DEVELOPING A MANAGEMENT TOOL FOR SCALING-UP HEALTH SERVICE INNOVATIONS IN MARGINALIZED COMMUNITIES: A SYSTEMS PERSPECTIVE

By Christi Johannes Christoffel Herbst

Thesis presented in partial fulfilment of the requirements for the degree of

Master of Engineering (Engineering Management) in the Faculty of Engineering at Stellenbosch University

Supervisor: Prof SS Grobbelaar

Co-supervisor: Prof J Grobler

March 2023

DECLARATION

By submitting this thesis electronically, I declare that the entirety of the work contained therein is my own, original work, that I am the sole author thereof (save to the extent explicitly otherwise stated), that reproduction and publication thereof by Stellenbosch University will not infringe any third party rights and that I have not previously in its entirety or in part submitted it for obtaining any qualification.

Date: March 2023

ABSTRACT

Systems transformation depends on the impact scale delivered through Innovations for Inclusive Development (I4ID). Simmons et al. [1] stated that "*scaling up is primarily a managerial, political, and organizational development issue rather than tied to a particular set of technical interventions.*"

The relationship between implementation procedures and the large-scale institutionalization of health service innovations is significantly influenced by systems dynamics. Scaling up consists of two paradigms. Firstly, scaling up comprises a linear, intervention-oriented expansive strategy that prioritizes the introduction of evidence-based interventions into current systems to promote the spread of their use. Secondly, scale-up can be perceived from a complex systems paradigm where interventions are conceptualized as events in systems. Implementation and scale-up operations should concentrate on creating changes within the system to achieve the desired result.

This study investigates scaling up from a systems-orientated perspective to develop a practical management tool for guiding implementers and practitioners of health service innovations during scaling up. To achieve this goal, the researcher developed ten research objectives, which were then converted into a research design based on the six Design Science Research Methodology (DSRM) activities developed by Peffers et al. [2].

The first activity, namely problem identification and motivation, discussed the background and research approach. The second activity, defining solution objectives, included the research objectives for developing a qualified knowledge base that would allow the researcher to define the solution objectives for the management tool accurately. To develop the knowledge base, the researcher conducted a conceptual literature review to gain in-depth knowledge about the research problem and the main elements of scaling up health service innovations. The conceptual literature review's conclusions served as the foundation for additional research undertaken as part of a systematic literature review to identify the prevalent frameworks and models for scaling up health service innovations. The knowledge acquired during the two reviews was used to determine the design requirements needed to develop the preliminary management tool based on the iceberg model [3] to incorporate a systems perspective of scaling up during the third DSRM activity, namely design and development.

During activities four and five, namely demonstration and evaluation, semi-structured interviews were conducted to validate the concepts used in the management tool and gain insight from various subject matter experts in the healthcare implementation and practice field. An impact-effort study of the suggested management routines yielded more qualitative data on the preliminary tool's efficacy. Following the analysis of the evaluation data, structural and conceptual improvements to the preliminary management tool were suggested. Improvements included adding additional routines, renaming routines, and restructuring and reorganizing the management tool.

The preliminary management tool was updated to form the final management tool, which was presented and discussed during the final DSRM activity, namely communication.

UITTREKSEL

Stelseltransformasie is afhanklik van die impakskaal wat deur Innovations vir Inklusiewe Ontwikkeling (I4ID) gelewer word. Simmons et al. [1] het gesê dat *"opskaling hoofsaaklik 'n bestuurs-, politieke en organisatoriese ontwikkelingskwessie is eerder as gekoppel aan 'n spesifieke stel tegniese intervensies."*

Die verhouding tussen implementeringsprosedures en die grootskaalse institusionalisering van gesondheidsdiensinnovasies word aansienlik deur sisteemdinamika beïnvloed. Opskaal bestaan uit twee paradigmas. Eerstens behels opskaling 'n lineêre, intervensie-georiënteerde uitgebreide strategie wat die bekendstelling van bewysgebaseerde intervensies in huidige stelsels prioritiseer om die verspreiding van die gebruik daarvan te bevorder. Tweedens kan opskaal waargeneem word vanuit 'n komplekse sisteemparadigma waar intervensies gekonseptualiseer word as gebeurtenisse in sisteme. Implementering en opskaalbedrywighede moet daarop konsentreer om veranderinge binne die stelsel te skep om die gewenste resultaat te bereik.

Hierdie studie ondersoek opskaling vanuit 'n sisteemgeoriënteerde perspektief om 'n praktiese bestuursinstrument te ontwikkel om implementeerders en praktisyns van gesondheidsdiensinnovasies tydens opskaling te lei. Om hierdie doel te bereik, het die navorser tien navorsingsdoelwitte ontwikkel, wat toe omskep is in 'n navorsingsontwerp gebaseer op die ses Design Science Research Methodology (DSRM)-aktiwiteite wat ontwikkel is deur Peffers et al. [2].

Die eerste aktiwiteit, naamlik probleemidentifisering en motiverings, het die agtergrond en navorsingsbenadering bespreek. Die tweede aktiwiteit, wat oplossingsdoelwitte definieer, het die navorsingsdoelwitte vir die ontwikkeling van 'n gekwalifiseerde kennisbasis ingesluit wat die navorser in staat sal stel om die oplossingsdoelwitte vir die bestuursinstrument akkuraat te definieer. Om die kennisbasis te ontwikkel, het die navorser 'n konseptuele literatuurstudie gedoen om in-diepte kennis te verkry oor die navorsingsprobleem en die hoofelemente van die opskaling van gesondheidsdiensinnovasies. Die konseptuele literatuurstudie se gevolgtrekkings het gedien as die grondslag vir bykomende navorsing wat onderneem is as deel van 'n sistematiese literatuuroorsig om die algemene raamwerke en modelle vir die opskaling van gesondheidsdiensinnovasies te identifiseer. Die kennis wat tydens die twee oorsigte verkry is, is gebruik om die ontwerpvereistes te bepaal wat nodig is om die voorlopige bestuursinstrument gebaseer op die ysbergmodel [3] te ontwikkel om 'n sisteemperspektief van opskaling in te sluit tydens die derde DSRM-aktiwiteit, naamlik ontwerp en ontwikkeling.

Tydens aktiwiteite vier en vyf, naamlik demonstrasie en evaluering, is semi-gestruktureerde onderhoude gevoer om die konsepte wat regdeur die bestuursinstrument gebruik word te valideer en insig te verkry van verskeie vakkundiges in die gesondheidsorgimplementering en praktykveld. 'n Impak-inspanning-analise van die voorgestelde bestuursroetines het meer kwalitatiewe data oor die voorlopige instrument se doeltreffendheid opgelewer. Na die ontleding van die evalueringsdata, is strukturele en konseptuele verbeterings aan die voorlopige bestuursinstrument voorgestel. Verbeterings het die byvoeging van bykomende roetines, die hernoeming van roetines en die herstrukturering en herorganisering van die bestuursinstrument ingesluit.

Die voorlopige bestuursinstrument is opgedateer om die finale bestuursinstrument te vorm, wat tydens die finale DSRM-aktiwiteit aangebied en bespreek is, naamlik kommunikasie.

ACKNOWLEDGEMENTS

First and foremost, I would like to thank my greatest teacher, my heavenly Father, for His shower of blessings and guidance throughout my Master's journey and for providing me with the strength and energy to complete this endeavour.

I would like to dedicate this project to my parents, Dirk and Tessie Herbst, who provided me with unconditional love and support throughout my studies and without whom I would not be the person I am today. To my father, thank you for giving me a perspective on life that anything can be accomplished through persistence and determination. To my mother, thank you for believing in me and teaching me never to give up. I will always cherish that.

I would like to thank my supervisors, Prof Saartjie (Sara) Grobbelaar and Prof Jacomine Grobler. Thank you for your unwavering support throughout my Master's studies and for allowing me to be a part of the Stellenbosch Imperial Collaboration Initiative (SUCI), which has been a valuable learning experience that has prepared me for my future career path.

I would also like to express my gratitude to Lynda Toussaint, who provided me with a scholarship opportunity to pursue a study which I am passionate about. Thank you to all the members from Unjani Clinics NPC and the other participants for their active involvement during the discussions and willingness to share their knowledge and experience.

Last but not least, I would like to thank all my friends and family who supported me throughout my journey, especially my brothers Wilhelm and Dirk Herbst, who are my rock.

It always seems impossible until its done – Nelson Mandela

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

LIST OF ACRONYMS AND ABBREVIATIONS

BOP	Base of the Pyramid
CAS	Complex Adaptive System
GT	Grounded Theory
I4ID	Innovation for Inclusive Development
SA	South Africa
WHO	World Health Organization
SLR	Systematic Literature Review
CLR	Conceptual Literature Review

Chapter 1

INTRODUCTION

Chapter 1 Objectives:

- Background of study.
- Define research problem.
- Present research questions and objectives.
- Outline research design and methodology.
- Present research contributions
- Provide document layout

Chapter 1 introduces the study, providing background information on the problem landscape and explaining the research objectives. In this chapter, both the scope and the limitations of the study, as well as a general summary of the research methodologies, are discussed. At the end of the chapter, the document layout is given.

1.1 BACKGROUND

The lack of adequate healthcare contributes to poverty in low-and middle-income countries who face multiple health challenges. Besides the diseases common to all countries, such as diabetes and cancer, they face an additional disease burden related to their geography and poverty, including tropical diseases, such as malaria, dengue fever, and schistosomiasis; waterborne diseases due to unclean drinking water; respiratory diseases, due to indoor air pollution from cooking and heating with solid fuels; and, HIV/AIDS, which has been most prevalent in Africa [4].

Underdeveloped public healthcare systems in developing nations are unable to meet demand. To demonstrate the severity of an overburdened public healthcare system, South Africa's Minister of Health, Dr. Joe Phaahla, announced in 2022 that the country's doctor-to-patient ratio is 1:3198. (0.31 doctors per 1 000 patients) [5], compared to the World Health Organization's (WHO's) recommended doctor-to-patient ratio of 1:1000 . To reach the millions of people in need, the importance of accelerating the impact of non-government health service innovations at scale is emphasized throughout the literature [6].

Scaling up actions to improve population health has been a focus of the WHO for over a decade [7]. In 2018, the WHO Independent High-level Commission on Noncommunicable Diseases (NCDs) stated a global priority to achieve 'increasing investment in and implementation of evidence-based solutions [to NCDs] on a dramatically larger scale' [8].

Despite various definitions of scaling up, this report uses the following definition as defined by ExpandNet/WHO [9]: *"deliberate efforts to increase the impact of health service innovations successfully tested in pilot or experimental projects so as to benefit more people and to foster policy and programme development on a lasting basis."*

Despite many attempts to reach large-scale impact through public healthcare interventions for many health behaviours (e.g., childbirth mortality, nutrient deficiencies, and sexually transmitted diseases, etc.), there is a continued lack of public health interventions that have been scaled up sufficiently to achieve sustainable and equitable population health improvement [10]. There are multiple reasons why public health interventions might fail to achieve lasting population-wide impact, ranging from a lack of political prioritisation, and consequent lack of resources, to insufficient preparation to meet the challenges of implementing interventions in practice marginalized communities [10]. Challenges as resistance from communities to advocate and adopt the innovations, as well as systemic failures resulting in poor access to quality and affordable health services. Another reason is that for some health behaviours, current scale-up approaches may be ineffective at achieving system-wide impact [6].

Large-scale effective health interventions or programs must be embedded at the system level to achieve population-wide benefits. Still, only a small number of successful initiatives are implemented into practice and delivered at this magnitude [10]. The relationship between implementation methods and large-scale institutionalisation of public health initiatives is heavily influenced by systems transformation. Health systems are made up of highly heterogeneous groups of actors, including various types of healthcare providers, managers, policy-makers, patients, and regulators, which engage at various levels through various services and functions [11]. The dynamic interactions between stakeholders and their interdependence within the health system reflect the characteristics of a complex adaptive system (CAS) [12], [13].

Effective scaling can take many forms, but at one extreme, it can comprise a linear, *"intervention-oriented"* [10] expansive strategy that prioritizes the introduction of evidence-based interventions into current systems to promote the extension of their use [10]. On the other hand, scale-up can be integrated into a complex systems paradigm where interventions are conceptualized as "events in systems" [10]. To achieve the desired outcome in this situation, implementation and scale-up operations should concentrate on creating changes within the system itself. Scaling up approaches that focus on systems changes is referred to as *"systems-oriented"* [10] scale-up to improve population health, which can enhance conventional approaches in relevant circumstances.

However, in scaling up literature, *"systems-orientated approaches"* are still underutilized [6]. Public health scale-up approaches have traditionally focused on intervention replication via linear expansion. Recent scaling-up literature suggests a new perspective on scaling up approaches that shifts focus away from the intervention and more towards achieving desired population-level health outcomes [6], [10], [11].

1.2 RESEARCH PROBLEM

Health service "innovations" has two aspects [9]. Firstly, it refers to health service practices that are novel or regarded as novel in the context of the implementation area. Regardless of how readily accessible and used elsewhere, innovations include established or well-known technologies, processes, service models, or best practices that have not been employed in a particular place [9]. Second, health service innovations are a collection of interventions rather than a single medical therapy, clinical practice, or program element [9]. These interventions include the procedures required

to develop long-term implementation capacities, the operational model, and the structure. A technology alone hardly offers a straightforward answer to a complex problem and therefore is not a health service innovation [9].

Health service innovations are often aimed at marginalized communities where alternative healthcare options other than overburdened or inaccessible government institutions are needed. Economically excluded communities need access to quality and affordable healthcare to realize inclusive development towards systems-level social transformation. These innovations not only allow for reducing disease burden and improving the overall welfare of the marginalized communities by offering new ways for accommodating healthcare needs but also stimulating economic activity, thus empowering these communities out of poverty [14].

Once a health service innovation proves to be sustainable and could have a positive impact regarding inclusivity and improved well-being of individuals in the implementation area, implementers are interested in replicating and extending the reach of the innovation into other geographical regions to achieve the same sustainable health benefits as shown in the pilot models [1], [15]. The objective of scaling up is thus to increase the innovations' impact towards a specific social goal, such as reaching the hundreds of marginalised groups and providing them with access to affordable and quality healthcare services in their communities [16].

Social healthcare organizations often do not have access to government funds and need to rely on the self-sustainable business model and, at the same time, relevant to resource-scarce communities with weak buying power. During the scaling-up process, management often faces challenging decisions regarding where to scale up to and how to pursue scaling up sustainably. Trade-offs usually exist regarding inclusivity and social impact, return on investment (profitability of the model), and rate of expansion in the scaling-up process [7]–[9].

Inclusive impact aims to deliver sustainable social transformation on a systemic level. Therefore the extent of large-scale implementation must match the degree of the social problem the innovation intends to address.

Strategically managing and planning the scaling-up process presents challenging decisions regarding the best course of action given the resource-scarce target market. Managers and implementers are concerned with replicating the model across diverse social, cultural, political, and infrastructural environments and choosing between trade-offs so as not to risk losing sight of the social objective of pursuing scaling up [1]. These and other difficulties are brought up by scale-up management [1].

Simmons et al. [1] stated that "*scaling up is primarily a managerial, political, and organizational development issue rather than tied to a particular set of technical interventions.*"

The literature on scaling up health service innovations points out the need for more comprehensive development initiatives and strategies across conventional sectoral boundaries. Therefore, implementers are encouraged to place emphasis on detailed strategic planning and management of scaling up in addition to implementing a higher degree of synergy across operations [17]. Creating a good service model is only the beginning of the scaling-up process. The sustainability and social impact outcomes will largely depend on how the scaling-up process is managed [17], [18].

This thesis aims to develop a management tool that could facilitate management and decision-makers to approach scaling up through a *systems-orientated perspective* to complement traditional *intervention-orientated* linear approaches and enhance the outcomes of scaling up towards inclusivity and sustainability of the healthcare service model in marginalised communities.

This thesis supports the argument that applying a systems perspective in scaling up may facilitate management to embrace complexity, exploit contextual leverages, and assists individuals in leadership roles to align growth towards social goals. Understanding scaling-up objectives through a systems perspective could ultimately lead to more sustainable success and improve communication of social goals to investors, donors, and stakeholders participating in social healthcare.

1.3 Research Questions And Objectives

1.3.1 Research Questions

This thesis asks the following question: What constitutes a management tool that could facilitate management and decision makers to approach scaling up through a systems perspective to optimize scaling up results and increase impact towards inclusive healthcare goals?

To ensure the research topic is thoroughly investigated throughout this thesis, the following sub-questions were created:

Literature review:

How is innovation for inclusive development (I4ID) defined?

How does I4ID apply to healthcare?

How is scaling up defined in the domain of health service innovations?

What are the challenges regarding sustainable scaling-up?

What is a systems perspective approach for scaling-up health service innovations?

Management tool development:

Which theoretical frameworks exist for scaling-up health service innovations, and what are their practical applications and utility?

What are the design requirements for a management tool that could facilitate strategic management and decision-making in the face of the complexity inherent in the scaling-up process of health service innovations?

Evaluation of the management tool:

How can the practical application and usefulness of the management tool be validated?

Which evaluation method should be used by the researcher to improve the tool?

Which type of subject matter experts will have meaningful input in the tool development and evaluation process?

1.3.2 Research Objectives

This section identifies the significance of the study by highlighting the critical research study-related objectives. The literature domain which focuses on scaling-up health service innovations for inclusive development goals is underdeveloped and lacks empirical data.

By exploring the literature on health service innovations, this thesis aims to conceptualize the process of strategic planning and to manage the scaling-up process of health service innovations for extending the reach into different geographical locations to maximize the impact of the innovation for sustainable health benefits and facilitate inclusive development goals.

The study aims to add to the body of knowledge (BOK) of scaling-up methodologies by developing a management tool based on addressing scaling up through a "systemic perspective" (i.e., *"systems-orientated scale-up"* [10]). The tool aims to facilitate management and decision-makers in the light of complex challenges (e.g., dealing with trade-offs and variation in implementation contexts) in the process of scaling up, as well as to conceptualise scaling-up goals with a focus on generating changes in the system itself to achieve desired outcomes [10].

A two-phase strategy was adopted, and the objectives were divided for this study. Phase one focused on the theoretical components and phase two focused on the practical components.

Phase 1 – Theoretical Component: Three components made up the initial phase. Firstly, a conceptual literature review (CLR) of the literature was carried out to gain a deeper understanding of the topic of inclusive healthcare and what constitutes sustainable scaling-up outcomes. The CLR aims to provide a basis for understanding the challenges of scaling up health service innovations and how a systems perspective approach to the scaling-up process may enhance the strategic planning and management of the scaling-up process to achieve sustainable, inclusive healthcare outcomes.

Secondly, a systematic literature review (SLR) was carried out to extract essential concepts from the frameworks and models for scaling up health service innovations in the literature and their practical application and utility for strategic management and planning.

Finally, design requirements for the management tool were developed using the existing literature obtained throughout the CLR and SLR.

The primary outputs of phase one included a conceptual and systematic literature review as well as the design requirements for the preliminary management tool.

Phase 2 – Practical Component: Phase 2 consisted of two steps, (1) developing a preliminary management tool and (2) evaluating the preliminary management tool based on the tool's validity, usefulness, and practical application. The preliminary management tool was developed using theoretical insights from the CLR and SLR conducted in phase 1.

The evaluation of the management tool was done using three methods.

1. The first evaluation method included validating the preliminary management tool per the design requirements derived from the literature research.

2. The second evaluation method included conducting an impact-effort analysis with subject matter experts to evaluate the relevance, applicability, and importance of the management routines extracted from the literature to be included in the tool.
3. The third evaluation method included semi-structured interviews with subject matter experts to gain deeper insights into scaling up elements, gain deeper understanding of the challenges and success factors of scaling up health service innovations, and enable further discussion and draw conclusions.

Specific research objectives (ROs) addressed by phase one and two is indicated in Table 1.1 below:

Table 1.1: Research Objectives

RO'S	DESCRIPTION	CHAPTER
PHASE 1: THEORETICAL COMPONENT		
CONCEPTUAL LITERATURE REVIEW (CLR)		
RO1	Identify how health service innovations facilitate I4ID goals in marginalized communities.	CH3
RO2	Identify the essential elements for scaling up health service innovations.	CH3
RO3	Establish the literature gap on scaling up health service innovations and strategic planning and management of scaling up through a systems perspective.	CH3
SYSTEMATIC LITERATURE REVIEW (SLR)		
RO4	Identify frameworks and models for scaling up social healthcare interventions in the literature.	CH4
COMBINING INSIGHTS FROM CLR AND SLR		
RO5	Establish the design requirements for the development of a preliminary management tool to approach scaling up through a systemic perspective.	CH5
PHASE 2: PRACTICAL COMPONENT		
RO6	Develop a preliminary management tool for scaling up social health service innovations based on the existing literature gathered during the SLR and CLR.	CH6
RO7	Validate the preliminary management tool with the design requirements defined during Phase 1.	CH6
RO8	Evaluate the concepts used within the management tool through an impact-effort analysis and semi-structured interviews with subject matter experts.	CH7
RO9	Update the preliminary management tool based on the feedback from the evaluation phase.	CH7
RO10	Present the final management tool for scaling up health service innovations in marginalized communities through a systems perspective to facilitate inclusive healthcare goals.	CH8

1.4 THEORETICAL LENSES USED FOR LITERATURE ANALYSIS

The research problem is approached using three theoretical lenses, similar to that used in the study by [19], where they conceptualise the spread and scale of interventions under three categories**:** *implementation science, social science, and complexity science*. Each of the lenses offers a unique

change logic (mechanical, ecological, and social, respectively) that could enhance scaling up outcomes towards I4ID goals and sustainability of the health service model in the implementation area [10]. The theoretical lenses used for the solution development of this thesis are indicated in the diagram illustrated in Figure 1.1.

It is evident in the literature that much successful spread and scale-up programs primarily draw on one of these lenses while incorporating elements of the other two.

Integrating innovation into the health system is challenging for several rational reasons. Any change requires effort and typically involves spending money, putting pressure on employees to operate across more than just their regular duties, attempting to effect deep-rooted cultural and professional norms, and taking risks [19].

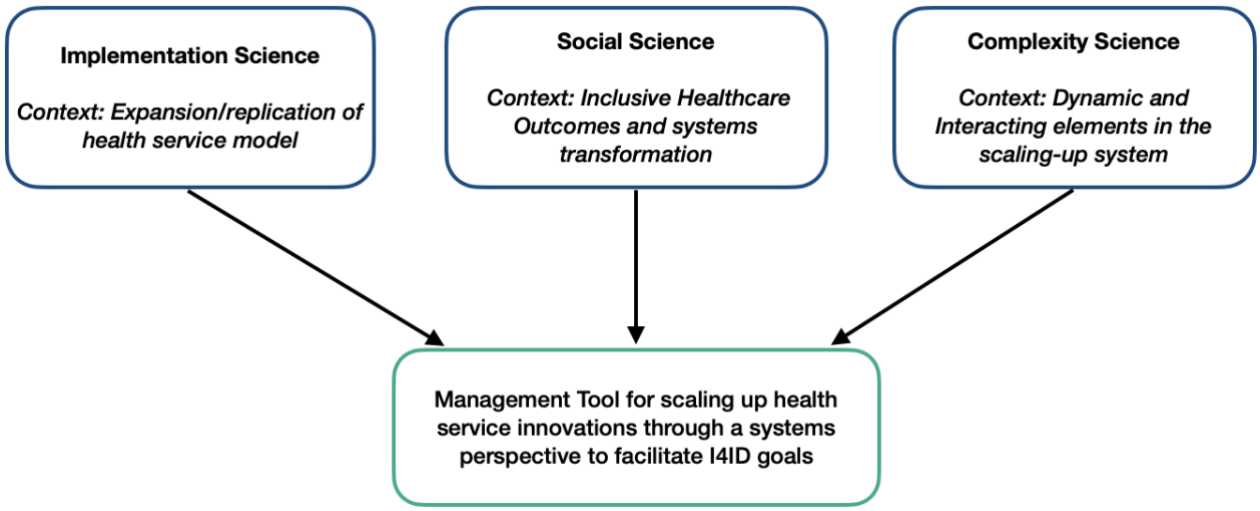


Figure 1.1: Theoretical lenses used for solution development

The literature strongly agrees that no simplistic “blueprint” methods for scaling up health service innovations are sufficient to obtain the same outcomes across various contexts and changing environmental conditions [10], [11], [20]. Scaling up health service innovations in marginalized communities is driven by the desire to implement change in the system by facilitating I4ID goals. However, there is no easy or universally reproducible approach to implementing large-scale change in a complex system [19]. A technology or delivery method showing promising outcomes in one setting might deliver different results in another [19]. Scaling up health service innovations is thus non-linear [9], necessitating a dynamic management approach that considers variances and changing situations across several contexts.

In light of these facts, this report aims to draw insights from this rapidly expanding research area to benefit decision-makers, managers, and policymakers in scaling up healthcare innovations to facilitate inclusive healthcare goals.

Each theoretical lens used for the solution development provides a distinct change logic to inform and interpret scaling-up action and is briefly discussed below.

Implementation science: Implementation science represent linear thinking models and focuses on the sequential processes often described as a 'mechanistic' spread of interventions [10]. Implementation science entails the systematic and critical exploration and analysis of the contextual, dynamic processes that affect how people, populations, and health systems change to accept new interventions and technologies. The focus begins conceptually with an intervention expected to deliver individual or community health improvements (based on efficacy and effectiveness trials). It then systematically describes and analyses the process and outcomes from pre-intervention to successful adoption, or even failure, through the development and testing of approaches that support the scale-up of health improvement programs [21].

Social Science: Social science attempts to understand social (i.e., humanistic) phenomena, behavioural patterns, and cultural norms. In the context of scale-up, [10] discusses how social science focuses on mechanisms underlying scale-up, i.e., effective approaches for sustainable implementation of the innovation in the social system. Social science studies social (or humanistic) phenomena, behavioural patterns, and cultural standards. Koorts et al. [10] highlight how social science focuses on the factors underpinning scale-up to understand what works, for whom, and under what conditions.

Complexity Science: Complexity science is concerned with the features of complex adaptive systems, such as unpredictability, uncertainty, emerging phenomena and social behaviours, and an ever-changing environment [10]. Complexity science questions the traditional "reductionist thinking" method for problem-solving [10] and suggests the possibility of multiple solutions existing outside of the current paradigm that can only be discovered by interacting with the system and gradually shifting time and attention to those things that appear to be working best [22]. The relevance of interdependencies between system elements is highlighted by complexity research. An example of complexity thinking would be recognizing how politics impacts social behaviour and thus actively participating in political processes in the process of scaling up to increase health system capacity [10].

Table 1.2 identifies the contribution and practical application offered by the various theoretical lenses for strategically planning and managing scale-up, as mentioned by [19].

Table 1.2: Contribution and practical application of various theoretical lenses on scaling-up healthcare

	IMPEMENTATION SCIENCE	COMPLEXITY SCIENCE	SOCIAL SCIENCE
MAIN FOCUS	Evidence based interventions in practice.	The changing and emerging properties of systems.	Social study of individuals, groups, and organizations.
CONTRIBUTION	Provide a rigid strategic approach to achieve scale.	Ecological perspective as the health system as a CAS and highlights the necessity for adaptive change in the face of unpredictability.	Demonstrates social interaction and behaviour patterns, professional values and beliefs, and organizational procedures and structures.
KEY MECHANISMS OF SCALING UP	Reducing uncertainty, focus on fidelity and contextual influences.	Emergent properties of an interacting system – self-organization, management	Social behaviour (individual or groups) is influenced by social,

		of interdependencies, and sensemaking.	professional, and organizational factors.
PREFFERED METHODS FOR ACHIEVING SCALE	Systematic (quantitative) approach to mechanism and processes for improvement.	Case study approach combining qualitative and quantitative methods. Complex causal chains can be synthesised using narrative as a method.	providing insights into social interactions and context through ethnography, interview-based methodologies, and case studies.
MEASURE OF SUCCESS	Replication of a particular service model in multiple contexts ("fidelity")	Detailed account of what happened and why, mentioning (if appropriate) how the intervention was modified, abandoned, or how it was successful.	Theory-based and empirically supported explanations of organizational and human behaviour.

Table 1.2 provided three distinct logics for approaching the spread and scale-up of healthcare innovations: mechanistic (implementation science), ecological (complexity science), and social (social science). Although these concepts could be understood separately, there are significant connections between them and they act synergistically.

Recent literature, including [6], [9]–[12], [23] agrees that realigning the scale-up discourse to embrace a systems perspective can provide valuable insights to healthcare implementers about how and why specific change initiatives are successful. A systems perspective might enhance the impact of health service innovations in marginalized communities to ensure successful embeddedness of the innovation in the healthcare system and community to enable system-wide transformative change.

Complexity science and systems approaches to scaling up health service innovations are increasingly being acknowledged to advance the field of social healthcare [10]. The influence of systems characteristics on scaling-up success is undeniable (e.g., the "innovation-system fit," which is a crucial aspect of a system's readiness to accept change brought about by an intervention [19]). However, implementation science methodologies have dominated the scale-up literature [10]. Linear replication approaches have received most of the attention, and scaling up can often be misinterpreted as a 'blueprint' expansion of interventions into current systems.

Scale-up also frequently follows the "pipeline model" [19] of research translation from efficacy to effectiveness and then scale-up [24], starting with pilot trials before moving on to implementation in larger real-world contexts [10]. This "linear approach" to scaling in public health is termed by [10] an *"intervention-orientated scale-up."* It is defined as *"an approach that aims to widen intervention reach into existing systems and adheres to a predefined protocol for linear expansion and replication in other settings, which can involve scaling any number of elements to reproduce intervention effects."*

Intervention-orientated scale-up is mainly focussed on the interplay of an intervention's characteristics with external factors, such as the scaling environment (e.g., the feasibility of investment based on political climate) or the implementation delivery setting (e.g., infrastructural suitability for intervention) [10]. Intervention-orientated scale-up approaches may certainly deliver promising health improvement outcomes. However, this approach resonates with the traditional "reductionist perspective" approach, which mainly focuses on the role of the intervention in achieving

system-level impact rather than starting from the standpoint of the system-level outcomes and what is needed to achieve them [10].

A critical risk outlined by ExpandNet et al. [9] is that when the impact of systems is regarded as merely contextual influences on the outcome, it "risks oversimplifying what is required to achieve population health impact." Additionally, this risky assumption may support the notion that scaling is a linear process and that desirable program adoption rates (reach) are a good indicator of scaling success.

Intervention-orientated scale-up contradicts the beliefs of scaling up through a lens of I4ID, where success is defined as sustainable system-level change [25], [26]. Complexity science thus changes this belief and emphasises the importance of exploiting system levers at different levels that could, over time, enhance outcomes [9]. Complexity science changes the direction of scale-up literature to move away from linear, reductionist approaches towards dynamic and holistic approaches that consider the complex interrelationships among various parts of the health system [27]. Complexity science also considers the multiple perspectives, agendas, and power of its different actors and stakeholders [27].

Despite the potential benefits of a systems-oriented perspective, conventional intervention-orientated approaches continue to be highly effective in various situations; complex systems approaches are not always necessary for scale-up [10]. When an intervention is scaled up, many alternative pathways are used [24], and a complex problem need not always necessitate using a complex systems approach. Numerous other political, social, and cultural elements affect this decision-making process, in addition to the complexity of the problem, which may determine if a systems approach to scaling up is necessary [10].

According to [19], the more complex the pathway toward inclusive goals, the more should "mechanical" and "linear" intervention replication approaches be reinforced with ecological (complexity) and social practice perspectives for maximum impact.

We support the argument mentioned by [10] that scaling-up occurs along a continuum: The dominant traditional model at one end states that effective scaling involves a linear, intervention-orientated expansion prioritising evidence-based interventions (EBI) into existing systems. On the other end, we argue that scale-up can fit within the complex systems paradigm, where interventions are conceptualized as "events in systems" [28]. In this case, implementation and scaling-up operations should focus on producing system-level changes to accomplish population health improvement, referred to as *"systems-orientated scale-up."* Systems-orientated scale-up is defined by [10] as "*an approach that prioritises the behaviour and function of the system, with a focus on relations between a number of system elements, using system-level levers and dynamic system changes to drive impact at scale*." We argue that "systems-orientated scale-up" can enhance traditional approaches to achieve inclusive healthcare outcomes at system-level scale.

Therefore, this thesis aims to develop a management tool to facilitate managers and decision-makers to incorporate a systems perspective towards scaling up health service innovations to promote inclusive healthcare objectives and sustainability of scaled-up interventions.

1.5 Research Design Overview

This thesis followed the Design Science Research Methodology (DSRM) outlined by Peffers et al. [2]. The DSRM includes six activities that serve as a guide for the researcher to follow to produce a final management tool artifact as the output of the DSRM. The six activities are (1) problem identification and motivation, (2) defining solution objectives, (3) design and development, (4) demonstration, (5) evaluation, and (6) communication.

A similar approach, as used by Venter [29], was used to determine objectives for each DSRM activity, based on their definitions [2], as a guideline to produce the research objectives of this study. Figure 1.2 illustrates the six DSRM activities aligned with the corresponding research objectives of this study.

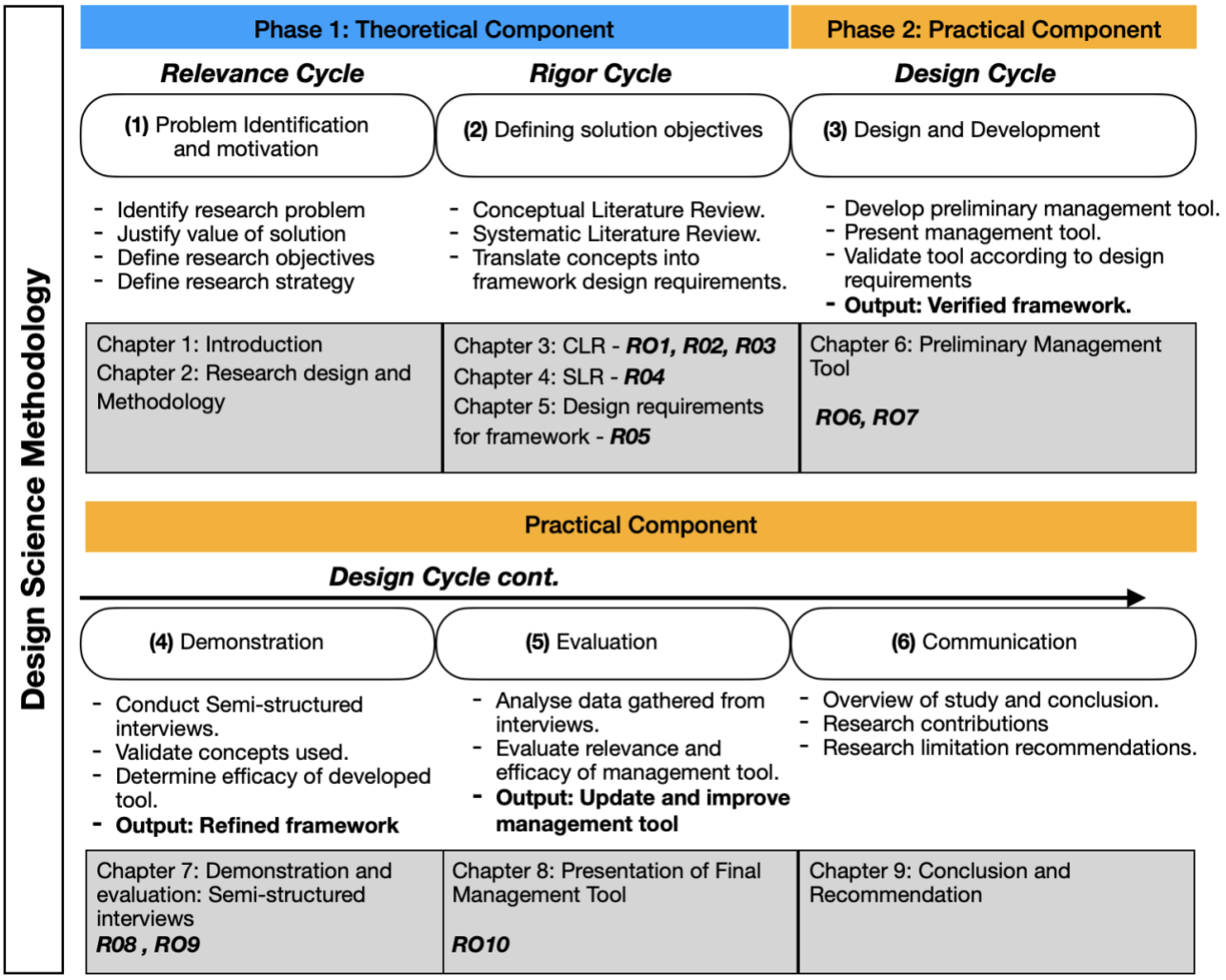


Figure 1.2: Research Design Overview

1.6 Research Contributions

The research will contribute to the literature on scaling up healthcare by addressing the gap regarding how conventional linear scaling-up approaches can be enhanced to achieve inclusive objectives through strategic planning and management from a systems perspective.

This thesis also contributes to systems science and complexity science literature by illustrating their application to management during scaling up. Although the management tool was developed with a

focus on health service innovations such as primary care clinical practices, it could be applied to a wide variety of health service innovations wanting to scale up their impact towards inclusivity through systemic transformation and enhance the sustainability of implementation.

1.7 Ethical Considerations

Ethical clearance from the Faculty Ethics Screening Committee (FESC) of the University of Stellenbosch was required to collect data from the participants through semi-structured interviews for this study. The project has been classified as low risk by the FESC, and the researcher implemented safeguards to completely mitigate any other risks or discomforts that the participants might experience from participating in the research project.

The FESC granted the ethical clearance for this study under SU project number 25446, and the researcher took note of the following during the semi-structured interviews:

- Participation in the interviews was completely voluntary, and any participant was free to withdraw at any time.
- The researcher was responsible for obtaining electronic consent from participants before data collection.
- The participants were not forced to answer questions if they felt uncomfortable with the question.
- All information gathered during the interviews remained confidential and stored securely.
- No personal information of any participant will be disclosed throughout the study.

1.8 Document Structure

This document consists out of nine chapters. A summary of each is given below:

Chapter 1: Introduction

The introductory chapter presents the context of the study. An overview of the literature gap regarding management approaches for scaling up health service innovations is given, which forms the basis for the research problem and motivation for the research project. This results in the formulation of the study's research objectives. The scientific contributions and ethical considerations of this study are also addressed. The chapter finishes by providing an overview of the research document.

Chapter 2: Research Design and Methodology

The research methodology used in the study is the primary focus of Chapter 2. The researcher investigates the context and evaluation criteria for qualitative research. Following that, the essential concepts of design science research are thoroughly investigated. As a result, the design science research methodology, as employed throughout the study, is introduced. Finally, the use of interviews as a method of evaluation is examined. The chapter concludes with the research approach, followed throughout the rest of the study.

Chapter 3: Conceptual Literature Review

Chapter 3 includes the conceptual literature review (CLR). The review gives in-depth background information regarding innovation for inclusive development (I4ID) and how it applies to healthcare.

Subsequently, I4ID and scaling up are tied together by discussing the concept of scaling up health service innovations in marginalised communities for inclusive goals. The CLR is concluded by discussing the value of applying a systems perspective in strategic planning and management activities in scaling up approaches.

Chapter 4: Systematic Literature Review

The fourth chapter presents the results of a systematic literature review (SLR) conducted to identify the most prevalent frameworks and models for scaling up health service innovations in the literature. The SLR results were analyzed to identify the key concepts surrounding strategic planning and management of scaling up health service innovations in marginalized communities for inclusive goals.

Chapter 5: Design Requirements for a Framework Scaling-up healthcare interventions for population health improvement

In Chapter 5, the main aspects of conceptual frameworks are defined. The knowledge base developed in the CLR and SLR is used to translate the critical concepts required for a systems perspective for strategic planning and management of scaling up health service innovations into design requirements for a management tool.

Chapter 6: Towards a Management Tool for Scaling-up healthcare interventions

Chapter 6 methodically presents the rational used by the researcher to develop the management tool. The preliminary management tool is introduced, and the concepts of the tool are verified by comparing the tool to the design requirements specified in chapter 5.

Chapter 7: Demonstration and Evaluation: Semi-structured interviews

Chapter 7 illustrates the information obtained from the semi-structured interviews with subject-matter experts. During the interviews, the concepts used in the management tool were validated, and the tool's efficacy was assessed. The researcher transcribed the interviews to code for data analysis as part of the evaluation process. The conclusions drawn from the evaluation process are then examined in light of the project's theoretical foundation. Finally, the management tool was adapted and improved in response to the evaluation findings and recommendations.

Chapter 8: Presentation of Final Management Tool

Chapter 8 presents the final management tool for scaling up health service innovations in marginalized communities to facilitate inclusive objectives through a systems perspective strategic planning and management approach, with an overview of the objectives and application of the tool.

Chapter 9: Conclusions and Recommendations

The final chapter provides a summary of the DSRM activities that were carried out in this study. The research objectives and how they were met are then discussed, followed by the research contributions and study limitations. The study concludes with recommendations for future research.

1.9 CHAPTER 1 SUMMARY

The first chapter presents the contexts of the research study. The problem statement and motivation for this thesis are based on an overview of the literature gap on implementation strategies for scaling up health service innovations. As a result, the research objectives for the study are developed. The study's scientific contributions and ethical considerations are also discussed. The chapter concludes with an overview of the research document.

Chapter 1 addresses the following DSR progression checklist items as specified by Hevner and Chatterjee [30] and illustrated in Section 2.5, Table 2.1.

Table 1.3: DSR Progression Checklist [30] **- Item 1**

NUM	QUESTION(S)	RESPONSE
1	What is the research question	This thesis asks the following question: What constitutes a management tool that could facilitate management and decision makers to approach scaling up through a systems perspective to optimize scaling up results and increase impact towards inclusive healthcare goals? To ensure the research topic is thoroughly investigated throughout this project, the question was broken down into sub-questions regarding scaling up approaches for health service innovations through the required literature reviews and evaluation methods.

Chapter 2

RESEARCH DESIGN AND METHODOLOGY

Chapter 2 key objectives:

- Brief background on research approach.
- Discuss quantitative research methods.
- Introduce design science research.
- Discuss the design science research methodology process.
- Detail the evaluation process.
- Present final research design.

Chapter 2 briefly discusses the research methodology used in this study. This study used design science research methodology (DSRM) as a foundation to develop the research design to achieve project objectives. This study is qualitative by nature, and as part of the DSRM, a progressive review approach is used to construct the final management tool.

2.1 RESEARCH APPROACH

There are three common approaches to conducting research: 1) qualitative, 2) quantitative, and 3) mixed methods.

Qualitative research follows inductive reasoning [31] to contribute to the literature by developing theories based on subjective interpretations of individuals about their experiences or social surroundings.

Quantitative research follows a deductive method to test and refine the research-related theories by implementing positivist and natural science methods [31]. A mixed methods approach uses quantitative and qualitative data and other design methodologies that may include theoretical frameworks and underlying philosophical presuppositions [31].

A qualitative research approach is adopted for this thesis since it correlates with the context and perceptions of qualitative studies, as suggested by [32].

2.2 QUALITATIVE RESEARCH

Qualitative techniques provide answers to questions about experience, meaning, and insights, typically from the participant's experience-based perspective. This type of data is usually difficult to quantify or measure. Hammarberg et al. [32] gives the following examples of qualitative research techniques:

- Small-group discussions for examining beliefs, attitudes, and concepts of normative behaviour;
- Semi-structured interviews with key informants for background information or an institutional perspective;

- In-depth interviews to understand a condition, experience, or event from a personal perspective; and
- Analysis of texts and documents, such as government reports, media articles, and legal documents are all examples of qualitative research techniques.

Qualitative research evaluation criteria are based on the following criteria [32].

1) **Trustworthiness:** A thorough methodological description should be included in the report of a qualitative investigation. The report should explicitly and transparently explain the data production and management processes, the study's objectives, methodology, and decision-making processes. A reviewer of the report should be able to follow the researcher's logic and decision-making as well as the logic behind the research progression [33].

2) **Credibility:** Credibility is a measure of qualitative research's internal validity. A qualitative study is credible when its results are identifiable to those who are knowledgeable in the research field and share the experience [32]. As the instrument in qualitative research, the researcher defends its credibility by reflexivity (reflection on the researcher's influence on the research), triangulation (when applicable, answering the research question in a variety of methods, such as through interviews, observation, and documentary analysis), and extensive description of the interpretation process verbatim data quotations are provided to demonstrate and support their interpretation) [34].

3) **Applicability:** The criterion for assessing external validity is the applicability of the research findings. A study meets the applicability requirement when its findings may be applied to contexts other than the study circumstance and when clinicians and researchers see the findings as significant and valuable to their own experiences. Greater sample sizes do not increase generalizability. There may be a trade-off between depth and breadth or too much data for an adequate analysis. In qualitative research, sample sizes are often modest [34].

4) **Consistency:** The reliability of the study is reflected by the consistency of the data. Consistency does not necessarily imply that the same findings would be obtained in other circumstances, but it suggests that, given the same data, other researchers would discover comparable patterns. Researchers typically seek a maximal variance in the perception of a phenomenon, not just to demonstrate it but also to prevent bias or to follow restricted researcher expectations (for example, cases of failure or particular instances that do not align with emerging theory should be actively sought and explored) [34].

2.3 Design Science Research

Design science research (DSR) is a problem-solving paradigm aiming to enrich technology and science knowledge bases by developing new artifacts that address complex real-world problems involving various stakeholders [35]. The artifact aims to enhance the environment in which it is implemented [36]. DSR is prevalent due to its potential to foster organizations' innovation capabilities and to investigate society's much-needed transformation towards sustainability [37], [38].

Thus, due to the similarity of the DSR application and the context of this project, DSR is a suitable methodology for achieving the ultimate objective of this study, which is to develop a practical management tool to assist managers and decision-makers in enhancing the social impact of healthcare interventions in the process of scaling up.

The DSR paradigm stems from engineering and artificial sciences [39] widely used in information systems, health care, education, engineering, and computer sciences to create new or expand on existing knowledge to improve current practices by developing artifacts. During the DSR process, the artifacts are evaluated for efficacy and practical application through iterative design cycles and reflection [40]. The outcomes of DSR comprise both newly designed artifacts and design knowledge that provides a deeper understanding of why the artifacts enhance the relevant application contexts and provides utility to the user efficiently [36].

2.3.1 Design Science Research Cycles

DSR can be seen as an embodiment of three closely related cycles of activities: the relevance cycle, the rigor cycle, and in between, the design cycle [35]. The three-cycle view of DSR is illustrated in Figure 2.1.

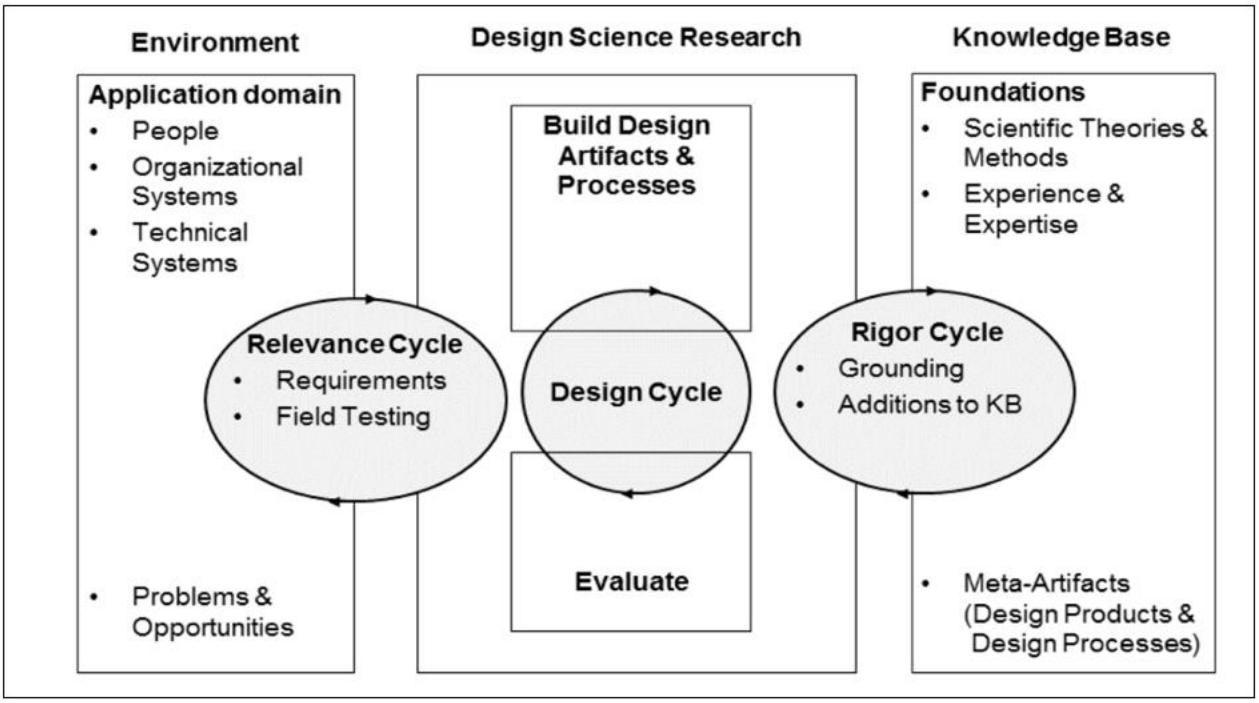


Figure 2.1: The three-cycle view of DSR (copied from [30]**)**

2.3.2 Relevance Cycle

The first cycle of DSR is the relevance cycle, unfolding the context of the research problem or opportunity, the requirements for the research as inputs, and the acceptance criteria for the ultimate evaluation of the results demonstrating the artifact's practical application and relevance in the field [35]. The relevance cycle connects the environment with the DSR artifact, which acts as an "interface between internal workings and the elements of its environment" [35]. As indicated in Figure 2.1, the application domain consists of individuals, organizational systems, and technical systems within a particular domain (e.g., healthcare, business) [35]. The relevance cycle is iterative and moves the research requirements from the application domain back into the DSR domain for field testing and evaluation to realign them in light of experience [30].

2.3.3 Rigor Cycle

The rigor cycle provides past knowledge to the research project to illustrate the artifact's innovation based on already-existing knowledge bases, including scientific theories, experience, and expertise. The iterative evaluation of the artifact contributes to these knowledge bases by documenting what functions well, what does not work, and how the evaluation's results correspond with and build upon existing theories and experiences [30], [35].

2.3.4 Design Cycle

The central design cycle iterates between artifact design and the development and evaluation of the artifact. Artifact evaluation can happen during the design cycle in both controlled environments (such as thought experiments or lab settings) or in real-world contexts (which include field tests as part of the relevance cycle) [41].

To offer a comprehensive viewpoint on the subject, the three-cycle view of DSR improves the artifact design repeatedly across several "interconnected design, relevance, and rigor cycles" [41]. This refinement process improves the artifact in its effectiveness in addressing the real-world problem and how much it adds to the body of knowledge over several iterations [41].

2.4 Design Science Research Methodology

The design science research methodology (DSRM) is a widely accepted framework, developed by Peffers [2], for carrying out the research based on DSR principles discussed above. The methodology is represented as a process model consisting of six activities arranged in a nominal sequence, illustrated in Figure 2.2 and discussed further in this section. The six activities: problem identification and motivation, define objectives of a solution, design and development, demonstration, evaluation, and communication [2].

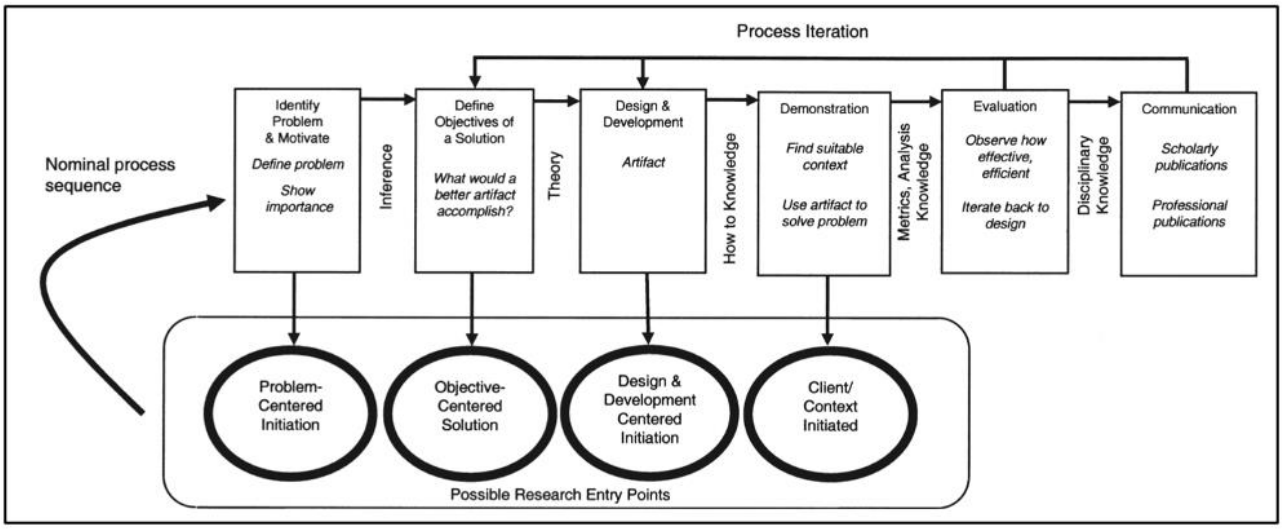


Figure 2.2: DSR Methodology Process Model [36]

2.4.1 DSRM Process Steps

Activity 1: Problem Identification and Motivation

The process starts with clarifying the unique research issue and supports the necessity for a solution. In addition to encourage the research and the research's audience to pursue the solution, justifying the value of a solution also enables the audience to appreciate the researcher's comprehension of the issue at hand. This activity requires knowledge of the problem's current status and the significance of finding a solution [36].

Activity 2: Define the Objectives for a Solution

Following the problem identification phase, solution objectives are developed from conceptualizing the problem domain and the possible solution outcomes. The objectives can be qualitative, such as describing how a new artifact is intended to support solutions to the problem not previously addressed, or quantitative, such as conditions where a desirable solution would be more effective than the ones currently in place. The objectives should be logically deduced from the problem identification [36].

Activity 3: Design and Development

The artifact is produced. A DSR artifact can theoretically be any creation incorporating a research input into the design. In this process, the required functionality and structure of the artifact are determined before the actual artifact is built [36].

Activity 4: Demonstration

This activity demonstrates the application of the artifact to an issue in one or more instances, such as an experiment, simulation, case study, piece of evidence, or another applicable task [36].

Activity 5: Evaluation

The evaluation activity measures how well the artifact contributes to a solution for the research problem [36]. During this activity the actual outcomes of using the artifact in its intended context is compared to the solution objectives. Evaluation can take many different shapes depending on the artifact and the problem setting. Upon completion of this activity, the researcher can choose to either progress on to the next activity, communication and leave further development to following projects, or iterate back to step three in an attempt to increase the effectiveness of the artifact [36].

Activity 6: Communication

The last activity involves informing all pertinent stakeholders of the problem's details and the intended artifact. Based on the objectives of the research and the target audience, such as professional practitioners, appropriate communication methods are used [36].

2.5 PROGRESSION CHECKLIST FOR DSR

Hevner and Chatterjee's checklist [30], provided in Table 2.1, is widely used to evaluate design research projects. Researchers have found through experience with practising DSR that these questions provide a helpful checklist for ensuring critical aspects of DSR are addressed during their research projects. The eight questions are mapped by [30] to indicate their relation to the relevant research cycles covered in the previous section and is illustrated in Figure 2.3.

Table 2.1: DSR Progression Checklist

NUM	QUESTION(S)
1	- What is the research question? - What are the design requirements for the artifact?
2	- What is the artifact? - How is the artifact represented?
3	- What design processes (search heuristics) will be used to build the artifact?
4	- How are the artifact and the design processes grounded by the knowledge base? - What, if any, theories support the artifact design and the design process?
5	- What evaluations are performed during the internal design cycles? - What design improvements are identified during each design cycle?
6	- How is the artifact introduced into the application environment and how is it field tested? - What metrics are used to demonstrate artifact utility and improvement over previous artifacts?
7	- What new knowledge is added to the knowledge base and in what form (e.g., peer-reviewed literature, meta-artifacts, new theory, new method)?
8	- Has the research question been satisfactorily addressed?

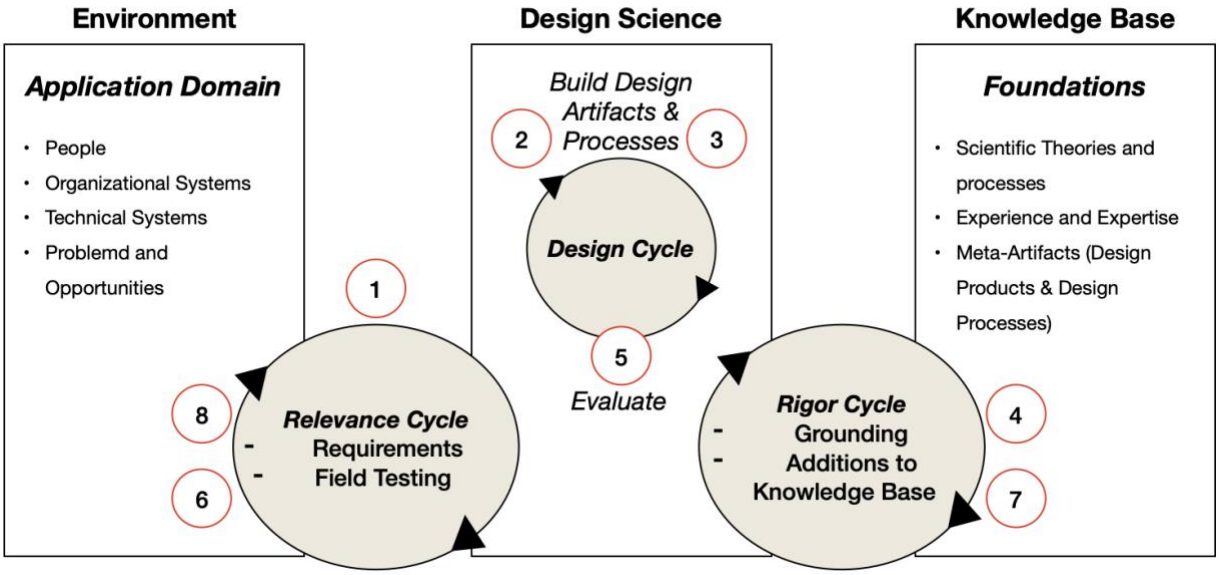


Figure 2.3: Relationship between DSR Checklist and Design Research Cycles (adapted from [30]**)**

According to [30], DSR results generally interest both technology- and management-focused audiences. Technology users require enough information to produce (implement) and use the given artifact in the intended setting. The study project is shown to be repeatable by implementing the artifact, and a knowledge basis is created for future design science researchers to extend their research [30].

However, management audiences require enough information to decide whether or not to invest organizational resources in creating (or purchasing) and utilizing the artifact in their particular organizational setting. A complete presentation of the experimental design of the artifact's field test in an organizational environment is required to balance the rigorousness of the artifact design process. The significance of the issue, as well as the originality and usefulness of the artifact to facilitate solution development, must be highlighted [30].

2.6 EVALUATION PROCESS

The evaluation stage of the DSRM process examines and assesses how well the artifact supports a problem-solving approach. Comparing a solution's objectives to the results obtained when the artifact was used in the demonstration is the focus of this activity. It calls for expertise in appropriate measurements and analysis methods [2]. Evaluation can take many shapes depending on the artifact and the problem context. It might consist of activities like a contrast between the functioning of the artifact and the solution goals established in the relevance cycle, objective quantitative performance measurements like budgets or output, the outcomes of satisfaction surveys, client feedback, or simulations. Conceptually, this evaluation could incorporate any relevant logical or empirical support [2], [41].

Due to the qualitative nature of this research project, information from the field was gathered through interviews to evaluate the management tool. The DSRM approach has identified interviews as a suitable method for evaluation [42]. Interviews are a popular research tool because of their potent capacity to deepen understanding in the data collection process by obtaining insightful information based on personal experiences, offering flexibility in adjusting questions based on responses, and providing opportunities for additional exploration during the interview [43], [44].

The interview protocol of this study was developed according to the six-step interview process developed by [45] and is indicated in Table 2.2.

Table 2.2: Six-Step Interview Process [45]

STAGE	STAGE DESCRIPTION
Select type of interview	Decide which type of interview structure to follow.
Establish ethical guidelines	Consider the possible consent, confidentiality, and protection issues that may arise during the interview.
Craft interview protocol	Provide interview context and develop questions and follow-up probes.
Conduct interviews	Conduct interviews and determine how they will be recorded.
Analyze interviews	Summarising gathered data and data analysis.
Report findings	Present the results from the interview data analysis.

Three main types of interviews are used for qualitative research studies namely, structured, unstructured, and semi-structured interviews.

Structured Interviews

Structured interviews are performed by asking a standard set of questions to all participants in the study. Structured interviews have the advantage of giving the researcher control over the themes and structure of the interview, simplifying the write-up process of the responses to analyze, code, and compare. A drawback of using structured interviews in a qualitative study is the lack of flexibility for further questions and discussion of new concepts, limiting the scope of knowledge to extract. The researcher is often expected to adhere to the list of decided questions irrespective of how insightful the follow up questions ad discussions could be among the various participants.

Unstructured Interviews

Unstructured interviews are a method where the researcher interacts with the respondents in an informal conversation about a specific research topic. Unstructured interviews are flexible because the researcher aims to establish a bond with the respondents to carry the conversation and encourage the respondents to be truthful in their responses. Since the interviews aim to extract insights from the respondents' perspectives and experiences as subject matter experts, the respondents' skills and knowledge should be pertinent to the study issue. Unstructured interviews can often take much time to conduct, and because there is not a predetermined list of questions, their validity may be called into question. Unstructured interviews have the advantage of being more casual, which enables respondents to offer detailed insights without much effort. In unstructured interviews, the spontaneous dialogue between the researcher and the respondents allows participants to ask questions about the context of the interview questions and explain the logic behind their given answers.

Semi-structured Interviews

Semi-structured interviews maintain a basic structure while allowing the researcher substantial flexibility for further questioning and discussion. The researcher might follow any notion or take creative advantage of the entire interview while keeping the structure in mind. In contrast to structured interviews, semi-structured interviews have questions that are carefully thought through and prepared in advance, and the researcher can express the interview questions in the way that they like.

Semi-structured interviews are a reliable and successful method for gathering qualitative data. Unlike structured interviews, comparing the responses from the semi-structured interviews might be challenging because no two answers will have the same format. However, the answers from semi-structured interviews may enable the researcher to develop a more in-depth and comprehensive conceptualization of the research topic.

Based on the features of the various interview methodologies, it was determined that semi-structured interviews would provide the maximum value for this research project. Due to the complexity of the research topic for this project, the interview questions must remain focused and sufficiently flexible to allow for new perspectives on healthcare innovations in marginalized communities.

Following the discussion on DSRM and the evaluation method, the research design for this study is outlined and discussed in the following section.

2.7 RESEARCH DESIGN

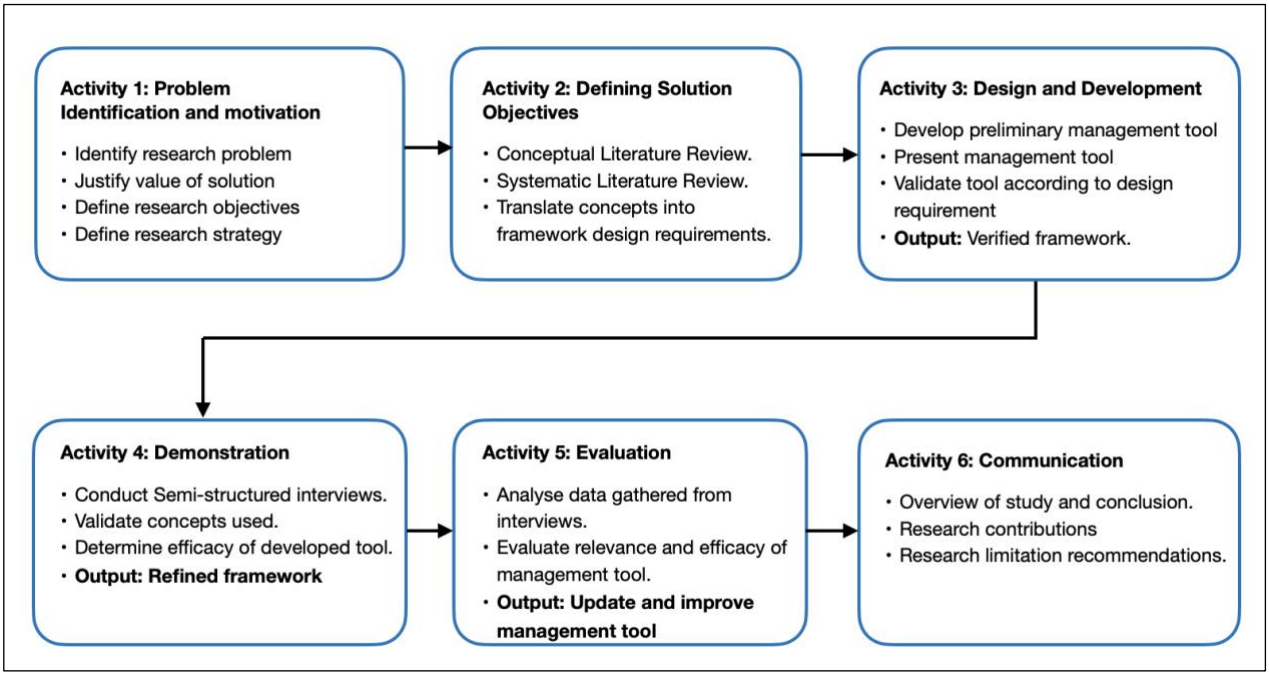


Figure 2.4: Research Design based on DSRM

Activity 1: Problem Identification and Motivation

The first activity involves studying the topic of inclusive innovations in the health service domain and how to scale up health service innovations. The approaches to strategic planning and management, as well as the barriers and challenges to scaling up, are evaluated, and explored. The context was used to define the research problem and establish the motive for a management tool. Objectives and research questions were afterward devised to address the research problem.

Identifying the study's research contributions provided an additional foundation for the tool. The research methodology was then explained, including the actions to answer the research questions and achieve the study objectives. A thorough investigation was conducted to find the most relevant research and evaluation methodology.

Activity 2: Define Solution Objectives

The researcher has first to establish a solid knowledge foundation about the problem's current status, existing solutions, and their efficacy in order to be able to describe the solution objectives in detail. There were three stages to activity 2. The researcher started by conducting a conceptual literature review (CLR) of the literature to gain in-depth knowledge about the scaling up of health service innovations in marginalized communities for inclusive goals. The CLR also highlighted strategic planning and management approaches toward sustainable scale-up. Secondly, a systematic literature review (SLR) was conducted to study the most prevalent scaling frameworks and models and their management applications. Concepts were extracted from the various literature identified in the SLR. Research on conceptual framework features was added to the information obtained from the CLR and SLR.

The final step included translating the knowledge obtained into design requirements for the preliminary tool that served as the solution's objective.

Activity 3: Design and Development

Activity three was divided into three steps. The first step was to create a concept matrix in which essential management routines and concepts taken from the SLR were organized under the primary scaling-up elements. The concept matrix was then refined, creating a conceptual framework outlining the procedures needed for strategically planning and managing scaling up from a systems perspective. Finally, the researcher completed the development process by ensuring that the framework met all of the framework design requirements.

Activity 4: Demonstration

During the demonstration phase, the researcher conducted semi-structured interviews with subject matter experts in the health service implementation and operation domain. The three primary objectives of the interviews were to validate the theoretical concepts used in the preliminary management tool to establish the tool's relevancy. Secondly, to evaluate the tool's efficacy by comparing each management routine's required effort to implement against the potential positive impact it may have on sustainable scaling-up outcomes through executing an impact-effort analysis of the management routines. Thirdly, to gain further insights from the subject matter experts regarding health service implementation and scale-up approaches to identify new concepts and update and improve the preliminary tool.

Activity 5: Evaluation

The researcher coded the information extracted from the interview into MS Excel to be coded and analyzed. The subject matter experts' answers were thoroughly analyzed to gain an in-depth understanding of what is required to strategically manage the scaling up of health service innovations in marginalized communities for inclusive objectives. The efficacy of the various routines was validated by analyzing the impact-effort analysis results. The researcher completed the evaluation process by revising the preliminary management tool for the updates and improvements suggested from the analyzed data.

Activity 6: Communication

Activity 6 presents the final management tool artifact as the output of the DSRM process. The study was then concluded by outlining the significance of the research project, providing a brief overview of the research process, highlighting the research contributions and limitations, and discussing recommendations for future research.

2.8 CHAPTER 2: SUMMARY

The primary focus of Chapter 2 is the study's research methodology. The researcher investigates the context and evaluation criteria for qualitative research. The fundamental concepts of design science research are then thoroughly addressed.

As a result, the design science research approach used throughout the project is presented. Finally, the utilization of interviews as a method of evaluation is investigated. The chapter closes with the research approach, which is used throughout the rest of the study.

The six design science research activities are listed in below, along with how they connect to the study's research objectives and pertinent chapters.

Table 2.3: DSRM Activities in Relation to Research Objectives and Chapter

DSRM ACTIVITY	RO'S	DESCRIPTION	CHAPTER
ACTIVITY 1			CH1, 2
ACTIVITY 2	RO1	Identify how health service innovations facilitate I4ID goals in marginalized communities.	CH3
	RO2	Identify the essential elements for scaling up health service innovations.	CH3
	RO3	Establish the literature gap on scaling up health service innovations and strategic planning and management of scaling up through a systems perspective.	CH3
	RO4	Identify frameworks and models for scaling up social healthcare interventions in the literature.	CH4
	RO5	Establish the design requirements for the development of a preliminary management tool to approach scaling up through a systemic perspective.	CH5
ACTIVITY 3	RO6	Develop a preliminary management tool for scaling up social health service innovations based on the existing literature gathered during the SLR and CLR.	CH6
	RO7	Validate the preliminary management tool with the design requirements defined during Phase 1.	CH6
ACTIVITY 4	RO8	Evaluate the concepts used within the management tool through an impact-effort analysis and semi-structured interviews with subject matter experts.	CH7
ACTIVITY 5	RO9	Update the preliminary management tool based on the feedback from the evaluation phase.	CH7
ACTIVITY 6	RO10	Present the final management tool for scaling up health service innovations in marginalized communities through a systems perspective to facilitate inclusive healthcare goals.	CH8

Chapter 2 addresses the following DSR progression checklist items as specified by Hevner and Chatterjee [30] and illustrated in Section 2.5, Table 2.1.

Table 2.4: DSR Progression Checklist [30] **- Item 3**

NUM	QUESTION(S)	RESPONSE
3	What design processes (Search heuristics) will be used to build the artifact?	The Design Science Research Methodology (DSRM) proposed by Peffers [2] was adopted for this study. A conceptual and Systematic literature review was conducted to build a solid knowledge base for this study. The data extracted from the literature was translated into design requirements based on Van Aken and Barends' [46] recommendations.

Chapter 3

A Conceptual Review of the Literature

Chapter 4 key objectives:

- Background on innovation for inclusive development (I4ID).
- Background on I4ID in healthcare.
- Background on health service innovations for population healthcare improvement.
- Defining scaling up of health service innovations.
- Types of scaling-up.
- Discuss what is meant by approaching scaling up though a systems perspective.
- Discuss adaptations to local context.
- Scaling-up healthcare interventions for system-wide impact.
- Discuss strategic management approaches for scaling up.

3.1 Innovation For Inclusive Development

Typically, individuals and communities caught in a cycle of poverty and disenfranchisement and experiencing social inequality are categorized as residing at the base of the pyramid (BOP) [47]. The BOP, bottom of the wealth or income pyramid is the largest, but poorest socio-economic group.

Social inequality is a characteristic of the unequal distribution of resources across social groups or communities. Various factors could lead, in one form or another, to the existence of social inequality, for example, historical events (such as war, apartheid, pandemics, or epidemics), processes in society that affects social status, or a result of the development and commercialization of specific innovations [25]. Social inequality could even be considered a natural phenomenon or characteristic of complexity in a social system that is impossible to control [48]. Inclusive development is a characteristic of positive transformation in a social system aiming to mitigate social inequalities.

The concept of innovation for inclusive development (I4ID), or "inclusive innovation" for short, is described as a *process* and a *performance outcome* of innovations aimed to benefit disadvantaged communities. I4ID asks: "What are solutions to the problems of those at the BOP, and how do we implement solutions sustainably?".

Research in I4ID aims to explore directions to enable or enhance "inclusive growth," which [25] defines as improvements in the social and economic well-being of groups of people who have historically been denied access to resources, capabilities, and opportunities. The term "inclusive growth" is often used interchangeably with "inclusive development" and other interpretations of social development, poverty reduction [49], and population health improvement [50]. The value of research on the topic of I4ID is acknowledged as "an alternative to the traditional wisdom of how to alleviate global poverty" [51].

Although different interpretations and definitions exist for the terms "inclusive innovation," "social innovation," and "innovation for inclusive development," they all narrow down to the understanding of innovations in social relations, power dynamics, and governmental transformations that provide or increase chances to improve the well-being of those at the bottom of the economic pyramid. They may include institutional and systems transformations [26], [27], [47].

In the context of I4ID, the term "innovation" is considered as the development and implementation of new ideas [9], [51]. The term encompasses all types of innovation, whether they pertain to products, services, processes, institutions, business models, or supply chains, with the only condition being that they are unique recombination or novel to the context in which they are implemented [9], [51]–[53]. Numerous NGOs, academics, and managers have begun to debate the necessity for an alternative strategy to poverty reduction and the possible participation of the private sector and entrepreneurship as one of the key components [20], [51].

Inclusive development can be understood as both the *desired outcome* of social innovation activities and a characteristic of the *processes* to connect disenfranchised individuals/communities with opportunities that facilitate social and economic growth and development [25]. According to George et al. [25] there is value in distinguishing the *process* of I4ID from its *outcomes* by recognizing that striving for inclusivity and examining I4ID actions may be valuable for research purposes, even if they fail to fully achieve desired outcomes. Because of the complexity of societal problems, both the process and the outcome are essential to growing the research field.

In the management literature, the boundaries of I4ID are still evolving, and many observers of the phenomenon consider inclusive innovation to be primarily concerned with business model breakthroughs that enable previously disenfranchised poor people to participate in high-growth, high-profit ventures [25]. This engagement manifests as ownership, managerial control, employment, consumption, and involvement in the supply chain. Additionally, inclusive innovation entails the creation of new services that could benefit a target population, such as microfinancing or healthcare interventions, that serve as a foundation for future economic empowerment [25], [54], [55].

To embrace a diverse array of breakthroughs in I4ID, this thesis use the definition of inclusive innovation given by [25] as "*the development and implementation of new ideas which aspire to create opportunities that enhance social and economic well-being for disenfranchised members of society*."

Several theoretical perspectives have been used to examine the multifaceted idea of inclusive innovation, which is seen through a variety of pragmatic lenses, including "complexity science", "systems science" or "complex adaptive systems" which emphasise the unpredictable, non-linear nature of systemic social change [22], [23], [56].

Beyond seeing inclusive innovations as physical products or solutions developed to fulfil unmet societal needs, inclusive innovations fundamentally challenge the dominant system's underlying culture, values and social behavioural patterns. I4ID can thus address the fundamental problems that prevent systems from serving society as a whole [26].

According to Prahalad [51] the process of I4ID "*must start with respect for BOP consumers as individuals.*" Co-creation is based on the premise that customers are equally significant components in problem-solving. The needs and demands of consumers are the priority in entrepreneurship. This

process of fostering an engaged and activist consumer is already a trend emerging in current markets. The BOP market offers the chance to accelerate this transformation process in the consumer-organization relationship [51]. According to [51], it is essential to acknowledge that the process of transforming the BOP into an active market is not about improving the service of an existing market but rather a developmental activity to introduce new and innovative approaches for converting poverty into an opportunity for social and economic wellbeing through a profitable and sustainable business [51], [54].

Challenges towards realizing sustainable social impact often experienced by inclusive innovation attempts are the consistent confrontation of trade-offs between factors such as the rate of scaling-up of the innovation (also referred to as growth or expansion), degree of social impact implied by the innovation, and profitability, sustainability, or financial strength of the organization [9]. Social organizations aim to initiate systemic social change for underserved target groups. Therefore, they often deliberately tap into contexts containing environmental and contextual barriers, such as lack of infrastructure and equipment, limited resources and capabilities, and attempts to serve a population with limited financial capabilities [27]. In the context of scaling up the innovation, [16] argues that one of the main differences between scaling social organizations striving to facilitate I4ID and traditional commercial organizations is that deliberately tap into contexts vastly distinct from the contexts in which their model has proven successful to accommodate the social needs of the disadvantaged communities. In contrast, commercial organizations are encouraged to minimize contextual differences when maximizing economic value[16]. Social organizations must therefore be cautious about following "*blueprint*" approaches but rather have an adaptive working model when scaling up across diverse contexts to ensure adoption, advocacy, and local fit for realizing inclusivity [57]–[59].

3.2 Application Of I4ID In Healthcare

The term "innovation" in the context of I4ID in the healthcare domain refers not only to instrumental and technical innovations [26] but also includes business model innovations and novel delivery systems for healthcare or sometimes termed "health service innovations." These health service innovations (i.e., affordable and quality primary healthcare clinics) are aimed at marginalized communities to achieve inclusivity by providing an alternative to inaccessible, often overpopulated, poorly managed governmental institutions and unaffordable private healthcare institutions.

Marginalized groups in South Africa experience a variety of healthcare issues that are aggravated even more by poverty, a lack of resources, and language and cultural barriers. The following are the most important needs: quality care, mental health assistance, reproductive health services, HIV/AIDS care, and non-communicable diseases are all available [60]. There is an urgent need in South Africa for culturally acceptable and accessible healthcare services in marginalized communities. Addressing these healthcare demands will necessitate a multifaceted approach that addresses the underlying social determinants of health and involves community participation.

In low-and middle-income countries, although free of charge, governmental institutions often lack the capacity and resources to accommodate the demand, resulting in poor quality service and an increasing disease burden. Social healthcare initiatives offer an alternative option for healthcare for marginalized communities and potentially provide significant value in terms of I4ID. Social companies seek to optimize their social impact to fulfil their social goals. Social impact aims to

enhance the social well-being of underserved or severely disadvantaged groups [16]. Expanding the impact of a social innovation is referred to as *"scaling up"* (often referred to as "expanding," "spreading," "scaling," or "replicating"). Scaling up is defined by [7] as *"deliberate efforts to increase the impact of health service innovations successfully tested in pilot or experimental projects to benefit more people and to foster policy and program development on a lasting basis*." In recent literature, several theoretically and empirically grounded approaches and models that provide strategies and essential components for maximizing social impact have received attention [7], [8], [14], [59].

Health service "innovations," as defined by [9] possess two facets. Firstly, in the context of a specific program, it first refers to techniques or components of health services that are novel or seen as novel. Regardless of how readily accessible and used elsewhere, innovations include well-known or existing processes, service models, best practices, and technology that have not been implemented in a particular setting. Secondly, [9] defines health service innovations as a collection of actions and procedures required to develop long-term implementation capacities rather than a single medical therapy, clinical practice, or program component. Technology on its own is not a healthcare innovation since it rarely offers a straightforward answer to a complex problem [9].

Social innovation describes actions to achieve structural transformation and social reform [61]. In other words, the outcome of I4ID in the healthcare domain should be directed towards social change on a "systemic level" to realize the sustainable positive impact on society. The terms "inclusive healthcare interventions" [15], [47], and "social healthcare interventions" [62] are used interchangeably to refer to interventions aimed at achieving I4ID goals. Although the boundaries are ill-defined for these terms, they consistently refer to initiatives and actions for serving marginalized populations and communities with the primary objective of catalysing systemic social transformation by tackling healthcare inequalities [14].

Although recent literature provides valuable insights on how to improve the application, adoption, scale-up, and spread of health service innovations to facilitate I4ID, there is, however, a lack of empirical evidence in the literature to say whether the implementation of such inclusive health innovations has empowered people or had long-lasting transformative effects in society [26].

Many authors acknowledge that systemic social change can only be achieved if such health service innovations are scaled-up to a degree equivalent to the degree of the social problem it seeks to address [9], [16], [27]. However, it is difficult to quantify the degree of impact resulting from scaling up efforts. In contrast, it is worth noting that not all social innovations have the potential for large-scale implementation; some can be maintained locally without giving scale-up any thought [63]. However, participants that strive towards systemic level impact, in other words realizing "inclusive development" through implementing health service innovations, should be committed and determined to take their interventions to scale to achieve their social goals. Investors and stakeholders of inclusive healthcare projects must be aware of the necessity for large-scale implementation, long-term support, and investment for growth from the commencement of such projects [9], [16].

A key factor for successful scaling up is the consideration thereof from the beginning of such projects instead of leaving scaling up as an afterthought once a pilot project is finished [9]. The explanation is straightforward: when the effects of scaling up are taken into account during the design phase of the interventions, they tend to be adjusted to a specific policy, programmatic, economic, and socio-

cultural environment and are, therefore, likely to achieve success [9]. According to [9] a common misconception is that once a pilot project demonstrates the effectiveness of an innovation, the new model will spread on its own. The shortcomings of this way of thinking are demonstrated by the innumerable pilot and experimental programs that have achieved great success with little significant systemic influence [9]. Although not impossible, spontaneous and complete diffusion of health service innovations is rare. It is more likely for pilot or experimental projects to scale up if they consider how the intervention will be used more widely from the beginning [9].

Another prominent factor highlighted in recent literature for ensuring effective health service innovations is the importance of acknowledging contextual variation in the context of implementation, use, and adoption of healthcare practices [9], [16], [26], [59], [64], [65]. Contextual variation is considered a significant challenge in the process of scaling-up health service innovations and requires deliberate efforts to adapt interventions for local fit [59]. According to [26], "one-size-fits-all models are restricted" because no two circumstances are treated similarly. Therefore literature calls for participants in I4ID in healthcare to intentionally take into account the complexities and originality of different social contexts when scaling-up health service innovations to reflect a patient-centred approach to healthcare [9], [11], [57], [59]. Due to the complexity of implementation across many contexts where the population, infrastructure, cultural beliefs and behaviours, finances, and resources may differ, successfully scaling up a health service innovations takes time and is challenging [59].

Although many efforts in healthcare research have brought forth promising solutions to population health improvement, according to [66], only about 14% of healthcare research is anticipated to be used in real-world situations because of the difficulties of implementing such initiatives sustainably. Thus, speculations suggest that many current health issues might be resolved by incorporating practical scaling-up approaches to expand the delivery of proven beneficial interventions. For instance, it is estimated that existing health interventions, such as oral rehydration and zinc therapy treatment, might prevent 85% of childhood fatalities in low- and middle-income nations if they are scaled up effectively to reach needy populations [67].

There is a growing discussion on the need to strengthen the understanding of scaling up health service innovations towards I4ID goals and how to address this research-to-practice gap [9], [11], [24], [52], [55], [65].

3.3 Scaling-up Health Service Innovations

Section 3.3 investigates how scaling up is defined, the types of scaling up approach that exists, the objectives of scaling and make a distinction between intervention-orientated scaling up and systems-orientated scaling up approaches.

3.3.1 Defining Scaling-up

The term "scaling-up" is often used synonymously with going to scale, replication, spread, expansion, and adaptation of techniques, ideas, approaches, and concepts to increase the scale of social impact [68]. Spreading social innovation aims to scale up to maximize social change and address the issues at hand [69].

It is important to note that not all social innovations are destined to expand; some can continue to operate locally without worrying about expansion [63]. Although in regards to I4ID, systems-level change requires large-scale implementation of inclusive innovations. This statement is supported by Weber [16], who defined "scaling" as *"increasing the impact a social-purpose organization produces to match better the magnitude of the social need or problem it seeks to address."* Other studies, specifically aimed at health service innovations, have defined the term "scale-up" as "*replicating and extending the intervention's reach into other localities, cities, or regions to achieve sustainable health benefits*" [10]. This definition of scaling up emphasizes increasing the reach of an intervention to more people. However, scaling up is not merely about extending the space. The focus—improving the impact of the intervention holistically.

Thus, this study prefers to use the definition given by ExpandNet and WHO, defining "scaling up" as *"deliberate efforts to increase the impact of health service innovations successfully tested in pilot or experimental projects as to fit more people and to foster policy and programme on a lasting basis"* [7]. This definition includes not only the expansion and replication of the actual intervention but all actions necessary to result in sustainable social transformation on a systems level to ensure inclusivity and improved welfare of the targeted communities. The following vital features shape this definition:

1. "Innovation" refers to features of services, other procedures, or goods that are novel or seen as novel. The innovation often consists of a "collection of interventions" that may include new technology, clinical practice, educational elements, community activities, and the management procedures required for successful implementation [9].
2. The phrase "successfully tested" emphasizes that the interventions being scaled-up are supported by logically generated proof of the programs' efficacy and viability, attained through the pilot, demonstration, or experimental projects. The phrase "policy and program development on a lasting basis" emphasizes the significance of institutional sustainability and capacity-building [9].
3. Scaling up is identified as a guided process by "deliberate efforts," as opposed to the unplanned spread [9].
4. The phrase "policy and program development on a lasting basis" emphasizes the significance of institutional sustainability, growth, and system embeddedness [9].

Despite the importance of the scaling-up issue, few studies focus on understanding the process from implementation to sustainable population health improvement. Understanding the scaling process can be interesting for the empirical domain and its theoretical value because many social innovations fail at this point [63].

3.3.2 Types of Scaling up

Although various terms have been used to describe various forms of scaling up, the literature highlight the following four distinctive types of scaling-up: the first one representing natural spread and the last three representing deliberate, guided scaling-up [7], [9].

- **Spontaneous diffusion:** One sort of scaling up is the organic spread of innovations from one person to another and from innovative program settings to other surroundings. Spontaneous diffusion generally occurs when the innovation addresses a genuine need or when a significant

event brings attention to a need. Successful scaling up does not, however, frequently occur by accident. It almost always calls for deliberate focus [1].

- **Expansion or replication (also known as horizontal scaling up):** This is the most common form of scaling up and happens when innovations are replicated in new geographical locations to serve more people and expand the reach to different target groups. As mentioned earlier in this section, adaptability plays a significant role in horizontal scaling up because a 'mechanical' replication of health service innovations, as seen in commercial franchise operations, rarely produces successful scaling-up outcomes regarding I4ID goals. Instead, it necessitates tailoring the innovation to the various environmental conditions presented across a nation [9], [10], [57], [59]. The term '*horizontal scaling up'* is used consistently throughout this document for this type of scaling.

- **Policy/political/legal/institutional scaling up (also known as vertical scaling up):** The goal of vertical scaling up is to receive government advocacy from implementing the innovation on a national or subnational level and to institutionalize it through national planning processes, policy changes, or legal action. Changes are made to systems and structures, and funds are reallocated to establish permanent institutional procedures that assure sustainability [9]. The term *'vertical scaling up'* is used consistently throughout this document.

- **Diversification:** As circumstances and community health needs change or organizational capacity grows, diversification allows for incorporating new interventions or products into an existing package to accommodate the health needs of more individuals [7], [9]. One example is expanding a women's reproductive health program to include services for young people or men [7], [9].

As illustrated in Figure 3.1 it is critical to incorporate both vertical and horizontal scaling up from the beginning of the process to achieve sustainable scaling up. After a health service innovations has attained a sufficient degree of coverage and enough support to suggest continuous growth, diversification may be sought if applicable and estimated that the program could benefit from added interventions.

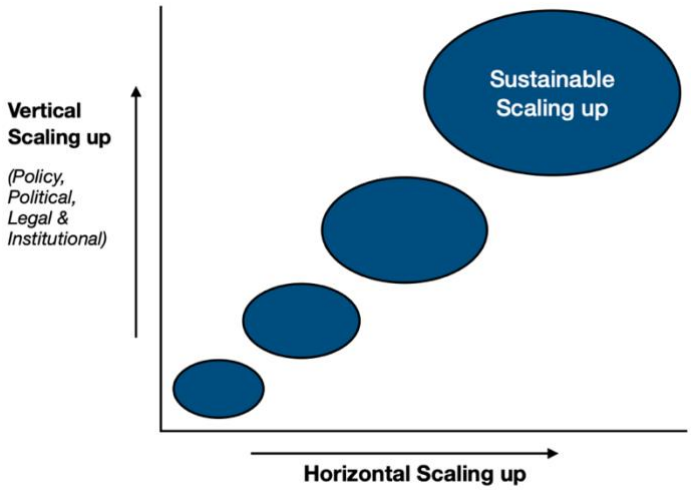


Figure 3.1: Combining horizontal and vertical scaling up for sustainability (Adapted from [9]**)**

It is clear from the above literature that expanding to new geographic locations is only one aspect of part of the scaling up. Many authors agree that a critical ingredient for sustainable scaling is that expansion has to be driven by the organization's social mission, thus investing resources in activities where the most impact can be generated during the scaling-up process [16], [25], [70]. Strong advocacy is required for vertical scaling up to establish the legitimacy of the innovation and the necessity for systemic transformation. To receive support for the innovation's implementation and gain policy and financial approval, advocacy on social mission is critical [7]. The mission of the scaling-up process must be clearly defined. Additionally, it necessitates an awareness of the planning cycles for the health system and the implementation of appropriate measures to integrate the innovation and its related requirements—financing, human resources, logistical requirements, and supply needs—into health policy and budgets [9].

For example, in 2000, the scaling up of a national program in Ghana known as Community-based Health Planning and Services (CHPS) demonstrated the necessity of vertical scaling up [9]. The CHPS began as a national policy discussion on how to best provide family planning and community health services during health sector reform. A pilot project revealed how to integrate two new community healthcare models. According to the findings, the strategy incorporating traditional leaders, social networks, volunteers, and the movement of underutilized clinic-based nurses to community-built clinics was most effective at reducing fertility and childhood mortality. By exploiting regularly accessible resources of the Ghana Health Service systems, the approach was adapted and validated for new settings in scaling up. This experiment proved that a research project's service model might be transferred to a district health service with different cultural and ecological backgrounds and resources. The scaling-up procedure envisaged tailoring the program's operational parts to the local context in this "multi-ethnic, multilingual" [9] nation via decentralized planning [9]. By 2006, 105 of 110 districts had relocated primary care from clinics to communities [7].

Thus, the vertical scaling up of the CHPS effort in Ghana focused on reformulating the national nursing training policy and program. The innovation expanded sustainably due to the change from a centralized strategy that did not work well with community-based innovation to a more decentralized, socially relevant strategy [7].

Additionally, diversification enables scaling up to adapt to new national policies or shifting donor objectives. When done concurrently with expansion, diversification does come with some challenges (i.e., change of internal processes and structures). Diversification should only be considered when the resource team is competent to support it, and the user organization has the competence to implement additional interventions [7].

3.3.3 Scaling-up Objectives

The adoption of inclusive healthcare innovations to enhance the welfare of excluded groups, such as rural residents, marginalized groups, and socioeconomically disadvantaged backgrounds, is currently seen in low-and middle-income countries as a critical phase of modernization and industrialization [14].

For example, new delivery models of community-based primary health care have been implemented in low-and middle-income countries such as Vietnam [9], Uganda [17], Kenya [17], and South Africa [71] for I4ID goals. Other examples include interventions to increase access, use, and quality of

family planning services in Brazil and Ghana [9]. Technical advancements like a sanitary pad manufacturing machine that produces inexpensive sanitary pads for low-income women in India is an example of other inclusive healthcare technologies [14].

These innovations reduce disease burden and improve the welfare of marginalized communities by offering new ways to accommodate healthcare needs. Moreover, these innovations aim to stimulate economic activity, thus empowering these communities out of poverty [14]. Many of these pilot projects have demonstrated significant success in community health improvement. However, expanding their impact beyond the original target areas remains a considerable challenge.

Traditional models of scaling up health service innovations have extensively focussed on intervention attributes that enhance scaling potential. In this context, there is abundant literature in the social healthcare domain focused on determining the best methods for implementing novel health service innovations in low-and middle-income countries. However, while intervention-orientated scale-up approaches are necessary and have significance, many authors, including [9]–[11], [19], agree that scaling up in social health should move toward a new perspective of scaling, beyond only the intervention, by focussing on achieving the desired population-level health outcomes [10]. Improving population health corresponds with the goals of I4ID, which “aspire to create opportunities that enhance social and economic wellbeing for disenfranchised members of society” [25].

Scaling-up health service innovations to achieve system-level impact is not a straightforward task [9], [64]. The challenges in achieving lasting population-wide impact not only stem from factors such as poor infrastructure and limited financial resources inherent in low-and middle-income countries [14], [16], but successful scaling-up requires a high-level understanding of complex relationships between fundamental elements that can either enhance or restrict the potential for scaling up the social impact of healthcare innovations [16]. The sustainability of impact from scaling up efforts is thus highly dependent on its management and strategic decision abilities [7], [9], [65].

Studies have revealed a variety of barriers that prevent efforts to scale up inclusive healthcare from having a long-lasting systemic impact. Lack of political prioritization, funding, and inadequate planning to handle the difficulties of implementing initiatives are a few explanations [14]. Another reason for failed scaling-up attempts is ineffective strategies resulting from failure to account for contextual variances addressing social, political, and cultural differences. Mistakenly expecting the same outcomes as those shown in the pilot study could lead to interventions not working as intended or expected due to variations in health, social, and behavioural patterns [59].

Scaling up healthcare to achieve system-level impact is not a linear process [10], and the literature clearly emphasizes the risk of oversimplifying what is required to achieve population health impact [9], [10], [16].

3.3.4 Intervention-Orientated Scale-up

The spread of interventions into current systems and their linear replication have received the most attention [11]. The scaling-up process generally reflects the ‘pipeline model’ in the research domain from efficacy to effectiveness and ultimately to scale-up, starting with small-scale pilot projects for evidence-based testing before large-scale implementation [6].

The traditional intervention-orientated approach to scale-up focuses on the relationship between the intervention's attributes and the external environment, for example, the implementation delivery setting (system readiness to adopt intervention) or scaling environment (political, social, and cultural climate to support the intervention) [10]. Koorts et al. [10] define *"intervention-orientated scale-up"* in public health as "*an approach that aims to widen intervention reach into existing systems and adheres to a predefined protocol for linear expansion and replication in other settings, which can involve scaling any number of elements to reproduce intervention effects*."

Systems change could undoubtedly result from this way of thinking, but this approach stems from a perspective of the role of the intervention itself to bring about system-level outcomes rather than starting from the perspective of system-level outcomes and filling in the gaps to bring about the desired results. The strength of linear approaches for scale-up is the consideration of replication methods by studying the most effective attributes of the intervention to achieve desired outcomes. Scaling up outcomes could be enhanced, however, by complimenting it with a "systems perspective" approach – also referred to as "holism," which attempts to understand a system by examining the linkages and interactions between the elements that comprise the system as a whole [10], [11], [23].

Systems thinking challenges the traditional "reductionist approach" or "cartesian paradigm" [72] which intends to simplify a complex phenomenon by breaking it up into its essential parts and studying the minor elements to understand the whole. According to systems thinking, systems cannot be comprehended by analysis since the properties of the pieces can only be understood in the context of the complete system [72].

Traditional scaling-up models prioritize the replication of interventions with absolute fidelity, often ignoring the distinctive characteristics of local contexts [64]. Failures of scale-up and spread efforts are frequently linked to the lack of understanding of how local context affects the implementation of health service innovations and failure to consider the differences between various healthcare settings [64]. In order to make significant advancements in the quality, safety, and efficacy of healthcare, this issue must be resolved [64].

3.3.5 Systems-Orientated Scale-up

Regarding the systems perspective approach, Koorts et al. [10] contend that scale-up can sit within a complex systems paradigm in which interventions are conceptualized as 'events in systems' [28]. In this case, implementation and scale-up operations should concentrate on bringing changes inside the system to accomplish the desired outcome (i.e., population health improvement) [10].

Systems-orientated scale-up and defined by [10] as *"an approach that prioritises the behaviour and function of the system, with a focus on relations between a number of system elements, using system-level levers and dynamic system changes to drive impact at scale."*

Understanding system dynamics and behaviours, especially historical outcomes of system transformation and interactions and relationships between system elements, can significantly enhance the system adoption of an innovation. Monitoring and evaluating system performance indicators allows for tracking system-wide outcomes and providing feedback to guide and adapt ongoing implementation [28]. Therefore, understanding how systems dynamics could affect the implementation and scale-up of health service innovations and their impact on social objectives could significantly enhance scaling-up outcomes [28].

Despite the potential benefits of a systems-oriented perspective, traditional intervention-oriented tactics remain highly relevant in many situations; complex systems approaches are not always necessary for scale-up [10]. Many diverse pathways are used to scale-up interventions [28], and a complex problem does not always necessitate a complex systems approach when scaling [10].

The degree of the situation's complexity may determine whether a systems approach to scaling up is required. However, numerous other factors, such as political, social, and cultural aspects, also affect decision-making and outcomes of scaling-up attempts [10]. Other influential factors can include historical support for problem prevention, cultural norms and social acceptance of the proposed evidence-based practice, and community readiness to adopt and incorporate a "new way of doing things" [10].

Complexity can refer to the characteristics of the intervention and the system into which it is being implemented rather than just the problem or approach [11], [12]. Similarly, social interventions may be included as part of a larger, more comprehensive health strategy that may have included a comprehensive systems study of the problem and the development of defined goals of health system transformation [10].

The approach used to conceptualise the problem (systems analysis), and the strategy's end goal (systems transformation) is, however, independent of the approach used to scale relevant interventions or achieve outcomes at scale [10]. A population intervention can be embedded in a systems-based implementation approach, although the strategy used to plan and carry out a large-scale roll-out of that intervention can remain linear [10].

3.4 Adapting The Implementation Model For Local Fit

The promotion and adoption of basic “one-size-fits-all” approaches are criticized in the literature on scaling up inclusive healthcare models and initiatives [10], [16], [23]. Replication with total fidelity is insufficient for expanding health service innovations’ impact to new geographical areas. Although there are many definitions of scalability and scaling, there seems to be widespread agreement in the literature on social entrepreneurship and inclusive healthcare that the operational model’s replicability, adaptability, and transferability are crucial elements of scalability [73], [74]

For scaling up social impact, [16] defines replicability, adaptability, and transferability. *“Replicability”* is the ability to reproduce the structures, procedures, goods or services, and behaviours of behavioural enterprise [74] and essentially to “move an organization’s theory of change to a new location” [73]. The ability to modify the social enterprise’s structures, operations, goods or services, and routines are referred to as “*adaptability”* [16]. Based on the following logic, “*transferability”* unites replicability and adaptability [16]. The scaling-up process can be understood more thoroughly by separating it into the two essential elements of replicability and adaptability.

A study by Power et al. [59] aimed at identifying necessary actions to make adaptations to health interventions for local fit defined "*adaptations"* as "deliberate and unintended changes to the intervention content, context or training and delivery" [75]. The term "*healthcare intervention,*" as per international classification, is defined as "*an act performed for, with, or on behalf of a person or*

population to assess, improve, maintain, promote or modify health, functioning or health conditions" [76].

Pure replication (for instance, to new geographic regions without any adjustment) is rarely standard because present knowledge and processes nearly always need to be adjusted to new situations [77]. The ability to transfer every component of a fundamental operational model to the new location of the social company is unusual in the field of social healthcare. Therefore, it is recommended that a healthcare intervention's core elements must be clearly defined to determine the degree of fidelity necessary to maintain the initial intentions the invention is designed for during the scaling-up process [9]. Only after determining the replicability of the operational model to a new geographical location has been taken into account the modifications required for successful adaption to the new site should be considered [16]. To ensure that an intervention's effectiveness is not diminished or lost, it is essential to maintain fidelity to the intervention theory and critical components when making adjustments [59]. Thus, scaling up inclusive healthcare requires balancing elements of fidelity and adaptability to accommodate local fit [59]. The study by [78] stated that fidelity refers to the original intention of the program as designed and tested, but they also observed that adaptations are frequently needed for local fit.

Although the perception of adaptability is also supported by scalability literature in the "commercial domain" (i.e., profit-driven) [73], [74], in the context of the "social domain" (i.e., impact-driven), the adaptability factor has a higher degree of importance to achieve organizational goals and sustainability. Incorporating adaptability in the implementation model is essential because social enterprises aim to target underserved populations to bring out systemic social change and thus purposefully operate in environments that are often highly dissimilar from the context in which they have tested the pilot study [16]. Commercial organizations, on the other hand, prioritize the optimization of economic value by limiting contextual differences [16]. Social enterprises generally aim to accommodate unmet needs. Thus, adapting organizational processes and functions to local fit during scaling up is not only for economic sustainability but also to maximize social impact in the implementation area[56]. In order to connect organizational resources with community needs and to win the community's trust and ownership, adaptation has been considered a crucial process [59].

Generally, fidelity is viewed as a top-down process (researcher, intervention developer) driven strategy, and adaptability has been seen as more of a bottom-up, community-driven strategy (frontline service providers, communities, individuals) [59]. Therefore to enable the adaption of the model for local fit in various contexts, stakeholder engagement, in particular, community participation, should be utilized during the scaling-up process to enhance program outcomes [7], [9], [55], [70]. When evaluating fidelity, it is advised that any modifications to the intervention in the scaling-up process maintain the underlying intervention theory to keep the essential components in place while tailoring any adjustments to the particulars of the context [59].

Within complex systems, such as healthcare, applying a ‘one-size-fits-all’ approach in different contexts is unlikely to be successful because it ignores contextual variations and fails to acknowledge the inherent complexity in the infrastructural-, social-, political- and cultural settings of the implementation site. Therefore, adaptations are critical to ensure that the intervention’s content and delivery strategy meet local needs at scale-up sites [59]. Trade-offs may often exist during scaling-up regarding the rate of scaling up to preserve the local values, relevance, quality, and sustainability

of the intervention impact [9], [59]. Additionally, because a system with inherent complexity continually changes over time, it is necessary to allow for adaptations with contextual changes rather than a once-off action in the implementation phase. Managing scale-up thus requires decision-makers to be vigilant towards contextual changes by incorporating deliberate actions and mechanisms to scan and monitor the environment to ensure sustainable impact [9], [57].

Although adaptations are rarely documented in the scale-up process [59] highlighting the research gap in the literature on scaling up health service innovations. In these examples, the adaptation of interventions was necessary for the health spectrum, ranging from maternal and child health [79], malaria prevention [80], prevention of mother-to-child HIV transmission [81], mental health, and primary healthcare [7], [9]. Studies have shown the need for adaptations even in programs that have undergone thorough reviews and evaluation as science-based effective programs of program activities that conflict with the needs of local participants, referred to by [78] as being *culturally mismatched.* For example, among immigrants or racial/ethnic populations, acculturation, assimilation, and cultural change are significant factors to consider when scaling up health service innovations in those populations [82]. The loss of traditional cultural traditions and social supports may jeopardize the resiliency displayed by some unacculturated populations [78].

Although, according to Castro et al. [78] more research is required to include these defence mechanisms in healthcare programs that are culturally sensitive to benefit minority communities, many authors, including [9], [57], [59], [78] agree that community acceptance of a program and its local adaption are far more successful when there is community ownership or “buy-in” to inspire and maintain local community participation.

3.5 Complexity Science Informed Scaling-up Approach

Complex adaptive systems (CAS) is a term used to describe a system with inherent complexity. A CAS is characterised by non-linearity, unpredictability, self-organization, interdependencies, and emergent behaviour [11]. A CAS is dynamic, meaning the whole is larger than the sum of its parts. In CAS, solutions cannot be imposed; instead, they emerge from the situation [11]. Examples include the immune system, a colony of termites, the financial market, and just about any collection of humans (for example, a family, a committee, or a primary healthcare team) [12].

According to [83], many attempts to understand systems, which are CAS, are frequently oversimplified or incorrect, presenting significant challenges for decision-makers trying to manage such systems through traditional linear methods, which are often easily influenced by unexpected shifts in public opinion. Systems generally do not respond as expected to repeated attempts at management and often shift radically and unexpectant when reaching a tipping point [84]. For instance, many high-cost health investments to mitigate smoking habits or sexual and reproductive health campaigns have had little impact on social behaviour or health status, whereas a change in public opinion over smoking bans and contraceptive methods resulted in dramatic changes in behavioural patterns [11].

For example, aspects of CAS have been applied in public health in areas such as epidemiology, unpredictable diseases such as cancer [85] and HIV/AIDS [86] or simulating the spread of flu and other predictable diseases such as smallpox [87]. In some research, CAS theories are also used to

define and clarify how the physical, social, and economic environments affect people's health and how individuals and the environment change and adapt over time [88]. CAS theories have also been used to interpret research observations of healthcare organizations, focusing on discovering managerial levers of influence and examining which methods work and why others do not [89]. A study by [90] used the CAS theory to examine policies to simulate the response of refugees to alternative courses of action and examine the effects of these actions on the health and well-being of the community.

Although the ideas and approaches underlying CAS have not received enough attention and reflect a significant research gap, many authors agree that the understanding of CAS behaviours could enhance the outcomes of health systems processes like scaling up [11], [56], [64]. In recent studies, CAS theory has been applied to understand the pathways of scaling up healthcare interventions [11] and examine how CAS theory could inform the scale-up process to enhance social impact [11], [64].

Health systems are made up of highly heterogeneous groups of actors, including various types of healthcare providers, managers, policy-makers, patients, and regulators, which engage at various levels through various services and functions [11]. The dynamic interactions between stakeholders and their interdependence within the health system reflect a CAS's characteristics[12], [13]. Expanding the availability of health services is only one aspect of scaling up healthcare. It can be characterized as a series of procedures that result in a broader, more durable coverage of services. These procedures include enhancing the capacity of service providers, broadening the variety and stability of funding and management arrangements, and improving the system's overall capacity to add new services to accommodate the health needs of communities. Scaling occurs through various methods that are as unique as the environments in which they occur [11].

Lanham mentions the following crucial features of a complexity science-informed scaling-up approach [64]:

Acknowledge unpredictability

Because complex system interactions are nonlinear, inputs and outputs are not always proportional, and new, unanticipated consequences may occur [11], [23]. Because of this unpredictability, complex systems are difficult to control [64], [91]. Scaling up efforts is challenging to design and develop from traditional linear planning and implementation perspectives since they occur within complex systems.

Instead of planning on the presumption of predictability, complexity science encourages implementers and practitioners to explore various possible outcomes, which must constantly be monitored and adapted [64].

Recognize self-organization

Self-organization is a property of complex systems that could explain variances in local contexts that are typically prominent in scaling up initiatives [64]. Social and behavioural patterns of how people interact are the environment given the resources and settings available locally. Because local contextual variables influence self-organization, it can be difficult to control [92]. For these reasons, the limitations of imposed structures like implementation designs, project plans, and formal organizational hierarchies must be recognized [64].

Self-organization patterns are strong indicators of what is required to accomplish successful implementation activities. Self-organization will continue to occur in the face of formal rules, processes, and structures designed to regulate it, depending on needs that exist but may not be recognized at higher levels of a system[64].

Attending to patterns of self-organization can be an effective method for increasing the diffusion of evidence-based health service innovations across diverse contexts [11]. Understanding self-organization enhances implementation designs by acknowledging the importance of local contexts' social, cultural, infrastructural, and political environment and improving the likelihood of sustainable scaling-up outcomes [64]. Sensemaking and interdependencies are essential in understanding self-organization in ways that support sustainable scaling-up outcomes [11].

Facilitate interdependencies

A complex system cannot be understood by analyzing its parts independently [72]. Understanding system behaviour requires understanding the interdependencies between system components and between the system and its environment [11]. Interdependence is an umbrella term covering relationships, connections, and interactions among complex system components [64]. Interdependence refers to people's structures and procedures to interact, exchange information, and interpret observations. Patterns of interdependence have an impact on self-organization [64].

Understanding how scaling up effort might manifest in recognizing the interdependencies between the many participants and systems elements. Interdependence influences how individuals organize themselves to complete tasks and how information is used and shared within the system [64].

Interdependence among elements in the system underpins and influences self-organization. The degree of interconnectedness or interdependence among health service innovation stakeholders influences intervention uptake [64].

Encourage sensemaking

The process through which humans ascribe meaning to their experiences is known as sensemaking [89]. Interdependence influences sensemaking since it is a social activity. Sensemaking can be enhanced by empowering interdependencies and being open to new ideas and multiple perspectives of a situation [64].

Encouraging effective sensemaking can enhance scaling up outcomes by facilitating the introduction and dissemination of the intervention in implementation. Sensemaking can also assist individuals in recognizing the potential benefit of the novel interventions and provide real-time feedback that could be critical for successful adoption [64].

The relationship between sensemaking and behaviour is an essential feature of sensemaking. Effective sensemaking is likely to result in productive behaviour [93]. People act based on their perception of what has occurred or is occurring [93]. An example of the importance of sensemaking in healthcare is illustrated by a study conducted by Ghaferi et al. [94] who investigated complication rates in low and high-mortality hospitals.

3.6 SYSTEMS PERSPECTIVE OF SCALING-UP

In the literature on scaling up health service innovations, the *"ExpandNet"* framework [9], developed by a collection of experts in the field, is one of the most widely recognized frameworks developed for conceptualizing the essential elements in scaling up healthcare. The document resulted from three meetings between 2001 and 2004 at the Rockefeller Foundation Bellagio Conference Centre—led by Peter Fajans from the World Health Organization's (WHO) Department of Reproductive Health and Research and Ruth Simmons of the University of Michigan School of Public Health. The framework was compiled from the collaboration of participants with extensive experience in scaling-up initiatives in low-and middle-income countries, including Africa, Asia, Eastern Europe, and Latin America [9].

3.6.1 EXPANDNET/WHO FRAMEWORK

Adopting ExpandNet's "*open-systems perspective"* [9] to scaling up indicated in Figure 3.2 may support managers and decision makers to identify changing contextual conditions continuously and to identify and leverage opportunities to mitigate weaknesses and exploit strengths to enhance impact. The ExpandNet model for scaling up healthcare innovation is built on four fundamental principles to guide all aspects of analysis, planning, and decision-making during the scaling-up process [1].

1. Systems thinking

Systems thinking approaches the scaling-up process through a holistic lens[72]. Systems thinking means being aware of the complex web of connections in which expansion and institutionalization occur and acknowledging the health systems having characteristics of a CAS [12]. Understanding system elements is vital for successful scaling up [72]. In the ExpandNet framework, systems thinking relates explicitly to the interactions between the innovation, the user organization, the resource team, and the larger ecosystem in which scaling up occurs. Each element interacts in an '*open system'* where changes in one element affect the others [1]. A significant aspect of developing and implementing a scaling-up plan is aiming for an optimal relationship or balance among these elements [1].

2. A focus on sustainability

Scaling up requires consideration of the development of sustainable policies and programs, paying particular attention to institutionalizing the innovation in policies, program guidelines, budgets, and other aspects of the health system, as well as the expansion of innovations into new areas [1].

3. Enhancing scalability

The process of strategic planning includes evaluating and improving scalability. Scalability refers to the ease or difficulty scaling up the innovation [7]. Scalability of the health service model can be accomplished by incorporating research- or experience-based attributes across scaling-up elements [1].

4. Respect for human rights, equity, and gender

Scaling up should be informed by client-centred, inclusive, and participatory methodologies. It should ensure that human dignity, the needs and rights of vulnerable groups, gender perspectives, and fair access to high-quality services are all considered [1].

As mentioned earlier in this document, the ExpandNet definition of scaling-up is defined as "*deliberate efforts to increase the impact of health service innovations successfully tested in pilot or experimental projects to benefit more people and to foster policy and programme development on a lasting basis*" [7]. The principles of respect for, fulfilment of, and promotion of human rights serves as a foundation for the ExpandNet approach for scaling up health service innovations [9]. Considering systems elements also entails incorporating human rights standards, such as respect for human dignity, consideration for the interests and rights of vulnerable groups, and a focus on ensuring that everyone has access to high-quality healthcare [9].

The ExpandNet framework for scaling up healthcare innovations, presented in Figure 3.2, "conceptualizes scaling up as an open system with interrelated elements" [9]. The elements of the framework form the basis for scaling up, and the method for strategically planning and managing scaling up is centred on making sure that the elements of the framework are '*balanced'* in light of the numerous conflicts, ambiguities, failures, and strokes of luck that can (and will) occur. Five interconnected components comprise the scaling-up process: *innovation*, *user organization*, *environment*, *resource team or organization*, and *scaling-up strategy* (Figure 3.2). Each of the elements is briefly discussed in this section.

From an open-systems perspective, scaling up is not just a technological and managerial activity unaffected by external factors. Environmental aspects include enduring gender disparities, the level of poverty in a nation, the effectiveness of the national health system, its bureaucratic structures, and political forces, which all significantly impact the contextual environment [7]. Important decisions must be taken regarding how scaling up takes place, advocacy and dissemination, process structure, expenses, and resource mobilization, as well as evaluation and monitoring [9].

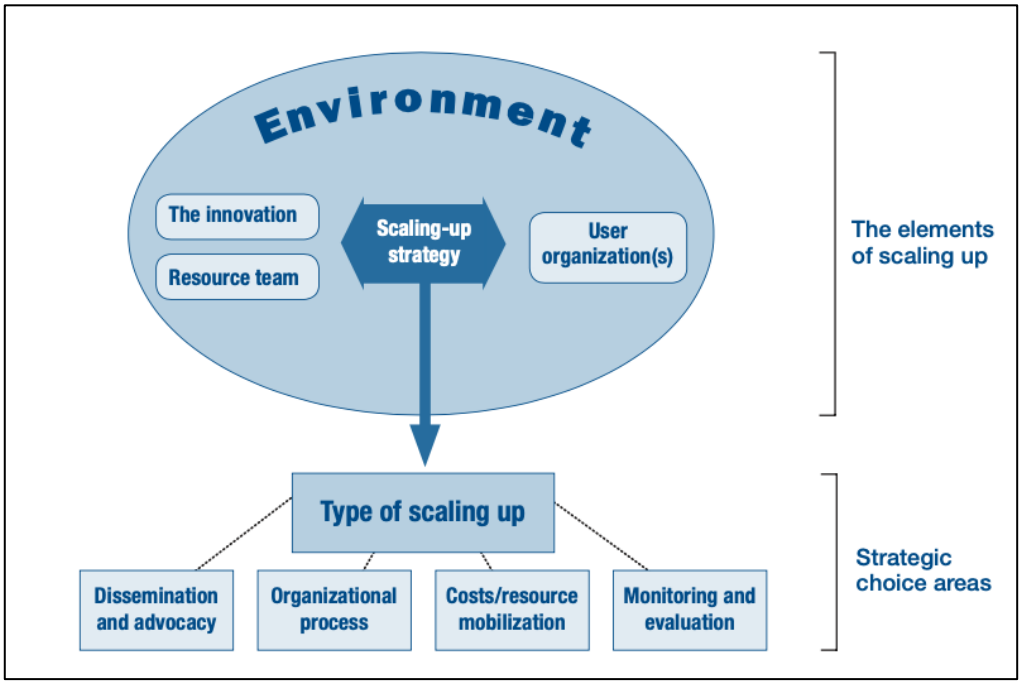


Figure 3.2: ExpandNet/WHO framework for scaling up health service innovations [9]

When creating and putting into practice a scaling-up plan, one of the critical tasks is aiming for harmony or congruence among the system's elements [7]. The scaling-up system's elements engage in frequent and intricate interactions with one another, reflecting the characteristics of a CAS [12]. Changes in one element's state can impact the other elements' states, which can have ramifications for the scaling-up process. An efficient scaling-up strategy will reduce or avoid limitations while increasing the chances of success [9].

The innovation: An array of health service interventions being scaled up constitute the innovation [9]. After being successfully tested, the set of interventions can be used as a template to improve health services aimed at reducing disease burden and improving population health. The human rights-based strategy denotes that an innovation upholds particular ideals. Other crucial elements of innovation include eliminating prejudice against minorities, gender sensitivity in services, and community involvement in decision-making, if appropriate.

One or more of the following could be part of a set of interventions [7]:

- New healthcare technology
- processes to enhance community participation and mobilization;
- new services to unserved populations (e.g., adolescents, men, migrants);
- information, education, and communication or behaviours change communication materials and activities;
- operational procedures, such as service delivery protocols, guidelines, and supervisory tools;
- training curricula and educational approaches;
- management, information, and logistics systems;
- capacity-building mechanisms to strengthen the user organization; and
- healthcare financing approaches and organizational restructuring;

The user organization: The institutions or organizations looking to adopt and apply the innovation on a big scale are referred to as the user organization. The user organization may be a network of private, commercial sector providers, an NGO, an alliance of NGOs, a public sector health service system, or a combination of these organizations [7]. Members of the user organization actively participate in scaling up rather than merely passively receiving the innovation. Interactions between the resource team and the user organization are dynamic, evolving as necessary during different phases of the scaling-up process and under various conditions [95]. People employed by the user organization may join the resource team at the beginning or later as they gain knowledge and become interested in assisting in scaling up.

The environment: The process and opportunities for scaling up are significantly impacted by various factors and institutions external to the user organization. The desire to provide services to more people more swiftly and more equally is the environmental force that is the motive behind scaling up. Additionally, scaling up occurs in a social, cultural, political, and economic context that significantly impacts the other framework component elements. Determined by the scale-up strategy used, many opportunities and challenges are presented in the environment that must be identified and addressed [7].

The resource team: The resource team refers to the people and groups who actively participate in the spread and extended usage of innovation. The resource team acts as a “catalyst for change” [9]

and assists scaling-up by offering direction and technical support to expand reach, facilitate adoption, provide financial support, recruit more investors and donors, and essentially strengthen the capacity and growth of the innovation for large-scale implementation. Individuals who might fill this role include researchers, program managers, trainers, collaborating organizations, product and equipment suppliers, service providers, community representatives, healthcare advocates, government authorities, and policymakers [9].

Strategic choice areas: The strengths and weaknesses of the healthcare innovation, the user organization, the environment, and the resource team all affect how scaling up takes place. The strategy refers to the plans and actions required to implement the innovation in policies, programs, and healthcare service delivery. The strategy includes efforts and capabilities from the resource team and organization to ensure the embeddedness of the innovation in the health system to ensure the impact on a systemic level. Designing a scaling-up strategy includes choices regarding the following key areas:

- **Type of scaling up:** Sustainable scaling up takes place when multiple dimensions of scaling up are used together. The most common approach is expansion or '*replication'* [74] (horizontal scaling-up) [9], which involves expanding to new geographical locations and new target populations. Sometimes opportunities exist for adding new services and activities to an existing innovation, known as '*diversification'* (or functional scaling up) [9]. Another form of scaling up involves initiatives to formalize the innovation inside the regulatory and legal environment, also known as '*institutionalization'* (vertical scaling up) [9].
- **Dissemination and advocacy:** Dissemination and advocacy includes *'communication'* of the innovation to the target market. Dissemination is choosing the channels through which the innovation will be disseminated, applied, and promoted to the user organization and other stakeholders. Interpersonal, mass media, and other channels can be combined with approaches like training, technical support, policy dialogues, or peer exchanges [9].
- **Organization of the scaling-up process:** The organization of the scaling-up process includes all critical organizational decisions, such as bringing in new partners, rate of expansion, and degree of flexibility in implementation [9].
- **Costs and resource mobilization:** Identifying the expenses of scaling up, the potential for economies of scale, and the steps necessary to ensure that the necessary resources are accessible and appropriate for sustainable scaling up [9].
- **Monitoring and evaluation:** Identifying necessary data for valuable insights into the scaling-up process and outcome evaluation techniques.

3.6.2 Systems Perspective of Management

Systems thinking has been accepted as an alternative technique for understanding and responding to complex problems in many fields, including healthcare, business, economics, engineering, and environmental sustainability [10], [96].

Systems thinking provides a comprehensive picture of behaviour and system performance, as well as a grasp of how system components interact and influence one another via non-linear feedback and causality [97]. The core assumption of systems thinking is that understanding behaviour in any context cannot be accomplished by evaluating components in isolation; instead, the system as a whole should serve as the unit of analysis [72], [96]. The methodology is based on general systems theory

and complexity theory [98], and it offers a variety of models and methodologies to aid in system analysis and design.

Humans are innate systems thinkers [97]. However, our learning environments may stifle this innate ability by teaching us that in order to understand complex systems, we must first break them down into manageable isolated components, understand how the components work, and then reassemble them in an attempt to understand the system as a whole [97]. This approach to problem resolution had its roots in the scientific revolution when a mechanistic Newtonian-Cartesian worldview was formed, and it is still used today [99]. However, systems theorists have often critiqued this reductionist approach since it frequently fails to examine the various components inside a system, how they interact dynamically, and the consequent emergent features of these interactions [3].

The behaviour of a social system is complex and unpredictable, however being aware of system dynamics may enhance the ability of implementers of health service innovations to exploit leverage points in the system when making strategic decisions to attain desired outcomes when scaling up. Figure 3.3 illustrates a simple conceptual model of systems thinking that displays the system as an iceberg [3]. The iceberg of system thinking is derived from organizational management [100] and can be used to illustrate how management and policy actions are often manifested [100].

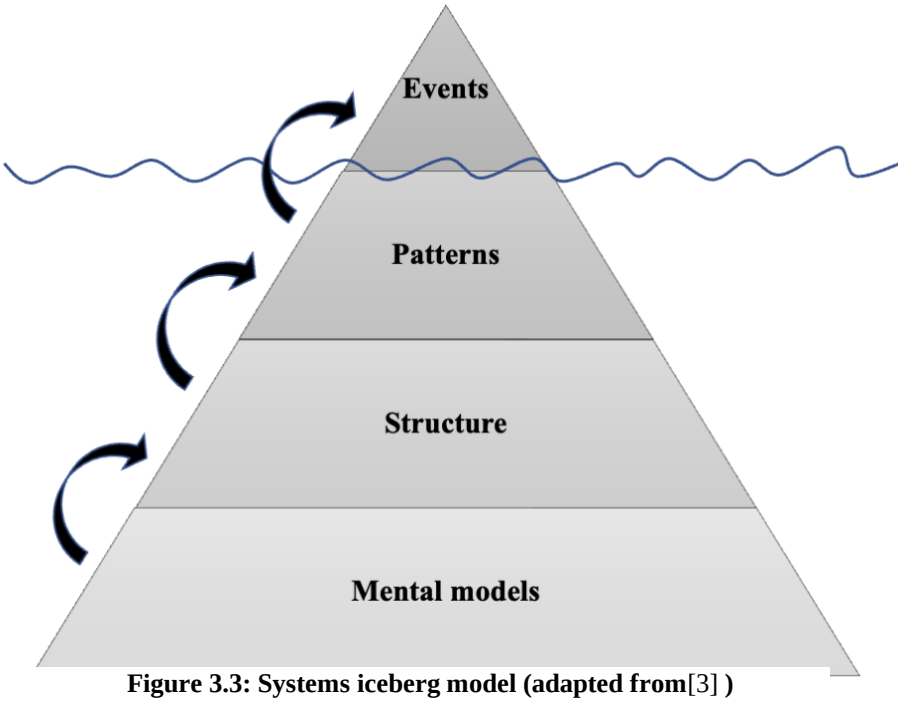


Figure 3.3: Systems iceberg model (adapted from[3] **)**

The iceberg's levels are interrelated; for example, key stakeholders' mental models within the system determine how the system is constructed, which then generates system patterns that cause system events [97]. For example, the visible tip of the iceberg symbolizes events in a specific system, the second level just beneath the surface indicates systemic patterns, and the deepest and largest levels represent systemic structure and mental models of people inside the system [3], [97].

The system events are what we see and notice, whereas the patterns are a collection of less noticeable occurrences that interact to create events when implemented together. The iceberg's systemic

structure represents how the system is organized (in terms of physical, social, and regulatory structures). The model indicates that the system structure generates patterns and events. The iceberg's mental model level represents the assumptions, beliefs, and values that shape and sustain system structures [97]. The mental models of the system's stakeholders are said to diverge and occasionally clash [6] frequently.

It might be argued that the focus on discrete and isolated occurrences throughout the scaling up of health service innovations provided an in-depth understanding of the tip of the iceberg and isolated system events. Therefore, implementers and practitioners might significantly enhance their understanding of scaling up outcomes at deeper levels of the iceberg. A thorough understanding of the system structure and mental models will provide insight into the system's behaviour, why recurring difficulties arise, and how issues can be addressed to improve performance [3].

3.7 Strategic Management of Scaling-up To Enhance Impact Of Interventions

Planning to scale up initiatives tested in pilot settings and have a broad impact demands systematic planning and exceptional attention to systems thinking [9], [10]**.** After health service innovations demonstrate efficacy in pilot projects, the next stage is their widespread application. Pilot study success does not imply success in other settings. When innovation is scaled up, unique organizational, financial, and human resources are not usually present, as often seen in pilot projects [9].

Program managers face a daunting challenge when scaling a healthcare innovation to a sub-national or national level. They must implement the innovation on a large scale with limited resources in health systems that may be characterized by limited capabilities, social resistance, a lack of infrastructure, and multiple urgent priorities [1]. According to the ExpandNet approach [9], successful scaling up to various contexts requires “a careful balancing act between desired outcomes and practical realities and constraints” [1]. It also calls for a planning procedure that strengthens the capabilities of national health systems rather than adding more stress to already weak public sector systems [1].

Considering the ever-changing conditions, multiple agents, different world views, self-organizing networks, co-evolution, and systems adaptation of the health system described as a CAS by many authors [11]–[13], [23], [92], developing a scaling-up strategy is only the first step. Throughout the implementation phase, strategic thinking must be maintained, necessitating a continuing focus on the numerous variables affecting scaling up and revising and modifying the strategy as needed. The scaling-up strategy, once developed, should not be seen as a strict plan to follow linearly but rather have some degree of flexibility and allow managers and decision-makers to consider adaptions as scaling-up proceeds intentionally. As contextual conditions change, some elements may become obsolete, and other elements that were not important before may suddenly require more attention, and resources may be more valuable in different areas of the scaling-up approach [1].

A significant risk in the process of expanding inclusive innovations to new geographical locations is the decline of the impact it is intended to serve as a result of lacking consideration and acknowledgment of the level of complexity of the problem at hand and understanding the main objective of scaling up inclusive innovations – which are to achieve systemic transformation towards I4ID goals [8], [15], [25], [47], [65].

Program reach (i.e., the '*spatial dimensions'* [10] of scaling up), including location, size, or proximity of adopters, has dominated the scale-up literature and is still a key concern in public health. However, the literature highlights the lack of consideration for the *temporal dimensions* (i.e., incorporating the past, present, and future of temporality and objective time) [10] of scaling up traditional models. Overemphasizing the influence of systems as solely a contextual factor on outcomes runs the risk of oversimplifying the steps necessary to impact population health and failing to take into account the potential benefits of taking system levers into account at various levels and over time [10]. Another significant risk in failing to consider systems complexity in scaling up is a misinterpretation of the impact of scaling up outcomes. As stated by [10], *"It may also implicitly reinforce the conceptualization that scaling is a linear process and desirable rates of program uptake (reach) are a sufficient indicator of scaling success."*

ExpandNet's Systematic Approach To Scaling up:

A systems approach enables the development of a scaling-up plan with consideration of how the many components and strategic options in the scaling-up framework interact with one another. A systems perspective suggests, for instance, that expectations about the rate and extent of scale-up must be balanced with the innovation's complexity, the adopting organizations' implementation capacities, and the capabilities of the support system [1].

ExpandNet's systematic approach to scaling up describes three stages, indicated in Figure 3.4. Stage I start with a pilot project designed and implemented to emphasize sustainability and scalability, anticipating future scale-up if proven successful. Based on the effectiveness of the innovation, the decision to scale up is made. Stage II involves participation from key stakeholders to develop a scaling-up strategy. Stage III calls for strategically managing the scaling-up process, which tends to be the lengthiest, most labour-intensive stage.

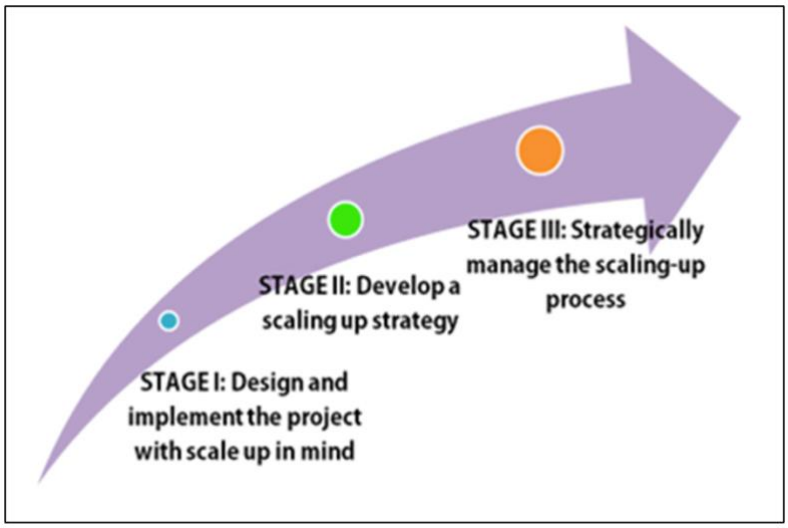


Figure 3.4: ExpandNet's Systematic approach to scaling up [9]

Stage I: Design and implement the project with scale up in mind

Several key recommendations are highlighted by ExpandNet/WHO's guidance tool "*Beginning with the end in mind: Planning pilot projects and other programmatic research for successful scaling up*" [8] which is indicated in Table 3.1.

Table 3.1: ExpandNet/WHO's 12 Recommendations For Beginning With Scaling Up In Mind

STAGE I: RECOMMENDATIONS	
1	Engage in participatory process involving key stakeholders
2	Ensure the relevance and feasibility of the proposed innovation
3	Reach consensus on expectations for scale-up
4	Tailor the innovation to the sociocultural and institutional settings
5	Keep the innovation as simple as possible
6	Test the innovation in the variety of sociocultural and institutional settings where it will be scaled-up
7	Test the innovation under the routine operating conditions and existing resources constraints of the system
8	Develop plans to assess and document the process of implementation
9	Advocate with donors and other sources of funding for financial support beyond the pilot stage
10	Prepare to advocate for necessary changes in policies, regulations and other service system components
11	Develop plans for how to promote learning and disseminate information
12	Plan on being cautious about initiating scale-up before required evidence is available

Stage II: Developing a scaling up strategy

The second stage of ExpandNet's systematic methodology highlights the necessity of engaging in a strategic planning exercise as soon as piloted treatments exhibit signs of success. ExpandNet developed a nine-step guide [1] for assisting with the development of a comprehensive scale-up plan. The nine steps for developing a scaling-up strategy are listed in Table 3.2 below. According to [1], typical topics for analysis in this stage includes determining expectations and necessary steps for both horizontal and vertical scaling up based on the characteristics of the innovation and scale-up setting. The innovation's complexity is also assessed regarding scaling-up implications.

Table 3.2: ExpandNet/WHO's Nine Steps For Developing A Scaling-Up Strategy

STAGE II RECOMMEDNATIONS	
1	Planning actions to increase the scalability of the innovation
2	Increasing the capacity of the user organization to implement scaling up
3	Assessing the environment and planning actions to increase the potential for scaling–up actions
4	Increasing the capacity of the resource team to support scaling up
5	Making strategic choices to support vertical scaling up (institutionalisation)
6	Making choices to support horizontal scaling-up (expansion/ replication)
7	Determining the role of diversification
8	Planning actions to address spontaneous scaling up
9	Finalizing the scaling-up strategy and identifying next steps

Stage III: Strategically manage the scaling up process

Although it frequently receives the least attention, the third step of strategically managing the scaling-up process calls for the most expertise, time, and resources. The ExpandNet/WHO scaling-up framework should be used at this stage to review and modify the scaling-up plan in light of recent developments and to seize new opportunities [1]. Open-system analysis can assist the scale-up team in methodically identifying and prioritizing critical activities and shortages in the strategy. "Scaling up is a complex, non-linear process" [1], [17], and a framework aids in ensuring an extensive assessment of essential concerns.

Scaling up presents challenging management decisions such as choosing the best course of action to be taken given the unquestionably limited resources available and the decerning between trade-offs so as not to risk the objective of sustainable scaling up [1]. An essential part of maintaining sustainable scale-up is an ongoing study of monitoring outcomes and suggesting how systematic evaluation efforts could improve implementation approaches [1]. After the pilot projects are finished, funding for research and monitoring typically drops significantly. Thus, a compelling case must be made to collect data on fidelity or if the degree of adaption during implementation has resulted in the innovation incapable of producing the same desired results as in the pilot study. These and other difficulties are brought up by scale-up management [1].

ExpandNet's first experience was in scaling up family planning and other reproductive health breakthroughs, but the framework and guidelines are generalizable and can be used in a wide range of thematic and technical areas. As stated by [1], "*scaling up is primarily a managerial, political, and organizational development issue rather than tied to a particular set of technical interventions.*"

The literature on scaling up inclusive healthcare points out the need for more comprehensive development initiatives and strategies across conventional sectoral boundaries. Therefore, change is required to ensure a focus on detailed strategic planning and management of scaling up in addition to implementing a higher degree of synergy across operations [17]. Creating a good model is only the beginning of the scaling-up process. The sustainability and social impact outcomes will largely depend on how the scaling-up process is managed [17], [18].

3.8 CHAPTER 3: CONCLUSION

The conceptual literature study is included in Chapter 3. (CLR). The review provides extensive background information on Innovation for Inclusive Development (I4ID) and how it applies to healthcare. I4ID and scaling up are linked by exploring the concept of scaling up health service innovations in marginalized populations to achieve inclusive aims.

The CLR concludes by emphasizing the importance of incorporating a systems perspective into strategic planning and management operations while scaling up techniques.

Chapter 4

SYSTEMATIC LITERATURE REVIEW ON FRAMEWORKS FOR SCALING-UP HEALTH SERVICE INNOVATIONS

Chapter 4 key objectives:

- Outline general systematic literature review purpose and methodology.
- Detail planning and data collection procedures.
- Identify the existing frameworks for scaling up inclusive healthcare innovations.
- Identify the key concepts of scale-up frameworks.
- Identify the key management routines for sustainable scaling up.
- Present results of review in the form of concept matrix.
- Discuss influence of results on further research.

4.1 SYSTEMATIC LITERATURE REVIEW

A systematic literature review (SLR) will be used to identify existing frameworks of scaling-up inclusive healthcare innovations to identify essential management routines from the scaling-up literature to enhance outcomes of scaling-up health service innovations. The identified management routines will be used to construct a framework for developing a management tool to facilitate decision-making to enhance the scalability of inclusive healthcare innovations.

Systematic reviews have grown in significance within the healthcare domain. SLRs are often used in clinical research as a preliminary step for developing management and clinical practice guidelines. Some publications in the healthcare domain are evolving in this manner, and funding organizations may demand a systematic review to ensure there is a rationale for conducting additional research [101]. SLRs also reduce bias and subjectivity based on a selected field of study [102]. The SLR methodology enables a research study to provide insights from a broad spectrum by synthesizing literature into the fields and sub-fields of the research topic [103].

The Preferred Reporting Items for Systematic Reviews and Meta-Analysis (PRISMA) by [101] is a widely used reporting method for SLRs and thus is chosen for this section. The SLR procedure is illustrated in Figure 4.1 and the various phases of the procedure are described in this section.

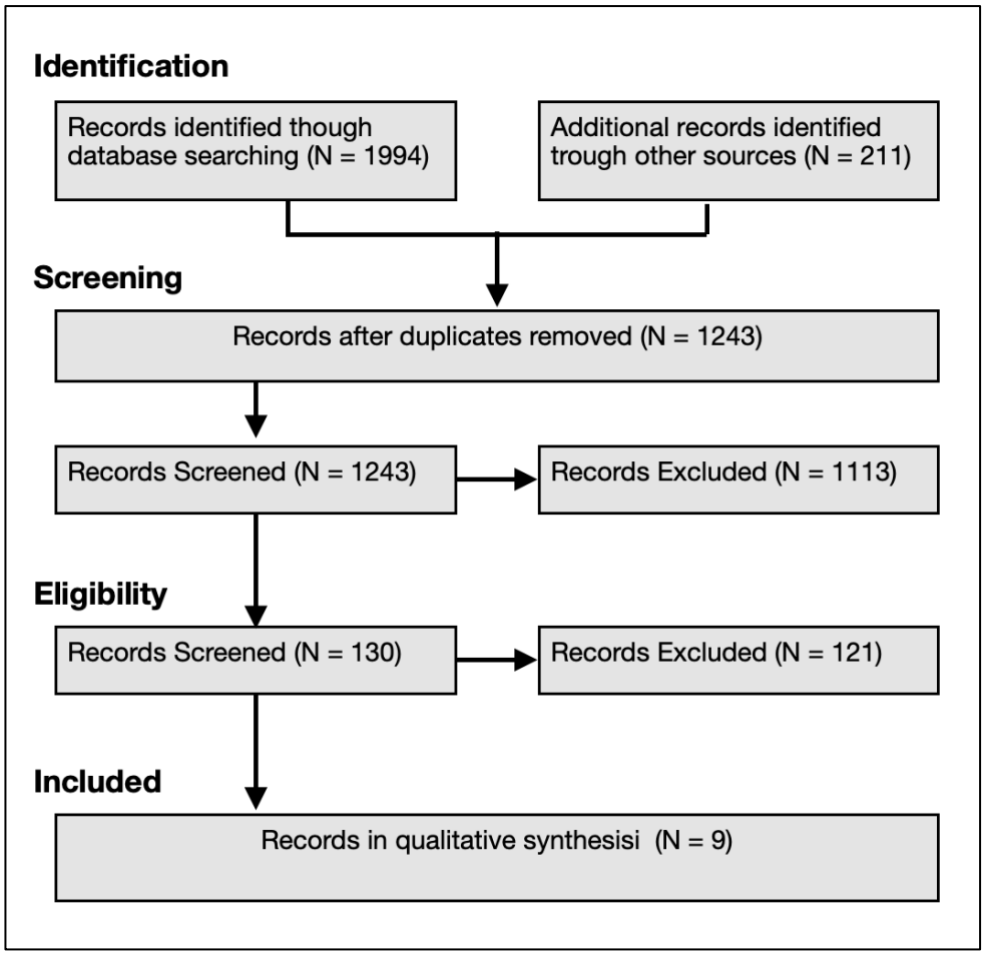


Figure 4.1: SLR procedure

4.2 SLR Process Steps

4.2.1 Identification and database search strategy

Published peer-reviewed literature was identified through a systematic search strategy undertaken from March to August 2021 using several search engines, including Scopus, PubMed, Science Direct, SUNLearn Library, Google Scholar, and Google Search. Search terms were developed to identify literature relevant to frameworks or models for scaling up inclusive healthcare innovations. The search terms were based on the terminology used in previous similar reviews, combined with search terms for scaling up frameworks, inclusive healthcare, and inclusive innovations. In addition to the electronic databases, we searched for relevant published, unpublished, and grey literature in the bibliographies of relevant studies and reviewed them based on their relevance to this study.

Literature extracted from search engines was found using combinations of the following keywords indicated in Table 4.1 .

Table 4.1: Keywords used in the SLR

RESEARCH AREA	KEYWORDS
SCALING-UP	Scaling-up, Scaling, Scalability, Scale up
INCLUSIVE HEALTHCARE INNOVATIONS	Social Healthcare innovations, Inclusive healthcare, healthcare innovations, Healthcare interventions
FRAMEWORKS	Theoretical model, framework, model, guidelines, steps, elements, mechanisms, approach

The keywords were applied in the literature search as follows: “theoretical model” AND “scaling up” AND “inclusive healthcare”.

4.2.2 Literature Screening

The first literature selection in this study was made by surveying only the titles, abstracts, and summaries of the literature. The decision as to which literature to include was based on its relevance to the research topic. The screening procedure helps significantly narrow the literature from broad topics to related topics [104].

4.2.3 Eligibility Criteria

After the screening, irrelevant literature was removed, and only relevant literature remained. The full text of the remaining literature was then assessed for eligibility. A systematic literature review must include predefined criteria and a quality assessment to evaluate which studies should be included or excluded [104]. The inclusion/exclusion criteria and quality assessment enable the researcher to reduce the amount of literature by forming a targeted list of relevant literature.

This study's inclusion and exclusion criteria were based on the literature type, language, timeline, and category, as indicated in Table 4.2. Only literature from reliable sources such as indexed peer-reviewed journals, book chapters, conference proceedings, industry reports, and published papers was considered to ensure the reliability and good quality of data extracted.

Context Of Literature:

All the theoretical frameworks analyzed have the following elements in common.

- Focus on scaling up (i.e., expanding the innovation's geographical reach, enhancing the innovation's impact on population health improvement, and strengthening the organization to enable sustainability in the scaling-up process.)
- Facilitate decision-making by presenting a conceptual model of scaling up towards inclusive impact.
- The literature present essential elements and management routines for scaling up.

Table 4.2: Inclusion and exclusion criteria for the SLR

	INCLUSION	EXCLUSION
LITERATURE QUALITY	Indexed peer-reviewed journals, book chapters, conference proceeding, industry reports, and published papers will be considered.	Non-indexed journals, non-peer reviewed articles, Wikipedia, non-peer reviewed conference papers
LANGUAGE	English	Non-English
TIMELINE	2000 - 2021	Before 2000
SCALING-UP RELEVANCE	Relevant to scaling up healthcare innovations for wider population reach or/and enhancing the impact at the implementation site.	Not relevant to scaling up. Not relevant to healthcare.

4.2.4 LITERATURE INCLUDED:

The SLR procedure was concluded with a remaining collection of 9 literature articles representing the most relevant and reliable data according to the quality criteria from the SLR process. The remaining articles were studied in depth to extract theoretical data and build a solid theoretical foundation by identifying the elements and managerial concepts around scaling up inclusive health innovations. The SLR process enabled the researcher to narrow down the literature resources to only the most reliable and relevant literature on the topic of this research project. However, out of the collection of articles, there are sufficient diversity in the scope and methodologies used to develop scaling-up knowledge, which reduces bias and strengthens the reliability of the preliminary management tool in the next section.

The main findings in the literature used to extract data were summarised as a *"concept matrix."* The concept matrix enabled the researcher to categorize the key factors/lessons (mental models) of scaling up, as well as insights regarding strategic planning and management approaches of scaling up according to the various authors and their different approaches towards framework development. The concept matrix simplified the process of comparing various conceptualizations and approaches towards scaling up and allowed the researcher to consider viewpoints from multiple resources to develop a non-bias mental model for approaching scaling up healthcare innovations.

A summary of the main findings in the concept matrix is listed in Table 4.3. The complete SLR concept matrix is given in Appendix B. The SLR identified various scaling-up frameworks for success that were used to identify primary elements of scaling up inclusive healthcare, as well as other important concepts such as management routines, challenges faced, actions with mitigating challenges, and factors influencing decision-making. An essential element of data extraction from the literate was insights regarding the managerial application of scaling-up frameworks or their relevance to practitioners in scaling up.

The SLR resulted in a comprehensive overview of scaling-up concepts, management approaches, and factors influencing decision-making, which enabled the researcher to gain an in-depth understanding of the challenges faced by healthcare implementers when attempting to scale up their innovations in marginalized communities. The findings also highlighted the social impact scaling up healthcare can

have regarding population health improvement on a systemic level. Theoretical frameworks and tools may thus facilitate strategic management and decision-making in social organizations to achieve sustainability by aligning scaling-up approaches towards inclusive development goals in low-and middle-income countries.

Table 4.3: Summary of Concept matrix for the SLR Key Findings

#	TITLE & REFERENCE	KEY ELEMENTS OF SCALING UP INCLUSIVE HEALTHCARE	PROPOSED STRATEGIC PLANNING AND MANAGEMENT APPROACH
1	**Title:** Practical Guide for Scaling Up Health Interventions [9]. ***Framework**: ExpandNet framework of scaling-up health service innovations.*	Scaling-up is conceptualized as an "open system with interrelated and interacting elements: - The innovation - The environment - The user-organization - The resource team or organization - The scaling-up strategy	Scaling up components frequently engages in complex interactions with one another. Changes in one element can affect the other elements, which can have ramifications for the scaling-up process. Strategic planning and management of scaling up focus on efforts to ensure balance among the interrelated elements considering many tensions, ambiguities, setbacks, and instances of luck that can and will arise.
2	**Title:** Scaling-up High-Impact Health Interventions in CAS ***Framework**: Pathways for scaling-up health services through the lens of complex adaptive systems* [11]	Management Approaches to respond to CAS behaviour in the system: - Capabilities to respond to dynamic and unpredictable health systems (Path dependency, interdependent subsystems, and non-linear outcomes.) - Accelerators of expansion and institutionalization (Strategies for accelerating the delivery of the intervention, Feedback loops, self-organization, and non-linear outcomes) - Adaptive mechanisms for responding to changes in contexts (changing contexts)	Acknowledging CAS behaviours and looking at scaling up through a CAS lens may assist the organization to be "internally owned" rather than being "externally imposed" by systems characteristics [23]. Scale effort should not aim to suppress the unexpected but acknowledge and accept CAS behaviours and incorporate them for improved scale-up design and implementation.
3	**Title:** Understanding Pathways for Scaling-Up Healthcare Services Through the Lens of Complex Adaptive Systems [23]. ***Framework:** Scale-up high impact health intervention in Complex Adaptive Systems*	Characteristics related to a CAS: - Path dependence - Feedback - Scale-free networks - Emergent Behaviour - Phase Transition	The CAS approach facilitates management decision-making by considering local context variation, engaging with the system and actors in the system, anticipating unintended consequences, and developing and implementing programs that engage critical actors through transparent data for ongoing problem-solving and adaptation. Management should anticipate adaptation and flexibility in implementing inclusive healthcare innovations.

4	**Title:** Mechanisms of Scaling-Up: Combining A Realist Perspective and Systems Analysis to Understand Successfully Scaled Interventions. ***Framework****:* *Systems Model of Scaling up* [6]	<u>Key Outcomes leading to sustainable scale:</u> - Communication adoption - Political support/ Buy-in - Institutional Implementation Capacity - System Level (policy) embeddedness - Replication in other contexts - Stakeholders' buy-in/ perceived value - Evidence of the impact on target outcome - Community sustainability/ embeddedness	The following recommendation is made for managing to scale up healthcare innovations: - Watch for correct and incorrect imbalances as elements of the scaling-up systems interact. - Recognize trade-offs are necessary - Commit to upholding the participation of a broad range of stakeholders. - Protect organizational elements that differ most from the user organization's culture (e.g., those easily lost during scale-up). - Maintain the resource team staying in power - Remain vigilant (e.g., expect the unexpected and be prepared to act quickly or pause momentarily)
5	**Titles:** 5.1 Evaluating and Extending SCALERS: Implications for social entrepreneurs [105] 5.2 Scaling Social Entrepreneurial Impact [SCALERS] [20] ***Framework:*** *The SCALERS model:* We analyzed this model through two sources: the original SCALERS model by [20] and an extended version of the model by [105].	<u>SCALERS model elements:</u> - Staffing *(Contingency: Labour needs)* - Communication *(Contingency: Public support Communication as service)* - Alliance-building *(Contingency: Potential Allies)* - Lobbying *(Contingency: Supportive Public policy)* - Earnings generation *(Contingency: Access to capital Clients' ability to pay)* - Replication *(Contingency: Dispersion of beneficiaries)* - Stimulating Market Forces *(Contingency: Availability of economic incentives)* - Internal systems (NEW) [105] *(Contingency: Heterogeneity of clients/ beneficiaries)* - Client Selection (NEW) [105] *(Contingency: Clients' concern with social vs. economic goals)*	The SCALERS model recognizes that some capabilities are more critical than others, depending on the context. The SCALERS model, taken together with the concept of dynamic capabilities, acknowledges that "certain situational contingencies may place more or less importance on developing any given capability" [105]. The idea behind dynamic capabilities is that the need to develop new capabilities is strongly influenced by the environment in which an organization operates [106]. An organization can use the SCALERS model to assess its ecosystem and determine where its past actions have strengthened and weakened its ability to scale.
6	**Title:** A Theoretical Model For Understanding	<u>Steps of assessing the scalability of the organization identified in the</u>	Social impact on a systems level can only be realized through scaling up the healthcare innovation to the

	Scalability Of Social Impact [16]. ***Framework**: Theoretical model for scalability of social innovation)*	*<u>"Theoretical model of scaling up social impact":</u>* 1. Precondition: Viable Operational Model. 2. Commitment 3. Management Competence. 4. Replicability of the operational model. 5. Ability to identify the scope of social demands. 6. Ability to obtain necessary resources. 7. Network 8. Effectiveness 9. Adaptability	degree of social need for health services. Managing the scaling-up process of "transferring" the model to various implementation locations requires careful consideration of how the healthcare innovation model can be replicated and how adaptability can be incorporated to fit local contexts.
7	**Title:** A Framework For Understanding Healthcare Interventions: Lessons Learned From Large Scale Improvement Initiatives In Africa[107].	<u>Key considering elements of developing a scaling-up strategy:</u> 1. Scaling up phases. 2. Adoption Mechanisms 3. Support Systems (Infrastructural Support)	This study contradicts the statement that lessons from previous implementation experience be incorporated into the subsequent design makes, by making the case that rapid and successful scale-up would benefit from a formative rather than a summative approach, giving as many opportunities as possible to reflect and redesign throughout the process. There is sufficient evidence that real-life implementation of scale-up initiatives rarely follows a set design [108]. This encourages flexibility and adaptability in the intervention design and the planning of the scale-up strategy.
8	**Title:** Scaling Up Global Health Interventions – A Proposed Framework for Success [55].	<u>Components of the scaling up process to manage:</u> 1. Attributes of the Tool or Service being scaled up: 2. Attributes of the implementers: 3. The chosen delivery strategy: 4. Attributes of the 'adopting' community: 5. Socio-political context: 6. Research Context	Scaling up health innovations requires the development of strategies that incorporates the influence of contextual factors and systems behaviour. Success factors for scaling up were identified from interviews with implementation experts and the published literature. These factors include the following: - choosing a simple intervention widely agreed to be valuable, - strong leadership and governance, - active engagement of a range of implementers and the target community,

			- tailoring the scale-up approach to the local situation, and - incorporating research into implementation.
9	**Title:** Developing a framework to inform scale-up success for population health interventions: a critical interpretive synthesis of the literature [50] ***Framework****: Scale-up Readiness Assessment Framework)*	<u>Phases of scaling up inclusive healthcare innovations:</u> - Phase 1: Groundwork and preparation - Phase 2: Implementing Scale-Up - Phase 3**:** Sustaining the Scaled-Up PHI	Scaling up does not unfold linearly; thus, no universal pathway exists for scaling up healthcare innovations or interventions. Key management components highlighted across various literature sources include: - The Population Health Improvement (PHI) - Contextual Environment - Capacity of Organization - Stakeholders**.**

4.3 CHAPTER 4: CONCLUSION

The fourth chapter presents the findings of a systematic literature review (SLR) that was carried out to identify the most prevalent frameworks and models for scaling up health service innovations in the literature, as well as the key concepts surrounding strategic planning and management of scaling up health service innovations in marginalized communities for inclusive goals.

Chapter 5

DESIGN REQUIREMENTS FOR A CONCEPTUAL FRAMEWORK

Chapter 5 key objectives:

- Discuss conceptual framework features.
- Develop design requirement for management tool.
- Analyze literature to extract concept and routines to include in the management tool.

Chapter 5 illustrates the development process of a management tool based on the CLR and SLR findings in chapters 3 and 4, respectively. The data extracted during the SLR are organized using a concept matrix shown in Appendix B.

5.1 FRAMEWORK METHODOLOGY

A concept matrix is an organizational tool that shows connections between some aspects of a chosen topic and research articles that are currently available by placing articles on one side and specific aspects of the topic on the other. An advantage of using a concept matrix is that it serves as a guideline for the reader to assess the relevance of the literature sources used to develop the framework requirements and preliminary management tool in the following sections. It also serves as a visual indication and holistic viewpoint of the nature of concepts extracted, serving as a mental model for understanding the problem situation.

The theoretical data in the concept matrix was critically analyzed and compared to develop a conceptual framework. The conceptual framework serves as the foundation from which all knowledge is constructed for the management tool artifact. The artifact is the outcome of the DSRM process of this study.

As suggested by the findings in the CLR and SLR [6], [10], [11], scaling up healthcare innovations calls for a *"shift of attention from the scaling up of an intervention to achieving an outcome at systems scale"* [10]. This study aims to develop a management tool that reflects a *"systems-orientated"* management approach for scaling healthcare innovations [10]. A systems perspective on management was achieved using the *Ice-Berg model* [97] as the foundation for the conceptual framework. As mentioned in chapter 1, the researcher used a theoretical lens of implementation, social, and complexity science to conceptualize the theory. The framework developed in this study aimed to reflect the complex nature of the scaling-up process of healthcare innovations for inclusive objectives. Therefore the iceberg model was seen as an appropriate model for guiding the development of the management tool.

The conceptual framework is given in Table 5.4 under section 5.3 (data extraction and synthesis), illustrating how the elements extracted from a broad spectrum of literature are categorized under the main concepts of the iceberg model to build a systems-orientated management tool for scaling up healthcare innovations.

The Ice-Berg paradigm, in which the system is represented as an iceberg, is a well-known straightforward conceptual illustration for comprehending systems thinking [97]. The iceberg model stems from the organizational management domain [109] to demonstrate how management and policy actions frequently manifest [100]. The levels of the iceberg are interconnected; for instance, the *mental models* of significant stakeholders impact how the system is *structured*, which in turn causes *patterns* in the system that finally lead to *event*s in the system. The aim of using the iceberg model for the development of the conceptual framework was to effectively illustrate the dynamic and complex characteristics of scaling up healthcare innovations as highlighted extensively throughout the literature [6], [11], [23], [56], [64].

5.2 Conceptual Framework Features

The essential characteristics of a conceptual framework typically found in current research are listed by Ngongoni [110] and are shown in Table 5.1. The framework of this study was developed according to the recommended guidelines [110].

Table 5.1: Key features of a conceptual framework

FEATURE	DESCRIPTION
Integrative	There must be a degree of coherence between the chosen concepts within the framework.
Evolving	As the study progresses, the researcher's knowledge deepens, and the conceptual framework evolves, thus making it non-static.
Constructability	Framework development employs multi-disciplinary approaches.
Interpretative capacity	A framework provides an interpretive approach to social reality through the "soft interpretation of intentions" rather than the "hard facts."
Indeterministic	Conceptual frameworks do not enable the researcher to predict an outcome of a particular set of activities but aid in improving the likelihood of specific outcomes.
Understanding	The goal of a conceptual framework is to provide an understanding of the theory.
Capacity For modification	Conceptual frameworks can be reconceptualized and modified as the research question evolves. Further studies can result in modification as new data and publications become available after the framework's first development.

5.3 Requirements For An Artifact

Based on the recommendation regarding management and strategic decision-making extracted from the SLR, a number of requirements were developed for the DSRM management tool artifact.

A "systems-orientated" scale-up approach aims to achieve population health improvement and can complement traditional "intervention-orientated" approaches. Koorts [10] defines this type of scaling as "*an approach that prioritises the behaviour and function of the system, with a focus on relations between a number of system elements, using system-level levers and dynamic system changes to drive impact at scale*." The essence of this approach is to consider the characteristics of the target system(s) in which scaling-up occurs (such as the capacity of health systems and socio-cultural contexts to react to change) to identify how best to reorientate that system to achieve the desired outcomes [10].

Developing a good relevance cycle outcome is essential in designing a solution through DSRM. The design outline provides an idea of the intended solution by formulating critical requirements to guide the design process.

Categories to group the different design requirements as suggested by [46] include:

i. **Functional requirements (FR):** Key requirements that frequently relate to the effectiveness or requirements of the designed solution;
ii. **User requirements (UR):** The requirements relating to using the tool.
iii. **Design requirements (DR):** The total design limits may also contain negotiable components not addressed by the tool.
iv. **Boundary conditions:** Unnegotiable design requirements to be met; and
v. **Attention points (AP):** Specifications are not essential to the tool but worth noting during the design phase.

The key concepts identified throughout Chapters 3 and 4 are translated into the design requirements for a management tool according to the five categories of design requirements described above. The first validation cycle for the preliminary management tool is assessed based on the design requirements in Table 5.2.

Table 5.2: Design requirements for the management tool

TOOL REQUIREMENTS	CODE	DESCRIPTION	REFERENCE
Functional Requirements	FR1	The tool must represent an "open-systems perspective" of interrelated elements. Strategic planning and management efforts are dynamic and ensure balance among the interrelated elements considering many tensions, ambiguities, setbacks, and instances of luck that can and will arise.	[9] [20], [105]
	FR2	The tool must provide a mental model of how scaling up healthcare innovations could be aligned with inclusive development goals.	[20], [105] [50]
	FR3	The tool must reflect the inherent complexity of scaling healthcare innovations in various contexts.	[23], [11]

	FR4	The tool must assist managers in aligning strategic decision-making with their organization's social goals, vision, commitment, and stakeholder needs.	[16] [55]
	FR5	The tool must represent a patient-orientated model of inclusive healthcare, which incorporate flexibility and adaptability in the implementation of scale-up to ensure local fit and community adoption in various implementation sites.	[107] [55]
	FR6	The tool must indicate the various phases of scale-up.	[107], [9], [50]
User Requirements	UR1	The tool must be easily understandable and interpretable, and comprehensive.	Generic
	UR2	The tool must be dynamic and applicable in different situations.	Generic
	UR3	The tool must be generalizable for any inclusive healthcare innovation.	Generic
Design Requirements	DR1	The tool must be able to communicate knowledge visually.	Generic
	DR2	The tool must be neat and brief, only highlighting key elements.	Generic
	DR3	The tool must reflect a systems perspective or holistic representation of managing the scaling up of inclusive healthcare innovations.	Generic
Boundary Requirements	BR1	The tool must be relevant to implementing healthcare innovations.	Generic
	BR2	The tool must encourage a dynamic management approach and not a linear "one-size fits" approach.	[9], [11], [107], [55], [23], [20], [105][94]
Attention Points	AP1	The tool must indicate leverage points to use/build organizational strengths to mitigate weaknesses or challenges.	[9] [20], [105]
	AP2	The tool must demonstrate the need to acknowledge the healthcare system's inherent complexity to achieve social goals.	[23], [11]

5.4 Data Extraction And Synthesis

Scaling up healthcare innovations for inclusive objectives is inherently complex, containing many uncertainties, unpredictable behavioural patterns, and non-linear outcomes [9], [11], [13], [64], [92]. Because scaling up healthcare innovations occurs in a non-linear fashion, experts strongly recommend approaching scaling up by acknowledging the system's complexity. Therefore applying a systems-orientated perspective in strategically planning and managing the process of scaling up healthcare innovations for inclusive objectives could significantly contribute to scaling up success [10], [11].

Understanding the interactions and influence of systems components on one another through non-linear feedback and causality could provide a comprehensive perspective on systems dynamics

regarding implementing healthcare innovations in marginalized communities [10], [96], [97]. A systems-orientated scaling-up approach reflects the concept of "*systems thinking*," which is fundamentally grounded in the idea that behaviour in any context cannot be understood by looking at components in isolation; instead, the system as a whole should serve as the analytical unit [10], [96]. Von Bertalanffy [98] and other general systems -, and complexity theorists laid the foundation for this approach, which offers several models and techniques to enable systems analysis and design.

The Ice-Berg model is a well-known simple conceptual demonstration of systems thinking, depicting the system as an iceberg [97]. The *"systems thinking iceberg model"* originates from organizational management [109], [100] to illustrate how management and policy actions often manifest [100]. The levels of the iceberg are interconnected; for instance, how the system is *structured* is determined by the *mental models* of essential stakeholders; the structure then produces *systems patterns* that ultimately generate *systems events*. The iceberg model represents the dynamic and complex nature of interacting elements of healthcare systems and therefore is chosen as a good layout of the theoretical framework in this section.

As illustrated in Figure 5.1, the tip of the iceberg, usually the only visible part of the system, represents the events in the given system. The second level, just beneath the surface, represents the systemic patterns, and the systems' structure and mental models are represented by the deepest and largest levels [97].

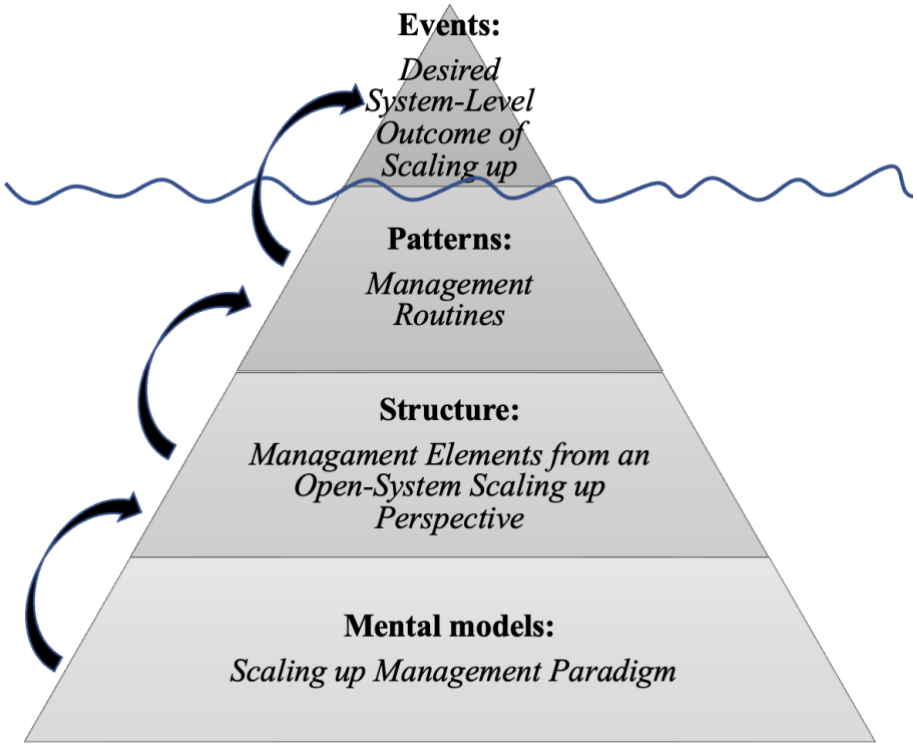


Figure 5.1: Iceberg model in the context of strategic planning and management of scaling up health service innovations (adapted from [3]**)**

Table 5.3: Iceberg levels in the context of strategic management of scaling up health service innovations

Iceberg levels	Description	Context of strategic management of scaling up
Events	Events in the systems are what we observe and pay attention to. It represents the performance (i.e., sustainability of the model, inclusive impact, embeddedness, local fit) of the healthcare innovation in its implementation context as a result of scaling up.	(Desired) Outcomes of sustainable scaling up according to the literature
Patterns	Patterns are a collection of less obvious occurrences that, when they occur in concert, interact to produce events.	Recommended Management Routines to achieve outcomes
Structures	The system is arranged according to the iceberg's structure (i.e., physical, social, and regulatory structures). The model proposes that the system structure produces patterns and events.	Management Elements for categorizing routines
Mental Models	The systems structures' underlying preconceptions, perspectives, and values are represented by the mental model level of the iceberg. It is argued that the mental models of the system's stakeholders are frequently dissimilar and may clash.	Scaling up management paradigm

The researcher identified and extracted the most relevant elements in the concept matrix for developing a conceptual framework and organized the theory based on the structure of the iceberg model. The conceptual framework contains a collection of the most relevant theoretical concepts from various scaling-up literature articles for developing a management tool artifact as the output of the DSRM process.

The elements contained in the iceberg model are extracted from the following literature sources.

Events: The "events" section contains an adaption of some elements extracted from the *"Systems Model of Scaling Up Health Interventions"* framework [6].

Structure: The "structure" section contains an adaptation of the elements extracted from the *"ExpandNet framework of scaling-up health service innovations"* [9].

Routines: The "routines" section contains a collection of elements identified as the most relevant management routines which extracted from various frameworks and articles in the SLR collection.

Mental Models: The "mental models" section was developed using a combination of management philosophies, thinking paradigms, lessons learned, and general mental models regarding scaling up healthcare innovations. These elements were extracted from various frameworks and articles in the SLR collection. The concept matrix is the foundation for developing the management tool artifact, illustrated in chapter 6.

Table 5.4: Conceptual framework for strategic management of scaling up health service innovations

EVENTS	
OUTCOMES OF SUSTAINABLE SCALING UP FROM EFFECTIVE STRATEGIC MANAGEMENT	
Outcomes of effective strategic management in a CAS	**Description**
Community adoption of healthcare innovation	Healthcare innovation indicates strong community buy-in and perceived value and relative advantage over existing practices in the implementation context [16], [50]. The community perceives the credibility of the innovation to solve health problems [6], [9].
Political support/ buy-in	The intervention objectives align or produce evidence with state national priorities (i.e., National Sustainable Development Goals). Involvement of political advocates and strategies for political support. The political system perceives credibility in solving social health problems [6], [9].
Institutional implementation capacity	The implementation organization can leverage existing processes and structures and develop strategies to address implementation weaknesses within scale-up planning [6], [9], [11], [23]. The organization can use capacity-building strategies continuously to overcome or minimize the impact of implementation weaknesses [16].
System level embeddedness	Healthcare innovation is integrated into the social, infrastructural, and cultural system [6], [9]. System-level embeddedness necessitates contextual relevance and mobilizes local resources [6], [10], [24]. The healthcare innovation integrates structure, budgets, and practices of the system (centralized approach) while being contextually relevant and involving local mobilization of resources and local adaptions and knowledge building (decentralized approach) [6], [9], [50]. The conflict between centralized and decentralized approaches hurts the mobilization of resource ownership, which reduces integration into systems, budgets, and practices [107].
Transferable in other contexts	Transferability combines replicability and adaptability of the innovation to enhance local fit and system-level embeddedness [16], [6], [9]. Implementation of healthcare innovation is applicable in a wide range of settings. Successful transferability requires an understanding of crucial implementation/organization/ innovation components and known barriers [9], [16], [105]. Transferability requires the availability of resources and strategies for contextual adaptation and fidelity of implementation components [8]. During scale-up, components crucial for replication's effectiveness and fidelity of execution are not lost.
Stakeholders' buy-in/ perceived need	Strong perceived need for innovation to be implemented in a target area, and the implementation objectives align with stakeholders' agendas and needs [6], [9]. Stakeholders perceive advantages over current procedures or methods for achieving their agenda, aims, or goals. The organization practice intentional data collection (both prospective and retrospective) based on evidence that stakeholders find credible. Proof of an intervention's effectiveness in the actual world boosts credibility, legitimacy, and donor and investor support.
Evidence for impact on target outcome	The innovation proves a positive social impact on population health improvement. Healthcare innovation represents a catalyst for social health transformation [6], [16].
Community stakeholder embeddedness	The innovation addresses community needs and has the necessary resources and capacity for contextual adaptation, which enhances systems integration.

Adaptability and flexibility in planning and implementation	Scaling up is a non-linear process [6], [50], which often requires adaptation or changes to the implementation of healthcare innovation to enhance sustainability and success of scaling up [11], [23], [107].
STRUCTURE AND PATTERNS	
ENVIRONMENT *The dynamic and changing social, political, cultural, and infrastructural environment.*	
Management Routines	**How routines apply to scaling up healthcare in a CAS**
Identify factors in the environment that influence the implementation and operation of the healthcare model.	Consider historical background, cultural norms, and infrastructural and social circumstances in the implementation environment that could affect the implementation and adoption of healthcare innovation to accommodate local health needs [9], [23].
Continuous assessment of changes in the social, political, infrastructural, and cultural environment and circumstances as the process of scaling up evolves.	The health system is described as a CAS with emergent behaviour, phase transition, path dependence, feedback, and scale-free networks [11]. During the lifecycle of healthcare innovation, the environment and social behaviour in the implementation context are expected to change with time. Active community engagement, knowledge building and sharing, and decentralized control enhance organizational adaptability for local fit [9], [23].
Community needs assessment	Effective community adoption realizes when the community sees the value and advantage of the intervention over existing practices. Assessment of community needs constantly enhances adaptability to local fit to enhance the value proposition.
INCLUSIVE INNOVATION *The innovation's contribution to I4ID is by including marginalized communities in developing the healthcare system and serving the needs of these communities.*	
Management Routines	**Description**
Dissemination of healthcare innovation	Public promotion and dissemination of healthcare innovation through strategic stakeholder channels to increase visibility in the community and enhance perceived legitimacy and impact of advocacy efforts [9], [16].
Assess the inclusiveness of the innovation according to relevance and compatibility in the implementation area.	Healthcare innovations with the following features are more likely to be successfully transferable if they are relevant, credible, easy to install and understand, and compatible with the implementation area [9].
Tailor innovation to the context	Action such as engagement with the community in their local language and considering their cultural beliefs and norms in the implementation process could drastically enhance scaling up success [9], [23].
Monitoring and sharing broad outcomes indicators	Inclusive healthcare aims to provide access to healthcare services in resource-scarce communities as an alternative to governmental institutions. It is important to remain focussed on broad goals (i.e., population health improvement (PHI), behavioural change, social transformation) by measuring and sharing outcome and impact indicators [9], [23].
Identify the scope of social demands of the implementation area.	"Identifying the scope of social demands determines *where* and *how* replication of the innovation can scale the social impact most effectively" [16]. Determine unmet social needs and align scaling up goals to be primarily driven by maximizing social impact as opposed to maximizing profit (as the driver for commercial enterprises). The allocation of interventions, which are frequently

resource-constrained, must be carefully considered to ensure the delivery of a maximal and long-lasting impact [16].

IMPLEMENTATION ORGANIZATION *The individuals and organizations (and resource teams) that seek to promote and facilitate the broader use of the innovation.*	
Management Routines	**Description**
Groundwork and preparation for implementation.	Develop a scale-up plan that is thorough and organized. Establish a solid basis for later scale-up stages. Provide adequate information for decision-makers to decide whether to conduct scale-up [50].
Provide strong leadership and governance over healthcare innovation	A robust support system is required when implementing a healthcare innovation in a novel setting. For example, health clinics often require financial support for the first few years until the customer base reaches break-even numbers.
Active community engagement	Active engagement with a range of implementers of the target community to enhance tailoring the scale-up approach to the local community [6], [9], [23].
Incorporating research into implementation	Incorporating implementation research ("learning and doing" [55]). Learn from the implementation process and identify expected and unexpected challenges faced, strategic decisions and trade-offs faced, and what worked and what did not work.
Providing internal systems/(infrastructural) support	Provide infrastructural support for formal processes and procedures used to run the organization (i.e., human capability, infrastructure, data collection and reporting systems, learning systems, and design implementation for sustainability) [107], [105].
Assess strengths and weaknesses to build capacity.	Assess strengths and weaknesses in all organizational elements such as resources, staffing, technical capability, management and administration, organizational culture, policy and legal framework for service delivery, and leadership [9].
Make use of existing processes and structures	Leverage existing processes and structures (i.e., transport systems, hospitals, and shopping centres) when developing an implementation strategy [9].
Scaling with "others."	Social businesses can scale their humanitarian efforts independently or rely on other institutions, corporations, and organizations to provide the resources they require [6], [16]. To broaden their social impact, social enterprises either actively participate in partnerships or strategic alliances that perform social activities or actively support and advocate for just their partners [16]. "*Depending on the estimated potential of "scaling with other organizations" or "scaling by their own," the social enterprise should opt for the alternative that promises to be most effective for scaling social impact"* [16].
HEALTHCARE MODEL *The set of health service interventions that is being scaled up. Once successfully tested, the package of interventions serves as a model to improve health services, leading to reduced disease and improved health status.*	
Management Routines	**Description**
Target client assessment	The target communities/clients are identified by comparing and balancing social and economic goals. Defining the type of client to serve and not to serve is an essential organizational capability for scaling up [105].
Healthcare professional selection assessment and training	The healthcare professionals are the frontline workers and the contact point between the organization and the community. It is essential to select the appropriate individual to serve the community based on their skills and personal

	profile (trustworthiness, passion for healthcare, and hardworking) to fit the local circumstances and culture of the implementation organization.
Identify core elements for replicability	The core elements of the operational model (fidelity) should remain intact while replicating the innovation in other contexts so that the innovation does not lose its original purpose and objectives [9], [16]. Keeping core elements in place enables standardization of procedures and brand and keeps elements intact, which induces social impact [16].
Balance centralized (top-down communication) and decentralized (bottom-up communication) management approaches	Unpredictability and unexpected challenges and barriers are often experienced when scaling healthcare innovations. Contextual variations between implementation sites influence adoption, stakeholders' buy-in, systems and community embeddedness, and the potential social impact delivered through the innovation [6], [9], [16]. While centralized management is essential for factors such as standardization and quality of service, decentralized management approaches delegate a degree of decision-making authority to lower levels of management, such as frontline health workers. Decentralized management approaches could enhance adaptability to local conditions or challenges/barriers and enable communication of community needs to top management (bottom-up communication) through the engagement of frontline workers with the community. It is essential to balance decentralized and centralized management in social healthcare because disagreement between centralized and decentralized approaches hinders resource mobilization and "ownership" and weakens integration into practices, systems, and budgets [6].
Tailored support to overcome the initial problem with implementation and adoption of the innovation in the local context	After implementing the healthcare organization in a new context, the implementation organization might need to provide tailored support to the healthcare professional and staff, financial support, and management support to overcome the initial problems with the implementation and adoption of the innovation in the local context and build customer base [23].
Understanding of workplace context	Understanding the motivation and obstacles faced by frontline workers and other significant agents in the process enhances scaling-up performance [23]. Understanding the workplace context can be enhanced by effective bottom-up communication channels and relationships with implementation organizations [23].
Strong communication channels and relationships with implementation organization.	Effective communication channels and relationships with implementation organizations are fundamental adaptive mechanisms for responding to context changes or creating consensus about adapting to new contexts [23], [50].
Monitoring and sharing broad outcome indicators.	Various monitoring techniques are used through the three stages of scaling up: pilot, scaling up, and large-scale implementation. Some many different M&E techniques and technologies are best suited for each stage [11], [24], [107], [111]. M&E during the pilot phase involves precisely gauging the impact of an invention and the entire set of interventions that will be scaled up. The focus switches to assessing processes throughout the scale-up phase to ensure the innovation is implemented with fidelity, at a reasonable speed, and achieves the target coverage while retaining the invention's fidelity. Once an innovation has reached scale or has become “embedded in the system”[23], attempts to measure fidelity continue, but they may also include assessing the impact on the population [9]. These shifting priorities must be reflected in M&E procedures, metrics, benchmarks, and data collection techniques [111].
STRATEGIC CHOICE AREAS	

Designing and implementing a scaling-up strategy also involves making several strategic choices related to the type of scaling-up strategy, approaches for dissemination and advocacy, costs of scaling up and mobilization of resources to support scaling, and monitoring and evaluation.	
Management Routines	**Description**
Define the scope of social demands **[16]**	The degree of the social need indicates where and how to replicate the innovations to have the most significant social impact. The primary motivation for scaling up healthcare in the social domain is to maximize social effect [16]. Social businesses, therefore, continually scan their surroundings for unmet social needs. The efficiency of social enterprises to scale their social impact is determined by their capacity to identify the [scope of] prospective demand for a program and pinpoint where the essential elements for success can be located [9], [16].
Incorporate phases in the scaling process **[107]**	Many studies, including [107], define four phases required to progress to full-scale: (1) Set-up, which prepares the ground for the introduction and testing of the intervention that will be implemented at full scale; (2) Develop the Scalable Unit, which is an early test and demonstration phase; (3) Test of Scale-up, which spreads the innovation to various settings that are likely to represent contexts that will be encountered at full scale; and (4) Go to Full Scale, which develops quickly to allow a more significant number of sites to adopt and replicate the innovation [107]. The importance of incorporating sustainability through all the phases is highlighted throughout the literature [9], [16], [107]. Although the phases in this sequence appear to flow logically from concept to full scale, they may be more spontaneous and iterative, with various levels of effort required at different times and progressing at different rates [107].
Develop adoption mechanisms **[107]**	The intervention's pace and extent of adoption are strongly influenced by the environment for change and the psychology of change. In an unreceptive environment, rapid scale-up will not happen [107], [6], [9], [16], [23]. The innovation's design must consider and be tightly integrated with policies, procedures, and other health system structures at every stage of the scale-up process. Effective adoption mechanisms are developed through being sensitive to social attitudes and health system practices [6], [9], [16], [23]. Better ideas, leadership, communication, policy, and a culture of urgency are five factors that affect adoption [107].
Develop a Support System **[107]**	The "phased scale-up approach needs a supporting infrastructure" [107]. The implementation organization has centralized control over all the branches of healthcare innovations implemented through the support system. The following components of support should be considered in scale-up design (i.e., human capability, infrastructure, data collection and reporting systems, learning systems, and design implementation for sustainability) [107], [105]. Effective use of the support system may facilitate the exploitation of demonstration sites [9] (i.e., knowledge building, community engagement, systems embeddedness). Leaders must commit to a learning system that uses continuous data input to pinpoint and address performance gaps to sustain the scale-up process [6], [9], [23].
Address both horizontal and vertical scaling up **[9]**	Horizontal scaling refers to expanding geographical reach through "replication." Vertical scaling up is the formal adoption of innovation at the national level by the government, and it is institutionalized through national planning processes, policy adjustments, or legal action [9]. Replication alone is insufficient to integrate a healthcare innovation into the healthcare system. Scaling up must consider both the horizontal and vertical aspects of diffusion if it is to be sustainable. Strong advocacy is required for vertical scaling up to establish the legitimacy of the invention and the necessity for change. Legitimizing change is necessary to

	accept budgetary priorities, pass policies, and build support for the innovation's execution [7], [9]. Additionally, it necessitates an awareness of the planning cycles for the health system and the implementation of appropriate measures to integrate the innovation and its related requirements—financing, human resources, logistical requirements, and supply needs—into health policy and budgets [9], [16].
Combine centralized and decentralized approaches **[9]**	A decentralized strategy can be utilized to execute the innovation while involving central-level control to ensure it is integrated into a health system's systems, structure, budgets, and practices [9]. The benefit of decentralized methods is that they promote the local initiative, spontaneity, mutual learning, and problem-solving. Local initiatives will naturally ensure innovations progress towards local fit [6], [9], [57]. However, a decentralized approach, especially for an extensive network of health interventions, might significantly increase the workload for the resource team. Additionally, in a decentralized setting, officials lack the authority of central authorities. They cannot compel widespread replication and infrequently wield power or resources to implement the necessary policy change. Central-level involvement is typically necessary to incorporate an invention into structures, budgets, and procedures. National entities frequently influence health care finance, resource allocation, and setting and monitoring compliance with norms and standards, even in the most decentralized systems [7], [9]. Despite the limited options that the health system's structure may provide for choosing between a centralized and a decentralized approach, it is recommended to combine both for their unique benefits and drawbacks [9].
Assess the costs of the scaling-up process and identify possibilities for economies of scale **[9]**.	Understanding the expenses of scaling up makes it clear what kind and how much support is required to reach scale. There are costs associated with all three types of deliberate scaling up [9]: (1) Horizontal scaling up: Expanding the innovation to new geographic areas or population groups; (2) Vertical scaling up: investing the frequently lengthy time and energy required to win political support for scaling up and integrating the innovation into regular program operations; and (3) Diversification: Diversifying the innovation through additional testing of new components.
MENTAL MODELS	
STRATEGIC MANAGEMENT OF SCALING UP HEALTHCARE INNOVATIONS THROUGH A SYSTEMS PERSPECTIVE	
Management routines/beliefs	**Description**
Design and implement healthcare innovations with scaling up in mind from the very beginning **[9]**.	Implementers frequently make the erroneous assumption that after a pilot study shows that healthcare innovation is practical, the new model will spread on its own. The limitations of such thinking are demonstrated by the innumerable pilot and experimental programs that have demonstrated spectacular performance with little significant large-scale impact. It is uncommon for advances in health and development to spread completely naturally [9]. The significance of inventing and testing innovations with the implications for scaling up in mind, instead of leaving them as an afterthought once a pilot project is finished, is a crucial lesson emphasized throughout scaling up literature. It is more likely for pilot or experimental projects to scale up if they consider how the invention will be used more widely from the beginning. The necessity of inventing and testing innovations with the implications for scaling up in mind, as opposed to considering them just after a pilot project is over, is a crucial lesson emphasized throughout scaling up literature. Scalability is more likely to occur in pilot or experimental initiatives that, from the outset, consider how the invention will be used more broadly. The explanation is

	straightforward and logical: when the effects of scaling up are considered during the planning and development of the healthcare innovation, they tend to be tailored into a specific policy, programmatic, economic, and sociocultural context and are therefore likely to be achievable [9].
Scaling up healthcare is a non-linear process	During scaling up, conditions that shape the scaling-up components and their interactions change, sometimes radically. The scaling-up process' multidimensional, non-linear, and context-dependent nature does not follow any simple rules or transparent sequential processes to achieve full-scale [9], [11], [16], [23]. There will be conflicts between the elements, such as trade-offs of priorities and unexpected challenges and changes. Management involves a continuous balancing act to resolve emerging conflicts.[9].
Scaling up management strives for balance among the elements of the system	The concept of scaling up is portrayed as an open system of elements that interact with one another [9]. When creating and putting into practice a scaling-up plan, one of the critical tasks is aiming for harmony or congruence among the system's components [9]. The scaling-up system's components engage in frequent and intricate interactions with one another [9]. Changes in one element's state can impact the other elements' states, which can have ramifications for the scaling-up process. Effective scaling-up management will reduce or avoid constraints and increase prospects for success.
Scaling up requires adoption from the community	No matter how effective the implementation strategy is, scaling up is not sustainable if the community (social system) or health system is resistant to healthcare innovation. To enhance uptake and sustain continuing implementation of healthcare innovations on a systems level, a systems approach of scaling up is required, considering the complex interplay between perceptions, worldviews, values, goals, and agendas, which can affect scaling up outcomes [6], [9], [23].
Scaling up inclusive healthcare is impact-driven rather than profit-driven	The primary objectives of the existence of social organizations are to fill an unmet social need. The main driver of scaling up a healthcare innovation aimed to serve the marginalized population is to maximize impact [9], [16], [23]. Trade-offs often exist in the scaling-up process between inclusiveness, profitability, and rate of scale [7]–[9], [16]. Constantly aligning scaling up goals towards the organization’s desired social impact will facilitate decision-makers in choosing where to invest their often-limited resources carefully. Decision-making must be based on the potential to maximize the impact with available resources and enable appropriate adaption of the healthcare innovation scaling-up approach (i.e., location of implementation, target population, value proposition, and delivery model design).
Three types of scaling up exist in healthcare innovations [9]	(1) Horizontal scaling up: Expanding the innovation to new geographic areas or population groups; (2) Vertical scaling up: investing the frequently lengthy time and energy required to win political support for scaling up and integrating the innovation into regular program operations; and (3) Diversification: Diversifying the innovation through additional testing of new components [9].
Healthcare system defined as a CAS	Health systems are described as dynamic, unpredictable, and ever-changing, with emerging social and cultural behavioural patterns representing a CAS [10], [11], [23]. Management must acknowledge the complexity of the healthcare system and accept the strong likelihood that scaling up will provide different (less than ideal) results than anticipated. Characteristics of CAS include path dependence, interdependent subsystems, non-linear outcomes, feedback loops, self-organization, changing context, emergent behaviour, and phase transition [23], [11].

5.5 CONCEPTUAL FRAMEWORK SUMMARY

In Chapter 5, the most relevant literature in the field of scaling up healthcare innovations, identified during the SLR, was discussed and translated into design requirements for the development of the management tool in this study.

After analysing the existing literature and categorizing the findings in the form of the systems thinking iceberg concept matrix, the researcher identified nine sustainable scaling-up outcomes, seven mental models for strategic management for scaling up, five structures representing management elements, and 31 patterns representing management routines required for sustainable scaling up goals. The identified management routines are integrated into the proposed management tool developed in the following chapter.

Table 5.5: Summary of the conceptual framework for strategic management of scaling up healthcare innovations

STRUCTURES AND PATTERNS OF ICEBERG MODEL		
STRATEGIC MANAGEMENT ELEMENTS AND ROUTINES		
ENVIRONMENT	**INCLUSIVE INNOVATION**	**IMPLEMENTATION ORGANIZATION**
• Identify factors in the environment that influence the implementation and operation of the healthcare model. • Continuous assessment of changes in the social, political, infrastructural, and cultural environment and circumstances as the process of scaling up evolves. • Community needs assessment	• Dissemination of healthcare innovation • Assess the inclusiveness of the innovation according to relevance and compatibility in the implementation area. • Tailor innovation to the context • Monitoring and sharing broad outcomes indicators • Identify the scope of social demands of the implementation area.	• Groundwork and preparation for implementation. • Provide strong leadership and governance over healthcare innovation • Active community engagement • Incorporating research into implementation • Providing internal systems/(infrastructural) support • Assess strengths and weaknesses to build capacity. • Make use of existing processes and structures • Scaling with “others.”

HEALTHCARE MODEL	STRATEGIC CHOICE AREAS
• Target Client Assessment. • Healthcare professional selection assessment and training. • Identify core elements for replicability. • Balance centralized (top-down communication) and decentralized (bottom-up communication) management approach. • Tailored support to overcome the initial problem of implementing and adopting the innovation to the local context. • Understanding of workplace context. • Strong communication channels and relationships with implementation organization. • Monitoring and sharing broad outcome indicators.	• Define the scope of social demands. • Incorporate phases in the scaling process. • Develop adoption mechanisms. • Develop a Support System. • Address both horizontal and vertical scaling up. • Combine centralized and decentralized approaches. • Assess the costs of the scaling-up process and identify possibilities for economies of scale.

Table 5.6: Mental models and events of strategic management of scaling up

EVENTS	MENTAL MODELS
DESIRED OUTCOMES OF SUSTAINABLE SCALING UP TOWARDS INCLUSIVE HEALTHCARE	*STRATEGIC MANAGEMENT OF SCALING UP HEALTHCARE INNOVATIONS THROUGH A SYSTEMS PERSPECTIVE*
• Community adoption of healthcare innovation. • Political support/ buy-in. • Institutional implementation capacity. • System level embeddedness. • Transferable in other contexts. • Stakeholders' buy-in/ perceived need. • Evidence for impact on a target outcome. • Community stakeholder embeddedness. • Adaptability and flexibility in planning and implementation.	• Design and implement healthcare innovations with scaling up in mind from the very beginning. • Scaling up healthcare is a non-linear process. • Scaling up requires adoption from the community. • Scaling up inclusive healthcare is impact-driven rather than profit-driven • Three types of scaling up exist in healthcare innovations. • The healthcare system is defined as a CAS.

5.6 CHAPTER 5: CONCLUSION

The essential components of conceptual frameworks are defined in Chapter 5. The CLR and SLR knowledge bases are used to translate essential concepts necessary for a systems viewpoint for strategic planning and management of scaling up health service innovations into design requirements for a management tool.

Chapter 5 addresses the following DSR progression checklist items as specified by Hevner and Chatterjee [30] and illustrated in Section 2.5, Table 2.1.

Table 5.7: DSR Progression Checklist [30] **- Item 1, 3, 4**

NUM	QUESTION(S)	RESPONSE
1	- What are the design requirements?	- Sixteen design requirements were proposed as either functional requirements, user requirements, design requirements, boundary conditions, and attention points.
3	- What design processes (Search heuristics) will be used to build the artifact?	- The Design Science Research Methodology (DSRM) proposed by Peffers [2] was adopted for this study. A conceptual and Systematic literature review was conducted to build a solid knowledge base for this study. The data extracted from the literature was translated into design requirements based on Van Aken and Barends' [46] recommendations.
4	- How are the artifact and the design processes grounded by the knowledge based	- The design process is based on the DSRM process, which produces an artifact as the final output of the process. The mental models, management elements, and routines used throughout the tool are based on the data extracted from the CLR and SLR and their application within strategic planning and management of scaling up health service innovations.
	- What, if any, theories support the artifact design and the design process?	- The logic behind the artifact is based on the iceberg model, which is rooted in organizational management and systems science, illustrating how management and policy actions often manifest in outcomes.

Chapter 6

TOWARDS A MANAGEMENT TOOL FOR SCALING-UP INCLUSIVE HEALTH SERVICE INNOVATIONS

Chapter 6 key objectives:

- Develop preliminary management tool.
- Verify preliminary management tool with design requirements.
- Discuss rational used through the development process.

6.1 PRELIMINARY MANAGEMENT TOOL

The design requirements outlined in chapter 5 were adhered to, to create a framework for managing the scaling up of healthcare innovations. Scaling up management concepts (structures), management routines (patterns), mental models, and ideal scaling-up outcomes (events) were all implemented to develop a preliminary management tool.

The management tool is designed by following the structure of the systems thinking iceberg model. Thus, following the iceberg model, the levels of the management tool are interconnected. For instance, how the system is structured is determined by the mental models of key stakeholders, which produce systems patterns that eventually result in system events [3].

6.1.1 MENTAL MODELS FOR STRATEGIC MANAGEMENT OF SCALING UP HEALTHCARE INNOVATIONS

The mental models of the management tool represent the assumptions, beliefs, and values that shape and perpetuate the strategic approach to scaling up healthcare innovations. The mental models are a collection of critical lessons from scaling-up approaches in healthcare highlighted throughout the literature. The mental models of system stakeholders often differ, which can cause conflict in objectives and decision-making, especially when unexpected challenges emerge in the scaling-up process [3]. The management tool's components (from mental models to structures and patterns) interact and are interdependent. Changes in one mechanism in the system affect the other mechanisms and thus affect the scaling-up approach as a whole.

The mental models provide a guideline that could serve as a lens to understand the scaling-up process through a systems perspective. The lens reflects the complexity inherent in healthcare and the non-linear nature of the scaling-up process of healthcare innovations [10], [11], [23]. Many authors, including [9], [10], [23] agree that approaching scaling up through a systems perspective might

enhance strategic management approaches to embrace the complexity, expect the unexpected, and incorporate adaptability and flexibility in the design and implementation process [9], [11].

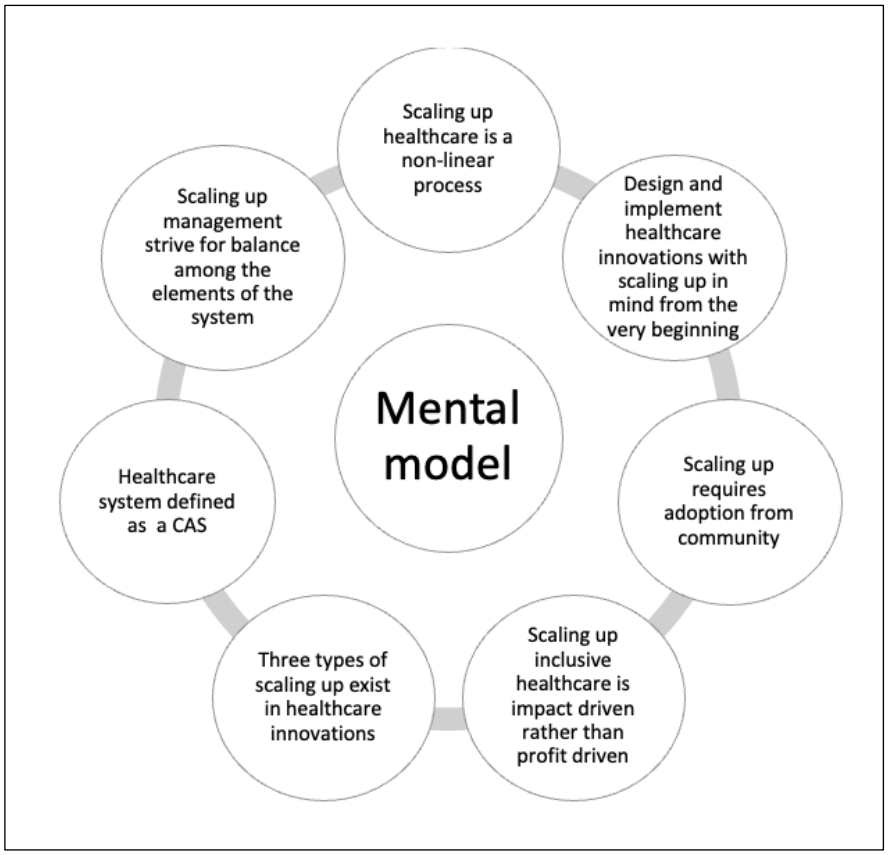


Figure 6.1: Systems iceberg mental model of scaling up

6.1.2 Outcomes of sustainable scaling up (Events)

The ideal outcomes of sustainable scaling up represent the systems' iceberg' *events.'* The characteristics of sustainable scaling-up outcomes highlighted by [6] were used for the events section of the iceberg. The events section presents a broad vision of what the outcomes of sustainable scaling up would look like at a systemic level to compare the results of scaling-up attempts and align decisions according to the desired outcomes or change. As mentioned before, the mechanisms in the management tool engage in complex interactions with one another, where changes in one element can affect the other elements. The outcomes of sustainable scaling up are interconnected and interdependent with each other. Failure to accommodate one element could influence the actual outcomes of scaling up. Strategic management must strive to achieve balance among the desired outcomes and thus continuously review and compare the outcomes of their scaling-up attempts to determine where more/less attention is needed.

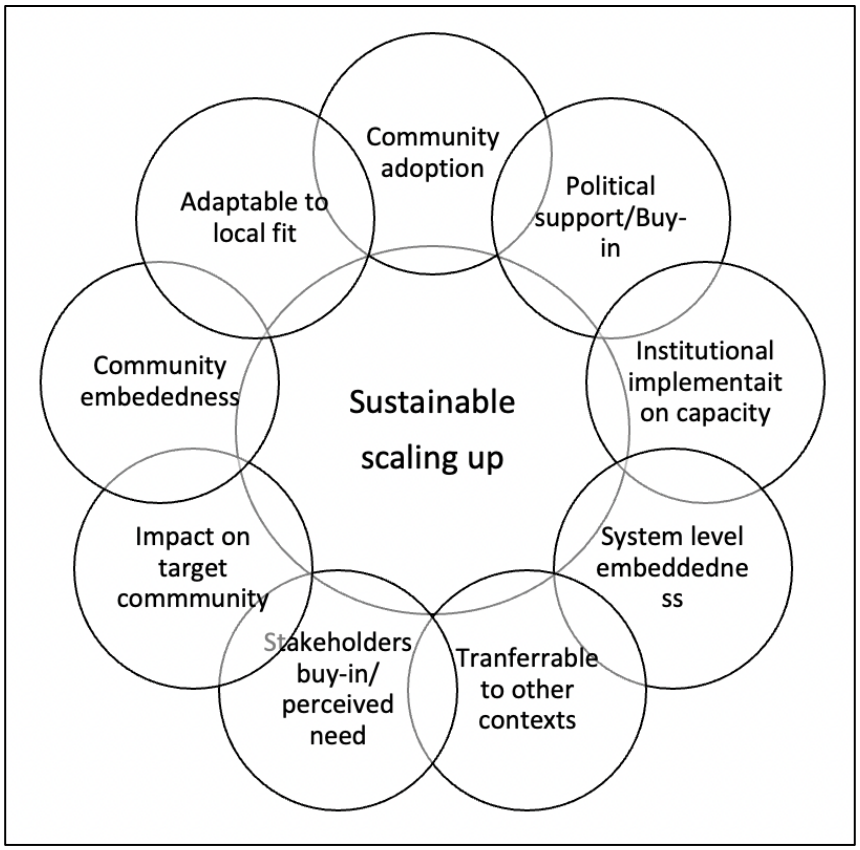


Figure 6.2: Systems iceberg events of sustainable scaling up

6.1.3 STRATEGIC MANAGEMENT ELEMENTS (STRUCTURES)

The scaling-up elements represented in the ExpandNet/WHO framework [9] for scaling up health service innovations were adapted and used as the *'structures'* in the iceberg model for the management tool. As indicated by the ExpandNet/WHO framework, scaling up involves an "open system" of connected components [7]–[9]. Scaling up is not merely a technological and managerial endeavour unaffected by outside variables, as shown by an open-systems perspective. The effectiveness of scaling up initiatives is significantly impacted by environmental factors such as persistent gender imbalances, poverty in a country, the efficiency of the national health system, its bureaucratic systems, and political influences [7].

The critical elements in the open-system perspective are: the environment (social, political, infrastructural, and cultural), the healthcare model, scaling up strategy, implementation organization, and inclusive innovation. Changes in one element can impact the other elements, which can have repercussions for the scaling-up process [9]. Strategic planning and scaling-up management strongly emphasize working to maintain equilibrium among the various interrelated elements while taking into account potential conflicts, ambiguities, failures, and instances of luck [7]–[9]. The model suggests that the system structure generates the patterns (management routines), eventually leading to the event (outcomes of scaling up) [3].

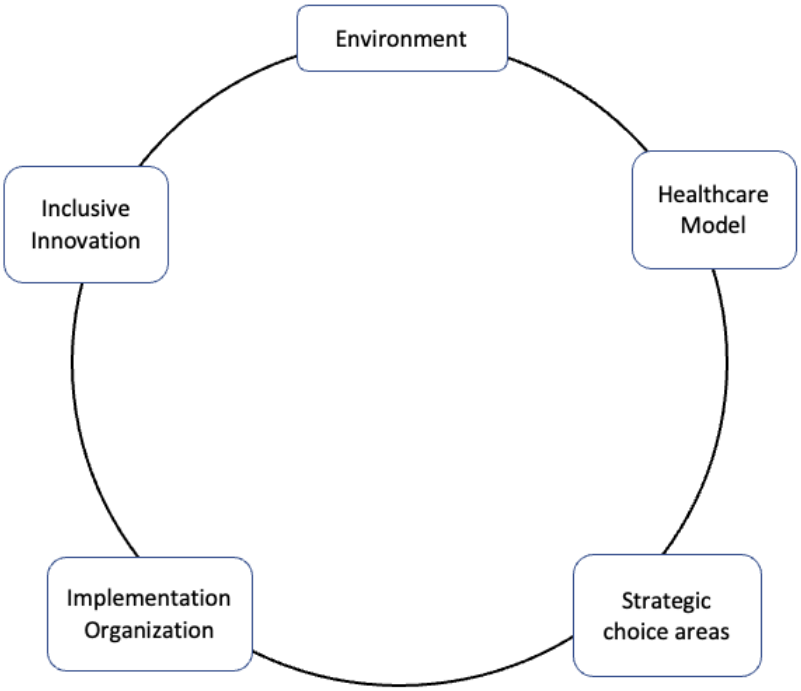


Figure 6.3: Systems iceberg structure of scaling up health service innovations

6.1.4 MANAGEMENT ROUTINES (PATTERNS)

The management procedures represent the iceberg model's '*patterns.*' Events and patterns are produced by the interaction between the mental models and system structures [3]. Management might make event-driven strategic decisions that may not necessarily provide a comprehensive view of the particular decision if it merely focuses on isolated events [3]. Implementers might see, for instance, that, based on patient numbers, the healthcare innovation in one place is not as financially viable as anticipated compared to other implementation sites. It could seem rational to move the innovation to a different area and avoid the underserved areas by focusing on a different market. However, it may not be possible to fully understand how and why the community seems resistant to using the innovation without knowing how various factors interacting in the scaling-up process affect the system.

The literature on scaling up healthcare innovations shows a paradigm shift away from identifying specific causes and effects in favour of comprehending the plethora of system-wide elements that affect results [9], [11], [23].

By enabling more information about how and why the events occurred, the management tool created aims to comprehend various healthcare systems levels better. The management routines were extracted from the literature during the SLR. The routine are listed under each structure element represents crucial steps that must be taken to achieve sustainable scaling-up outcomes (events), and they are grounded in the tool's mental models.

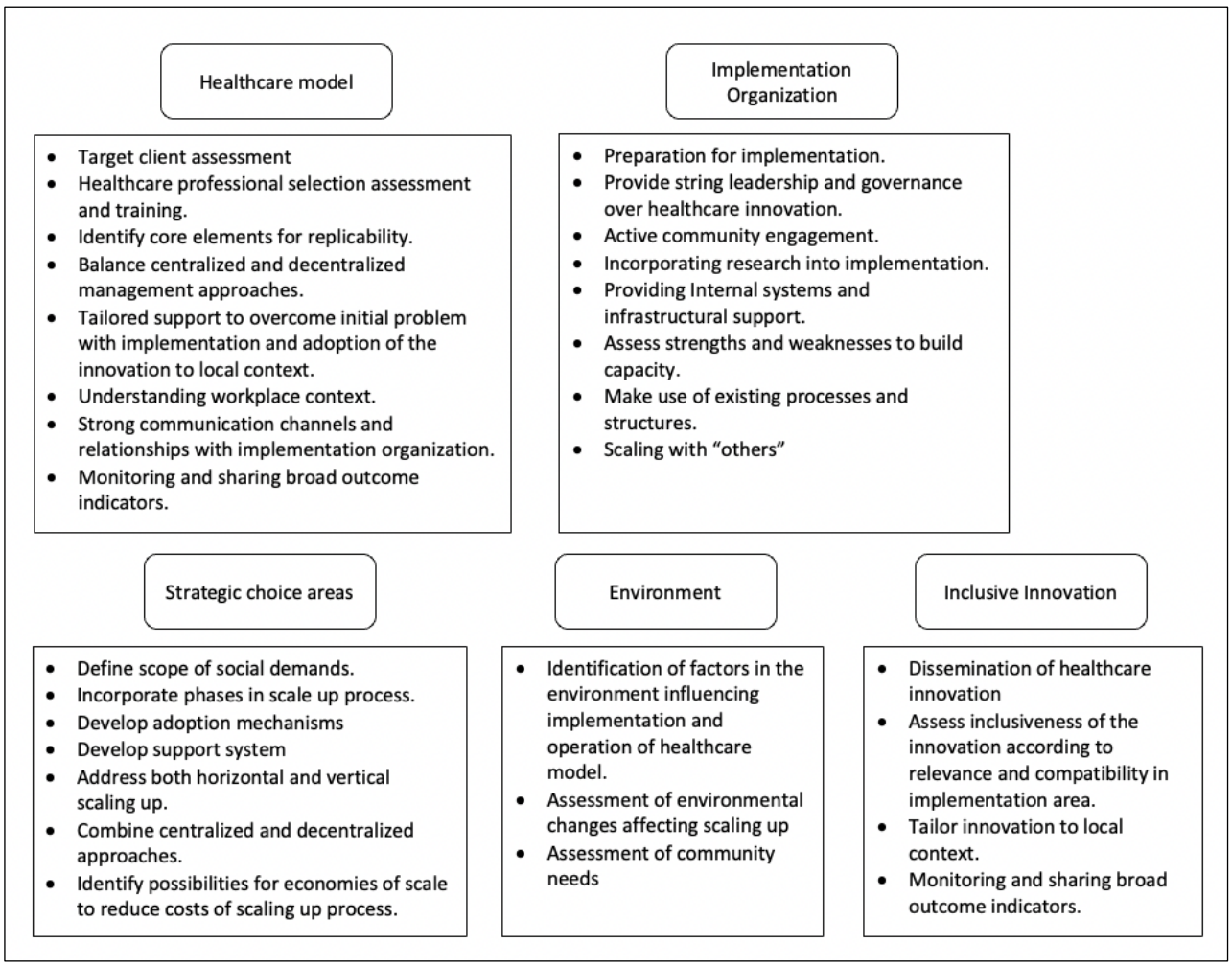
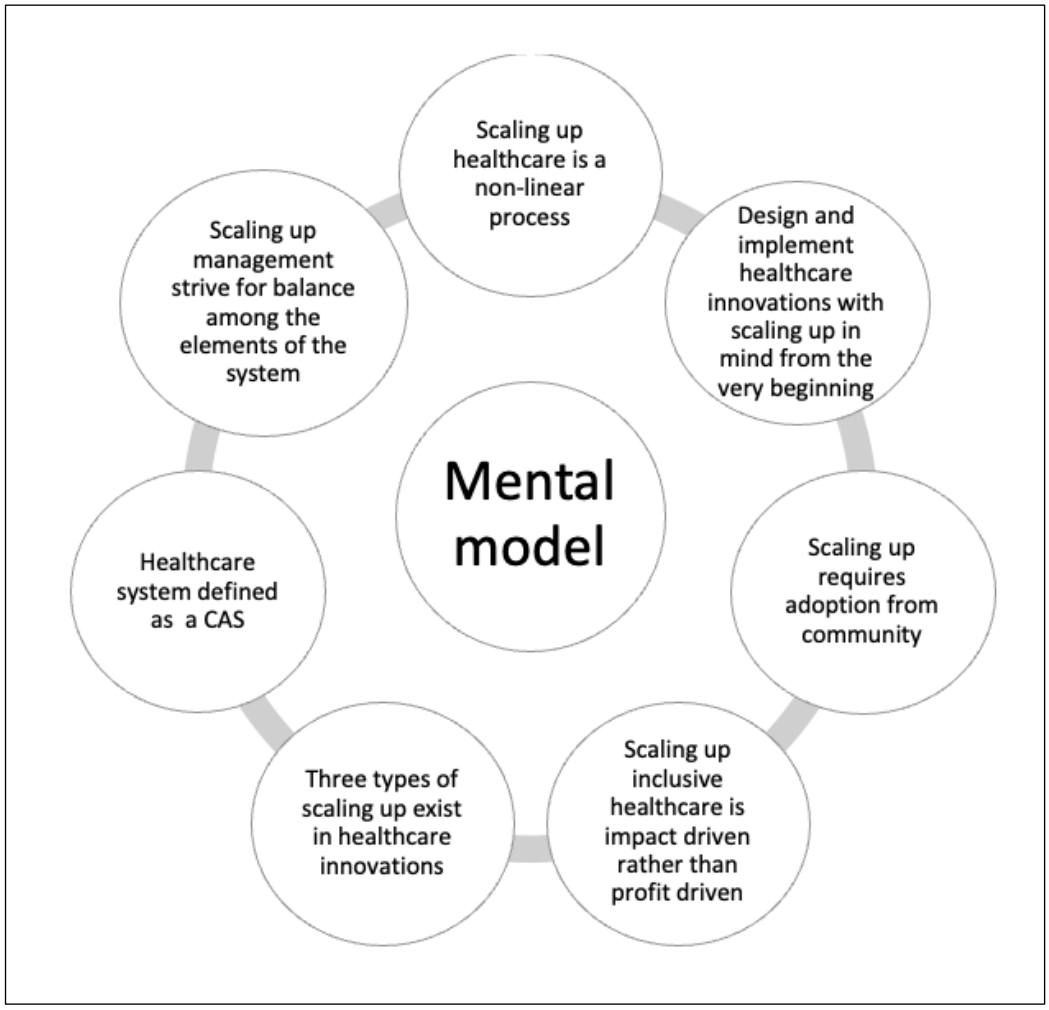


Figure 6.4: Systems iceberg patterns - management routines

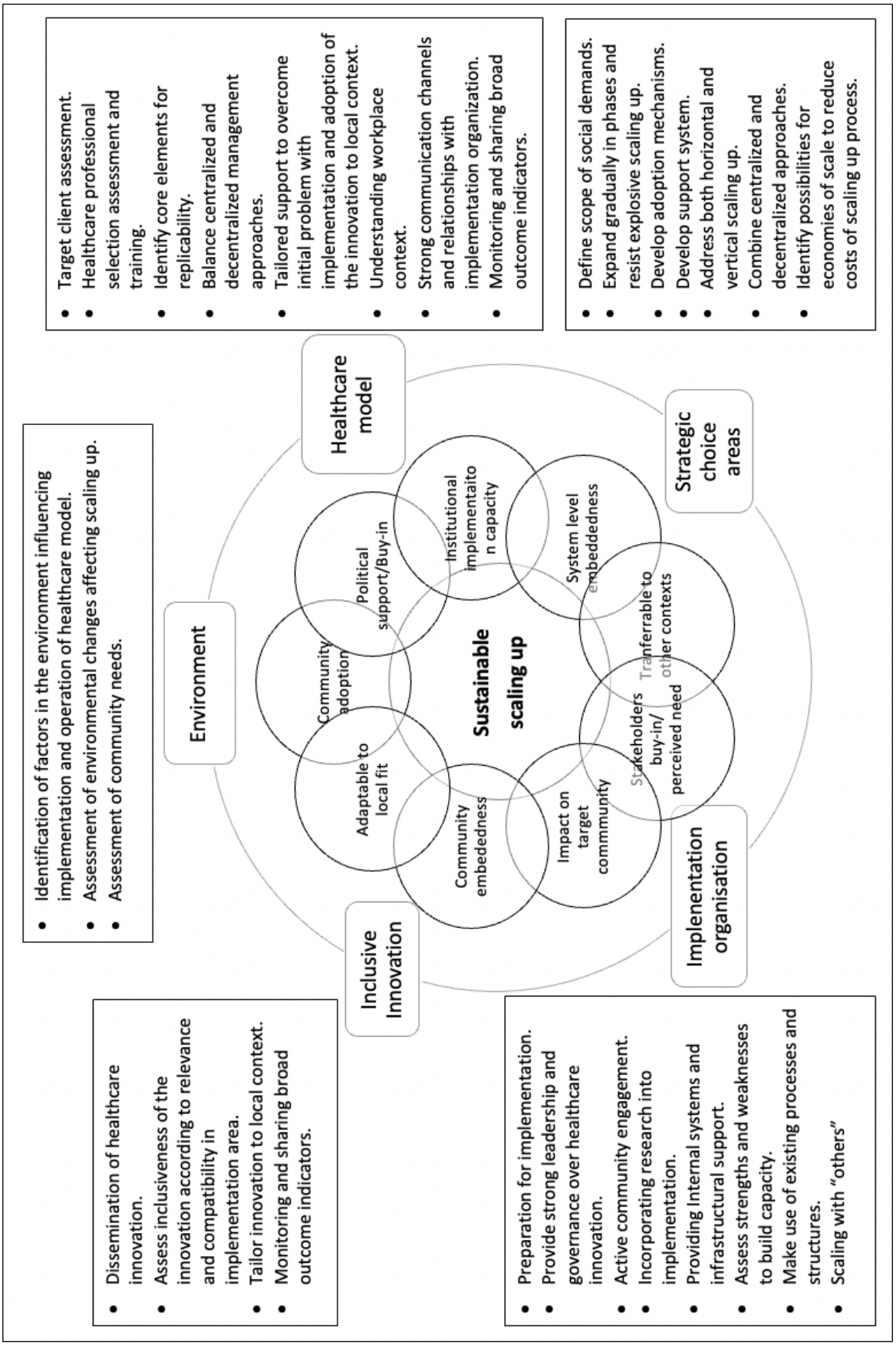
6.1.5 PRELIMINARY MANAGEMENT TOOL

The preliminary management tool is presented below together with the recommended mental models.

6.1.5.1 PRELIMINARY MANAGEMENT TOOL – CANVAS 1



6.1.5.2 PRELIMINARY MANAGEMENT TOOL – CANVAS 2



6.2 PRELIMINARY MANAGEMENT TOOL VERIFICATION

Several requirements for a framework that would be utilized as a management tool for scaling up inclusive healthcare innovations were specified in Section 5.2. These needs, which served as recommendations for creating the preliminary framework and management tool, were based on data acquired throughout the conceptual and systematic literature research in Chapters 3 and 4, respectively. Following that, the different requirements were classified as either functional requirements (FR), user requirements (UR), design requirements (DR), boundary conditions (BC), or attention points (AP).

The preliminary tool is initially evaluated using these requirements to ensure that it has considered the many factors outlined in the literature that are essential for the sustainable scaling up of health service innovations.

Table 6.1: Preliminary Tool Validation

Code	Description	Verify	Management tool aspect
FR1	The tool must represent an "open-systems perspective" of interrelated elements. Strategic planning and management efforts are dynamic and ensure balance among the interrelated elements considering many tensions, ambiguities, setbacks, and instances of luck that can and will arise.	√	The tool uses the systems iceberg model to represent various systems levels of the health system.
FR2	The tool must provide a mental model of how scaling up healthcare innovations could be aligned with inclusive development goals.	√	The tool provides mental models to conceptualize scaling up objectives and expectations.
FR3	The tool must reflect the inherent complexity of scaling healthcare innovations in various contexts.	√	The tool reflects the interdependencies and interconnectedness of the various systems level, elements, and routines toward scaling up outcomes.
FR4	The tool must assist managers in aligning strategic decision-making with their organization's social goals, vision, commitment, and stakeholder needs.	√	The tool incorporates mental models as a foundation for decision-making and illustrates how structures and patterns are formed accordingly to align strategic decisions towards desired outcomes of scaling up.
FR5	The tool must represent a patient-orientated model of inclusive healthcare, which incorporate flexibility and adaptability in the implementation of scale-up to ensure local fit and community adoption in various implementation sites.	√	The tool highlights the complexity inherent in the process of scaling up. The mental models illustrate non-linear outcomes as a characteristic of scaling up, and the structures and patterns are suggested flexibility and continuous assessment for possible adaptation to enhance local fit, community adoption, and systems embeddedness.
FR6	The tool must indicate the various phases of scale-up.	√	The scale-up strategy indicates that scale-up occurs in phases and that the

			various phases require different management approaches.
UR1	The tool must be easily understandable and interpretable, and comprehensive.	√	Concise wording is used, and explanations are given for each routine.
UR2	The tool must be dynamic and applicable in different situations.	√	The tool is presented as a dynamic representation of elements interacting across various levels of the systems perspective of scaling up. For each unique implementation site, the application of the tool will be unique.
UR3	The tool must be generalizable for any inclusive healthcare innovation.	√	The framework is generalizable and applicable to all healthcare innovations wanting to scale up.
DR1	The tool must be able to communicate knowledge visually.	√	The tool is easy to understand visually.
DR2	The tool must be neat and brief, only highlighting key elements.	√	The tool is minimalistic and neat and only highlight key element.
DR3	The tool must reflect a systems perspective or holistic representation of managing the scaling up of inclusive healthcare innovations.	√	The tool reflects the dynamic, interconnected, and interdependent nature of elements affecting the scaling-up outcomes across various systems levels to illustrate a holistic perspective of scaling-up management.
BR1	The tool must be relevant to implementing healthcare innovations.	√	The tool is relevant to healthcare innovation implementation.
BR2	The tool must encourage a dynamic management approach and not a linear "one-size fits" approach.	√	The tool is presented as a dynamic representation of elements interacting across various levels of the systems perspective of scaling up. For each unique implementation site, the application of the tool will be unique.
AP1	The tool must indicate leverage points to use/build organizational strengths to mitigate weaknesses or challenges.	√	The tool illustrates the idea that small actions can have a significant impact on scaling up outcomes.
AP2	The tool must demonstrate the need to acknowledge the healthcare system's inherent complexity to achieve social goals.	√	The tool illustrated the inherent complexity of scaling up healthcare innovations. The framework structure, patterns, and mental models are rounded in acknowledging the health system as a CAS.

6.3 CHAPTER 6:CONCLUSION

The rationale employed by the researcher to design the management tool is presented carefully in Chapter 6. The preliminary management tool is introduced, and its principles are validated by comparing it to the design requirements provided in Chapter 5.

Chapter 6 addresses the following DSR progression checklist items as specified by Hevner and Chatterjee [30] and illustrated in Section 2.5, Table 2.1.

Table 6.2: DSR Progression Checklist [30] **- Item 2, 4, 5**

NUM	QUESTION(S)	RESPONSE
2	- What is the artifact? - How is the artifact represented?	- The artifact is a management tool that can be used by implementers and practitioners of health service innovations in marginalized communities to guide the process of scaling up to enhance outcomes toward sustainable inclusivity. - The final management tool consists of two canvases. The first canvas illustrates a rich picture in the form of a mental model for managing the scaling up of health service innovation in marginalized communities. The second canvas illustrates a rich picture of sustainable outcomes of inclusive healthcare and the management elements and routines that could be implemented to enhance scaling up outcomes towards the desired social goals.
4	- How are the artifact and the design processes grounded by the knowledge based - What, if any, theories support the artifact design and the design process?	- The design process is based on the DSRM process, which produces an artifact as the final output of the process. The mental models, management elements, and routines used throughout the tool are based on the data extracted from the CLR and SLR and their application within strategic planning and management of scaling up health service innovations. - The logic behind the artifact is based on the iceberg model, which is rooted in organizational management and systems science, illustrating how management and policy actions often manifest in outcomes.
5	- What evaluations are performed during the internal design cycles?	- The first evaluation method verified the critical aspects of the tool based on the design requirements based on existing literature.

Chapter 7

DEMONSTRATION AND EVALUATION: SEMI-STRUCTURED INTERVIEWS

Chapter 7 Objectives:

- Discuss semi-structured interview process followed.
- Analyze data extracted from the interviews.
- Evaluate and present the findings.
- Discuss changes to preliminary management tool based on the findings.
- Update framework based on findings.

7.1 SEMI-STRUCTURED INTERVIEWS AND PROCESS FOLLOWED

Chapter 7 presents the second stage of the evaluation procedure. The first evaluation procedure in chapter 6 discusses the basic framework's validation based on design requirements identified in the literature. Chapter 7 details the researcher's demonstration and assessment method using semi-structured interviews to validate, discuss, and obtain more information for tool improvement. The data gathered from the semi-structured interviews are analyzed, and the findings are presented. The management tool is then updated and improved according to the results.

The explorative character of semi-structured interviews allowed the researcher to use follow-up questions to prompt the subject to share more information. The interview protocol and procedure were created by following the six-stage approach suggested by Rabionet [45]. The various stages presented in this study are depicted in Table 7.1 below.

Table 7.1: Six-Stage interview approach by Rabionet [45]

Stage	In this study
Stage 1: Selecting the kind of interview	Semi-structured
Stage 2: Establishing the ethical guidelines	Ethical clearance approved by REC, Interview consent form
Stage 3: Crafting the interview protocol	Section 7.2
Stage 4: Conducting and recording the interview	Section 7.3
Stage 5: Analysing the summarising the interview	Not included in report
Stage 6: Reporting the findings	Section 7.5

7.2 INTERVIEW PROTOCOL

The two primary parts of stage 3 (Crafting the interview protocol) include (1) explaining the study's context and (2) conducting interview questions. Each interviewee received a quick introduction via a presentation before the interview process began. This introduction explained the study's problem statement and the reason for the interview and presented the preliminary management tool that would be reviewed. Aside from the presentation, additional background information was provided in text via the consent form, which the interviewee had to read and sign before the interview. After the introduction and background of the study, the participants were explicitly questioned to obtain responses for evaluating the preliminary management tool.

The preliminary management tool was developed using the systems thinking iceberg model [3] as a framework. Within the tool, there are seven mental model elements, five management elements (structure), thirty-one management routines (*iceberg patterns*), and nine sustainable scaling-up outcomes (*iceberg events*) that are all interconnected and interrelated to each other.

The interview process consisted of framework evaluation exercises regarding the concepts used to build the tool and specific semi-structured interview questions based on the interviewee's expertise to gain further insights.

An impact-effort analysis (framework ranking exercise) formed part of the evaluation process to gain quantitative data regarding the validity and efficacy of the proposed management routines included in the tool. The researcher discussed each management routine in simple terms and asked the interviewee to rate the routines according to their opinion regarding the positive impact on sustainable scaling-up objectives and the degree of effort required to implement it. The rating ranged between one and five, with one being the lowest potential positive impact/effort required and five being the highest possible positive impact/ effort required. The terms "*impact"* and "*effort"* were defined as follows before beginning the exercise:

- *Impact:* The potential positive impact that the specific management routine can have on the desired outcomes of scaling up (i.e., *iceberg events*).
- *Effort*: The number of resources (financial, human, physical), time, and planning required to implement the specific management routine.

Considering the type of interviews used, being semi-structured, the researcher could ask follow-up questions when needed or ask the interviewees to give their rationale behind each rating to gain further insights.

Furthermore, the researcher developed semi-structured interview questions to be asked following the impact-effort exercise to gain additional insights into the management elements (iceberg structure), management paradigm (iceberg mental models), desired outcomes of sustainable scaling up (iceberg events), and general questions about the implementation and scaling up of inclusive healthcare innovations.

The interview slideshow and questions are given in Appendix C of this thesis.

7.3 CONDUCTING THE INTERVIEW

The interviews were conducted using a standardised approach, as shown in Figure 7.1 and briefly detailed below. To save time, all interviews were conducted utilizing MS Teams.

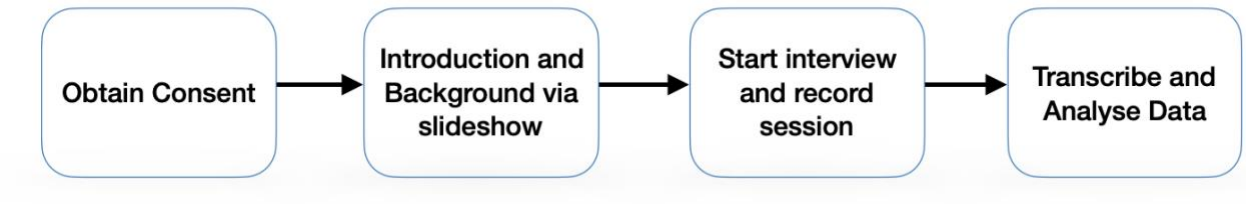


Figure 7.1: Interview process

Step 1: Consent was obtained from each participant by sending the consent form via email to be signed and sent back. The participant was encouraged to ask any necessary questions before signing the consent form. The consent form is attached in Appendix A. After consent was granted from the participant, the appointment was scheduled for the interview.

Step 2: At the start of the interview, a brief introduction and background regarding the study were presented to the interviewee using a PowerPoint presentation slideshow.

Step 3: After the introduction and background, the participant was asked to complete the impact-effort analysis of each management routine and answer the formulated questions. The interview was recorded using MS Teams for analysis. The interviewee was encouraged to ask questions or provide constructive criticism or feedback on any element of the management tool during the interview.

Step 4: After the interviews, the researcher made notes on the data gathered from the participants. The researcher used the MS Teams recording to revise and transcribe the data from the interview into Microsoft Excel, where the data were coded and analysed. The data analysis process is discussed in the following section.

This study included nine participants. Due to the multi-disciplinary and complex nature of this research topic, the researcher interviewed a diverse group of participants to validate the aspects of the preliminary management tool from various disciplinary lenses. Each participant was individually selected based on their expertise in their respective field. Based on the multi-disciplinary nature of the participants, the interviews were done in three categories: healthcare implementation experts, social healthcare experts, and healthcare professional experts. The researcher decided only to include four out of nine participants (the healthcare implementation experts) to do the impact-effort analysis because of the industry-specific background needed regarding implementing healthcare innovations to provide accurate feedback on the management tool. The four healthcare professional experts and one social healthcare expert were asked separate interview questions related to their expertise. The specific interview questions asked are illustrated in Appendix A. The profiles of each participant are given in Table 7.2 below.

Table 7.2: Participant Profiles

PARTICIPANT	NATIONALITY	VOCATION	CONTRIBUTING AREA OF EXPERTISE	CONTRIBUTION TO INTERVIEW
A	South Africa	Operational manager	Healthcare implementation expert	Impact-effort analysis and interview questions
B	South Africa	CEO	Healthcare implementation expert	Impact-effort analysis and interview questions
C	South Africa	General manager	Healthcare implementation expert	Impact-effort analysis and interview questions
D	South Africa	CEO	Healthcare implementation expert	Impact-effort analysis and interview questions
E	South Africa	Scholar	Social healthcare expert	Interview questions
F	South Africa	Medical professional	Healthcare professional experts (inclusive healthcare innovations, public)	Interview questions
G	South Africa	Medical professional	Healthcare professional experts (inclusive healthcare innovations, public)	Interview questions
H	South Africa	Medical professional	Healthcare professional experts (public, private)	Interview questions
I	South Africa	Medical professional	Healthcare professional experts (public, private)	Interview questions

7.4 Interview Data Analysis

The following sections describe the data analysis process. The data gathered from the interview included both quantitative and qualitative data. A similar process as the one used by Venter [29] in his thesis was used to analyse interview data and is briefly discussed in this section.

7.4.1 Quantitative Data Analysis

The quantitative data refers to the results of the impact-effort ranking exercise for the proposed management routines included in the preliminary management tool. The rating, which was from one to five, were all transcribed into Microsoft Excel, whereafter, the average rating of each management routine was calculated and plotted on an impact-effort matrix. According to [112], an impact-effort analysis is a common practice among product developers and project managers to identify the most critical processes and determine where to concentrate the most effort and resources.

The matrix is divided into four quadrants and illustrated in Figure 7.2 below [112]:

- Quick wins (High Impact, Low Effort)
- Major Projects (High Impact, High Effort)

- Fill-ins (Low Impact, Low Effort)
- Thankless Tasks (Low Impact, High Effort)

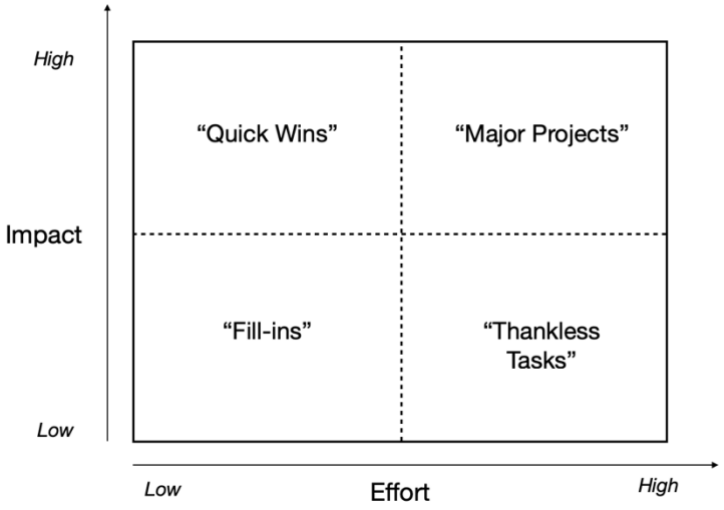


Figure 7.2: Impact-Effort Matrix

Management routines with ratings in the "Quick Wins" and "Major Projects" quadrants are considered the most critical to implement in the management approach to scaling up inclusive healthcare innovations. Routines in the "Fill-ins" quadrant are optional requirements that may or may not have a significant beneficial impact, but they require little work to implement for experiential purposes. The "thankless tasks" quadrant is for routines with little applicability and requiring a high level of work to implement. Based on further insights from interview data, these routines were re-evaluated and re-considered for inclusion in the management tool.

7.4.2 Qualitative Data Analysis

The qualitative data includes the semi-structured interview questions and insights or rationale behind the impact-efforts rating exercise. The researcher followed Creswell's six-step process [113] for qualitative data analysis to ensure a well-structured analysis and presentation of the data.

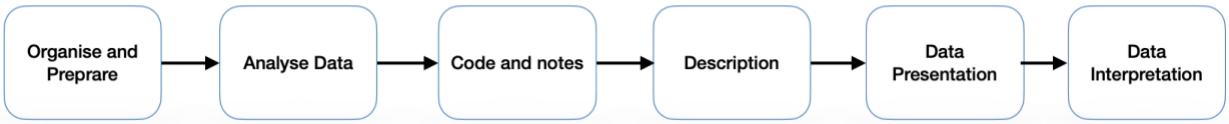


Figure 7.3: Qualitative Data Analysis Process

First, the transcripts and recordings of the interview data were revised, and notes were made. The relevant data regarding the management routines were then organized under each management element (*iceberg structure*) and analysed during step 2. Step 3 included coding the data in validated concepts, missing concepts, disagreements, and additional insights.

Coding can be performed cyclically to organize and refine core features of the qualitative data [114]. Similarly to Venter [29], this study incorporated two coding cycles to analyze the interview data. The first coding cycle was used to validate the concepts regarding the critical management elements *(iceberg structure)*, scaling up management paradigm *(iceberg mental models)*, and desired outcomes of scaling up *(iceberg events)* group sets of the management tool and identify disagreements, missing concepts, and additional insights. The second cycle was used to validate concepts, identify disagreements, and provide additional insights regarding the management routine *(iceberg patterns)* by analysing comments and rationale behind the effort-impact ratings and other insights during each participant's semi-structured interview and discussion.

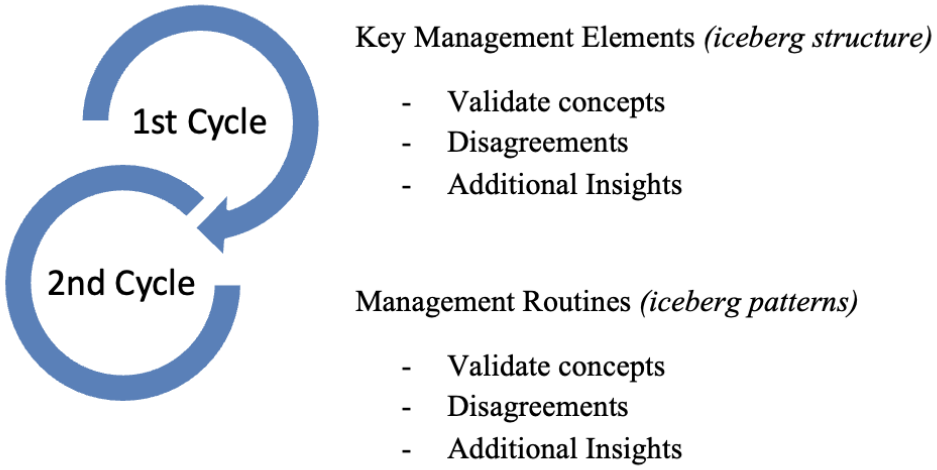


Figure 7.4: Coding Cycles for Qualitative Data Analysis

7.5 Results and Conclusion

7.5.1 Quantitative Analysis Results

After analysis of the impact-effort results, the average for each management routine was calculated and plotted on an impact-effort matrix. Figure 7.5 depicts thirty-one recommended management procedures plotted within the four impact-effort quadrants.

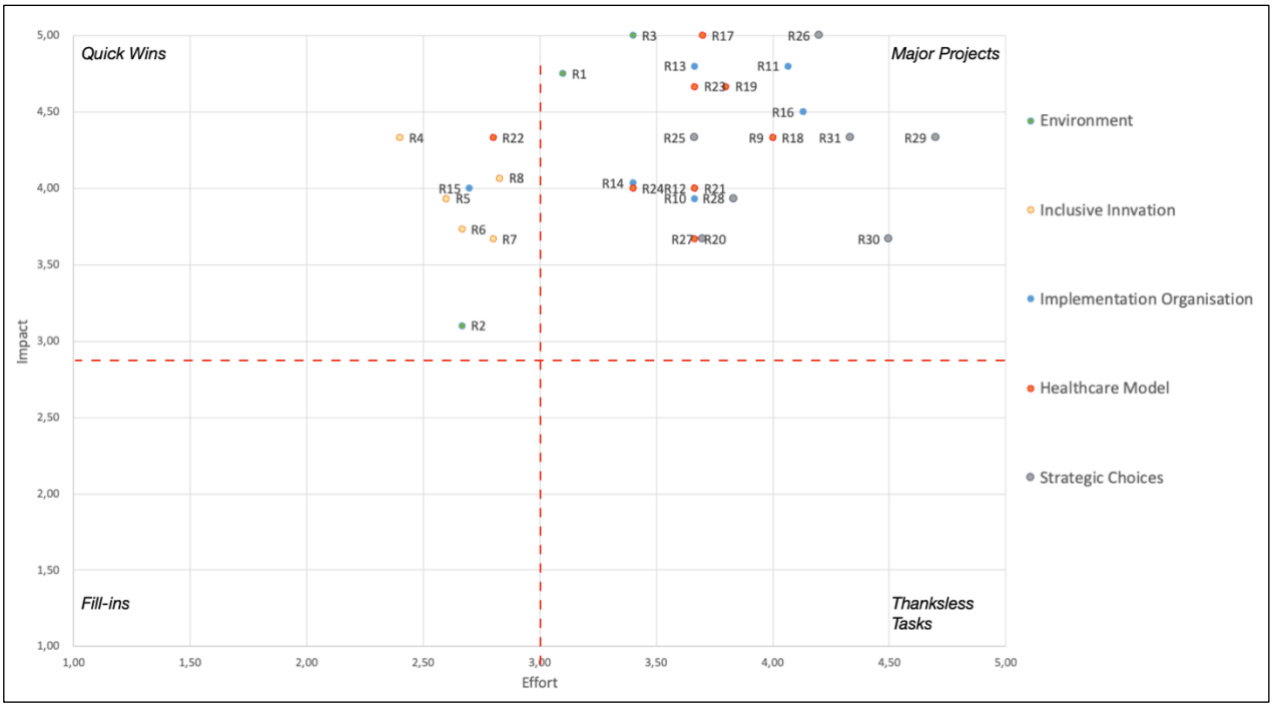


Figure 7.5: Impact-Effort Matrix of Preliminary Management Routines

Table 7.3: Reference codes for routines on Impact-Effort matrix

"MAJOR PROJECTS"			
ENVIRONMENT *(SOCIAL, POLITICAL, CULTURAL, INFRASTRUCTURAL)*			
R1	Identify factors in the environment that influence the implementation and operation of the healthcare model.	**R3**	Community Needs Assessment
HEALTHCARE MODEL			
R17	Assessment of Target market (Clients)	**R20**	Balance centralized (top-down communication) and decentralized (bottom-up communication) management approach.
R18	Healthcare professional selection assessment and training	**R21**	Tailored support to overcome the initial problem with implementation and adoption of the innovation in the local context
R19	Identify core elements for replicability	**R23**	Strong communication channels and relationships with implementation organization.
INCLUSIVE INNOVATION *(SOCIAL IMPACT)*		**R24**	Monitoring and sharing broad outcome indicators
IMPLEMENTATION ORGANIZATION		**STRATEGIC CHOICES FOR SCALING UP**	

R9	Groundwork and preparation for implementation.	**R25**	Define the scope of social demands in the implementation area.
R10	Provide strong leadership and governance over healthcare innovation	**R26**	Incorporate phases in the scale-up process (set-up, develop the scalable unit, a test of scale up. go to full scale)
R11	Active community engagement	**R27**	Develop adoption mechanisms (leadership, culture, communication, policy, and ideas for improvement)
R12	Incorporating research into implementation.	**R28**	Develop Support System
R13	Providing Internal Systems/(Infrastructural) Support	**R29**	Address both horizontal and vertical scaling up
R14	Assess strengths and weaknesses to build capacity.	**R30**	Combine centralized and decentralized approaches
R16	Scaling with "others."	**R31**	Assess the costs of the scaling-up process and identify possibilities for economies of scale

"QUICK WINS"			
ENVIRONMENT ***(SOCIAL, POLITICAL, CULTURAL, INFRASTRUCTURAL)***		**INCLUSIVE INNOVATION** ***(SOCIAL IMPACT)***	
R2	Continuous assessment of environmental changes as the process of scaling up evolves.	**R4**	Identify the scope of social demand (bigger picture)
IMPLEMENTATION ORGANIZATION		**R5**	Assess the inclusiveness of the innovation according to relevance, relative advantage, and compatibility in the implementation area.
R15	Make use of existing processes and structures	**R6**	Tailor innovation to the context
HEALTHCARE MODEL		**R7**	Monitoring and sharing broad outcomes indicators
R22	Understanding of workplace context	**R8**	Dissemination of healthcare innovation

As illustrated in Figure 7.5, all the proposed routines fell in the "Major Projects" or "Quick Wins" quadrant, confirming the relevance of each routine the researcher identified in the literature. Twenty-three out of thirty-one routines occurred in the "Major Projects," with the remaining eight in the "Quick Wins" quadrant. The results indicate that all the routines contribute to successful scaling up, and the majority require extensive and continuous effort to implement. It is difficult to assign accurate quantitative values to management routines. However, the impact-effort analysis identified the "outlier routines," which indicates the most prominent elements management should focus on during scaling up Table 7.4 shows the outlier routines of the study.

Table 7.4: Impact-Effort Outliers

Rating	Ref number
Major Project: Highest Effort (4.5-5)	R30, R29
Major Project: Highest Impact (4.5-5)	R1, R3, R11, R13, R16, R17, R19, R23, R26

"Quick Wins"

The routines that fell in the "Quick Wins" quadrant all had an effort score between 2,5 and 3, meaning these routines would still require moderate effort to implement. However, the necessary effort might decrease over time and often does not require extensive effort continuously.

All the routines identified under the "inclusive innovation" management element were considered moderate efforts. The results indicate that routines such as R4, R5, R6, R7, and R8 significantly impact the sustainable scaling up of healthcare innovation, especially regarding local fit and community embeddedness. These routines also contribute considerably to political–, and stakeholder advocacy. Evidence of positive outcome indicators, as identified in R7, could gain significant attraction from investors, donors, or the government to support the scaling up of the healthcare innovation because of its effectiveness and impact towards inclusive development.

Remaining vigilant by continuously assessing the environment for any drastic changes in the political, social, cultural, or infrastructural domain (R2) is a routine that stems from acknowledging the healthcare system as a CAS [11], [23]. The healthcare system is dynamic and is characterized by emergent behaviour, path dependence, feedback loops, and phase transitions [11], [23]. Small changes in one system element may drastically affect other elements or social behaviours. Acknowledging the inherent complexity in scaling up health service innovations might enable managers and decision-makers to leverage emerging opportunities resulting from environmental changes to benefit the scaling-up process.

Similar to the environmental factors, using existing structures and processes (R15) when scaling up could enable the organization to leverage existing systems such as transport, logistics, and information systems to enhance the effectiveness of scaling up. Another routine that could affect several other success factors is clearly understanding the workplace context in which healthcare professionals operate (R22). A good understanding of the workplace context could facilitate managers and decision-makers in strategic decisions such as adaptation to local fit, quality improvements, defining the scope of social demand, ensuring community embeddedness, and approaches for dissemination of healthcare innovation. Effective communication channels and good relationships between healthcare professionals and top management are effective methods to enhance the understanding of the workplace across various implementation sites.

"Major Projects"

The impact-effort analysis results indicate that all the routines in the "Major Project" quadrant are essential to sustainable scaling. Under the environment element, R1 and R3 showed significantly high impact ratings. The results are expected as the scaling-up literature emphasizes the importance of considering contextual variation in various implementation sites. The assessment of social, political, infrastructural, and cultural factors in the implementation site enables implementors to adapt the implementation approach to accommodate local fit and ensure community-, and system embeddedness. During the semi-structured interviews, multiple participants mentioned the significant effect of cultural and social norms when attempting to implement an innovation in these communities. A unique insight revealed through the interview discussions was that marginalized communities are often traditionally orientated with local authority figures such as a "king" or "chief" of the community. Community support, advocacy, and embeddedness rely heavily on permission granted from these authority figures. Since marginalized communities often suffer from being historically excluded, the community members also need and expect employment opportunities for locals rather than supporting outsiders doing business in their communities. Thus, implementers could benefit from identifying unique environmental factors in implementation sites to leverage opportunities for advocacy and adoption and avoid community resistance by assessing the community's specific needs before implementation. Community engagement (R11), groundwork and preparation (R9), incorporating research into implementation (R12), and identifying the scope of social demands (R4) are all routines that could enhance community adoption, stakeholder advocacy, and community embeddedness of the innovation.

Under the healthcare model elements, the routines "assessing the target market/clients" (R17) and "identifying core elements of replicability" (R19) had the highest impact score. Identifying the target market is essential because the whole business model will be developed around the target market. Participant A mentioned that private inclusive healthcare innovations often target *"employed but uninsured individuals."* Often the delivery models are designed to accommodate those willing to pay a small consolation fee for quality primary healthcare as an alternative to overburdened public healthcare facilities. Scaling up quality and affordable private healthcare services enables the millions of individuals without health insurance to have access to quality healthcare and reduce the burden on the already overburdened public healthcare institutions by redirecting a large section of the healthcare demand to alternative services.

As mentioned by participant A, *"defining the target market also allows the organization to illustrate the social impact created as a result of the organization's delivery model."* For example, the impact is twofold: first, previously unavailable services are made available to marginalized groups; second, redirecting a portion of healthcare demand to alternatives other than the public sector reduces the burden on the public sector and allows it to accommodate the poorest of the poor to use the existing free healthcare services. As a result of explicitly identifying the target market and how the healthcare innovation meets the requirements of these individuals or communities, the organization can identify societal needs while remaining focused on the inclusive objectives they aim to address.

Identifying the healthcare model's main factors of replicability (R19) is critical for horizontal scaling, which necessitates balancing the replicability and adaptability of organizational features to efficiently transfer innovation [1]. Internal systems, the technique of implementation, trademarks, and

established procedures for internal quality control are examples of replicable factors. Adaptable aspects such as presentation of the innovation, local operations, and emerging opportunities for expansion and investment may naturally occur as a result of indicating decentralized management approaches across a network of health service innovations.

A routine that came out as highly significant under the implementation organization aspect is the internal systems (infrastructure) (R13) provided by the implementation organization to the healthcare model. Participant A mentioned that the internal system serves as the healthcare model's “backbone.” The system allows for the organization of medical records and financial systems, the monitoring and evaluation of outcome indicators at multiple sites, and the inventory control of medical devices or medicine. During the interviews, participant B mentioned that *"one of the key lessons learned from scaling up experience was that the organization should have a well-developed internal system and infrastructure in place before considering large-scale implementation of the healthcare innovation."*.

Scaling up with “others” (R16) refers to collaborations during the scaling-up process. Participant C mentioned, "*Partnerships can greatly improve the effectiveness of operations or save expenses, especially if the parties have the same vision for social purposes*."

Another noteworthy practice is introducing phases into the scaling-up process (R26). Participant A stated during the interviews that *"scaling up too soon is a common mistake among healthcare implementers, which can lead to a costly and time-consuming procedure to correct."* Because different implementation sites reveal distinct scaling-up challenges, the first few scaling-up approaches should be considered opportunities for learning, refining, and improving the model. Given the importance of environmental factors in scaling up, implementers should be prepared to face unanticipated challenges. Incorporating learning and research into implementation (R12) during the early stages of scaling up would also enhance the process of identifying and improving the model's core competencies and replicability and adaptability features prior to large-scale implementation of the innovation.

Routines that stood out as requiring the most effort but significantly impacted long-term scaling up included addressing both horizontal and vertical scaling (R29) and merging centralized and decentralized approaches (R30). The process of increasing geographical reach through "replication" is known as horizontal scaling up. Vertical scaling is the government's formal endorsement of an idea at the national level, allowing the innovation to be institutionalized through national planning processes, policy changes, or legal action [9]. During the interviews, one participant mentioned that vertical scaling up could be difficult due to political constraints and challenges. Participant A mentioned that in her scaling-up experience, they tried for eight years to receive advocacy from the government to support their healthcare innovation’s scaling-up process and are still to this day in the process of convincing the government to work with them. Although government aid in scaling up is desirable, experts believe it can be difficult and time-consuming. Participant A mentioned, "*The government started to take us seriously only after we scaled up to about 100 clinics*. *When the network of health interventions is already integrated into the health system and has sufficient evidence of the positive impact, the government cannot ignore the initiative anymore."*

Integrating centralized and decentralized approaches (R30) is one of the most challenging routines to perform, but it substantially contributes to the success of healthcare innovation. A decentralized

strategy can be implemented while incorporating the main level to ensure that the innovation is incorporated into a health system's processes, structure, budgets, and practices. Local initiative, spontaneity, reciprocal learning, and problem-solving can be encouraged via decentralized strategies. Participant B mentioned that *"local efforts will invariably ensure that innovations are tailored to the local environment."* However, a decentralized approach, particularly for large networks of health activities, may significantly increase the workload of resource teams.

Furthermore, decentralized officials lack the authority of central authorities. They lack the power or resources to compel widespread replication and rarely have the requisite policy change. In order to incorporate innovation into structures, finances, and procedures, central-level engagement is essential. Despite the limited options for selecting between a centralized and a decentralized method that the health system structure provides, it is recommended to combine both for their distinct benefits and drawbacks

7.5.2 Quantitative Analysis Conclusion

The management tool is based on the theoretical underpinnings of "systems theory" [10]. The tool's various management elements (iceberg structure) offer an open-systems approach to scaling up management, as proposed by the ExpandNet/WHO paradigm [9]. The identified management routines aim to improve organizational efficiency and effectiveness in implementing healthcare innovation at various sites and scale impact through an open-system perspective between the various management elements in the preliminary management tool.

Although some of the routines differ in terms of the level of *impact* produced or the amount of *effort* necessary to apply them, a systems approach to scaling up aims to achieve congruence among the various elements [9], certain routines are more crucial in specific settings or situational contingencies. A systems approach to management recognizes that the tool's elements and processes are all interrelated and interdependent, with changes in one affecting the others. As a result, the tool is intended to reflect a dynamic method to strategically plan and manage the scaling-up process of healthcare innovations in marginalized communities, where the value of a particular routine may vary depending on the situation. Scaling up necessitates constant balancing of management routines to achieve congruence among the scaling up elements [7]–[9].

The researcher attempted to reduce subjectivity and ambiguity in the qualitative data by clarifying the meanings of "impact" and "effort" in the context of this project and urging participants to express their rationale for each impact-effort evaluation. Four volunteers from diverse backgrounds with substantial expertise and knowledge in implementing healthcare innovations in marginalized communities completed the impact-effort rating exercise. The ratings across participants revealed a high degree of similarity in the level of importance, indicating that the proposed routines within the preliminary management tool are relevant to improving the outcomes of strategically managing the scaling up of healthcare innovations to facilitate inclusive goals.

7.5.3 Qualitative Analysis Results

The main objective of the qualitative data analysis was to validate the concepts used throughout the preliminary management tool. Semi-structured interviews with subject matter experts were used to collect data, validate concepts, identify disagreements or missing concepts, extract additional insights, and explore the practical applications of the tool, as well as proposals to change or improve the tool. This section discusses the two qualitative coding cycles employed and the data analysis and results.

7.5.3.1 First coding cycle

The first coding cycle includes the analysis of the information collected from the semi-structured interview questions. The five management elements that compose the iceberg structure of the management tool served as the foundation for the developed questions. The aim of the first coding cycle was to evaluate to concepts used to construct the mental models, desired outcomes, and management elements of the tool. The relevance, potential disagreements, and additional insights were extracted from the semi-structured interviews to gain a better understanding of each management aspect. By understanding the application of each management element as well as the mental models and desired outcomes of inclusive healthcare, the researcher could use these insights as a lens when analysing the management routines throughout the second coding cycle.

Mental Models: Scaling up management paradigm

REF	SCALING UP MANAGEMENT PARADIGM (ICEBERG MENTAL MODELS)	VALIDATED CONCEPTS (V)	ADDITIONAL INSIGHTS (A), DISAGREEMENTS (D)
M1	Scaling up is a non-linear process	M1-V1 – Flexibility in planning and implementation is essential M1-V2 – Contextual variance has a significant influence on the implementation approach	M1-A1 – It is essential to have all funds at hand before the implementation, because generating funds is also non-linear and inconsistent. M1-A2 – Being confronted with trade-offs (regarding financial sustainability, inclusion, and growth rate) throughout the scaling-up process can frequently affect significant strategic decisions about the implementation area or target market.
M2	Design and implement healthcare innovations with scaling up in mind from the beginning	M2-V1 – Focus on the social need. M2-V2 – Large-scale implementation is the only way to achieve systemic social impact.	M2-A1 – The extent of the social problem should indicate the degree of scale-up required. M2-A2 – Social healthcare problems are complex and might not have one right solution but only various attempts to mitigate the problem. Rename: *To facilitate inclusive development and social transformation, the desired level of scaling up should correspond to the level of social need addressed by the innovation.*

M3	Scaling up requires adoption from the community	M3-V1 – Adoption and community buy-in is critical.	M3-A1 – Utilizing community resources or creating jobs during implementation can significantly increase community support.
M4	Scaling up healthcare is impact-driven rather than profit-driven	M4-V1 – If the healthcare innovation is implemented where there is a need, people will use it.	M4-A1 – When healthcare innovation is embedded within the community, the community members will support the service.
M5	Three types of scaling up exist in healthcare innovations	M5-V1 – Combining horizontal scaling, vertical scaling, and diversification is ideal.	M5-D1 - Vertical scaling is not always easy to do. Convincing the government to adopt the innovation on a national level can be a lengthy and prolonged process and might never realize. M5-A1 – Investing in brand recognition and publicity can also significantly improve scale-up when donors or private investors provide resources and capital. Government support is frequently surpassed by contributions from international donors and philanthropic organizations. Rename: *Sustainable scaling up requires combining horizontal scaling up, vertical scaling up, and diversification.*
M6	Healthcare system defined as a CAS	M6-V1 – The healthcare system and its contextual conditions are dynamic, unpredictable, and ever-changing with emerging social and cultural behavioural patterns. M6-V2 – Every implementation of a new healthcare model is a new learning opportunity.	M6-A1 – Different social or cultural groups view healthcare and health consciousness differently. M6-A2 – Decentralised business structures may greatly enhance adoption to local fit and reduce unpredictable and unexpected challenges and complexities from the perspective of the implementation organization. The likelihood that a healthcare practitioner will leverage local resources and ensure community advocacy, and support, for instance, is higher if they are a part of the local community and have some ownership of the innovation. Local actions will inevitably guarantee that innovations move toward localization, and mere centralized management could restrict community embeddedness. Rename: *Acknowledge inherent complexity regarding contextual variance when scaling up healthcare*
M7	Scaling up management strives for balance	M7-V1 – Continuous assessment of strengths and weaknesses in the healthcare	Rename: *Scaling up requires a dynamic balancing act among management elements.*

	among elements of the system	model and implementation approach is essential. M7-V2 – It is essential to manage the internal and external environment of the healthcare model.	

Desired Outcomes of scaling up

REF	Outcomes (ICEBERG EVENTS)	VALIDATED CONCEPTS	ADDITIONAL INSIGHTS (A), DISAGREEMENTS (D)
E1	Community Adoption	E1-V1 – Community adoption is essential for the sustainability of the innovation	E1-A1 – Community engagement should be done as early as possible to ensure advocacy and buy-in of the innovation. E1-A2 - Active community engagement is a requirement for sustainable scale-up.
E2	Political Support/ Buy-in	E2-V1 – Evidence for impact on national state priorities could significantly contribute to political support. Political support could drastically increase the effectiveness and efficiency of scaling up. E2-V3 – Political support and buy-in is the desired outcome.	E2-A1 - Political obstacles exist, and gaining support is not always straightforward. E2-A2 – The implementation organization should not hold off on scaling until it has political backing. Once there is enough proof of the positive impact of large-scale healthcare innovation implementation toward inclusive objectives, the government may be more prepared to fund the scaling-up process.
E3	Institutional implementation capacity	E3-V1 – The organization needs to use capacity-building strategies continuously to minimize implementation weaknesses and exploit strengths.	E3-A1 - Strengths and weakness assessment such as SWOT analysis could enhance capacity building.
E4	System level embeddedness	E4-V1 – It is essential that healthcare innovation is relevant in the context and mobilize local resources.	E4-A1 – Brand reputation may enhance system embeddedness. E4-A2 – Decentralisation enables more effective adaption for local fit and integration of healthcare innovation into the social, infrastructural, and cultural system.
E5	Transferrable to other contexts	E5-V1 – Transferability combines the replicability of the model and adaptability to local fit. E5-V2 – It is crucial to ensure that the model's core components are not lost and that the model fidelity remains intact.	E5-A1 – Defining the target market and aligning decisions and brand reputation towards the organization's social goals could strengthen the model's fidelity during horizontal scale-up.

E6	Stakeholders' buy-in/ perceived need	E6-V1 – The stakeholders must perceive the need for healthcare innovation to be implemented in the target area.	E6-A1 – Effective communication of the inclusive impact the healthcare innovation can offer to the various stakeholders (donors, investors, community, and healthcare professionals) can significantly enhance advocacy, financial support, and community adoption. E6-A2 – Even if there is a significant need for innovation in the implementation site, if there is insufficient community engagement and mobilization of local resources, support might be limited.
E7	Impact on the target community	E7-V1 – It is essential to share outcome indicators on target communities. E7-V2 – Community engagement enables the organization to assess and accommodate the community's needs.	E7-A1 – Monitoring and evaluation are essential to determine the impact on population health improvement. E7-A2 – Healthcare innovation catalyzes social transformation.
E8	Community embeddedness	E8-V1 – Without being embedded in the community, the innovation will not be sustainable. E8-V2 – Using medical practitioners that are part of the local community significantly impacts the sustainability and community adoption of the innovation.	E8-A1 – Instead of being offered an 'engineered' answer, marginalized communities prefer to be empowered. As a result, scaling up is primarily a management task. Strategic planning and management strive for consistency among scaling up elements to best integrate innovation within the system and community.
E9	Adaptable to local fit	E9-V1 – Decentralized approaches can enhance adaptation and local fit modifications.	E9-A1– Language, cultural, and social norms all influence local fit, so having a medical professional from the community reduces unforeseen hurdles and increases community acceptance and support.

Management Elements

REF	MANAGEMENT ELEMENTS *(ICEBERG STRUCTURE)*	VALIDATED CONCEPTS	ADDITIONAL INSIGHTS (A), DISAGREEMENTS (D)
S1	Environment	S1-V1 – Identifying influential factors in the implementation site's external environment is a critical managerial aspect of scaling up inclusive healthcare innovations.	S1-A1 – In many circumstances, the cultural environment is the most influential environmental factor in the scaling-up process. Although the environment cannot be controlled, its effects on the implementation process can be identified and leveraged to ensure scaling-up success. Community engagement and decentralized techniques may enhance sustainability by

			improving community adoption and adapting innovation to the local context.
S2	Inclusive Innovation	S2-V1 – It is essential to identify the organization's social goals and how they are met during the scaling-up process.	S2-A1 – Having a "patient-centered" mindset in the development and planning of scaling up healthcare innovations could greatly enhance decisions to align with inclusive objectives.
S3	Implementation Organization	S3-V1 – It is important to identify strengths and weaknesses in the implementation organization.	S3-A1 – The critical functions of the implementation organization are developing and implementing the healthcare innovation concept, implementing the control and support system, allocating resources, and monitoring and evaluating performance. Continuous adaptation, local community engagement, and dissemination are frequently the professional's responsibility in the healthcare model via a decentralized management structure.
S4	Healthcare Model	S4-V1 – The healthcare model is controlled by the implementation organization but can be seen as a different entity to manage.	S4-A1 – Good understanding and insight into the workplace context are essential. S4-D1 – Rename "healthcare service model" for clarity.
S5	Strategic Choices	S5-V1 – Deliberate efforts to increase the impact of the healthcare innovation are necessary and effective scaling up and require careful strategic planning.	S5-A1 – Successful scaling up depends mainly on the strategic choices made during the planning and implementation process.

7.5.3.2 Second Coding Cycle

The second cycle attempted to further refine the qualitative information received for each suggested routine and identify any other concepts that might be added to, substituted with, or eliminated from the management framework. This was accomplished by examining the explanations offered by the interviewees for their ratings during the effort-impact analysis and insight from semi-structured interview questions through the lens of the five scaling-up management elements of the tool. In this way, the management framework's analysis of the routines' justifications might be used to assess if the suggested routine might indeed enhance scaling up outcomes towards I4ID goals.

Management Routines

Ref	MANAGEMENT ROUTINES *(ICEBERG PATTERNS)*	VALIDATED CONCEPTS	ADDITIONAL INSIGHTS (A), DISAGREEMENTS (D),
Environment			

R1	Identify factors in the environment that influence the implementation and operation of the healthcare model.	R1-V1 – The model could fail if there is a lack of consideration of environmental factors.	R1-A1–Assessing environmental factors can be time-consuming. R1-A2 – Influential actors are often unanticipated and unexpected. It is essential to expect unanticipated influential factors.
R2	Continuous assessment of changes in the social, political, infrastructural, and cultural environment and circumstances as the process of scaling up evolves.	R2-V1 – Continuous reassessment of the environmental factors is essential as the environment often changes.	R2-A1 – Decentralized approaches, such as delegating clinic ownership to healthcare employees, enable and encourage ongoing development and adaptation to local needs in the face of change. The implementation organization is not required to examine the environment, but it appears to be more effective to use decentralized ways to achieve ongoing adaptation and improvement.
R3	Community needs assessment	R3-V1 – Assessing community needs (accessibility, healthcare services, treatment requirements, affordability, and social health issues) is critical and must begin at the outset. Without addressing the initial community need, the value offering of the healthcare innovation is unclear (from an organizational-, investor-, community-, and healthcare professional standpoint).	R3-A1 – The assessment of community needs may necessitate considerable effort on the part of the implementation organization at first. However, once the healthcare innovation is in place, decentralized management from community healthcare workers can ensure that community needs are identified continuously.
		Inclusive Innovation	
R4	Identify the scope of social demand in the implementation area.	R4-V1 – If the model does not meet the need, it will fail to have sufficient impact.	R4-A1 - Without addressing the initial social need, the motive to scale up the healthcare innovation is unclear (from an organizational-, investor-, community-, and healthcare professional standpoint).
R5	Assess the inclusiveness of the innovation according to relevance, relative advantage, and compatibility in the implementation area.	R5-V1 – There must be sufficient inclusiveness for the model to make sense.	R5-A1 – Although health innovations are more sustainable if they target a specific model, they should exclude individuals. However, in most cases, the poorest of the poor will not be able to afford private healthcare.
R6	Tailor innovation to the context	R6-V1 – Tailoring the innovation to the local context is essential for community	R6-A1 – Tailoring the innovation to the local context depends on the target market.

		embeddedness and community advocacy, and stakeholder support.	
R7	Monitoring and sharing broad outcomes indicators	R7-V1 – It is critical to disclose social effect and inclusion indicators to track progress and gain governmental and stakeholder support.	R7-A1 – The effort required depends mainly on the effectiveness of the system.
R8	Dissemination of healthcare innovation	R8-V1 – Dissemination will drive many of the patient numbers.	R8-A1 – Word of mouth and social media are effective and will not require much effort.
		Implementation Organization	
R9	Groundwork and preparation for implementation.	R9-V1 – Getting the foundation right to spread practical impact is essential.	R9-D1 – Move R9 to the environment management element. Because groundwork and preparation mostly require attempts to understand the community and be accepted by the community. R9-A1 – The local healthcare professional must be the 'face' of the innovation because they understand the culture. Without understanding the culture, the approach to implementation might seem disrespectful to the culture and its norms.
R10	Provide strong leadership and governance over healthcare innovation	R10-V1 – Leadership, and governance are crucial points when scaling up, as this enables the medical staff to seek support when needed.	R10-A1 – The degree and type of leadership and government requirements depend on the organizational structure and relationship between individuals that are part of the organization. R10-A2 – An effective internal system enables governance and support.
R11	Active community engagement	R11-V1 – Ensuring the buy-in from the community and that the innovations accommodate a real need. R11-V2 – It is crucial to involve the community in the solution for their community rather than presenting a solution that they should use that has no connection to their community.	R11-A1 – Delegating power to the healthcare professional running the clinic, for example, through a decentralized approach, might boost community participation dramatically by making the nurse or doctor the face of healthcare innovation. Rather than an organization unknown to the community presenting a solution, the community nurse or healthcare professional brings the solution that will secure local buy-in and support.

			R11 – D1 – Place this procedure under the healthcare model management aspect instead, as it is typically performed from the healthcare model's side.
R12	Incorporating research into implementation.	R12-V1 – It is critical to ensure enough research regarding the need and environmental factors is conducted for successful implementation.	R12-A1 – It is essential to document what worked and did not work during implementation for future improvements.
R13	Develop effective internal Systems and organizational Infrastructure Support	R13-V1 – To remain lean on the back end, systems are essential to driving the processes in the front end. R13-V2 - Monitoring goes hand in hand with systems to provide oversight. R13-V3 – It is essential to capture important information as quickly as possible.	R13-A1 – In the healthcare sector, scaling up a program includes ensuring quality services, reporting, showing proof of quality, having oversight, and monitoring through the internal systems. R13-A2 – Having an effective system in place is something implementers should consider from the very beginning of the scaling-up process.
R14	Assess strengths and weaknesses to build capacity.	R14-V1 – During the scaling-up process, it is essential to stop/pause and reflect and assess strengths and weaknesses and what changes are required to improve the following implementation or system in place.	R14-A1 – When pausing and assessing the changes for improvement during scaling up, it is essential to implement those changes before the following implementation occurs.
R15	Make use of existing processes and structures	R15-V1 – It is essential to exploit processes and structures (such as transport and information systems) that could enhance scaling up.	R15-A1 - Move this routine to the "Environment" management element.
R16	Scaling with "others."	R16-V1 – Siloed approaches and thinking makes scaling up in the healthcare industry much more expensive and time-consuming. R16-V2 – It is essential to scale with partners who can offer value for the organization rather than "reinventing the wheel" because it will speed up the process and have a more significant impact.	R16-A1 – Rename: *Scaling with partners* R16-A2 – The effort is high as partnerships depend on convincing other people to share resources, time, money, and often the intellectual property. R16-A3 – The more extensive the network of healthcare innovations, the easier it will be to collaborate with others because the network has value and can generate profit prospects. R16-A4 – The key to forming partnerships is to keep the

			organizational goal in mind and align the partnership's roles accordingly.
Healthcare Model			
R17	Assessment of Target market (Clients)	R17-V1 – Understanding the target market is critical because the implementation model may work for only specific communities or individuals.	R17-A1 – Assessing the target market determines where the organization places its focus.
R18	Healthcare professional assessment and training	R18-V1 – Choosing the right partner (healthcare professional) could greatly ease the journey.	R18-A1 – Managing employees who were not the proper people from the start can be time-consuming and exhausting. R18-A2 – It is essential to work with healthcare professionals from the community.
R19	Identify core elements for replicability	R19-V1 – It is critical to establish basic features of replicability, especially if the organization intends to extend far beyond the usual domain (out of the country).	R19-A1 – The more the organization grows and experiences, the clearer it becomes about what worked and what did not. R19-D1 – This routine is performed from the implementation organization's perspective.
R20	Balance centralized (top-down communication) and decentralized (bottom-up communication) management approach.	R20-V1 – It is critical to be flexible in the model and to have trust in the partners with whom the organization collaborates. R20-V2 – Centralizing the main components of the model or brand message through the implementation organization but leaving the community's requirements to the healthcare professional who is a community member.	R20-A1 – The implementation organization does not always recognize what the community needs, but the local community does. R20-D1 – Split up this routine so that decentralized control is under the healthcare model and centralized control is under the implementation organization.
R21	Tailored support to overcome initial problems with implementation and adoption of the innovation to the local context	R21-V1 – Most of the effort will be expended in the early stages of scaling while the organizational model is still being adapted and refined.	R21-A1 – If the model is well-developed, it should be applicable in most communities, and the exact implementation process can be employed.
R22	Understanding of workplace context	R22-V1 – It is critical to ensure that the healthcare professional works in a productive and pleasant atmosphere.	R22-A1 – Depending on the model structure, the healthcare professional must also take a risk in terms of career choices. If a healthcare worker enjoys his or her job, he or she will be more

			effective in impacting the community through the business.
R23	Strong communication channels and relationships between healthcare service model and implementation organization.	R23-V1 – From an impact standpoint, it is critical to have strong communication channels and partnerships between implementation organizations, healthcare professionals, and healthcare innovation personnel.	R23-A1 – An effective system enables strong communication channels and relationships.
R24	Monitoring and sharing broad outcome indicators	R24-V1 - The monitoring system is used to determine the impact of healthcare innovation and is thus very important.	R24-A1 – The internal systems determine the efficiency and effectiveness of the monitoring and evaluation activities. R24-D1 – Rename operational and performance monitoring and evaluation.
Strategic Choices			
R25	Define the scope of social demands	R25-V1 – Scale-up is not necessary unless the organizational goals are to deliver a massive impact. R25-V2 – It is essential to define why the organization wants to scale.	R25-A1 – One way to define the scope of social demand is to decide how many individuals the organization aim to reach. R25-A2 – Although it does not take much effort to implement, it requires leadership and regular reassurance to drive the motive behind scaling up to align towards the social goals. R25-A3 – Unnecessary to repeat the routine. Remove this routine from strategic choices and keep it under the inclusive impact element.
R26	Incorporate phases in the scale-up process (set-up, develop the scalable unit, the test of scale up. go to full scale)	R26-V1 – One of the essential success criteria in sustainable scaling is scaling up in phases. If the organization is not equipped for large-scale implementation and operation, the concept's essence may be lost, and due to the lack of knowledge or experience, management might make mistakes along the scaling-up process.	R26-A1 – If suitable systems and processes are not in place when scaling up, the organization might lose touch and oversight of the health service network. R26-A2 – As the organization acquires experience, a phased approach to scaling up will help the organization define the core elements of replicability (R19). R26-A3 – Prior to large-scale implementation, it is critical to ensure that internal systems and infrastructure (R13) are in place. R26-A4 – Unprepared scaling may result in losing the model's most critical elements, lowering

			the model's value for patients and healthcare professionals.
R27	Develop adoption mechanisms (leadership, culture, communication, policy, and ideas for improvement)	R27-V1 – Community adoption and embeddedness are vital for the model's sustainability; therefore, the model must include mechanisms for continuous improvement and adoption to local fit.	R27-A1 – Ensuring community embeddedness of the innovation will naturally drive or create adoption mechanisms.
R28	Develop Support System	R28-V1 – It is critical to give operational (financial and administrative) assistance to the medical personnel and measure outcome indicators to track impact. R28-V2 – The support system enables the implementation organization to have centralized control over all branches of implemented healthcare innovations. R28-V3 – The proper utilization of the support system may facilitate demonstration site exploitation (i.e., knowledge building, community engagement, systems embeddedness).	R28-A1 – The support system can be classified as one of the core elements of replicability.
R29	Address both horizontal and vertical scaling up	R29-V1 – Horizontal and vertical scaling up complement each other; therefore, it is critical to integrate both. R29-V2 – Replication is insufficient for embedding a healthcare innovation into the healthcare system. To be sustainable, scaling up must address diffusion's horizontal and vertical components.	R29-A1 – Vertical scaling up might entail developing entrepreneurial abilities for the healthcare professional to increase the efficiency of the clinical practice and to eventually open and operate more than one facility, which increases the reach of inclusive impact. R29-A2 – Combining horizontal and vertical scaling strengthens the innovation's systems embeddedness (E4).
R30	Combine centralized and decentralized approaches.	R30-V1 – Control over integration into the system, structure, funding, and procedures of the health system is critical at the central level. Decentralized techniques encourage community efforts, collaborative learning, and problem-solving.	R30-A1 – Decentralized functions and operations are frequently determined by whom the organization collaborates with and whether partners are willing to take ownership of specific operations. R30-A2 – Decentralised approaches strengthen

			community embeddedness (E8) and adaptability to local fit (E9). R30-A3 – Centralised approaches strengthen transferability to other contexts (E5) and systems embeddedness (E4).
R31	Assess the costs of the scaling-up process and identify possibilities for economies of scale	R31-V1 – It is critical to push for economies of scale as the organization expands, especially given the high cost of infrastructure and equipment.	R31-A1 – As the number of implemented innovations increases and the implementation process becomes perfected, more chances for economies of scale will be presented.

7.5.4 QUALITATIVE ANALYSIS CONCLUSIONS

This section discusses the findings regarding the management tool and the subsequent management elements procedures that make up their group sets, as shown in Chapter 5, the most relevant literature in the field of scaling up healthcare innovations, identified during the SLR, was discussed and translated into design requirements for the development of the management tool in this study.

After analysing the existing literature and categorizing the findings in the form of the systems thinking iceberg concept matrix, the researcher identified nine sustainable scaling-up outcomes, seven mental models for strategic management for scaling up, five structures representing management elements, and 31 patterns representing management routines required for sustainable scaling up goals. The identified management routines are integrated into the proposed management tool developed in the following chapter.

The discussion covers broad observations on the preliminary tool's presentation, the critical priorities of each management component evaluated by the interviewees, and the overarching themes discussed in the impact-effort rational conversations for each routine.

7.5.4.1 Mental Models

Based on the feedback from the semi-structured interviews, the mechanisms contained in the mental model all closely resemble a systems perspective paradigm for scaling up healthcare innovations. The mental models reflect two major themes in the scaling-up management literature: (1) a social impact-orientated management approach and (2) a systems perspective of scaling up inclusive healthcare innovations.

Impact-orientated management approach:

As suggested by many authors, including [6], [10], [11], [53], it is essential for the motive behind scaling up healthcare innovations to be driven by the organization's social objectives to be sustainable. The main focus and goal of scaling up are to reach the areas where the service is most needed. Hence decision-making from a leadership and management perspective must be based on the intention to address a recognized social problem.

The mental models contribute to the effectiveness of the management tool by providing an impact-orientated lens for decision-making through the following mechanisms in the mental model.

It is critical that scaling up is considered at the development phase of the innovation (M2). Scaling up during the development and implementation phases will improve the development process and tailor the invention to a specific sociocultural, programmatic, or economic setting for large-scale implementation.

The mental model M3 recognizes that for healthcare innovation to be sustainable, both in terms of practicality and impact, it must be adopted and integrated into the community. The necessity of focusing on patient-centeredness and how impact could be scaled up in the context of the unique community is emphasized in community adoption. According to the argument in M4, healthcare innovations are impact-driven instead of profit-driven. There will occasionally be trade-offs between inclusion and financial gain during the scaling-up process, and management must make choices based on the possible long-term impact. Having a mental model of social impact as the top priority for scaling up may considerably strengthen the alignment of organizational decisions toward social goals. Local needs frequently require a decentralized approach (R20) and adaptations to the operational model for community adoption (E1), community embeddedness (E8), and impact on the target community (E7).

The idea of innovation for inclusive development (I4ID) was created to address the need to transform societal norms and behavioural patterns to address social issues. Healthcare innovation can contribute significantly to I4ID goals by scaling up through an impact-oriented perspective.

Systems-orientated management approach:

As described in the conceptual literature review, scaling up has two sides. Firstly, scaling up entails a linear, intervention-oriented expansion strategy aimed at expanding the geographical reach of the innovation. Secondly, scaling up can also occur inside a complex systems paradigm, where innovation is viewed as 'events in the system' [10]. The innovation is embedded in the system and has the potential to contribute to system change and societal transformation in the direction of long-term I4ID goals.

To accomplish sustainable scaling up, the implementation process of inclusive healthcare innovations on a broad scale requires a balance between implementation strategy and adoption from the target community's "system." The mental models illustrate a systems perspective of scaling up by acknowledging the complexity in the healthcare system (M6), recognizing the non-linearity of the scaling-up process (M1), and scaling up requires adoption from the community (M3).

Strategic scaling planning and management is a dynamic method that seeks balance among the various elements (M7) that can be used to manage scaling up *(iceberg structure elements).* Scaling up a healthcare innovation across diverse marginalized communities, each with its own cultural, infrastructural, and social environment and a distinct collection of disadvantaged backgrounds, cannot be done effectively using a linear or "blueprint approach." A systems approach to scaling up a healthcare breakthrough recognizes the complexities of the scaling-up process by anticipating unanticipated demands and focusing on systems (E4) and community embedding (E8).

Before large-scale implementation, it is critical to take a staged approach to scale up, perfecting the model through several trial and test pilot sites and identifying fundamental aspects for replicability (R19). Three types of scaling-up approaches (horizontal scaling up, vertical scaling up, and diversity) should be combined to maximize the impact of innovation toward social goals.

The data analysis study concludes that the mental model is an essential component of the management tool and that the mechanisms in the mental model have been validated as relevant and valuable to use in the management tool for guiding strategic decision-making and facilitating management related to scaling up healthcare innovations.

7.5.4.2 Desired Outcomes of Scaling up

The *'iceberg events'* domain of the management tool depicts a systems approach to the essential characteristics of sustainable implementation and scaling up of healthcare innovation in a marginalized community. The mechanisms in the events category of the management tool (E1 - E9) illustrate a holistic perspective of the successful integration of healthcare innovation in a marginalized community. Systems integration of the innovation is necessary to ensure long-term benefits regarding inclusivity, population health improvement, and organization sustainability from a systems perspective.

The model recommends that while scaling up healthcare innovations, strategic decision and management processes should try to meet the outcomes stated (E1 - E9) to scale up impact and facilitate long-term I4ID goals effectively. The concepts for the desired outcomes of scaling up were validated as relevant and applicable during the data analysis study.

7.5.4.3 Management Elements

Environment

The management routines included in the environmental management aspect focus on recognizing multiple variables and institutions outside of the organization and healthcare model that significantly impact the scaling-up process and prospects. The environmental force driving scaling up is the need to serve more people quickly and equitably. Furthermore, the social, cultural, political, and economic context in which scaling up occurs significantly impacts the other components of the framework. When selecting how to scale up, opportunities and obstacles in the environment must be identified and addressed. The routines R1 *(Identify factors in the environment that influence implementation and operation of healthcare model)* and R3 *(community needs assessment)* were rated as “major projects,” and R2 *(Continuous assessment of changes in the social, political, infrastructural, and cultural environment and circumstances as the process of scaling up evolves)* were rated under “quick wins.”

Figure 7.6: Environmental factors affecting scaling up

The cultural environment (S1-A1) can often significantly affect the scaling-up approach. Participants A and C stated that in their experience, they have seen that marginalized communities in South Africa often have a unique social and political structure that needs to be considered when tapping into these contexts. Participant B mentioned during the semi-structured interview that *"implementing a healthcare innovation in semi-rural communities often requires permission from the local authorities (king or chief) for advocacy from the community."* Although marginalized communities are often in desperate need of health services, if the delivery model is implemented without engagement with the community, the community often resists using the service. Based on the insights from participant C, *"marginalized communities need and desire empowerment rather than being presented with an 'engineered' solution from outsiders."* Groundwork and implementation preparation (R9) primarily entails making an effort to understand and be accepted by the community; therefore, this routine is moved to the environmental management element (R9-D1). Participant A noted that one key to success is to make the community (i.e., the local healthcare professional) the "face" of the innovation because they are familiar with the community. Without cultural awareness, there is a chance of disrespecting the culture and its values (R9-A1).

Active community engagement may significantly enhance sustainability by improving community adoption and advocacy and enabling the adaption of the innovation to the local context. Assessment of community needs (R3) (for example, the accessibility of healthcare services and treatment requirements, affordability requirements, and social health issues) is critical and must begin at the beginning stages of implementation. Without addressing the initial community need, the value offering of the healthcare innovation is unclear (from an organizational-, investor-, community-, and healthcare professional standpoint) (R3-V1).

According to Participant A, decentralizing control of healthcare innovation to a local healthcare professional (i.e., a nurse-owned clinic) dramatically enhanced community acceptance and participation. Participant A mentioned that in many cases, the community healthcare professional is

responsible for engaging with the local community to receive the needed support from the community and also discuss the value of the innovation to the community.

Local healthcare providers generally receive sufficient community support to put healthcare innovation into practice due to the perceived need from the community leaders and from successful local engagement to demonstrate respect for the community. Participant E said that there had been several instances where local authorities have given away land for free in order to facilitate the adoption of healthcare innovations.

Identifying environmental elements influencing scaling up is not always an easy task. The implementation organization is frequently unfamiliar with the cultural and social norms of the implementation site. The fact that the healthcare practitioner is from the community, speaks their language, and accepts personal responsibility for the clinic's performance (by decentralized control) improves the detection of environmental elements affecting the scale-up process significantly.

Inclusive impact

The management aspect for inclusive innovation has been termed "inclusive impact." This management area considers the routines that ensure the inclusiveness of the scaling up approach. Because scaling up is motivated by social impact, it is critical to understand the motive behind scaling up as an effort to address a social problem. As mentioned by participant C, it is crucial to identify the scope of social demand (R4) because if the model does not meet the need, it will fail to have a sufficient impact (R4-V1). The ability to recognize the scope of social demands dictates *where* and *how* replication of the healthcare innovation model can effectively scale the social impact.

Figure 7.7: Inclusive Impact towards social transformation

In underprivileged places where access to quality healthcare is limited, private healthcare innovations frequently try to provide alternatives to public healthcare services. For the model to make sense, the organization must approach scaling up to provide inclusion (R5-V1). Participant C stated that *"the*

thousands of South Africans who use these services for a little affordable charge despite the availability of free public healthcare are evidence of the scope of the healthcare demand and that private healthcare innovations provide solutions to this need." Participants E, F, and G, medical professionals that provide private healthcare in underserved regions, confirmed that residents prefer to pay a small fee to receive private healthcare over free public care because patients in the public sector do not receive high-quality, patient-centred care. The impact of inclusive healthcare enables residents of underserved areas to have access to inexpensive, high-quality healthcare. By serving a social need, scaling up could catalyse social transformation on a systemic level to facilitate I4ID goals.

The management routines identified under the "inclusive impact" management element were rated as "Quick Wins" during the impact-effort analysis indicating a high positive impact with the moderate effort required. If the organization can show how much it has contributed to an inclusive impact, funding and donor opportunities may be considerably improved. Participants A and B both mentioned that because funding is frequently uncertain, it is frequently one of the major hurdles when expanding. By demonstrating the potential for population health improvement, behavioural change, and social transformation for scaling up the innovation, broad outcome indicators (R7) may be monitored and shared to boost advocacy from all stakeholders, including donors and investors.

Dissemination techniques for innovation are vital because they will drive patient numbers (R8-V1), particularly in the beginning when patient numbers are low. However, participant D validated the impact-effort rating by stating that disseminating awareness about the innovation does not necessitate much effort because word-of-mouth and social media strategies are highly efficient (R8-A1). The community-based healthcare staff personnel are primarily responsible for disseminating healthcare innovation (R8) and adapting it to local conditions (R6). Top management rarely understands community requirements. Therefore by delegating this duty to healthcare staff members, innovation would inevitably move in the direction of localization. Participant A mentioned that *"regarding dissemination from a management perspective, it is important to be open-minded and willing to learn and acknowledge that it is not a one-size-fits-all approach. Healthcare deals with unique individuals and communities."*

Participant B stated, *"In the model we have established, we do have a target market, which is employed but uninsured. By focusing on the employed but uninsured, we are not necessarily excluding individuals at the bottom of the pyramid; rather, we are attempting to draw the employed but uninsured away from government facilities so that the poor do not have to deal with the costs incurred by inefficiencies such as waiting in lines. As a result, even though we are not directly serving the bottom of the pyramid, we are considering them".*

In conclusion, the *"inclusive impact"* management element provides a set of procedures to guide management to ensure that the innovation meets the demands of the target implementation site and considers the bigger picture of how the innovation old contribute to inclusive development to achieve long-term scaling up results.

Implementation Organization

The "implementation organization" management element refers to routines from the organization's perspective and the people and groups working to spread and encourage innovation adoption. The implementation organization is the "brand" owner and has centralized authority over the network of innovations (R20) for ensuring standardization and quality control. The routines included in the implementation organization management element, views scaling up from the perspective of senior management decisions to effectively plan and develop a scaling-up approach and manage the network of healthcare innovations.

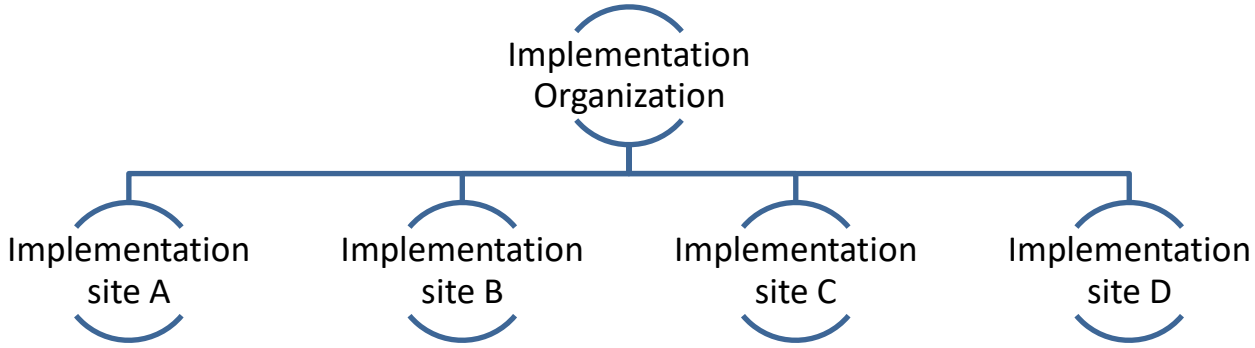


Figure 7.8: Implementation organization structure

A factor that stood out as one of the most significant factors contributing to success in scaling up during the interviews was the provision of robust internal systems and infrastructure support to the healthcare innovation network (R13). The importance of the internal systems was also validated during the impact-effort analysis having one of the highest impact ratings among the management routines. Participant A stated that *"to stay lean on the back end, you need internal systems to drive the processes on the front end* (R13-V1) *and monitoring and evaluation works in tandem with systems to give oversight*" (R13-V2). According to participant B, *"it is critical to ensure that the organization has effective processes in place prior to large-scale deployment since the system allows you to have centralized control over the network of implemented healthcare innovations."* Because each healthcare innovation launched is controlled and monitored by the same system, the internal system is also regarded as one of the core elements of replicability (R19). Participant A stated, *"it is crucial to make sure the system is in place before the large-scale roll-out because the system serves as the backbone of the healthcare innovation network."*

Providing strong leadership and governance over the healthcare innovation network is one of the fundamental management routines for the implementation organization (R10). The type of leadership and governance depends on the organizational structure and interactions between the organization's members (R10-A1). For example, participant B said that *"during the early phases of implementation, healthcare staff members may require more support and close communication with senior management to overcome initial operational issues with the healthcare model."* In terms of governance, an efficient internal system is required to track the performance and status of each healthcare innovation in the network to maintain control (R10-A2).

Active community participation (R11) is crucial, although it is usually more effective when undertaken from the healthcare model's side. Therefore R11 is moved under the healthcare model management element (R11-D1). Local healthcare workers and employees are more conversant with cultural and social values, allowing them to provide quality treatment. Delegating power to the healthcare professional in charge of the clinic, for example, through a decentralized strategy, may significantly increase community participation by making the nurse or doctor the face of healthcare innovation. Instead of a solution being presented by an organization unknown to the community, the community nurse or healthcare professional brings the solution that will secure local buy-in and support.

Identifying the core elements of replicability (R19) is a routine that is more appropriate from the perspective of the implementation organization. Hence it has been relocated to this area (R19-D1). It is critical to establish that the model is the essential feature of replicability. Participant B stated that this routine is crucial if the organization intends to extend beyond the organization's usual domain (for example, out of the country). Replicability measures how successfully an organization can replicate the initiatives and programs it has created. Whereas the ability to recognize the scope of social demands (R4) dictates *where* and *how* replication of the elements can scale the social impact most effectively, the "replicability of the operational model" specifies which aspects of the operational model can be reproduced [16]. Participant C noted that as the executive team learns and gains experience, what worked and did not work becomes evident, and the model becomes more refined for replication. As stated in the conceptual literature review, for the healthcare innovation model to be effectively "transferrable," it must be replicable and adaptable [16]. As a result, it is critical to determine which model components can be standardized for large-scale implementation and which aspects can be more flexible to allow adaptability to different contexts.

Scaling with partners (R16) can significantly enhance the scaling-up process. As mentioned by participant B, *"siloed approaches and thinking makes scaling up in the healthcare industry much more expensive and time-consuming"* (R16-V1). Participant C mentioned, *"If you can identify people who are doing something that could benefit your organization, scale with them rather than 'reinventing the wheel' because it will speed up the process and have a greater impact"* (R16-V2). However, the effort is high as partnerships depend on convincing others to share resources, time, money, and often intellectual property (R16-A2).

Participant A noted that as the network of healthcare innovations increases (as it scales up), the collaboration will appear more appealing to others since it has value and can offer economic opportunities (R16-A3). When forming partnerships, participants A and B both stressed the importance of keeping the organization's target market while also considering the size of the market/demand and aligning the goal with the impact on the community (R16-A4).

Healthcare service model

The aim of the management element *"healthcare service model"* is to advise management during scaling up from the perspective of the actual healthcare innovation (i.e., clinical practice) being implemented in a marginalized community.

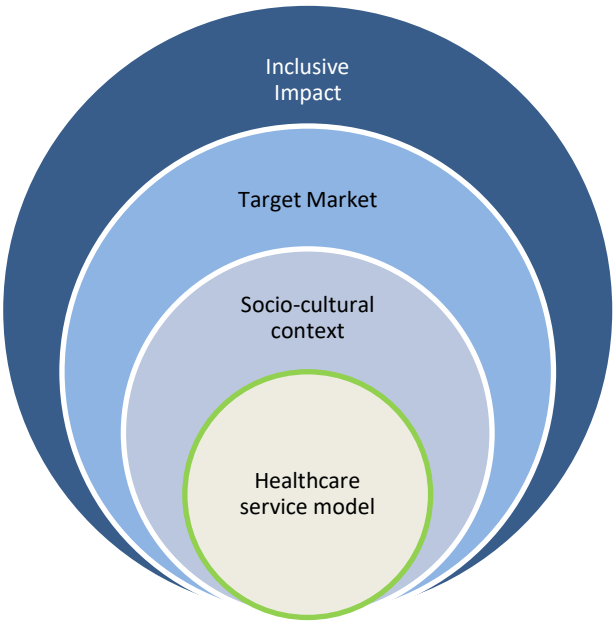


Figure 7.9: Healthcare service model implementation

Assessing the target market (clients) (R17) is a critical determining factor in deciding where to deploy the healthcare innovation. Understanding the organization's target market is essential because the service model may work for some people but for others (R17-V1). *"Considering the cost structure and type of service offered by the model, the assessment of your target market defines where the organization places its focus,"* participant C stated (R17-A1). In terms of the model's "inclusive impact," the target market is influenced by the routine "identifying of the scope of social demand" (R4). To ensure the sustainability of the service model, scaling up is pursued where there is a social demand for affordable healthcare services and a market for the use of the services.

Healthcare professional assessment and training (R18) is one of the most important routines for successful implementation, as *"the healthcare professional is the face of the model."* Depending on the organizational structure and type of healthcare service model, the healthcare professional is chosen based on the essential qualifications and the perceived competence to trust and collaborate with the individual. Choosing a healthcare professional to run the healthcare service model who is preferably from the community (or at least familiar with the community's culture, language, and social norms) was mentioned during the interviews (R-18-A2) as being crucial due to the diversity of the socio-cultural contexts of marginalized (semi-rural, semi-urban, and peri-urban) communities in South Africa.

As was already mentioned earlier in this section, implementation is typically greatly influenced by the socio-cultural context. Even though marginalized groups frequently have an urgent need for healthcare access, they frequently resist using the service if the delivery model is established without their input. According to participant C's observations, underprivileged communities prefer being empowered rather than receiving a "engineered" answer from outsiders. Therefore, choosing a healthcare provider from the community who is able and willing to interact with local community members and authorities could significantly reduce the work required of the implementation organization. It could also increase community adoption and, more importantly, community

embeddedness in the socio-cultural context, which ensures the model's sustainability and enables the innovation to have significant positive impacts regarding inclusivity and population health improvement.

Decentralized management of the healthcare service model is frequently the most efficient way to assure community adoption and effective adaption to local needs (R20). Participant D stated that *"the implementation organization does not always recognize what the community needs, but the local community does,"* making it crucial to be adaptable in the model and to have trust in the partners and collaborators with whom you work (R20-V1) because they oversee the implementation's initial operations.

Tailored support (R21) is frequently required in the early stages of implementation to overcome initial issues with implementation and adapt the innovation to the local context. As a result, adequate employee assessment and training are vital (R18). Strong communication channels and linkages between the healthcare service model and the implementation organization (R23) are essential for providing practical assistance (R21) and for the implementation organization to understand the workplace context (R22) for effective centralized management.

The internal systems (R13) offered by the implementation organization determine the efficiency and effectiveness of operational and performance monitoring and evaluation (R24). *"The monitoring system is the instrument used to determine the impact of the healthcare innovation and is thus crucially important,"* said participant B.

Strategic planning and management

The “strategic planning and management” element refers to the plans and initiatives required from a strategic perspective to improve sustainability and ensure systems embeddedness of the healthcare innovation in the health system and community.

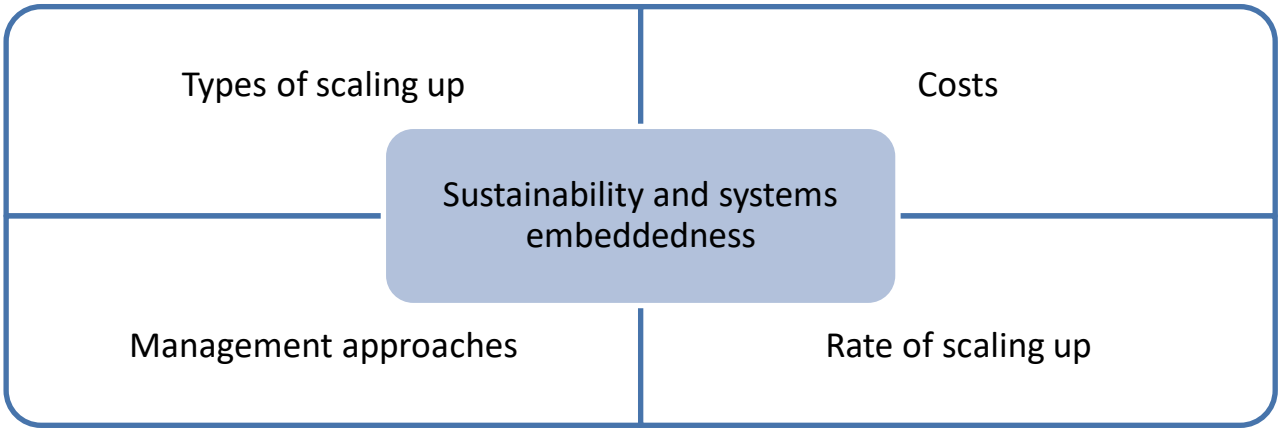


Figure 7.10: Strategic planning and management of scaling up health service innovations

According to participant C, a gradual approach to horizontal scaling up (i.e., expansion to new geographical areas) is one of the essential success elements for sustainability. When expanding a healthcare innovation, it is critical to incorporate phases in the scaling-up process and to resist the demand for what some have called "explosive" scaling-up [8]. Expanding the network of healthcare

innovations gradually and in phases allows for more time to implement the numerous activities required to refine and improve the healthcare service model and the internal control systems. As mentioned b participant B, *"As you acquire experience, a phased approach to scaling up will help you define the core elements of replicability"* (R26-A2).

Scaling up too soon, according to Participant A, *"may be problematic because if an organization is not prepared for large-scale implementation and operation, it might result in the loss of the model's most critical elements as the innovation is expanded to new areas. Losing the model's essence results in a decrease in the model's value for both patients and healthcare professionals"* (R26-A4).

The management and oversight of an extensive network of healthcare innovations rely heavily on the internal systems and infrastructure of the organization. As mentioned by participant A *"It is important to ensure that internal systems and infrastructure are in place (R26-A3) to avoid losing touch and oversight of the health service network (R26-A1) as it grows".*

Donors may often prefer a rapid implementation approach to investors or the government. However, the organization must first demonstrate that the same positive impact shown in pilot programs is achieved in new implementation areas before rapid large-scale implementation. If the organization has adequate human and financial resources, or if the innovations can be replicated with few changes to organizational processes and culture, large-scale implementation can be considered earlier than more complex models.

This thesis uses ExpandNet/WHO's definition of scaling up, defined as *"deliberate efforts to increase the impact of health service innovations successfully tested in pilot or experimental projects to benefit more people and to foster policy and programme development on a lasting basis"* [9].

Expansion is typically insufficient to ensure the healthcare innovation's system-level embeddedness (E4). Both horizontal and vertical dimensions of diffusion are necessary to achieve sustainable scaling-up outcomes. Horizontal scaling focuses on expanding (replicating) the innovation to new geographical locations, whereas vertical scaling aims to gain strong support for the credibility of the innovation and the need for social transformation regarding healthcare concerns. The routines under the *inclusive impact* management element (S2) seek to legitimize both the need for change and the possibility for innovation to function as a change mechanism, which is crucial for approval of policies, adopting budgetary priorities, and developing the support needed for the implementation of the innovation. Understanding the planning cycles of the health system and implementing the necessary steps to integrate the innovation and its related requirements (i.e., financing, human resources, logistics, and supply needs) into health policy and budgets are also necessary for vertical scaling.

An example of vertical scaling up in a decentralized organizational structure where the healthcare professional owns and operates the healthcare service model is to train the healthcare professional to develop entrepreneurial abilities to open and manage multiple facilities. Participant B mentioned that shifting from a centralized approach that did not fit well with a community-based innovation to a more decentralized, socially relevant approach could significantly enhance expansion. As mentioned by participant A *"vertical and horizontal scaling complement each other,"* and therefore, to achieve system-level impact (E4) and embeddedness of the innovation, it is essential to integrate both.

The preceding example also demonstrates the power of combining centralized and decentralized approaches. Where control over the integration of healthcare innovation into the systems, structures, funding, and procedures of the health system is critical at the central level, decentralized techniques encourage community efforts, collaborative learning, and problem-solving (R30-V1). Decentralized functions and operations are frequently influenced by whom the organization collaborates with and whether potential partners are willing to take ownership of specific operations (R30-A1) and can considerably strengthen community embeddedness (E8) and adaptability to local fit (E9) (R30-A2). Centralized approaches are more focused on enhancing the transferability to other contexts (E5) and systems embeddedness (E4) (R30-A3).

Given the high cost of infrastructure and equipment, it is vital to seek economies of scale as the health service network expands (R31-V1). As the number of implemented health service models grows and the implementation process has been standardized, additional opportunities for economies of scale will emerge (R31-A1).

Three strategic management routines that could enhance the sustainability of scaling up were added to the management tool. These include (1) starting with points of strength, (2) creating opportunities for continuous learning, and (3) building coalitions and networks both within and outside the healthcare sector. These routines were also mentioned in the ExpandNet/WHO framework [9] and validated during the interviews.

Generally, it is recommended to focus initial efforts on areas with points of strength (i.e., resources and financial strength) where the innovation is more likely to succeed. Even though wealthier regions or urban areas tend to have more robust health services, competent sites can still be located in marginalized communities with few resources.

When multiple sites demonstrate the model's effectiveness and sustainability, these pilot sites can serve as evidence-based models for policymakers and program managers to further develop and expand to other parts of the country. As a result, the scaling rate increases exponentially over the long term by starting points of strength. Participant B stated that evidence-based illustration sites and sharing broad outcome indicators (R7) often enhance buy-in from donors and investors and increase patient demand as the brand grows and builds a reputation. A reputable brand inspires additional healthcare professionals to pursue a career in a specific health service innovation network, which widens the network's potential areas for future growth.

To ensure that the network of participants' knowledge and skills are up to date and to promote mutual learning among the innovation members, it is crucial to establish ongoing training and learning opportunities. The most efficient way to link several partners and healthcare professionals with the resource team is through internal systems (R13) and communication channels (R23). According to participant A, *"a management style that involves mentoring and problem solving between the implementation organization and the healthcare service model, as well as between the various healthcare workers in the health service network, provides additional opportunities for mutual learning."*

Since national funds are rarely set aside for scaling-up healthcare innovation objectives and a quick shift of human and financial resources to new priorities is uncommon, the scaling-up process often

calls upon external or donor resources. One of the team's primary responsibilities is to locate resources, ideally within a period, that can keep things moving and minimize the likelihood of protracted action pauses.

Finding and utilizing national and local support resources is essential to ensuring sustainability once the innovation has been adopted as a standard component of the healthcare system and is incorporated into health policy and budgets. Pharmaceuticals, for instance, might be included in centralized procurement systems like essential drug lists, and training and human resource development could be supported by national, provincial, or district health funding. Vertical scaling up is highly dependent on broad-based support, frequently in the form of coalitions or networks that can promote the changes in policy, law, or programs.

Such alliances should ideally be unaffiliated with political party systems so that support for the effort can endure despite changes in government. Therefore actors outside the government health sector, such as multilateral lending institutions, bilateral donors, international NGOs, prominent social actors, and communities, may play this role.

However, such interactive, cross-institutional collaboration can be time-demanding and labour-intensive. More often these coalitions and networks need to be created or expanded and nurtured from the time the innovation is designed and tested.

7.5.5 UPDATES TO PRELIMINARY MANAGEMENT TOOL

This section outlines the updates made to the preliminary management tool in considering the results from the quantitative and qualitative data analysis. The suggested improvements either involved the tool's structure or its conceptual design. According to the knowledge gathered from the interviews, the suggested routines were renamed or reorganized and given new definitions, and new routines were added. The visual representation of the tool was also updated.

The revisions to the preliminary management tool are shown in Table 7.5, together with the justification for the change. The "Rationale" allusion alludes to the researcher's ability to adjust the tool due to gaining a deeper knowledge of the routines.

Table 7.5: Updates to Preliminary Management Tool

CONCEPTUAL CHANGES			
#	UPDATE	MOTIVATION	REF
Mental Models	Add the following element *"Recognise that trade-offs are often necessary."*	When scaling up healthcare for inclusive goals, decision-makers frequently face trade-offs such as financial sustainability, inclusion, and expansion rate. Management must focus on long-term goals while understanding that trade-offs are frequently inevitable.	M1-A2, Rationale
M2	Rename: *To facilitate inclusive development and social transformation, the desired level of scaling up should correspond to the level of social need addressed by the innovation.*	This phrase emphasizes that scaling up is necessary for social transformation and assumes that the idea of scaling up should be incorporated from the planning and development phase of the innovation.	Rationale
M3	Rename: *Sustainable implementation requires adoption and social acceptance from the community*	This phrase is more concise than the original routine's name.	Comment from the interviewee
M4	Rename: *Scaling up is driven by desired system level outcomes and identifying what is required to achieve them.*	M4 originally stated that scaling up is *impact-driven* – focussing on the desired system-level outcomes is more concise regarding the desired impact that drives scaling up actions.	Rationale
M5	Rename: *Combine horizontal scaling up, vertical scaling up, and diversification.*	This phrase is more concise than the original routine's name.	Comment from the interviewee
M6	Rename: *Acknowledge variance regarding socio-cultural contexts in marginalized communities.*	Complexity mainly applies to the social and cultural norms affecting the scaling-up process.	Rationale
M7	Rename: *Scaling up requires a dynamic balancing act as management elements interact.*	This phrase is more concise than the original routine's name.	Rationale

R13	Rename: *Provide internal systems and organizational infrastructure support to the healthcare service model network*	This phrase is more concise than the original routine's name.	Rationale
R15	Move this routine to the Environment management aspect.	This routine involves scanning the environment (infrastructure) for existing processes and structures that might enhance scaling-up success.	Rationale
R11	Move routine from Implementation organization (S3) to Healthcare Model (S4)	According to multiple interviewees, community engagement is more effective from the perspective of the healthcare model as the healthcare professionals are the face of the model.	Rationale
R16	Rename: *Assess potential benefits for scaling with partners*	This phrase is more concise than the original routine's name.	Rationale
S2	Rename: *Inclusive Impact*	Managing scaling up from the perspective of the "inclusive impact" the innovation seeks to achieve is the goal of this management element.	Rationale
S1	Environmental management elements add the following management routine: *"active engagement with cultural authorities or leaders during implementation."*	Under the environmental factor influencing scaling up, the cultural environment is often the most influential element regarding advocacy and community adoption.	S1-A1
R6	Rename: *Tailor innovation to the local context to reflect patient-centeredness.*	The reason for tailoring the innovation to the local context is to reflect the patient-centred approach to providing healthcare.	Rationale
R8	Rename: *Make use of multiple channels for dissemination of healthcare innovation.*	This routine emphasizes that dissemination should be done through multiple channels to tell a compelling story.	Rationale, R8-A1
R9	Move routine to the environment management element and rename as follows: *Implement groundwork for social acceptance and preparation for implementation.*	Groundwork to prepare implementation should be done from the perspective of the implementation environment. Without understanding the culture, the approach to implementation might seem disrespectful to the culture and its norms.	Rationale, R9-D1
R20	Under the "healthcare model" (S4) – Rename: *Implement decentralized management to enhance adaptability to local conditions*	The standard R20 is split under the healthcare model (S4) and implementation organization (S3). Centralized management is generally performed from the perspective of the implementation organization, and decentralized	R20-D1

		management is from the perspective of the healthcare service model and community.	
R20	Under "Implementation organization" (S3) – Rename: *Implement Centralised management for standardization of quality control*	The standard R20 is split under the healthcare model (S4) and implementation organization (S3).	R20-D1
R18	Rename: Local healthcare professional selection and training	When scaling up in marginalized communities, the healthcare professional must be from the community.	R18-A2
S4	Rename: *Healthcare service model*	This phrase is more concise than the original routine's name.	Rationale
R24	Rename *Operational and performance monitoring and evaluation.*	This phrase is more concise than the original routine's name.	R24-D1, Rationale
R25	Remove this routine	Unnecessary to repeat the routine. Remove this routine from strategic choices and keep it under the inclusive impact element.	R25-A3, Rationale
R28	Remove this routine	The routine might be repetitive. This routine can be assumed under routine R13.	Rationale
S5	Under "strategic choice," management elements add the routine *"Start with points of strength."*	During the interviews, this routine was mentioned as an essential success factor and recognized from the literature.	Rationale, Comments from interviewees.
S5	Under "strategic choice," management elements add the routine *"Create opportunities for continuous learning."*	During the interviews, this routine was mentioned as an essential success factor and recognized in the literature.	Rationale, Comments from interviewees.
S5	Under "strategic choice," management elements add the routine "*Build coalitions and network (inside and outside the health sector)."*	During the interviews, this routine was mentioned as an essential success factor and recognized from the literature.	Rationale, Comments from interviewees.
R27	Remove this routine	This routine is unnecessary because other activities imply the activities throughout the tool.	Rationale
S5	Rename Management element to *Strategic Planning and management*	These management elements contain strategic planning and management principles	Rationale
EVENTS	Rename *events* to be *System-Level Outcomes of Inclusive of Healthcare*	The events represent the desired system level outcomes of inclusive healthcare, which is the core idea of systems-orientated scaling up of health service innovations in the context of this thesis	Rationale
STRUCTURAL CHANGES			

#	UPDATE	MOTIVATION	REF
Visual representation	Add some colours to the tool.	Colours may improve the readability and conceptualization of a tool.	Rationale

The final management tool now includes eight *mental models*, nine *events*, and 33 *routines* distributed among five *management elements*. Chapter 8 of this study presents the final management tool.

7.6 CHAPTER 7: CONCLUSION

The information collected through semi-structured interviews with subject-matter specialists is illustrated in Chapter 7. During the interviews, the management tool's principles were validated, and the tool's efficacy was evaluated. The researcher transcribed the interviews to code for data analysis as part of the evaluation procedure. Next, the evaluation process's conclusions are assessed in light of the project's theoretical framework. Finally, the management tool was updated and improved in response to the evaluation findings and recommendations.

Chapter 7 addresses the following DSR progression checklist items as specified by Hevner and Chatterjee [30] and illustrated in Section 2.5, Table 2.1.

Table 7.6: DSR Progression Checklist [30] **- Item 5 and 6**

NUM	QUESTION(S)	RESPONSE
5	- What evaluations are performed during the internal design cycles? - What design improvements are identified during each design cycle?	- The first evaluation method verified the critical aspects of the tool based on the design requirements based on existing literature. Semi-structured interviews and Impact-Effort analyses were conducted for further detailed evaluation. - The evaluation procedure led to the application of 30 structural and conceptual alterations to the initial framework.
6	- How is the artifact introduced into the application environment, and how is it field tested? - What metrics are used to demonstrate artifact utility and improvement over previous artifacts?	- During the semi-structured interviews, subject matter experts rated the impact and effort of each management routine. - The validity of the proposed routines and preliminary management tool is based on qualitative and quantitative data acquired via semi-structured interviews.

Chapter 8

PRESENTATION OF FINAL MANAGEMENT TOOL

Chapter 8 Objectives:

- Give background on proposed management tool.
- Present final management tool.
- Illustrate practical application of tool.

Following the improvements done throughout the review phase, Chapter 8 presents the final management tool as the output of the DSRM process. The chapter begins with a brief context and motivation for the management tool, followed by a summary of the design process. The completed management tool is then presented, and its components are discussed, followed by a demonstration of the practical application of the tool. The chapter's structure is self-contained and may incorporate previously examined pieces in this study.

8.1 THE MANAGEMENT TOOL BACKGROUND

Many global health interventions in low- and middle-income countries focus on accelerating health improvements through scale-up. Scale-up activities seek to expand and institutionalize proven health interventions so that they become standard practice in national health systems and are accessible to individuals who need them[23]. At the same time that more emphasis is being placed on scaling up interventions, practitioners, donors, and academics in global health are shifting their perspectives on how national health systems work. National health systems are increasingly being recognized as complex adaptive systems (CAS) with diverse components and actors that interact in multiple ways with each other and with the external environment [6].

When interventions in health service innovations are scaled up inside a CAS, they interact with these numerous components and individuals in complex ways, resulting in unanticipated outcomes [6]. There may be conflicts between the objective of implementing well-defined, targeted health service innovation in every marginalized community throughout a country and the complex reality of how individuals and communities adopt the health service innovation and how it is integrated and embedded within the systems.

Although scale-up initiatives typically strive to make the targeted intervention as simple to implement as possible, because of the poor living conditions and historical exclusion of disadvantaged communities, even basic treatments require the replacement of old social and behavioural patterns with new ones, which is an inherently complex process [6]. The mixed results of efforts to enhance

and sustain the usage of innovative health service technology and practices imply that there is still much to learn about scaling up.

The management tool developed throughout this research study provides a visual tool for policy-makers, practitioners, and academics wishing to strategically plan and evaluate future health service innovations' scaling-up efforts to facilitate outcomes towards inclusive objectives through a systems perspective. The tool provides theoretically generalizable relationships between scaling-up contexts and subsequent outcomes, highlighting practical routines that could potentially be leveraged during future scale-up efforts to influence population impact. The management tool demonstrates a practical application of strategic planning and management of scaling up through a systems perspective by combining concepts drawn from theoretical frameworks of prior research studies and categorizing them according to the iceberg model [3]. The iceberg model is a systems thinking tool that can discover behaviour patterns, supporting structures, and mental models that underlie a particular event.

Understanding behaviour in complex systems can only be achieved by taking the overall system as the unit of analysis [91]. Therefore, developing a framework for scaling up management by using the iceberg model presents a visual illustration of a systems-orientated scaling-up approach that defines the desired outcomes as well as the management routines needed to achieve the outcomes in a structured as well as dynamic manner as recommended by the literature [10], [11].

8.2 The Proposed Management Tool

The four main components of the iceberg model—Mental models, Structure, Patterns, and Events—comprise the management tool and are split across two canvasses. Figure 8.1 and Figure 8.2 illustrates how the structure of the management tool relates to the components of the iceberg model. The levels of the iceberg are interconnected as illustrated in Figure 8.3; for instance, the mental models of important system stakeholders influence how the system is structured, which in turn causes system patterns, which generate system events [3].

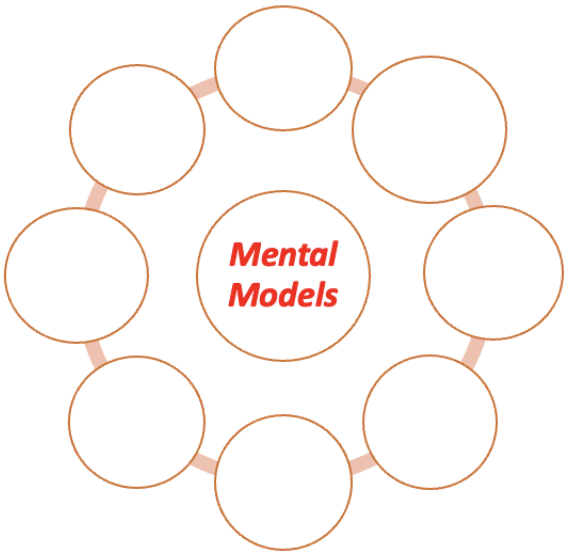


Figure 8.1: Structure of Management Tool - Canvas 1

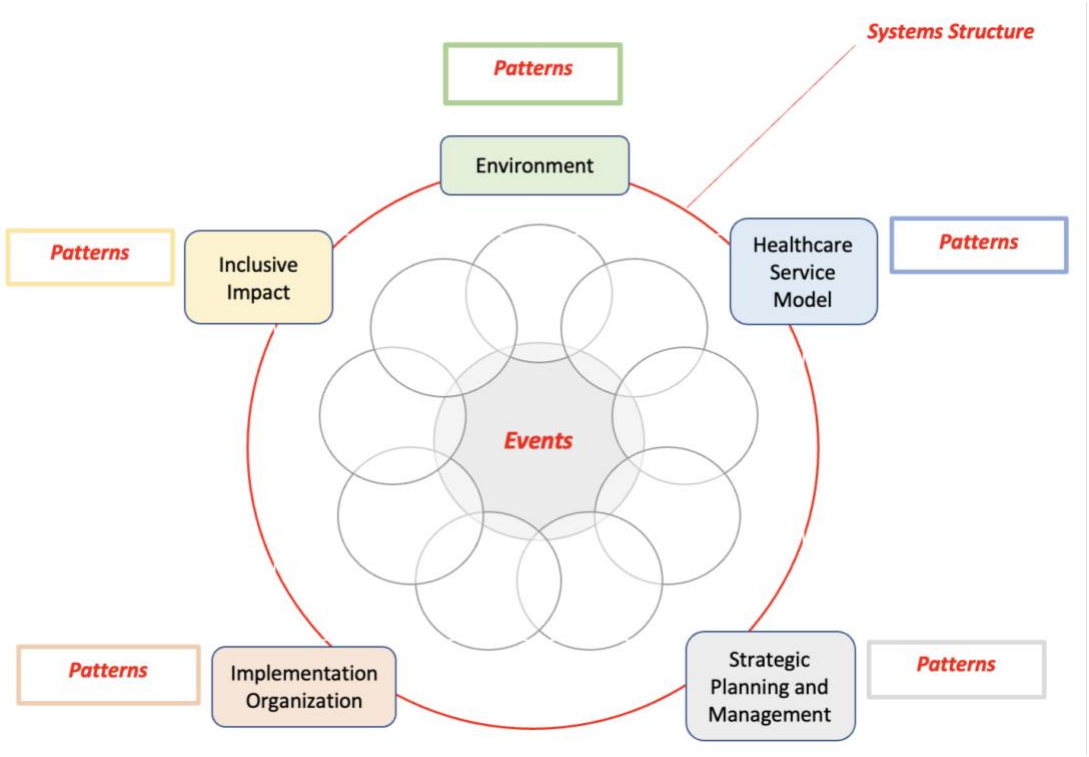


Figure 8.2: Structure of Management Tool - Canvas 2

The first canvas, representing the *mental models* of scaling up, is an original creation of this thesis which combines a collection of core concepts and experience-based lessons from the literature and case studies to create a mental paradigm for conceptualizing scaling up through a systems perspective. The second canvas presents the *iceberg events*, *structure*, and *patterns*. The iceberg *events* represent the desired system-level outcomes for inclusive healthcare as an objective of I4ID. The *Iceberg events* elements are based on the "*key outcomes leading to scale up"* defined by Koorts [6].

The *iceberg structure* represents the various elements in the scaling-up framework and is based on the open-systems perspective concept for scaling-up defined by ExpandNet/WHO's framework for scaling-up health service innovations [9]. The elements from the ExpandNet framework were adapted to fit the context of this study. The *iceberg patterns* represent the essential management routines categorized under the various management elements. The management routines were extracted from the SLR results and validated during the semi-structured interviews and Impact-Effort analyses indicated in Section 7.5. The iceberg *mental models*, *events*, *management elements*, and *routines* are not meant to present a specific solution for a problem. Instead, each implementation opportunity of the health service model in a new location will present unique challenges, and some routines will offer more impact in certain situations than others. Therefore, the management tool represents a dynamic model that could be interpreted in various ways depending on the context of the situation and needs to be constantly revised and updated as knowledge is gained from scaling up experience.

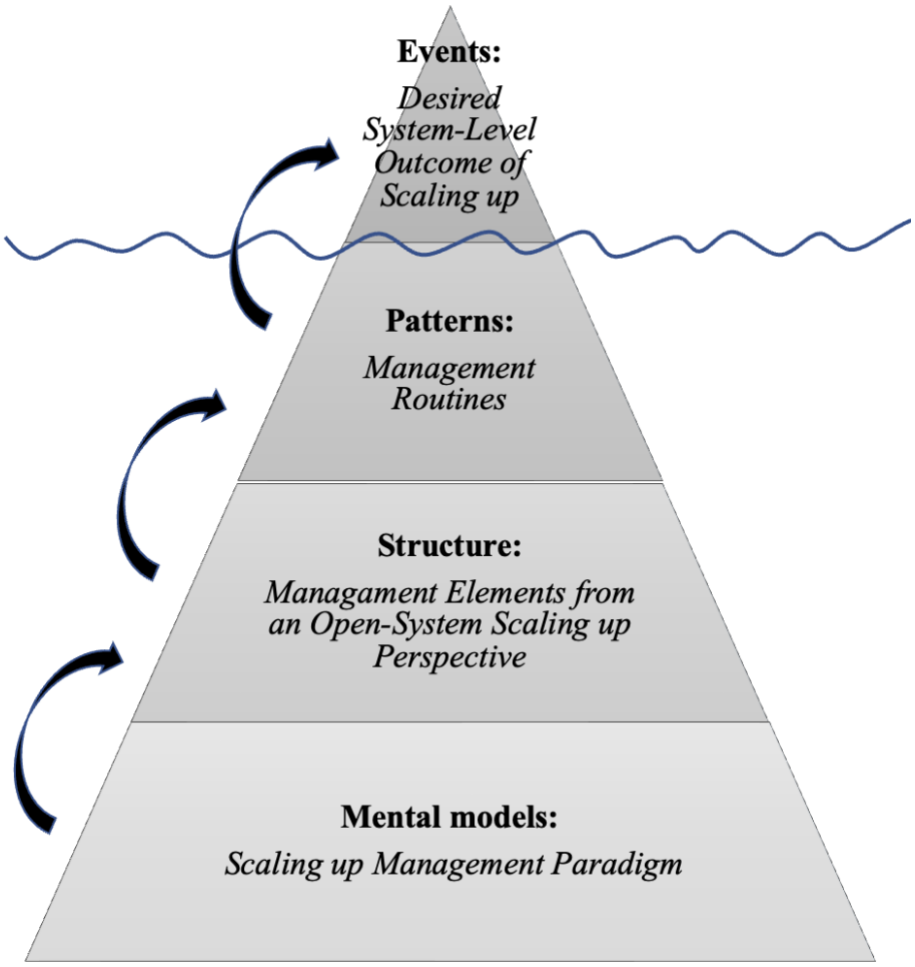
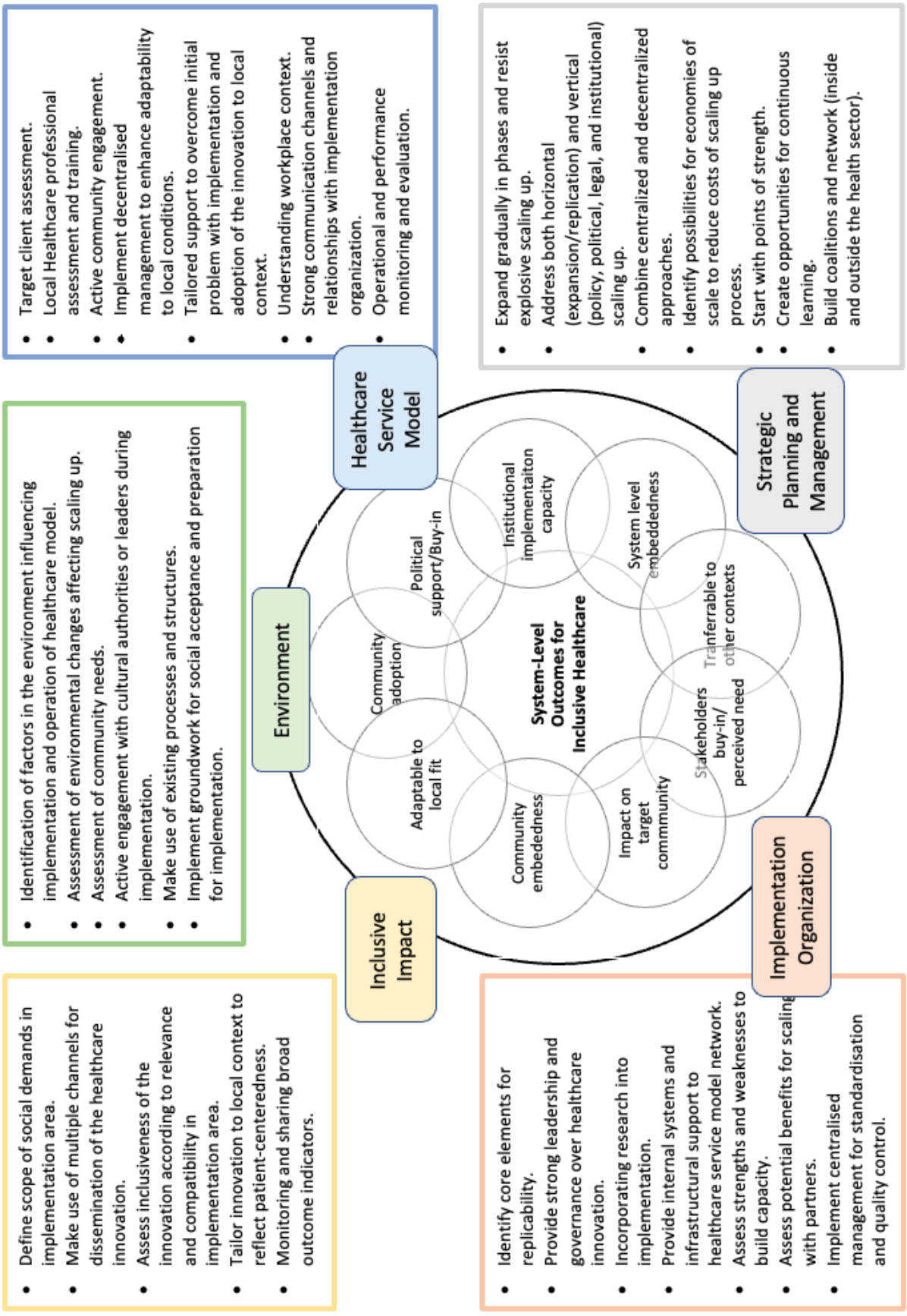


Figure 8.3: Iceberg Model - Systems Perspective for Strategic Planning and Management of Scaling up

Having categorized the various management elements and routines of scale-up [9], suggested non-linearity of the process [11], and guiding scaling-up management actions towards achieving the desired system-level outcomes [10] this study's findings explicitly illustrate the inherent complexity of scale-up including the many interrelations between and within relevant scale-up domains. Thus, the findings demonstrate that achieving intervention implementation at scale depends on a complex set of interacting variables to align strategic planning and management activities towards defined desired systems outcomes of sustainable scaling up.

8.2.1 MANAGEMENT TOOL CANVAS 1

8.2.2 MANAGEMENT TOOL CANVAS 2



8.3 Discussion of Management Tool Elements

8.3.1 Iceberg Mental Models for Scaling-up Health Service Innovations

The assumptions, ideas, and values that shape and sustain system structures are represented by mental models [97]. It is argued that the mental models of system stakeholders are frequently dissimilar and can conflict [3]. Therefore, the objective of the mental models is to align stakeholder expectations of scaling up and conceptualisation of inclusive healthcare with a systems perspective of scaling. The mental models are discussed below in Table 8.1

Table 8.1: Final Management Tool - Iceberg Mental Models for Scaling up Health Service Innovations.

Mental Models	Description
Scaling up healthcare innovations is a non-linear process	Because of the dynamic nature of complex adaptive systems (e.g., health systems and socio-cultural systems), seemingly small amounts of effort can result in significant changes, or, more typically, extensive efforts can result in proportionately small or no changes. Intentional or unintentional change can also occur in system elements that were not directly involved in the scale-up effort. Conditions that shape scaling up components and their interactions vary, sometimes dramatically. Due to its multidimensional, non-linear, and context-dependent nature, the scaling-up process does not adhere to any simple principles or evident sequential steps to achieve sustainable impact in the implementation area. There will be conflicts between the elements; strategic decisions such as trade-offs will be required, and management will need to maintain a continuous balancing act to address emergent conflicts.
The degree of scaling up should match the social need to achieve a sustainable impact toward systems transformation.	Inclusive healthcare initiatives aim to enhance marginalized communities' living conditions and health. Examining the ramifications of scaling up early in the innovation's development and testing phases is critical. Not all healthcare innovations are intended to be scaled up. Still, for those aiming for long-term system-level impact (i.e., social transformation), the magnitude of scaling up should correspond to the severity of the social problem. When the consequences of scaling up are considered throughout the design and development of healthcare innovation, they tend to be customized into a specific policy, programmatic, economic, and socio-cultural environment. As a result, they are more likely to attain large-scale success.
Sustainable implementation requires adoption and social acceptance from the community	Scaling up is not sustainable, no matter how efficient the implementation approach is, if the community (social-cultural system) or health system in the implementation area is resistant to the healthcare service model. One of the essential success factors to consider when implementing healthcare innovations in marginalized groups is societal acceptance. Approach scaling up by considering the complex interaction of perceptions, worldviews, beliefs, ambitions, and agendas that can significantly influence scaling up outcomes.
Recognize that trade-offs are often necessary for long-term sustainability	There may be tensions between several scaling-up approaches, such as the rate of scale-up, the degree of inclusion, service diversification, and the choice of implementation areas or target

	market are all examples of trade-offs. Trade-offs are often unavoidable, and decision-makers may give up one benefit or advantage to obtain another. Comparing each option's potential rewards and losses are necessary to resolve these tensions. As trade-offs can significantly impact the process and the results of scaling up, planners and implementers must carefully assess their long-term repercussions.
Scaling up is driven by desired system level outcomes and identifying what is required to achieve them.	Initiatives for inclusive healthcare are primarily intended to meet an unmet social need. Scaling up is motivated by the goal to maximize the impact of the innovation once it has successfully proven to deliver beneficial healthcare-related impact. A systems-orientated approach pursues scaling up from the perspective of desired system-level outcomes and identify the actions required achieving the outcomes. It is crucial to direct decision-making toward the organization's desired social goals, especially when considering trade-offs (such as inclusivity, profitability, and rate of scale) during the scaling-up process. Good leadership and clearly stated objectives will facilitate the decision-making process to decide where to allocate social organization's frequently constrained resources in a way that makes the most impact towards systems change.
Combine horizontal scaling up, vertical scaling up, and diversification.	The following three scaling forms complement each other and should be combined when possible. (1) Horizontal scaling up: Expanding the innovation to new geographic areas or population groups; (2) Vertical scaling up: Investing the frequently lengthy time and energy required to win political support for scaling up and integrating the innovation into regular program operations; and (3) Diversification: Diversifying the innovation through additional testing of new components.
Acknowledge variance regarding socio-cultural contexts in marginalized communities	It is necessary to consider the uniqueness of each implementation site's infrastructural, social, and cultural settings to achieve extensive regional rollout. Decentralized approaches, such as hiring healthcare professionals from the community and delegating some of the responsibilities (e.g., community engagement), could thus significantly improve implementation strategies to ensure community advocacy and social acceptance.
Scaling up requires dynamic balancing as elements in the scaling-up system interact.	Health systems are intrinsically complex, with dynamic, unpredictable, and ever-changing social and cultural behavioural patterns. Scaling up could be enhanced by implementing a systems perspective approach, which necessitates a dynamic balancing act among scaling up elements *(i.e., environment, inclusive impact, implementation organization, healthcare service model, and strategic planning and management)* to monitor and assess scaling up performance and outcomes at various implementation sites to ensure sustainability.

8.3.2 Characteristics of System-Level Outcomes for Inclusive Healthcare – Iceberg Model System Events

It can be argued that the emphasis on discrete and isolated events has allowed for a thorough grasp of the tip of the iceberg and isolated system events in scaling up health service innovations. As a result, our understanding of scaling-up consequences can potentially be enhanced at deeper levels of the iceberg. A thorough understanding of the system structure and mental models will provide insight into the system's behaviour, why recurring problems occur, and how issues can be addressed to improve performance.

The management tool is intended to improve understanding of how systemic structures and mental models interact to produce such events and patterns. Rather than focusing on isolated events that can lead practitioners and implementers to make event-driven decisions, the tool provides a holistic view of interconnected system aspects that can lead to desired outcomes. For example, the implementation organization could observe that based on a specific healthcare service model's activity profile or patient numbers in a given community, the model is not operating as intended, which might provide a deceptive image of demand driven by patient number analysis (i.e., events).

Based on patient numbers, it may appear that the model is not viable in that location. However, other elements, such as community adoption and the model's adaptation to local fit, may require some attention to increase the model's sustainability. Without the context of understanding the system-wide influences on the community's behavioural patterns, it may not be possible to fully understand how to achieve the desired outcomes of inclusive healthcare or why an intervention is not performing as expected.

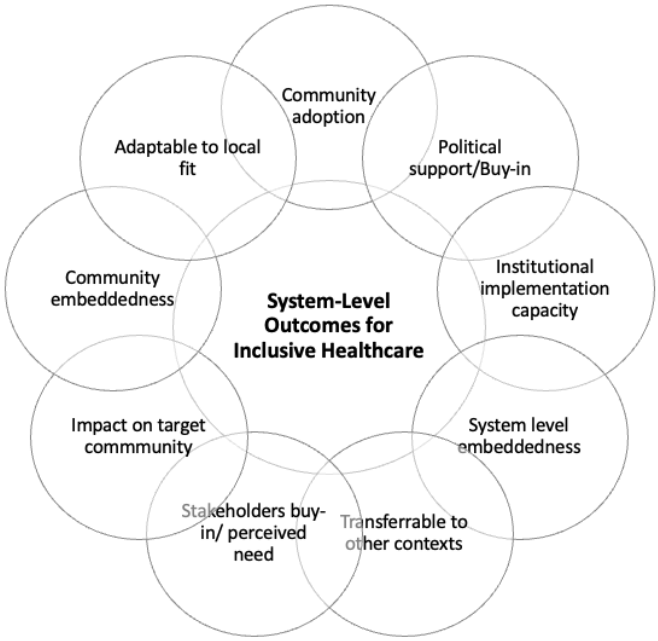


Figure 8.4: Final Management Tool - System Level Outcomes of Inclusive Healthcare

Table 8.2: Final Management Tool – System-Level Outcomes of Inclusive Healthcare

Inclusive healthcare characteristics	Description
Community adoption	The health service innovation receives social acceptance and advocacy from the community of the implementation site.
Political support/buy-in	Innovation aligns with state/national priorities and receives advocacy from the government.
Institutional implementation capacity	Ability to leverage existing processes and structures and introduce other alternative resources or incentives during scale-up to reduce weaknesses and enhance implementation.
System level embeddedness	Simultaneous integration into system structure, budgets, and practices (centralized method) while contextually relevant and incorporating local resource mobilization (decentralized approach).
Transferable to other contexts	Intervention and implementation resources are easily replicable and allow flexibility in various contexts.
Stakeholders' buy-in/perceived need	Stakeholders perceive a need to address a priority area and see benefits over current practices/methods for achieving their goals.
Impact on the target community	The innovation illustrates sufficient evidence for a positive impact on the target community.
Community embeddedness	The health service innovation is integrated into the community's infrastructure and socio-cultural environment.
Adaptable to local fit	Flexibility is incorporated into the implementation method to ensure adaptability to the local context.

8.3.3 MANAGEMENT ELEMENTS AND ROUTINES FOR SCALING UP HEALTHCARE INNOVATIONS – ICEBERG MODEL SYSTEMS STRUCTURE AND PATTERNS

Understanding behaviour in complex systems can only be achieved by taking the overall system as the unit of analysis [22]. A systems approach acknowledges that the whole system in which scaling up takes place is much greater than the sum of its individual components of scaling-up performance. Therefore, to achieve desired system-level outcomes, the management approach necessitates understanding the interactions among systems components.

As such, a comprehensive understanding is required to fully appreciate the interactions and emergent properties that underpin performance and the extent to which those interactions influence systems' behaviour. A systems perspective approach argues that making changes to the system's structure will have a far more significant influence on improving events than decisions made at the level of external events [3].

The management element represents the various perspectives for scaling up a health service innovation towards inclusive impact. The management routines are categorized under their respective management elements and discussed in Table 8.3.

Table 8.3: Final Management Tool - Management Elements and Routines

ENVIRONMENT *The dynamic and changing social, political, cultural, and infrastructural environment.*	
Management Routines	How routines apply to scaling up healthcare in a CAS
Identifying factors in the environment influencing implementation and operation of the healthcare model.	Consider environmental factors such as historical background, cultural norms, social circumstances, infrastructural conditions, and crime in the implementation environment that could affect the implementation method and community adoption of the healthcare innovation.
Assessment of environmental changes affecting scaling up.	The health system is described as a CAS with emergent behaviour, phase transition, path dependence, feedback, and scale-free networks. During the lifecycle of healthcare innovation, the environment and socio-cultural behaviour patterns in the implementation context are expected to change with time. Being vigilant for changes, ensuring active community engagement, knowledge building, sharing, and decentralized control enhances organizational adaptability for local fit.
Assessment of community needs.	Effective community adoption realizes when the community sees the value and advantage of the intervention over existing practices. Assessment of community needs constantly enhances adaptability to local fit to enhance the value proposition.
Active engagement with cultural authorities or leaders during implementation.	Local authorities or leaders in rural or semi-rural communities are frequently independent of the government. When scaling up in these communities, it is critical to recognize and respect the authorities by engaging with them during the implementation phase to improve advocacy and social acceptance.
Make use of existing processes and structures.	When developing an implementation strategy, opportunities to leverage existing processes and structures (e.g., transport systems, hospitals, shopping centres, and information systems) often exist and could enhance effectiveness and efficiency and scaling up approach.
Implement groundwork for social acceptance	Establish a solid understanding of the social-, infrastructural-, cultural-, and political environment in the implementation area to ensure the scaling-up plan

and preparation for implementation.	is thorough and organized and that decision-makers have considered all the necessary elements to ensure social acceptance and community advocacy. Establish a solid basis for later scale-up stages. Provide adequate information for decision-makers to decide whether to conduct scale-up
INCLUSIVE INNOVATION *The innovation's contribution to the inclusivity of marginalized communities and the healthcare system's development to serve these communities needs.*	
Management Routines	Description
Define the scope of social demands in the implementation area.	Identifying the extent of social demands indicates where and how replication of the elements can most effectively increase the social impact. Determine unmet social needs and align scaling-up ambitions to maximize social impact rather than profit. Intervention allocation, typically resource-constrained, must be carefully assessed to guarantee maximum and long-term impact.
Make use of multiple channels for the dissemination of healthcare innovation.	Use public promotion and dissemination of healthcare innovation via targeted stakeholder channels to raise community visibility and enhance advocacy initiatives' perceived validity and impact.
Assess the inclusiveness of the innovation according to relevance and compatibility in the implementation area.	Determine whether the impact of the innovation in the implementation area leads to inclusive development in marginalized groups in terms of quality of life and well-being through access to high-quality, affordable healthcare services.
Tailor innovation to the context.	Engagement with community locals and authority figures, connecting with the community in their native language, and considering their cultural ideas and norms in the implementation process and delivery method could significantly improve community advocacy and adoption.
Monitoring and sharing broad outcomes indicators.	Inclusive healthcare aims to provide access to healthcare services in low-income communities as an alternative to state institutions. By evaluating and communicating outcome and impact indicators, it is crucial to stay focused on broad goals (e.g., population health improvement (PHI), behavioural change, and social transformation) to assess the scaling up outcomes according to these goals. Sharing evidence of the innovation's potential for positive social impact may also dramatically increase investor, government, or donor interest.
IMPLEMENTATION ORGANIZATION *The individuals and organizations (and resource teams) that seek to promote and facilitate the broader use of the innovation.*	
Management Routines	Description
Identify core elements for replicability.	While replicating the innovation to new contexts, the critical features of the operational model (fidelity) should remain intact so that the innovation does not lose its original purpose and aims. Keeping basic features in place allows for consistency of operations and branding and the preservation of elements that have a societal impact.
Provide strong leadership and governance over healthcare innovation.	A robust support system is essential when adopting a healthcare innovation in a unique setting. For example, health clinics frequently require financial assistance for the first several years until they are self-sufficient.
Incorporating research into implementation.	Research is conducted in the implementation process ("learning and doing") to document what worked and did not. Learn from the implementation process by identifying expected and unforeseen problems, strategic decisions and trade-offs, and what worked and did not.

Providing internal systems/(infrastructural) support.	Provide infrastructure support for the organization's formal processes and procedures (e.g., human capabilities, infrastructure, data collection, reporting systems, learning systems, and design implementation for sustainability).
Assess strengths and weaknesses to build capacity.	Assess strengths and weaknesses in all organizational elements such as resources, staffing, technical capability, management and administration, organizational culture, policy and legal framework for service delivery, and leadership.
Assess potential benefits for scaling up with partners.	Organizations in the social sector may benefit by working with other institutions, firms, and organizations to offer the resources they need. Social enterprises can widen their social effect by actively participating in partnerships or strategic alliances that execute social activities or by actively supporting and advocating for their partners. Depending on the expected potential of either cooperating with other groups or scaling on its own, the social organization should choose the option that guarantees the most effective impact.
Implement centralized management for standardization and quality control.	The implementation organization needs centralized control over the network of implemented healthcare service models. Centralized management is necessary for aspects such as standardization, service quality, brand name, internal processes, systems provision, leadership, and monitoring and evaluation of outcomes.
HEALTHCARE MODEL *The set of health service interventions that is being scaled up. Once successfully tested, the package of interventions serves as a model to improve health services, leading to reduced disease and improved health status in the implementation area.*	
Management Routines	Description
Target client assessment	The target community/clients by comparing and balancing social and economic goals. Defining the type of client to serve and not to serve is an essential organizational capability for scaling up [105].
Local healthcare professional selection assessment and training	The target community/clients are selected by comparing and balancing social and economic goals. Defining the type of client to serve and not to serve is an essential organizational capability for scaling up to determine implementation locations and what to include/exclude in the service model. The target market can be identified by comparing and balancing the organization's social and economic goals.
Active community engagement.	Active engagement with the community may enhance needs assessment, community advocacy, adaptation to local fit, community embeddedness, and overall scaling up success.
Tailored support to overcome the initial problem with implementation and adoption of the innovation in the local context	Following the implementation of the healthcare organization in a new context, the implementation organization may need to provide tailored support (e.g., leadership and guidance, financial support, and management support) to healthcare professionals and staff to overcome initial implementation and adoption problems and build a customer base.
Understanding of workplace context.	Understanding the motivations and challenges faced by frontline workers and other critical actors improves scaling-up performance. Effective bottom-up communication channels and ties with implementation organizations can help improve understanding of the working situation.
Strong communication channels and relationships with	Effective communication channels and partnerships with implementation organizations are critical adaptive mechanisms for responding to changing circumstances or reaching a consensus on adapting to new situations and improving monitoring and evaluation of scaling up outcomes.

implementation organization.	
Monitoring and sharing broad outcome indicators.	Throughout the three stages of scaling up: pilot, scaling up, and large-scale implementation, various monitoring approaches are used. Some numerous M&E approaches and technologies are appropriate for each level. During the pilot phase, M&E entails measuring an invention's impact and the entire set of interventions that will be scaled up. The emphasis shifts to evaluating processes during the scale-up phase to ensure that the innovation is executed with fidelity, at a reasonable speed, and reaches the goal coverage, all while maintaining the fidelity of the innovation. Once an innovation has attained scale or has become "integrated into the system," efforts to measure fidelity continue, but these may also include analyzing the population's impact. These shifting priorities must be reflected in M&E procedures, metrics, benchmarks, and data collection techniques.

Strategic Management and Planning

Designing and implementing a scaling-up strategy also involves making several strategic choices related to the type of scaling-up strategy, approaches for dissemination and advocacy, costs of scaling up and mobilization of resources to support scaling, and monitoring and evaluation.

Management Routines	Description
Expand gradually in phases and resist explosive scaling up.	In general, four stages are necessary to reach full-scale: (1) Set-up, which prepares the ground for the introduction and testing of the intervention that will be implemented at full scale; (2) Develop the Scalable Unit, which is an early test and demonstration phase; (3) Scale-up Test, which spreads the innovation to various settings that are likely to represent contexts encountered at full scale; and (4) Go to Full Scale, which develops quickly to allow a more significant number of sites to adopt and replicate the intervention. Although the phases in this sequence appear to flow logically from concept to full scale, they may be more spontaneous and cyclical, requiring different levels of effort at different times and progressing at different rates.
Address both horizontal and vertical scaling up.	Horizontal scaling up is the process of increasing geographical reach through "replication." Vertical scaling up is the government's formal endorsement of innovation at the national level, which is institutionalized through national planning processes, policy changes, or legal action. Integrating a healthcare innovation into the healthcare system requires more than just replication. If scaling up is to be sustainable, it must include both the horizontal and vertical components of dissemination. Vertical scaling requires strong advocacy to establish the legitimacy of the idea and the need for change. Legitimizing change is required to accept budgetary priorities, pass policies, and develop support for implementing the innovation. Furthermore, it involves understanding the health system's planning cycles and the execution of suitable mechanisms to incorporate innovation and its associated requirements—financing, human resources, logistical requirements, and supply needs—into health policy and budgets.
Combine centralized and decentralized approaches.	A decentralized strategy can be used to implement the innovation while integrating the central level to ensure that it is integrated into a health system's systems, structure, budgets, and procedures. Decentralized techniques can encourage local initiative, spontaneity, reciprocal learning, and problem-solving. Local initiatives will inevitably ensure that ideas develop toward local relevance. However, a decentralized strategy, particularly for vast networks of health interventions, may dramatically increase the workload for the resource

	team. Furthermore, officials in a decentralized structure lack the authority of central authorities. They lack the strength or resources to compel mass replication and rarely wield the necessary policy change. Central-level engagement is usually required to incorporate innovation into structures, finances, and procedures. Even in the most decentralized systems, national entities usually influence health care funding, resource allocation, and creating and monitoring conformity with norms and standards. Despite the restricted possibilities for choosing between a centralized and a decentralized strategy provided by the health system's structure, it is recommended to mix both for their unique benefits and cons.
Identify possibilities for economies of scale to reduce the costs of scaling up the process.	Understanding the costs of scaling up clarifies the type and amount of assistance required to achieve scale. All three methods of deliberate scaling up have related costs: (1) Horizontal scaling up: expanding the innovation to new geographic areas or population groups; (2) Vertical scaling up: investing the time and energy required to gain political support for scaling up and integrating the innovation into regular program operations; and (3) Diversification: diversifying the innovation through additional testing of new components.
Start with points of strength.	Working initially in areas of strength— sites where scaling up is most likely to succeed—is sometimes more appropriate. Although affluent regions or urban areas typically have better health care, devoted, capable sites can also be in resource-poor communities. Working with areas of strength may help accelerate the long-term expansion rate. Once numerous samples of how innovations succeed within a program are available, they can serve as models for policymakers and program administrators and develop support and motivation for further rollout to other regions.
Create opportunities for continuous learning.	Successful scaling requires constant training and learning. In resource-constrained situations, training workshops' direct and indirect expenses may limit the frequency with which this method can be used. Alternative learning and dissemination tactics are necessary to encourage participants and keep their knowledge and skills up to date. Effective communication and relationship-building among healthcare professionals in the network can facilitate collaborative learning.
Build coalitions and networks (inside and outside the health sector).	Scaling up often necessitates utilizing external or donor resources, mainly because national funds are rarely available for such efforts. Identifying external resources that might boost momentum and eliminate potential time delays in scaling up processes is a vital responsibility of the resource team.

8.4 Application of Management Tool

The management tool is designed to be applied dynamically to ensure balance among elements in the scaling-up system to achieve the desired outcomes. The management tool elements also require continual revision and adaptation as knowledge and experience are gained during the scaling-up process. Each situation may require different actions or combinations of routines to enhance the scaling up outcome. The management tool aims to incorporate the necessary flexibility in the planning and implementation of scaling up a health service innovation in marginalized communities by providing 33 routines that can be leveraged to influence the scaling-up systems dynamic to achieve the desired system-level scaling-up outcomes. Figure 8.5 below describes the application of the management tool in brief.

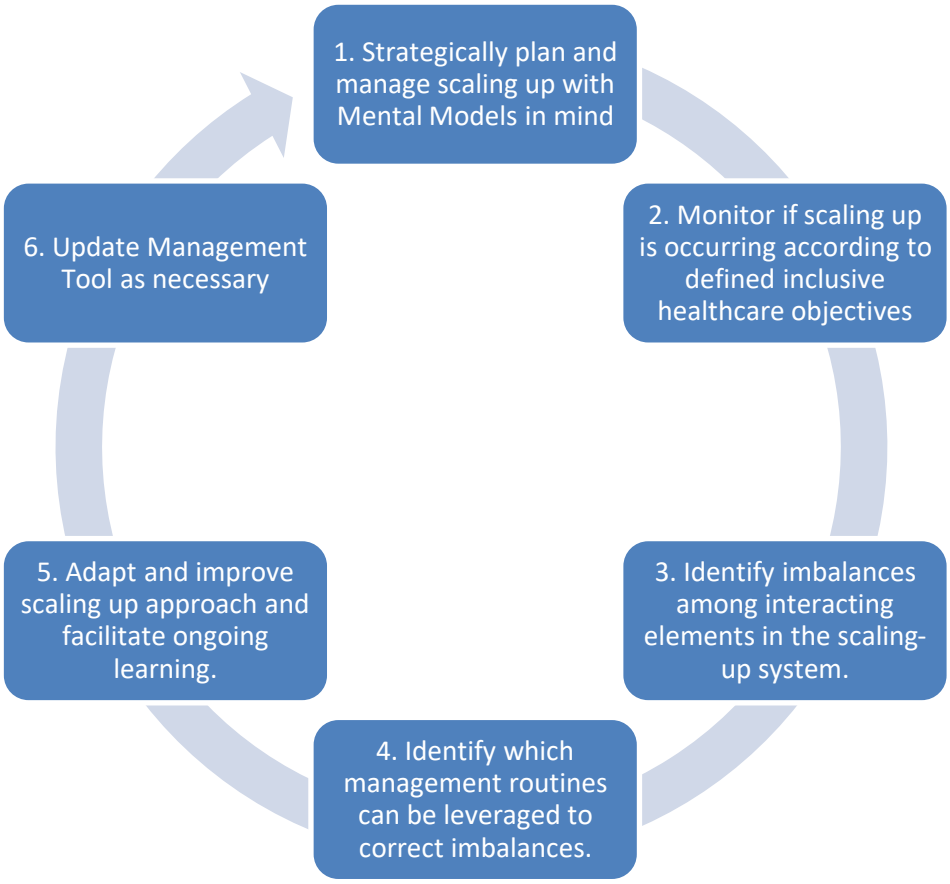


Figure 8.5: Practical Application of Final Management Tool

Step 1: In the process of strategic design and development of a scaling up approach, ensure all necessary stakeholders involved in planning and implementing the scaling-up process have a consensus about the expectations of the scaling-up process of the healthcare innovation. Expect the possibilities of unanticipated and unpredictable events and factors to emerge by incorporating flexibility in the scaling-up approach to enable adaptability to unanticipated changes in the process.

Step 2: Scaling up is not a matter of routine program implementation. It is necessary to have procedures to monitor if scaling up is occurring according to the desired system-level outcomes of inclusive healthcare as defined in the *iceberg-events* aspect tool. Methods such as *gap analysis*, or

swot analysis could be helpful to compare the actual state of the implementation site (system) to the potential or desired outcomes of scaling up to implement change in the system. It is important for the organization to make the best use of current resources and investment in capital or technology to produce or perform toward the idealized outcome.

Step 3: The conditions that shape scaling up elements and their interactions vary throughout scaling up, sometimes radically. Because the scaling-up process is multi-dimensional, non-linear, and context-dependent, there are no simple principles or clear-cut sequential steps to achieving full scale. Each implementation site is unique and have different imbalances between scaling up elements. Tensions will occur among the elements, and choices about managing such tensions will frequently result in trade-offs; therefore, a continuous balancing act among elements is necessary. In the presence of tensions or uncertainty in the directions towards scaling up, the *mental models* and desired *events* of the tool could be used to visualise potential opportunities or risks and to guide and rationalise decision-making to reflect ideal organizational goals.

Step 4: In the presence of imbalances (e.g., opposing stakeholder perspectives on the rationale for system change or in the face of trade-offs and uncertainty), the management tool can be used to identify what management elements and routines could be leveraged to allow for efficient system changes. Also, the routines highlighted in the tool can be used with emerging opportunities (for example anything from a national pandemic; to a unique investment opportunity) that present themselves to mitigate weaknesses and enhance strengths to achieve congruence among elements in the scaling-up system. Knowledge building in the step is critical. Continuous assessment and revision of what works and what does not work and why could enhance future decision making.

Step 5: After examining the system dynamics, the necessary steps must be undertaken to improve the scaling-up outcomes and promote continued learning by continuing the balancing act as the scaling-up process progresses. System dynamics could observed by identifying systems archetypes (i.e., systems expressed by circles of causality). Identifying a system archetype and finding the leverage enables efficient changes in a system.

Step 6: The management tool elements and routines require continual revision and adaptation as knowledge and experience are gained during the scaling-up process to enhance future endeavors. Managers, implementers, and important stakeholders (i.e., healthcare professionals) might have to contradict mental models and experiences from every new implementation site. It is thus essential to communicate learning experiences within the organization to update the tool's mental models, structure and routines, and events consciously as new insights emerge.

Systems perspective for scaling up:

This thesis supports the argument by [10], stating that scaling-up occurs along a continuum: The traditional "*intervention-orientated*" scaling up at one end is based on the model that effective scaling involves a linear, intervention-orientated expansion prioritizing evidence-based interventions (EBI) into existing systems.

On the other end, *"systems-orientated scale-up"* adopt the perspective that scale-up can exist within the complex systems paradigm, where interventions are conceptualized as "events in systems" [28].

In this case, implementation and scaling-up operations should focus on producing system-level changes to improve population health.

Systems-orientated scale-up is defined by [10] as "*an approach that prioritizes the behaviour and function of the system, with a focus on relations between several system elements, using system-level levers and dynamic system changes to drive impact at scale*."

The management tool aims to reflect a systems perspective of scaling up to enhance traditional approaches in the face of complexity, allowing managers and implementers to adopt a holistic conceptualization of scaling up through the lens of complexity and systems. A systems perspective may enhance strategic decision-making by rationalizing decision-making when dealing with trade-offs and uncertainty and allow strategic development of scaling-up pathways to achieve inclusive healthcare outcomes at the system level when scaling up health service innovations.

8.5 CHAPTER 8: CONCLUSION

Chapter 8 provides an overview of the objectives and application of the final management tool for scaling up health service innovations in marginalized communities to promote inclusive objectives using a systems perspective strategic planning and management approach.

Chapter 8 addresses the following DSR progression checklist items as specified by Hevner and Chatterjee [30] and illustrated in Section 2.5, Table 2.1.

Table 8.4: DSR Progression Checklist [30] **- Item 2, 7, 8**

NUM	QUESTION(S)	RESPONSE
2	What is the artifact? How is the artifact represented?	The artifact is a management tool that can be used by implementers and practitioners of health service innovations in marginalized communities to guide the process of scaling up to enhance outcomes toward sustainable inclusivity. The final management tool consists of two canvases. The first canvas illustrates a rich picture in the form of a mental model for managing the scaling up of health service innovation in marginalized communities. The second canvas illustrates a rich picture of sustainable outcomes of inclusive healthcare and the management elements and routines that could be implemented to enhance scaling up outcomes towards the desired social goals.
7	What new knowledge is added to the knowledge base and in what form (e.g., peer-reviewed literature, meta-artifacts, new theory, new method)?	The knowledge base now includes a new management tool. The management tool displays a new representation of existing scaling-up management elements and routines, and new theories are added using the proposed application of the tool.
8	Has the research question been satisfactorily addressed?	The research question has been addressed sufficiently. This study's management tool addresses the various aspects required to enhance the scaling up outcomes of health service innovations in marginalized communities towards inclusive healthcare objectives.

Chapter 9

CONCLUSIONS AND RECOMMENDATIONS

Chapter 9 Objectives:

- Present overview of the study and research methodology.
- Discuss evaluation of research objectives.
- Discuss research contributions.
- Discuss study limitations.
- Provide recommendations for future research .

The conclusions of this thesis are discussed in Chapter 9. A synopsis of the study and the research methodology is first provided to demonstrate how the research objectives were attained. After discussing the research contributions and limitations of the study, the chapter ends with suggestions for additional research. Figure 9.1 illustrates the six DSRM activities aligned with the corresponding research objectives of this study.

9.1 RESEARCH SUMMARY

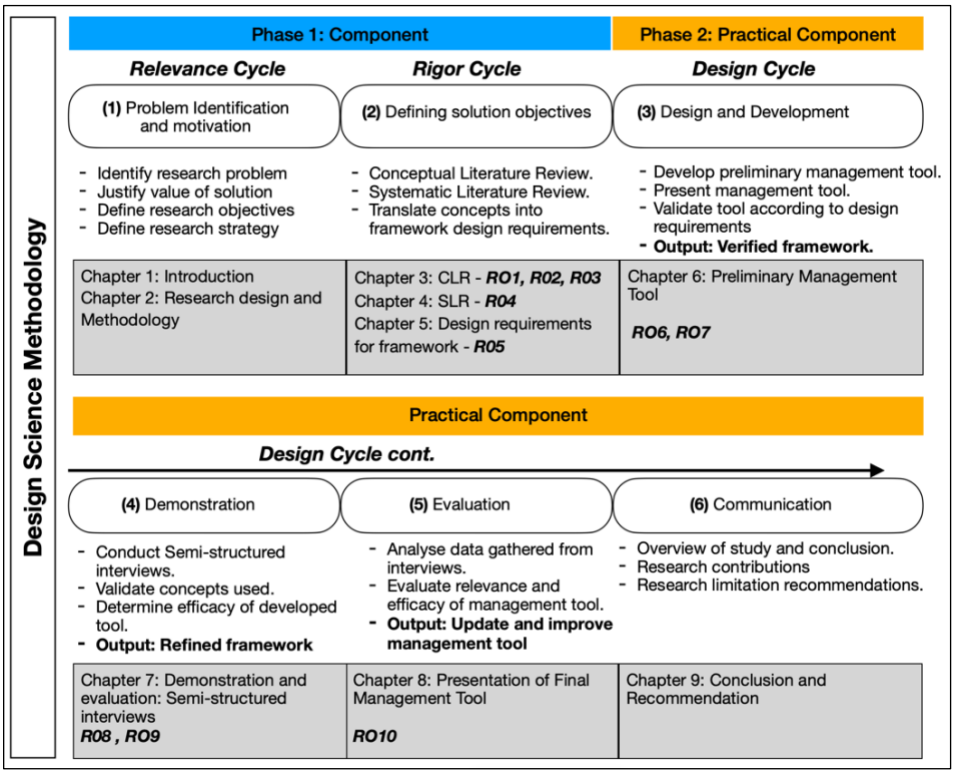


Figure 9.1: Research Design Overview

9.1.1 Activity 1: Problem Identification and Motivation

Chapters 1 and 2 addressed activity 1 of the DSRM. Chapter 1 provided background information on the research problem by discussing the implementation of health service innovations for inclusive objectives. Scaling up is defined, and the various approaches for scaling up to achieve systems-wide impact towards inclusive goals are discussed. The background information motivated the need for developing a management tool to approach scaling up through a systems perspective to enhance scaling-up outcomes. Additional research questions and objectives were devised and structured under the two main phases of the thesis to ensure that the research topic was appropriately addressed: phase 1 - the theoretical component, and phase 2 - the practical component.

Phase 1 focussed on building a solid theoretical foundation for the research problem, which led to identifying the management tool's design requirements and the most significant elements derived from the theory to include in the management tool.

Phase 2 involved developing and evaluating the preliminary management tool and presenting the final updated and improved management tool.

Chapter 2 discussed the research methodology and design of the research project. The researcher investigated various approaches to select the most appropriate method for this study. A qualitative approach was selected as the most appropriate and effective research method for this study.

Design science research (DSR), which is motivated by the aim to improve the environment via the introduction of new and innovative artifacts [36], was selected as the appropriate research methodology to develop a management tool to enhance strategic planning and management of the scaling up of health service innovations to facilitate inclusive goals.

9.1.2 Activity 2: Defining Solution Objectives

Activity 2 in the DSRM was covered in chapters 3,4 and 5. Each chapter was a phase in developing a solid knowledge base allowing the researcher to refine and describe the solution objectives.

The conceptual literature review (CLR) was incorporated in Chapter 3 to gain in-depth knowledge about the research problem. The researchers' outcome objectives of the CLR included the following: to understand what is meant by I4ID, understand the application of healthcare development towards I4ID goals, understand what is meant by scaling up health service innovation and the main scaling-up elements, understand various types ad approaches for scaling up, and finally, understanding what is meant by approaching scaling up through a systems perspective and how a systems perspective could enhance strategic planning and management approaches and enhance scaling up outcomes to facilitate inclusive goals.

After the CLR, a systematic literature review (SLR) was conducted in Chapter 4 to identify the prevalent frameworks and models for scaling up health service innovations. The studies identified in the SLR were analyzed, and essential scaling-up management concepts and routines were extracted and organized in a concept matrix.

In chapter 5, the researcher analyzed the necessary features for a conceptual framework which, combined with the knowledge acquired from the CLR and SLR, completed the necessary knowledge

and understanding for solution development. The researcher established sixteen design requirements for the management tool based on the research.

The concepts and elements in the concept matrix, together with consideration of the design requirements and consideration of the features of a conceptual framework, are used to develop a conceptual framework based on the structure of the ice-berg model [3] to reflect a systems perspective for strategic management and planning of scaling up health service innovations. The conceptual framework serves as the core basis for developing the management tool.

9.1.3 Activity 3: Design and Development

In Activity 3 of the DSRM, the design and development process included reconstructing the conceptual framework into a visually comprehensive management tool. The management tool's design depicts the dynamic, non-linear character required for strategically planning and managing scaling up.

The preliminary tool consisted of two canvasses, the first illustrating seven mental models for scaling up health service innovations, the second illustrating nine outcomes for sustainable scale-up, five management elements representing the various scaling-up system perspectives, and 31 initial management routines divided between the various management elements. Finally, as the initial evaluation approach, the researcher concluded the development process by ensuring that all design requirements were met.

9.1.4 Activity 4: Demonstration

Chapter 7 included the demonstration and evaluation phase of the DSRM for activities 4 and 5, respectively.

The demonstration phase included evaluating the management tool's concepts through semi-structured interviews with nine interviewees. To gather credible feedback on the many concepts and components of the proposed management tool, the researcher selected a diverse group of subject matter experts in the healthcare implementation and practice field. The participant profiles are shown in Table 9.1 below.

Table 9.1: Interview Participant Profiles

PARTICIPANT	NATIONALITY	VOCATION	CONTRIBUTING AREA OF EXPERTISE	CONTRIBUTON TO INTERVIEW
A	South Africa	Operational manager	Healthcare Implementation Expert	Impact-Effort Analysis and Interview Questions
B	South Africa	CEO	Healthcare Implementation Expert	Impact-Effort Analysis and Interview Questions
C	South Africa	General Manager	Healthcare Implementation Expert	Impact-Effort Analysis and Interview Questions
D	South Africa	CEO	Healthcare Implementation Expert	Impact-Effort Analysis and Interview Questions
E	South Africa	Scholar	Social Healthcare Expert	Interview Questions

F	South Africa	Medical Professional	Healthcare professional experts (Inclusive Healthcare Innovations, Public)	Interview Questions
G	South Africa	Medical Professional	Healthcare professional experts (Inclusive Healthcare Innovations, Public)	Interview Questions
H	South Africa	Medical Professional	Healthcare professional experts (Public, Private)	Interview Questions
I	South Africa	Medical Professional	Healthcare professional experts (Public, Private)	Interview Questions

The researcher followed a standardized interview process to ensure proper structure and comparability of the interview responses.

The interviews aimed to achieve three goals. Firstly, to validate the concepts used throughout the preliminary management tool based on their relevance and applicability to the study context. The researcher presented the background of the research problem and the development of the tool, via an MS PowerPoint presentation, at the beginning of the interviews. The participants were asked for feedback on whether the concepts used in the tool are relevant and applicable, as well as general comments on the tool's presentation.

The second goal was to establish the efficacy of the management routines identified in the tool by gathering qualitative data through an impact-effort analysis. The respondents rated the recommended management routines based on the required effort to implement them and the impact they could have on sustainable scaling-up outcomes. The management routines were assessed on a scale of 1 to 5 during the impact-effort exercise and mapped on a matrix to be analyzed during the evaluation phase.

The third goal was to gain in-depth insight regarding implementing and scaling up health service innovations in marginalized communities to uncover themes that may have been neglected and where the management tool could be enhanced by asking semi-structured interview questions and discussing the rationale behind answers for more insight.

9.1.5 Activity 5: Evaluation

The evaluation phase of the DSRM included the analysis of the information obtained from the semi-structured interviews and was covered in Chapter 7. Both qualitative and quantitative data were collected throughout the interviews, which were converted to text and coded using Microsoft Excel.

To ascertain the applicability and effectiveness of each routine, the quantitative data analysis involved mapping the average routine ratings on an impact-effort matrix. quick wins (high impact, low effort), major projects (high impact, high effort), fill-ins (low impact, low effort), and thankless tasks (high impact, low effort) were the four quadrants of the matrix.

thirty-on preliminary routines were mapped, with twenty-six in the major project quadrant and eleven in the quick wins quadrant. all the preliminary routines suggested were deemed to have an above-average beneficial influence on scaling up outcomes as all the routines either fell in the major project quadrant (included twenty-three routines) or in the quick wins quadrant (including eight routines). as a result, all preliminary routine was included in the final management tool.

The interviewee's justification for their impact-effort ratings, their responses to the prepared questions, and the realizations made by the researcher during the interview discussions were all included in the qualitative data gathered—the researcher adhered to Creswell's six-step process for qualitative data analysis [113]. The process includes organizing and preparing, reading the data, using a coding process, describing the data, presenting the data, and interpreting the results to ensure that the qualitative data are analyzed and presented in a structured manner.

The information acquired during the interviews was transcribable using two coding cycles. The first coding cycle focussed on the management tool's mental models, defined desired outcomes of scaling up, and the main elements/systems perspectives for managing scaling up. The first cycle coded and grouped the concepts of the aspects mentioned above of the tool under three categories: validated concepts, additional insights, and disagreements. By coding the primary aspects of the tool first, the researcher could reflect and establish the functions and value of each aspect of the tool for further evaluation of the routines in the second coding cycle.

The second coding cycle focussed on the proposed management routines by verifying their validity and identifying additional insights and possible disagreements. The evaluation phase was concluded by proposing 30 conceptual and structural changes to improve the management tool. The conceptual adjustments included reorganizing and renaming the suggested routines based on the insights gathered during the interviews, while the structural improvements included updates to the management tool's visual presentation.

Finally, four additional routines and one additional mental model element were suggested, three routines were removed, one of the original routines was split up into two, five mental model elements, three management elements, eight routines were renamed, and four routines were reorganized.

9.1.6 Activity 6: Communication

The final step of the DSRM process is presented in Chapters 8 and 9 to present the developed artifact and communicate its practical application.

The management tool was updated and improved from the results of the evaluation stage, and the final version is presented in Chapter 8. The practical application of the tool was discussed to highlight its efficacy.

The final tool is presented via two canvasses. The tool illustrates the interrelated levels of perspectives necessary for the effective management of scaling up health service innovations to facilitate inclusive objectives. Such as depicted in the iceberg model, the levels of the management tool are dynamic and interrelated. For example, the mental models of critical stakeholders in the system determine how the system is structured, generating system patterns that generate system events [3]. The final tool included eight mental models, five management perspectives, nine inclusive healthcare objectives, and thirty-three management routines.

9.1.7 DSRM CHECKLIST

Hevner and Chatterjee's [14] DSRM checklist assists researchers in ensuring that their research projects qualify as design research projects by assessing the essential progress steps. The DSRM checklist consists of questions that, if correctly answered, demonstrate that the project addresses the key features of design science research.

The addressed checklist items and questions were listed at the end of each chapter of this study. The complete checklist with accompanying responses, as well as the chapter that addressed the DSR component, are included in Table 9.2.

Table 9.2: Reflection on complete DSRM Checklist

NUM	QUESTION(S)	RESPONSE	CH.
1	What is the research question What are the design requirements?	This thesis asks the following question: What constitutes a management tool that could facilitate management and decision makers to approach scaling up through a systems perspective to optimize scaling up results and increase impact towards inclusive healthcare goals? To ensure the research topic is thoroughly investigated throughout this project, the question was broken down into sub-questions regarding scaling up approaches for health service innovations through the required literature reviews and evaluation methods. Sixteen design requirements were proposed as either functional requirements, user requirements, design requirements, boundary conditions, or attention points.	CH1 CH5
2	What is the artifact? How is the artifact represented?	The artifact is a management tool that can be used by implementers and practitioners of health service innovations in marginalized communities to guide the process of scaling up to enhance outcomes toward sustainable inclusivity. The final management tool consists of two canvases. The first canvas illustrates a rich picture in the form of a mental model for managing the scaling up of health service innovation in marginalized communities. The second canvas illustrates a rich picture of sustainable outcomes of inclusive healthcare and the management elements and routines that could be implemented to enhance scaling up outcomes towards the desired social goals.	CH6 CH8
3	What design processes (Search heuristics) will be used to build the artifact?	The design science research methodology (DSRM) proposed by Peffers [2] was adopted for this study. A conceptual and systematic literature review was conducted to build a solid knowledge base for this study. The data extracted from the literature was translated into design requirements based on Van Aken and Barends' [46] recommendations.	CH2, CH3, CH4
4	How are the artifact and the design processes grounded by the knowledge based	The design process is based on the DSRM process, which produces an artifact as the final output of the process. The mental models, management elements, and routines used throughout the tool are based on the data extracted from	CH3, CH4, CH5

	What, if any, theories support the artifact design and the design process?	the CLR and SLR and their application within strategic planning and management of scaling up health service innovations. The logic behind the artifact is based on the iceberg model, which is rooted in organizational management and systems science, illustrating how management and policy actions often manifest in outcomes.	CH5, CH6
5	What evaluations are performed during the internal design cycles? What design improvements are identified during each design cycle?	The first evaluation method verified the critical aspects of the tool based on the design requirements based on existing literature. Semi-structured interviews and Impact-Effort analyses were conducted for further detailed evaluation. The evaluation procedure led to the application of 30 structural and conceptual alterations to the initial framework.	CH5 CH7 CH7
6	How is the artifact introduced into the application environment, and how is it field tested? What metrics are used to demonstrate artifact utility and improvement over previous artifacts?	During the semi-structured interviews, subject matter experts rated the impact and effort of each management routine. The validity of the proposed routines and preliminary management tool is based on qualitative and quantitative data acquired via semi-structured interviews.	CH7 CH7
7	What new knowledge is added to the knowledge base and in what form (e.g., peer-reviewed literature, meta-artifacts, new theory, new method)?	The knowledge base now includes a new management tool. The management tool displays a new representation of existing scaling-up management elements and routines, and new theories are added using the proposed application of the tool.	CH8, CH9
8	Has the research question been satisfactorily addressed?	The research question has been addressed sufficiently. This study's management tool addresses the various aspects required to enhance the scaling up outcomes of health service innovations in marginalized communities towards inclusive healthcare objectives.	CH8

9.2 RESEARCH OBJECTIVES

The main objective of this thesis was to develop a general management tool that would facilitate practitioners and implementers in the healthcare domain to enhance their strategic planning and management activities in scaling up health service innovations in marginalized communities to achieve sustainable social impact towards inclusive goals. The project was divided into ten sub-objectives, which were methodically accomplished during the study to meet the primary objective. Table 9.3 provides the sub-objectives and the chapter in which they are addressed.

Table 9.3: Research Objectives

RO'S	DESCRIPTION	CHAPTER
PHASE 1: THEORETICAL COMPONENT		
	CONCEPTUAL LITERATURE REVIEW (CLR)	
RO1	Identify how health service innovations facilitate I4ID goals in marginalized communities.	CH3
RO2	Identify the essential elements for scaling up health service innovations.	CH3
RO3	Establish the literature gap on scaling up health service innovations and strategic planning and management of scaling up through a systems perspective.	CH3
	SYSTEMATIC LITERATURE REVIEW (SLR)	
RO4	Identify frameworks and models for scaling up social health service innovations in the literature.	CH4
	COMBINING INSIGHTS FROM CLR AND SLR	
RO5	Establish the design requirements for the development of a preliminary management tool to approach scaling up through a systemic perspective.	CH5
PHASE 2: PRACTICAL COMPONENT		
RO6	Develop a preliminary management tool for scaling up social healthcare interventions based on the existing literature gathered during the SLR and CLR.	CH6
RO7	Validate the preliminary management tool with the design requirements defined during Phase 1.	CH6
RO8	Evaluate the concepts used within the management tool through an impact-effort analysis and semi-structured interviews with subject matter experts.	CH7
RO9	Update the preliminary management tool based on the feedback from the evaluation phase.	CH7
RO10	Present the final management tool for scaling up health service innovations in marginalized communities through a systems perspective to facilitate inclusive healthcare goals.	CH8

9.3 RESEARCH CONTRIBUTIONS

The final management tool makes a research contribution to the innovation for inclusive development (I4ID) and implementation- and scaling up of health service innovations literature. The tool also makes a practical contribution to healthcare implementers for guidance in strategic planning and management of scaling up health service innovations. The practical research contributions are listed in Table 9.4 and Table 9.5 respectively.

Table 9.4: Practical Research Contributions to Implementers and Practitioners of Health Service Innovation Scale-up

TOOL COMPONENT	CONTRIBUTION
Ice-berg model structure	• The management tool presents causal linkages between various levels of management that are interrelated and dynamic. • The tool shows the importance of strategic alignment of actions towards a defined vision.
Mental models	• The tool shows a management paradigm of scaling up from a systems perspective.
Management perspectives	• The tool depicts the primary scaling-up system elements as perspectives from which impact toward inclusive goals is created, which must be balanced in strategic scaling-up planning and management to ensure maximum inclusive impact. • The tool shows the interrelated and interdependent nature of the scaling-up system elements.
Inclusive healthcare outcomes	• The tool illustrates a vision for inclusion in healthcare by illustrating the essential characteristics of sustainable scaling-up outcomes.
Management routines	• The tool shows the implementer and practitioner the essential activities and considerations required to implement and scale up health service innovations in marginalized communities to facilitate inclusive objectives. • The logic behind the routines transcends disciplines, using implementation science, complexity science, and social science lenses to scale up health service innovations.
Routine distribution	• Routine distribution assists implementers and practitioners of health service innovations in understanding why routines are required from the standpoint of inclusive healthcare. • The tool represents the dynamic nature of the routines, with some being more significant than others at certain times.
Systems-orientated scaling up perspective	• The tool represents a systems-orientated approach where scale-up can be integrated into a complex systems paradigm where interventions are conceptualized as events in systems.

Additional contributions focused on filling the gaps in the literature and extending it. The management considerations and strategic approaches for organizations in the social sector with inclusive goals differ from the linear expansion strategies of commercial organizations, as discussed in the CLR [16]. The literature recommends that implementation and scale-up operations concentrate on creating changes within the system to achieve sustainable, inclusive outcomes of health service innovations. These arguments highlighted the necessity for a working management tool to facilitate

implementers and practitioners of health service innovations in scaling up to maximize impact towards inclusive goals.

As a result, the management tool was developed to be beneficial for the social healthcare industry and used by implementers and practitioners while developing and scaling up social healthcare innovations. The routines in the management tool indicate where small systems changes can significantly impact outcomes.

The management tool links engineering and a social business perspective in healthcare, demonstrating how engineering management activities could enhance social impact. Finally, this thesis also contributes to the literature by addressing the scarcity of systems- or complexity-based approaches for scaling up health service innovations where linear, intervention-orientated approaches have dominated the scaling-up literature.

The final management tool considers the complexity inherent in scaling up healthcare. Many literature sources discuss the inherent complexity in healthcare systems and scaling-up approaches and mention the need for a systems-orientated approach. However, very few studies illustrate a practical example of how a systems approach can be utilized. Applying a systems perspective to scaling up health service innovations is a clear gap that this research aimed to address and contributes to the academic literature by proposing management routines for scaling up that reflects the dynamic and complex nature of social healthcare.

Table 9.5 outlines the study's research contributions to the current literature, and the gaps addressed. The rationale for each contribution is also provided, along with supporting references obtained during the research.

Table 9.5: Research Contributions Towards Existing Literature

CONTRIBUTION	MOTIVATION	REF
Systems perspective for scale-up and spread of health service Innovations.	There is a lack of empirical studies that can incorporate a systems perspective toward scaling up.	[10], [19]
Scaling up is depicted as a management task.	Many studies merely focus on the implementation process of scaling up and do not focus on the management aspect. Scaling up impact is essentially a management endeavor rather than only the development of the most effective implementation model.	[9], [105]
Practical management tool	There is a lack of practical management tools in the literature that illustrates how the systems perspective of scaling up could enhance outcomes toward sustainable, inclusive goals.	[10], [55]
Links engineering management with social healthcare	Many studies discuss scaling up health service innovations from a social science or a business perspective. The management tool illustrates how the impact of scaling up outcomes towards inclusive goals can be enhanced by engineering management principles to develop a practical management tool.	[16], [19], [25]

9.4 Study Limitations

The researcher reflected critically on the research design and the findings gathered from literature reviews, the evaluation method (impact-effort analysis and semi-structured interviews), and the final management tool. The researcher acknowledges that the study and its conclusions have limitations. The researcher identified the following limitations and aspects that could have been different.

1. The systematic review was carried out by a single researcher, which leaves an opportunity for bias.
2. During the SLR, only nine studies were identified. More research would have yielded a broader range of scaling-up concepts.
3. The SLR was conducted by only one person, more than one person would have reduced bias, and improve the quality and dependability of search results.
4. Even though the management tool's design requirements were based on extensive research, they were specified by a single researcher, which allowed for bias.
5. Only semi-structured interviews were employed to assess the management tool. Further testing would have resulted in a more refined and proven management tool.
6. A case study was not used as an evaluation approach during the study, which could have provided deeper information about the tool's efficacy.
7. Only four participants completed the impact-effort analysis because of their relevant experience. More participants might have provided more accurate results.
8. Not all the interviewees were asked the same follow-up questions or had the same line of discussions, making it more difficult to compare results.
9. The impact-effort exercise was based on the participant’s personal opinions, which makes room for bias.
10. The analysis and interpretation of the findings depended on the researcher’s background in the research topic. Multiple data analysts might have provided a much richer comprehension of the results.
11. The management tool was not examined after the final revisions and was based on the researcher's justification from knowledge obtained during the research project, leaving an opportunity for bias.

9.5 Recommendations For Future Work

The researcher recommended several avenues for further research based on the study limitations and outcomes of the final management tool.

This thesis aimed to obtain in-depth knowledge about health service innovations and scaling-up principles and incorporate the key concepts extracted from the literature to create a management tool that could facilitate strategic decision-making in scaling up.

The management tool is based on the iceberg model, which originated in organizational management [3], and can illustrate how typical management and policy acts manifest to achieve desired outcomes. Further research might build on this project's management tool by analysing it within a case study scenario to demonstrate how various management and policy activities could manifest in sustainable scaling-up outcomes.

Another idea for using the management tool is to incorporate systems archetypes to show how specific management routines can alleviate problems and improve system-level outcomes of scaling-up efforts. The management tool was created with a systems perspective paradigm and integrated some characteristics of systems thinking.

Thus, systems archetypes would be a valuable way to demonstrate the complexities of system dynamics in healthcare. Systems archetypes could also demonstrate the dynamic nature of the tool in various scenarios and illustrate how small actions could result in significant outcomes. Future research studies could also concentrate on the various scaling-up stages to establish which routines are most suited at each stage of the scaling-up process. It is also recommended to undertake a Delphi study and community engagement to further refine the tool, followed by empirical validation.

There is a shortage of research on the I4ID research topic that explores how the degree of impact of social innovations could be measured. Future research for monitoring and evaluating health service innovations to assess performance in terms of inclusive healthcare goals is strongly advised.

The literature generally reveals a scarcity of applications of complexity science concepts in healthcare practice. The researcher suggests future research studies to investigate how healthcare could be improved through patient-centred and context-specific approaches that acknowledge the complexity of the health system and the complexity of what is understood about health and well-being.

Recent research in the social healthcare domain emphasizes the necessity of shifting away from intervention-based scaling-up approaches and toward systems-oriented approaches [10], [64]. As a result, this thesis advises that future research focus on systems thinking and systems dynamic incorporated approaches towards scaling up.

9.6 Chapter 9: Conclusion

The final chapter summarizes the DSRM actions carried out in this investigation. Following that, the research aims and how they were met are explained, as are the research contributions and study limitations. The report finishes with research recommendations for the future.

REFERENCES

[1] R. (Ruth S.) Simmons, Laura. Ghiron, Peter. Fajans, Nancy. Newton, World Health Organization. Reproductive Health and Research., and ExpandNet., *Nine steps for developing a scaling-up strategy*. World Health Organization, 2010.

[2] K. Peffers, T. Tuunanen, M. A. Rothenberger, and S. Chatterjee, "A design science research methodology for information systems research," *Journal of Management Information Systems*, vol. 24, no. 3, pp. 45–77, Dec. 2007, doi: 10.2753/MIS0742-1222240302.

[3] S. McLean *et al.*, "Beyond the Tip of the Iceberg: Using Systems Archetypes to Understand Common and Recurring Issues in Sports Coaching," *Front Sports Act Living*, vol. 1, Oct. 2019, doi: 10.3389/fspor.2019.00049.

[4] P. Dupas, "Health Behavior in Developing Countries," 2011.

[5] Michele Clarke MP – DA Shadow Minister of Health, "Critical shortage of doctors in SA – less than 1 doctor for every 1 000 patients," 2022, Accessed: Nov. 10, 2022. [Online]. Available: https://www.da.org.za/2022/05/critical-shortage-of-doctors-in-sa-less-than-1-doctor-for-every-1-000-patients

[6] H. Koorts, S. Cassar, J. Salmon, M. Lawrence, P. Salmon, and H. Dorling, "Mechanisms of scaling up: combining a realist perspective and systems analysis to understand successfully scaled interventions.," *Int J Behav Nutr Phys Act*, vol. 18, no. 1, p. 42, Dec. 2021, doi: 10.1186/s12966-021-01103-0.

[7] R. (Ruth S.) Simmons, Peter. Fajans, Laura. Ghiron, World Health Organization., and ExpandNet., *Scaling up health service delivery : from pilot innovations to policies and programmes*. World Health Organization, 2007.

[8] ExpandNet, "Beginning with the end in mind Planning pilot projects and other programmatic research for successful scaling up." Accessed: Mar. 26, 2022. [Online]. Available: https://www.who.int/reproductivehealth/publications/strategic_approach/9789241502320/en/

[9] ExpandNet and World Health Organization, *Practical guidance for scaling up health service innovations*. World Health Organization, 2009.

[10] H. Koorts and H. Rutter, "A systems approach to scale-up for population health improvement.," *Health Res Policy Syst*, vol. 19, no. 1, p. 27, Mar. 2021, doi: 10.1186/s12961-021-00679-0.

[11] L. Paina and D. H. Peters, "Understanding pathways for scaling up health services through the lens of complex adaptive systems," *Health Policy Plan*, vol. 27, no. 5, pp. 365–373, Aug. 2012, doi: 10.1093/heapol/czr054.

[12] T. G. Kannampallil, G. F. Schauer, T. Cohen, and V. L. Patel, "Considering complexity in healthcare systems," *J Biomed Inform*, vol. 44, no. 6, pp. 943–947, Dec. 2011, doi: 10.1016/j.jbi.2011.06.006.

[13] J. M. Tien and P. J. Goldschmidt-Clermont, “Healthcare: A complex service system,” *J Syst Sci Syst Eng*, vol. 18, no. 3, pp. 257–282, Sep. 2009, doi: 10.1007/s11518-009-5108-z.

[14] B. K. Bitanihirwe, “Scaling-up innovation as a means of tackling health inequalities. Commentary.,” *Ann Ist Super Sanita*, vol. 52, no. 2, pp. 143–5, 2016, doi: 10.4415/ANN_16_02_01.

[15] C. J. C. Herbst, S. S. Grobbelaar, and J. Grobler, “Key elements involved in scaling-up inclusive healthcare-A Scoping Review,” 2021.

[16] C. Weber, A. Kroeger, and K. Lambrich, “A theoretical model for understanding the scalability of social impact,” in *Theory and Empirical Research in Social Entrepreneurship*, Edward Elgar Publishing, 2014, pp. 112–153. doi: 10.4337/9781782546832.00010.

[17] A. Omimo *et al.*, “Applying ExpandNet’s Systematic Approach to Scaling Up in an Integrated Population, Health and Environment Project in East Africa,” *Soc Sci*, vol. 7, no. 2, p. 8, Jan. 2018, doi: 10.3390/socsci7010008.

[18] ExpandNet, “The Implementation Mapping Tool A tool to support adaptive management and documentation of scale up.” Accessed: Mar. 26, 2022. [Online]. Available: https://expandnet.net/PDFs/ExpandNet-IMT-Updated-Oct-2020.pdf

[19] T. Greenhalgh and C. Papoutsi, “Spreading and scaling up innovation and improvement,” *BMJ (Online)*, vol. 365, May 2019, doi: 10.1136/bmj.l2068.

[20] P. N. Bloom and A. K. Chatterji, “Scaling Social Entrepreneurial Impact,” 2009.

[21] P. Allotey, D. D. Reidpath, H. Ghalib, F. Pagnoni, and W. C. Skelly, “Efficacious, effective, and embedded interventions: Implementation research in infectious disease control,” *BMC Public Health*, vol. 8, 2008, doi: 10.1186/1471-2458-8-343.

[22] P. E. Plsek and T. Greenhalgh, “Complexity science: The challenge of complexity in health care,” *BMJ*, vol. 323, no. 7313, pp. 625–628, Sep. 2001, doi: 10.1136/bmj.323.7313.625.

[23] A. Larson, R. Mcpherson, J. Posner, A. Lafond, and J. Ricca, “Scaling Up High-Impact Health Interventions in Complex Adaptive Systems: Lessons from MCHIP AUTHORS,” 2015. [Online]. Available: http://www.jhpiego.org

[24] D. Indig, K. Lee, A. Grunseit, A. Milat, and A. Bauman, “Pathways for scaling up public health interventions.,” *BMC Public Health*, vol. 18, no. 1, p. 68, Dec. 2017, doi: 10.1186/s12889-017-4572-5.

[25] G. George, A. M. Mcgahan, and J. Prabhu, “Innovation for Inclusive Growth: Towards a Theoretical Framework and a Research Agenda,” *Journal of Management Studies*, vol. 49, no. 4, pp. 661–683, Jun. 2012, doi: 10.1111/j.1467-6486.2012.01048.x.

[26] L. van Niekerk, L. Manderson, and D. Balabanova, “The application of social innovation in healthcare: a scoping review.,” *Infect Dis Poverty*, vol. 10, no. 1, p. 26, Mar. 2021, doi: 10.1186/s40249-021-00794-8.

[27] R. Sohal, “Scaling Up Health Services Delivery for Bottom of the Pyramid Populations in Lower-and-Middle-Income Countries,” 2018.

[28] P. Hawe, A. Shiell, and T. Riley, “Theorising interventions as events in systems,” in *American Journal of Community Psychology*, Jun. 2009, vol. 43, no. 3–4, pp. 267–276. doi: 10.1007/s10464-009-9229-9.

[29] S. Venter and S. Grobbelaar, “Towards a management tool for technology platforms based on technology management capabilities,” 2021.

[30] A. Hevner and S. Chatterjee, *Design Research in Information Systems*, vol. 22. Boston, MA: Springer US, 2010. doi: 10.1007/978-1-4419-5653-8.

[31] M. Saunders, P. Lewis, and M. Saunders Philip Lewis, “Doing research in business and management : an essential guide to planning your project,” 2012. [Online]. Available: www.pearson-books.com

[32] K. Hammarberg, M. Kirkman, and S. de Lacey, “Qualitative research methods: When to use them and how to judge them,” *Human Reproduction*, vol. 31, no. 3. Oxford University Press, pp. 498–501, Mar. 01, 2016. doi: 10.1093/humrep/dev334.

[33] S. C. Kitto, J. Chesters, and C. Grbich, “Qualiy in qualitative research: Criteria for authors and assessors in the submission and assessment of qualitative research articles for the Medical Journal of Australia,” *Medical Journal of Australia*, vol. 188, no. 4. Australasian Medical Publishing Co. Ltd, pp. 243–246, Feb. 18, 2008. doi: 10.5694/j.1326-5377.2008.tb01595.x.

[34] M. Sandelowski, “The problem of rigor in qualitative research,” 1986.

[35] A. Drechsler and A. Hevner, “A four-cycle model of IS design science research: capturing the dynamic nature of IS artifact design,” 2016. [Online]. Available: http://hdl.handle.net/10468/2560

[36] J. vom Brocke, A. Hevner, and A. Maedche, “Introduction to Design Science Research,” 2020, pp. 1–13. doi: 10.1007/978-3-030-46781-4_1.

[37] J. vom Brocke, R. T. Watson, C. Dwyer, S. Elliot, and N. Melville, “Green information systems: Directives for the IS discipline,” *Communications of the Association for Information Systems*, vol. 33, no. 1, pp. 509–520, 2013, doi: 10.17705/1cais.03330.

[38] A. Malhotra, N. P. Melville, and R. T. Watson, “Call for Papers MISQ Special Issue on Information Systems and Environmental Sustainability Guest Editors.” [Online]. Available: http://mc.manuscriptcentral.com/misq.

[39] H. A. (Herbert A. Simon, *The sciences of the artificial*.

[40] S. Hlongwane and S. S. Grobbelaar, “A Practical Framework for Value Creation in Health Information Systems From an Ecosystem Perspective: Evaluated in the South African Context,” *Front Psychol*, vol. 13, Jun. 2022, doi: 10.3389/fpsyg.2022.637883.

[41] J. Venable, J. Pries-Heje, and R. Baskerville, "FEDS: A Framework for Evaluation in Design Science Research," *European Journal of Information Systems*, vol. 25, no. 1. Palgrave Macmillan Ltd., pp. 77–89, Jan. 01, 2016. doi: 10.1057/ejis.2014.36.

[42] S. E. Hove and B. Anda, "Experiences from conducting semi-structured interviews in empirical software engineering research," in *Proceedings - International Software Metrics Symposium*, 2005, vol. 2005, pp. 10–23. doi: 10.1109/METRICS.2005.24.

[43] J. O'Keeffe, W. Buytaert, A. Mijic, N. Brozovic, and R. Sinha, "The use of semi-structured interviews for the characterisation of farmer irrigation practices," *Hydrology and Earth System Sciences Discussions*, vol. 12, no. 8, pp. 8221–8246, Aug. 2015, doi: 10.5194/hessd-12-8221-2015.

[44] D. E. (David E. Gray, *Doing research in the real world*.

[45] S. Rabionet, "How I Learned to Design and Conduct Semi-structured Interviews: An Ongoing and Continuous Journey," *The Qualitative Report*, vol. 16, no. 2, pp. 563–566, Oct. 2014, doi: 10.46743/2160-3715/2011.1070.

[46] J. Ernst van Aken, H. Berends, and H. van der Bij, "Problem Solving in Organizations - A methodological Handbook for Business Students," 2018.

[47] F. Angeli and A. K. Jaiswal, "Business Model Innovation for Inclusive Health Care Delivery at the Bottom of the Pyramid," *Organ Environ*, vol. 29, no. 4, pp. 486–507, Dec. 2016, doi: 10.1177/1086026616647174.

[48] Y. Merali and P. Allen, "Complexity and systems thinking," in *The SAGE Handbook of Complexity and Management*, SAGE Publications Inc., 2011, pp. 31–52. doi: 10.4135/9781446201084.n1.

[49] A. K. Sen, "WELL-BEING, CAPABILITY AND PUBLIC POLICY," 1994. [Online]. Available: http://www.jstor.orgURL:http://www.jstor.org/stable/23247762

[50] D. T. K. Nguyen, L. McLaren, N. D. Oelke, and L. McIntyre, "Developing a framework to inform scale-up success for population health interventions: a critical interpretive synthesis of the literature," *Global Health Research and Policy*, vol. 5, no. 1. BioMed Central Ltd, Dec. 01, 2020. doi: 10.1186/s41256-020-00141-8.

[51] C. K. Prahalad, "The Fortune at the Bottom of the Pyramid," 2005.

[52] R. L. MORAIS-DA-SILVA, A. R. W. TAKAHASHI, and A. P. SEGATTO, "Scaling up social innovation: a meta-synthesis," *RAM. Revista de Administração Mackenzie*, vol. 17, no. 6, pp. 134–163, Dec. 2016, doi: 10.1590/1678-69712016/administracao.v17n6p134-163.

[53] É. Côté-Boileau, J.-L. Denis, B. Callery, and M. Sabean, "The unpredictable journeys of spreading, sustaining and scaling healthcare innovations: a scoping review.," *Health Res Policy Syst*, vol. 17, no. 1, p. 84, Sep. 2019, doi: 10.1186/s12961-019-0482-6.

[54] T. Golja and S. Požega, "Inclusive Business-What It Is All About? Managing Inclusive Companies," *International Review of Management and Marketing*, vol. 2, no. 1, pp. 22–42, 2012, [Online]. Available: www.econjournals.com

[55] G. Yamey, "Scaling up global health interventions: A proposed framework for success," *PLoS Med*, vol. 8, no. 6, Jun. 2011, doi: 10.1371/journal.pmed.1001049.

[56] D. Litaker, A. Tomolo, V. Liberatore, K. C. Stange, and D. Aron, "Using complexity theory to build interventions that improve health care delivery in primary care.," *J Gen Intern Med*, vol. 21 Suppl 2, no. S2, pp. S30-4, Feb. 2006, doi: 10.1111/j.1525-1497.2006.00360.x.

[57] INSPIRE Working Group, "Guide to Adaptation and Scale Up," 2021.

[58] C. Escoffery *et al.*, "A systematic review of adaptations of evidence-based public health interventions globally.," *Implement Sci*, vol. 13, no. 1, p. 125, Dec. 2018, doi: 10.1186/s13012-018-0815-9.

[59] J. Power, B. Gilmore, F. Vallières, E. Toomey, H. Mannan, and E. McAuliffe, "Adapting health interventions for local fit when scaling-up: a realist review protocol.," *BMJ Open*, vol. 9, no. 1, p. e022084, Jan. 2019, doi: 10.1136/bmjopen-2018-022084.

[60] K. de Villiers, "Bridging the health inequality gap: an examination of South Africa's social innovation in health landscape," *Infect Dis Poverty*, vol. 10, no. 1, Dec. 2021, doi: 10.1186/s40249-021-00804-9.

[61] D. M. Logue, *Theories of social innovation*. 2019.

[62] A. K. L. Robinson, "Social franchising primary healthcare clinics--a model for South African National Health Insurance?," *S Afr Med J*, vol. 105, no. 7, pp. 531–4, Sep. 2015, doi: 10.7196/SAMJnew.7814.

[63] F. Westley, N. Antadze, D. J. Riddell, K. Robinson, and S. Geobey, "Five Configurations for Scaling Up Social Innovation," *J Appl Behav Sci*, vol. 50, no. 3, pp. 234–260, Sep. 2014, doi: 10.1177/0021886314532945.

[64] H. J. Lanham, L. K. Leykum, B. S. Taylor, C. J. McCannon, C. Lindberg, and R. T. Lester, "How complexity science can inform scale-up and spread in health care: understanding the role of self-organization in variation across local contexts.," *Soc Sci Med*, vol. 93, pp. 194–202, Sep. 2013, doi: 10.1016/j.socscimed.2012.05.040.

[65] L. Cooley, R. Kohl, and R. R. Ved, "Scaling Up - From Vision to Large-Scale Change A Management Framework for Practitioners," 2016.

[66] L. W. Green, J. M. Ottoson, C. García, and R. A. Hiatt, "Diffusion theory and knowledge dissemination, utilization, and integration in public health," *Annual Review of Public Health*, vol. 30. pp. 151–174, 2009. doi: 10.1146/annurev.publhealth.031308.100049.

[67] M. E. Kruk *et al.*, "Transforming Global Health by Improving the Science of Scale-Up," *PLoS Biol*, vol. 14, no. 3, Mar. 2016, doi: 10.1371/journal.pbio.1002360.

[68] H. P. Binswanger-Mkhize, J. P. de Regt, and S. Spector, “Scaling Up Local & Community Driven Development (LCDD) A Real World Guide to Its Theory and Practice.”

[69] F. Perrini, C. Vurro, and L. A. Costanzo, “A process-based view of social entrepreneurship: From opportunity identification to scaling-up social change in the case of San Patrignano,” *Entrepreneurship and Regional Development*, vol. 22, no. 6, pp. 515–534, Oct. 2010, doi: 10.1080/08985626.2010.488402.

[70] M.-L. Moore, D. Riddell, and D. Vocisano, “Scaling Out, Scaling Up, Scaling Deep: Strategies of Non-profits in Advancing Systemic Social Innovation,” *Journal of Corporate Citizenship*, vol. 2015, no. 58, pp. 67–84, Jun. 2015, doi: 10.9774/GLEAF.4700.2015.ju.00009.

[71] M. Sutherland and K. Krige, “Unjani ‘clinics in a container’: social franchising in South Africa,” *Emerald Emerging Markets Case Studies*, vol. 7, no. 1, pp. 1–23, Jan. 2017, doi: 10.1108/EEMCS-06-2016-0151.

[72] M. Steve, A. Peter, and M. Bill, “Complexity and Systems Thinking,” in *The Sage Handbook of Complexity and Management*, 1 Oliver’s Yard, 55 City Road, London EC1Y 1SP United Kingdom : SAGE Publications Ltd, 2011, pp. 1–26. doi: 10.4135/9781446201084.n1.

[73] J. L. Bradach, “The Challenge of Replicating Social Programs,” 2003. [Online]. Available: www.ssireview.com

[74] S. G. Winter and G. Szulanski, “Replication as Strategy,” 2001. [Online]. Available: https://about.jstor.org/terms

[75] N. Fortune, R. Madden, and A. H. Almborg, “Use of a new international classification of health interventions for capturing information on health interventions relevant to people with disabilities,” *Int J Environ Res Public Health*, vol. 15, no. 1, Jan. 2018, doi: 10.3390/ijerph15010145.

[76] S. W. Stirman, C. J. Miller, K. Toder, and A. Calloway, “Development of a framework and coding system for modifications and adaptations of evidence-based interventions,” *Implementation Science*, vol. 8, no. 1, Jun. 2013, doi: 10.1186/1748-5908-8-65.

[77] I. Nonaka and H. Takeuchi, “The knowledge-creating company: How Japanese companies create the dynamics of innovation,” *Long Range Plann*, vol. 29, no. 4, p. 592, Aug. 1996, doi: 10.1016/0024-6301(96)81509-3.

[78] F. G. Castro, M. Barrera, and C. R. Martinez, “The Cultural Adaptation of Prevention Interventions: Resolving Tensions Between Fidelity and Fit,” 2004.

[79] A. Byrne, A. Morgan, E. J. Soto, and Z. Dettrick, “Context-specific, evidence-based planning for scale-up of family planning services to increase progress to MDG 5: health systems research.,” *Reprod Health*, vol. 9, 2012, doi: 10.1186/1742-4755-9-27.

[80] C. E. Dunn, A. le Mare, and C. Makungu, “Malaria risk behaviours, socio-cultural practices and rural livelihoods in southern Tanzania: Implications for bednet usage,” *Soc Sci Med*, vol. 72, no. 3, pp. 408–417, Feb. 2011, doi: 10.1016/j.socscimed.2010.11.009.

[81] E. Audureau, J. G. Kahn, M. H. Besson, J. Saba, and J. Ladner, "Scaling up prevention of mother-to-child HIV transmission programs in sub-Saharan African countries: A multilevel assessment of site-, program- and country-level determinants of performance," *BMC Public Health*, vol. 13, no. 1, 2013, doi: 10.1186/1471-2458-13-286.

[82] E. Alderete, W. Armando Vega, B. Kolody, and S. Aguilar-Gaxiola, "Lifetime Prevalence of and Risk Factors for Psychiatric Disorders Among Mexican Migrant Farmworkers in California," 2000.

[83] D. Dörner, "The logic of failure," in *Human Factors in Hazardous SituationsProceedings of a Royal Society Discussion Meeting held on 28 and 29 June 1989*, Oxford University Press, 2012, pp. 15–25. doi: 10.1093/acprof:oso/9780198521914.003.0002.

[84] G. Malcolm, "The Tipping Point: How little things can make a big difference," 2002.

[85] I. R. Bell and M. Koithan, "Models for the study of whole systems," *Integr Cancer Ther*, vol. 5, no. 4, pp. 293–307, Dec. 2006, doi: 10.1177/1534735406295293.

[86] D. Perrin, H. J. Ruskin, and M. Crane, "Model refinement through high-performance computing: An agent-based HIV example," in *Immunome Research*, 2010, vol. 6, no. SUPPL. 1. doi: 10.1186/1745-7580-6-S1-S3.

[87] I. M. Longini *et al.*, "Containing a large bioterrorist smallpox attack: a computer simulation approach," *International Journal of Infectious Diseases*, vol. 11, no. 2, pp. 98–108, Mar. 2007, doi: 10.1016/j.ijid.2006.03.002.

[88] A. H. Auchincloss and A. v. Diez Roux, "A new tool for epidemiology: The usefulness of dynamic-agent models in understanding place effects on health," *American Journal of Epidemiology*, vol. 168, no. 1. pp. 1–8, Jul. 2008. doi: 10.1093/aje/kwn118.

[89] M. Jordon, H. J. Lanham, R. A. Anderson, and R. R. McDaniel, "Implications of complex adaptive systems theory for interpreting research about health care organizations," *Journal of Evaluation in Clinical Practice*, vol. 16, no. 1. pp. 228–231, Feb. 2010. doi: 10.1111/j.1365-2753.2009.01359.x.

[90] J. Anderson, A. Chaturvedi, and M. Cibulskis, "Simulation tools for developing policies for complex systems: Modeling the health and safety of refugee communities," *Health Care Manag Sci*, vol. 10, no. 4, pp. 331–339, Dec. 2007, doi: 10.1007/s10729-007-9030-y.

[91] M. , MacDonald *et al.*, "Complexity Science in Brief," 2012. [Online]. Available: www.uvic.ca/cphfri,

[92] B. Ellis, "Complexity in practice: understanding primary care as a complex adaptive system," *J Innov Health Inform*, vol. 18, no. 2, pp. 135–140, Jun. 2010, doi: 10.14236/jhi.v18i2.763.

[93] B. Czarniawska, "Sensemaking in organizations," *Scandinavian Journal of Management*, vol. 13, no. 1, pp. 113–116, Mar. 1997, doi: 10.1016/s0956-5221(97)86666-3.

[94] A. A. Ghaferi, J. D. Birkmeyer, and J. B. Dimick, "Complications, failure to rescue, and mortality with major inpatient surgery in medicare patients," *Ann Surg*, vol. 250, no. 6, pp. 1029–1033, Dec. 2009, doi: 10.1097/SLA.0b013e3181bef697.

[95] National Center for the Dissemination of Disability Research (NCDDR), "A Review of the Literature on Dissemination and Knowledge Utilization," 1996.

[96] G. Midgley, "Systems thinking, complexity and the philosophy of science," 2011. [Online]. Available: https://www.researchgate.net/publication/43527346

[97] P. M. Senge, "The Fifth Discipline The Art Practice of The Learning Organization," *New York, NY: Doupleday Currence*, 1990.

[98] L. von Bertalanffy, "General System Theory Foundations, Development, Applications," *New York, NY: George Braziller Inc.*, 1969.

[99] S. Dekker, *Drift into Failure*. CRC Press, 2016. doi: 10.1201/9781315257396.

[100] D. H. Kim, *Systems archetypes II : using systems archetypes to take effective action*. Pegasus Communications, Inc, 1994.

[101] D. Moher, A. Liberati, J. Tetzlaff, and D. G. Altman, "Preferred reporting items for systematic reviews and meta-analyses: the PRISMA statement," *J Clin Epidemiol*, vol. 62, no. 10, pp. 1006–1012, 2009, doi: 10.1016/j.jclinepi.2009.06.005.

[102] P. A. Tavares, N. Beltrão, U. S. Guimarães, A. Teodoro, and P. Gonçalves, "Urban ecosystem services quantification through remote sensing approach: A systematic review," *Environments - MDPI*, vol. 6, no. 5. MDPI AG, May 01, 2019. doi: 10.3390/environments6050051.

[103] D. Tranfield, D. Denyer, and P. Smart, "Towards a Methodology for Developing Evidence-Informed Management Knowledge by Means of Systematic Review*," 2003.

[104] Jill. Jesson, Lydia. Matheson, and F. M. Lacey, *Doing your literature Review : traditional and systematic techniques*. 2011.

[105] J. Gauthier, S. G. Ruane, and G. R. Berry, "Evaluating and extending SCALERS: Implications for social entrepreneurs," *Journal of Small Business & Entrepreneurship*, vol. 31, no. 4, pp. 349–370, Jul. 2019, doi: 10.1080/08276331.2018.1498260.

[106] D. J. Teece, G. Pisano, and A. Shuen, "DYNAMIC CAPABILITIES AND STRATEGIC MANAGEMENT," 1997.

[107] P. M. Barker, A. Reid, and M. W. Schall, "A framework for scaling up health interventions: lessons from large-scale improvement initiatives in Africa," *Implementation Science*, vol. 11, no. 1, p. 12, Dec. 2015, doi: 10.1186/s13012-016-0374-x.

[108] E. C. Nelson *et al.*, "Microsystems in health care: Part 1. Learning from high-performing front-line clinical units," *Jt Comm J Qual Improv*, vol. 28, no. 9, pp. 472–493, 2002, doi: 10.1016/S1070-3241(02)28051-7.

[109] D. H. Kim, *Systems archetypes I : diagnosing systemic issues and designing high-leverage interventions*. Pegasus Communications, Inc, 1993.

[110] C. N. Ngongoni, "The Role of Innovation Intermediaries in Developing Healthcare Innovation Ecosystems: Value Co-Creation through Platforms," Stellenbosch University, 2020.

[111] A. , Fixen, R. , Lundgren, S. , Igras, V. , Jennings, and I. Sinai, "Monitoring and evaluating scale-up of health system innovations," 2013. [Online]. Available: www.irh.org

[112] M. Andreev, "Prioritization Methods and Techniques - Part 4: Value vs. Effort Matrix as a Lean Prioritization Approach," *Blinklane Consulting*, 2020.

[113] J. W. Creswell and J. David Creswell, "Research Design: Qualitative, Quantitative, and Mixed Methods Approaches," 2018.

[114] J. Saldaña, "The Coding Manual for Qualitative Researchers," 2012. [Online]. Available: www.sagepublications.com

APPENDIX A: INTERVIEW CONSENT FORM

STELLENBOSCH UNIVERSITY

CONSENT TO PARTICIPATE IN RESEARCH

TITLE OF RESEARCH PROJECT:	Developing a management tool to facilitate sustainable scale-up and spread of inclusive health service interventions.
REFERENCE NUMBER:	ING-2022-25446
PRINCIPAL INVESTIGATOR:	Christi J.C Herbst
ADDRESS:	Institute for Industrial Engineering, Stellenbosch Central, Stellenbosch, 7599
CONTACT NUMBER:	+27 79 885 9695
E-MAIL:	18472192@sun.ac.za

Dear prospective participant

I am master's student at the Institute of Industrial Engineering at Stellenbosch University in South Africa.

You are invited to take part in a research project entitled:**" Developing a management tool to facilitate sustainable scale-up and spread of inclusive health service interventions."**

Please take some time to read the information below which will explain the details of this research project. Please feel free to contact the researchers about any part of this project that you do not fully understand. It is very important that you are completely satisfied that you clearly understand what this research is about and how you could be involved.

Your participation is completely voluntary, and you are free to decline to participate. In other words, you may choose to take part, or not. Saying no will not affect you negatively in any way whatsoever.

You are also free to withdraw from the study at any point, even if you do agree to take part initially.

The Research Ethics Committee: Social, Behavioural and Education Research at Stellenbosch University has approved this study (Project ID: ING-2022-25446]. We commit to conduct the study according to the accepted and applicable national and international ethical guidelines and principles.

1. WHO IS CONDUCTING THIS STUDY?

This research study is conducted by Christi J.C Herbst, student number: 18472192

The researcher is from the Industrial Engineering at Stellenbosch University.

2. WHY DO WE INVITE YOU TO PARTICIPATE?

As an individual with extensive experience and expertise in the field of scale up and spread of health service innovations in a low-and middle-income country you are an ideal candidate to participate in this research project to share valuable first-hand information from your own perspective.

3. WHAT IS THIS RESEARCH PROJECT ABOUT?

Title: Developing a management tool to facilitate sustainable scale up and spread of inclusive health service innovations.

The aim of inclusive health service innovations is to achieve population health improvement to marginalised communities by means of innovative health service delivery methods.

To achieve system-level impact through scaling up is not a straightforward task. Successful scaling-up requires a high level of understanding of the inherent complexity in the health system and how certain internal and external factors affects the scaling up success.

Achieving sustainable impact from scaling up efforts is thus highly dependent on its management and strategic decision abilities. The study aims to develop a management tool that could provide a framework to facilitate management with strategic decision making in the process of scaling up social health service innovations in marginalised communities.

To achieve this aim, the researcher will first develop a preliminary management tool based on theoretical concepts gained through studying the literature on scaling up social health service innovations. Secondly, with the use of semi-structured interviews, the tool will be evaluated for efficacy by analysing data gathered through a survey and interview questions with subject matter experts. Based on the data collected from the participants during the semi-structured interviews the management tool will be updated and improved to develop the final management tool as output of this research project.

4. WHAT WILL BE ASKED OF ME?

If you agree to take part in this study, you will be asked to

<u>Activity 1:</u> Framework Validation

Activity 1 will involve concept validation which will be done by presenting the preliminary management tool to the participants and ask their feedback regarding the relevance of the concepts and any whether any concepts are missing and incorrect.

(Estimated time: 20mins)

<u>Activity 2:</u> Complete Framework ranking exercise (Survey)

Activity 2 will involve a framework ranking exercise, presented in the form of a survey. The framework ranking exercise is to determine the efficacy of the preliminary management tool by conducting an effort-impact analysis. This will be achieved by letting the experts rate the defined routines based on the effort required to implement the routine and level of positive impact the routine has or may contribute to sustainable scaling up of healthcare interventions. Both these metrics (impact and effort) will be rated on a scale of 1 to 5 and mapped during the evaluation process.

(Estimated time: 15mins)

<u>Activity 3:</u> Answer questions in Semi-structured interview.

The participants will be asked the answer specific interview questions. Depending on the background of the participant, the participant will answer the questions based on either their personal expertise as subject matter experts in their own right (i.e. not as representatives of the institutions they work for), or based on the viewpoint from their organization's management decisions.

(Estimated time: 35mins)

Location:

The interviews will be done telephonically or via online MS Teams meetings depending on the preference of the participant. As applicable, all necessary Covid 19 guidelines will be followed.

The participant is not responsible for anything particular upon agreement to participate in this study.

5. ARE THERE ANY RISKS IN MY TAKING PART IN THIS RESEARCH?

The researcher is unaware of any risks or discomforts that may be caused and will try their best to create an atmosphere that is conducive to learning. The participant will not be threatened by any physical or psychological risks during the interview.

6. WILL I BENEFIT FROM TAKING PART IN THIS RESEARCH?

Participation in this study is done voluntarily as no payment will be given to participants. The participants will therefore not benefit directly from the study but will assist in the development of knowledge for the social health service industry.

7. WILL I BE PAID TO TAKE PART IN THIS STUDY AND ARE THERE ANY COSTS INVOLVED?

Participation in this study is done voluntarily as no payment will be given to participants.

The researcher is unaware of any costs involve being a participant in this study. Regarding the time, and possible inconvenience to take part in the study, the researcher will send the participant the interview guides a day or two before the commencement of the interview/meeting in order for the participant to know what to expect from the meeting to enable them to prepare. The meeting will take place either online via MS Teams, or in person at a location convenient for the participant, to minimise the time and inconvenience to participate in the study.

8. WHO WILL HAVE ACCESS TO MY INFORMATION?

Any information you share with me during this study and that could possibly identify you as a participant will be protected. The default approach is that all data gathered from the interviews will be anonymised when reporting on these in the thesis or other research outputs. The responses obtained during this interview will be assigned a unique reference number, which will be used to identify data in the thesis itself. The identity of prospective participants will not be disclosed or published. ID codes in my research report will replace the names of participants. The only form of personal data required is the participants' academic qualifications, relevancy of expertise, years of relevant work experience, and affiliation to the relevant fields. The anonymised background information of participants will be reported (typically in bins, e.g., "10 – 14 years relevant work experience") as part of the study to motivate that it is appropriate to deem the participants as subject matter experts. You will not be asked to provide the names of organizations you are affiliated with, as you are asked to provide insights in your individual capacity, not as a representative of any specific organization. No names of specific organizations or projects cited by interviewees as examples during their interviews will be reported in the thesis document. Any form of correspondence between prospective participants and investigators will be kept confidential, and only the principal investigator and his supervisor will have access to this information.

In some cases, however, it may be valuable to cite a specific interview with a named individual. On the next page, you are asked whether you give consent for me to contact you via email to request your written permission to attribute a specific insight, perspective, or quote to you by name. I will not proceed with such de-anonymised attribution unless I receive written permission from you to do so.

9. HOW DO I MAKE CONTACT WITH THE RESEARCHERS?

If you have any questions or concerns about this study, please feel free to contact the researcher, Christi Herbst at 18472192@sun.ac.za and/or the study supervisor Prof. SS Grobbelaar at ssgrobbelaar@sun.ac.za.

10. RIGHTS OF RESEARCH PARTICIPANTS

If you have questions, concerns, or a complaint regarding your rights as a research participant in this research project, please contact Mrs Clarissa Robertson [cgraham@sun.ac.za; (+27) 021 808 9183] at the Division for Research Development.

DECLARATION OF CONSENT BY THE PARTICIPANT

As the participant, I declare that:

- I have read this information and consent form, or it was read to me, and it is written in a language in which I am fluent and with which I am comfortable.
- I have had a chance to ask questions and I am satisfied that all my questions have been answered
- I understand that taking part in this study is voluntary, and I have not been pressurised to take part.
- I may choose to leave the study at any time and nothing bad will come of it – I will not be penalised or prejudiced in any way.
- I agree that the interview with me can be [video-recorded / audio-recorded].

1.	I accept the invitation to participate in your research project, and if I decide to be interviewed, it will automatically mean that I have given consent for my responses to be used confidentially and anonymously, including in journal publications. I also give consent to be contacted via email to request my written permission to attribute a specific insight, perspective, or quote to me by name.
2.	I accept the invitation to participate in your research project, and if I decide to be interviewed, it will automatically mean that I have given consent for my responses to be used confidentially and anonymously, including in journal publications. I do not give consent to be contacted via email to request my written permission to attribute a specific insight, perspective, or quote to me by name.
3.	I give consent for an audio recording to be made of the interview conducted on an online platform.
4.	I DO NOT give consent for an audio recording to be made of the interview conducted on an online platform.
5	I decline the invitation to participate in your research project.

By signing below, I _____ *(name of participant)* agree to take part in this research study, as conducted by _____ *(name of principal investigator).*

_____ _____

Signature of Participant **Date**

DECLARATION BY THE RESEARCHER

As the **researcher,** I hereby declare that the information contained in this document has been thoroughly explained to the participant. I also declare that the participant has been encouraged (and has been given ample time) to ask any questions. In addition, I would like to select the following option:

	The conversation with the participant was conducted in a language in which the participant is fluent.
	I did/did not use an interpreter. (If an interpreter is used then the interpreter must sign the declaration below.)

_____ _____

Signature of Principal Investigator **Date**

_____ _____

Signature of Interpreter (if applicable) **Date**

Semi-structured interview Questions

1. Framework validation Questions

Introduce the preliminary management tool for facilitating sustainable scaling up of inclusive healthcare interventions.

- Do you think this framework incorporates all the essential elements to facilitate management decision making when scaling-up healthcare innovations?
- Is there any concepts that you disagree with?
- Is there any concepts missing in the framework?
- Is there any additional insights for any specific concept you want to add?

2. Framework Ranking Exercise (Survey)

Please rate the following management routine according to impact and effort.

NUM	MANAGEMENT ROUTINES	IMPACT (0-5)	EFFORT (0-5)
	ENVIRONMENT		
1	Identify factors in the environment that influence implementation and operation of healthcare model.		
2	Continuous assessment of changes in the social, political, infrastructural, and cultural environment and circumstances as the process of scaling up evolves.		
3	Community needs assessment		
	INCLUSIVE INNOVATION		
5	Dissemination of healthcare innovation		
6	Assess inclusiveness of the innovation according to relevance, relative advantage, and compatibility in implementation area.		
7	Tailor innovation to the context		
8	Monitoring and sharing broad outcomes indicators		
9	Identify scope of social demand		
	IMPLEMENTATION ORGANIZATION		
10	Groundwork and preparation for implementation.		
11	Provide strong leadership and governance over healthcare innovation		
12	Active community engagement		
13	Incorporating research into implementation.		
14	Providing Internal Systems/(Infrastructural) Support		
15	Assess strengths and weaknesses to build capacity.		
16	Make use of existing processes and structures		
17	Scaling with “others”		
	HEALTHCARE MODEL		
21	Assessment of Target market (Clients)		
22	Healthcare professional selection assessment and training		
23	Identify core elements for replicability		

24	Balance centralised (top-down communication) and decentralised (bottom-up communication) management approaches.		
25	Tailored support to overcome initial problem with implementation and adoption of the innovation to local context		
26	Understanding of workplace context		
27	Strong communication channels and relationships with implementation organization.		
28	Monitoring and sharing broad outcome indicators		
STRATEGIC CHOICES FOR SCALING UP			
26	Define scope of social demands		
27	Incorporate phases in scale up process (set-up, develop scalable unit, test of scale up. go to full scale)		
28	Develop adoption mechanisms		
29	Develop Support System		
30	Address both horizontal and vertical scaling up		
31	Combine centralized and decentralized approaches.		
32	Assess the costs of the scaling-up process and identify possibilities for economies of scale		

3. Specific semi-structures Interview Questions:

Scaling up management element	**Questions**
Environment	• Which environment (social , political, infrastructural, cultural) would say has the largest influence on implementation? • What were the most critical environmental (social, political, infrastructural, cultural) challenges that affected scaling up? What was done to meet these challenges? What worked, what didn't, and why? What strategies were considered and not pursued? • Were there any special circumstances (timing, champions) that facilitated or hindered the scaling up process?
Inclusive Innovation	• How is the perceived need for the healthcare innovation identified, and by whom? How strongly was the need felt initially by various stakeholders, decision makers, and policy makers? • What efforts were made to increase the visibility of the problem to which this innovation is the solution? • What strategies would you say are important for dissemination of the innovation in the implementation site? • What factors would you say are important to ensure inclusion of marginalised communities through the healthcare innovation?
Implementation organization	• What groundwork and preparation would you say is important for implementation? • How does leadership and governance over the healthcare innovation play a role? • How important is community engagement in the implementation phase?

	• Was the resource team able to expand its capacity during the process of scaling up? If so, how? Were they able to incorporate other additional members, develop partnerships or leverage other external resources? • What factors would you say are important to ensure the innovation is sustainable organizationally? • How is control regulated over various healthcare clinics?
Healthcare model	• Who were the franchisees/healthcare professionals selected and how was that done? • How different was the intervention from existing practices (the degree of change) in available in the geographical location and how did this affect the scaling-up process? • Did the intervention have a relative advantage over other practices seeking to address the same problem in terms of its effectiveness, cost-effectiveness, feasibility, donor/policy support, and evidence that it could be expanded under routine program conditions? • What are the most important factors regarding bottom-up communication from healthcare professional to top management for adapting practices to local conditions?
Strategic choices for scaling up	• What factors would you say are important for determining the pace and scope of expansion to new geographical locations? • What was the source of funding for all of the related costs of going to scale, such as the costs involved to support the resource team, and funding monitoring and evaluation of scaling up activities? Was there enough funding? How is economies of scale considered? • Did all core elements of the innovation remain intact during expansion or is there evidence that key principles (e.g. reproductive rights and gender perspectives or quality of care) were lost? Were efforts made to ensure that all relevant aspects of the intervention were kept intact? • What would you say are the most important factors considering monitoring and evaluation of the scaling up process and results?
<u>GENERAL</u>	• What do you think were the major determinants of the successes and failures of scaling up healthcare innovation? • In your experience in scaling up, were there variance in the effectiveness and sustainability of implementation across multiple sites, and if so, what explained this variance? • Were adaptations needed and made as the innovation was introduced into new sites and, if so, why were these needed?
<u>NURSE / DR QUESTIONS</u>	• In your opinion, would you say the implementation of the clinic contributed towards behavioural changes in terms of population health improvement in the community? How can this be monitored or observed? • What unexpected challenges did you face during implementation? How was it resolved? • Which environment (social , political, infrastructural, cultural) would say has the largest influence on implementation? • How do you feel the healthcare innovation contributes to inclusiveness compared to other existing practices?

APPENDIX B: SYSTEMATIC LITERATURE REVIEW

CONCEPTUALISING SCALING UP **a) Key lessons of Scaling-up (Mental models)** **b) Strategic planning and management approach for scaling up.**	**ELEMENTS OF SCALING-UP INCLUSIVE HEALTHCARE AND MANAGEMENT ROUTINES**
1) Title: Practical Guide for Scaling Up Health Interventions [9]**.** ***(Framework: ExpandNet framework of scaling-up health service innovations.)***	

CONCEPTUALISING SCALING UP

a. Key lessons of Scaling-up (Mental models)

Scaling up is defined: as "Deliberate efforts to increase the impact of health service innovations successfully tested in pilot or experimental projects to benefit more people and to foster policy and programme development on a lasting basis" [9].

Plan for scaling up from the start: Instead of considering the consequences of scaling up after a pilot project is over, and it is crucial to design and test innovations with them in mind from the start.

Scaling up is an "*open system"* with interrelated elements. An open-systems perspective illustrates that scaling up is not just a technological and managerial activity unaffected by external factors. Environmental aspects include enduring gender disparities, the level of poverty in a nation, the effectiveness of the national health system, its bureaucratic structures, and political forces, and all significantly impact the success of scaling-up attempts.

b. Strategic planning and management approaches of scaling up.

Scaling up components frequently engages in complex interactions with one another. Changes in one element can affect the other elements, which can have ramifications for the scaling-up process.

Strategic planning and management of scaling up focus on efforts to ensure balance among the interrelated elements considering many tensions, ambiguities, setbacks, and instances of luck that can and will arise.

ELEMENTS OF SCALING-UP INCLUSIVE HEALTHCARE AND MANAGEMENT ROUTINES

Interacting and interconnected elements in an open-systems perspective of scaling up healthcare innovations identified in the ExpandNet framework

1) THE INNOVATION

- Involve the user organization in a participatory process.
- Tailor the innovation to the context.
- Design research to test the innovation considering the objectives of the project and decision makers' expectations.
- Test innovation under real-life operating conditions.
- Identify the core elements for replicability.
- Reflect on the degree of change implied by the innovation for stakeholders.
- Initiate scaling up after the effectiveness and feasibility of the innovation have been established.

2) THE USER ORGANISAITON

- Recognize the value of policy entrepreneurs and champions.
- Assess strengths and weaknesses to build capacity. (Resources, staffing, technical capability, management and administration, organizational culture, policy and legal framework for service delivery, leadership).
- Make use of existing possesses and structures.
- Acknowledge scaling up as an institutional task.

3) ENVIRONMENT

- Identify the environmental factors influencing scaling up and understand how they affect the process. (policy/politics, bureaucracy, health sector, socioeconomic/ cultural context, people's needs and rights)
- Leverage opportunities arising in the environment to enhance positive support for scaling up.
- Continuous assessment of environmental changes in the evolving process of scaling up.

4) RESOURCE TEAM OR ORGANIZATION

- Include individuals who have been part of the design and testing of the innovation.
- Involve members of the user organization.
- Locate resources as closely as possible to promote effective communication.
- Ensure the team has the necessary skills and capacities.

	• Anticipate the need to adapt the resource team as a scaling-up process. • Support user organization ownership of the innovation and scaling-up process. **5) SCALING-UP STRATEGY** • Address horizontal expansion of the innovation and vertical scaling up to ensure sustainability. • Ensure scaling up is proceeding smoothly before adding innovations. • Use multiple communication channels to tell a compelling story. • Build coalitions and networks. • Organize training strategies to address content and process scaling up (prepare managers, generate a vision, create a commitment, and empower teams to move towards the vision). • Exploit demonstration sites. • Create opportunities for ongoing learning. • Weigh the advantages and disadvantages of bringing in new partners to promote, support, and implement scaling up; to the extent possible, involve potential partners early in the process. • Involve the central level to ensure that innovation is integrated into systems, structure, budgets, and practices of a health system while using a decentralized approach to implement the innovation • Adapt the innovation while working to ensure that essential features are maintained. • Learn about other tested innovations that address the same challenge. • Expand gradually, and resist pressure for "explosive" scaling up. • Start with points of strength. • Use organization development approaches to foster genuine participation in scaling up • Assess the costs of the scaling-up process and identify possibilities for economies of scale • Mobilize resources from within and outside the health system to promote sustainability. • Start with a joint vision of successful scaling up and include plans to use the data to adjust the scaling-up strategy. • Develop appropriate indicators for process, outcomes, and results/impacts. • Use appropriate methodologies but keep it simple (qualitative/quantitative analysis).

2) Title: Scaling-up High-Impact Health Interventions in CAS [23]**.**
Framework: Pathways for scaling-up health services through the lens of complex adaptive systems.

CONCEPTUALISING SCALING UP

a. Key lessons of Scaling-up (Mental models)

Health systems operate in a CAS where they are described as dynamic, unpredictable, and ever-changing, with emergent social and cultural behavioural patterns. Management must be aware of systems complexities and acknowledge that in a CAS, there is a high probability that the outcomes of scaling up will be different (less than ideal) than expected.

CAS characteristics:

- Path dependence
- Interdependent subsystems
- Non-linear outcomes
- Feedback loops Self-organization
- Changing context

b. Strategic planning and management approaches of scaling up.

Acknowledging CAS behaviours and looking at scaling up through a CAS lens may assist the organization to be "internally owned" rather than being "externally imposed" by systems characteristics [23]. Scale effort should not aim to suppress the unexpected but acknowledge and accept CAS behaviours and incorporate them for improved scale-up design and implementation.

ELEMENTS OF SCALING-UP INCLUSIVE HEALTHCARE AND MANAGEMENT ROUTINES

Management Approaches to respond to CAS behaviour in the system

1. **Capabilities to respond to dynamic and unpredictable health systems** (Path dependency, interdependent subsystems, and non-linear outcomes.)

- Adequate, flexible, and long-term financial investment
- Scale-up teams with reach to facilities and communities and responsiveness and adaptability to problems arising.
- Policies and Guidelines to define the principles of the intervention.
- Mechanisms to collect, share, and respond to information about implementation when scaling (Informed scaling).

2. **Accelerators of expansion and institutionalization** (Strategies for accelerating the delivery of the intervention, Feedback loops, self-organization, and non-linear outcomes)

- Understanding workplace context (motivations and obstacles faced by frontline workers and other significant agents who will implement the interventions.)
- Tailored Support to overcome initial problems with adopting the innovation.
- Encouraging local initiatives to deliver the intervention.
- Attention to equity and other local variations by implementing different strategies, depending on local capacity.

3. **Adaptive mechanisms for responding to changes in contexts (***changing contexts***)**

- Create a consensus about adapting to new/changing contexts through solid communication channels and relationships.
- Monitoring and sharing broad outcome indicators.

3) Title: Understanding Pathways For Scaling-Up Healthcare Services Through The Lens Of Complex Adaptive Systems [11]**.**
(*Framework: Scale-up high-impact health intervention in Complex Adaptive Systems.*)

CONCEPTUALISING SCALING UP	ELEMENTS OF SCALING-UP INCLUSIVE HEALTHCARE AND MANAGEMENT ROUTINES
a. Key lessons of Scaling-up (Mental models) A "Blueprint" approach to health services is not sufficient. Scaling up exists in a dynamic and unpredictable system; thus, the strategic approach to scaling should match these characteristics. The CAS lens accurately reflects the complex and changing nature of health systems and the social behaviours regarding health care. Thus, knowledge about CAS may facilitate management to leverage opportunities and threats that arise and significantly enhance scaling-up efforts. Approaching scaling up healthcare innovations through a CAS lens highlights systems characteristics such as path dependence, emergent behaviour, scale-free networks, feedback loops, and phase transitions which can enhance planning, implementation, monitoring, and evaluation approaches to scale up health services. **b. Strategic planning and management approaches of scaling up.** The CAS approach facilitates management decision-making by considering local context variation, engaging with the system and actors in the system, anticipating unintended consequences, and developing and implementing programs that engage critical actors through transparent data for ongoing problem-solving and adaptation. Management should anticipate adaptation and flexibility in implementing inclusive healthcare innovations.	**Characteristics related to a CAS:** **1. Path dependence:** • History Matters • Feedback • Positive feedback accelerates change • Negative feedback modulates the direction of change • Describe 'vicious cycles,' for example, ill health (malnutrition) and poverty. **2. Scale-free networks** • Structures are dominated by a few focus points (nodes) with unlimited links. (Following a power-law distribution) **3. Emergent behaviour** • Self-organization (the whole being more significant than the sum of its parts) **4. Phase transition** • Radical changes (behavioural patterns) when system parameters reach a certain critical point.

4) Title: Mechanisms Of Scaling-Up: Combining A Realist Perspective And Systems Analysis To Understand Successfully Scaled Interventions [6]**.**
(Framework: Systems Model of Scaling Up health interventions)

CONCEPTUALISING SCALING UP	ELEMENTS OF SCALING-UP INCLUSIVE HEALTHCARE AND MANAGEMENT ROUTINES
a. Key lessons of Scaling-up (Mental models) To increase the likelihood of adoption and ongoing implementation of evidence-based interventions at a population level, greater awareness and consideration of the complex interactions between the perceptions, worldviews, values, goals, and agendas of those involved in scaling interventions may be required.	**Key Outcomes leading to sustainable scale:** **1. Community Adoption** • The community sees value and embeds intervention in practice • The community sees an advantage over existing practices • Public promotion and dissemination of intervention through strategic stakeholder channels lead to increased legitimacy.

b. Strategic planning and management approaches of scaling up. - Watch for correct and incorrect imbalances as elements of the scaling-up systems interact. - Recognize trade-offs are necessary - Commit to upholding the participation of a broad range of stakeholders. - Protect organizational elements that differ most from the user organization's culture (e.g., those easily lost during scale-up). - Maintain the resource team staying in power - Remain vigilant (e.g., expect the unexpected and be prepared to act quickly or pause momentarily)	• Stakeholders see the advantage over existing practices/ways to meet their agenda/ targets/goals. • Increased intervention visibility in the community among government to enhance perceived legitimacy and impact of advocacy efforts. • Demonstrable evidence of intervention performance in the real-world increases credibility and legitimacy. • Politically well-connected advocates inspire others to support scale-up and timing. **2. Political Support/ Buy-in** • Intervention objectives align with or produce evidence used for national strategies/ policies. • Politically well-connected advocates inspiring others to support scale-up and timing • Leveraging opportune moments and advocacy strategies build political support • Favorable politically despite lack of evidence for impact on target outcome; garner ongoing support/funding. • Political instability undermines/ends political advocacy and resource availability in government; intervention is no longer valued/prioritized. • Advocates identified early, at various levels of government, within and outside the health system. • Resources (e.g., time and funds) required to engage with government planned for and strategies embedded in scale-up approach. • Adoption of a bi-partisan approach to advocacy instead of government/political changes. • Diversification of funds to ensure ongoing stakeholder commitment to implementation. • High awareness and value placed on intervention among critical political actors/ advocates. • Poor understanding of government/political structures; resources (time and funds) required for scaling with governments unanticipated and excluded from the scale-up approach. • The intervention is *initially* politically favorable (valued and prioritized) at all government levels; it need not be sustained support. **3. Institutional Implementation Capacity** • Strategies to address implementation weaknesses *within* scale-up planning; to avoid 'parallel' processes • Strategies to overcome barriers and leverage facilitators to effective implementation introduced on an *ad hoc basis*

	• Capacity-building strategies or incentives are introduced retrospectively to overcome/minimize the impact of implementation weaknesses. • Resources or incentives are introduced *during* scale-up to overcome weaknesses or minimize their impact, enhancing implementation. **4. System-level (policy) embeddedness** • Combined integration into the structure, budgets, and practices of the system (centralized approach) while contextually relevant and involving local mobilization of resources (decentralized approach) • The conflict between betwcentralizedised and decentralized approaches impacts the mobilization of resources and 'ownership'; reduces integration into systems, budgets, and practices **5. Replication in other contexts** • Intervention and implementation resources are easily replicable and facilitate flexibility in different settings. • Staggered implementation and scale-up of critical components to establish sustainability and lasting institutional capacities at all levels. • Key features central to success (i.e., the context of testing, underlying intervention concepts) understood before roll out; not necessarily previously tested in the scale-up context. • Resources/strategies are put in place to enable contextual adaptation. • Components essential for the effectiveness and fidelity of implementation during replication remain intact during scale-up. • Impact implementation barriers across different settings planned for/minimized. **6. Stakeholder buy-in/ perceived value** • Strong perceived need/on stakeholders' agenda to meet a priority area. Stakeholders see the advantage over existing practices/ways to meet their agenda/ targets/goals. • Intervention is perceived as credible/legitimate and more likely to solve the problem. • Lack of better/alternative approach; intervention perceived as credible/legitimate despite a lack of evidence base. • Components essential for the effectiveness and fidelity of implementation during replication remain intact during scale-up.

	• Data collection (prospective and retrospective) is tailored to evidence perceived as credible by stakeholders. • Staggered implementation and scale-up of critical components to establish sustainability and lasting institutional capacities at all levels. • Demonstrable evidence of intervention performance in the real-world increases credibility and legitimacy. • Automatic scaling in response to government targets/pressure for roll-out; inadequate resources or planning. • Intervention messaging/goals are framed according to different audiences' values and needs, reaching beyond the health sector and hard-to-reach groups. • The data collected was modified over time to reflect changes in Government needs. • Key features central to success (i.e., the context of testing, underlying intervention concepts) understood before roll out; not necessarily previously tested in the scale-up context. **7. Evidence for impact on target outcome** • Stakeholder perceptions of critical/persuasive evidence included in the evaluation plan, independent of researcher recommendations. • Ongoing evaluation is less relevant at the scale-up point; prior (early) evaluations are used to justify political decision-making. • Automatic scaling in response to government targets/pressure for roll-out; inadequate resources or planning. **8. Community sustainability/ embeddedness** • Attributes of future success and potential failure may/may not be identified early, so an 'improved' intervention is scaled up • The intervention and implementation process aligns with stakeholder priorities/objectives and community context/values • Scale up resources (physical and fiscal) required from community/Government explicitly and planned for • Required scale-up resources (physical and fiscal) developed as scale-up unfolds; reactive to real-world implementation • Resources/strategies put in place to enable contextual adaptation

	• Impact implementation barriers across different settings planned for/minimized • Intervention meets multiple system goals/priorities and is valued/relevant to multi-sector stakeholder agendas. • Leveraging opportune moments and advocacy strategies build political support • Favorable politically despite lack of evidence for impact on target outcome; garner ongoing support/funding • Intervention is more applicable to a wide range of settings/contexts (i.e., compatible with varying established norms) • Intervention capitalizes on existing delivery system structures, increases integration into existing policies/practices • Resources generated and time taken to engage with respected/influential community members and scale-up responses to real-world conditions, reflecting community needs and changes in a political environment • Costs of scaling (community/government funds required) need not be known (explicit) or planned for in advance; influenced by political favourability • Evaluation data used to adjust to the scale-up process or resources needed over time; increasing responsiveness to real-world implementation and potential practice/policy changes • Evaluation not embedded in the scale-up plan, monitoring/visual accounts replace formal measure of impact; leads to retrospective evaluation to meet stakeholder's needs • Evaluation not embedded in the scale-up plan; increased importance/perceived power of visual evidence ('individual experiences') • The evaluation was undertaken as planned; stakeholder perceptions of data value/relevance/influence/persuasiveness affected the use of the data to inform practice/policy • Evaluation embedded in scale-up, changes/ceases due to political instability/funding cuts; data unable to influence practice/policy • Evaluation embedded in scale and monitoring/data collection processes primarily driven/influenced by government/stakeholders as opposed to researchers; can hinder transparency and influence practice/policy

5) <u>The SCALERS model:</u> We analyzed this model through two sources, first, the original SCALERS model by [20]**, as well as an extended version of the model by** [105]**.**

5.1 Evaluating and Extending SCALERS: Implications for social entrepreneurs [105]

5.2 Scaling Social Entrepreneurial Impact [SCALERS] [20]

<u>CONCEPTUALISING SCALING UP</u>

a. Key lessons of Scaling-up (Mental models)

Defining Scaling: Scaling social impact refers to "increasing the impact a social-purpose organization produces to better match the magnitude of the social need or problem it seeks to address" (Dees 2008, 18).

SCALERS must be applied according to the state of situational contingencies.

b. Strategic planning and management approaches of scaling up.

By understanding the main capabilities that support the ability to scale successfully and create social value, organizations can assess their weaknesses and strengths accordingly and identify areas for improvement.

The SCALERS model recognizes that some capabilities are more critical than others depending on the context.

The SCALERS model, taken together with the concept of *dynamic capabilities*, acknowledges that "certain situational contingencies may place more or less importance on developing any given capability" [105].

The idea behind dynamic capabilities is that the need to develop new capabilities is strongly influenced by the environment in which an organization operates [106].

An organization can use the SCALERS model to assess its ecosystem and determine where its past actions have strengthened and weakened its ability to scale.

For example, The management team could take the model's situational contingencies and, one by one, assess whether the organization's ecosystem creates the opportunities for each SCALERS element to drive successful scaling.

<u>ELEMENTS OF SCALING-UP INCLUSIVE HEALTHCARE AND MANAGEMENT ROUTINES</u>

SCALERS model elements:

- **Staffing (Contingency: Labour needs)**

Filling labor needs with those possessing appropriate skills.

- **Communication (Contingency: Public support Communication as service)**

Persuading critical stakeholders to support the organization.

- **Alliance-building (Contingency: Potential Allies)**

Creating linkages with external individuals and organizations.

- **Lobbying (Contingency: Supportive Public policy.)**

Advocate for government actions that advance the mission.

- **Earnings generation (Contingency: Access to capital Clients' ability to pay)**

Organization's ability to generate revenues that exceed expenses.

- **Replication (Contingency: Dispersion of beneficiaries.)**

Reproducing the venture's products or services.

- **Stimulating Market Forces (Contingency: Availability of economic incentives.)**

Incentivizing the pursuit of private interests to create social value.

- **Internal systems (NEW)** [105] **(Contingency: Heterogeneity of clients/ beneficiaries.)**

Formal processes and procedures are used to run the organization.

	• **Client Selection (NEW)** [105] **(Contingency: Clients' concern with social vs. economic goals.)** Choosing which clients to serve and which not to serve.
6) A Theoretical Model For Understanding Scalability Of Social Impact [16]**.** *(Framework: Theoretical model for scalability of social innovation)*	
CONCEPTUALISING SCALING UP **a. Key lessons of Scaling-up (Mental models)** ***Defining scalability:*** *as "increasing the impact a social-purpose organization produces to match better the magnitude of the social need or problem it seeks to address"* [16]. **Replicability:** the capacity to reproduce or adopt the social enterprise's structures, processes, products or services, and behaviours [74]. **Adaptability:** the ability to adjust the social enterprise's structures, processes, products or services, and behaviours [59]. **Transferability** unites replicability and adaptability because pure replication (for example, to new geographic areas without any adjustment) is uncommon. After all, existing information and processes nearly always need to be modified to fit into new circumstances and environments [77]**.** **b. Strategic planning and management approaches of scaling up.** Social impact on a systems level can only be realized through scaling up the healthcare innovation to the degree of social need for health services. Managing the scaling-up process of "transferring" the model to various implementation locations requires careful consideration of how the healthcare innovation model can be replicated and how adaptability can be incorporated to fit local contexts.	**ELEMENTS OF SCALING-UP INCLUSIVE HEALTHCARE AND MANAGEMENT ROUTINES** Steps of assessing the scalability of the organization identified in the *"theoretical model of scaling up social impact":* 1. **Precondition:** Viable Operational Model. **2. Commitment** • leading individuals • conducting individuals **3. Management Competence.** • Constant preservation of social mission. • Formalization *(Manuals, job descriptions, and up-to-date templates ease the communication of processes and "articulate the organization's theory of change.")* • Quality assurance • Goal Setting • Evaluation **4. Replicability of the operational model.** • Focus on elements that induce social impact. • The core of the operational model • Standardization • Technology **5. Ability to identify the scope of social demands.** • "Identifying the scope of social demands determines *where* and *how* replication of the elements can scale the social impact most effectively" [16]. • Identify unmet social needs. • Maximization of social impact as the primary driver, compared to profit maximization (as a driver for commercial enterprises. • Careful consideration is required to decide where to allocate (often resource-constrained) interventions that allow for maximal and sustainable impact delivery. **6. Ability to obtain necessary resources.** • Tap into idle capacities of the current activities. • Reinvest surpluses generated by running current operations.

	• Sharpen the effectiveness of the current operations. • Mobilize resources from the environment. **7. Network:** • Mobilizing resources from the environment **8. Effectiveness of scaling with "others." (Partnership):** • Able to level social impact **9. Adaptability** • Degree of (dis)similarity between current and new context • Knowledge transfer/organizational learning • Training • Delegation/decentralization • Stepwise approach *Types of scaling strategies:* • Capacity Building • Diffusion of knowledge. • The ongoing agreement defines the relationship. • One adjacency move.
7) A Framework For Scaling up Health Interventions: Lessons From Large Scale Improvement Initiatives In Africa[107]**.**	
CONCEPTUALISING SCALING UP **a. Key lessons of Scaling-up (Mental models)** In a health system, "spread" refers to the adoption and replication of an intervention (with minimal modification), whereas "scale-up" deals with the system/infrastructure challenges during full-scale implementation [108]. In terms of replicability, health systems are much less automated and arguably more heterogeneous compared to equivalent large business enterprises; as a result, we cannot jump from the prototype scalable unit to wide-scale replication, as in other industries. The framework encourages "deep situational exploration" to get familiar with the environment and engage with local stakeholders to formulate context-sensitive designs. **b. Strategic planning and management approaches of scaling up.**	**ELEMENTS OF SCALING-UP INCLUSIVE HEALTHCARE AND MANAGEMENT ROUTINES** **Key considering elements of the scaling-up process** **1) Phases of Scale-up** • Best practices exist. New scale-up idea • Set-up • Develop the scalable unit. • Test Scale-up • Go to Full Scale **2) Adoption Mechanisms** • Rapid scale-up will not occur in an unreceptive environment. • The intervention design should be tightly aligned with social norms and health system practices throughout the scale-up process. This includes considering and integrating the policies, protocols, and other health system structures. • Understanding the infrastructure, culture, size, and strength of the health system's underlying social system is an excellent place to start when identifying

This study contradicts the statement that lessons from previous implementation experience be incorporated into the subsequent design makes, by making the case that rapid and successful scale-up would benefit from a formative rather than a summative approach, giving as many opportunities as possible to reflect and redesign throughout the process. There is sufficient evidence that real-life implementation of scale-up initiatives rarely follows a set design [108]. This encourages flexibility and adaptability in the intervention design and the planning of the scale-up strategy.	characteristics that influence adoption during the Set-up phase. • Scale-up success requires understanding the psychology of change and whom to target in the various scale-up phases. ***Factors contributing to adoption:*** • *Better ideas (innovation attributes: evident superiority, simplicity, and alignment with culture).* • *Leadership* • *Communication* • *Social Networks* • *Culture of urgency and persistence* **3) <u>Support Systems (Infrastructural Support)</u>** • Human capability for scale-up • Infrastructure for scale-up • Data Collection and reporting systems • Learning systems • Design for sustainability
8) Scaling Up Global Health Interventions – A Proposed Framework For Success [55]**.**	
<u>CONCEPTUALISING SCALING UP</u> **a. Key lessons of Scaling-up (Mental models)** The wide range of contextual circumstances, including politics, sociocultural norms and beliefs, and the economic environment, which might impact scale-up success, are crucial considerations when scaling up. As stated by [55], *"there is no single or straightforward delivery strategy that offers a formula for success."* Interacting with the system culturally and socially is necessary to allow engagement and exposure to local contextual circumstances and variation between other implementation sites. **b. Strategic planning and management approaches of scaling up.** Scaling up health innovations requires the development of strategies that incorporates the influence of contextual factors and systems behaviour. Success factors for scaling up were identified from interviews with implementation experts and the published literature. These factors include the following:	**<u>ELEMENTS OF SCALING-UP INCLUSIVE HEALTHCARE AND MANAGEMENT ROUTINES</u>** **Components of the scaling up process to manage:** **1) Attributes of the Tool or Service being scaled up:** • Simplicity • Scientifically robust technical policies **2) Attributes of the implementers:** • Strong leadership and governance • Engaging local implementers and other stakeholders • Using both state and non-state actors as implementers **3) The chosen delivery strategy:** • Applying diffusion and social network theories • Cascade and phased approaches to scale-up • Tailoring scale-up to the local situation and decentralizing delivery • Adopting an integrated approach to scale-up **4) Attributes of the 'adopting' community:** • An engaged, "activated" community **5) Socio-political context:** • Political will and national policies

- choosing a simple intervention widely agreed to be valuable, - strong leadership and governance, - active engagement of a range of implementers and the target community, - tailoring the scale-up approach to the local situation, and - incorporating research into implementation.	• Country ownership **6) Research Context:** • Incorporating research into implementation ("learning and going")
9) Developing a framework to inform scale-up success for population health interventions: a critical interpretive synthesis of the literature [50] ***(Framework: Scale-up Readiness Assessment Framework)***	

CONCEPTUALISING SCALING UP

a. Key lessons of Scaling-up (Mental models)

Definition of scale-up adopted: "scale-up refers to the deliberate process of enhancing the impact of an effective intervention" [7].

Phases of scale-up:

- Groundwork
- Implementing Scale-UP
- Sustaining Scale-up

b. Strategic planning and management approaches of scaling up.

Scaling up does not unfold linearly; thus, no universal pathway exists for scaling up healthcare innovations or interventions.

Key management components highlighted across various literature sources include:

- The Population Health Improvement (PHI)
- Contextual Environment
- Capacity of Organization
- Stakeholders.

ELEMENTS OF SCALING-UP INCLUSIVE HEALTHCARE AND MANAGEMENT ROUTINES

Phases of scaling up inclusive healthcare innovations:

Phase 1: Groundwork and preparation

The primary purpose of phase 1:

- Create a rigorous and systematic scale-up plan.
- Provide sufficient information for decision-makers to make an informed decision about whether to implement scale-up; and
- Develop a strong foundation for subsequent scale-up phases.

Key preparatory actions conducted prior to implementing scale-up

- Stimulating consideration to scale up a PHI
- Maintaining existing and building new stakeholder engagement and buy-in. (diverse range, maintain buy-in with regular communication).
- Conducting/Reviewing assessments
- Developing/Retaining/Refining/Modifying resources and stakeholder groups
- Deciding whether to implement scale-up of an existing PHI

Phase 2: Implementing Scale-Up

The primary purpose of phase 2:

- Successfully implement scale-up.
- Prepare to sustain the scaled-up PHI; and
- Decide how long to sustain the scaled-up PHI.

Key actions:

- Continuing / Modifying actions conducted during the ground-work phase.
- Building / Consolidating capacity for scale-up (training and flexibility to adapt to local conditions, especially in resource-poor settings where skilled workers were limited, over-burdened with responsibilities, and time-constrained)
- Deciding whether to sustain the scaled-up PHI

Phase 3: Sustaining the Scaled-Up PHI

The primary purpose of phase 3 is to sustain the scaled-up PHI for the intended period successfully.

- Continuous modification of previous actions to maintain the scaled-up PHI.
- Adapting and evolving to changing systems components.

APPENDIX C: SEMI-STRUCTURED INTERVIEW SLIDESHOW

PROBLEM BACKGROUND

Marginalized communities (social exclusion): Communities that have been historically excluded from involvement in our cities, as well as those continuing to face other barriers to civic participation. This includes those marginalized by race, wealth, immigration status, and sexual orientation.

Social exclusion - Healthcare:

- Inaccessibility to quality, affordable healthcare facilities
- Rely on overburdened public health sector
- Population disease burden
- Ill health = Increase Poverty

Inclusive innovations: New goods and services (innovations) are developed for and/or by those excluded from the development mainstream, particularly the millions living on the lowest incomes.

Inclusive Healthcare Innovations

Inclusion of marginalized communities in healthcare development for

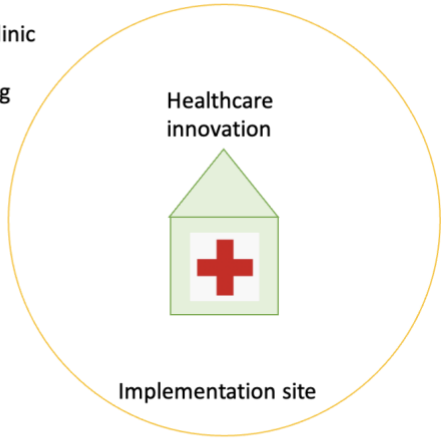
- Population health improvement
- Reduce disease burden.
- Improve well-being and quality of life

"Innovations" has 2 aspects:

- First, it means health service components or practices that are new or perceived as new in a particular program context. Existing or well-known technologies, procedures, service models or best practices that have not been used in a specific location are innovations, regardless of how widely available and applied elsewhere.
- Second, rather than a single medical therapy, clinical practice, or program component, health service innovations are a set of interventions, including the processes necessary to build sustainable implementation capacities. A technology in itself is rarely a simple solution to a complex problem, and as such, is alone not considered a health service innovation.

- For example: Unjani Clinic NPC – business service model, delivery method, processes, structure, healthcare service (entire concept)

- Primary care clinic
- Dental Clinic
- Family planning services
- Vaccination

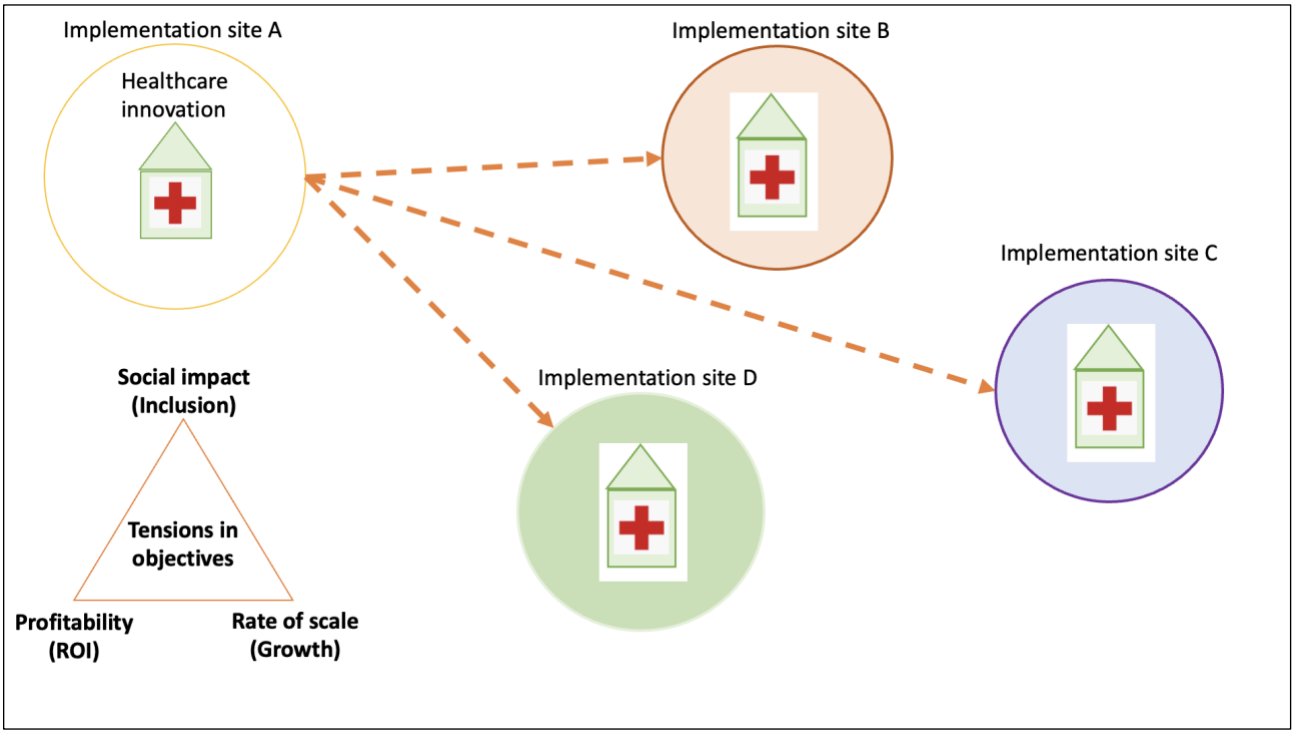


1) Develop and test healthcare innovation

2) Proof of concept in a pilot project

3) Scale-up healthcare innovation for greater reach (more significant impact)

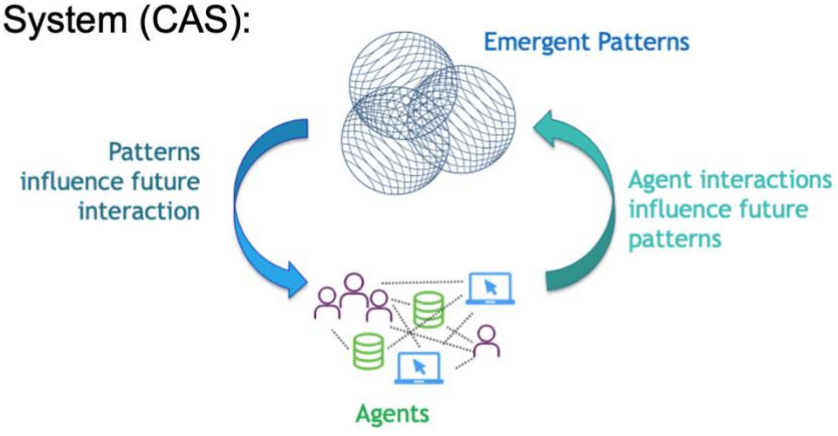
Scaling up: *Deliberate efforts to increase the impact of health service innovations successfully tested in pilot or experimental projects to benefit more people and foster policy and program development on a lasting basis.*

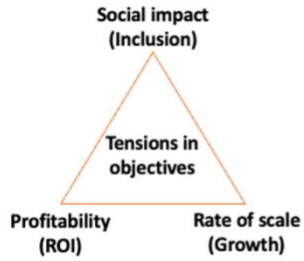


What type of system is the Healthcare system?

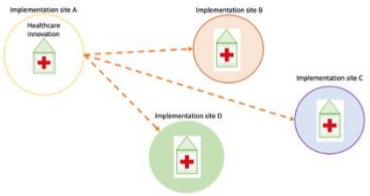
- **System**: A system is a collection of interacting or interrelated elements that act according to a set of rules to form a unified whole
- Complex Adaptive System (CAS):

A complex system is a large-scale system whose behaviour may change, evolve, or adapt.
- Unpredictable
- Non-linear outcomes
- Emergent behaviour
- Path dependencies
- Phase transition





Scaling-up innovation



Transferring an innovation
- Replicability
- Adaptability

= Ensure local fit/ adoption

Contextual variation at implementation sites

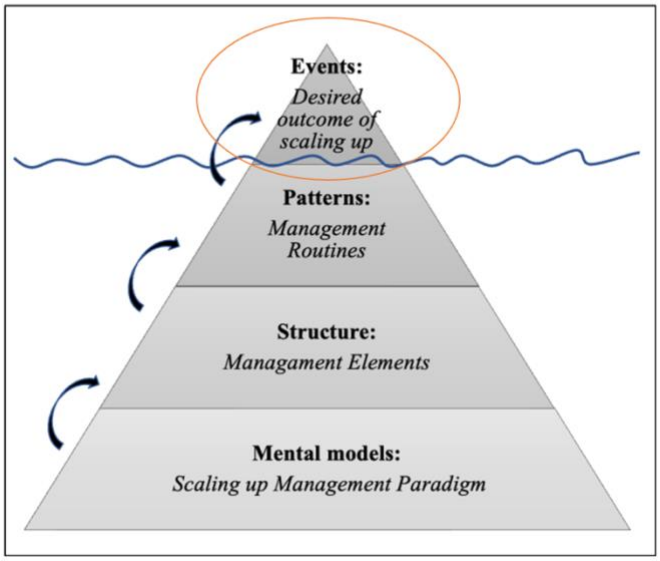
- Social, political, infrastructural, cultural
- CAS characteristics in health system

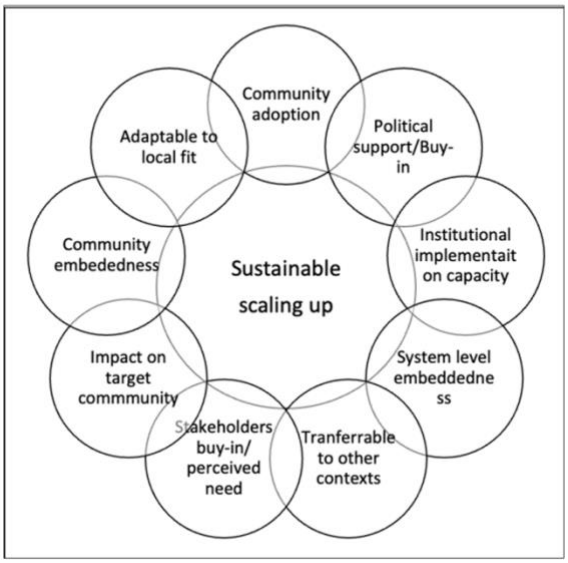
Healthcare as CAS:
- Non-linear outcome
- Unpredictable
- Self-organize
- Emergent behavior
- Phase transitions
- Path dependence
- Feedback loops

No "blueprint approach"

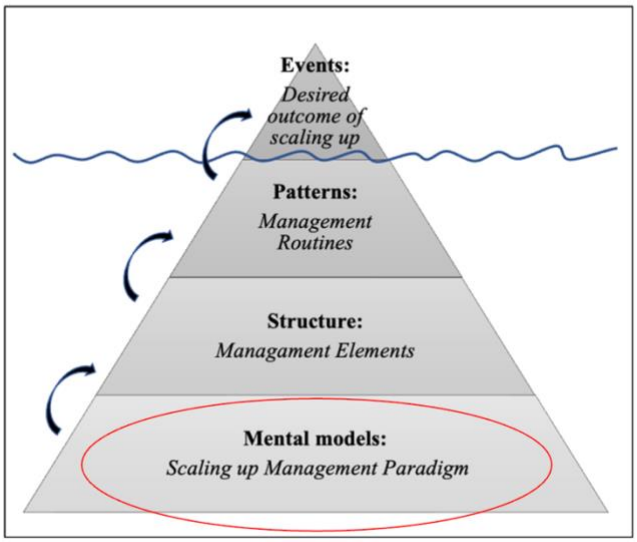
Managing scaling-up through "systems perspective"

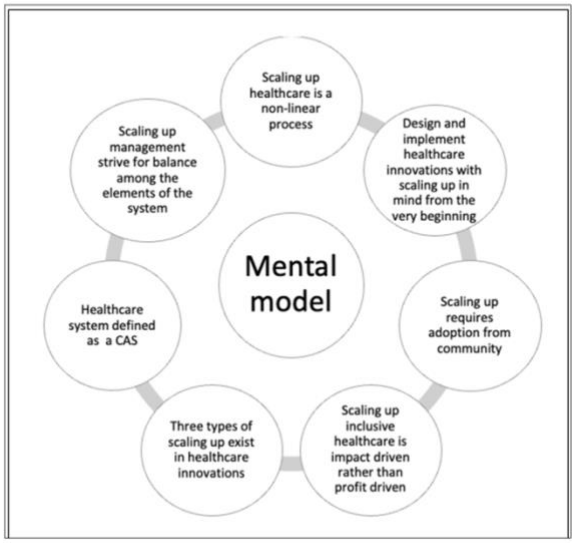
Management Tool Structure:



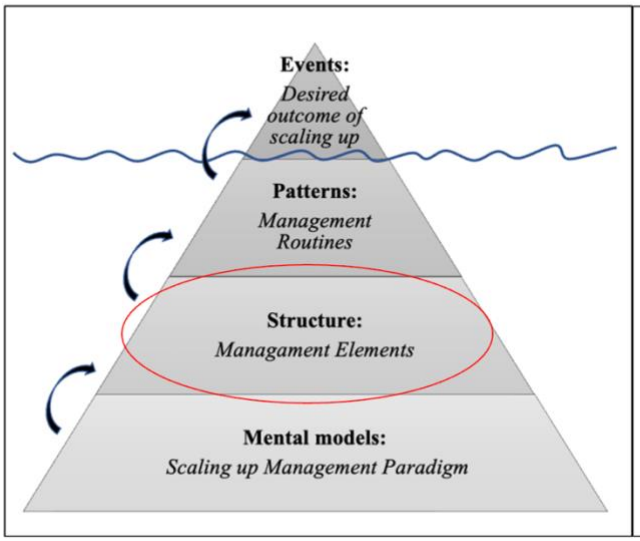


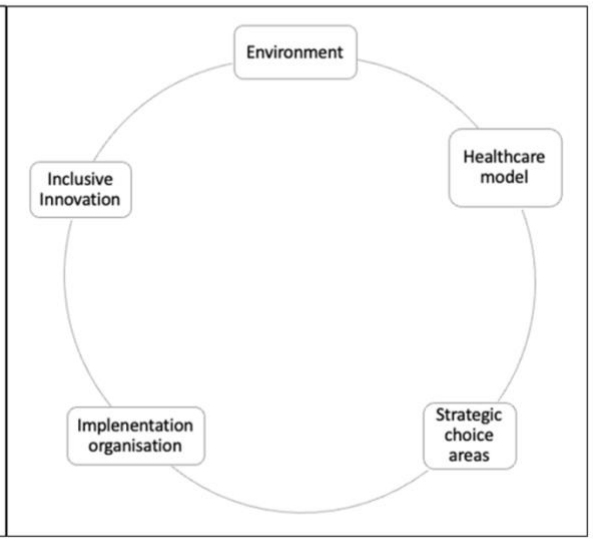
Management Tool Structure:



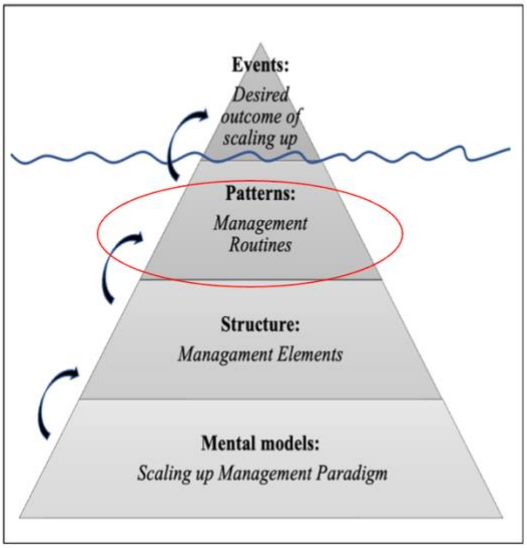


Management Tool Structure:





Management Tool Structure:



Healthcare model

- Target client assessment
- Healthcare professional selection assessment and training.
- Identify core elements for replicability.
- Balance centralized and decentralized management approaches.
- Tailored support to overcome initial problem with implementation and adoption of the innovation to local context.
- Understanding workplace context.
- Strong communication channels and relationships with implementation organization.
- Monitoring and sharing broad outcome indicators.

Implementation Organization

- Preparation for implementation.
- Provide string leadership and governance over healthcare innovation.
- Active community engagement.
- Incorporating research into implementation.
- Providing Internal systems and infrastructural support.
- Assess strengths and weaknesses to build capacity.
- Make use of existing processes and structures.
- Scaling with "others"

Strategic choice areas

- Define scope of social demands.
- Incorporate phases in scale up process.
- Develop adoption mechanisms
- Develop support system
- Address both horizontal and vertical scaling up.
- Combine centralized and decentralized approaches.
- Identify possibilities for economies of scale to reduce costs of scaling up process.

Environment

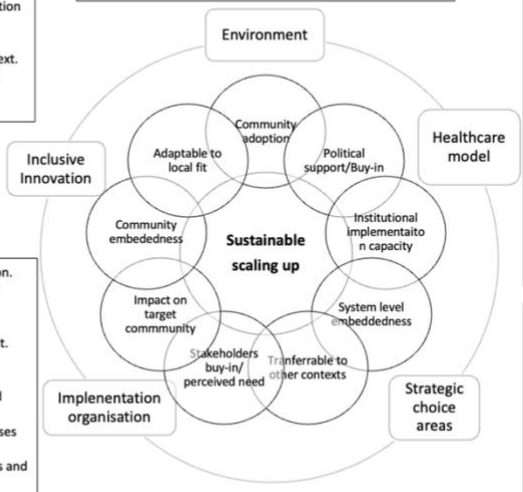
- Identification of factors in the environment influencing implementation and operation of healthcare model.
- Assessment of environmental changes affecting scaling up
- Assessment of community needs

Inclusive Innovation

- Dissemination of healthcare innovation
- Assess inclusiveness of the innovation according to relevance and compatibility in implementation area.
- Tailor innovation to local context.
- Monitoring and sharing broad outcome indicators.

- Dissemination of healthcare innovation.
- Assess inclusiveness of innovation according the "CORRECT" features.
- Tailor innovation to local context.
- Monitoring and sharing broad outcome indicators.

- Identification of factors in the environment influencing implementation and operation of healthcare model.
- Assessment of environmental changes affecting scaling up.
- Assessment of community needs.



- Target client assessment.
- Healthcare professional selection assessment and training.
- Identify core elements for replicability.
- Balance centralized and decentralized management approaches.
- Tailored support to overcome initial problem with implementation and adoption of the innovation to local context.
- Understanding workplace context.
- Strong communication channels and relationships with implementation organization.
- Monitoring and sharing broad outcome indicators.

- Preparation for implementation.
- Provide strong leadership and governance over healthcare innovation.
- Active community engagement.
- Incorporating research into implementation.
- Providing Internal systems and infrastructural support.
- Assess strengths and weaknesses to build capacity.
- Make use of existing processes and structures.
- Scaling with "others"

- Define scope of social demands.
- Expand gradually in phases and resist explosive scaling up.
- Develop adoption mechanisms.
- Develop support system.
- Address both horizontal and vertical scaling up.
- Combine centralized and decentralized approaches.
- Identify possibilities for economies of scale to reduce costs of scaling up process.