSION & REPRESENTATION OF ALL STAKEHOLDERS

To ensure the inclusion of all stakeholder representative groups, a stakeholder analysis is recommended [174], [218], [219]. Figure 52 provides an overview of the three main steps in the stakeholder analysis.



Figure 52: Overview of stakeholder analysis (Adapted from Reed *et al.* [220])

The functions of the stakeholder analysis include: 1) identifying relevant stakeholders; 2) identifying the existing conflicts between stakeholders to ensure that they are not exacerbated by future work; 3) understanding the power dynamics to enhance the transparency and equity of decision-making; and 4) understanding the agendas of all members.

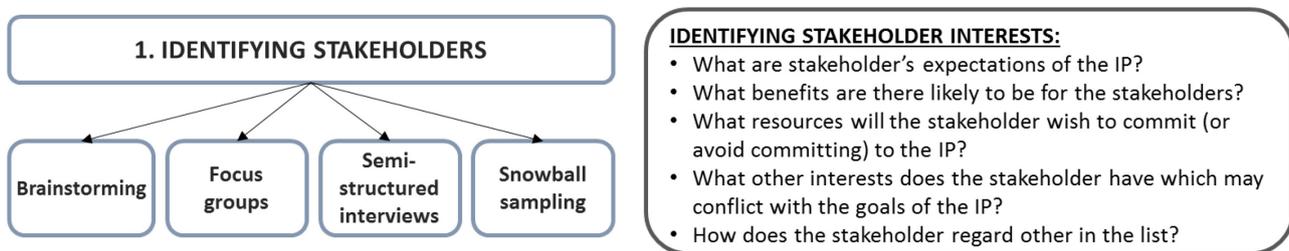


Figure 53: Step 1 - Stakeholder analysis (Adapted from Reed *et al.* [220])

In order to identify the various stakeholders, Figure 53 introduce the following mechanisms:

- **Brainstorming:** The team members all sit together and call out the names and groups of stakeholders;
- **Focus groups:** A smaller group brainstorm about the stakeholders, their interests, influence and other attributes, and categorise them accordingly;
- **Semi-structured interviews:** Interviews are conducted with a cross-section of stakeholders to check or supplement the focus group data;
- **Snow-ball sampling:** Individuals from initial stakeholder categories are interviewed to identify new stakeholder categories and contacts.

After identifying the various stakeholders, a stakeholder map is created. This chart visually represents the various stakeholders and their relevant categories that may prove useful. Figure 54 depicts Step 2 and Step 3 of the stakeholder analysis process.

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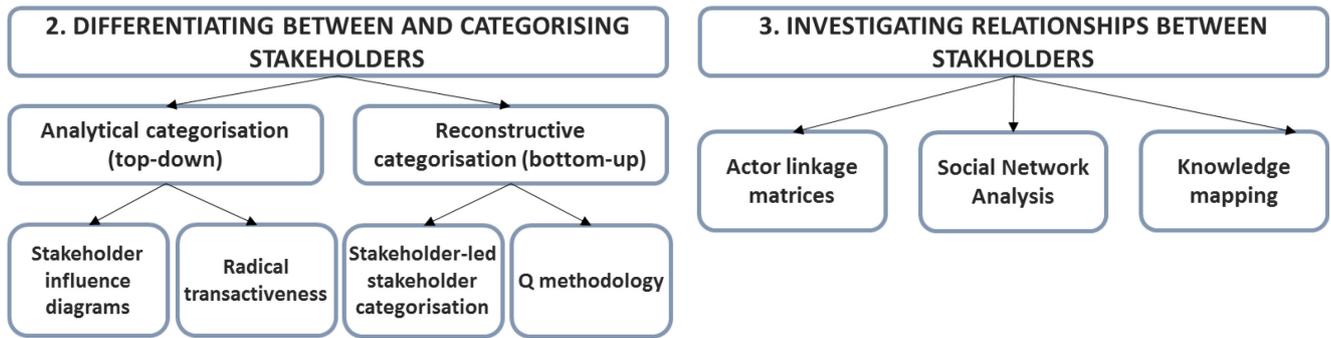


Figure 54: Step 2 & 3 - Stakeholder analysis (Adapted from Reed *et al.* [220])

The tools that are available for categorising stakeholders, during Step 2, include:

- Stakeholder influence diagrams: Stakeholders are placed on a matrix according to their relative interest and the influence they exercise;
- Radical transactiveness: Snow-ball sampling is used to identify fringe stakeholders and to develop strategies to address their concerns;
- Stakeholder-led stakeholder categorisation: Stakeholders themselves categorise stakeholders into categories which they have created;
- Q methodology: Stakeholders sort statements drawn from a discourse according to how much they agree with them, analysis allows social discourses to be identified.

During the investigation of the stakeholder relationships, in Step 3, the following methods can be adopted:

- Actor-linkage matrices Stakeholders are tabulated in a two-dimensional matrix and their relationships described using codes;
- Social Network Analysis: Used to identify the network of stakeholders and measuring relational ties between stakeholders through use of structured interview/ questionnaire;
- Knowledge mapping: This involves semi-structured interviews to identify the interactions and knowledge of stakeholders and is used in conjunction with Social Network Analysis.

Each stakeholder needs to value the role that they play within the IP as well as supporting each other as they work towards attaining their goals. A clear understanding of the expectations of all stakeholders will promote open communication. It is important for the stakeholders to foster trust amongst one another and to resolve any conflict that may arise [180].

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6.4.1.5 KNOWLEDGE TRANSFER & TYPE OF LEARNING

There are various enabling mechanisms that can be adopted by IPs to enhance their knowledge transfer capabilities. Learning breeds innovation and it sharpens members' capacity to innovate over time [205]. Formal learning opportunities to attain skills such as negotiation and communication can act as an incentive and also provide a foundation from which knowledge transfer can occur more easily.

Capacity development is a key objective across different IPs and it relies on efficient methods of communication to manage and transfer information. Through increased capacity, knowledge transfer can occur more easily, as members become better equipped to communicate with stakeholders across the VC, This allows for the appreciation of different types of knowledge and learning within the platform.

Strategic alliances simultaneously promote learning through doing as well as developing capacity [169]. This approach is documented as successful within the healthcare realm.

Communication possess the ability to bring diverse perspectives into light and thus assist in developing trust to share knowledge & views. The IP facilitator can organise reflection sessions to allow for the breakdown of the cultural barriers or to overcome status differences. Role-playing may also be adopted to allow members to embody non-traditional roles to develop an appreciation of different perspectives. This leads to the realisation of the knowledge transfer potential that exists within the platform.

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Table 27: Overview of the identified supplementary mechanisms

| Concept to address | Tools (from literature) | Tools (from interviews) | Desired impact |
|--|--|--|---|
| Design for scalability (Scaling up/out) | <ul style="list-style-type: none"> • Participatory workshops • Field visits • Awareness via print media • Awareness via digital media • Media roundtable • Communication via social media • Awareness via internet and web-based tools • Distribution of feedback and research briefs | <ul style="list-style-type: none"> • Presentation at national conferences • Presentation at provincial and national government departments • Meetings with hospital leadership at targeted facilities • Individual meetings with innovation teams • Outreach to internal hospital departments | A platform may not specifically aim to scale up or out, but within the healthcare context communication amongst all health system actors is required. To ensure that a platform is capable of reaching scale, a few essential criteria need to be addressed prior to its development. The mechanisms discussed promote awareness of a the platform as well as creating an attentiveness to scalability of outcomes and processes. |
| Mobilise resources | <ul style="list-style-type: none"> • Problem tree analysis • Revenue generation through improved business models • | <ul style="list-style-type: none"> • Dedicated roles to support platform functioning • Overall quality improvement effort | Mobilising resources includes human, financial and physical resources required to successfully engage and implement interventions. To ensure that this is addressed, mechanisms that support continuous improvement efforts are required. |
| Monitoring & evaluation | <ul style="list-style-type: none"> • Outcome mapping • Causal analysis • Most significant change • Social network analysis • Participatory impact pathways • Communication tools • Timeline or learning history • Data collection & analysis (data collection tools) • IP reflection meetings | <ul style="list-style-type: none"> • Support from quality assurance and impact expert • External M&E process to evaluate overall innovation programme | In order to track and report on the outcomes of the platform, M&E is required. This aids in reflecting on the platform objectives that are achieved as well as evaluating the outcomes of the process that is followed. To allow for successful M&E processes, communication is key. This includes the collection of the necessary documentation as well as getting feedback from all IP members continuously. |

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| Concept to address | Tools (from literature) | Tools (from interviews) | Desired impact |
|--|---|--|---|
| Inclusion & representation of all stakeholders | <ul style="list-style-type: none"> • Stakeholder analysis • Brainstorming • Focus groups • Semi-structured interviews • Snowball sampling • Stakeholder influence diagrams • Actor linkage matrices • Social Network Analysis • Knowledge sampling | <ul style="list-style-type: none"> • Focus Groups • Individual interviews • Staff workshops • Outreach via posters, newsletters etc, • Design sessions • Member workshops | Create an environment that is welcoming to all stakeholder groups. This will aid in developing inclusive interventions through stakeholder representation across the platform's life cycle. In order to attain this level of inclusivity, stakeholder awareness is required as well as workshops that allow for cohesion amongst diverse platform members. |
| Knowledge transfer & type of learning | <ul style="list-style-type: none"> • Strategic alliances • Formal learning opportunities • Capacity development exercises • Reflection sessions • Role-playing | <ul style="list-style-type: none"> • Focus groups • Project feedback meetings • Narrative reports • Programme end report outs • Project team presentations • Posters and newsletters | Knowledge transfer across linkages in the VC is needed to bring about context appropriate solutions. To ensure the successful transfer of knowledge, a set of auxiliary tools are required. These mechanisms promote the awareness of different types of knowledge that each member contributes and that the culmination of all these types of knowledge is key in addressing challenges. |

6.5 Case study

“Those who work in the hospital understand the challenges best, better than anyone from the outside can”.

~ Jennifer Kruger – CEO, The Health Foundation

The proposed framework recommendations presented in Section 6.3.2 are supplemented by the research findings in Section 6.4 which contribute towards the development of an enhanced framework. The case study exposed the framework for scrutiny and aimed to explore and discuss the practical application thereof. This created a space in which practical feedback was collected. The research objective of this phase, as displayed in Figure 55, is to validate the efficiency and effectiveness of the enhanced framework.

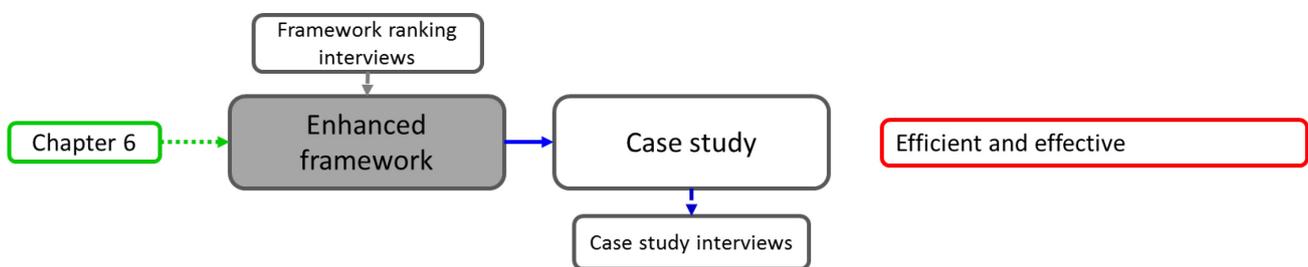


Figure 55: Case study validation

A single case investigation of the framework exposed some of its strengths and weaknesses thereby highlighting the areas that require future research. It is recognised that the completion of a single study is limited in the extent to which the findings can be generalised. Within the allotted timeframe for this thesis, it is not feasible to conduct multiple case studies that meet the required standard.

This study is founded upon both explorative and evaluative aspects. The case study is evaluative since it tests the applicability of the framework in the real world context. The aim of the case study application is to test the effectiveness of the framework in guiding the IP process. Furthermore, the case study introduces a holistic understanding of healthcare IPs through the use of inductive logic.

Section 6.5.1 presents the grounds for the case selection, followed by an overview of how the data was collected and analysed. After a comprehensive discussion regarding the selected case, to create the necessary context for investigation, the framework is applied to the case. The importance of each dimension addressed in the framework is presented in light of the case and the prevalent findings are documented.

6.5.1 CASE STUDY SELECTION

The purpose of the case study is to gain more in-depth practical insight into the application of the IP framework and the potential effectiveness of the proposed tools. The intent is to take apart the case, to find out if the IP functions successfully and the reasoning for this.

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To achieve this, the fieldwork conducted in this particular study analyses the case of the collaboration between the Bertha Centre for Social Innovation and Entrepreneurship²⁶ and GSH²⁷ towards the development and continued operation of the GSH Innovation Programme and subsequently the Innovation Hub. The GSH Innovation Hub was selected as it is the first public services Healthcare Innovation Hub in Africa

GSH is an academic hospital that is characterised by its innovative nature, whilst Bertha Centre is focused on uncovering, pioneering and connecting innovators and entrepreneurs to generate inclusive opportunities and to advance social justice in Africa.

Towards further delimiting the scope of this case, a specific focus is placed on the GSH Innovation Hub's initial Innovation Programme that was launched in July 2014 and the second Innovation Programme that was launched in January 2017.

6.5.2 DATA COLLECTION AND ANALYSIS

To extract the utmost value from the case study, various literature sources were consulted during the data collection process. Project documents were reviewed in order to understand the context in which the Hub started and the initial motivation behind its development. There is limited literature available regarding the GSH Innovation Hub and therefore the case study findings were supplemented through three site visits.

6.5.3 THE GSH INNOVATION HUB

The initiation of the hub was supported through a partnership between the Bertha Centre for Social Innovation and Entrepreneurship, University of Cape Town's (UCT) Faculty of Health Sciences²⁸, GSH, the GSH Facilities Board, and the Western Cape Provincial Department of Health²⁹.

The GSH Innovation Hub is located within GSH and was opened in March 2015. The motivation for the Hub's development was to create a space from which to catalyse innovation through harnessing the potential of frontline HCWs. This was spurred on through the Innovation Programme that commenced in 2014. The 2017 Innovation Programme was launched to celebrate the 80th anniversary of GSH in 2018.

²⁶ www.gsb.uct.ac.za/berthacentre

²⁷ www.westerncape.gov.za/your_gov.163

²⁸ www.health.uct.ac.za

²⁹ www.westerncape.gov.za/dept/health

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The inaugural GSH Innovation Programme focused on identifying challenges experienced by frontline HCWs within the hospital and to address these challenges collaboratively. The underlying aim is to develop a culture of innovation that leads to staff members thinking creatively to identify opportunities for improvement across all levels. Focus is placed on person-centred healthcare that creates a better patient experience as well as creating a superior working environment for staff.

The need for a specific space for collaborators to meet and discuss the various potential opportunities was noticed during the first Innovation Programme. The vision was to inculcate feeling of an inclusive space that would allow for teamwork amongst diverse members of the healthcare system.

The Innovation Hub runs separately from, but simultaneously with the GSH Innovation Programme, with events and workshops curated for the benefit of the Western Cape healthcare community as a whole, rather than for the sole use of GSH Innovation Programme participants.

The Hub was designed to achieve three objectives: 1) understanding the needs; 2) developing new solutions; and 3) connecting with the community.

The Hub is a space for HCWs, innovators, students, policy makers and community members to allow them to gain a deeper **understanding of the real challenges** within the system. This creates a platform from which unique opportunities for transformation are imagined.

The Hub encourages practical learning and skills development in innovation. This allows for the **co-creation of solutions** and creates a pathway from ideas to implementation.

The Hub **serves as a connector** between the PHS and the broader community as well as, between healthcare innovators and policy makers. The mandate rule behind the operation of this Hub is that everyone accesses healthcare and therefore everyone is encouraged to join the community towards making a difference. An underlying purpose of the Hub is to instil unity amongst stakeholders.

6.5.4 CASE STUDY DISCUSSION

“We’re excited to see what the employees come up with next, as the agency within each of them has now been unlocked to pioneer again as social innovators. They are now empowered to address health challenges they face within the hospital or on behalf of their patients.”

~ Dr Francois Bonnici [Director at the Bertha Centre]

Innovation lives in spaces where the process is given adequate attention and it does not occur in isolation. The Hub allows like-minded people to come together and collaborate while bringing people of diverse backgrounds to one place so that each person introduces a different perspective.

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Through the case study, the enhanced framework and its associated tools were applied practically. To foreground the relevancy of the framework on the case study, a stepwise analysis of the case was completed.

The collaboration project was used to reflect on what has been done and the processes and principles that were employed during the formation and functioning of the Innovation Hub. To this end, this section presents the specific concerns relevant to the GSH Innovation Hub and the similarities between the proposed framework and the reality of the case.

These processes are mapped against the framework to determine the framework's utility and practical application. Where disparities between the framework and the case are identified, further investigation is required into clarifying the reasons for the gap between the theory and the real world application. Table 28 provides an overview of the case study findings.

Table 28: Case study findings

| Dimension | Formation | Functioning | Recommendations |
|--|--|---|---|
| Interaction/ Engagement – Concertation | <ul style="list-style-type: none"> • Scoping interviews to identify challenges and opportunities. • Proposal submissions to determine project selection. • Ongoing project support by facilitator. • Trust building and interdependence exercises. • Context specific incentives. • Preventative action to steer away from conflict. | <ul style="list-style-type: none"> • Facilitate dialogue and interactions amongst multiple stakeholders. • Limited occurrence of member termination, rather rotation of roles. • The Hub is managed according to Groote Schuur Performance System³⁰ (GPS) and this guides the facilitation process. • Increased success with implementation when project ownership was established early on. | <ul style="list-style-type: none"> • It is important to nurture socialised informal (flexible) relations to foster innovation. • Knowledge brokers can assist in connecting GSH networks to stakeholders that are not familiar with each other but may provide “new combinations” essential to innovation. • The facilitator must create a link between daily operations and the executive management team. This creates a space for bottom-up trust development and transparency. • Build on incentives to ensure a demand-driven and contextualised innovation process. |
| Knowledge development | <ul style="list-style-type: none"> • A major function of the Hub is to act as a connector between frontline innovators and policy makers, consultants, and subject matter experts. • Equip members to explore and harness their full potential through focus groups. • An authentic M&E system is implemented that promotes transparency. | <ul style="list-style-type: none"> • Learning by doing to increase the buy-in over time, therefore reducing the need for incentives. • Technical learning through conventional training, demonstration and exposure to new skills. • The GSH newsletter, Facebook page³¹ and video campaigns contribute towards creating awareness among members with different levels of knowledge. | <ul style="list-style-type: none"> • Reflexive learning by challenging critical constraints, this is an important role for research within the Hub. • There is a need for knowledge translation to occur more easily across different levels. • On-going project evaluation is vital to assessing the impact of the programme. |

³⁰ GSH launched their unique continuous improvement system, Groote Schuur Performance System (GPS), in 2017.

³¹ www.facebook.com/gshinnovation/

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| Dimension | Formation | Functioning | Recommendations |
|----------------------|---|--|---|
| | | <ul style="list-style-type: none"> • Knowledge management is considered a high priority but it is not addressed effectively. • Continuous reflection process on what has been achieved and what the most appropriate indicators are to measure the success of the interventions. | |
| Capacity development | <ul style="list-style-type: none"> • Workshops and other events to stimulate innovation mindset are incorporated. • Ownership of projects is respected. • Various stakeholders across the board are involved. However, it is difficult to get people with different views in the same room. • The facilitator has to deal with the resistance to change. • Inclusivity is attained through an open platform policy and through supporting meaningful interactions that inspire transformative relationships. | <ul style="list-style-type: none"> • Members are sent for training and upskilling. • Currently developing training material to advance alignment with GPS, but it is not completed yet. • Encourage ownership through bottom-up process. • Develop leadership and problem solving skills to apply in various areas of life. • Address red tape through breaking down silos. | <ul style="list-style-type: none"> • It is important to allow the innovation process to catalyse new thought processes. • An IP should create an opportunity for participants to learn from each other rather than measuring progress against one another, as this may induce stress, tension, and fear of not living up to the Hub's expectations. |
| Innovation | <ul style="list-style-type: none"> • Encouraged to deliver as many innovative ideas as possible. • The Hub provide flexible and agile innovation support. | <ul style="list-style-type: none"> • Various activities completed towards the implementation of innovation projects. • A range of support mechanisms are required. | <ul style="list-style-type: none"> • Project timelines need to be adaptable. While the need for defined start and end dates are appropriate for an Innovation Programme, it is also important not to |

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| Dimension | Formation | Functioning | Recommendations |
|--------------|--|--|--|
| | <ul style="list-style-type: none"> • Pathways for actors to connect with one another are created. • Search guidance through feeding into the GPS and aligning the overall vision with the GPS. • Shift in focus level of projects and the scale at which innovation occurs due to change in facilitation. | <ul style="list-style-type: none"> • Graphs and visual management is utilised to share data. • Commercialisation of innovations is not currently addressed effectively. • Continuous monitoring for long-term tracking and to ensure GPS alignment. | <p>impose artificial timelines to individual project implementation.</p> |
| Actors | <ul style="list-style-type: none"> • Project members from different disciplines and background occupy the same space. • The Hub struggles to reach all actors across the VC. • Bottom-up process employed. • Specific roles and responsibilities are communicated clearly to actors. | <ul style="list-style-type: none"> • The Bertha Centre stepped away after assisting to activate the space and there was a shift in roles and responsibilities. • Single person project teams struggle to meet Innovation Programme demands. | <ul style="list-style-type: none"> • Social organisation of producers is important for learning and demand articulation. • Due to weak linkages between VC actors, intermediaries play a critical role to ensure representation of different types of VC actors. • Rules and regulations need to be adapted to include the poor. • Actors need to feel mutually dependent before engaging them in a process. • Take into account diversity among main beneficiaries when deciding on main focus of project. • Creating and fostering effective coalitions among actors is often hindered by incomplete information regarding what potential members can offer. |
| Institutions | <ul style="list-style-type: none"> • It is difficult to maintain high morale amongst actors as the | <ul style="list-style-type: none"> • Developing measurements to flow into the GPS. | <ul style="list-style-type: none"> • Formal institutions (and the change thereof) are important to support the innovation process. |

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| Dimension | Formation | Functioning | Recommendations |
|----------------|---|---|---|
| | <p>ownership of the Hub is not clear.</p> <ul style="list-style-type: none"> • There are house rules within the functioning of the Hub. • Hub members construct and deconstruct sub-systems and project teams as they see fit. • The selection of project sponsors and mentors did not work well. | <ul style="list-style-type: none"> • Introducing a legal agreement document is very difficult as there is no standard to work according to. • Support and influence policy-making through leveraging networks. | <ul style="list-style-type: none"> • Informal institutions such as trust, norms and values are important for people’s behaviour and it may require specific methods to address them. • To ensure sustainability, projects must be embedded within a specific context. |
| Infrastructure | <ul style="list-style-type: none"> • Further funding to test and implement solutions is available. • The limited access to human resources impedes the development of projects. • Context specific and authentic infrastructure is created. • Focus on doing more with less through continuous improvement and optimisation approach. | <ul style="list-style-type: none"> • Silos are broken down to reach all actors and overcome barriers to functioning. • Monthly quality improvement meetings are held. • Periodic innovation project reports outs. • Waste reduction and relocation of assets for improved flow. | <ul style="list-style-type: none"> • Specifically look beyond the symptoms of the problems, look at root cause and then identify the requirements to address challenges. |

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6.5.4.1 INTERACTION/ENGAGEMENT-CONCERTATION

1. Formation

The Innovation Programme commenced by conducting scoping interviews to identify persistent challenges that obstruct the delivery of healthcare at GSH. The innovative ideas range from improvements in programme protocol, delivery processes, events and interventions that focus on improving patient outcomes further. GSH staff were asked to respond to these challenges with proposals. From October 2014 to December 2014 a series of workshops and events were run in the hospital to stimulate staff to think differently.

By December 2014, 24 teams submitted proposals outlining their ideas. Out of these, 17 pitched their ideas to an external selection panel in February 2015. Project proposals were then reviewed for further development and implementation. Eight projects were selected to receive funding to further develop, test and implement their ideas.

The implementation of the projects consisted of various activities. Project members were encouraged to deliver as many innovative thoughts as possible. Through incubation, the final project ideas were assessed and explored further.

The activities and timeline for their implementation can be seen in Figure 56.

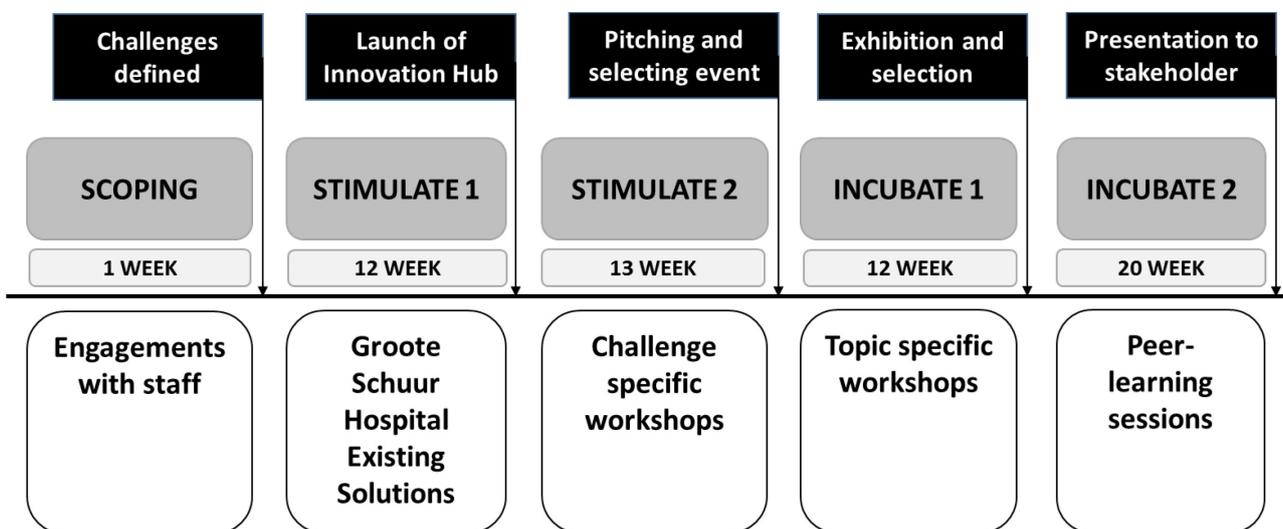


Figure 56: Innovation programme project timeline

During the Innovation Programme participants were encouraged to engage with the Innovation Hub facilitator. The role of the facilitator ranged from providing initial scope guidance to implementation or funding support. The facilitator embodied the role of mentor whilst also helping teams to figure out their implementation strategy.

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The facilitator is crucial in activating the space to achieve its potential. Since the Hub is very unique the functioning thereof is based on a trial and error basis as they do not have any guidelines that they work according to. To avoid Hub members becoming despondent to continuous change the facilitator tries to perfect the approach, implement it and then to maintain it. If a new approach is introduced prematurely, it has a negative impact on the trust within the space.

At the onset of the project, Hub members participate in exercises that highlight the interdependencies amongst VC actors. The goal of the exercise is to show that one person's irresponsibility becomes someone else's responsibility.

The programme needs to provide flexible support that will fit round the busy schedules of healthcare professionals, and that is relevant to the phase of the project that they are in. One size fits all workshops or sessions are difficult for team members to attend and might not be as valuable as one-to-one meetings.

During this initial engagement, the facilitator equips Hub members with the tools and knowledge to further explore their innovative ideas. This process was initially very informal and it's run by the facilitator until members become confident enough to do it on their own. This creates a sustainable approach. The Hub focusses on getting buy-in from Hub members at the onset of a project as it is extremely difficult to regain member's trust at a later stage.

The first Innovation Programme's participants were highly incentivised through the acknowledgement of their participation in a poster format that was displayed in the GSH corridors³². This also increased awareness of the Programme amongst the other stakeholders. Other incentives utilised by the Hub included distribution of awards at a closing ceremony, the knowledge gained through the process and certification as a competent coach as well as enhanced leadership skills. The Hub currently places a lot of emphasis on the novelty of the programme which thereby motivates the stakeholders to get more involved as they are going to leave a legacy through being part of something unique.

The Innovation Hub adopts a preventative approach to conflict. Through clarifying the purpose of the Hub, a common understanding is developed. The Hub aims to create a space in which all the members are regarded as equal and where traditional hierarchal structures do not dominate the project's direction.

2. Functioning

By facilitating dialogue and developing a community of practice amongst stakeholder groups the Innovation Hub was able to foster relationships, build networks, and connect stakeholders.

³² See Appendix I.

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GSH launched their unique continuous improvement system, the GPS, in 2017. The system is aligned towards a true North, which is their vision towards an leading innovative healthcare, developing leadership, creating an innovative environment and being person-centred. The Innovation Hub aligns itself with the GPS and it manages the Hub's activities according to this. Visual management tools are utilised to improve the facilitation and management of the Hub's processes. Project teams are encouraged to achieve easy, achievable goals.

Due to the nature of and the context within which the Innovation Hub functions, the termination of members rarely occurs. It is more likely that a member will rotate their role to assist in another project or support the project in a different capacity.

6.5.4.2 KNOWLEDGE DEVELOPMENT & LEARNING

1. *Formation*

Due to the vast number of stakeholders involved in the Hub, the type of knowledge across Hub members differ greatly. One of the Hub's goals is to create open sessions where knowledge is disseminated and where the Hub grows organically.

The Hub applies M&E in a unique, non-traditional manner. Hub members are trying to create a system that speaks to their specific context, but they have experienced limited success in this area. Hub members have noted that a lack of documentation could be a potential cause of failure. To increase transparency across the Hub's activities, an improved means of documentation is required.

2. *Functioning*

Knowledge management is substantially crucial as it provides guidance to not repeatedly make the same mistakes as have been made earlier in the course of time. The need for an improved knowledge management system is evident from the case study. The steering committee requires this information to make better and more informed decisions.

The Innovation Programme is additional in the hospital and therefore it is sometimes difficult to get the desired buy-in from hospital staff. When a proposed intervention is seen to be owned by and implemented by frontline workers, it is more likely that their peers and colleagues will be more inclined to buy into the innovation process and implementation versus having the intervention imposed upon them by management without their input.

6.5.4.3 CAPACITY DEVELOPMENT

1. *Formation*

It is clear that the Hub serves a vital role in contributing to and strengthening the innovation ecosystem. The skills, impact and knowledge that users of the space are seeking to understand and enhance is increased by having greater access to the resources, learnings, and peer experiences.

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There is a need for external parties that hold specific knowledge to be included in the Innovation Hub. External actors often introduce new, but extremely valuable knowledge. It is often difficult when different mind sets from external actors do not understand the GSH context.

2. Functioning

The GPS feeds from the bottom-up and therefore promotes inclusivity. The Innovation Programme is separate from, but complimentary to the continuous improvement projects that are also run from the Innovation Hub.

The Hub's workshops develop members' leadership and problem solving skills. The role of the government has an influence on the Hub's functioning as it has to address red tape during intervention implementation. This creates the potential to influence policy-making through creating the necessary linkages and improved communication.

6.5.4.4 INNOVATION

1. Formation

The GPS is used to guide the search through metrics. Visual management, team performance and team meetings ensure that all members share a common vision and are focused on improvement and optimisation of the current processes.

2. Functioning

During 2016, the Hub was run by GSH staff. The Hub was still utilised for different workshops and other functions, but it was not used optimally. GSH is very resource constrained and as such it required some time to activate the Hub-space with GSH at the steer. In 2016, the Hub primarily partnered with UCT to complete a few innovation projects. During this period the Hub grew slowly, but nevertheless it gained more traction and an increasing number of staff members became involved.

The Innovation Hub illustrates that innovation does not take place in an institutional vacuum, but that it requires facilitation towards the interaction of different actors. In June 2017, GSH permanently employed two staff members to run the Innovation Hub. The availability of funds for an innovation drive to celebrate GSH's 80th anniversary led to the launch of a second Innovation Programme. Numerous project suggestions were received and for the first time, input from across the VC was received.

The Hub is not currently equipped to deal with the development of commercially viable innovations. The necessary entrepreneurial support is not available to deal with intellectual property matters or the appropriation of viable business models within this space.

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6.5.4.5 ACTORS

1. *Formation*

The Innovation Hub was planned to serve as a site for moulding a community of like-minded innovators, in which membership is fluid and people from various strands of life and work are welcome.

The inclusion of all actors is extremely difficult because people are hidden in pockets across the hospital and they all have different agendas. The inclusion of all parties from the onset of the project is crucial, as the initial scoping feedback provides a foundation from which to address challenges. For the successful implementation of solutions, the context requires attention. Unless the purpose and value of the intervention is clear to IP members and stakeholders, long-term acceptance is impeded.

2. *Functioning*

The Bertha Centre was very explicit about the role they wanted to play in the Innovation Hub and that the initial facilitator was going to withdraw to ensure the sustainability of the Hub. At the end of 2015, the Bertha Centre stepped away from their hands-on role supporting the various project teams. This led to the creation of a space in which there were no dedicated resources coordinating the innovation initiatives.

The first innovation run highlighted the need to support single person project teams as they are unable to carry the totality of the Innovation Programme burden. These members find it difficult to stick to project timelines and to attend meetings, which leads to a time-delay in the implementation of their innovation.

6.5.4.6 INSTITUTIONS

1. *Formation*

The Innovation Hub has a set of house rules to ensure that the space is utilised optimally. These rules include standard operating procedures regarding the Hub's keys, the cleanliness of the Hub as well as booking the space for an event.

This creates the necessary structure to ensure that the Hub functions optimally and to reduce misunderstandings amongst Hub members. Additionally, Hub members adopt a democratic approach towards constructing and deconstructing sub-systems.

2. *Functioning*

The importance of the Innovation Hub in the public sector organisations is emphasised as such spaces are not typically conducive to innovation. Attempts towards innovation are often hindered through a lack of knowledge sharing amongst these organisations as well as internal politics.

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6.5.4.7 INFRASTRUCTURE

1. *Formation*

The Innovation Programme is based out of the GSH Innovation Hub, a physical space that allows programme participants to interact with various partners³³ across the Western Cape. The importance of creating an open space in which to interact is highlighted through this case study. This is due to the fact that the geographic concentration of people aids in creating social networks, which promotes inter-personal relationships and inter-organisation relations. This creates a platform through which knowledge can more easily be shared across organisational boundaries.

2. *Functioning*

To ensure the programme's sustainability, an active resource is required to streamline the implementation of the Hub and the Innovation Programme. This creates accountability regarding the use of resources and allows for the identification required resources. The support from the facility board is necessary to ensure sustainability.

Efforts to overcome many barriers to effective communication, cooperation, and ultimately innovation are central to ensure the sustainability within the Hub's infrastructure. Open communication amongst members allows for colleagues from different departments to work together to identify bottlenecks that affect everyone. This guides people to sit around a table to discuss matters and to establish trust amongst one another. The aim is to improve processes towards better utilisation of the resources through waste reduction and an improved process flow.

Table 29 presents the application of the identified tools on the case study. The potential impact that the tool has on a specific area within the Hub's functioning is described.

³³ Health innovators, entrepreneurs, students, clinicians, and practitioners.

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Table 29: Application of tools on case study

| Concept to address | Need for Hub to address the concept | Proposed tools | Potential impact on Hub |
|---|--|---|--|
| Design for scalability (Scaling up/out) | The novelty of the Hub and the lack of literature available on healthcare platforms in SA impedes the Hub's ability to scale up and out. The Innovation Hub has various external linkages and forms part of a great health system. Through the tools, the Hub can leverage these relationships to reach scale. | <ul style="list-style-type: none"> • Participatory workshops • Field visits • Awareness via print media • Awareness via digital media • Media roundtable • Communication via social media • Awareness via internet and web-based tools • Distribution of feedback and research briefs, publications • Presentation at provincial and national government departments | <ul style="list-style-type: none"> • This is very important to create the necessary linkages between platforms that aim to achieve the same outcome. • There are many things that different hubs can learn from each other or to assist each other with. • Showing people where they can play a role within projects and interventions • Creating awareness is very important in your area. • Making the research findings available to external parties creates an awareness of what the Hub is doing and this allows people to reach out to you. • Speaking at a conference also provides the necessary space to create linkages to allow for scaling. |
| Mobilise resources | The dedicated staff that support the functioning of the space allows for better utilisation and optimisation of platform resources. However, the Hub can benefit from a more systematic approach to address resource allocation. The Hub has experienced issues with funding and the commercialisation of innovations. | <ul style="list-style-type: none"> • Problem tree analysis • Revenue generation through improved business models | <ul style="list-style-type: none"> • Overall quality improvement effort. • This can be useful prior to project initiation to identify the project requirements and the Hub's resource availability. |

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| Concept to address | Need for Hub to address the concept | Proposed tools | Potential impact on Hub |
|--|--|---|--|
| Monitoring & Evaluation | The Innovation Hub appreciates the importance of M&E and it is in the process of creating an M&E system that is authentic to their needs. | <ul style="list-style-type: none"> • Outcome mapping • Causal analysis • Most significant change • Social network analysis • Participatory impact pathways • Communication tools • Timeline or learning history • Data collection & analysis (data collection tools) • IP reflection meetings | <ul style="list-style-type: none"> • The tools provide guidance in establishing what to monitor. • Through the tools, specific M&E indicators are identified. • Through M&E the most significant change is identified and this creates awareness and promotes participation amongst stakeholders. • Reflection meetings are very useful as a diverse range set of perspectives are considered. |
| Inclusion & representation of all stakeholders | The mandate of the Innovation Hub is to create awareness of the Innovation Programme amongst all staff members to gain insight from diverse stakeholders. This is difficult as people are hidden in pockets across the hospital and have different agendas. The Hub requires improved functioning through addressing stakeholder dynamics. | <ul style="list-style-type: none"> • Stakeholder analysis <ul style="list-style-type: none"> ○ Brainstorming ○ Focus groups ○ Semi-structured interviews ○ Snowball sampling ○ Stakeholder influence diagrams ○ Actor linkage matrices ○ Social Network Analysis ○ Knowledge sampling | <ul style="list-style-type: none"> • Through applying the identified tools, the Hub facilitator and members will be more informed regarding the stakeholder dynamics within the Hub. • This allows the facilitator to better structure meetings to ensure that all stakeholder views are heard and considered. • The adoption of the stakeholder analysis further assists the facilitator to prevent and efficiently deal with power dynamics, conflict resolution and resistance to change. • The stakeholder analysis provides insight into the perceived roles and responsibilities amongst Hub members. • The bottom-up approach of the stakeholder categorisation promotes inclusivity and looking across the VC to get a representative across each link. |

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| Concept to address | Need for Hub to address the concept | Proposed tools | Potential impact on Hub |
|--|---|---|---|
| <p>Knowledge transfer & type of learning</p> | <p>The Innovation Hub includes multiple stakeholders and as such it various different levels of knowledge is introduced. The Hub requires assistance in advancing knowledge transfer between members.</p> | <ul style="list-style-type: none"> • Strategic alliances • Formal learning opportunities • Capacity development exercises • Reflection sessions • Role-playing | <ul style="list-style-type: none"> • Reflection sessions create a space for members to share what they have learnt from other members and this creates an appreciation for the different types of knowledge that exists. This shows that different types of knowledge can aid in the design and implementation of an intervention. • Role-playing aims to create an understanding of different perspectives. • Workshops towards upskilling people and equipping them with specific tools that they may require within their projects in the Innovation Programme creates an opportunity for learning. |

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6.5.5 CASE STUDY CONCLUSION

The enhanced framework was applied and thereby validated by the means of a case study in the South African healthcare sector. Evidence from the GSH Innovation Hub case suggests that the framework satisfies its design goals by providing:

- Guidance towards the development of an IP;
- Providing support towards the operation of an IP; and
- Identifying interventions to support the development and continued functioning of more inclusive IPs.

The results discussed in Section 6.5.4 confirm that the framework is applicable to the GSH Innovation Hub case and furthermore it explicates that the framework can potentially aid the Innovation Hub in improving its functioning.

6.6 Evaluative case study interviews

Expert interviews were conducted to supplement the case study research performed during onsite visits, Figure 57. The motivation for the evaluative interviews is to validate the case study findings regarding the applicability of the framework within the real life context. The key areas that must be addressed prior to allowing stakeholders to use the framework were also discussed.

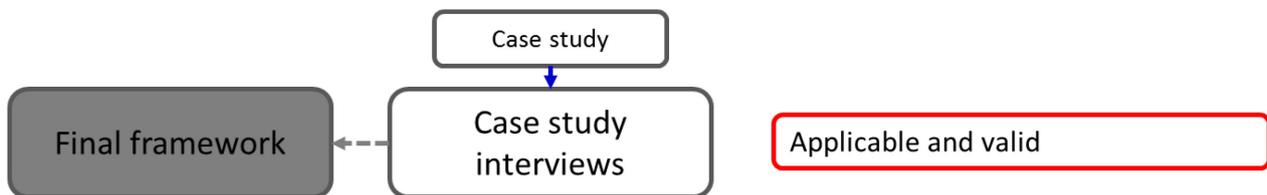


Figure 57: Validation through evaluative case study interviews

6.6.1 INTERVIEW METHODOLOGY AND GUIDELINE

The final stage of validation incorporates the experiences of three GSH Innovation Hub members. Table 40, in Appendix I, provides an overview of the key-informants that were interviewed.

For the evaluative case study interviews, the interview questions focused on getting feedback on the tools that were applied on the case study. The author acknowledges that the tools are not an exhaustive list.

The interviewee proceeded to explain the purpose of the interview as well as provide an overview of the case study findings. The tools that are incorporated into the framework were introduced and their applicability on the case was explained. After each tool-category was explained, participants were asked to confirm the validity of each tool as well as the author's findings.

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The interviews were concluded with the following questions:

1. Do the identified tools provide assistance in the process of developing and operating IPs?
2. Are there any key concerns to keep in mind when implementing the framework and the tools?

6.6.2 RESULTS AND DISCUSSION

The evaluative case study interviews validate the completeness of the framework and highlight the key stakeholder concerns regarding their implementation.

If implemented, the interviewees believe that the framework will aid IPs, like the GSH Innovation Hub, in promoting a culture of innovation that leads to an increase in collaborative efforts to address healthcare challenges. There is anonymous agreement that the specified tools are necessary for consideration as discussed in Table 30.

Table 30: Evaluative case study interview feedback

| Topic of discussion | The innovation head at GSH | The current Hub facilitator | The initial facilitator of the Hub from Bertha Centre's side |
|---|--|---|---|
| Are the tools to address the design for scalability (Scaling up/out) concept valid? | Yes , this is also very important. Platform literature is not well established, so scaling out to find out how to get the various role players and other people in the field involved is very important. | Yes . We currently utilise specific guidelines in terms of reporting to keep the reporting consistent and these tools assist us with this. | Yes . Presentations at various levels are key and extremely valid in thinking about and assessing readiness for scalability. Consideration of the efficacy of awareness creation requires attention. |
| Are the tools to address mobilising resources valid? | Yes . These tools makes sense within this context. I can see them being very valuable in our Hub. | Yes . This can assist us in the dual process approach that we currently make use of. | Yes , the tools (both literature and from interviews) are valid, and were used during the facilitation of the Innovation Hub. Of particular usefulness is the importance of establishing a dedicated resource. |
| Are the tools to address M&E valid? | Yes , we are trying to use these. It is however not always possible. It is definitely something that you need to do and it must be part of a standardisation. Having the resources to collect the necessary baseline and indicator information is the largest constraint. | Yes . These tools can potentially assist teams to clearly highlight all activities and major milestones to achieve. | Yes , Having an external process and expert is key; this is an extremely valid tool. |
| Are the tools to address the inclusion & representation of all stakeholders valid? | Yes , this is absolutely appropriate to meet our requirements. I definitely think this is very important. I could potentially implement this tool during the second round of our current Innovation Programme. | Yes the tools are valid. The Hub aims to utilise tools that suit the needs of the participants and these tool can assist us with this. | Yes , of particular validity and usefulness are focus groups, individual and semi-structured interviews, and design sessions. Stakeholder analysis done in a structured fashion, would be particularly useful. |

Chapter 6 • Validation

| Topic of discussion | The innovation head at GSH | The current Hub facilitator | The initial facilitator of the Hub from Bertha Centre's side |
|--|---|--|---|
| Are the tools to address knowledge transfer & type of learning valid? | Yes , this is really important ³⁴ . It is important to acknowledge that different members have different backgrounds and introduce different types of knowledge. All the types of knowledge should be perceived as having the same importance and these tools can help us achieve this. | Yes , the tools assist in providing participants with a programme that clearly highlights what is expected of them and what major milestones needs to be communicated. | Yes , focus groups, feedback sessions, and narrative reports are valid in disseminating knowledge both to the “users” of the innovation hub as well as more broadly. Reflection sessions would also be useful. However, in general, knowledge transfer tools varies depending on participant appetite and willingness to engage. |
| Do the identified tools provide assistance in the process of developing and operating IPs? | Yes , they do. This gives you a more holistic and systematic approach to evaluate and drive innovation and to also reflect on your innovation. | Yes . We constantly learn from our innovation/improvement programs. This gives up valuable feedback to develop the IP functionality and how it operates. | Yes , definitely. You have made me more aware of what is happening in this space. |
| Are there any key concerns to keep in mind when implementing the framework and the associated tools? | In the hospital setting, time is definitely the constraint. People who are involved in hospitals need to drive the projects because an external actor may not have an understanding of the context of the hub. The implementation must be very specific and authentic to how the hospital functions. It is also important to consider that certain people are heard in the platform context and there are others who do not raise their voices. There is always an imbalance to consider. | Yes . Our economic climate, together with our quadruple burden of disease makes the implementation of certain project very volatile. Managing the changes is one major concern. With the combined vision of moving towards continuous improvement within the hospital, the role of external researchers that specialise in healthcare improvement is highlighted. | The role of the Hub's facilitator and coordinator is pivotal to its success. The most important aspect of implementing any tools is to be thoughtful about how and why, and with whom they are deployed. Tools should support the entire endeavour rather than being applied in a blanket and uniform fashion. |

³⁴ I have also made use of the role-playing and it very interesting to see the different perceptions as some members take it up and reflect on it and other people struggle to see the worth of the exercise. It is important to note that this works for some people but not for everyone.

Chapter 6 • Validation

The lessons learned from the application of the framework on the case study are incorporated into the management tool design and provide recommendations for future studies.

6.7 Critical reflection

“The building is only as tall as the foundation is strong enough to build on!”

~ Paula White

Although the potential of IPs in the healthcare sector is recognised, various challenges remain pertaining to their implementation. Prior to the introduction of an IP, careful consideration and a trial period are necessary within certain contexts, because of their unfamiliarity with IPs.

The framework was specifically designed with the consideration that the IP BOK would grow within the future and that this has an effect on the framework’s longevity. The framework is resilient in nature as it has the ability to absorb changes in the knowledge base upon which it is developed.

The framework has been structured in such a way that the main categories provide guiding thoughts and are not rigid. With the addition of new literature findings these categories will expand in size as they are capable of absorbing additional information.

In addition to this, the CFA approach that is followed is systematic in nature making it easy to understand and refer back to. The logic that was followed can therefore be investigated to allow for improvements, if required.

Figure 58 depicts that in order to achieve success a set of core concepts and processes need to be drawn on to overcome challenges to adoption. The challenges that need to be overcome include regulatory demands, fair and just representation of actors as well as the importance of incentives to ensure demand driven processes. Furthermore, the storage of valuable data and behavioural aspects of the actors, demand consideration.

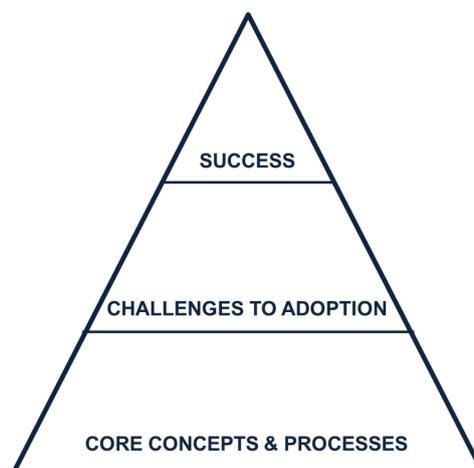


Figure 58: Inhibitors to success

6.8 Chapter 6: Conclusion

“ When you come upon a wall, throw your hat over it, and then go get your hat. ”

~ Irish proverb

This chapter cohesively presents the four stage progressive validation process that was adopted in this study. It presents the results from four semi-structured interviews, ten framework-ranking interviews, one case study analysis and three evaluative case study interviews. The iterative and systematic development and validation process ensured that the pre-determined validation objectives are achieved. The validation feedback leads to constructive criticism, recommendations, and opportunities for future research.

The completion of the semi-structured interviews, as discussed in Section 6.2, creates an understanding of healthcare IPs and provides new knowledge during the first iteration of the validation process. The quantification of the results from the framework-ranking interviews, in Section 6.3.2, proves vital in the identification of key concepts that require supportive tools to ease the effort required to address them.

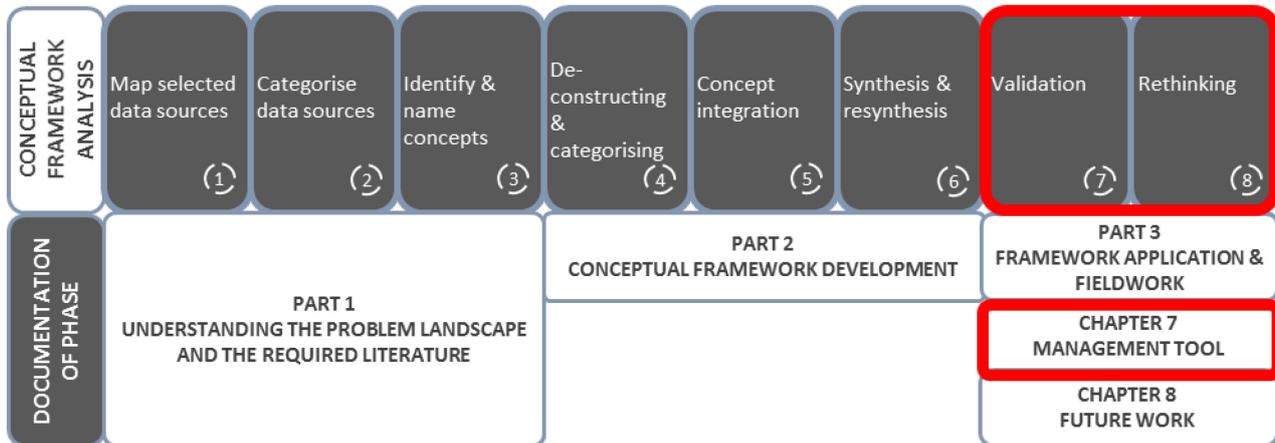
The case study application is completed in Section 6.5. The insights gained from this case study analysis are supplemented by evaluative interviews with key Innovation Hub members.

The author concludes that the interviews and case study provide sufficient evidence for the need for further research without proving that the framework is unnecessary. Chapter 7 introduces the IP management tool and provides a way for the user to align their IPs objective with the health system building blocks. .

CHAPTER 7 - The IP management tool

“Learn from yesterday, live for today, hope for tomorrow. The important thing is not to stop questioning.”

~ Albert Einstein



| | |
|-----------------------|--|
| Key objectives | <ul style="list-style-type: none"> Identify the architecture of the management tool Provide an overview of the management tool Present the final constructed tool |
|-----------------------|--|

The gap in literature that is identified is multi-fold. It is widely recognised that government ministries, globally, are looking for ways to optimise existing resource utilisation. There is a need for an innovative way to harness and synergise the knowledge of communities, NGOs, private sector actors, frontline HCWs and researchers to address health challenges [221]. The author acknowledges that a multi-disciplinary approach across sector boundaries is required to achieve better health outcomes. To this end IPs are proposed as an integrated response that recognises the interdependence of each VC actor in strengthening the health system.

A general lack of understanding of what an IP is and how it can be beneficial in various sectors, including healthcare, exists. With this, there is limited analytical methods available to analyse IP opportunities and to act on these. To this end, this chapter documents a tool which can be used to prepare and deploy IPs in areas with different resource availability. This chapter reveals the explicit development of the IP management tool.

The tool is conceptualised as a guidance intervention which is designed to support innovation across the healthcare VC. It allows for a better positioning of the validated framework given the healthcare VC perspective. The fundamental motivation behind the development of the tool is to provide a back-end design that guides the process towards the formation and functioning of an IP.

Chapter 7 • Management tool

This allows stakeholders to focus on the area that requires unique attributes based on the given context and the desired IP objectives.

The IP framework is not designed to replace the current methodology towards finding solutions within the healthcare domain, but rather to add to and improve on the existing problem solving methodologies. The outcome of the tool is that each phase of implementation has a specific set of outputs to achieve based on the inputs and the resources that are available. A selection of tools are introduced to address concepts that are extremely important and that have been classified as requiring a high degree of effort to manage.

The management tool aims to assist in: 1) establishing an understanding of the VCs; 2) guiding platforms towards aligning outcomes with the WHO health system building blocks; 3) building IPs through the implementation of the validated framework; and 4) facilitating improvement efforts of existing platforms.

7.1 Tool design

This section addresses the criteria that were considered during the design of the tool. The design recommendations are based on findings in literature as well as feedback from the framework validation process. This is listed as follows:

- There seems to be a lack of coherence amongst the major actors along the VC;
- to allow for improved collaboration towards addressing challenges within healthcare, VC actors need an avenue along which collaboration can take place;
- to develop such avenues the overarching common objectives need to be identified and understood;
- to achieve agreement on the vision the problem landscape needs to be demystified;
- to know what the capabilities of an IP is, the current infrastructure needs to be analysed and the desired infrastructure needs to be identified;
- to ensure that the proposed interventions are timely and realistic within the SA healthcare sector alignment is advised with the WHO health system building blocks.

The tool is developed to conceptualise the change effort as proposed by IPs. It does this by articulating the roles of the different VC stakeholders, the changes they hope to introduce through the IP and their motivation for participation.

The tool-outcome is aligned with the WHO's health system building blocks. The outcome typology provides a high-level understanding of each of the building blocks and creates a landscape within which the IP should identify its vision and objectives.

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The framework provides practical guidance to stakeholders throughout the IP life cycle. The assumptions made with regard to the framework as well as the recommendations from the validation process are included in Section 7.3.3.

Finally, the desired outputs refer to the specific IP objectives and the external factors that potentially influence their attainment.

7.2 The proposed innovation platform management tool

A means through which the chasm of traditional approaches to innovation in healthcare are overcome, is required. The management tool provides a foundation, its own platform from which many innovative uses can stem including potentially using the tool prior to the formation of an IP to evaluate the potential and to develop a preventative plan prior to investing in the platform's development. The creative ways in which IP facilitators can use the tool are many-fold.

Essentially, the tool aims to improve access to healthcare through focussing on the functioning of the health system from the VC perspective. This is achieved through implementing interventions that enhance access to the availability of high quality and safe care. To guide the development of these interventions, the IP conducts investigative/diagnostic studies to better understand bottlenecks in the healthcare VC.

It is not only a practical framework for a normative approach but also serves to analyse issues for formulating interventions. The tool provides guidance towards identifying blockages and target groups in order to design robust and effective interventions.

To facilitate entry into communities and access to multi-stakeholder knowledge, the tool adopts a patient-centred³⁵ approach. This creates the opportunity to tailor or target projects that inclusively speaks to the VC actors involved as well as addressing pressing challenges within the given context.

The tool places great emphasis on a stakeholder approach to address the root cause of healthcare issues in SA. This is achieved by aligning the overall IP strategy with the WHO's health system building blocks. Through this, the tool intends to support the National Department of Health in achieving the WHO building blocks. This allows for the goals to be cascaded down and aligned with the IP members' skillset.

³⁵ Providing care that is respectful of, and responsive to, individual patient preferences, needs and values, and ensuring that patient values guide all clinical decisions [230].

7.3 The assembled management tool

Figure 59 presents a graphical depiction of the relationship between the tool's phases. The respective inputs and outputs of each phase are listed. Figure 60 provides a graphical representation of the final management tool.

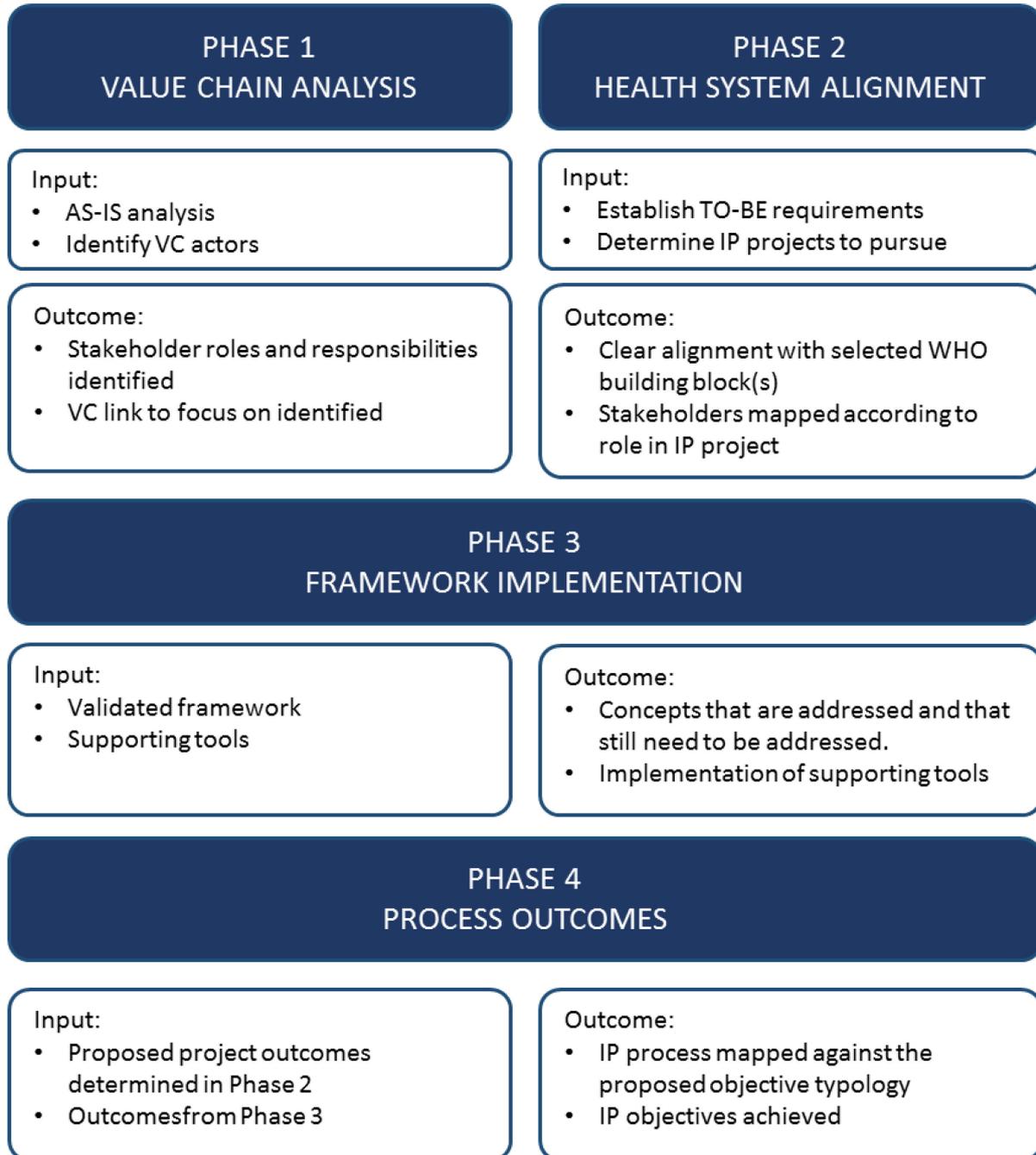


Figure 59: Management tool outline

The functioning of the final tool is framed by the outcomes of Phase 1 and Phase 2. The framework implementation, Phase 3, introduces a detailed approach to the formation and functioning of IPs. Figure 60 is founded on the outcome of Phase 3 and the input of Phase 4.

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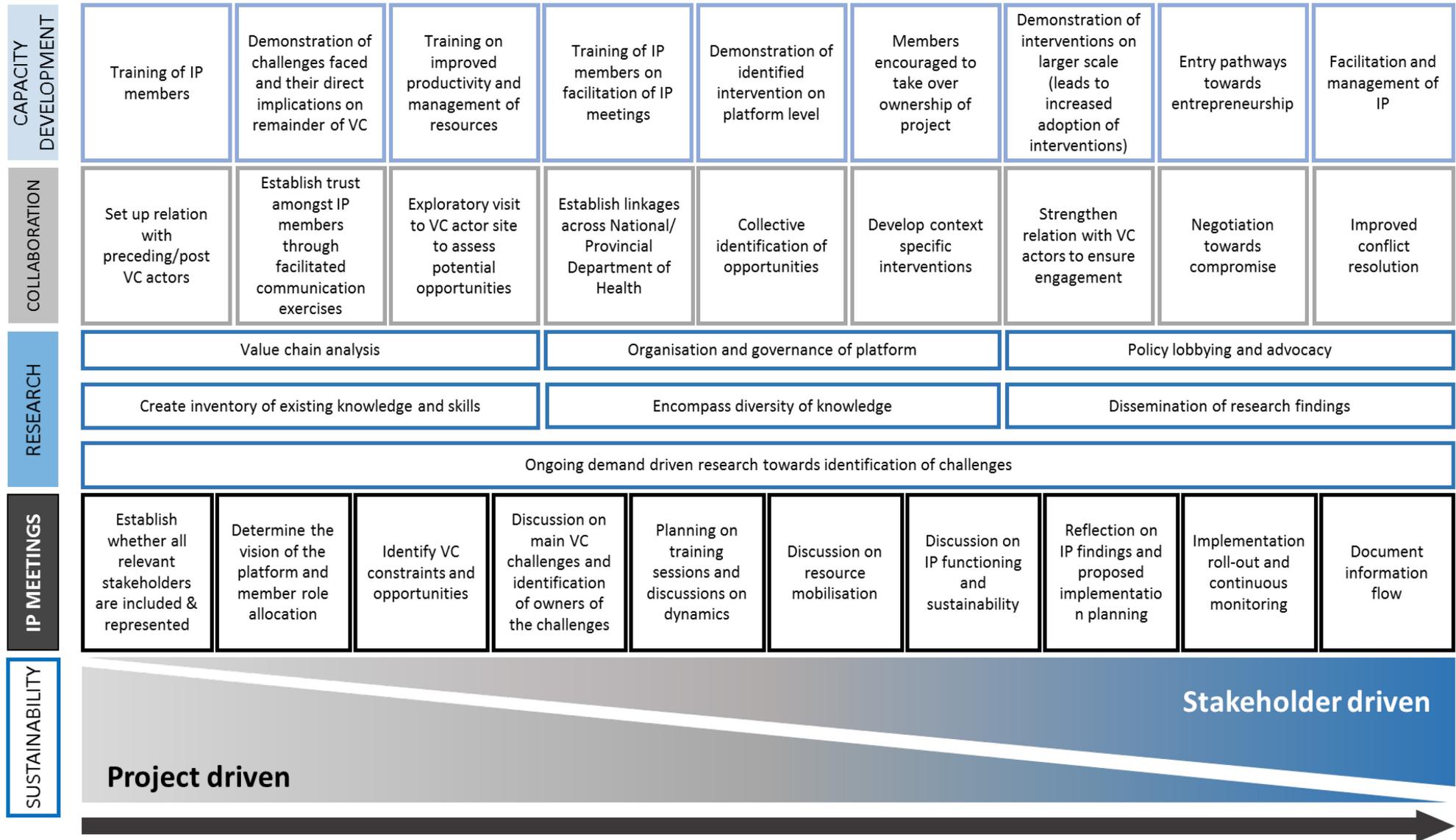


Figure 60: Final IP Management tool

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The tool follows a natural flow from left to right, bottom to top. Various activities within the management tool can be addressed simultaneously. Making use of colour-coding to track the completed activities is advised. As the IP progresses along the life cycle the platform should become more stakeholder driven to ensure sustainability.

7.3.1 PHASE 1: VALUE CHAIN ANALYSIS

The VC analysis forms Phase 1 of the tool and as such it investigates the AS-IS situation in a given context to determine the VC links that need to be consummated. The VC analysis assists in identifying the VC actors involved, the available resources and the required resources. The core capabilities of each actor is identified and effort towards collaborative problem solving are supported. Table 4 can be used in conjunction with Table 5 to assist with the VC analysis in this Phase. Through establishing the roles that the respective VC actors play as well as their agenda, improved means of incentives can be identified.

Health impacts are characterised by multiple pathways of cause and effect. Policy actors and sectors tend to look at these multiple linkages through different lenses – each of which enhances a different aspect of the same basic set of problems.

The initiation of the process starts through the identification of high development potential. This is usually done by a research organisation, government and/or development partners [217]. The involvement of government ensures alignment of entry themes with national policy and provides a space for government to express constraints.

This is traditionally followed by the appointment of a national facilitator that is well connected, working in national research organisation/NGO. This person has the proven capacity to facilitate co-creation of knowledge & collective action processes. National IP provides general support to community level through providing access to knowledge, inputs and services.

Through analysing the VC, the relation between actors is identified and this highlights the need for collective action across community and national level to enable change.

7.3.1.1 WHY THE VALUE CHAIN LENS?

If we are looking at the IP through the VC lens, it allows us to consider the healthcare system from the actors' perspective. It provides us with a basis to work from where the different stakeholders are seen and their different roles and responsibilities are considered.

The VC perspective provides insight into the major challenges faced in healthcare as well as the consideration of the various stakeholders involved.

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Key considerations regarding the VC approach include problem and root cause identification, provision of countermeasure suggestions, proposal of approaches towards ensuring stakeholder buy-in as well as the development of an implementation programme [81]. This provides a foundation from which to approach common challenges as well as a guideline as to what M&E indicators should be included in the platform.

The tool considers and breaks down the input through the VC analysis process for further investigation. The interaction among the stakeholders leads to joint diagnosis of problems followed by the exploration of opportunities and joint investigation of solutions. The generated solutions are often designed to target a specific link within a VC [100]. The identification of these links is pivotal in addressing the health systems building block to address in Phase 2.

7.3.2 PHASE 2: HEALTH SYSTEM ALIGNMENT

During Phase 2, a gap analysis between the AS-IS and TO-BE scenarios is completed. To ensure that the overall goal of the IP, and the respective VC actors, feeds into improved access to healthcare, project alignment with the health system building blocks is suggested. This provides a foundation from which the framework can be implemented.

The author recognises that not all healthcare IPs strategies need to be aligned with the health system building blocks, but for the purpose of this study, this link creates a base from which to identify relevant goals that support improved access to healthcare.

A health system, like any other system, is a set of inter-connected parts that have to function together to be effective [221]. It encompasses organisations, people and activities whose key focus is on promoting, restoring and maintaining health. At the centre of the deep inequities in health status is the failure of health systems. Inadequate health systems pose a major obstacle to interventions in achieving goals.

The evolution and sustainability of IPs along a continuum is dependent on a number of elements. The alignment with the WHO's health system building blocks allows for sustainability as it feeds into and supports the government and the National Department of Health in creating a healthier population.

In order for the IP to align its vision with the health system's building blocks it is necessary that each member has a basic perception of what a health system is, why it is important, how it aims to improve healthcare and how to monitor its progress.

The WHO's six building blocks identify the key areas to strengthen health systems. They are aimed to lead to improved health, equity, responsiveness, social and financial risk protection, and more efficiency.

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However, while a health system embraces all organizations, institutions, resources, and people whose primary purpose is to improve healthcare, the interactions and interrelations of actors and stakeholders, and measures for improved inter-sectoral work performance are not elaborated on in the building blocks [14], [221].

As such, it is important for the health system's building blocks to be integrated along healthcare VCs. Through this alignment, the small improvements that are introduced by the IP in the form of individual projects feed into a bigger picture towards overall improved access to quality care.

Irrespective of how a health system is organised, there are some desired attributes for each building block that hold true across all systems. Each building block, as displayed in Figure 61, is briefly discussed in this section.

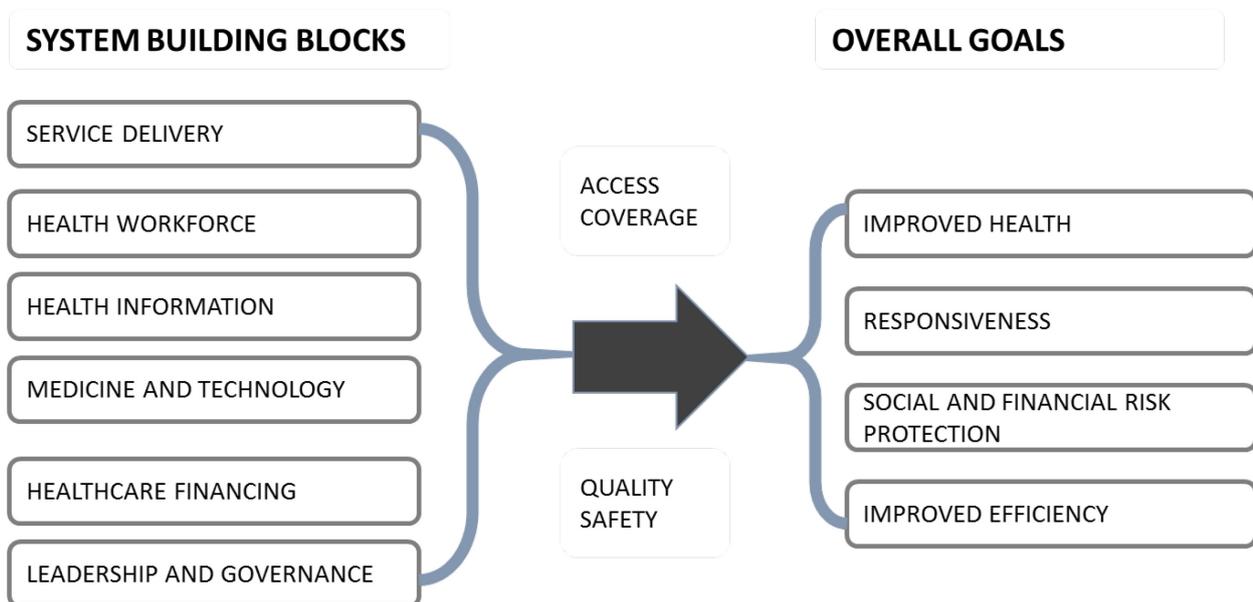


Figure 61: WHO health system building blocks, World Health Organisation [221]

7.3.2.1 SERVICE DELIVERY

Health services refer to delivering effective, safe, quality personal and non-personal health interventions to those that need them, when and where they are needed, with the minimum waste of resources [221].

This is considered a crucial component in the healthcare system and is key to improving a population's health status [222]. Emphasis is placed on using resources efficiently. A strategic objective of an IP is to address existing inequalities and poor health outcomes with regards to the cleanliness and quality of service delivery.

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7.3.2.2 HEALTH WORKFORCE

The workforce is a key element in a health system. According to the World Health Organisation [221], the workforce is defined as “people engaged in actions whose primary intent is to enhance health”. These workforce actors can also be analysed from a VC perspective, as proposed in Phase 1.

Literature highlights that HCWs with a high level of job satisfaction can deliver the best outcome for patients. The attitude of the health workforce can be linked to their motivation and work satisfaction, therefore high quality care can't be provided unless issues related to demotivated staff are systematically addressed [223]. Financial incentives, career development, and the quality of management are core factors affecting motivation of HCWs [14], [224].

The delivery of healthcare service are traditionally driven, with a paternalistic approach [225]. A shift to an approach more in line with partnership could help to improve service quality [14], [226]. The IP approach allows for enhanced collaboration and partnership across the health workforce.

7.3.2.3 HEALTH INFORMATION

There is a need for increased awareness, education and preventative health strategies that enhance personal protection and healthy behaviours in the face of environmental risks and hazards that cannot be eliminated completely [14]. To address this need, the availability of information is a pre-requisite.

For marginalised groups coming from a lower socioeconomic background, resources for obtaining information are scarce. Consequently, they have to rely on whatever information is provided by the municipality or government. Healthcare users should have access to reliable, usable, understandable, and comparative data and information [221]. A sound and reliable information policy to support and educate patients is a milestone to establish efficient decision making among the population [227]. The communication and dissemination of information is crucial to an effective prevention campaign [14].

Through promoting co-creation of solutions and advancing shared learning practices amongst diverse stakeholders the dissemination of health information is improved through IPs. IPs create a new awareness of the value that different types of information hold and that access to information is a necessity to achieving change within the healthcare system. Through the IP new context-appropriate pathways to disseminating information may also be identified.

7.3.2.4 MEDICINE AND TECHNOLOGY

A functional health system has to ensure equitable access to vital medical products, vaccines and technologies that are of high quality, safe to utilise and that are cost-effective [221].

Facilities periodically experience stock-outages and often lack basic infrastructural requirements. Improvements with respect to stock visibility across the VC are already being investigated.

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Traditionally, innovation in the healthcare sector is focused on technological advancements and developments. The recent shift towards incorporating process innovation will aid towards improved adoption of technologies. IPs may specifically be designed to address challenges that prevent the deployment of context-appropriate medicines and technologies. The consideration of technology transfer and the importance that co-creation amongst multi-stakeholders plays also needs further investigation.

7.3.2.5 HEALTHCARE FINANCING

According to Weimann and Stuttaford [14], “over 85% of the population in SA rely on public healthcare, while only 15% can afford private healthcare. Yet each sector has almost the same amount of money to spend”. With disparities of this magnitude, it is evident that a change is required.

Within the functioning of the tool, healthcare financing and the improvement thereof is viewed as a supplementary objective. The lack of finance availability is not addressed directly, but rather through streamlining operations and influencing policy-making where possible. The underlying objective of various healthcare IP projects may also aid in reducing unnecessary costs and re-allocating money more effectively.

7.3.2.6 LEADERSHIP AND GOVERNANCE

The WHO, defines the role of the government and the relationship of other actors in order to protect the public interest, as stewardship [221], [227]. The existence of strategic political frameworks in combination with effective oversight and accountability is required to foster stewardship [227]. Corruption³⁶ can impede the delivery of effective and high-quality healthcare to the people who need it the most [228]. In the South African context, a lack of transparency and corruption has been identified as major barriers to improved population-health.

One of the most difficult tasks to complete in an IP is to get buy-in and support from governmental bodies. These bodies are crucial to the overall acceptance of an IP and its optimal functioning. Within an IP, interventions are assessed in accordance to their impact and potential benefit for the country.

Table 31 provides an overview of the alignment of Phase 2 and Phase 3. Through further investigation into the priorities³⁷ of each building block the role of the IP is determined. The IP application elucidates the IP's ability to advance the priorities of the building blocks.

³⁶ The World Bank defines corruption as “the abuse of public office for private gain”. Corruption comes in four main types: theft, bribery, misinformation for private gain, and bureaucratic or political corruption [14], [228].

³⁷ This refers to the priorities as determined by [221]

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Table 31: Integration Phase 2 and 3

| Building block | Example of IP application |
|-------------------------|---|
| Service delivery | <ul style="list-style-type: none"> • Quality improvement projects, at health intervention as well as health facility level. • Consideration of delivery pathways across the VC and the creation of new entry points. • Process improvement through new management approaches that maximize service coverage, quality and safety, and minimize waste. • Optimisation of delivery of care within facilities through streamlining operations. • Waste reduction projects. • Development of improved M&E through incorporation of all VC actors. |
| Health workforce | <ul style="list-style-type: none"> • Workforce satisfaction improvement projects. • Ensure sufficient staff, fairly distributed that are competent, responsive and productive. • Allowing staff to take ownership of projects that they see are very needed within the facility. • Staff empowerment through brainstorming sessions and through transparent IP functioning. • Provide the opportunity to influence policies and investment plans. • Create a platform through which to advocate norms and standards across the national workforce. |
| Health information | <ul style="list-style-type: none"> • Projects that focus on getting buy-in from all VC actors to implement an electronic database that captures health information. To promote individual continuity of care where needed, over time and between facilities and to avoid unnecessary duplication and fragmentation of services. • Projects that rely on the expertise of health workers to provide insight into the need for the availability of information and the format in which it is required. • Projects that focus on providing an omnichannel experience across the National health system. • Development of facility and population based information and surveillance systems. • Advocate global standards and identify or develop tools to aid in optimal use of available data. |
| Medicine and technology | <ul style="list-style-type: none"> • Improved access to essential medical products and vaccines through stock-visibility systems. • Investment into healthcare technologies that are context specific and meet the needs of the operators at the required standards. • Research projects to identify new developments in medicine and technology, respectively. • Potentially influence the standards, policies and procurement procedures regarding technology transfer in healthcare. |
| Healthcare financing | <ul style="list-style-type: none"> • The IP can focus on influencing policy making rather than directly impacting healthcare financing. |

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| Building block | Example of IP application |
|---------------------------|--|
| | <ul style="list-style-type: none"> • Through reducing waste and streamlining operations within facilities, finances should become available to re-allocate. • Improved tracking of health expenditure through data collection tools. |
| Leadership and governance | <ul style="list-style-type: none"> • The inherent purpose of the IP is to promote ownership and to empower members to act pro-actively, this enables them to become better leaders in their own right. • Through research IPs can influence policy making and ensure that the voice of the actors across the VC are heard and considered . • The collaboration efforts lead to harmonisation and alignment of VC actors' intentions. • Focus on determining relevant M&E indicators for the health system can lead to systematic improvements in its governance as processes become more transparent and all VC actors become more informed. |

7.3.3 PHASE 3: FRAMEWORK IMPLEMENTATION

Healthcare is a complex, adaptive system where interactions and relationships of different components simultaneously affect and are shaped by the system. To alleviate this burden in a sustainable manner, collaboration across various industries is required.

IPs are developed as a response to the challenges to innovation in the healthcare sector. They create an environment for accelerating the development and adoption of products, services, and quality standards to obtain good outcomes.

The process that is considered in this tool is the conceptual framework that is presented in Chapter 5 and validated in Chapter 6. The conceptual framework is a valuable tool that helps to focus efforts on isolating the important factors that contribute to develop a particular innovation, or in this case, a platform, which in itself is replicable.

If health systems are to be strengthened, it is essential to be clear about the problems, where and why investment is needed, what will happen as a result, and by what means of change can be monitored [221]. It is crucial that platform members take ownership of a project and that they adopt a holistic understanding of the context within which they function.

The implementation of the framework is achieved through the guiding questions discussed in Table 17, in Section 5.2. The tool requires the user to determine whether each concept is addressed and whether it is something that requires further investigation. These concepts then feed into the management tool and is supported by the identified tools.

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The framework guides the formation and functioning process to create the appropriate infrastructure for a healthcare IP. The framework is not a recipe with a set of rules for each phase. The requirements of the process that turn the inputs into the deliverable are provided. Table 32 shows the updated framework with minor changes in the position of concepts, as suggest by experts.

Table 32: Updated framework

| | | FORMATION | FUNCTIONING | |
|------------------------------|--|--|--|--|
| Categories | Dimensions | Concepts | Concepts | |
| CORE CAPABILITIES | Interaction/ Engagement – Concertation | Visioning & planning | Driving participation, commitment, ownership | |
| | | Incentives & reward systems | Facilitation & management of interactions within innovation platform | |
| | | Facilitation & coordination | | |
| | | Conflict resolution & power dynamics | Termination of innovation platform/members | |
| | Knowledge development & learning | Knowledge, skills & interests exploration | | Knowledge transfer & type of learning |
| | | | | Approaches to knowledge management |
| | | Monitoring & evaluation | | Disseminate & diffuse knowledge |
| | | | | Continuous monitoring & evaluation |
| | Capacity building | Focus on inclusivity within process | | Draw on existing capacity & develop new ones |
| | | | Design for scalability (Scaling up/out) | Celebrate successful idea execution |
| | | | Consideration of dynamic processes | Approaches to change management |
| | | | Dealing with resistance to change | Address physical, socio-economic & political factors |
| | Innovation | Search guidance | | Supporting development of technology services |
| | | | Shift in focus level of IP | Supporting entrepreneurial activity |
| Continued search guidance | | | | |
| STRUCTURAL COMPONENTS | Actors | Inclusion & representation of all stakeholders | Seek opportunities for participation | |
| | | Stakeholder-representative demand articulation | Evolving roles & responsibilities with introduction of new ideas | |
| | Institutions | Setting up formal & informal institutions | Maintaining & strengthening formal & informal institutions | |
| | | Construction & deconstruction of sub-systems | Support and influence policy-making | |

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| | | FORMATION | FUNCTIONING |
|------------|----------------|---|---------------------------------------|
| Categories | Dimensions | Concepts | Concepts |
| | Infrastructure | Consideration of context of emergence | Overcome barriers to functioning |
| | | Level of access to resources & facilities | Establish knowledge sharing platforms |
| | | Required setup foundation | Mobilise resources |

7.3.4 PHASE 4: IP PROCESS OUTCOMES

Phase 4 of the tool, the process outcomes, refer to the various products produced through the IP. These vary and are considered in the context of a few key elements. The IP objectives, as identified through the systematic literature review in CHAPTER 4, are key during this phase and are listed in this Section.

The objectives that are inherent to IPs are summarised in Figure 62, The assembled management tool aligns the activities performed in the framework with the IP objectives. This creates a tool that is founded on logic and that is easy to implement and track.

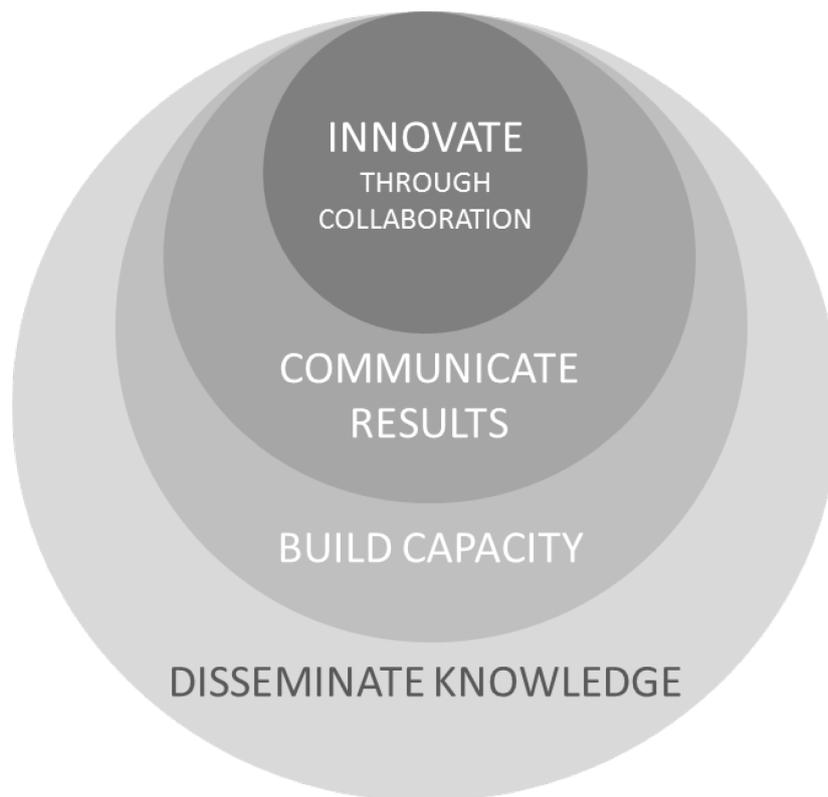


Figure 62: IP objectives

To conclude Phase 4, the overview of the main objectives portrayed in Figure 62 are expanded on:

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Innovate through collaboration

- Collective identification of opportunities
- Development of context-specific interventions
- Improved communication and subsequently trust amongst stakeholders
- Stakeholder engagement
- Negotiation towards compromise
- Improved conflict resolution

Increased capacity to innovate

- Entry pathway to entrepreneurship
- Improved productivity and management of resources
- Community empowerment and project ownership
- Ability to promote continuous learning
- Increased adoption of interventions

Improved research dissemination

- Demand driven research through improved demand articulation
- Appreciate local and indigenous knowledge
- Policy lobbying and advocacy

7.4 Chapter 7: Conclusion

Chapter 7 presents an assembled IP management tool. The tool is a culmination of the findings from the study and supports the framework as a guidance tool. The framework is well suited to guide the formation and functioning of a healthcare IP, as validated in Chapter 6. The tool incorporates the various facets at play during an IP's life cycle as well as considering the dynamic relationships amongst VC actors.

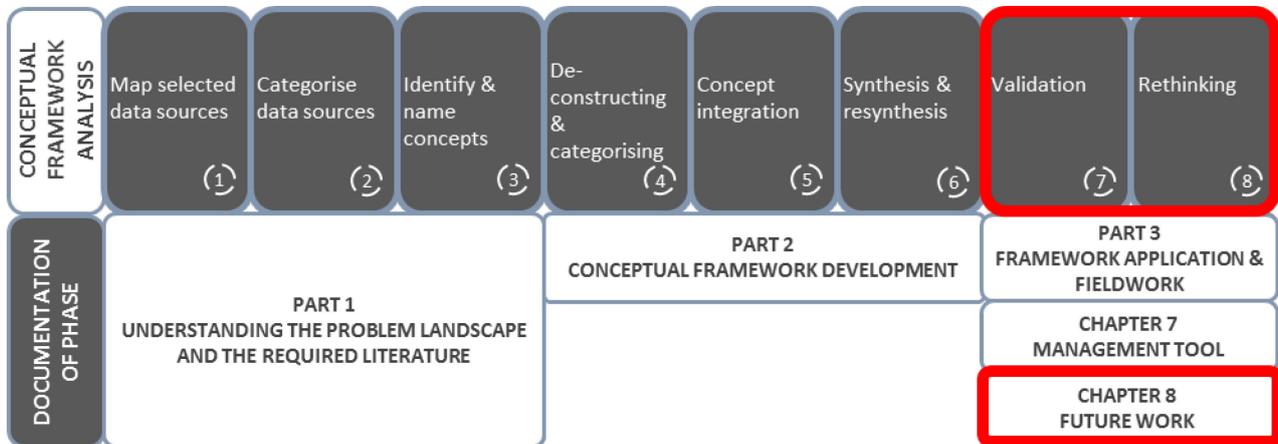
The insight provided in the management tool acts as a mechanism to allow stakeholders to better understand opportunities for working in cooperative endeavours towards attaining improved access to healthcare. In this context improved access to healthcare hinges on the WHO health system building blocks. The final result is projected as a changed, more connected healthcare environment for patients, frontline HCWs, providers, and government.

The systematic approach towards developing the final tool is demonstrated in this chapter. The relationship between the phases is outlined in Figure 59. Chapter 7 also provides an expanded view of the final framework. A complete outline of the final management tool is illustrated in Figure 60. Chapter 8 concludes the research study. It presents a concise summary of the conducted research, the final findings and recommendations for future work.

CHAPTER 8 - Conclusion and recommendations

“He who has health, has hope; and he who has hope, has everything.”

~ Thomas Carlyle



| | |
|-----------------------|---|
| Key objectives | Summarise and discuss salient points of the study |
| | Discuss the research objectives |
| | Present the limitations of the study |
| | Provide recommendations for future work |

This concluding chapter presents a discussion of the research findings and a summary of how the key objectives were achieved. In closing, the author discusses the limitations of the study and lists recommendations for future work.

8.1 Research summary

This section presents a summary of the research findings according to the four part research structure introduced in Chapter 2. The salient findings in each part are discussed.

8.1.1 PART 1: UNDERSTANDING THE PROBLEM LANDSCAPE AND THE REQUIRED LITERATURE

Put simply, radical change is necessary across the healthcare sector to improve the delivery of reliable and high quality care.

The currently fragmented healthcare VCs need to identify ways to collaborate across linkages to meet the rising expectations within technology-enabled systems. Historically, healthcare service providers, including hospitals and pharmacies, focused purely on the functions within their control. Presently, these actors are beginning to understand the importance of considering multiple views when designing context appropriate solutions to improve access to healthcare.

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This study commences by referring to the severe challenges in healthcare and the emerging need for intervention in this area. Existing literature in healthcare focus mostly on addressing the challenges faced across VCs. However, less attention is paid to the importance of collaboration amongst VC actors in achieving innovative solutions. This gap is addressed in this thesis by examining the need for IPs in this space and investigating the formation and functioning of such platforms.

The use of IPs within healthcare is recognised as a strategic mechanism towards stimulating inclusive delivery pathways. This is achieved through serving as a space for healthcare stakeholders to engage, improve and develop new care services and products. It introduces an avenue along which the engagement of healthcare consumers and healthcare professionals might take place and provides a space in which synergies across disciplines may be forged.

The recognition that stakeholders have diverse perspectives, interests and knowledge to add to the functioning of the IP contributes to the complexity. Each of these factors are dependent on one another, to some degree. However, by breaking down the siloes that exist within healthcare delivery, an open dialogue is created that promotes transparency, builds trust, and leads to the recognition that across the VCs similar agendas exist; focused on providing healthcare to all members of the population.

Limited literature is available in the healthcare IP domain. The systematic review explored the foundations of IPs in healthcare and the underlying fundamental concepts. The descriptive findings regarding IP literature, as discussed in Section 4.3, present evidence of the novelty of this field of study in healthcare. It also shows that causal links exist between the various concepts upon which IPs are developed. The review elucidated the seven core dimensions and 39 concepts that facilitate the formation and functioning of IPs. The review also categorised and illustrated how the different types of IPs are primarily utilised to address a specific challenge or opportunity.

IPs present an enabling infrastructure where connections take place, networks are built and innovative combinations are consummated. New work processes, governance structures and relationships are needed for the coevolution of innovation in healthcare. However, coevolution is slow, hindered by the scarcity of resources in legacy delivery systems and constrained by the prevailing patient-healthcare paradigm, in which the patient is not viewed as a knowledge contributor.

Knowledge co-creation and collective action processes are strongly shaped by those who are part of that process. The inclusion or exclusion of specific stakeholder group representatives and the subsequent power dynamics influence the quality of participatory multi-stakeholder processes, their outcomes and impact, and for whom these creates opportunities or additional barriers.

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The remaining challenge is to ensure that such approaches can be replicated, refined and scaled more broadly in the planning and processes of departmental government agencies and country decision-making. This requires mind-set and role changes that are often time-intensive.

8.1.2 PART 2: CONCEPTUAL FRAMEWORK DEVELOPMENT

Jabareen's approach towards conceptual framework development forms the foundation upon which the framework is developed.

Seven core dimensions are extracted from the IP definition, namely: engagement/participation; knowledge management; capacity development; innovation; actors; institutions; and infrastructure. The 39 concepts identified from the systematic review are categorised according to these dimensions. The two main trends identified in the systematic review are the core capabilities of IPs and their structural components. The dimensions and their respective concepts are then categorised into one of the main categories.

Phase 6 of the CFA elucidated the life cycle of an IP. The various depictions of the life cycle were considered and synthesised into formation and functioning. The findings from Phase 4 and Phase 5 were then mapped against the IP life cycle that is most prevalent. 19 concepts are addressed during formation while 20 concepts predominantly appear during functioning.

8.1.3 PART 3: FRAMEWORK APPLICATION & FIELDWORK

The data validation results constitute the empirical findings of the study. The validation process consists of four progressive stages that each address pre-determined validation outcomes.

The credibility of the preliminary framework developed in Chapter 5 was validated through four semi-structured interviews. In order to determine whether the framework is needed, reliable, relevant and useful, framework-ranking interviews were conducted. The results from the concept-ranking exercise were used to select the concepts that require auxiliary tools.

The enhanced framework was applied to a case study to determine the framework's efficiency and effectiveness. Furthermore, the applicability and validity of the final framework was confirmed during three evaluative case study interviews. Each validation stage provided useful recommendations towards the improvement of the framework.

The fieldwork presented great insight into the practical world of IPs and the feedback received allowed the framework to undergo iterative improvements. This rigorous approach ensured that the final framework is robust.

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8.1.4 PART 4: DEVELOPMENT OF AN IP MANAGEMENT TOOL

The final theoretical findings in this study culminate towards the development of the management tool presented in Section 7.3. The tool was built on the validated framework and the observations documented during the case study analysis. The management tool consolidates a linkage between the healthcare VC, the WHO's health system building blocks and the validated framework.

The positioning of the framework within the tool is supported by the findings from the literature overview presented in Chapter 3 and the systematic review completed in Chapter 4.

This study paves the way for future empirical studies to successfully deploy an IP through the tool's implementation. By drawing on the strengths of the various stakeholders and leveraging communication and technological solutions in a unique way, IPs have the ability to potentially transform healthcare. The author hopes that IPs will lead to the consideration and integration of all VC actors' views into policy and practise in the health system, more inclusive innovation occurring to address healthcare challenges and overall improved health outcomes.

8.2 Research objectives

The main research objective of this study is to contribute to the development and operation of IPs in the healthcare domain. This is achieved through addressing the six research objectives introduced in Table 1, Section 1.2.2.

Additionally, the findings of this study underline the importance of adopting a collaborative approach towards addressing healthcare challenges. The IP must be customised with consideration of the context in which it functions, the availability of resources as well as the infrastructure at its disposal. This study contributes significantly to the IP BOK through providing a management tool that guides the development of healthcare platforms. The tool assists researchers, entrepreneurs and government in their endeavours towards an improved healthcare system. Table 33 discusses how each objective is achieved. This is followed by a discussion regarding the study limitations.

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Table 33: Conclusion - Research objectives

| | Conclusion | Document reference |
|--|---|---|
| Objective 1 Determine the current state of the healthcare VC and the challenges faced within healthcare. | The problem statement scope required an understanding of three fields of study namely: 1) healthcare; 2) healthcare VCs; and 3) IPs. | Chapter 3 |
| | An overview of the current state of the healthcare landscape is formed through the review. The various delivery pathways are considered and the approaches to addressing challenges are investigated. | Section 3.1 |
| | By examining the intricate relationships between VC actors, with reference to healthcare innovation, an understanding of the current state of the healthcare VC is formed. | Section 3.2 |
| Objective 2 Form an understanding of the role of IPs as it pertains to healthcare. | The second research objective is achieved through a two-pronged approach. The overview of theory introduced the IP phenomena and provided the stage for undertaking a rigorous systematic literature review to investigate IPs. The literature review is not restricted to a specific geographic area, but focus is placed investigating healthcare IPs. Information regarding the stakeholders involved in healthcare IPs, the types of IPs that exist and the barriers to IP implementation are all investigated. | Chapter 3 Section 3.3.2 Chapter 4 Section 4.4 Section 4.6.3 |
| Objective 3 Identify the core concepts and processes upon which IPs are developed and operate. | Through the systematic literature review the prominent IP concepts are identified. This is done through investigating literature that discusses the development of IPs, publications that address specific IP concepts or papers that evaluate the legitimacy of IPs. The data is then codified to allow for easy interpretation and to provide a solid foundation from which to develop the conceptual framework. | Chapter 4 Section 4.5 Section 4.6 |
| Objective 4 Develop the conceptual framework. | The fourth research objective is completed through the development of the conceptual framework. The framework is constructed through the CFA method. The insight gained from the preceding chapters is used during this process. A two-phase framework is developed towards guiding the development and operation of healthcare IPs. | Chapter 5 Section 5.1 Section 5.2 Section 5.2.1 Section 5.3 |
| Objective 5 Validate the conceptual framework | The proposed framework is validated through various fieldwork applications across four stages. The feedback and findings from the validation process are | Chapter 6 Section 6.2 |

Chapter 8 • Conclusion and recommendations

| | Conclusion | Document reference |
|---|--|---|
| | incorporated in the final framework and it provides a foundation from which the management tool is developed. The potential inhibitors to success are also discussed during the validation process. | Section 6.3 Section 6.4 Section 6.5 Section 6.6 Section 6.7 |
| Objective 6 Develop a management tool from the validated framework. | The sixth research objective is achieved through combining the outcomes of the interviews and the case study application with the conceptual framework development. The penultimate tool provides a guideline to facilitate the development of IPs with the goal of addressing healthcare challenges. The management tool guides the platform development process from the initial analysis of the VC to identify healthcare challenges to the dissemination of the platform. Additionally, the tool provides the operator with supplementary mechanisms/tools that can be employed. | Chapter 7 Section 7.1 Section 7.2 Section 7.3 |

8.3 Study limitations

There are certain limitations that should be acknowledged when interpreting the findings.

1. Due to the heterogeneity of the field in terms of terminology, the search strategy, particularly the selection of key words, may have failed to identify some relevant studies. The author recognises that further investigation into the phenomenon of eco-systems could have been very insightful. This risk is minimised by conducting a preliminary review of the literature to inform the key word selection and choice of databases.
2. Interpretation is dependent on the author's understanding of the subject thus content analysis limits the bias of human interpretation.
3. The diversity of the publications included in the systematic literature review makes it difficult to codify a semantic category counter based on frequency of occurrence.
4. The participants in the interviews are from different types of IPs; this study identified 24 different types of platforms but unfortunately, the author could not identify an expert to represent every type of IP. The focus is placed on two types of IPs namely multi-stakeholder platforms³⁸ and technology IPs³⁹.
5. The interviewees represent different management positions in an IP and consequently introduce different viewpoints. Although the participants have vast amounts of experience, this does not necessarily mean that the participants' experiences apply to their entire sector.
6. The number of case studies that are analysed is limited due to resource constraints.
7. IPs are complex in nature and inherently require multiple considerations during formation and functioning. The management tool provides guidance during the development process but it should be noted that no IP functions the same and thus the consideration of the context and the resources at the IP's disposal should be accounted for.

³⁸ Multi-stakeholder platforms are aimed at developing innovation capacity for a range of actors that are market-oriented [49], [139], [169].

³⁹ Technology IPs are conceptualised as the result of the exploitation and reutilisation of knowledge and experience accumulated by the institutions in a sector. This is supplemented by the generation of new knowledge and distinctive technological competencies that can be shared [173].

8.4 Recommendation for future studies

“Patient-centric ecosystems will transform healthcare but need to overcome current industry fragmentation”.

~ Sangeet Paul Choudary

The fieldwork findings discussed in Chapter 6 along with the limitations discussed in Section 8.3 provide fruitful paths for future research.

An area for future research is the investigation of **successful business models** within the IP healthcare space. Business models that drive entrepreneurship, business appropriation and support product and service scaling are required. Currently, the business models adopted within this sector do not effectively address issues such as intellectual property rights or the tools needed to evolve local products into commercially viable products. The author proposes investigating the influence of social franchising on IP functioning. Furthermore, establishing a model for healthcare process improvement through integration with existing IPs, may potentially prove effective.

The role of **private venture capital** has not been explored in the IP world, but its growth in open innovation ventures has proven to be effective. The addition of private venture capital increases the ease with which start-ups are created and decreases the size-related liability experienced during the commercialisation stage. The funding structures of IPs require further investigation.

The resulting taxonomy in Figure 39 provides a new lexicon for researchers, policymakers, and HCWs for characterising key strategic and structural features of evolving IPs. The taxonomy also provides a key element in the framework for future inquiry regarding the relationship between **organisational strategy, structure and performance**, and for **assessing policy issues**. This should be supported by a mechanism/tool that is easy to utilise to assess and improve innovation capability in IPs.

From this study, it is clear that IPs are complex in nature. There are various factors that influence their success and effectiveness. This study identified 24 types of IPs, but only two IP types were investigated during the validation process. The author suggests investigating the remaining types of platforms and establishing the major differences between the platform life cycles of each type of IP. The development of a **risk mitigation strategy** for each phase in the IP life cycle, will be extremely beneficial during their development and operation.

The current tool can be amended to be more **user-friendly and inclusive**. This can be achieved through the implementation of the tool and building on the results thereof. Furthermore, investigation into the determination of the **optimal diversity** amongst IP members and the **governance of IPs** is required. Specific focus should be placed on where the consolidated IP data is stored and the management of access to confidential data.

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It is evident that an improved approach to IP **M&E** is needed. The information M&E gathers can be utilised to improve the management of the platform and its activities, change policies and promote larger scale changes. The author proposes a **systematic collection and analysis of data** on specific performance indicators in order to generate information on progress and achievement of a given objective. Future research should be focused on identifying **performance indicators** of IPs as well as establishing a set of alternatives to improving the respective indicators.

The purpose of this chapter is to conclude the research study and to discuss recommendations for the research as future work. The author believes that the actors across the healthcare VC can draw both inspiration and technical direction from the resources contained in this thesis and from the proposed tool.

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Appendix A

Appendix A: Systematic review data extraction

Table 34 describes how information is obtained from primary studies during the systematic review process.

Table 34: Data extraction protocol

| Data Source | Documentation |
|---|---|
| Digital Library | <ul style="list-style-type: none"> • Name of database • Search strategy for the database • Date of search • Years covered by search |
| Journal Hand Searches | <ul style="list-style-type: none"> • Name of journal • Years searched • Any issues not searched |
| Conference proceedings | <ul style="list-style-type: none"> • Title of proceedings • Name of conference (if different) • Title translation (if necessary) • Journal name (if published as part of a journal) |
| Efforts to identify unpublished studies | <ul style="list-style-type: none"> • Research groups and researchers contacted (Names and contact details) • Research web sites searched (Date and URL) |
| Other sources | <ul style="list-style-type: none"> • Date Searched/Contacted • URL • Any specific conditions pertaining to the search |

Appendix B: Systematic literature review publications

Table 35: Publications included in systematic literature review

| Number | Title of document | Reference |
|--------|--|-----------|
| 1 | Breeding innovation clusters through collaborative research networks | [132] |
| 2 | Strengthening capacity for health research in Africa | [15] |
| 3 | Early Experiences With Consumer Engagement Initiatives To Improve Chronic Care | [163] |
| 4 | Smart health community: the hidden value of health information exchange. | [79] |
| 5 | Innovation in Healthcare Delivery Systems: A Conceptual Framework | [33] |
| 6 | Online support forums as co-creation platforms: Value creation in health care services | [182] |
| 7 | The open nature of innovation in the hospital sector: The role of external collaboration networks | [8] |
| 8 | A multi-faceted approach to promote knowledge translation platforms in eastern Mediterranean countries: climate for evidence-informed policy | [168] |
| 9 | Stakeholder participation in comparative effectiveness research: Defining a framework for effective engagement | [165] |
| 10 | GE's open collaboration model | [170] |
| 11 | Open innovation in health care: Analysis of an open health platform | [161] |
| 12 | Enhancing innovation in livestock value chains through networks: Lessons from fodder innovation case studies in developing countries | [148] |
| 13 | Critical Factors in 'Livings Labs' for New Health Concepts and Medical Technology | [162] |
| 14 | Open Innovation in Health Service Value Networks: a Methodology for the Innovation of Ambient Assisted Living Platforms and Services | [157] |
| 15 | Innovation approaches for engineering-medicine-marketing interdisciplinary research teams | [181] |
| 16 | Living labs in health innovation: Critical factors in their application | [99] |
| 17 | Unravelling the role of innovation platforms in supporting co-evolution of innovation: Contributions and tensions in a smallholder dairy development programme | [122] |
| 18 | The aligning forces for quality experience: Lessons on getting consumers involved in health care improvements | [169] |
| 19 | Brief 1: What are innovation platforms? | [43] |
| 20 | Brief 2: Innovation platforms to shape national policy | [160] |
| 21 | Brief 3: Research and innovation platforms | [175] |
| 22 | Brief 4: Power dynamics and representation in innovation platforms | [174] |
| 23 | Brief 5: Monitoring innovation platforms | [143] |
| 24 | Brief 6: Innovation platforms for agricultural value chain development | [183] |
| 25 | Brief 7: Communication in innovation platforms | [183] |
| 26 | Brief 8: Developing innovation capacity through innovation platforms | [144] |
| 27 | Brief 9: Linking action at different levels through innovation platforms | [184] |
| 28 | Brief 10: Facilitating innovation platforms | [180] |
| 29 | Brief 12: Impact of innovation platforms | [141] |
| 30 | Online Innovation Intermediaries In Healthcare | [32] |
| 31 | Understanding value co-creation in complex services with many actors | [172] |

Appendix B

| Number | Title of document | Reference |
|--------|--|-----------|
| 32 | The crowd, the cloud and improving the future of medical device innovation | [93] |
| 33 | The Kuwait-Scotland eHealth Innovation Network (KSeHIN): A sustainable approach to quality improvement in healthcare | [166] |
| 34 | Operationalizing inclusive innovation: lessons from innovation platforms in livestock value chains in India and Mozambique | [35] |
| 35 | Convergent innovation for sustainable economic growth and affordable universal health care: Innovating the way we innovate | [36] |
| 36 | Accelerating learning for pro-poor health markets | [164] |
| 37 | Designing a technology and innovation platform for oncological drugs: An integrated foresight framework | [173] |
| 38 | Innovation platforms: experiences with their institutional embedding in agricultural research for development | [178] |
| 39 | A paradigm shift in African agricultural research for development: the role of innovation platforms | [177] |
| 40 | Improvised model for BOP healthcare in India: Lessons from NRHM | [49] |
| 41 | What online user innovation communities can teach us about capturing the experiences of patients living with chronic health conditions. A scoping review | [21] |
| 42 | From research-extension linkages to innovation platforms: Formative history and evolution of multi-stakeholder platforms in Ethiopia | [139] |
| 43 | Trust in open innovation – the case of a med-tech start-up | [171] |
| 44 | Health hackathons: theatre or substance? A survey assessment of outcomes from healthcare-focused hackathons in three countries | [167] |

Appendix C: Publication types

Table 36: Categorisation of literature according to the type of publication

| Studies published | Number of studies |
|--|--------------------------|
| CONFERENCE ARTICLE(S) | 6 |
| International Conference on E-Health and Bioengineering | 1 |
| International Conference on Engineering, Technology and Innovation | 1 |
| European Marketing Academy Conference | 1 |
| International Association for Management of Technology 2015 | 1 |
| 21st European Conference on Information Systems | 1 |
| Springer Lecture Notes in Business Information Processing | 1 |
| JOURNAL ARTICLE(S) | 26 |
| Agricultural Systems | 1 |
| Annals of the New York Academy of Sciences | 1 |
| BMJ Innovations | 1 |
| European Journal of Innovation Management | 1 |
| Experimental Agriculture | 1 |
| Forum for Health Economics and Policy | 1 |
| Health Affairs | 2 |
| Health Policy and Technology | 1 |
| Health Policy Journal | 1 |
| Health Research Policy and Systems | 1 |
| Innovation and development | 1 |
| International Journal of Agricultural Sustainability | 1 |
| International Journal of Pharmaceutical and Healthcare Marketing | 1 |
| Journal of Agricultural Economics, Extension and Rural Development | 1 |
| Journal of Comparative Effectiveness Research | 1 |
| Journal of Service Management | 1 |
| PLoS ONE | 1 |
| Quality in Primary Care | 1 |
| Research Technology Management | 1 |
| Science and public policy | 1 |
| Technovation | 1 |
| The American journal of managed care | 1 |
| The Lancet | 1 |
| Third International Engineering Systems Symposium | 1 |
| BRIEF | 11 |
| International Livestock Research Institute | 11 |
| NOTE | 1 |
| Globalisation and health | 1 |
| Grand total | 44 |

Appendix D: Stakeholder classification

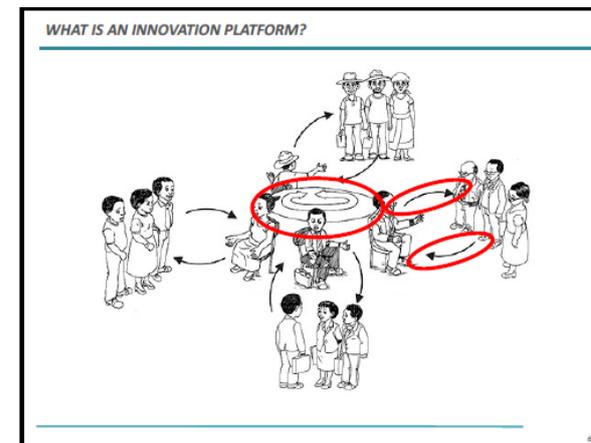
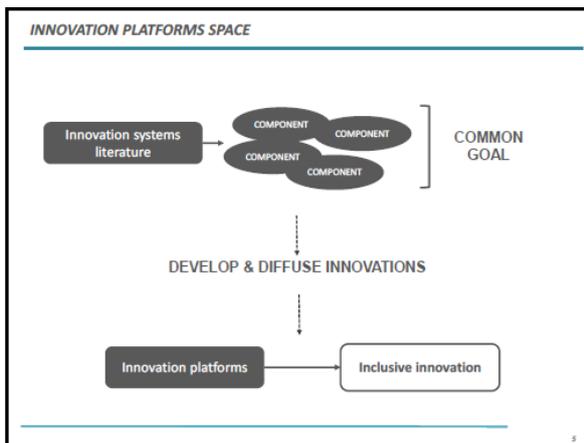
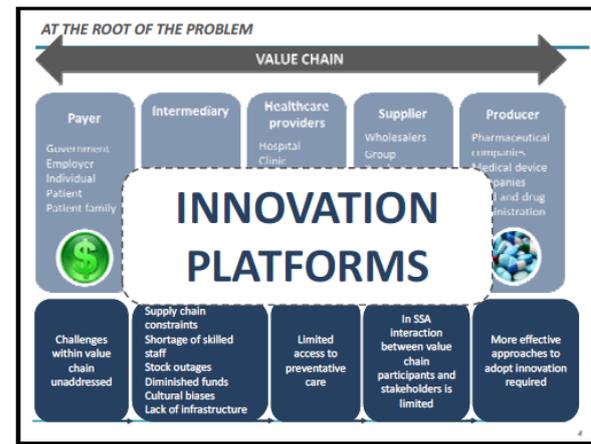
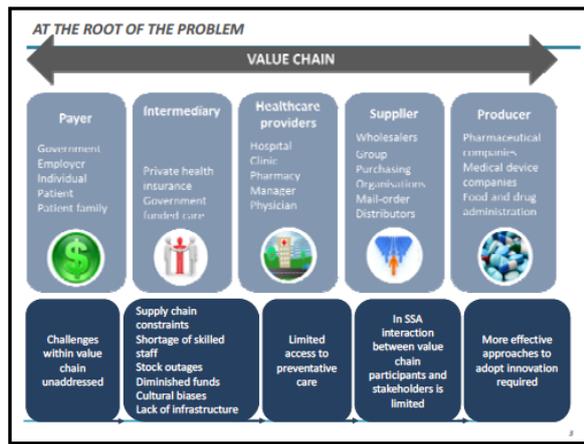
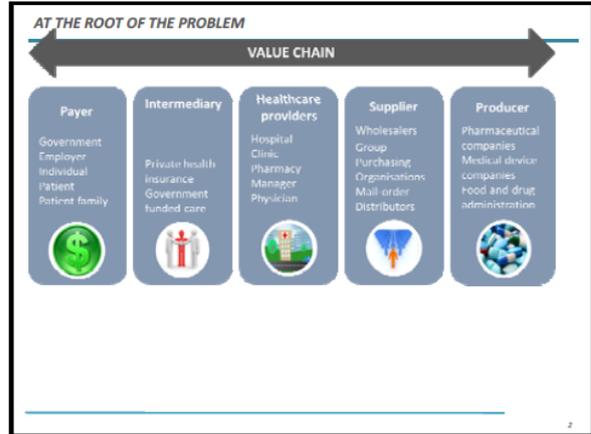
Table 37: Overview of stakeholder classification

| Primary stakeholders | | |
|---|--|--|
| <ul style="list-style-type: none"> Beneficiaries | This includes groups that stand to gain something from the effort. This includes knowledge advice, skills, monetary benefits, products or links to an organisation. | Examples: <ul style="list-style-type: none"> Residents of a particular geographic area – a neighbourhood, a town, a rural area. People experiencing or at risk for a particular problem or condition – homelessness, lack of basic skills, unemployment. Policy-makers that are the targets of advocacy efforts. |
| <ul style="list-style-type: none"> Targets of the effort | These stakeholders have the opportunity to gain personally. Their activities can potentially benefit specific populations or communities. | |
| Secondary stakeholders | | |
| Group 1 | Those groups or individuals that are involved with or responsible for the beneficiaries or targets. This includes the organisations or individuals that are living with, caring for or provide services to the beneficiary groups. | Examples: <ul style="list-style-type: none"> Parents, spouses, siblings, children, other family members, friends. Doctors and other medical professionals. Social workers. Health and human service organisations Community volunteers in various capacities. |
| Group 2 | Those whose livelihoods or existence may be affected by the process or implementation of the effort. Some of this group's stakeholders may have overlap with the above-mentioned group. | Examples <ul style="list-style-type: none"> Police and other law or regulation enforcement agencies. Emergency room personnel, teachers. Employers. A workplace safety initiative or strengthened workplace safety regulations, health insurance requirements. Ordinary community members whose lives, jobs, or routines might be affected by an effort or policy change. |
| Key stakeholders | | |
| Group 1 | Government officials and policy-makers. These are individuals who are in a position to devise, pass and enforce laws or regulations; these groups or individual's actions will have either the effect of fulfilling the goals of the effort or | <ul style="list-style-type: none"> Legislators. Federal and state or provincial representatives, senators, members of parliament, etc. who introduce and pass laws and generally control public budgets at the federal and state or provincial levels. Governors, mayors, city/town councillors, selectmen, etc. the executives that carry out laws, administer budgets, and generally run the show can contribute greatly to the success – or failure – of an effort. |

Appendix D

| | | |
|---------|--|---|
| | completely cancelling it out; | <ul style="list-style-type: none"> • Local board members. Boards of health, planning, zoning, etc., through their power to issue permits and regulations, can be crucial allies and dangerous opponents. • State/federal agencies. Government agencies often devise and issue regulations and reporting requirements, and can sometimes make or break an effort by how they choose to regulate and how vigorously they enforce their regulations. • Policy-makers. These people or groups often have no official power – they may be “advisers” to those with real power – but their opinions and ideas are often followed closely. If they are on your side, that is a big plus. |
| Group 2 | This group includes those that may influence others | <ul style="list-style-type: none"> • The media. • People in positions that convey influence. Clergy members, doctors, CEOs, and college presidents are all examples of people in this group. • Community leaders – people that others listen to. These might be people who are respected because of their position of leadership in a particular population, or may be established or lifelong residents who have earned the community’s trust over years of integrity and community service. |
| Group 3 | Those with an interest in the outcome of the effort. These people or groups may be unaffected by the process or outcome of the project, but care about the cause and may be willing to work towards achieving objectives. This includes individuals with a natural constituency like academics, senior business people or activists. | <ul style="list-style-type: none"> • Business. The business community usually will recognise its interest in any effort that will provide it with more and better workers, or make it easier and more likely to make a profit. By the same token, it is likely to oppose efforts that it sees as costing it money or imposing regulations on it. • Advocates. Advocates may be active on either or both sides of the issue you are concerned with. • Community activists. Organisations and individuals who have a philosophical or political interest in the issue or population that an effort involves may organise to support the effort or to defeat it. • People with academic or research interests related to a targeted issue or population. Their work may have convinced them of the need for an intervention or initiative, or they may simply be sympathetic to the goals of the effort and understand them better than most. • Funders. Funders and potential funders are obvious key stakeholders, in that, in many cases, without their support, the effort will not be possible. • Community at large. When widespread community support is needed, the community as a whole may be the key stakeholder. |

Appendix E: Interview introductory presentation



Appendix E

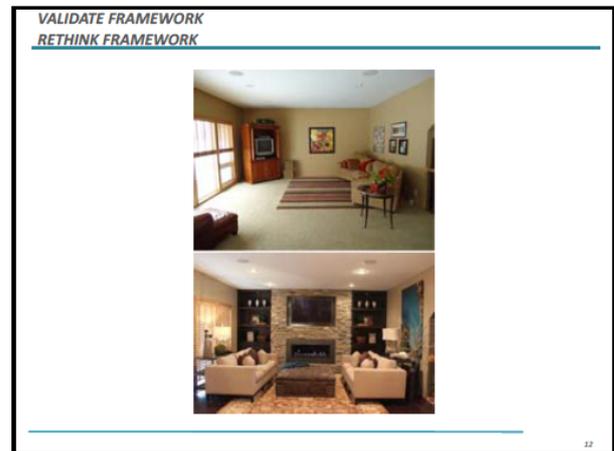
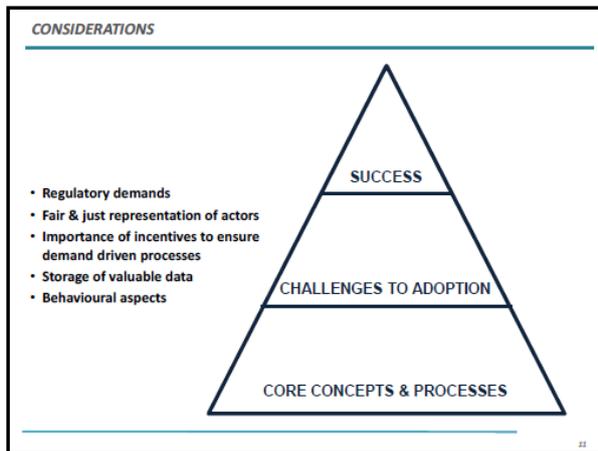
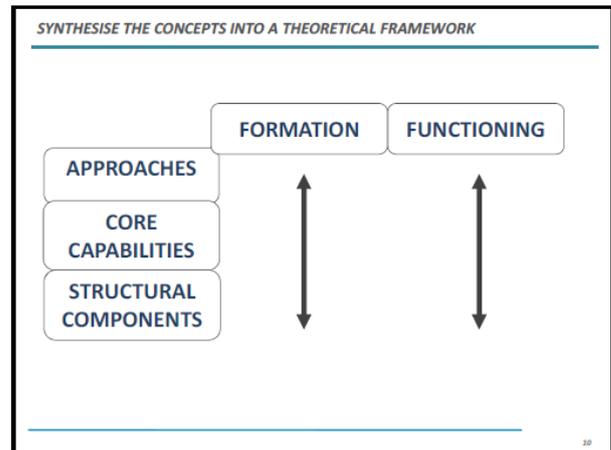
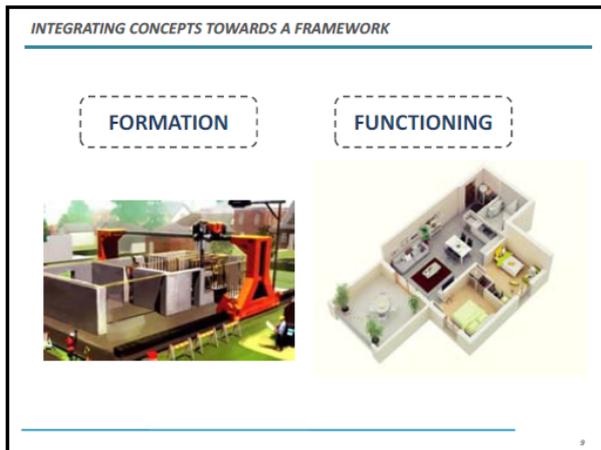
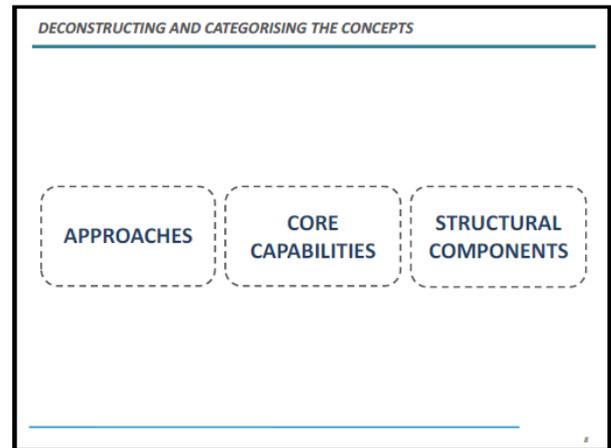
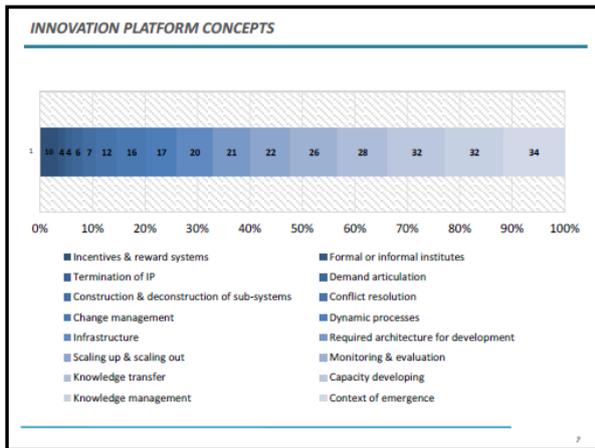


Figure 63: Interview presentation

Appendix F: Framework-ranking exercise outline

Dear [Participant],

Thank you for your willingness to participate in an interview as part of my research towards my Master's degree in Engineering Management. I appreciate the fact that you have agreed to be interviewed. The research study to be discussed is titled as follows: The role of innovation platforms in healthcare value chains. The desired outcome of this interview is to provide the researcher with practical insight into the formation and functioning of innovation platforms and to validate the proposed framework developed in this study. This specifically refers to the validation of the concepts that have been identified from the systematic literature review. The framework aims to provide guidance in the development process of innovation platforms.

To enable the researcher to refer back to the interview and analyse the discussion, a recording of the interview will be made. To ensure that all the information disclosed during this interview is correct, the researcher will send a typed up copy of the notes made as well as information gathered from the recording. The research is conducted in accordance with Stellenbosch University's Framework Policy for the Assurance and Promotion of Ethically Accountable Research and the researcher will gladly answer any queries you may have regarding this aspect of the study.

Please feel free to stop me at any time during the interview if you feel uncomfortable with any of the questions. You have the right to not participate in this interview as well as not having to complete the interview. Before we get going with the discussion, is there anything that you're uncertain of or any aspect that you need clarification of? Please refer to the comment boxes if there is any ambiguity with the choice of words within the proposed framework.

[READ ME](#) | Overview of platform | Framework ranking | Personal feedback | THANKS! | Types of IPs

Figure 64: Ranking exercise introduction

PLEASE VERIFY THAT THE COMPLETED DETAILS ARE CORRECT OR UPDATE THE FIELDS AS REQUIRED. THE COMMENTS PROVIDED (CAN BE SEEN BY HOVERING OVER THE BLOCK) PROVIDE ADDITIONAL INFORMATION.

| | |
|---|---|
| Name of platform | |
| Geographic focus area | |
| Location of office/meeting point of innovation platform | |
| Focus area of platform | Please specify whether or not the platform focuses on a specific disease area within healthcare, or within a specific department etc. If you are uncertain merely state this. |
| Current life cycle phase of innovation platform | Formation (Implementation) Functioning (Operational) Dissemination |
| Number of stakeholders involved | Formation (Implementation): Still within the development stages, Functioning (Operation): Currently operating with projects being birthed from platform, Dissemination: Platform is no longer functional. |
| Type of innovation platform (classification) | Refer to the 'Types of IPs' tab for more information regarding classification. <small>Chartered value exchange network Collaborative research network Communities of practice Community-based participatory research Convergent innovation platform Crowdsourcing virtual platform External collaboration network eHealth innovation network</small> |

[READ ME](#) | **Overview of platform** | Framework ranking | Personal feedback | THANKS! | Types of IPs

Figure 65: Platform background information

Appendix F

Please provide a ranking for each of the following concepts in terms of their impact versus the required effort to address the concept. Please also list any mechanisms or tools that you have employed to address this aspect within the innovation platform. If no tools or mechanisms were used please indicate this. If you are unsure regarding the definition of the concept, merely refer to the comment as it will provide a leading question or an interpretation. Alternatively, you can provide a note indicating the area of uncertainty that you require clarification on.

DID YOU MAKE USE OF THESE CONCEPTS DURING THE INNOVATION PLATFORM'S FORMATION OR FUNCTIONING?

sv = single value only, mv = multiple values possible

| FORMATION | | | | | | | |
|-------------------|--|--|------------------------|-------------------------------------|---|--|------------|
| Categories | Parameters | Concepts | Applicable (sv) | Impact of applying the concept (sv) | Effort required to address concept (sv) | Mechanism/ Tool employed to assist in process (mv) | NOTES (mv) |
| ABILITIES | Interaction/ Engagement - Consertation | Visioning & planning | Relevant, but not used | Extremely negative impact | Negligible degree of effort | | |
| | | Incentives & reward systems | Relevant, used | Negative impact | Minor degree of effort | | |
| | | Facilitation & coordination | Irrelevant, not used | No impact | Moderate degree of effort | | |
| | | Conflict resolution & dealing with power dynamics | Irrelevant, used | Positive impact | High degree of effort | | |
| | Knowledge development & learning | Knowledge, skills & interests exploration | | | Extremely high degree of effort | | |
| | | Monitoring & Evaluation | | | | | |
| FUNCTIONING | | | | | | | |
| CORE CAPABILITIES | Interaction/ Engagement - Consertation | Facilitation & management of interactions within innovation platform | Relevant, but not used | Extremely negative impact | Negligible degree of effort | | |
| | | Termination of innovation platform/members | Relevant, used | Negative impact | Minor degree of effort | | |
| | Knowledge development & learning | Knowledge transfer & type of learning | Irrelevant, not used | No impact | Moderate degree of effort | | |
| | | Consideration of various approaches to knowledge management | Irrelevant, used | Positive impact | High degree of effort | | |
| | | Disseminate & diffuse knowledge | | Extremely positive impact | Extremely high degree of effort | | |
| | | Draw on existing capacity & develop new ones | | | | | |
| | | Approaches to change management | | | | | |
| | | Continuous monitoring & evaluation | | | | | |
| | Capacity building | Driving participation, commitment, ownership | | | | | |
| | | Celebrate successful idea execution | | | | | |

Figure 66: Formation and functioning concept ranking

Appendix F

| PERSONAL FEEDBACK | |
|--|--|
| Platform join date & role | |
| From your experience with the innovation platform, what are some of the aspects that are pivotal to the success thereof? | |
| Does the framework, if implemented correctly, provide sufficient guidance towards the formation and functioning of an innovation platform? | |
| If not, where does the difficulty lie? | |
| Lastly, do you think that the framework and the components upon which it is developed is valid and useful? | |
| Thank you for your time and help in making this study valuable to healthcare innovation in South Africa! | |
| <div style="display: flex; justify-content: space-between; border-top: 1px solid black; border-bottom: 1px solid black; padding: 5px;"> ◀ ▶ READ ME Overview of platform Framework ranking Personal feedback THANKS! Types of IPs </div> | |

Figure 67: Personal feedback on framework

| |
|--|
| <p>Once again thank you for taking the time to participate in this interview and for providing valuable insight into the practical world of innovation platforms. Your input will assist in the process of improving the currently developed framework. At this point I would like to reassure you that your feedback will be dealt with confidentially.</p> |
| <p>The information collected via the questionnaire as well as the information recorded during the interviews will be summarised and will be available upon request. The final product produced by this thesis will also be available to all parties to see the role that you played in the creation thereof.</p> |
| <p>If you would like any further information regarding this study or if you have any further feedback to share please send me, Annica Marais, an email at 17100445@sun.ac.za and I will be happy to assist you.</p> |
| <p>Just to reiterate, the purpose of the interview and the ranking process is to validate the use of the concepts that were identified in literature and to provide a foundation from which a management tool can be developed.</p> |
| <div style="display: flex; justify-content: space-between; border-top: 1px solid black; border-bottom: 1px solid black; padding: 5px;"> ▶ READ ME Overview of platform Framework ranking Personal feedback THANKS! Types of IPs </div> |

Figure 68: Thanks for participation

Appendix F

| TYPE OF IP | BRIEF DESCRIPTION OF IP |
|--|--|
| Chartered value exchange network | These local entities promote consumer engagement in community-level multi-stakeholder organisations. |
| Collaborative research network | Collaborative innovation networks involve both technology and market stakeholders and are extended to include industry, research and technology producers. These clusters enable |
| Communities of practice | Communities of practice bridge different health market actors to help share experience-based |
| Community-based participatory research | Community-based participatory research is a model that focuses on eliminating health disparities and using research for social action and change. The key stakeholders are |
| Convergent innovation platform | Convergent IPs are focused on the integration of social and technological innovation. It takes a modular approach that convenes around roadmaps towards real world change. |
| Crowdsourcing virtual platform | Crowdsourcing virtual platforms are built on a combination of crowdsourcing principles and virtual world simulation modelling. It is an open innovation platform that allows a third party |
| External collaboration network | New innovative ecosystems emerge as partnerships and collaborations are established across hospitals and other organisations. The success of hospitals will be less reliant on technology |
| eHealth innovation network | eHealth networks are built on partnerships among health, education, industry and government. Focus is placed on research & development. |
| Health hackathon platform | Healthcare-focused hackathons are time-limited platforms intended to accelerate novel |
| Innovation intermediary | Innovation intermediaries are multi-actor arrangements that have been captured using |

[←](#) [▶](#) | [READ ME](#) | [Overview of platform](#) | [Framework ranking](#) | [Personal feedback](#) | [THANKS!](#) | **[Types of IPs](#)**

Figure 69: Overview of the types of IPs to consider

Appendix G1: Concepts identified through framework-ranking

Additionally, the ranking exercise identified concepts that were deemed as having a negative or no impact but that require a moderate, high or an extremely high degree of effort. These concepts are listed in Table 38. Further investigation into their inclusion is required, but this is outside this study's scope.

Table 38: Impact vs Degree of effort for specific rankings

| | I = Impact of concept, E =Degree of effort to address concept |
|--|--|
| | I=2:3, E=3:5 |
| Termination of innovation platform/members | 7 |
| Shift in focus level of IP | 3 |
| Construction & de-construction (sub-systems) | 3 |
| Dealing with resistance to change | 2 |
| Search guidance | 2 |
| Setting up formal & informal institutions | 2 |
| Support and influence policy-making | 2 |
| Conflict resolution & dealing with power dynamics | 1 |
| Focus on inclusivity within process | 1 |
| Consideration of dynamic processes | 1 |
| Stakeholder-representative demand articulation | 1 |
| Facilitation & management of interactions within innovation platform | 1 |
| Supporting development of technology services | 1 |
| Establish knowledge sharing platforms | 1 |

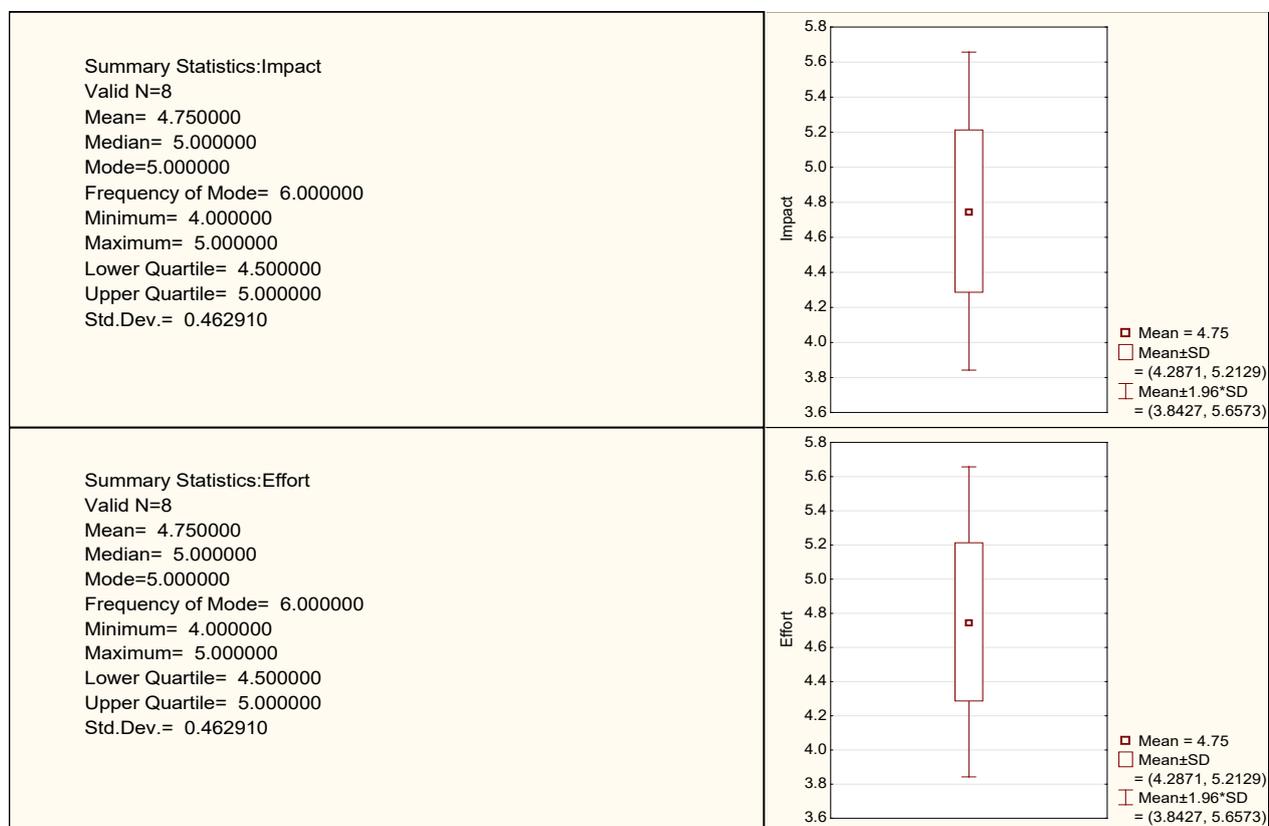
Appendix G2

Appendix G2: Framework-ranking outcomes

The selection of the concepts from Table 24 and Table 25 is supported by additional statistical analysis on the received feedback. Although the author appreciates that this is a very small sample size, the exploratory analytics of the results is included in this study.

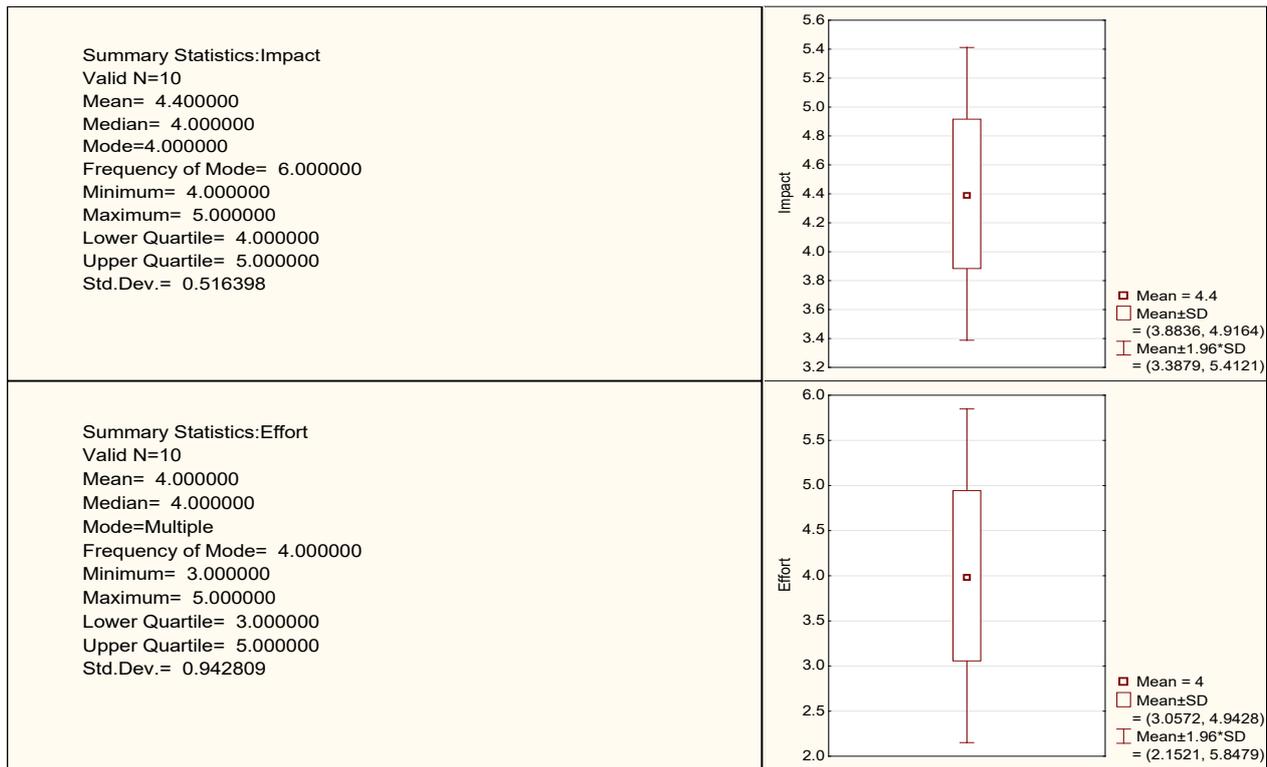
The concepts were selected based on the distribution of the rankings, but it is apparent from looking at the impact and degree of effort ranking for selected the concepts, individually, that the mean remains high for both the impact as well as the degree of effort.

Design for scalability (Scaling up/out)

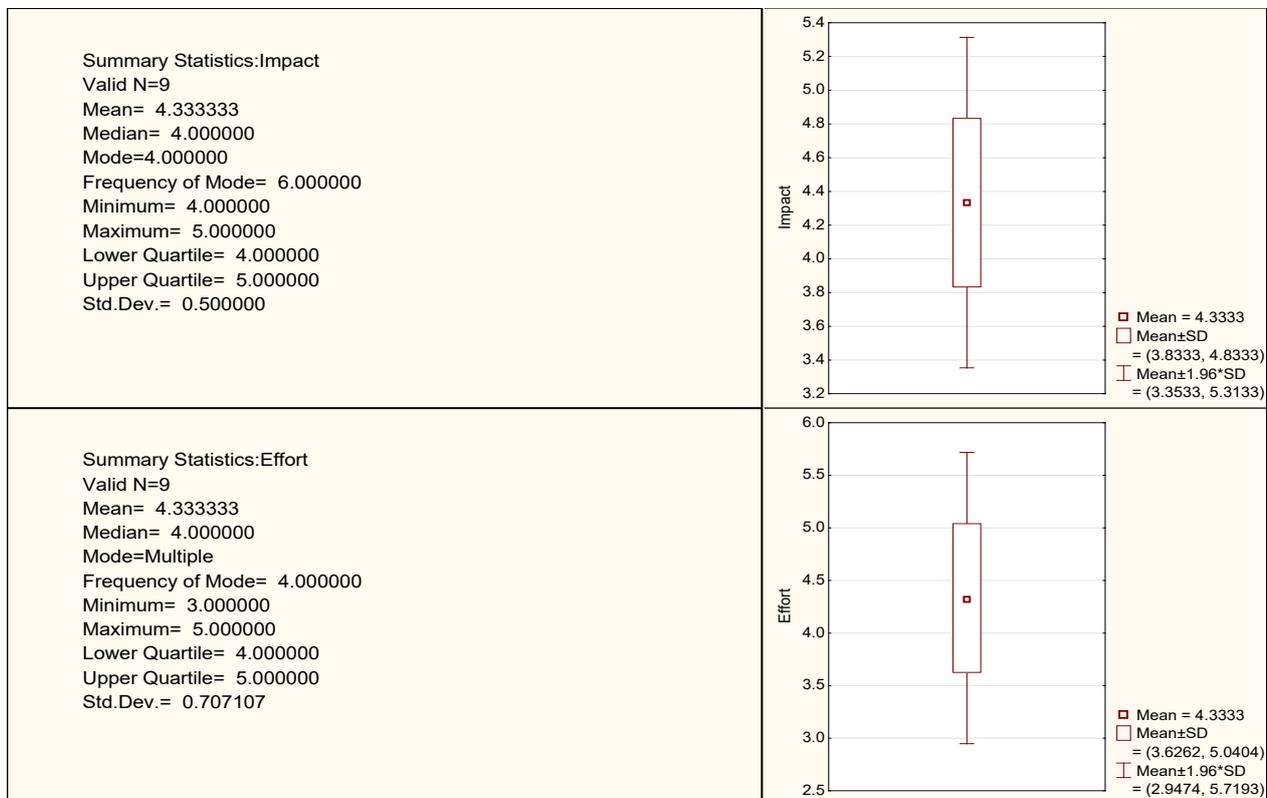


Appendix G2

Mobilise resources

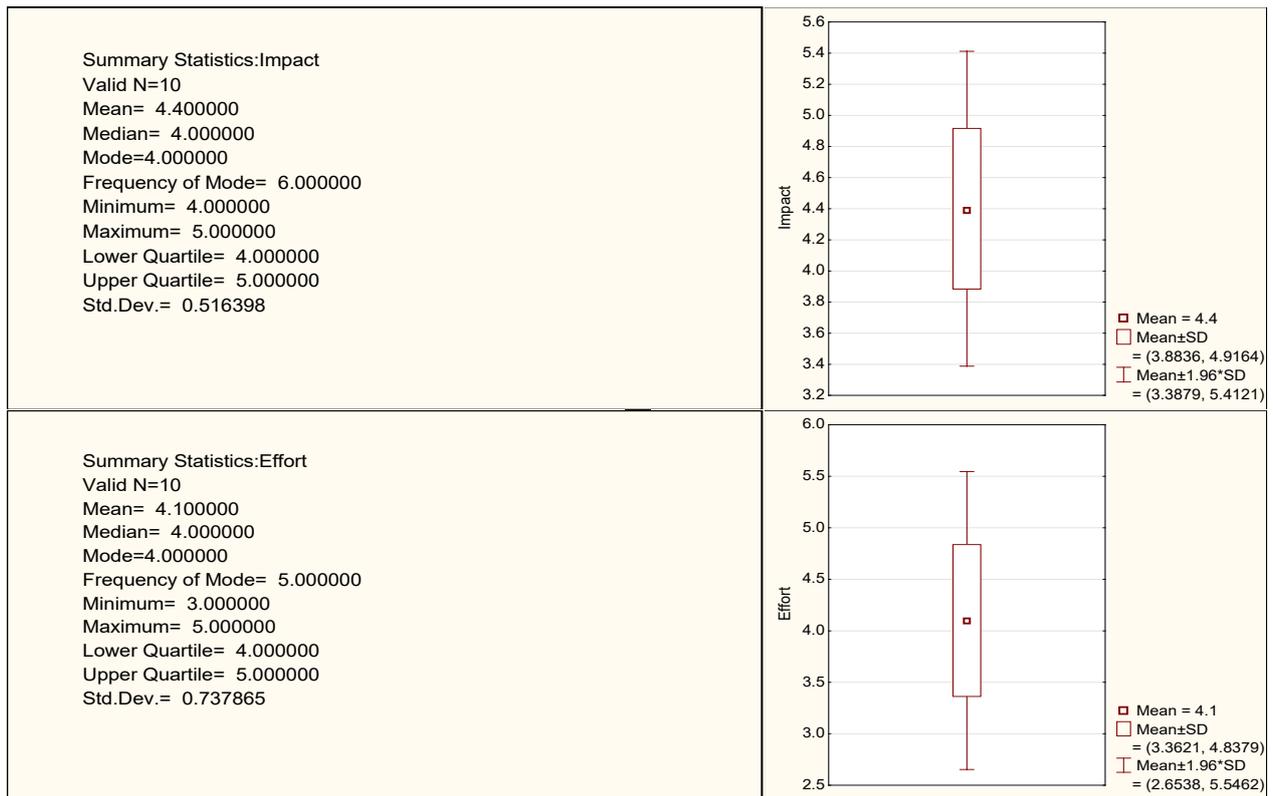


Monitoring and Evaluation

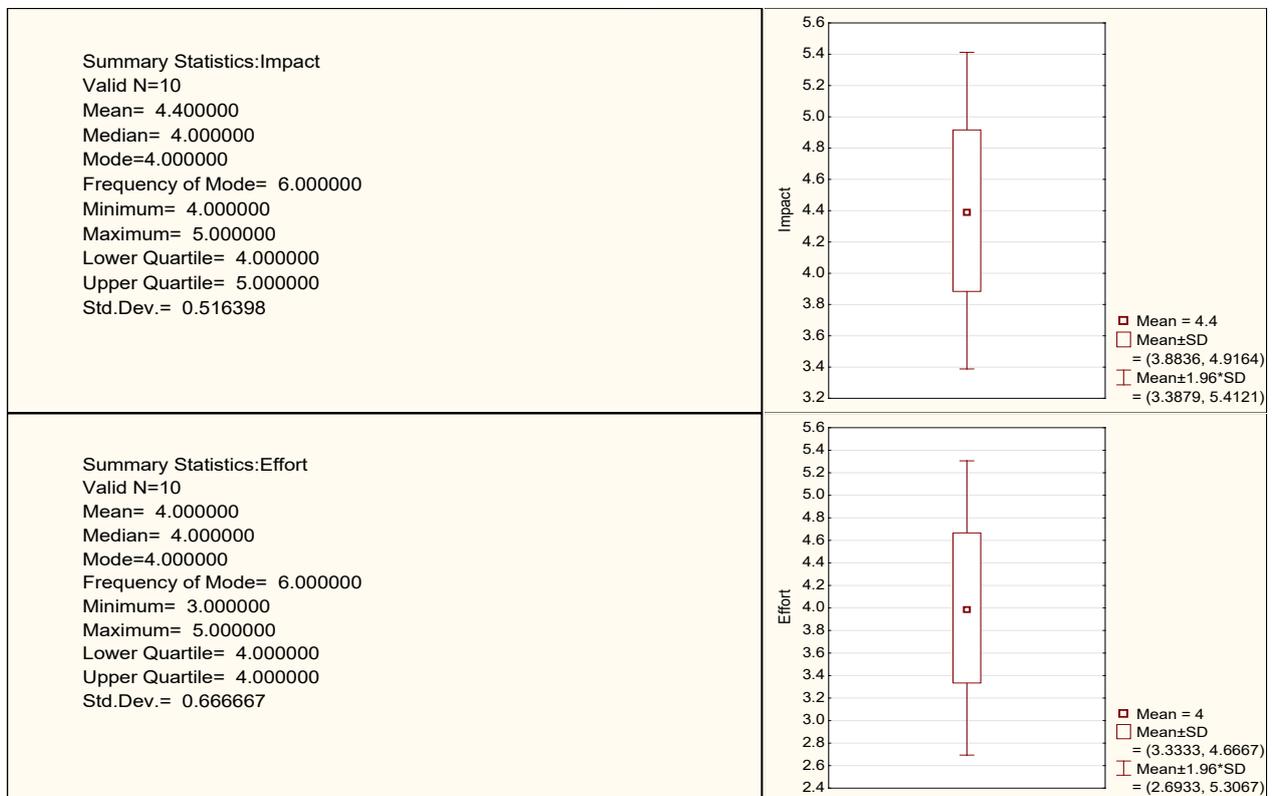


Appendix G2

Inclusion and representation of all stakeholder



Knowledge transfer and type of learning



Appendix H: Personal feedback (Framework-ranking)

Table 39: Personal feedback

| | | Concluding questions | | | |
|-------------|---|---|--|---|---|
| | | Does the framework, if implemented correctly, provide sufficient guidance towards the formation and functioning of an innovation platform? | If not, where does the difficulty lie? | Do you think that the framework and the components upon which it is developed is valid and useful? | Do you see any additional factors to consider when implementing an IP? |
| Interviewee | 1 | <p>Yes.</p> <p>It is important to note that the success of the programme requires explicit buy-in, not only from senior hospital management, but at all levels of management and operation.</p> | | <p>Yes.</p> <p>The framework and associated components are valid and useful, since they are replicable across many contexts within the public health sphere.</p> | <p>Pivotal to the success of the programme is senior level hospital support, outreach to hospital staff, and ensuring that there is continuous support to the innovation project teams in such a way that there is a negligible extra administrative burden placed upon the teams.</p> |
| | 2 | <p>Yes.</p> <p>It is important to remember that the central driving force or ongoing promotion for participation would still be required to ensure its success and sustainability over time. Stakeholder relations and integrated communications approach would be critical.</p> | | <p>Yes.</p> | <p>Based on our past experience, simply creating a portal to house information, programmatic or specialised areas of operation and contact details is not as useful. The platform still requires some driving force to actively push and link subscribers by making formal introductions and should have the ability to track and report on the progression of these linkages and proposed strategic partnerships. In your design, you would need to incorporate some method that drives inter disciplinary integration, which would become a key differentiator in comparison to existing platforms.</p> |

Appendix H

| Concluding questions | | | | |
|-----------------------------|--|---|--|--|
| | Does the framework, if implemented correctly, provide sufficient guidance towards the formation and functioning of an innovation platform? | If not, where does the difficulty lie? | Do you think that the framework and the components upon which it is developed is valid and useful? | Do you see any additional factors to consider when implementing an IP? |
| 3 | Yes. | | Yes. It could add significant value, if implemented and used. | There is a need for a clear understanding of intellectual property protection. A clear shared understanding of the value add from collaboration is needed. |
| 4 | Yes. In order for it to work sufficiently the people involved need the correct training and guidance. | | Yes. The framework will allow our hospital to respond to the increasing and volatile healthcare demands. | In this line of work one should be very patient and not put too much pressure on teams. Getting the right people around the table is one key element to achieve success. Usually if you introduce something new in the workplace it takes a while before people start to believe what you believe. We work with the willing and prove to the late adopters what successes are possible. |
| 5 | Yes. The framework is very helpful and supportive. | | Yes. | Allow for ongoing projects to be more visible. |
| 6 | Yes. Our stage and size means not everything is applicable (compared to a sizable, established organisation/platform). | | Yes. It provides value and sparks thinking about current shortcomings or future structural advancements | Planning, execution (most important), funding and support, relationships, collaboration and participation. |
| 7 | Yes. The challenge is capacity in terms of manpower and the culture of innovation that we | I think in future try to simplify the technical language and also shorten | Yes. | Develop solutions relevant to industry challenges and grow entrepreneurs with such solutions. Pivotal to platform success is the involvement of the various stakeholders and maintaining neutrality. |

Appendix H

| Concluding questions | | | | |
|----------------------|--|---|--|--|
| | Does the framework, if implemented correctly, provide sufficient guidance towards the formation and functioning of an innovation platform? | If not, where does the difficulty lie? | Do you think that the framework and the components upon which it is developed is valid and useful? | Do you see any additional factors to consider when implementing an IP? |
| | may not know how best to run for platforms. | the explanations provided. | | |
| 8 | No, not really. We manage complexity all the time and practically its more guided by the principles of Community Oriented Primary Care, complex adaptive systems, collaboration, and capability learning than by a platform framework. | We do not focus on innovation per se all the time. Improvement and innovation in a complex adaptive system relate to many agents at different levels all the time. We adapt and strategise to get innovations accepted and implemented and sustained. | Yes. We are not aware enough of these concepts. We work on an organismic way. Perhaps we regard frameworks and guidelines as a minimum; perhaps we would be more successful if we were more aware of frameworks. | Engagement of partners from different fields of innovation and development, Space for innovation from service delivery, which is mostly government/public sector if you work on solutions for poor section of society, Funding that gives space for innovation, not just to reach certain service delivery targets, but to innovate and implement. |
| 9 | Yes. | A context specific understanding is extremely important. | Yes. | Project-based work, with defined short term outcomes and measureable successes, with established stakeholders in the field of work are pivotal to the success of an IP. |

Appendix H

| | | Concluding questions | | | |
|--|----|---|--|--|--|
| | | Does the framework, if implemented correctly, provide sufficient guidance towards the formation and functioning of an innovation platform? | If not, where does the difficulty lie? | Do you think that the framework and the components upon which it is developed is valid and useful? | Do you see any additional factors to consider when implementing an IP? |
| | 10 | Yes. The best use of the innovation platform framework is as a tool for guidance that can be expanded/ build on, not as a strict manual | | Yes. It has proven to be very useful. | Full commitment from the industry partner, as well as participants is key as they co-create in solving the cases. We form international, multi-disciplinary teams and trust between partners is crucial with respect to delivering the best possible outcome. |

Appendix I: GSH Innovation hub

Table 40: Key informant interviewees

| Position within Innovation Hub | Role & responsibilities |
|--|--|
| The current Hub facilitator | GH was appointed as the Innovation Hub's facilitator in June 2017. He is in charge of the improvement projects within the hospital and constantly looks for ways to implement improvement projects through innovation. GH works closely with the Innovation Programme participants towards ensuring their project succeeds. |
| The innovation head at GSH | EW is the medical service manager at GSH and since 2016 she is also responsible for the functioning of the Innovation Hub. Her responsibilities to the Hub include providing guidance for Innovation Programmes and creating the necessary linkages between GSH and external parties. |
| The initial facilitator of the Hub from Bertha Centre's side | KdV played a major role in developing the Innovation Hub into what it is today. She forms part of the Bertha Centre team. She was predominantly involved with the launch of the Innovation Hub in 2015 where she worked as the facilitator and provided guidance to the participants of the 2015 Innovation Programme. Her position was always envisioned as a temporary supportive role until GSH could identify an internal party to facilitate and coordinate the Hub's activities. Currently, KdV does not work with the Hub directly, but she has embodied an advisory role to the new Hub facilitator. |



Figure 70: The GSH Innovation Hub

Appendix I



Figure 71: Examples of the posters that were utilised as incentives during the first Innovation Programme

Appendix I



New Possibilities
Bold Solutions
Better Patient Care

GSH INNOVATION HUB

GSH HEALTHCARE INNOVATION HUB 80th Anniversary Project Drive

We are embarking on a new project drive, with the intention of continuing our success story and encouraging staff, across all disciplines, to excel. Our aim is to develop a sustainable culture of continued staff driven improvement.

THE CHALLENGE

- Brainstorm ideas for a service improvement project.

INSTRUCTIONS

- Submit a project proposal (**max 3 pages**) that outlines the following:
 - the background information;
 - scope of the project;
 - detailed proposal;
 - the team;
 - timeline; and
 - the amount of financial support required.
- Deadline for submission is 30 April 2017.** Proposals to be submitted to Mr Garth Hankey: Garth.Hankey@westerncape.gov.za
- The selection committee will invite the finalists to discuss their proposals on 15 May 2017.

PLEASE NOTE

- Projects are supported by the GSH Facility Board, which is an independent charity trust. **Applications for funding to be sent to GSH Facility Board.**
- Preference will be given to interdisciplinary team approaches to close existing gaps in health care service delivery.

All Projects must show value to PATIENT CARE

- Projects will commence 01 JUNE 2017
- All Projects must be concluded by 30 NOVEMBER 2017
- Presentations and evaluations will be done during DECEMBER 2017 / JANUARY 2018
- Awards Ceremony will take place 29 JANUARY 2018

About the Selection Committee

They are also members of the Steering Committee. As we work cross sectorial, we have members from different areas (Management and Clinicians) on the selection committee. Dr. Patel, CEO of GSH, is head of the steering committee.

WE ARE HERE TO SUPPORT YOU

The selection committee provides a wide range of knowledge and expertise and they are here to assist you in developing the proposal, budget and support for implementation.

INNOVATION HUB CONTACT DETAILS:

GSH Executive Contact:

Prof. Edda Weimann
MD (LMU), MPH (UCT)
77-133
Edda.Weimann@westerncape.gov.za

Support & Guidance:

Mr. Garth Hankey
MPA
77-244
Garth.Hankey@westerncape.gov.za

Bookings & Information:

Ms. Nadine Ross
BA : PMA
021 404 6241
Nadine.Ross@westerncape.gov.za
Gsh.lhub@westerncape.gov.za

Technical Support & Guidance:

Mr. Faizel Adonis
ND : Business Analyst
021 404 6338
Faizel.Adonis@westerncape.gov.za

E-FLOOR, HOSPITAL STREET,
NEW MAIN BUILDING

Figure 72: 2017 Innovation drive poster