

A Qualitative Study and Thematic Analysis concerning the
Applicability and Efficacy of Service Design Processes applied to
Healthcare Service Innovation

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Abstract

The emergence of design and systems development have arisen as legitimate tools for facilitating innovative practices in the delivery of care within public services. Development mechanisms deriving from design led thinking and their associated methodologies have evidently been adopted to construct services that fulfill the interest of public health outcomes. Moreover, the innovations are being generated in response to multi-faceted factors necessitating the need to generate new solutions to improve health outcomes. These factors range from changing, and increasingly complex health needs of the current local population; to advances in medical science; and of the development trends emerging in medical technologies further enhancing potential in health outcomes.

The research is conducted to answer key questions regarding both relevance and effective impact, surrounding the adoption of design-led thinking and processes in developing health services within the National Healthcare Service in Wales. The research focus and scope of this investigation encompasses the development processes that are integral to creating innovative services. These processes consist of a combination of tools and principles used by stakeholders with the aim of improving the delivery of health related outcomes. The research has sought to address its core questions by implementing a thematic interpretive analysis, to qualitatively extrapolate how live engagement with design processes among relevant stakeholders facilitate innovative interventions. The relevance and effectiveness by which design processes seek to generate ideas against a set criterion is therefore sought through the interpreted narrative of transcribed data from participant stakeholders. From the analytical narrative, the research aims to establish an original framework that would help stakeholders make sense of the developmental means by which innovative services emerge and can concurrently be evaluated for their appositeness to a design exercise.

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Glossary of terms

ABMUHB	Abertawe Bro Morgannwg University Health Board
C4B	Change for Better initiative
CBT	Cognitive Behavioural Therapy
CCG	Clinical Commissioning Group
COPD	Chronic Obstructive Pulmonary Disease
CPD	Continuing Professional Development
EBD	Evidence / Experience Based Design
EPP	Expert Patient Programme
HCSWs	Healthcare Support Workers
HCP	Healthcare Practitioner
IWE	Institute for Wellness Education
LHB	Local Health Board
LMC	Local Medical Council
NHS	National Health Service (United Kingdom)
NICE	National Institute for Health and Clinical Excellence
NLIAH	National Leadership and Innovation Agency for Healthcare
NISCHR	National Institute for Social Care and Health Research
NMP	Non-Medical Practitioner
PDSA	PDSA Cycle denoting a process of planning, doing, studying and acting for testing innovation
PROMS	Patient Reported Outcome Measures
SMS	Self – Management Support

1 Introduction

1.1 Background and core definitions

Access to an effective, efficient and safe health service is seen as one of the markers of a civilised society. It is also apparent from recent literature that the health service is strained in staffing and resources, in the face of increasing service demand particularly in the United Kingdom (Cordery, 2017). According to the Cambridge Business English Dictionary (2019), the provision of healthcare and its associated services are foremost enterprises concerned for the appropriate treatment and management of an individual's physical, and mental wellbeing. The key construct to this provision of care encompasses a population of important actors and contributors such as medically qualified professionals, intermediary therapists and nursing personnel, and personal contributors such as family members and vocational colleagues. The population acts with the primary motive of maintaining, restoring, or improving one's state of health (World Health Organization, 2009). This endeavour is supported by systems that structurally provide medicinal, technological, financial, and governmental resources to help facilitate a delivery of services aimed at addressing a broad spectrum of health needs. Examples of such structures exist in differing geographical and spatial contexts, in the form of hospitals, drop-in clinics, medical surgeries, home visits and specific emergency or crisis situations.

Structures within health services can be perceived as relationally inter-dependent and involve social contexts and dynamics that play a role in understanding behaviours that support, or hinder appropriate health interventions (Davidson and Fitzgerald, 2008). Consequently, the theoretical perspectives used to study and make sense of the healthcare field have derived from cross-disciplinary approaches relevant to the examining of multi-layered human behaviours, combining examples such as social, and complexity science (Begun, Dooley, and Zimmerman, 2002. pp.8).

In view of the current landscape concerning the accessibility of health services, healthcare providers are referring also to cross-disciplinary approaches to develop adaptive solutions to the pressures facing their services. The Royal Academy of Engineering for example, outlines a series of approaches such as Human-Centred Design, Six Sigma, and risk management principles that can be incorporated into a multi-disciplinary framework, for tackling systemic challenges within health services (Royal Academy of Engineering, 2017. pp.20).

The endeavour to study the operational and organizational nature of health services has thus far been characterized by the discovery of a system that is self-organizing; that is adaptable to situational or environmental changes; that is in a state of constant change; and are influenced by non-linear relationships that have varying impacts on health delivery (Eoyang and Berkas, 1999; Marion and Bacon, 2000). Furthermore, factors such as the socio-cultural and socio-economic conditions embedded in a health service, act as complex determinants with potential impacts to successful delivery of individual health outcomes (Iles, and Sutherland, 2001).

What is also apparent in the context of generating health innovation is the need for an epistemological approach that allows existing assertions about service processes and their users to be scrutinised, so creating approaches to innovation that better responds to the complex challenges that are distinctive to health services (Mark and Snowden, 2006). It is evident that the unpredictable fluctuations in human health, and the non-linear nature of development in medical advances, critically influence the way health providers discern what service interventions and corresponding health outcomes are deemed successful (Halfon, et al. 2013). The complex nature involved in managing health means that the effectiveness in which healthcare resources are appropriated, is not directly proportional to the quality of health one can expect to achieve.

There is not at present a finite solution to every conceivable ailment, nor are they accompanied by simplistic and rudimentary outcomes that can definitively determine the success of a deliverable health outcome (Begun, Dooley, and Zimmerman, 2002. pp.1). According to Begun, Dooley, and Zimmerman (2002. pp.2-4), there is a need to develop the understanding of health services as adaptive systems with a fluid nature as to how it is shaped, informed and adapted to meet the health needs of the public. These participatory steps are to fully involve where appropriate, the collaborative and facilitating efforts of both the service provider and its users. Alluding to Friere and Sangiorgi (2010), the co-creating and co-participatory efforts of all relevant stakeholders in the service enable an exploration of innovative opportunities from all possible perspectives while also uncovering the social norms and practices that shape current needs and resolutions (Junginger, 2008).

Involvement and permeation of design practice in developing health services has coincided with a shift in how design methodologies create the mechanisms and conditions that empower service users to manage their own well-being (Friere and Sangiorgi, 2010). The de-centralisation of creating value exclusively from the top down in healthcare systems has created a need to introduce visualisation and ideation tools that can widely be articulated to the general public, enabling service users to grasp creative concepts together with health professionals. The development of stakeholder engagement has progressed to reflect a growing need to involve health service users in managing their health (Department for Health, 2005), helping to evolve the role that design plays in a co-creating framework for generating new interventions.

Design, as an activity, is something we all undertake in our daily lives. On a superficial level we decide on our look, arrange the furniture in our rooms, and plan our daily schedules.

These are routine tasks that require cognitive processes like design. However, design is a deeper and more profound activity spanning professions such as art, architecture, engineering, graphic design, and industrial design. In these disciplines there is a need to reconcile the endless scope of the possible with the need to meet the required outcome.

Whilst there may be some dispute about the precise definition of the term 'design', it is accepted and seen to be a purposeful and creative activity. Design seeks to create outcomes with the object of satisfying certain requirements in new ways. In health service design, a variety of requirements must be considered ranging from clinical and social needs, to patient satisfaction and workforce development.

Service Design is more than just translating a set of specified requirements into a service; it involves discovering and exploring new requirements (Design Council, 2015). Thus, service design involves finding problems and solutions simultaneously, and this is where creativity is important. Documented studies have taken place with the aim of identifying and understanding aspects of creativity in design (Candy and Edmonds 1996; Christiaans and Dorst 1992; Goldschmidt and Talsa 2005). These studies suggest that creative designing involves movement from one 'solution space' to another.

According to Cross, (1997), this is what characterises creative design as exploration, rather than a narrow search for a specific solution. Design exploration can be performed in a range of ways. Some designers, especially those interested in the visual composition of objects, explore designs according to guiding principles of composition (Stiny, 2006). Studies have shown that personal cognitive processes, such as perception and thinking, contribute to the designers' ability to explore designs (Oxman, 2002). Smithers, (2001) suggests that design exploration should be understood as a personal activity situated in the context and conditions of the designer and design requirements.

Service design, however, has a purpose that is external to the designer. Here the designer acts as interpreter or translator of a wider system (Friere and Sangiorgi, 2010), bridging the divide between function, form and human perception. The designer acts to make sense of complex systems by making the potential of health innovation accessible to its beneficiaries.

1.1a Research Question

Despite significant research and an expansive literature base covering Service Design in Healthcare (Lee, 2011; Sanders and Stappers, 2008; Design Council, 2015), there exists no widely accredited set of design factors to benchmark the service development process specific to the health sector. There are at present varied responses in relation to how quality of healthcare delivery can be articulated and measured exist. From the literature, these ranges from care delivery based on the highest possible standard of clinical outcomes (Øvretveit, 2009); to appropriating science and technology in a manner that maximizes positive effects on health (Donabedian, 1980). Both ends of the spectrum aim to provide a health service of high efficiency and efficacy to the degree it satisfies both patient and providers (Mosadeghrad, 2012). Mosadeghrad (2012) has outlined numerous factors and characteristics that allude to the delivery of quality healthcare, with terms such as accessibility, timeliness, privacy, and attentiveness.

The question the research is aiming to address from the literature gap is if a set of design factors can be identified and be used to evaluate the effectiveness of service design methods in the context of healthcare innovation. The proposed question prompts a review into how innovation is currently evaluated in the service development process. As reflected in the literature, this aspect of the service design process is considered a critical element in an emphasis of continuous improvement using benchmarking methods by Ettorchi-Tardy, Levif, and Michel, (2012).

Within the main research question, a broader context surrounds the appropriate selection and effective application of design model processes among service stakeholders. How the design process is conceived through drivers for innovation is thus investigated with a primary focus on applicability (contextual relevance) and efficacy (effectiveness in facilitating innovative outcomes). To begin understanding the theoretical and practical proposition of stakeholder engagement with design methods, a qualitative ethnographic approach is chosen to investigate the impact of design processes in planning, strategizing, and developing new services. Through this approach, the research immerses into the thinking process behind the application of design tools, and thus accounts for what are critical elements in creating new service deliverable outcomes. More importantly, this cognitive element provides an interpretative account of the theoretical basis and relevant influences (i.e., statistical, political, and existing agenda) that shape the ideas contributed by stakeholders. These factors form a basis for examining the ideologies, preconceptions and underlying influences that inform how stakeholders are engaging with the design process.

The capture of rich qualitative data that documents the theoretical and semantic cues from stakeholder engagement, aids in the appropriate analysis to identify thematic categorisations, possible patterns, and inconsistencies from the manifest data. The synthesis and organisation of the qualitative account reflected by participant engagement with the design process creates a narrative serving to theorize how, and why design processes are implemented the way stakeholders engage with them in relation to the two variable measures investigated from the research question. The framework developed from the research can be summarized by three original contributions that aim to encourage constructive engagement regarding the adoption and use of design methods in health service development.

1.1b Contribution to Knowledge

The first contribution is a newly co-produced concept design model with the research sponsor, Med-Co Europe. This represents a newly developed model that is shaped upon the contingent service specifications and objectives that are set out before the design process begins.

Building upon the phases used to guide service innovation from established models derived from literature, the contribution of the new model aims to address the dynamic opportunities and implications in using a design process that is relevant to addressing healthcare service criteria.

The second contribution is the conception of an analytical tool consisting of eight distinctive design factors with the purpose to benchmark the applicability and effectiveness of service design methods. The design factors enable a categorization of foundational determinants to effective service delivery and ensure that design interventions align with a project's proposed criteria. The analytical tool enables the components of design processes to be scrutinized, deployed and evaluated appropriately from the stakeholders. It forms part of the overall framework in the design process of services and can be engaged within a multi-disciplinary setting that is prevalent in existing health service development.

The third contribution is a research structure and theoretical underpinning used to assist in the analysis of design tools in relation to their applicability and efficacy, in addressing specific service criteria. Using a thematic analysis process in tandem with a statistical T-test, the research framework is used as a guidance tool for stakeholders to assess the causal explanations of applicability and efficacy within design models using the proposed factors analytical tool.

The findings within the thematic analysis report is triangulated with the statistical analysis of the evaluation data, to generate a holistic assessment concerning the performance of the newly generated model alongside the two established models identified from the literature.

1.1c Research Scope and Context

The context and scope of the research is established within the Primary Care service platforms operating across two neighbouring Health Boards that form part of seven wider Health Boards across the National Health Service in Wales.

Providers of Primary Care are based in varied locations such as district hospitals, community health centres and local pharmacies (Health in Wales, 2019). The services available within these platforms range from advice for managing specific conditions such as arthritis or chronic obstructive pulmonary disease, to multi-level provisions such as optician services (Health in Wales, 2019).

The two Health Boards, namely Abertawe Bro Morgannwg University Health Board and Hywel Dda Health Board, cover the geographical Welsh Counties of Ceredigion, Pembrokeshire and Carmarthenshire to the west of the region, and cover Swansea, Port Talbot and Bridgend counties to the south west of the region.

As a devolved administration in the United Kingdom, the National Health Service of Wales receives funding resources from the Central Government, and delegates those resources accordingly to the varying Health Boards that manage local health services across the geographical spread of the region (NHS Health Education England, 2019).

In addition to the Health Boards, three additional Trusts help to contribute on going health delivery and its integrated development with a specific Welsh focus. The Welsh Ambulance Service Trusts specialises in the provision of emergency services; the Velindre NHS Trust offers specialist services in cancer care; and the Public Health Wales Trust help to advise Health Board directors on matters such as service quality, public health issues, and for leadership in helping Health Boards work effectively with local community partners (Public Health Wales, 2013). Each Health Board seeks to serve its local population by working closely with its local authorities, of which there are 22 County Councils across Wales.

Within the region are seven Community Health Councils who offer the voices and views of user and patient groups, and so act as statutory bodies responsible identifying, and informing innovation in localised health delivery (Howson, Martin, and Scowen, 2015).

Other stakeholder groups that are influential in informing the field of local services include the Welsh Government, the Welsh Local Government Association, and Natural Resources Wales (Public Health Wales, 2013). These organizations inform local health delivery with focus areas such as national health policy, setting political and governmental agendas important to the discussion about local health in the context of wider public service provision, and environmental factors that influence health (Welsh Local Government Association, 2019).

The key distinctions unique to the development and delivery of health services in Wales compared to the other home nations, include a universally free prescription of medication at the point of access, and the creation of a health agenda that is lead and chiefly instigated by the Welsh Assembly Government (NHS Wales and Welsh Assembly Government, 2009).

Since 2009, the NHS Wales services structure underwent a major re-organisation to become a more integrated institution shifting the focus of care towards enabling wellness and a better co-ordination of services across frontline acute care and social care.

Restructuring the approach to innovating health, allowed for increasing opportunities to introduce collaborative ways of working between the health service, the local government and third sector partners (NHS Wales and Welsh Assembly Government, 2009). This thereby created a champion for engagement processes such as co-production and co-creation methods (1000 Lives NHS Wales, 2013) to create delivery solutions that are designed inclusive of multiple stakeholder perspectives between patients, non-users and professional health personnel.

Moreover, it has been reflected upon that co-production strategy for creating and scoping services require measures that effectively evaluate interventions against the design criteria established earlier in the design process (1000 Lives NHS Wales, 2013, pp.26).

Relating back to question regarding appropriate adoption of design methods, there is an opportunity to further develop an understanding for how the evaluation strategy could also consider a framework to measure the impact of the design processes themselves in the building and execution of innovative solutions.

Thus, the engagement of the research within the current operating structure of NHS Wales services enable an investigation into the adoption of service design methods to be sought, considering three ontological factors that help inform the original contribution. Firstly, there is epistemological relevance to the research regarding identified health needs and the region's specific strategies for responding to them that have a bearing on whether the design methods investigated have the desired impact.

Design methods have transferrable influences over the design process involving various scope and specificity (Malmberg and Wetter-Edman, 2016). However, their implementation within Welsh specific strategies and engagement contexts mean that the evaluation measures will be observed within the frame of stakeholder learning and perspectives pertinent to their setting, and time frame. The scope of the research engagement within a distinctly set up health system and its contextual backdrop helps to validate the research findings and its arguments within an appropriate analytical and theoretical frame for interpreting the application of service design methods.

The research question is addressed contextually within the realities of the development stakeholders, and the wider systems where innovative activity takes place.

Secondly, the collective understanding and on-going stakeholder engagement regarding health services in Wales reveals how the knowledge base surrounding the co-production of services is being shaped over a known period. This point is significant in affecting how the research makes sense of the existing knowledge and underpinning perspectives that subsequently shape the engagement process to the design of new services. The contribution of the research aims to extrapolate meanings about ways of working and care interventions, deriving from principles and system wide aims (Bevan Commission, 2015; Health in Wales, 2016) within the Welsh health agenda. It is clear from the literature and the dissemination of healthcare development initiatives to the wider public, that the consolidation of knowledge about developing the local NHS play an integral part contributing to key stakeholders' thinking processes. The interpretive account of the design process engaged by the research, aims to accurately reflect on the execution of service design methods in relation to a set design criterion, based on the evaluation accounts from each research participant. Collectively these accounts form a wider narrative that builds onto the literature base, a deeper understanding into the planning and evaluation of a design process that is fit for purpose.

Thirdly, the objective outcomes of the research contributions shall align its influence according to the core principles of delivering a well-governed National Health Service in Wales, based on the nationally recognized Prudent Health Approach that is adopted across the region (Bevan Commission, 2015). In the conclusions and recommendations set out in the thesis, there is a clear connection between the practical implications of the original contribution, and the chief principles that govern the agenda and planning processes found in the service development process. In this way, the literature and practical contributions consolidate current known practices and build on case studies that sought to reflect on the impact of design and its nuances in generating healthcare innovation.

1.2 Aims

The intended purposes for undertaking the research in response to the need for identifying an effective framework for evaluating service design methods in health service development is outlined in this sub-section.

The research sets out to investigate how design process models practically support stakeholders in creating innovative service deliverables within the national health context of Wales. The applicability and efficacy of design in generating health service innovation is interpreted in relation to the National Health institution's present core principles, and an established theoretical approach to health innovation as present in the NHS Wales (Health in Wales, 2016).

The research intends to deploy two established design models from the literature, and one newly co-created model against a health service design criterion to evaluate their support and guidance to participants throughout the service design process. The intention to introduce a co-developed model into the evaluation phase of the research is to draw out a deeper understanding about the conception of design models, and subsequently produce comparative observations about its performance in relation to known adopted models. More importantly, the conception process is reflected to specifically analyse the thought processes used to inform the development of the new model (Dym, et.al, 2005). The insights generated about this process is intended to elaborate how stakeholder engagement from the third-party sector (Med-Co Europe) play a role in planning a process effective for innovating services (1000 Lives, NHS Wales, 2013, pp.16). As part of the conclusions stated in the thesis, the research contributions and their practical implications for private organisations such as the research sponsor are discussed to evolve the knowledge base regarding the Health Service's role in collaborating effectively with different stakeholder groups (Health in Wales, 2016).

In this way, the aim is to further inform the NHS Wales and their core principle of partnership working particularly in the area of service design methods deployment and the collaborative consultation over their effective selection.

The design of the research evaluation methodology facilitates the benchmarking of each design model against an established set of factors focuses on drawing conclusions about their applicability and efficacy, in relation to fulfilling a known set of design criteria. This process intends to draw out thematic categories generated from participant responses that serves to theorize how each of the selected design models performed against the criteria as they are deployed.

Thus, the evaluation method as proposed by the research will enable comparative observations of participant engagement with both established and newly created models, with the potential to expand on the analytical narrative through further research.

The thematic codes that are generated from the qualitative analysis of the data extracts are mapped and identified in relation to the research question (Braun and Clarke, 2006). This way of coding focuses the analytical view of the extracts considering the performance of the models, as well as the underlying motivations and agendas that underpin the conception of new ideas. In this way, the final themes that are discussed in the research will potentially resonate or expand upon observations from previous studies over service design in healthcare (Braun and Clarke, 2006, pp.84). Finally, the research aims to generate recommendations for planning and constructing service design processes that would be effective in facilitating the creation of innovative healthcare services. The key observations around the applicability and efficacy of design models will be discussed in the reporting of the theoretical thematic analysis, and the discussion of each model's performance in relation to the themes and their underlying codes.

The comparative observations specific to the performance of the new conceptual model and the literature-derived models relate closely to the conception process for the new model, with reference made to the rationale of their specific phases. On the other hand, the statistical significance of the benchmarking results for each model will be conducted to specifically analyse performance indicators attributed to the design factors in the contributed analysis tool.

Lastly, the discussion of the results of significance between the three design models tested in the research intends to further consolidate the research findings about their suitability to addressing criteria specific to healthcare services. It is intended that the contributions of the analysis process, with the development of a new model, can be built upon through further research.

1.3 Objectives

This sub-section outlines the research steps and measures used to achieve the desired aims as articulated in the previous section. In order to explain clearly how the research makes sense of the qualitative data in connection to the original inquiry, a sequential list is shown in Figure 1.1 that systematically maps out the cognitive processes undertaken to generate new knowledge involving the data from the research (Morse, 1994; Thorne, 2000).

Comprehension of phenomenon under study:	<ul style="list-style-type: none"> - Review of existing literature on research subject - Identifying existing gaps from literature and case studies in relation to the research question - Definition of key concepts in chosen research field
Making sense of the phenomenon accounting for relations and linkages within its aspects:	<ul style="list-style-type: none"> - Identification and development of design factors conducive to service development - Identification of design models and their competencies benchmarked against the design factors to ascertain their applicability and efficacy for stakeholders, and their engagement with the design process - Using the appropriate philosophical approach, along with an analysis process that will help draw out meaningful interpretations and insights.
Theorising about how and why certain themes emerge the way they do:	<ul style="list-style-type: none"> - Reporting of themes and their corresponding codes, about the narrative they tell from selected and relevant data extracts. - Reporting of statistical significance to further elaborate on participant evaluation of their action plan and relevant use of the design model
Re-contextualising the new knowledge about the phenomena:	<ul style="list-style-type: none"> - Generating recommendations relating back to the aims and objectives in addressing the research question - Clarifying the original contributions in relation to the existing literature base - Outlining how the research methods and analysis undertaken could be developed to research the phenomena further

Figure 1.1 – Sequential list of research steps and measures to map the objectives in relation to the cognitive processes used to address the primary research inquiry.

A depiction of this process helps to extrapolate the considerations by which the steps and measures contextualise the data extracts to become insightful, and meaningful knowledge.

The steps involved in understanding and framing the phenomenon in the research helps to establish the theoretical assumptions that underpin how stakeholders in the health service field engage with service design methods. It also reinforces the analytical view by which the new data is sought to explain how and why selected design models support the service design process, in reference to a newly devised list of design factors (Thorne, 2000, pp.68).

The review and survey of the literature brings into focus the prevailing tools, methods and principles behind the field of design to understand how its thinking and practice are applied across a range of disciplines including health services. It also reflects on past and present studies into the dynamics of stakeholder engagement using design within health service development to further inform the overall theoretical frame for analysing participant feedback in the research (Chilvers, 2008; Pohl, 2007; Studd, 2002).

The development of the design factors plays an integral part in contributing to an original framework for the evaluation of the design models tested according to the research inquiries. It is through the design factors and their role in benchmarking the performance of each design model that their relevance and efficacy in supporting stakeholder engagement can be interpreted. Thus, the factors form part of the analytical process that creates new insights regarding both the conception and the effective deployment of service design models. The underlying meanings behind each of the factors help to re-contextualise the qualitative data extracts found in the participant feedback, to form meaningful connections with a known set of design criteria. These meanings therefore form relevant linkages between the performances of a design model, to the health specific requirements that the research participants are seeking to address.

The factors, in combination with the design of the ethnographic case study and accompanying thematic analysis, creates the reality backdrop that seeks to make sense of the present studied phenomenon in service design engagement (Braun and Clarke, 2006, pp.84).

Lastly, reporting of the thematic patterns and interpretations of the relevant themes play the subsequent part of theorising about the performance of the design models, in relation to the research inquiry. In addition to the qualitative interpretations of the thematic patterns in the data extract, the statistical significance found in the participant evaluation of the design models facilitates in generating knowledge about the performance of each model in light of the factor's analysis. From this evaluation, the thematic patterns from the qualitative data extracts thus reinforce new ways in which the applicability and efficacy of design models can be observed. This is particularly important for the conclusions outlined in the thesis that demonstrate the theoretical link between the analytical framework found in the design factors, and how this generates a new way for understanding the performance of design models to address particular service criteria (Thorne, 2000, pp.70).

By placing the new knowledge about the phenomena and its key patterns into the frame of how others have interpreted the deployment of service design models (Thorne, 2000, pp.70), the research questions are addressed in building on the existing knowledge base. A flow diagram that illustrates the research process to generate the practical, and academic recommendations can be referred in Figure 1.2. The three overlapping elements consisting of the design model, deployment of the design process, and the factors analysis tool generate the data extracts necessary for making sense of the phenomenon and identify the emerging themes and patterns that are relevant to analysing the performance of each design model tested. The subsequent phases show how the data is analysed, interpreted then synthesized to generate new knowledge about the measures that aid in the evaluation of the capabilities to generate innovation using the process prescribed from the service design model.

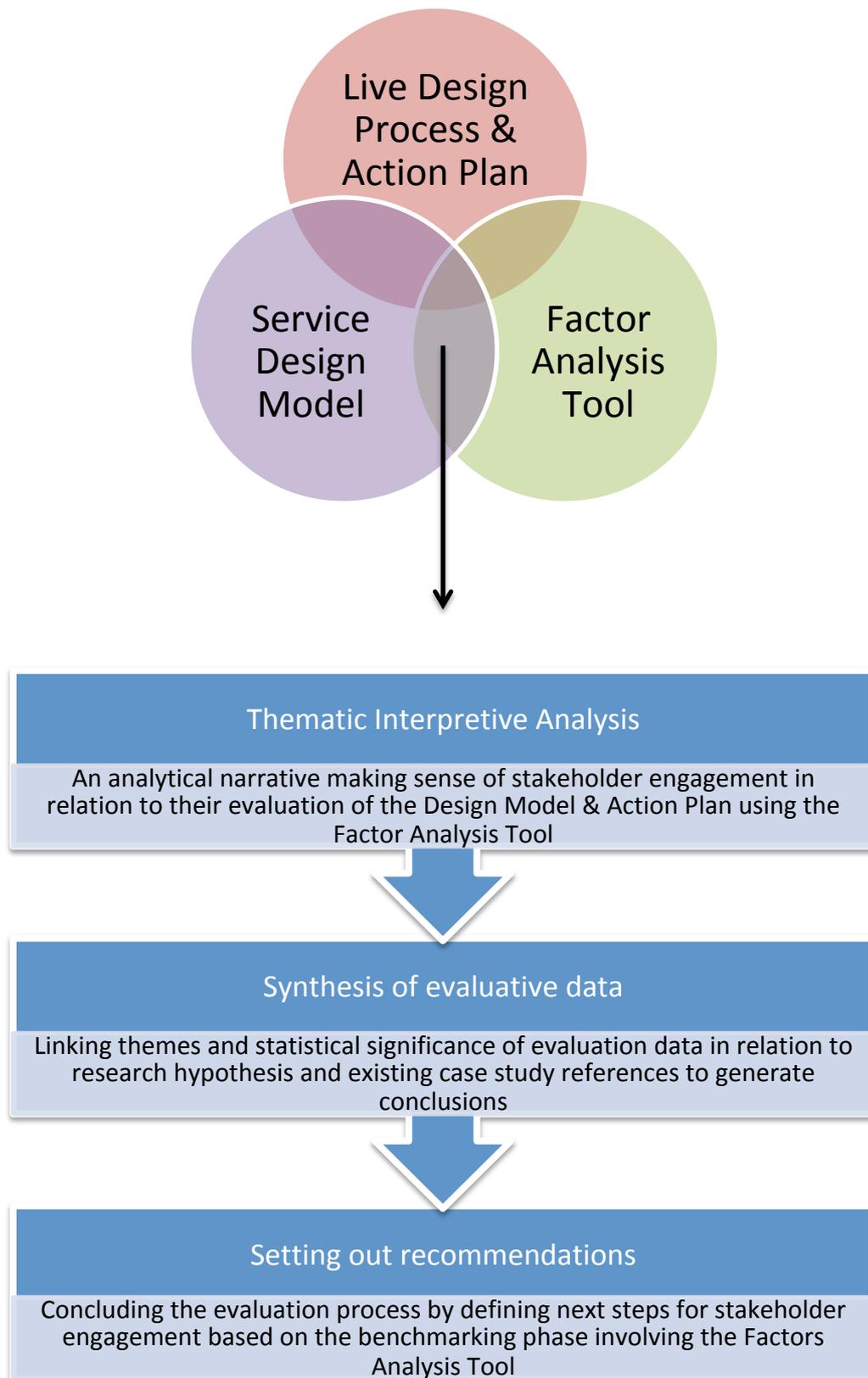
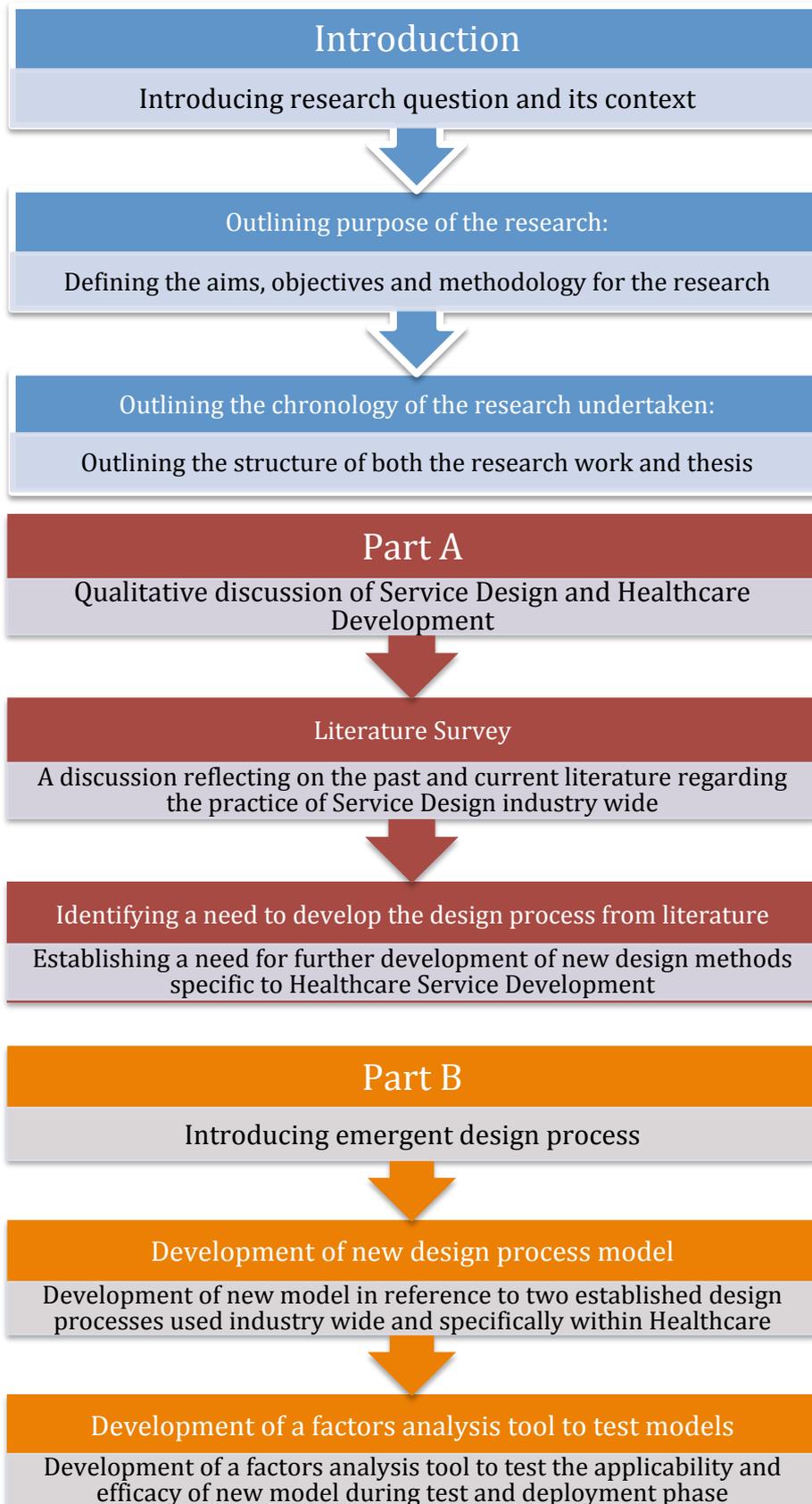


Figure 1.2 – Proposed Factors Analysis Tool and accompanying ethnographic study phases to appraise the applicability and efficacy of Service Design Models

1.5 Structure of the Thesis

The structure of the thesis comprises of three sections as illustrated in Figure 1.3. The introduction sets out the background context and emergence of the research question that follows with the aims of addressing the need for further developing the knowledge base of the service design process. Part “A” opens with a literature survey of existing service development practices, both as a general discipline and how it is being applied within the healthcare field. The literature sets to establish current approaches towards healthcare innovation within the context of public institutional services, and how that differentiates from private enterprises. The research sponsor Med-Co Group represent a collaborative service provision between a private enterprise and public institutions (i.e. HM Prisons, Ministry of Defence and National Health Service). The survey discusses about the inter-relationship between policy makers, healthcare practitioners, and user patients and how the three spheres work together within the context of developing a service and the roles they play within the design process. The identification of what service design practice entails, and how the development participants involved engage in service design, enables a proposition to be made to test how a particular design method and tool (in the form of the design model) can assist them in planning a service design project. This proposition of a new service development method is expanded in Part “B” and narrates the development of a new design development model informed by two other models currently adopted in industry and health practice. The developing of a test methodology in which these models can be benchmarked and assessed for how effective, and applicable in a deployment test is explained via a discussion of the action plan workshops. Part “C” presents the analysis of how useful the models were in helping test participants in completing their action-plans, before drawing to recommendations for how they might be improved or refined for future applications. Lastly, this is followed by a conclusion outlining recommendations for how the new model can improve the ideation process particular to health service development.



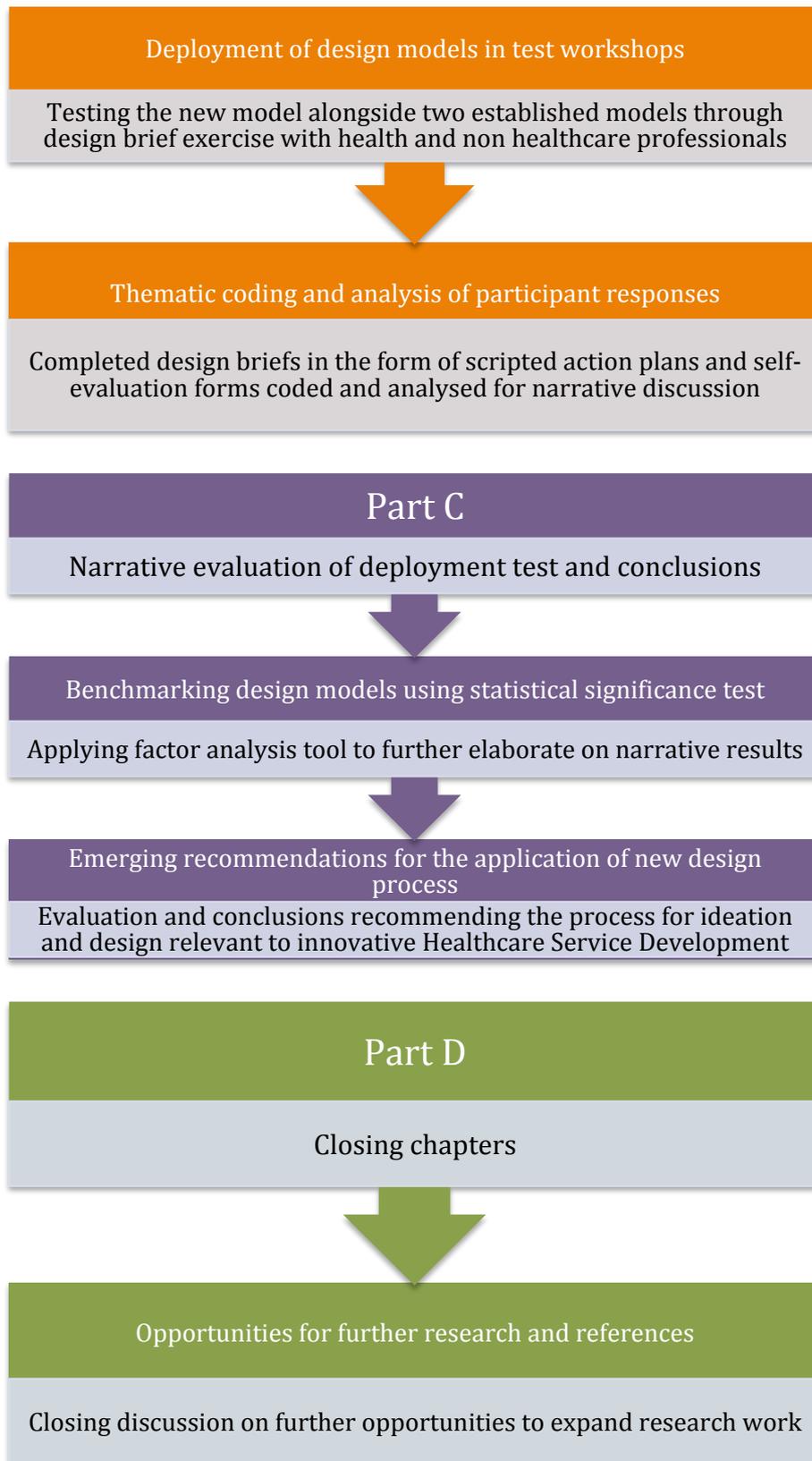


Figure 1.3- Structure of research thesis

1.6 Structure of the Research

The research process undertaken is shown in the phase tables of Figure 1.4, beginning with a literature survey and qualitative discussion of established service design practices industry wide. The literature survey informs the background context for unpacking the role design methods serve in the context of healthcare development, and the wider sphere of commercial fields. This initial phase also establishes how approaches to delivering and improving healthcare services are distinguished between the public National Health Service, and private enterprising healthcare providers.

The identification of design factors derives from the design process literature about effective design criteria. The design factors express to design participants about relevant design criteria requirements. The design factors are deployed to assist in the analysis and evaluation of design process models, where participant responses to the design criteria are coded and analysed for causal mechanisms that reflect on the performance of the design models.

A theoretical thematic analysis is sought to identify the extent a Design Model guided the participant responses, informs how effective the design models supported their generation of service ideas.

Literature survey of Service Design practice and application in the healthcare field – Phase 1

Overview of Service Design as a general field

- Review of service design practice as a disciplinary field
- Review of service design theories, processes and tools
- Review of current service design applications within healthcare

Review of Service Design in health and well-being

- Identifying governance, standards and guidelines from national and regional levels that inform the operation of healthcare services
- Identifying service innovation and their methods from a public provider, and a private provider's perspective within healthcare
- Profile of Med-Co Group practice

Development of services with public and private collaboration

- Case study documentation of collaborative practice with public healthcare institutions
- Analysing the role of service design in co-creating and collaborative workforces

Introduction of design process models – Phase 2

- Breakdown of the design models
- Establishing application and methodology within the design process
- Review of the three process models chosen to be benchmarked
- Identifying relative strengths and weaknesses between the models

Development of deployment testing – Phase 3

- Development of test methodology
- Introduction of the design factors
- Breakdown of the initial list of design factors
- Refining and narrowing the factors, translating into design criteria
- Development of the design brief and test rationale
- Selection of participant groups for workshop deployment

Testing Service Design Model – Phase 4

- Conducting the test exercise in the form of a written action plan in response to an established design brief
- Breakdown of the workshop process involving the participants
- Participant evaluation of the applicability and efficacy of the design models in relation to the completion of their task to address the design criteria in the brief
- Conduct benchmarking process through assessment of completed written responses by participants using new factors analysis tool

Experiment analysis – Phase 5

- Evaluation methodology introduced
- Qualitative thematic analysis of completed action-plans
- Comparative analysis of results of Model A and C, in relation to the new Model B
- Benchmarking design models according to application of factors analysis tool
- Implement a significance test to the Likert Analysis data to evaluate performance of the design models against design factors criterion
- Draw evaluative recommendations and conclusions regarding design models in relation to the narrative discussion of the workshop data

Figure 1.4 – Phase tables outlining research process undertaking

2 Research Methodology

2.1 Theoretical position of research approach

A qualitative approach to investigate the phenomena that take place in health service development has been sought to depict the engagement process of stakeholders involved in deploying service design methods (Denzin and Lincoln, 2000; Sandelowski and Barroso, 2003; Tong et.al, 2007; Bondas, Turunen and Vaismoradi, 2013, pp.398). Within this approach are distinct qualitative methods chosen in the research, considering the appropriate ontological and epistemological perspectives that coherently reflect the known experience of those participating in the research (Giorgi, 1970; Holloway and Todres, 2005). These methods must also interpret those observations in a way that is relevant to addressing the research inquiry (Carpenter and Speziale, 2007), and contextualise the data in a way that is consistent with its theoretical viewpoint (Braun and Clarke, 2006, pp.97). In this section, the rationale for the data collection and subsequent thematic analysis process is outlined, with the primary objective of explicitly justifying key decisions made about the theoretical framework and research methods that address the stated aims and objectives (Braun and Clarke, 2006, pp.80). The overall assertions expressed in this section establish how the research process identifies meanings and patterns that tell about the applicability and efficacy of service design approaches. To conclude, this section also asserts how meaningful insights link effectively to the knowledge contributions in deploying the overall research methodology.

To begin, a summary table that articulates the rational basis for the qualitative approach is shown in Figure 2.1. This table expresses explicitly what the overall approach is trying to explore in relation to the research inquiry; how the philosophical position of the approach appropriately interprets the data findings; and how the analysis process links the data with the analytical interest based on the research question.

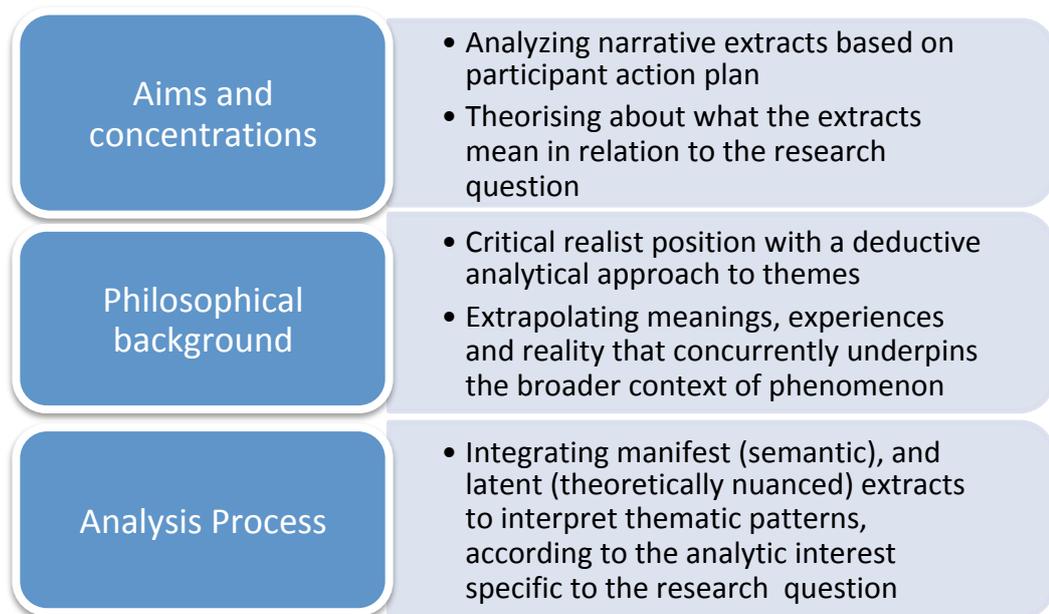


Figure 2.1 – Summary table outlining the qualitative approach to the research

It is clear according to Bondas, Turunen and Vaismoradi (2013), that a qualitative approach to the collection of data and of its subsequent analysis facilitates a thorough understanding over the perspectives and contexts present within the research participants and their environment. A commitment to produce findings that postulates individual viewpoints in relation to the original inquiry through detailed participant narrative characterises the data findings within a qualitative analytical framework (Carpenter and Speziale, 2007). It is apparent that to generate new insights to the research question, a comprehensive assessment about the capabilities of service design processes needs to be sought, whilst also sensitizing their performance in relation to the context of their deployment (Bondas, Turunen and Vaismoradi, 2013, pp.401).

The research methodology therefore requires an epistemological and ontological framework whereby the data can be interpreted coherently to address the relevant research questions set out in the study (Krippendorff, 2004).

According to Downe – Wamboldt (1992) the methodology should also consider the broader understanding of the context that influence the research participants. This encompasses the researcher and its participant’s knowledge of service design methods (Dearden, Grindell and Wolstenholme, 2017), and the policies and innovation principles that are disseminated and adopted by the participants in their formal practice (National Institute for Social Care and Health Research, 2013).

The literature review thus plays an important role in establishing the qualitative analytical view of the research, and thereafter assists with the analysis to theorise why research participants engage with the service design models in the manner reflected by their action plan responses (Thorne, 2000, pp.68). Definitions about healthcare and of its delivery from the literature informs the theoretical framework for understanding health’s complexity and delineate the approaches that are used to manage health within the delivery structures of a health service (Ferlie and Shortell, 2001). While the literature review examines the broad landscape of health service practices and their models of delivery in a global context, the practices of developing health services specific to Wales especially inform the analysis process. This is relevant in the selection of research participants where individuals are affiliated with principles and best practices informed by the NHS Wales, and other relevant knowledge pathways that potentially influence the participant responses (Jackson-Bowers, Kalucy, McIntyre, and Reed, 2017). Participants from industrial sponsor Med-Co Europe, contribute their presuppositions regarding effective healthcare delivery, and express their underlying assertions about approaches to health innovation from a third sector perspective.

2.2 Philosophical underpinning of the research approach

As it is evident that multi-disciplinary and varying perspectives play an active role when engaging stakeholders to co-produce health services (NHS Wales, Welsh Government, 2018, pp.20), the epistemological position in the research must take into account the multiple contextual layers that construct an understanding into the differing creative inputs from stakeholders. To sufficiently make sense of the design process phenomena, and what underlying assumptions drive the adoption of service design methods, the research ontological and epistemological position reflects the contextualist stance as expressed by Pettigrew (1985), and Johaneck (2000). Sitting between the positive realist and constructive interpretivist theoretical positions, the contextualist paradigm recognizes the presence of manifest realities that exist beyond human perception and knowledge in its realist ontology, and simultaneously posits that human understanding is constructed from individual and social perspectives, culminating in an interpretivist epistemological stance (Mitchell, 2013; Walsh and Evans, 2013).

The Contextualist paradigm has close semblance with the philosophical approach expressed in critical realism, that asserts fundamental distinctions between the realms of empirical reality, and interpreted reality (Bhaskar and Danermark, 2006). The core tenet of critical reality is the separation of a singular unobservable reality from the knowledge and understanding that is generated about it. An analogy to illustrate this according to Fleetwood (2014, pp.24) is expressed whereby “entities existing on one level are rooted in but irreducible to, entities existing on another level”. Knowledge in this instance seeks to identify and explain causal mechanisms that link potential patterns or relational associations together.

To place this into the context of the research field of study, it can be expressed that “the tendencies for relevant stakeholders to engage with and apply design methods are rooted in, but irreducible to, the tendencies of the materially, ideally, and / or socially real entities that constitute accepted design practice; including the (human) agents that reproduce and transform these entities” (Fleetwood, 2014, pp.24). The philosophical basis of critical reality posits that knowledge of an epistemological nature is subordinate to the overarching dimension of the unobservable reality (Bhaskar, 1975; Scott, 2013; Hartwig, 2015). It is asserted that the empirical observable world contains the mechanisms that causally affect the transitive dimensions of knowledge, seeking to make sense of the observed reality. (Barrett, Scott, and Zachariadis, 2010). The epistemological claims regarding generated knowledge then, is subject to iterative review due to its emergent and ever transforming nature, being subject to constructive development in a continual evolving state (Fleetwood, 2014). This view arguably supports the supposition that the application of design methods and the scope of its capability and potential are in a continuum of and ever changing, and ever-growing knowledge base (Owen, 1998).

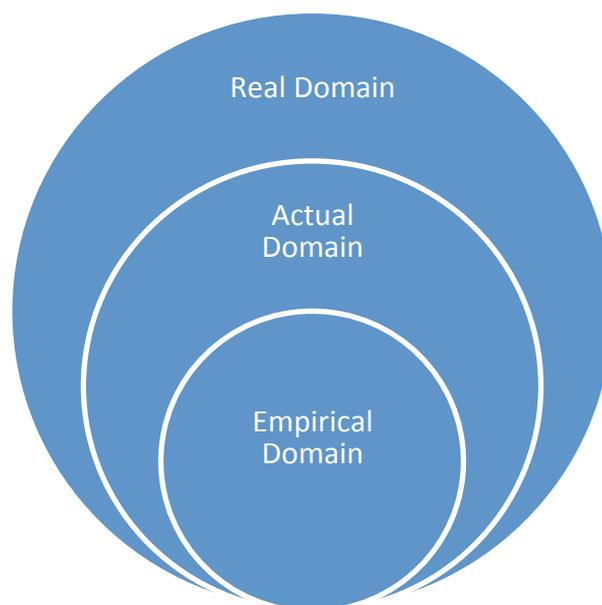


Figure 2.2 Stratified Ontology based from Bhaskar (1978)

2.2a Stratified Ontology

According to Bhaskar (1978), ontology in the critical realist framework is stratified. Ontology of the research field is not constrained to the empirical and actual dimensions of reality commonly adopted by empirical realists (Fleetwood, 2014), but considers the causally affected mechanisms and structures as an influential domain. Figure 2.2 illustrates the relationships between the three identified areas of knowledge owing to Bhaskar's (1978) stratified ontology. The mechanisms and structures replicated and informed by social agents from the 'real' domain generate the events within the 'actual' domain.

The mechanisms that influence and drive the manifest events in the 'actual' domain may or may not be observable, where events that are concretely observed and experienced by their agents come under the empirical domain (Raduescu and Vessey, 2009). When the ontological position is translated to the operation of healthcare services it is clear that the structures and the resources put in place, whether its tendency (tendency meaning its power) can be observed or not, critically affect the outcomes desired from the service as experienced by their end users (Commissioning Support Programme, 2010). Beyond the mechanisms put in place in the 'actual' domain of operating the service, lie the concepts and principles in the 'real' domain that have been used to construct, design, and regulate the criteria that determine in part how a service delivers on desired health outcomes for patients.

A redefined table illustrating the various entities within the stratified ontological domains as prescribed from Bhaskar's (1978) model is shown in Figure 2.3. Though not exhaustive in description, the entities are nevertheless representative of the critical realist's approach to understanding how those entities relate to each other in the context of healthcare delivery, and the generated proponents that determine the causality of outcomes in the observed empirical dimension.

A key facet to the critical realist ontology that has significance in health research is the distinctive relationship dynamic between structure and agent prominently proposed through transformation theory of agents conceptualised in Bhaskar's transformational model (Mingers, 2004), and Archer's (2013) Morphogenetic (transform) / Morphostatic (reproduce) approach. These approaches seek to make sense of how social structures and individual agency influence observed functions or behaviours (Walsh and Evans, 2013, pp.4), and explain how pre-existing structures and mechanisms are reproduced and transformed rather than created by individual agents (Fleetwood, 2014, pp.206). Figure 2.4 shows the cyclical interaction between agents and the ever-present structures that undergo iterative reproduction and transformation. The implications from these approaches to the ontology of the research is that structures (or the generative mechanisms identified) represent pre-existing conditions that social agents reproduce, or transform in continually manifest outcomes; and that the agents' interaction with structures, whether purposefully or subconsciously (Fleetwood, 2014), shape the very structures that consequently enable and constrain social action.

Both structure and agent are therefore argued to be distinct (Fleetwood, 2014, pp.207) and yet inter-relational as explained through the dialectical perspective (Roberts, 2014), that "the wholes (social structures) find their reproduced and transformed identity through the parts (agency), and that parts come into being through wholes" (Roberts, 2014, pp.25). This position regarding the relationship between structure and agent present ramifications towards the research methodology's permissiveness to analyse how structurally related tendencies influence agency, and conversely the agential tendencies that influence pre-existing structures. According to Fleetwood (2014), ontological concerns exist for positivist idealists who subordinate structure to agency and for structural functionalists who replace human agency with inanimate discourse.

The former approach leans towards voluntarism and that would not be able to recognise the causal tendencies expressed by non-agential sources and thus ignoring the existence of social structures.

Conversely, structural determinism of the latter eliminates distinctions between human and non-human agency such as that found in assistive technologies (Fleetwood, 2014, pp.207). This removes the possibility that human qualities such as self-expression, creative ingenuity and self-determination can uniquely inform relevant structures in ways that non-agential discourses cannot (Walsh and Evans, 2013). It is convincing from the literature on health research that the design of services pertains to value – driven tendencies (Bertoni, Eres and Scanlan, 2014; Kawamoto, Martin, and Williams, 2014). Recognition of the impact (human) agency has in transforming structure is therefore integral in the research to understanding the health service design process and the multi-perspectives that stakeholders contribute. The critical realist paradigm therefore compliments the need for research to investigate how value is shaped and enacted into the design process, and how agential values subsequently influence the generative mechanisms that are conducive to effective service development. The ontological position of critical realism regarding the influence of agency is also underpinned by its axiological positioning. Research findings extrapolated from this paradigm ought to enhance health outcomes and the potential to finding determinants that are conducive to the design of such outcomes (Maxwell, 2012; Mark and Snowden, 2006).

The analytical framework of the research as defined in its ontological underpinning is thus focused on the generated causal mechanisms, and their effect on the manifest development of health services. Such mechanisms that are found in the structure of design models are analysed with specific interest regarding their contextual relevance and efficacy in developing innovative health services.

Stratified Ontology into the taxonomy of Health Service delivery	
Domain	Entities
Empirical	<ul style="list-style-type: none"> • Medical, administrative and prescriptive interventions • Physical spaces such as hospitals, personal residence and any geographical location • Artefacts such as medicines, medical equipment, patient records and diagnostic • Manifestation of diagnosed health conditions and their effected state from interventions
Actual	<ul style="list-style-type: none"> • Consultative interactions between service provider and end user • Manifestation of time lapse required to undertake health interventions • Educating end users on effective management of their health • Effective management of known artefacts and physical space to achieve effective delivery of service • Qualification and development of healthcare professional practice • Deployment of new or existing health interventions
Real	<ul style="list-style-type: none"> • Evolving clinical theory • Instigating Clinical trials and research • Enactment of policies on the delivery and development of healthcare • Adoption of delivery and management processes from multi-disciplinary fields • Decision making from front line, commissioning, and governmental levels.

Figure 2.3 - Stratified Ontology over the taxonomy of Health Service delivery

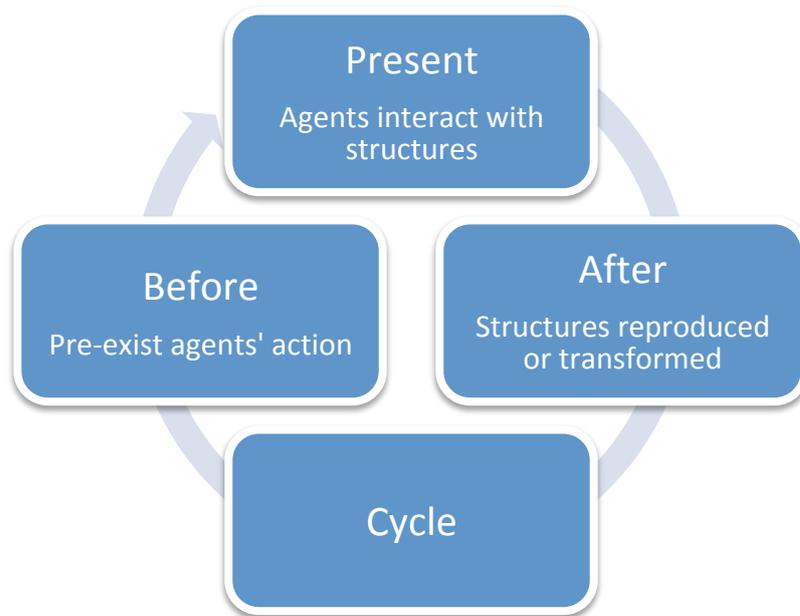


Figure 2.4 – Cycle of the Morphogenetic and Morphostatic approach adapted from Archer (2013)

2.2b Epistemology

The stance of the research epistemology influences what can be said about the research data, and how meaning is thus delineated from the data linking to the research question (Braun and Clarke, 2006). As recognised in the stratified dimensions of reality from Figure 2.2, the presence of the ‘real’ domain (wherein causal structures and mechanisms govern manifest events) reorients the focus of the analytic view to the causal explanations that enable empirical manifestations. Rather than investigating potential consequences that result in what occurs within the empirical and ‘actual’ domain; assuming that events occur strictly from laws and event regularities (Fleetwood, 2014, pp.207), the emphasis of analysis is on the interpretation and explanation of how causal mechanisms influence events the way they do. In the context of health, how a phenomenon is interpreted is subject to the individuals who experience them, that result in differing interpretations or relations to the same event, such as childbirth pain (McCrea et al., 1998).

Elaborating this same principle on the commissioning of design related activities to develop health services, this could be interpreted as the facilitating tools or cognitive processes involved to affect the design outcomes, or to establish criteria that takes into account the interpretative explanations about the existing issues and shortcomings.

Knowledge generated from individual perspectives is therefore a construct of what individuals find from investigating a phenomenon (Madill, Jordan and Shirley, 2000). As one unpacks the casual explanations asserted by a knowledge claim, it presents a window into the underlying assertions, interpretations and intentions of the individual observer (Easton, 2010). Constructed knowledge is claimed to be relativist in its epistemic perspective due to its changeable and incomplete nature, as new research has the potential to challenge or reshape knowledge (Walsh and Evans, 2013). Though as Fleetwood (2014) asserts, does not make the paradigm agree towards a judgemental relativism. Rather, the premise of epistemic relativism and its wider constructionist epistemological profile can still complement realist ontology by the position that reality as a singular entity contains several discourses acting as interpretations of the one entity (Fleetwood, 2014, pp.208).

A qualified comparative causal explanation regarding the implementation of different design models from the research participants can therefore provide a powerful explanatory account regarding their applicability and efficacy. The subsequent conclusions from the research findings will help researchers and service developers to ascertain the particular strengths and weaknesses that each design model exhibits, and to consider critically the underlying mechanisms (whether effected by agential, or non-agential tendencies) that underpin those explanations.

2.2c Research method

This sub-section sets out the methods utilised to answer the questions set out in the research. The chapter has thus far explicitly expressed the ontological and epistemological underpinning required to frame the analysis process as expressed from Figure 2.1. It is important that the methods selected can capture within the data, meaningful insights that allude to the performance of the design models. In addition, the assertions of the data findings facilitated in the methods are made within the established theoretical position to ensure that the interpretation of data is apposite to a congruent explanation about the practical uses of each design model (Walsh and Evans, 2013; Braun and Clarke, 2006).

To capture the appropriate qualitative data required, the research incorporates an ethnographic method of data collection. The core basis of an ethnographic method is it enables the researcher to observe and understand the contextual mechanisms that are active within the service design process (Lewis, Mateas, Palmiter, and Lynch, 1996). Consequently, questions relating to tendencies linked to both applicability and efficacy can be proposed to participants during the deployment of the design models. In this way, the data response regarding the design models can be interpreted considering the prevailing mechanisms that are active, and thus explain the mechanisms that influence participant responses regarding the design process.

Within the ethnographic study, the introduction of a design brief sets out the service criteria to draw out participant responses about the design process that would positively address the criteria. It is possible then, to draw out within those responses what impact the design model has to guide the outcomes of the design brief where relevant (Reeves, Cooper and Hodges, 2008). The elements that point towards causal mechanisms and tendencies towards an effective design process can thus be extrapolated to identify from the data, explanations about the conduciveness of design models towards addressing an established design criterion.

Alongside the design brief, an evaluation method is incorporated in the form of a Likert Scale analysis that requires participants to rank how applicable and effective a design model addressed the design brief considering the design factors. The responses from this evaluation contribute towards a quantitative analysis into the statistical significance of a model's performance in relation to the evaluation measures based from the factors analysis. The purpose of this evaluation is to strengthen triangulation with the analysis of qualitative findings, and thus propose an effective contribution of an analytical framework that considers the broad selection of analysis methods necessary to theorise on the research observations in relation to the research question (Fleetwood, 2014; Jacob, 1982). The statistical analysis facilitates the constructive discussion about both the established and conceptual design models and their performance elaborated by the deployment of the factors analysis. It forms part of the generated recommendations for how stakeholder engagement with design methods can be further informed through the wider narrative explanations about their influence on participant engagement.

The research subsequently utilises a thematic analysis to primarily identify from the qualitative data, themes that theorise important meanings in relation to the research question. According to Braun and Clarke (2006, pp.82), the theme represents "a level of patterned response or meaning within the data set", of which contribute to the expression of causal explanations that link to participant engagement with the design model. Thematic analysis is a method that does not stipulate on a certain theoretical framework, providing flexibility regarding the choice of framework being used to interpret themes. This is in contrast with methods such as grounded theory that is bound to a commitment towards theory generation interpreted from the data (Charmaz, 2002). In another instance, Interpretative Phenomenological Analysis is committed to a phenomenological epistemology asserting that experience and of its analysis is primacy to the truth claims about the phenomena (Smith and Osborn, 2003; Holloway and Todres, 2003).

Both instances of qualitative methods also aim towards the analytical perspective of patterns across a data set, though they fundamentally differ from the philosophical position expressed in the research methodology. This results in critical ramifications to the analysis process in terms of what validates the explanations generated about the data, and how that posits within the theoretical frame that defines what is truthful about them. Within the contextualist paradigm, thematic analysis has been asserted to be effective in reflecting the reality being investigated, and unravelling underlying influences so emphasized from the 'real' domain within critical realist ontology (Braun and Clarke, 2006, pp.81; Fleetwood, 2014).

The philosophical position of the contextualist paradigm within the method of thematic analysis influences what constitutes as a theme, and the implications for coding towards a theme. It is important to consider that the themes that are generated must first capture an important insight in relation to the research question, and in this context the themes should concern about elements in the design process that can be enhanced, or further facilitated by the deployment of the design models. To establish within the data whether a legitimate theme can be judged as meaningful, Braun and Clarke (2006) suggests a way to justify a theme through its prevalence across a data set and within the data items themselves.

Prevalence is defined by the research ontology and therefore coding of a theme is not dependent on event frequencies (Fleetwood, 2014), but rather it is a measure of uncovering the causal mechanisms and tendencies that capture an important relation to the original hypothesis. More than one theme can be captured within a data item and therefore the initial coding process is undertaken comprehensively across the entire data set to identify the exact number of themes required to analyse all possible casual mechanisms, in order to achieve appropriate theoretical saturation.

The rationale for coding the data and how the themes are to be presented in relation to the research hypothesis is connected to the mode of inference within the method. As reflected from Frith and Gleeson (2004), and Boyatzis (1998), themes or patterns in data can be identified directly from the data in an inductive approach to the analysis, or are derived based on the analytic and theoretical interest of the research as with a deductive approach.

The research devises a theoretical deductive approach, as this type of analysis focuses on the thread of causality connections between the themes and the corresponding codes generated from the data items. This means that the interpretation of the data and its themes are analysed considering the pre-existing theoretical framework and research hypothesis. In contrast, an inductive approach to thematic analysis crucially does not contextualise the codes to inform towards the researcher's analytical framework, meaning the themes may have no semblance to the questions being asked of participants about the performance of the design models (Braun and Clarke, 2006, pp.83).

Another issue inherent in the way themes are generated within an inductive approach is the lack of reference to historical sources that have identified themes sharing a similar discourse, due to a coding process that looks exclusively within the data set (Braun and Clarke, 2006, pp.84). As reiterated in Figure 2.4, structures and their manifestations are outcomes generated by the continual transformational and reproductive interactions from agents. Based on this assertion, the structure to the service design process is evolving continually both in its historical manifestations, and how stakeholders enact the design process in the present (Fleetwood, 2014). It is therefore important that the approach of the thematic analysis allows consideration for the permissiveness of themes, with regard to the prevailing discourses influencing the performance of design models recorded from previous studies where appropriate. This approach characterizes the involvement of the factors analysis tool that combines statistical significance about permissive design factors, into the overall conclusions to the research about prominent themes.

It can be argued then, that the theoretical deductive approach to the analysis process of themes compliments with the philosophical position established from the previous sub-sections. Most explicitly, it is an approach that enables effective causal explanations and their underlying mechanisms to be investigated for conclusions about the themes to align with the research hypothesis.

Finally, the themes generated in the research can be expressed in varying levels in terms of how the theme derives from the data and subsequently explain patterns and their underlying meanings. Themes can be generated from the explicit or surface meaning of the data item, giving semantic significance to the theme. On the other hand, themes can be analysed on a latent interpretative level where it is focused on identifying theoretical, and causal mechanisms that inform or shape the semantic level in data (Braun and Clarke, 2006).

In this sense, the themes themselves are developed with interpretation of both latent theorized meanings as well as considering the explicit meanings derived from the written excerpts. What is important in the context of the research methodology is that the generation of themes on a latent level is more congruent to examining the relations between the unseen causal tendencies and the semantic elements found in the data. This however does not negate the need to interpret and examine the manifest data on an explicit level, for they too contribute to the understanding of causal mechanisms in play within the design process.

It can be asserted, that the specific thematic analysis method used to underpin the contribution of the evaluation framework is that of a theoretical latent thematic analysis. This configuration of method utilises a constructionist epistemological approach as stated from the philosophical position in the overall research approach.

It aims to theorize the socio-cultural contexts and structural conditions in which the prevalence of the theme operates. Using this configured method, the research makes sense of the causality of themes uncovered from the data extracts that according to Mark and Snowden (2006), could lead to successful identification of interventions that prove to be innovative towards better health outcomes.

A summary diagram that explicates on the components making up the methods working towards the analysis is shown in Figure 2.5. The outcome to uncovering the causal mechanisms behind effective use of the design process frames what the research expresses about both the qualitative, and statistical data generated from the methodology. An analysis into the permissiveness of the themes allows the conclusions to carry the thread of both existing literature and research findings to underpin the claims about the discourses that influence the conception of an effective design process.

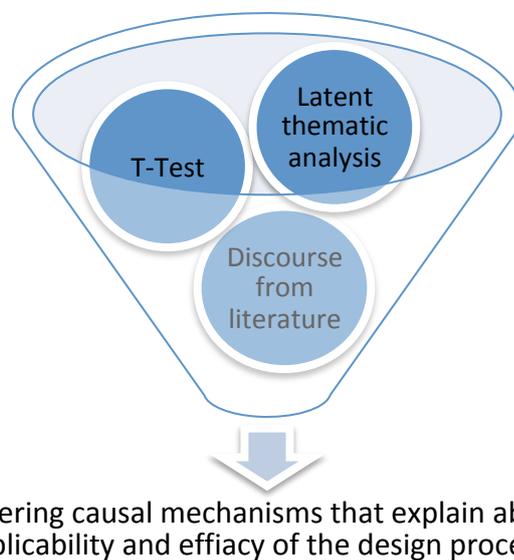


Figure 2.5 – Method composition that contribute towards the analysis process

3 Literature Review

3.1 Introduction

The beginning of this research commences with the literature review to reveal a critical understanding of what the design of services entail, and what are its out workings as contextualised to the service needs within the field of healthcare. The purpose of the literature survey is to enable an understanding of how a service is developed, and how a successful service is defined. The meaning of this success is defined through using the appropriate tools to design and conceptualise a service delivery for fulfilling human needs and desires (Knemeyer, 2006). The review of literature also reveals the trajectory of the developing knowledge base in this field, which enables an understanding of how healthcare services are being developed within the time bound context of conducting this research. It also serves to review how specifically the healthcare sector is bringing their own innovations into being, using a combination of existing service design methods and theoretical frameworks as well as generating those that are relevant within their specific requirements.

The process of undergoing this literature review brings about an awareness of specific design methodologies inherently being used across the commercial, and healthcare fields. This leads to the focused research investigation onto design guidance frameworks as a methodology to be the testing ground for original emergent knowledge, with an aim to identify their applicability and efficacy in helping service design teams to innovate their services.

3.2 Reviewing the discipline of Service Design

At the core of the discipline, the design of services is primarily concerned about seeking human needs, their motivations and subsequent behaviours that strive to fulfil them, and to resolve the challenges of providing the appropriate structure to satisfy the dynamics described above. Methodologies developed and defined normatively as a service design tool has been compiled as an informative toolkit in ‘This is Service Design Thinking’ (Stickdorn, and Schneider, 2010). This literature provides quality insight into design case studies demonstrating their own design tool implementations from various organizations and enterprises, in addition to the conceptual thinking and processes that help service users and providers to arrive at solutions and scenarios that make a service deliver their targets.

Knowledge regarding service mechanisms such as operational management and their conceptual underpinnings is discussed from a paper on applying Service Concept to Service Design research (Goldstein et al., 2002). The contributors outline strategic objectives and an understanding of a customer’s perceptions of a service encounter and experience as integral to planning and defining the specific service provisions from both the organization’s and the customer’s perspective. The paper also demonstrates how the defining of a service concept provides a platform for informing the design of the delivery system, the service experience, and decision making when it comes to aligning those components to the objectives and service identity outlined by the primary concept (Goldstein et al., 2002, p.123). This is outlined in the taxonomy of a service design-planning model in figure 2.1.

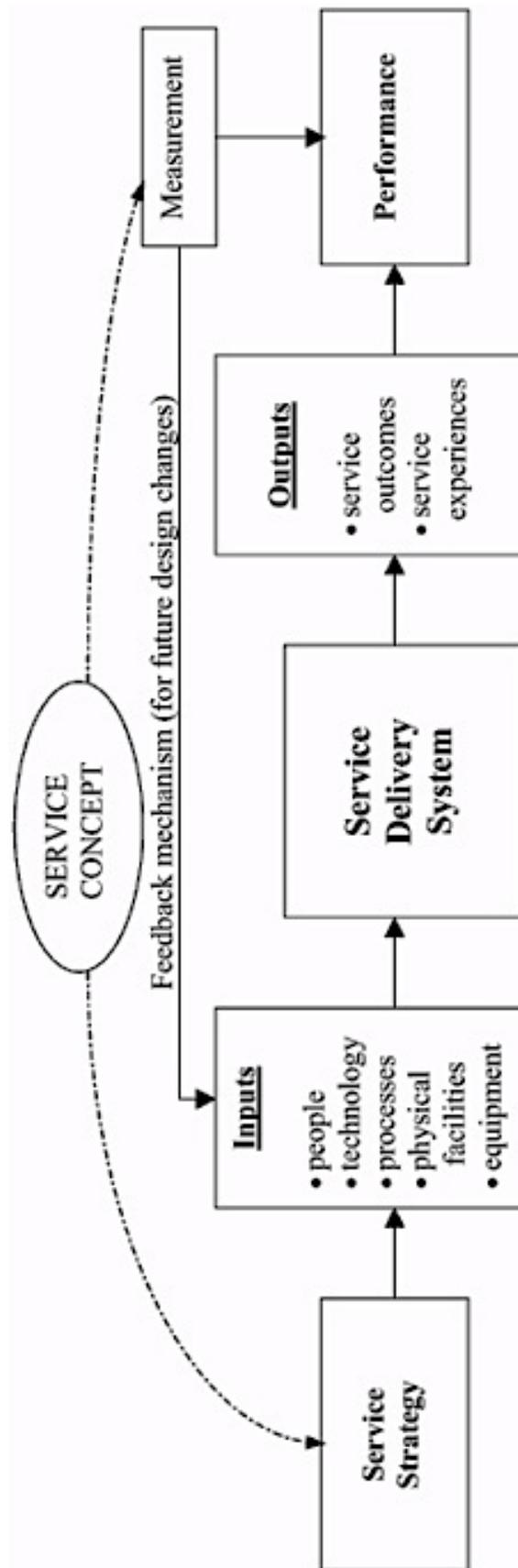


Figure 3.1 - Service Design taxonomy model, adapted from (Goldstein et al., 2002, p.126)

The field of Service Design greatly influences the experiential elements of encountering a service in the sense of its time, its interventions and the decisions that are made to construct a particular outcome for both the customer and the provider. Thus, this discipline uncovers a whole science behind cognitive behavioural and psychological processes that can crucially inform how services are designed to elicit certain behavioural responses and decisions that is interpreted as a ‘desired’ outcome. An extensive research on the application of behavioural science to Service Design has been produced with a series of frameworks devised to create understanding of a customer’s emotional experiences and perceptual expectations based on a service encounter triad model illustrated in the next page (Cook et al., 2002).

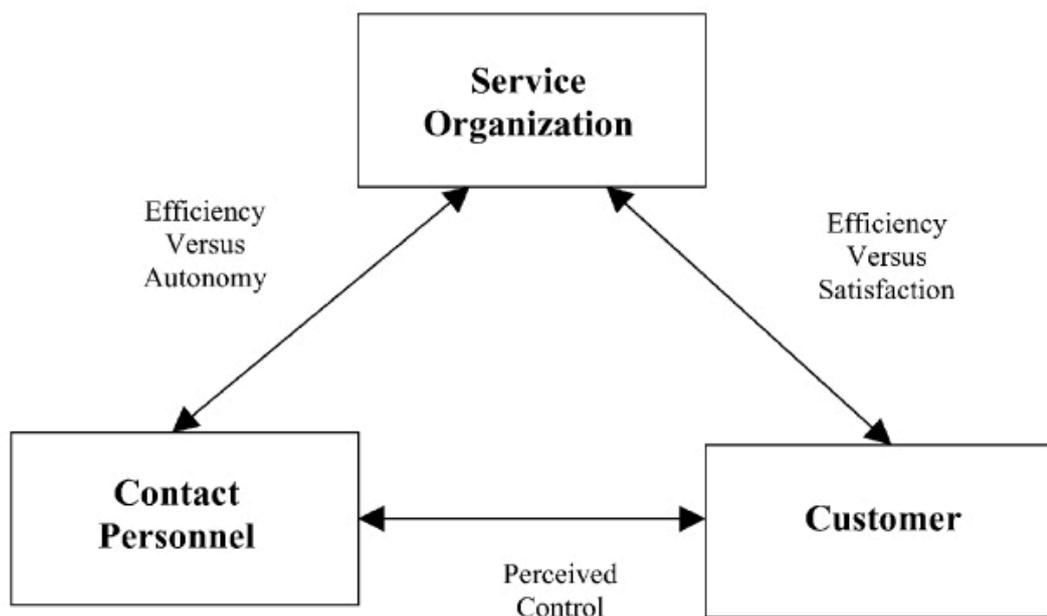


Figure 3.2 - Service encounter triad model, adapted from (Cook et al., 2002, p.160)

The above framework deals with the sequential aspects of a service such as a customer’s perception of their service experience in terms of time flow, what occurs along the sequence of a service, and summative judgements a person makes having encountered the service. The work also touches on the principles of core needs, defined by Schneider and Bowen (1999) as three facets of security, fairness, and esteem (Cook et al., 2002, p.163) that are deeply

embedded in what customers expect first and foremost from the treatment of services. A methodology for resolving and defining the link between the service organization and contact personnel include the role of the 'mystery shopper' (Cook et al., 2002, p.170), that in essence is a shadowing service assessment measurer who helps assist providers in understanding their intended roles and to present a customer's view point of the underlying service being trialled.

A method to analyse how a service deals with the relationship between the organization and the customer is a process known as customer scripting. This methodology predefines expectations of a customer and is mapped out to help the organization align their service design blueprint with the most desired paradigm. This will ensure the customer will experience as much as they expect to encounter from a service (Cook et al., 2002, p.166).

From this research, Schneider et al. (1996) have also advocated the need for the employees (the contact personnel in reference to the above model) to be empowered in imparting their values and beliefs into the service culture and philosophy for their provision of service quality citing their contribution of productivity and motivation as sources of resultant customer satisfaction (Cook et al., 2002, p.167). The authors have cited a service profit chain produced by Heskett et al. (1994) to visualise the importance of their role in driving the cultural (values and beliefs) and climatic (policies, practices and procedures) dimensions of an organization towards better services. This has been illustrated as a business flow model in the next page that emphasizes how service quality in the context of the internal workplace among an organisation's employed staff has a consequential effect in creating the external service value of delivering what the service user expects and desires.

The aim of this model (referring to Figure 2.3) is to explain how service quality is not exclusively defined merely for its external deliverables and that the satisfaction of the customer is not independent from the satisfaction of the service workforce whom are responsible for delivering the service.

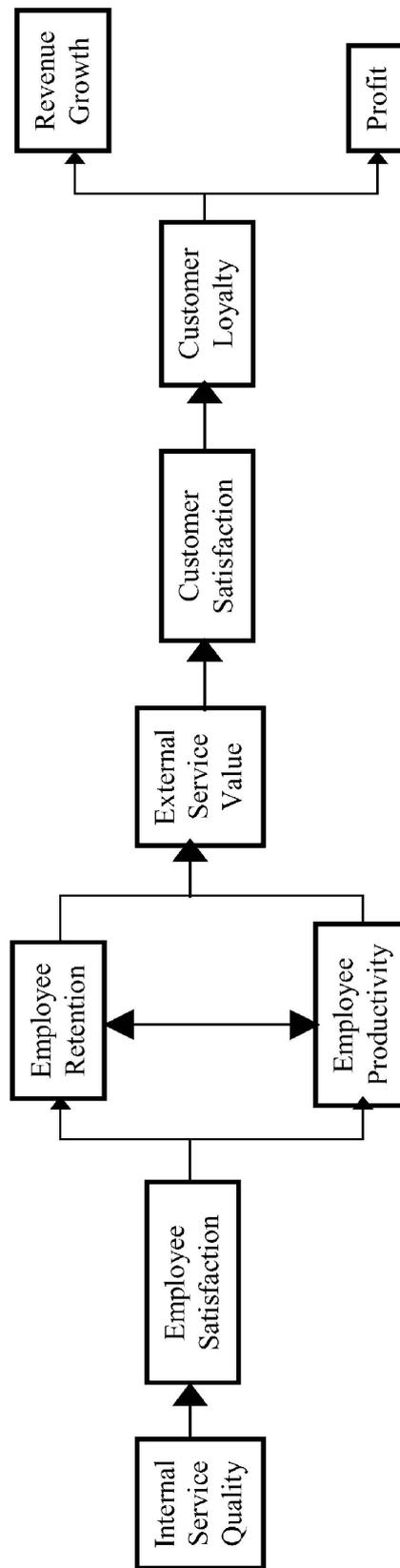


Figure 3.3 - Service profit chain, adapted from (Cook et al., 2002, p.168).

The gathering of data based on the construction of experiential mapping is non-prescriptive, because data synthesis later in the process is completely dependent on the decisions made by the multi-disciplinary group of stakeholders/users. It has been reflected however, that use of the EBD methodology requires giving participants more time to think about alternative ideas and solutions before moving to a stage of converging into final design decisions, in order to widen the scope of more radical ideas put forward (Bowen et al., 2010).

A key area of interest of understanding the connection between service design processes and healthcare research is the significance of narrative thinking and projection of individual responsibilities, motives and the dynamics of user/operator relationships within healthcare services. (Lindsay, 2008) has suggested that it allows service users and developers to construct service experiences by drawing from individual experiences and communicating honest accounts of positive, and negative tensions between the persons who they genuinely are and the 'artificial' persons constructed out of their obliged responsibilities and roles as defined by their operating systems.

In a selection of material concerning ethnographic poetic representation, Rapport and Harthill (2008) refers to poetic means of accounting for the health and wellbeing of a known individual who had gone through the hardships of the Holocaust. The authors presented the emotive nuances and circumstantial expressions found in poetic expression to represent qualitative data concerning how their health condition was subject to their living environment.

In the Service Design field there is currently large emphasis on the recording and immersion into the experiential aspects of services, with examples such as service line mapping, profiling of service use, and service blueprinting for ease in articulating the new service systems and concepts (Stickdorn, and Schneider, 2010).

The justification for these methods is to centralise experiential development as the foundations for creating services that create resolve and satisfaction.

3.3 Reviewing the role of Service Design in Health and well being

In addition to methodologies that are synonymous with delivering commercial service development and design, healthcare specific models and approaches to creating the appropriate care pathway for healthcare services are discussed in this section. Examples of clinical models for delivering medical service pathways are outlined in this section, as well as tools and methodologies that are used to inform best medical practice and how health innovations are generated closely with rigorous scientific studies.

The role of service design in developing healthcare services is understood largely as a multidisciplinary practice that seeks to incorporate skill sets and resources from various fields and integrating them in a way that fulfils complex multi-layered requirements. These requirements can range from medicine and treatment delivery, handling and recording of patient records, managing care facilities such as specialist departments and hospital beds, to managing budgetary constraints. Every layer of these multi-faceted components that make up a healthcare service require different skill sets and expertise, yet as systemic concept a service in this field requires personnel of very different disciplines to work together to co-ordinate a service. As a healthcare delivery structure is rarely just transactional by nature, it is important to recognise that the interplay and engagement of multidisciplinary *relationships* play a key role in facilitating service development. This is because the deliverable of healthcare doesn't stop with the obtainment of a product or an experience, but that healthcare influences an on-going effect on people's health outcomes, for better or worse.

Influences on human factors encompass the physiological and psychological needs of a person. Service outcomes delivered in one surgery for example can vary in terms of patient expectations and are targeted to achieving specific health outcomes as required. Consequently, healthcare services have been developed to treat conditions of varying degrees of specificity and that medical professionals are trained accordingly to be able to care for and treat a wide range of health ailments. Until recently, there has been a shifting paradigm of healthcare delivery that focuses on integrated services designed around complex patient needs, and that are not limited to delivering outcomes only concerning the physical. Walsh (2014) had raised her views in a report on collaborative leadership in healthcare, that care services become fragmented as a result of institutional barriers embedded in the system. Clinical leaders can be protective of the speciality approach and thus being resistant to seeing holistic wellbeing as the goal for integrated healthcare delivery (Walsh, 2014).

An iteration of the Chronic Care Model (CCM) has been implemented and evaluated for its effectiveness in improving self-management of patients with long-term chronic illnesses (Bodenheimer, Wagner, and Grumbach, 2002). Their application of randomized trails and controlled before-and-after study design provides a strong scientific evaluation of the model's effectiveness in managing illness and consequent reduction of health care costs by analysing core elements of the care model's interventions. The impacts of these interventions are discussed in its impacts to hospital systems, ambulatory systems and to two other long-term illnesses including congestive heart failure, and asthma.

A primary care team based in Cambourne; Cambridgeshire developed the 'Spotlight Approach' to implement an evidence-based methodology for creating best clinical practice in the Primary Care Group Trust of South Cambridgeshire. The method emphasizes commonality of structure and language for effective co-production of service development, and firm alignment with clinical governance as the basis for translating research findings into practice (Bateman et al., 2003).

The study documenting their spotlight developments demonstrated positivity in clarifying goals, rationalising design decisions, and ensuring that their process is grounded in documented evidence.

The use of Randomised Controlled Trials (RCTs) has been adopted as one of the most effective methods for assessing the effectiveness of new healthcare interventions. It is demonstrated through a theory and modelling process that faithfully builds upon evidence to produce alternative interventions that can then be analysed both qualitatively and quantitatively before being implemented with replicable results. Campbell et al. (2000) produced a framework that supports the design and evaluation of complex interventions that usually comprise of several components that may have variations proving difficult to crystallise for accurate reproduction. The producers advocate an iterative phased approach that integrates qualitative and quantitative research methods to develop new trials from observation of current models to generating and explaining new theory.

The NHS Institute for Innovation and Improvement has compiled a variety of tools for the benefit of healthcare professionals, commissioners and lead managers to design, or improve their services. Their tools include mechanisms for clinical engagement, for understanding patient journeys within the service, and improving service efficiency and quality. There are conventional process mapping methodologies and unconventional methodologies that involve using alternative approaches to recording data on service experience. For example, shadowing a patient and enter the service as a customer receiving the service to note how it is rehearsed in real-life simulation. Figure 2.4 as illustrated in the next page shows their encompassing approach to healthcare delivery with a series of working values and actions that seek to develop an initial vision (in this case new or improved health outcomes) to a deliverable strategy. This strategy continues to withhold the five working values surrounding present, and future healthcare delivery design.



Figure 3.4 - NHS Leadership Framework for Health care delivery plan (NHS Leadership Framework, 2014)

3.4 Overview of Health Organisations involved in Service Innovation within the UK

In the field of long-term (or primary) care within the UK, the processes established to initiate improvement, or reconfiguration of services comes via planning procedures through clinical engagement between Local Health Boards, Community Health Councils and Local Medical Committees based at a geographical area. Engagement practices are supplemented by data evidence produced regarding demographic profiles for each Health Board, health priority outcomes, and other determinants that impact on health, such as housing, education, employment, social welfare (Public Health Wales, 2013). Data on the above measures in addition to prescription guidelines are drawn from institutions such as Public Health Wales and the National Institute for Health and Care Excellence (NICE) to guide planning of healthcare service pathways.

The National Leadership and Innovation Agency for Healthcare has extensively reviewed current mechanisms for effective clinical engagement within the National Health Service and have recommended several factors that are considered significant for effective engagement in chronic conditions management. This included a thorough understanding of the current problems, knowing how the current pathway of care is being delivered, identifying root causes of shortfalls, finding out which innovative approaches should progress to pilot testing, and to prepare the necessary training and implementation measures for professionals to carry forward changes (NLIAH, 2008, pp.59).

Some of the identified factors are also relevant across other fields and disciplines regarding service development and the engagement mechanisms that are required to deliver effective changes. This includes a need for clarity of purpose, and a strong clinical leadership to encourage a positive outlook of change to their stakeholders and building clear communication mechanisms that ensure new approaches are piloted and analysed in a transparent setting (NLIAH, 2008, pp.36). The agency has also sought to identify what the barriers are to forming effective clinical engagement, including the perspectives on this issue with the Local Health Boards and the Local Medical Committee.

The LMCs have been quoted to express the fact that a number of GPs were willing to suggest positive improvements that would make an impact in primary care delivery, (NLIAH, 2008, pp.49) though some spheres of GPs might see this commitment as an extra burden to their everyday work. However, they have also expressed the concern that GPs find it difficult to engage with their Local Health Boards in regards to their significance and capacity for enabling service improvements, and a perceived ill-trust from the Health Boards has been seen as a hindrance to effectively collaborate with GPs in developing service improvements (NLIAH, 2008, pp.49).

This suggests that more work is needed in identifying the root causes of where misunderstandings arise and that result in the breakdown and fragmentation of communication between the different managerial and clinical bodies that simultaneously operate within the care system.

These concerns in retrospective form important design factors regarding how the Local Health Boards for example evaluate and package strategic engagement mechanisms that are exclusively appropriate, and relevant to the organising, planning, and delivery of their services (NLIAH, 2008, pp.50).

3.5 Overview of National and Regional Policies that influence Healthcare Services and their development

The Welsh Assembly Government, along with NHS Wales and the National Leadership and Innovative Agency for Healthcare are at the forefront of setting out the national strategy frameworks and target setting for the development of Health and Social Care services within Wales. These organizations produce national-lead frameworks based on evidence-based data generated by doctors and health practitioners to respond to current healthcare challenges identified via national strategy documents.

The Welsh Assembly Government and the NHS of Wales produce these documents, whilst the proposed action plans may be conducted and facilitated by National led Agencies like NLIAH and NISCHR on behalf of these organizations for the benefit of local hospitals and community services. Examples of this include the NLIAH's direct support to local health services in regard to developing from the Government's Chronic Conditions Management framework, which encompasses pathway development, education and personal development of the medical staff, and facilitating workshops for staff consultations (National Leadership and Innovation Agency for Healthcare, 2009).

The major strategic frameworks set by the Welsh Assembly Government for long-term conditions include the first introduction of the Chronic Conditions Management framework in *Designed to Improve Health and the Management of Chronic Conditions in Wales* (Welsh Assembly Government, 2007), which was followed up with a Service Improvement Plan between 2008 and 2011. Another major strategic policy published by the Welsh Assembly Government in 2008 focuses on service development, self-management and commissioning guidance for addressing chronic health conditions.

The NHS of Wales have published further elaboration of their working practices and frameworks that help NHS staff deliver outcomes in line with their core values, in addition to change directives outlined in their paper “*Working differently – Working together: A Workforce and Organisational Management Framework*”, (2012). This paper compiled four core objectives on workforce development and the striving for a sustainable delivery plan for NHS services fit for the needs of the 21st century (NHS Wales, 2012, pp.6), as a response to the identified areas requiring major change from the principal strategies explained in the paper *Together for Health – A Five Year Vision for the NHS in Wales* (NHS Wales, 2012).

This document produced by NHS Wales starting from 2011 was devised as the current strategy for improving public health and the present services up to the year 2016, which has stated the need for the Government and NHS Boards to work together to produce a care system that increases accessibility, patient safety and experience, and better health outcomes (NHS Wales, 2012, pp.3).

At regional level, objectives for work streams specifically for the management of long-term conditions have been established through the *Changing for the better* initiative in localities such as Swansea, Port Talbot and Bridgend (Abertawe Bro Morgannwg, 2012). The focus of this initiative is on delivering care closer to the community and to strengthen support networks enabling patients to self-manage their condition effectively (Abertawe Bro Morgannwg,

2012, pp.41-42). Abertawe Bro Morgannwg is one of seven local health boards managing healthcare delivery from major hospitals, to local community services and General Practice, and covering the regions of Swansea, Neath Port Talbot, and Bridgend.

3.6 Review of collaboration between public and private sectors in Healthcare development

There is established evidence in the Welsh Assembly Government's statistical findings during the past decade that indicates the local health and social care system needs a structural transformation (1000 Lives Plus, 2011, pp.5). It is evident that a new response is needed to address the increasing and complex health needs, of an ageing population (Welsh Government – NHS Wales, 2015, pp.4). The demand of expectation placed on the current health care system has been compounded by Government pressure on Health Boards to cut spending and deliver efficiency savings on budgets (Chapman, 2013). In light of rising service demands and a concurrent challenge to meet them with sufficient clinical expertise (Drakeford, Welsh Government, 2015, pp.1), there is a need for health care providers to think of innovative ways to deliver and sustain high levels of care, whilst achieving better cost effectiveness and service efficiency (Alonso and Mager, 2017, pp.12).

There has been extensive work on identifying transformative measures to reform the healthcare system's various provisions in care services across Wales (NHS Wales Delivery Framework 2017 – 2018, 2017, pp.2-11). From the year 2005, The Welsh Government's report, *Designed for Life (2005)*, advocated better management of chronic conditions. The Government subsequently produced a Chronic Care Management Framework in 2007 (Welsh Assembly Government, 2007). This framework sought to guide health authorities at a regional, and local level to work collaboratively in developing service frameworks and standards for long-term conditions.

The nature of the research is collaborative in nature. Med-Co Europe identified a need to research how services delivered in partnership with the public sector could drive innovation and improve health outcomes. The company has established interests in collaboration as they seek to extend their activities into service innovation, building upon their involvement with telemedicine and their applications to the field of secure medicine within HM Prisons in the UK (Med-Co Europe Ltd, 2013).

The company supply General Practitioners and other specialist clinical staff to a variety of healthcare operations within the UK including the NHS, the Ministry of Defence, Out of Hours Care organizations such as Harmoni, and HM Prisons through their Medical Recruitment expertise.

Med-Co Europe have thus developed extensive knowledge of the operational procedures of the different types of healthcare provision they service, for example building understanding of how each military base deliver care through frequent visits to bases and other military facilities (Med-Co Europe Ltd, 2013).

The company's specialist knowledge of the primary care field encompasses different delivery pathways such as individual surgeries and larger polyclinics. The knowledge gleaned from Med-Co Europe's work in building partnerships with public sector service providers offers benefits to the research resulting from established partnerships with Clinical Commissioners. The company's increasing involvement with delivering care pathways for long-term conditions is supported by their relationship with Tunstall UK who are a major supplier of Telehealth and Telecare equipment. These examples show that Med-Co Europe is well placed to increase its involvement in research into the inner workings and latest innovation in service development and the redesign of current services to better meet the needs of both the public and the health professionals who work with the company.

The researcher's role in this project benefits stakeholders by engaging healthcare professionals as active participants in the design process (Del Glaudio, Franzato, and Oliveira, 2016, pp.53), and by communicating the significance of design thinking and design tools.

As an external observer the researcher can provide a neutral perspective and a big picture mind-set to settings and situations where those with a specialist and intimate knowledge of practice may fail to see the innovation opportunity. By exploring service design without being encumbered with the burden of historic custom and practice liberates the researcher to explore all options and examine the patient's all-round experience rather than their specific treatment.

3.7 Review of innovative practice within Med-Co Europe Ltd

In 2010 Med-Co Europe Limited, a sole recruitment business entity, launched a new clinical services initiative that aimed to co-ordinate sustainable primary care services to HM Prisons across the UK in the form of an Alternative Provider of Medical Services (APMS). The new division is known as Med-Co Secure Health Services. The company contained a separate budget dedicated to the growth of this business operation. The broader provision of managing the operation of health services gave the company new responsibilities about the wider operational needs within secure healthcare, in addition to be a preferred supplier of qualified general practitioners to a selection of Her Majesty Prison sites. Such responsibilities included the training of general practitioners to become familiar with the prison facility's security systems such as SystemOne (The Phoenix Partnership, 2015), a centralised clinical computer database that stores patient records.

Other types of staff training, and shadowing sessions are organised by the company co-ordinating with the prisons to help general practitioners to get a feel for the role if this is a novelty to their working experience.

Med-Co provide day-to-day management of clinic sessions, in addition to advice regarding the latest governance regulations that inform best practice within secure medicine as a medical field to ensure that doctors are well equipped to practice healthcare in prisons. This extension of impact regarding the company's influence on actual service delivery rather than mere supplier of medical professionals has enabled them to work collaboratively with medical, and non-medical staff with public-sector organisations. Med-Co Group presently aim to deliver primary care pathways that empower the health professional to make clinical decisions for the interest of maintaining health, and not merely to treat illnesses and ailments. This has invoked interest from the company to conduct research into the nature of secure healthcare service delivery, and to explore the complexities of patient needs in prisons, which can often be illegitimate, and masked as a need of legal drugs for disorderly use.

Med-Co Group, a private Medical Recruitment Agency based in South West Wales. Med-Co Group liaise with private healthcare suppliers and the public health service throughout the UK, whilst also commissioning Primary Care services within the secure healthcare field (HM Prisons, Immigration Removal Centre and Youth Offender Institute across England and Scotland).

For the selection of participant groups to carry out the research, the involvement of Med-Co Europe staff in partaking was critical to determine how their knowledge of the primary healthcare field influenced their response to the deployment of design model processes.

Though there is an awareness that the company does not specifically run, or co-ordinate the operational aspects of a self-management programme, they do have a working portfolio demonstrating experience in co-ordinating daily primary care services (Med-Co Secure Health Services, 2011).

Contracted general practitioners employed by Med-Co Europe co-ordinate on site clinics that care for patients with needs such as on-going medication issues, mental health issues and dealing with long-term conditions. The facilitation of primary care services is conducted through various contracts as aforementioned in the form of Alternative Provider Medical Services (APMS). The APMS enables private businesses such as Med-Co Europe to fully commission or provide such services particularly within the secure prison environment. At present, the company present themselves to their APMS contracted locations as 'Med-Co Secure Healthcare Services Limited' to distinguish from their recruitment operations that only involve the recruitment of, and supply of general practitioners and registered nurses. The wording and usage of the phrase 'Healthcare Services' is communicated to contracted clients the distinguished aspect of service facilitation as explained above, as opposed to merely being a supplier of personnel.

Moreover, the capacity for the company to influence the co-ordinating of services places the developmental aspect of primary care services to the forefront of their business aims and concerns. Research, and application of the methods and principles that contribute to service design and development therefore is aligned to the Med-Co Europe's continuing interest in becoming more involved with how primary care services could be developed to deliver higher outcomes.

In this respect, the testing and benchmarking of service design models and responding towards a given list of design criteria provides an opportunity for the staff to engage with service design, and to appraise how applicable and effective they perceive the tested service design models.

Finally, it was considered appropriate for company staff to participate in scripting the action-plan and to evaluate how helpful the design model was to them, in order to understand how the knowledge contribution of this research will impact their future practice. As the sponsor company of this body of

research, their participatory work in evaluating the design models is integral to inform how the company deploy service design practices to develop healthcare services. The experience and building of the company's knowledge base of service design practice aims to benefit their engagement with relevant stakeholders in contributing to new, or redesigned healthcare services. Through being educated about the use of design models, the company is equipped in understanding the tasks involved at every stage of the design process, and discern what tools are best to fulfil the relevant design tasks at each phase.

3.8 Review and analysis of Service Design Models

Design models have two clear purposes. Firstly, they can help a development team visualise new delivery requirements, identify existing issues, and plan new service innovations. These steps act as a structural bridge of development between present delivery methods and new delivery propositions. In the context of establishing and working through the design process of a service project, a team may incorporate methods and tasks that articulate that process to stakeholders. Secondly, the models can help each stakeholder in the design team to define their roles within the design process, and in identifying which area of the new service delivery they have a specific influence upon. Both are essential in determining how a user eventually benefits from using the service.

A series of three model frameworks were chosen for the analysis of their applicability and effectiveness in generating new service innovation. Having reviewed the literature concerning the service development for healthcare, the research advocates that the benchmarking assessment of design model frameworks is contributing theoretical basis for planning a design process. Three model frameworks specifically used for the design of services were identified for benchmarking. One model derived from within educational teachings of the design process for commercial services and is presented in this research as a process developed with known industry practices of creative ideation theory. Another model derives from an established design model for innovating within a healthcare institution, specifically geared towards addressing the multi-level complexities concerning health challenges. A third business-derived model was newly co-created as a strategy for exploring new business opportunities through creating innovative service offerings (Med-Co Europe. Ltd, 2013).

For the case of this research study, the selected models have been termed 'Service Design Process Model' to clearly illustrate the following points:

- It is known as a development model as it illustrates a framework for how design related activity is augmented as a service is being created and developed
- It is known as a model as it articulates the design process into a breakdown of design stages outlining specifically the developmental tasks that encompass each stage. Moreover, the progression and movement of this process is likened to an iterative, cyclical form meaning that the stages described within the design models are often revisited even as the service concept has advanced into its final versions.
- It is known as a model concerned with the creation and design of 'services', even though the model can be extrapolated to support the design of physical products.

The three selected design models have been regenerated to ensure that all three carry a consistent format of illustration and explanation of their various specific stages. Each model illustration has been discretely lettered A, B, or C and illustrates a standardised format of how the model articulates the design process, in addition to what specific design stages it uses to guide a design project. The models were labelled in alphabetical letters to prevent preferential bias during the benchmarking test exercise, and to ensure that no vested interest in any model became apparent from specific sources. The participants also did not know which model they would be given until the start of the exercise where their given model would be found in a covered workshop pack.

A breakdown explanation of the design stages outlines in brief detail what each design stage entails to further construct the form of the designed service across the three design models. They explain tasks that are carried out at their assigned stages with the intention of enabling test participants to understand how each stage covers the development, testing, or implementation of designed innovations. Each of the design models also share a common illustration of a design process that is iterative, that explain how the development of a service involves revisiting, or reapplying principles, tasks or design considerations. While the design progress of a developing service can be monitored and assessed to the extent of which set goals and targets are being met, the design process remains active in improving, redesigning, or replacing a service that may already be in operation.

Each of the three selected models are illustrated in the diagrams to follow and are elaborated individually for how they each interpret a service design process.

Service Design Development Model (A)

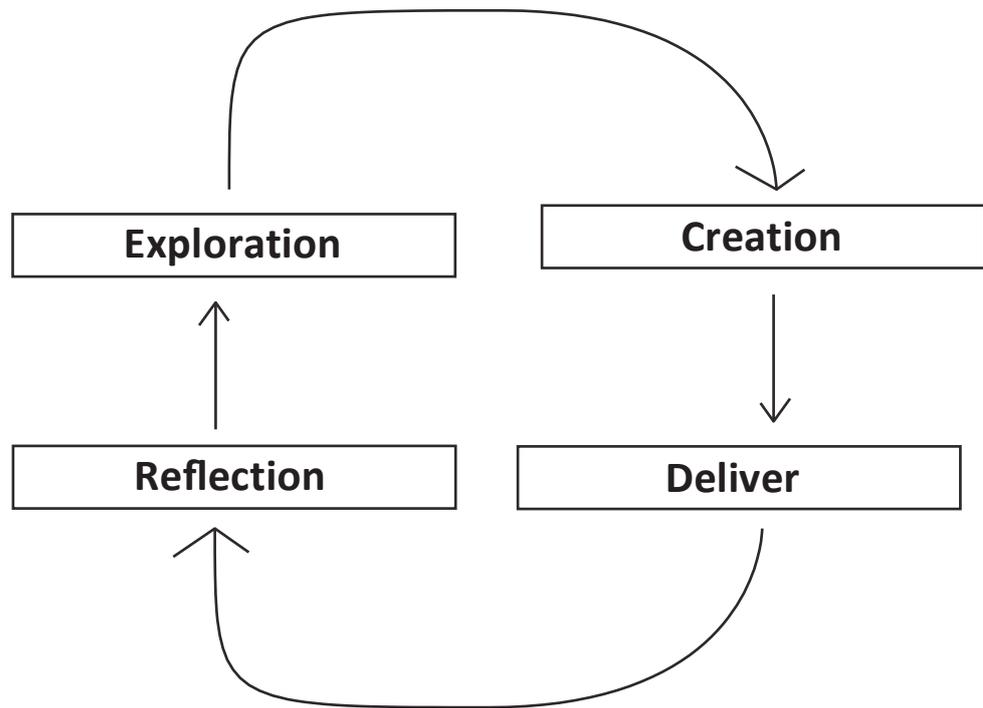


Figure 3.5 Service Design Model (A)

The design model (A) illustrated in Figure 3.5 represents the iterative principle of a service design process as explained through established literature in the specialist, multidisciplinary field of service design (Schnieder, and Stickdorn, 2010). This structure also cites reference to a similar design process illustration created by the British Design Council known as the double diamond model (Design Council, 2010). The latter process uses a pair of overlapping squares arranged in diamond shapes to explain the divergent nature of generating new ideas and converging towards refined solutions that fulfils the design brief and remedies defined issues and problems. It also describes a design process that utilises four distinct actions which help progress a design project from firstly identifying a current problem to specifying how that problem would be addressed before developing the service, accordingly, meeting new specifications (Design Council, 2010).

The first aspect of the 'exploration' stage involves understanding the current goals and operational culture of the service provider, which refer to their company ethos, their core delivery values and their unique approach to development practices. It is a preliminary process for the design team concerned to map out the service provider's current trajectory of their service provisions in relation to their specific targets, service growth, market / sector focus and resourcing requirements. The second aspect is establishing the customer profile and identifying how the company profile as explored align themselves as a service to fulfil and satisfy user needs or desires from the customer's perspective. This is an aspect where the company can delegate time and attention to discern with focus how their company values draw customers in, or in other words, identify the distinctions and service benefits that encourage customer retention or drawing in new customers. Those considerations lead to the third aspect and that is to map out the current service to identify its strengths and successes, while paying attention to areas where customers or designers can suggest areas for improvement. Design tools such as user profiling and service blueprinting are helpful aids to use in exploring the aspects of what the current service delivery looks like in relation to the values and goals it was originally designed to deliver its intended customers.

The exploration stage sets the direction of the service design process by establishing a clear focus for what aspects of the current service needs design work to fulfil new requirements, and to what scale this is envisioned. The end outcome of the work done in this stage may draw to the conclusion that certain aspects of their current service require tweaking to further consolidate their service targets, or it may identify a deeper need for wider organisational change in order to deliver services to their desired outcomes. Having explored the reality of how the service currently operates, the design team will have gained enough insight as to how new concepts and innovations would be channelled to implement changes best suited to the service environment.

This leads to the next design process stage in the design model that is to generate concept development and packaging potential ideas into understandable solutions.

Ideas for new service elements in this stage of the process are co-created by the design team that commonly consists of stakeholders working in multi-disciplines in a collaborative manner. It is regarded as important that potential service users for the new service become involved and engage with the team in generating new concepts at this stage, to ensure that the project team understand how their ideas aim to address user requirements. Design tools that can support the team in generating new ideas are such as using post-it notes to brainstorm concise ideas and posting them under design themes or factors they wish to address. The use of service design touch point illustrations helps map out how each idea help to construct different aspects of the service timeline, or seek to address a particular design criteria established in the team's specification brief. Incorporating the use of physical artefacts, photographs and animated walkthroughs can also be useful mediums for showing how ideas could operate in simulated environments, enhancing the visualisation of concept development.

The third stage of this design model encompasses the processes of refining the ideas that are put forward for further consideration, in addition to testing new service components and evaluating this process against their design criteria. The key activity in this stage is the prototyping process for implementing the refined service concepts and simulating them in real life, or virtual environments to test and evaluate innovations. The evaluation criteria encompass the innovation's operational viability and practicality; assessing factors such as ease of use and access, adequate instructive mechanisms are in place for appropriate functions, ease of navigating through the service touch points, and delivering desired outcomes at the right points throughout the service timeline.

A design team may use tools such as role-play and utilising the storyline method of playing out the new service components to compare how well an original service prototype performs against their design criteria in comparison to a new service prototype.

This helps a design team to identify the real term benefits of the new service, and to further refine the prototype and test again as necessary to ensure innovations satisfy their design criteria as optimised as practically possible.

The evaluation process is in addition, an opportunity for the design team to facilitate team engagement regarding matters of feedback from prototype testing and this enables constructive appraisal of how well the new service will function in real time.

The fourth stage of this design model concerns the processes and task structures involved in implementing the new and resolved service deliverables that have been developed through the whole design process. To have gotten to this stage, it may have required the design team to apply the design process iteratively, and to have revisited several of the design stages beforehand in order to sufficiently develop new service components into the final agreed outcomes. The successful transition of a service concept into becoming a tangible and fully operational service is the goal of this design stage. It involves seeking to outline and strategize how the service provider and design team can move their project to a fully developed solution, and to devise implementing measures that require a co-ordination amongst the service provider team to ensure new deliverables are performed successfully.

As an iterative design model, it could be applied again throughout the life cycle and continuous development of an operating service that may lead to service improvements or larger scale change.

Service Design Development Model (B)

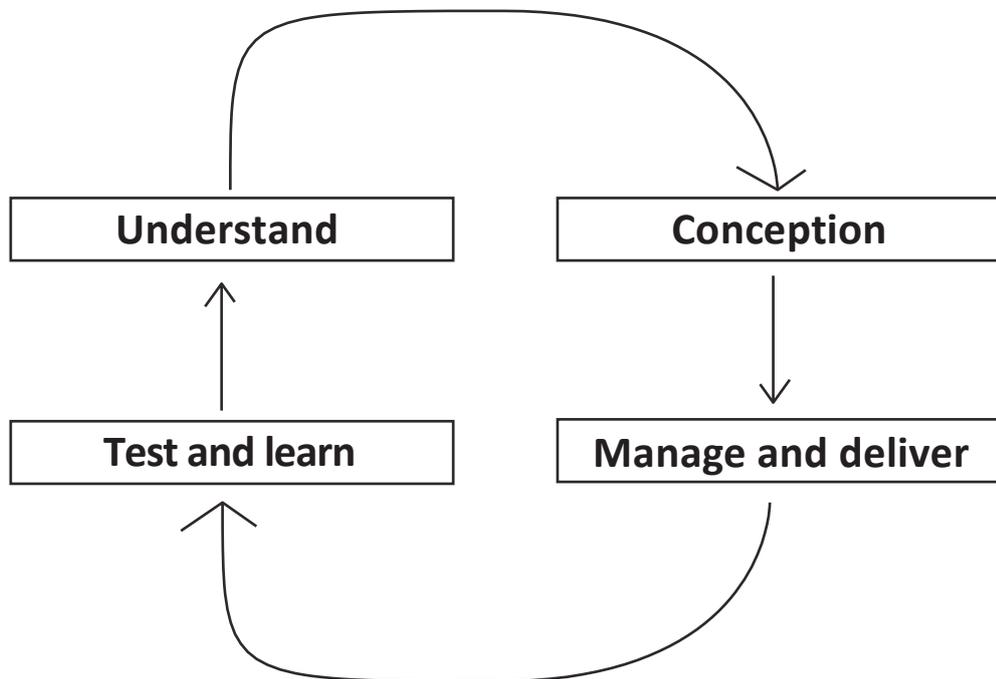


Figure 3.6: Service Design Model (B)

The design model (B) as illustrated in Figure 3.6 is a development model used within the NHS approach to design and testing new service innovations. This is a simplified model outlining four project stages, though the National Health Service has articulated models concerning service improvement and service change that are different and more comprehensive to this one being discussed.

The first stage of the model seeks to understand the roles and influences of stakeholders involved with the current service delivery, as well as to understand and frame service issues that need to be addressed.

The positive engagement and involvement of stakeholders (clinicians in the context of designing NHS services) is integral to empower them to make honest assessments about their role within the service, and to encourage the whole team early in the process to work together towards brainstorming potential new ideas. Perspectives on the current service from service users can

also be incorporated into the engagement process, helping the providers to understand how the needs of the users are currently being addressed. This is a critical stage for good relationships to be established within the stakeholder team in order to build trust and transparency when sharing different views with different perspectives regarding the strengths and the shortfalls of the current service. Addressing resistant attitudes to change can also be an important aspect to address at this stage to gain an understanding of people's perceptions towards change, and whether the whole stakeholder team has the design readiness necessary to innovate together, despite resistant views being present.

To understand and frame current service issues, it was advisable to generate a holistic picture of the whole service map to identify clearly what the service is trying to achieve from start to end point. In the healthcare context this is known as the whole patient journey (NHS Institute for Service and Improvement, 2013), that outlines every touch point of a service the patient goes through and the impact each has on their health outcomes and overall patient satisfaction. It is important at this stage to identify how the current capacity of the service addresses the user demand for its service, and to assess how sustainable that is subject to changes in the demand. This helps to gauge whether innovative approaches are needed to increase service capacity in order to maintain a consistent quality of service for rising user expectations or growing user numbers. This step helps to determine how efficiently a user can move through a service that has the built-in capabilities to serve under current, or emerging rates of demand. An example of this work is when a healthcare service delivery team endeavours to identify bottlenecks during patient consultations and referral processes that require waiting times and physical re-assignment to other medical departments. All the actions require a usage of time, and an inefficient management of these factors can slow down the running of the service and cause delays throughout the patient journey.

Having framed the design issues of the current service delivery and identifying how each stakeholder plays a part in developing the service, the design model progresses to a stage of conceptualising new ideas. From NHS derived principles, this design stage concerns how stakeholders engage with the process of generating new service concepts. The stage is concerned with how techniques and approaches can be used to broaden and maximise creative thinking that leads to emergent ideas reflecting the ideal expectations of the service user (NHS Institute for Innovation and Improvement, 2013). Other determinants that can help stimulate innovative thinking in this stage include the gathering of service perspectives from different stakeholders, who may have ideas that are radical and seek to challenge established specifications. A benefits analysis can be used in this stage to start screening each generated service proposal through to final implemented solutions to monitor and assess how well the propositions deliver against the established design specifications set out at the beginning of generating new concepts.

This is a time where the design team can begin defining the roles and the responsibilities of the service providers who would operate the new service. The team's task for this exercise is to communicate delivery roles clearly and to make clear if any changes to that role may emerge, either as when the project management side of things progress, or as the new service transitions into full operating capacity.

A series of service modelling and simulation tools may be applied at this stage to test the viability of new service concepts and evaluate their potential impact on the intended service outcomes. Tools such as forecasting software and service simulation models can give the design team a virtual estimation of how their new idea would perform against the intended design requirements and enable the concepts to be refined in targeted areas. The team can always refer to the original service map that outlines the user's journey through the system as a blueprint reference for how the new system will operate, and so it serves as a supplementary visualisation tool when testing new propositions.

When the design team is satisfied that a design proposal is to be developed for further testing and final implementation, the design model describes a later stage of testing the service concept through to delivery. It is important that the stakeholders continue to engage with the process in evaluating the service concept and re-assesses the new proposed service changes if necessary. By assessing the impact through trialling, the cost of making changes to a fully implemented service where economic and resource impact is realised by then would be drastically reduced. The NHS recommends using additional supplementing models to further guide design teams for testing and learning from this design stage, an example such as the PDSA Cycle (NHS Institute for Innovation and Improvement, 2013).

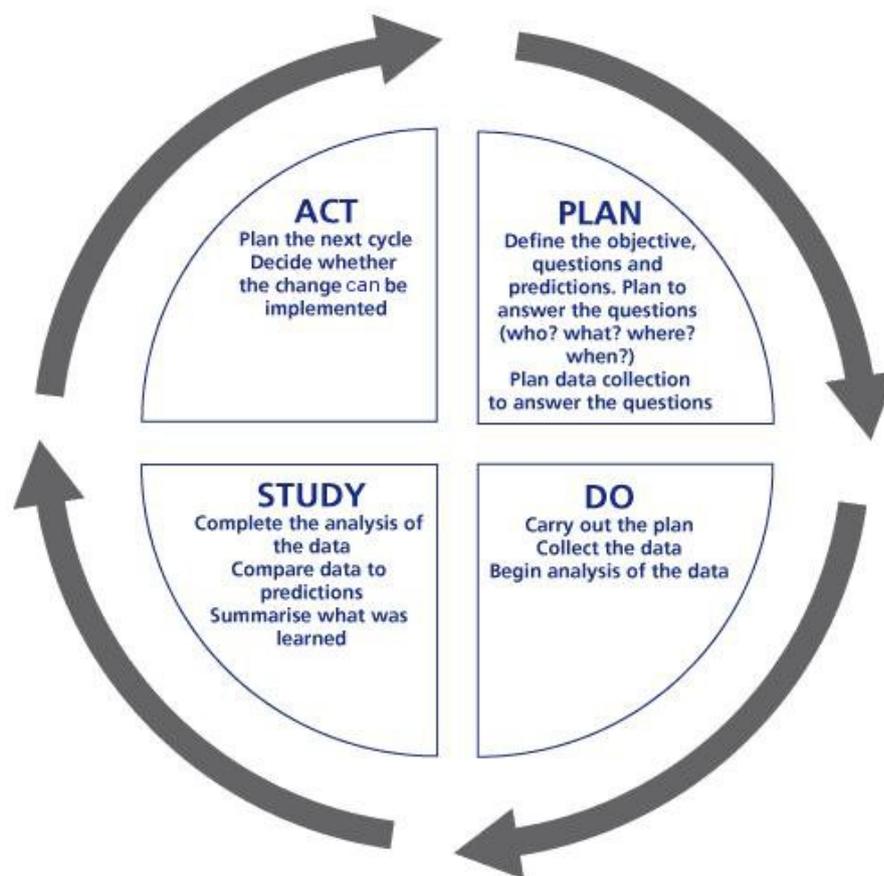


Figure 3.7 - The PDSA Cycle - NHS Institute for Innovation and Improvement, 2013

Figure 3.7 describes a testing process where service changes begin as lines of enquiries that the design team subsequently tests and analyses for possible outcomes. The incoming test data is then used to determine whether the change outcomes observed aligns with the needs of new requirements in the service. It is important in this practice that the design team establishes measurement tools to assess the performance and the impacts so that the benefits of the new service can be identified clearly and interpreted in ways that are understandable to all the stakeholders. The measurements and results generated from small-scale tests can be used to sensibly make a case for larger scale reforms in a new service (Spencer, M., Dineen, R., and Phillips, A., 2013, pp.11). It also acts as an evidence base containing data that persuades a change to be both beneficial, and feasible.

Service Design Development Model (C)

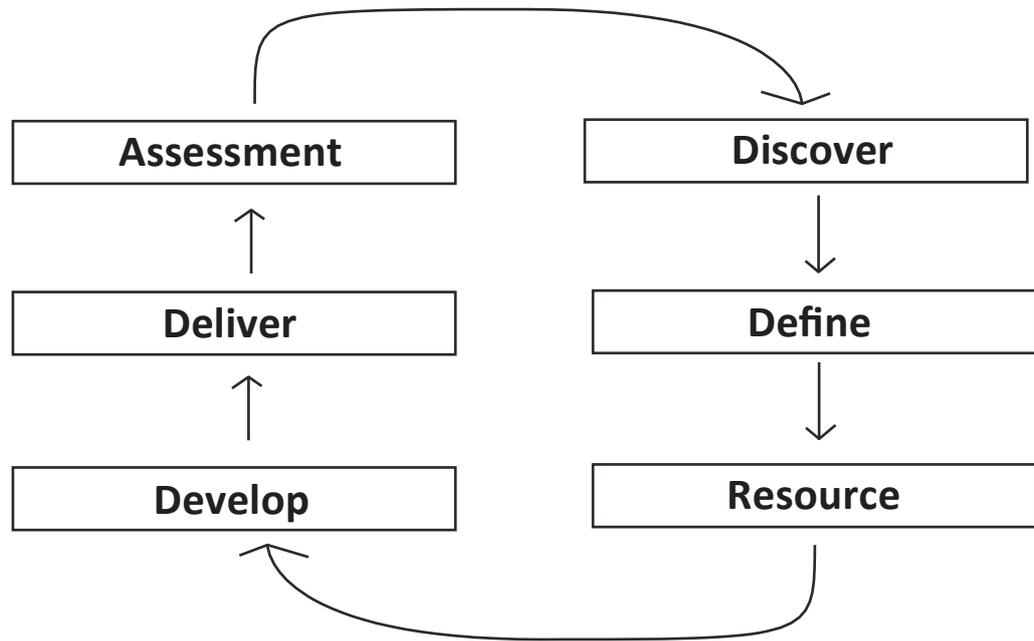


Figure 3.8: Service Design Model (C)

The design model (C) as illustrated in Figure 3.8 represents the co-developed model between the researcher and Med-Co Group. This model is an approach to innovation (healthcare specific or not) from an enterprising perspective that combines the need to assess the design readiness of a team or organisation.

The model incorporates pragmatic measures to develop and deliver succinct strategies within service innovation, and to provide cohesive steps in helping to visualise specific service elements that ought to be addressed.

The model is developed with knowledge regarding service design and general design process models from the literature, along with emergent knowledge generated from the feedback on the development of the design factors alongside Med-Co's team. The model process stages consider the research survey regarding the inter-relationship dynamics regarding clinical engagement concerning the development of healthcare services.

On reflection of this dynamic, the model aims to help the team in identifying the relationship driven values that is generated through working together across different disciplines and approach to service delivery. The identification of these value-driven attributes found internally within a team or organisation helps to inform the service delivery practice, and the potential that new developments can enhance and improve upon their existing services.

The preliminary stages of this process model involve a thorough assessment and discovery process of the service provider themselves. This encompasses an evaluation of a provider's service vision, their internal value propositions and what motivates them to deliver their service offering. The provider's financial, management and resourcing capacities are also established to determine the viability of how successful they can align themselves to their future service targets, and the likelihood they can realistically develop their offering to their desired capacity. This stage provides an opportunity for the provider to consider what sort of people will make suitable candidates to form the design development team should a new project be implemented, and is therefore important to discern the kind of members who would back the service vision and the organisation's internal values.

The outcome of this stage is primarily to establish and define the design environment, in addition to the existing operational structure of the service. The design environment concerns the conditions and resources that are important and necessary for putting new ideas into a coherent development process, encompassing constructive levels of consultation and engagement, and the effective communication of what specifically needs developmental work. The existing operational structure needs to be defined so that the design team can visualise how the current service runs from beginning to end, and to specify every touch point of the service to ensure all service components are identified for the purpose of further design work. Defining the existing service also helps to determine the scalability and extent to which the current delivery would be developed and changed.

This may range from improvements made to certain aspects of the existing service delivery, to a fundamental transformational change to the whole service's operational system.

The service provider may also undertake research to look for other providers who run a similar service offering, in addition to keeping abreast of the latest emerging products and ideas that they may wish to incorporate into their service design work. This process helps the design team in creating value propositions that will distinguish their service offering from other providers with similar offerings and ensures that the new service can be measured for clear improvements over the previous service offering. In public service provision, this research task may reveal potential benefits of incorporating practices and products from other fields and disciplines. These elements may be tested in the design process to determine how feasible they could be applied in the context of the public services sphere.

The next stage of this design process model is to start defining and communicating clearly how the service is operating in the present, through to what issues need resolving and how the design process needs to be planned for a clear design strategy to emerge. This is a stage that occurs when a design team and its service provider have undergone feasibility studies to conclude that a new, or improved service would benefit the quality of service outcomes and that service users are likely to receive a better quality of service as a result of innovative change. A design team would concentrate its efforts into defining an appropriate framework for developing the new service, and delegating leadership responsibilities over specific roles each individual play in the new project. The vision of the new service is communicated and expressed to the whole team clearly at this stage and throughout the design project to ensure clarity of purpose in their creative endeavours.

The practicalities of running a design project covering aspects such as time scales, economic investment and impact, and input expenditures such as contracting with external suppliers are also established in preparation for the design process to commence with the design team.

It is finally important at this stage that the service provider is clear with what is not working with the current service, and to clearly focus on those areas that have a consequent effect to other parts of the service. This step is necessary for partly establishing the new service specification, a list of service innovation targets that the new service is expected to operate towards. This also forms the design direction that the team would follow into the design process for new ideas to be refined and aligned towards the new specification.

The next stage of this design model involves a process of resourcing for appropriate tools, member expertise, and facilitates engagement opportunities that would serve as ingredients for creating new service innovation. This process serves as building the blocks towards a design process where the team can draw from a resource of skills, tools and decision making to undertake service development tasks. In this stage the team may seek to establish project roles and assign team members to focus on specific design-led activities and select the design tools that would suit the design tasks at hand.

When the team is prepared to work through the design process with the appropriate development strategy and resources in place to create service innovation, the creation and testing of new service concepts takes place. The development stage here involves taking feasible service concepts and refining them to align best to the design team's service specifications and using design factors to screen an idea's potential viability as a new delivery design. The design task of generating new service propositions may uncover new design issues that may warrant re-addressing those issues with the reflective processes gone through previously in the design model.

This stage is designed to allow for such time to re-assess new developments, explore the existing issues and to use those tasks to inform further development of new service innovation.

The design methods, processes, visualisation techniques and concept generating equipment would be applied appropriately to bring to shape the new ideas that have been generated among the design team. These ideas become realised and expressed in a variety of mediums such as physical mock ups in an enclosed space; a walkthrough guide created through animated media footage, an illustrated diagram of the new service sequence mapped on printed sheets, or using team members to role-play the key interactions of a new concept.

The ideas that have been established to align best with the design specifications would undergo further refinement processes through further trials and prototyping, and to receive feedback from test participants regarding suggestions for specific improvements. This latter development stage enables the design team to think further ahead to create evaluation methods that would be used to benchmark the new service innovation against the intended service delivery outcomes, that would be used to inform future service design changes in the longer term. When the final service delivery design is ready for implementation, the design model devises the delivery phase to guide the design team in establishing the procedures necessary to start operating the new service. An implementation time plan could be devised to help the team understand and deliver their role in putting the service into full function in the real-life environment. The plan could involve a series of final mock up tests with the targeted users in order to determine if any final adjustments and changes could be made to ensuring the service runs and delivers as successfully as it can against the design requirements.

4 Design Factors

4.1 Introduction

To test the outcomes regarding the applicability and efficacy of service design models, a set of benchmarking factors regarded as influential in the design process for healthcare development is identified. The list of factors outlines specific parameters as action points within a design process, with examples including the defining of service goals, understanding current shortcomings, and forming an effective strategy for researching into identified issues.

The design factors are primarily derived from the literature and selected based on their prevailing considerations over the wider development process of services. The consideration for the factors, of which eight are selected, is discussed in this section in reference to a range of research assertions and case studies that have emphasized their influence over the delivery of healthcare services. The selection and discussion over the impact of the design factors culminates in the creation of a factor analysis tool that enables potential stakeholders to unpack the factors and review its considerations against their service criteria. The design factors and its role in evaluating the proponents for an effective design process to generate innovative solutions towards the service criteria, forms the second contribution proposed from the research.

4.2 Review of the design factors

This section expands upon each of the eight selected design factors with a discussion about their derivation, and critical influences over the service design process. The selected factors are deemed to be relevant to the development of healthcare services, though these factors would be transferrable across several different contexts aside from the healthcare field. The review and discussion include a table mapping the literature considered to support the inclusion of each factor.

Identify where new ideas are likely to form

Literature Map
Ballegaard, S. A., Hansen, T. R., and Kyng, M. (2008). Healthcare in everyday life: designing healthcare services for daily life. In <i>Proceedings of the SIGCHI Conference on Human Factors in Computing Systems</i> (pp. 1807-1816). ACM.
Essén, A., and Lindblad, S. (2013). Innovation as emergence in healthcare: unpacking change from within. <i>Social science & medicine</i> , 93, 203-211.
Omachonu, V. K., and Einspruch, N. G. (2010). Innovation in healthcare delivery systems: a conceptual framework. <i>The Innovation Journal: The Public Sector Innovation Journal</i> , 15(1), 1-20.
Sloan, T., Fitzgerald, A., Hayes, K.J., Radnor, Z., Robinson, S., Sohal, A., Drotz, E. and Poksinska, B. (2014). Lean in healthcare from employees' perspectives. <i>Journal of health organization and management</i> .
Thakur, R., Hsu, S. H., and Fontenot, G. (2012). Innovation in healthcare: Issues and future trends. <i>Journal of Business Research</i> , 65(4), 562-569.
Verma, R., Elg, M., Engström, J., Witell, L., and Poksinska, B. (2012). Co-creation and learning in health-care service development. <i>Journal of Service Management</i> .

Exploring and investigating the sources of where new ideas form and can be identified is the premise of this design factor's consideration. Having an awareness of how the current service or other means of service delivery in other sectors can help design development teams to focus on key design issues and opportunities to inspire new ideas (NHS Institute for Innovation and Improvement, 2013). Ideas can originate from within the healthcare system (Essén, and Lindblad, 2013) or sourced externally via other healthcare service provisions, literature case studies, and ideas emerging from other fields that find transferability to the context of healthcare provision. The avenues for identifying ideas emerge from a variety of different engagements and perspectives, whether on an individual level reflecting on professional practice or through a collaborative context where ideas are shared and co-produced with a clear mandate towards an ideation process (Verma, Elg, Engström, Witell, and Poksinska, 2012). In view of the wide possibilities for new ideas to emerge, their sources can originate from a fluid and organic process of discovery to more pragmatic measures in formulating avenues, such as applying human factors to identify possible new interventions towards more patient-centred outcomes (Ballegaard, Hansen, and Kyng, 2008). Other principles aside from human factors such as in lean healthcare help to frame ideas to improve important factors in running effective health services, such as the elimination of waste and the more efficient co-ordination of the delivery mechanisms that facilitate timely and effective care (Sloan, Fitzgerald, Hayes, Radnor, Robinson, Sohal, Drotz and Poksinska, 2014).

Tendencies that drive new initiatives for ideas can emerge from theoretical assertions made from the socio-political level, such as in the form of demographic projections and its implications on public health, or from political tensions found in conflict and war that have direct consequences to the health needs of a population. In the health science field, tendencies for new ideas can emerge from the possibilities that new technology or advanced medication can have in treating or managing health conditions in ways not thought possible before (Thakur, Hsu, and Fontenot, 2012).

An increased understanding of how the health profession can work differently, be trained and mobilised more effectively can open avenues to identify how healthcare staff can interact with patients in order to better understand their health needs. The transformation of the (human) agent role for delivering the service has the potential to create ideas that consequently provide innovative solutions in creating service pathways that optimise the working effectiveness of the health professional.

Establish what the problems are in the current service

Literature map
<p>Borrill, C.S., Carletta, J., Carter, A., Dawson, J.F., Garrod, S., Rees, A., Richards, A., Shapiro, D. and West, M.A. (2000). <i>The effectiveness of health care teams in the National Health Service</i>. Birmingham: University of Aston in Birmingham.</p> <p>Clarkson, P. J., Buckle, P., Coleman, R., Stubbs, D., Ward, J., Jarrett, J., and Bound, J. (2004). Design for patient safety: a review of the effectiveness of design in the UK health service. <i>Journal of Engineering Design</i>, 15(2), 123-140.</p> <p>Dahlgaard, J. J., Pettersen, J., and Dahlgaard-Park, S. M. (2011). Quality and lean health care: A system for assessing and improving the health of healthcare organisations. <i>Total Quality Management & Business Excellence</i>, 22(6), 673-689.</p> <p>Herzlinger, R. E. (2006). Why innovation in health care is so hard. <i>Harvard business review</i>, 84(5), 58.</p> <p>Pope, C., Van Royen, P., and Baker, R. (2002). Qualitative methods in research on healthcare quality. <i>BMJ Quality & Safety</i>, 11(2), 148-152.</p> <p>Walshe, K., & Shortell, S. M. (2004). When things go wrong: how health care organizations deal with major failures. <i>Health Affairs</i>, 23(3), 103-111.</p>

Having a clear vision of what specifically needs addressing in how a service or system is run, on both a micro and macro level, is the premise of this design factor's consideration.

Taking the time and space to work out where a problem or shortcoming originates, helps design teams to address adequately the issues that influence how the service is run or the quality of the service outcome achieved (Maher, Mugglestone, 2005). The issues and concerns that drive the agenda for innovation according to the literature range from systemic issues in health services as delineated by Walshe and Shortell (2004), deficiencies in patient outcomes rooted in delivery shortcomings (Borrill, et al., 2000), to the assessment of health quality using systematic approaches to make sense of embedded problems in an existing service (Dahlgaard, Pettersen and Dahlgaard-Park, 2011). The resources used to visualise and articulate issues within the health service have come through the use of examples such as patient satisfaction questionnaires; patient reported outcome measures (PROMs); collaborative engagement sessions intended to gather multi-perspective feedback; and the use of caseload data that can help uncover whether current delivery structures are failing to stabilize patient conditions (Pope, Van Royen and Baker, 2002). These tools and among others are integral in helping relevant stakeholders across the service to understand what the identified problems are and where specifically, can service interventions aim to remedy those issues. As reflected by Herzlinger (2006), there is a need to investigate the underlying barriers that cause issues to persist and so it is an imperative factor that these are adequately deconstructed in order to effectively address the surface issues. From this observation, it is important to consider whether the prevailing problems affecting a health service is attributed to the delivery mechanisms themselves, or whether there are relational (agential) factors that consequently affect delivery. An example of this could be poor communication between staff and patient, or that best practice procedures may be poorly disseminated among staff resulting in agential error and ineffectiveness to intervene up to best practice standards.

As with a health system, one confronts the complexities that enable a service to operate and must therefore unravel the inner workings to properly investigate potential issues. When such issues are identified, their source and causal effects to other components of the service must then be asserted, and only then can a sufficient assessment of the shortcomings emerge (Clarkson, et al., 2004).

Establish agreed goals and potential outcomes

Literature map
Bevan, G. (2006). Setting targets for health care performance: lessons from a case study of the English NHS. <i>National Institute Economic Review</i> , 197(1), 67-79.
Blumenthal-Barby, J. S., and Burroughs, H. (2012). Seeking better health care outcomes: the ethics of using the “nudge”. <i>The American Journal of Bioethics</i> , 12(2), 1-10.
Black, N. (2013). Patient reported outcome measures could help transform healthcare. <i>British Medical Journal</i> . 346
Boyce, M. B., Browne, J. P., and Greenhalgh, J. (2014). The experiences of professionals with using information from patient-reported outcome measures to improve the quality of healthcare: a systematic review of qualitative research. <i>British Medical Journal</i> , 23(6), 508-518.
Dixon-Woods, M., Baker, R., Charles, K., Dawson, J., Jerzembek, G., Martin, G., McCarthy, I., McKee, L., Minion, J., Ozieranski, P. and Willars, J. (2014). Culture and behaviour in the English National Health Service: overview of lessons from a large multimethod study. <i>BMJ Qual Saf</i> , 23(2), 106-115.
Morris, C., Janssens, A., Allard, A., Thompson Coon, J., Shilling, V., Tomlinson, R., Williams, J., Fellowes, A., Rogers, M., Allen, K. and Beresford, B.A. (2014). Informing the NHS Outcomes Framework: evaluating meaningful health outcomes for children with neurodisability using multiple methods including systematic review, qualitative research, Delphi survey and consensus meeting.
Pencheon, D. (2015). Making health care more sustainable: the case of the English NHS. <i>Public Health</i> , 129(10), 1335-1343
Porter, M. E. (2010). What is value in health care? <i>New England Journal of Medicine</i> , 363(26), 2477-2481.
Taylor, R. (2001). Using Health Outcomes Data to Inform Decision-Making. <i>Pharmacoeconomics</i> , 19(2), 33-38

Following through from the design factor discussed above, this design factor's consideration focuses on the need to frame design goals and new outcomes in a manner which all the design team and other stakeholders involved hold in mutual agreement. This then becomes the overarching vision and establishes targets to be accomplished through the design project and process (Perera, R., Dowell, T., Crampton, P., and Kearns, R., 2006). From the literature, it is apparent that PROMs plays a prominent role as a method for capturing service outcomes that are specific to the services' specialty, and gives voice to the agential impact that the patient group has on informing the standards of service delivery (Black, 2013; Boyce, Browne and Greenhalgh, 2014). Goals can be expressed as targets that aim towards a certain level of delivery performance (Bevan, 2006), or satisfaction measures stipulated from patients that would legitimately form a benchmark for new pathways. These two proponents help to inform the service specifications that sets out what needs to be addressed and helping to define what new solutions are expected to deliver in light of the proposed outcomes criteria (Morris, et al., 2014).

Agree about the economic impacts of a project

Literature map
Gaynor, M., Propper, C., and Seiler, S. (2016). Free to choose? Reform, choice, and consideration sets in the English National Health Service. <i>American Economic Review</i> , 106(11), 3521-57.
Majeed, A. (2015). Primary care: a fading jewel in the NHS crown. <i>London journal of primary care</i> , 7(5), 89-91.
Patel, A. (2016). Evaluating the impact of a pharmacy homecare team at Kettering general hospital. <i>Pharm Manag</i> , 32(2), 52-8.
Morton, R., Sayma, M., and Sura, M. S. (2017). Economic analysis of the breast cancer screening program used by the UK NHS: should the program be maintained? <i>Breast Cancer: Targets and Therapy</i> , 9, 217.
Robertson, R., Wenzel, L., Thompson, J., and Charles, A. (2017). Understanding NHS financial pressures. <i>How are they affecting patient care?</i>
Robertson, R., Appleby, J., and Evans, H. (2017). Public satisfaction with the NHS and social care in 2016. <i>Results and trends from the British social attitudes survey</i> . London: King's Fund.
Sculpher, M., Claxton, K., and Pearson, S. D. (2017). Developing a value framework: the need to reflect the opportunity costs of funding decisions. <i>Value in Health</i> , 20(2), 234-239.
Vowden, P., and Vowden, K. (2016). The economic impact of hard-to-heal wounds: promoting practice change to address passivity in wound management. <i>Wounds International</i> , 7(2), 10-15.

The economic impact of designing a service encompasses the impact over the planning and commissioning costs, as well as the impending costs involved in operating a service (Robertson, Wenzel, Thompson, and Charles, 2017). The assessment of the financial impacts of a service entails having mutual agreement regarding how management, logistics, expertise, labour and resources will impact the development team. Further to the financial costing involved with the design of the service, there are interdependent factors such as allocated funding that can influence the likelihood certain solutions receive enough backing for further development (Sculpher, Claxton and Pearson, 2017).

How funds are allocated from an organizational level can positively, or negatively affect the viability of innovative solutions being implemented. The organization's allocated funds are affected further from the decisions made to funding on the government level, and such is inevitably the case for healthcare institutions such as the National Health Service in the UK, where potential for service development is in part contingent upon political agenda (Robertson, Appleby and Evans, 2017). Systemic changes towards how the healthcare model is funded could affect how certain services are accessed, as private health services can testify by generating revenue streams via payment for services in contrast to the free access provided within the National Health Service. Factors such as freedom of choice in regard to how the population wants to fund their own care, could potentially influence how businesses and enterprises get involved in resourcing health service offerings (Gaynor, Proper, and Seiler, 2016). In turn, these become pressing factors that potentially lead to imbalances to service quality, as funding avenues increasingly favour services that are well resourced and can thus be better positioned to deliver and satisfy on patient expectations more than others (Majeed, 2015).

Economic impact can also be assessed from mapping out the service in its current form and used to forecast the projected differences in impact with the introduction of new measures and interventions. This enables stakeholders conducting the assessment to ascertain the cost benefit analysis towards developing innovative solutions that have the potential to make financial savings to the health services in the short, and long term. Services that need addressing clinical interventions to not just improve health outcomes, but to efficiently save on resources throughout the patient journey is a useful example of cost saving implications from new interventions (Vowden and Vowden, 2016).

Define an appropriate research strategy and structure

Literature map

Birken, S.A., Powell, B.J., Presseau, J., Kirk, M.A., Lorencatto, F., Gould, N.J., Shea, C.M., Weiner, B.J., Francis, J.J., Yu, Y. and Haines, E. (2017). Combined use of the Consolidated Framework for Implementation Research (CFIR) and the Theoretical Domains Framework (TDF): a systematic review. *Implementation Science*, 12(1), 2.

Cooke, J., Booth, A., Nancarrow, S., Wilkinson, A., and Askew, D. (2006). Re: Cap-identifying the evidence-base for Research Capacity development in health and social care: a scoping review of the literature.

Cooke, J., Nancarrow, S., Dyas, J., and Williams, M. (2008). An evaluation of the 'Designated Research Team' approach to building research capacity in primary care. *BMC Family Practice*, 9(1), 37.

Cooke, J. (2005). A framework to evaluate research capacity building in health care. *BMC Family practice*, 6(1), 44.

Doull, M., O'Connor, A. M., Tugwell, P., Wells, G. A., and Welch, V. (2017). Peer support strategies for improving the health and well-being of individuals with chronic diseases. *The Cochrane database of systematic reviews*, 2017(6).

Evans, T. W. (2006). Best research for best health: a new national health research strategy. *Clinical Medicine*, 6(5), 435-437.

Gardner, G., Gardner, A., and O'Connell, J. (2014). Using the Donabedian framework to examine the quality and safety of nursing service innovation. *Journal of clinical nursing*, 23(1-2), 145-155.

Gee, M., and Cooke, J. (2018). How do NHS organisations plan research capacity development? Strategies, strengths, and opportunities for improvement. *BMC health services research*, 18(1), 198.

Hulcombe, J., Sturgess, J., Souvlis, T., and Fitzgerald, C. (2014). An approach to building research capacity for health practitioners in a public health environment: an organisational perspective. *Australian Health Review*, 38(3), 252-258.

Heaton, J., Day, J., and Britten, N. (2015). Inside the "black box" of a knowledge translation program in applied health research. *Qualitative Health Research*, 25(11), 1477-1491.

Hollis, C., Morriss, R., Martin, J., Amani, S., Cotton, R., Denis, M., and Lewis, S. (2015). Technological innovations in mental healthcare: harnessing the digital revolution. *The British Journal of Psychiatry*, 206(4), 263-265.

Paparella, G. (2016). Person-centred care in Europe: a cross-country comparison of health system performance, strategies and structures. *Policy Briefing*.

Devising a planned strategy for how design research is undertaken forms the premise of this design factor's consideration.

Research is an activity that is often undertaken, on both primary and secondary levels, in order to generate and interpret data that informs how a design problem may be addressed. This is typically an iterative activity that takes place throughout a project's development stages (Evenson, S., Holmlid, S., Kieliszewski, C., and Mager, B., 2008). There is a breadth of approaches from the literature as to how the research capacity of health organisations can be integrated further into service delivery, and to embed these practices within a wider strategy to instigating health improvement (Hulcombe, Sturgess, Souvlis, and Fitzgerald, 2014). A research framework in the context of health service development may incorporate a range of methodologies to examine current practices and discourses that help organizations to uncover factors that lead to further examination through stakeholder engagement. As research activity potentially crosses over different spheres such as with policy, research, and practice-based domains, the strategies for devising effective research across organisational contexts needs to be integrated (Albert and Mickan, 2003). Successful integration ensures that the research aims, and application of research methods align in purpose across the cultural contexts present in the wider framework.

Structures on the other hand, help stakeholders involved in research to visualise the features and processes interacting within a wider infrastructure, wherein sub-structures can exist across different ontological domains, and are inter-relational within their parts (Coen, Bottorff, Johnson, and Ratner, 2010).

The infrastructure of a given research strategy and its process can help to identify both opportunities and barriers conducive to transformative research, where contributory factors such as training, leadership, funding, and networks

(Cook, Ariss, Smith and Read, 2015) act as causal mechanisms that determine effective levels of research engagement. The agential impact on the implementation of research strategies is perceived as a critical aspect from the literature. Conceptual frameworks on research engagement have focused on how to empower healthcare professionals to be equipped for conducting a high level of research (Farmer and Weston, 2002), in addition to informing working conditions to facilitate adequate time towards research activities (Golenko, Pager and Holden, 2012). It is clear from the literature that various research structures have been devised to further evaluate factors that can incentivise research activity and increase the prevalence of strategies and structures that facilitate collaborative efforts to innovative research (O’Byrne and Smith, 2011).

Establish the specifications for what a service needs to achieve

Literature map
<p>Haste, A., Penn, L., Rodrigues, A.M., Marques, M.M., Budig, K., Bell, R., Summerbell, C., White, M., Adamson, A.J. and Sniehotta, F.F. (2018). Using evidence-based guidelines to inform service provision: a structured mapping exercise within the National Health Service Diabetes Prevention Programme in England. <i>BMC research notes</i>, 11(1), p.510.</p>
<p>Kane, B., Cramb, S., Hudson, V., Fleming, L., Murray, C., and Blakey, J. D. (2016). Specialised commissioning for severe asthma: oxymoron or opportunity? <i>Thorax</i>, 71(2), 196-198.</p>
<p>Ramsbottom, H., Rutter, P., and Fitzpatrick, R. (2017). Post discharge medicines use review (dMUR) service for older patients: Cost-savings from community pharmacist interventions. <i>Research in Social and Administrative Pharmacy</i>.</p>
<p>Seston, E. M., Ashcroft, D. M., Lamerton, E., Harper, L., and Keers, R. N. (2019). Evaluating the implementation and impact of a pharmacy technician-supported medicines administration service designed to reduce omitted doses in hospitals: a qualitative study. <i>BMC health services research</i>, 19(1), 325.</p>
<p>Stafford, F., Ah-See, K., Fardy, M., & Fell, K. (2016). Organisation and provision of head and neck cancer surgical services in the United Kingdom: United Kingdom National Multidisciplinary Guidelines. <i>The Journal of Laryngology & Otology</i>, 130(S2), S5-S8.</p>

Walker, I. F., Leigh-Hunt, N., and Lee, A. C. K. (2016). Redesign and commissioning of sexual health services in England—a qualitative study. *Public health, 139*, 134-140.

Worsley, D. J., Marshman, Z., Robinson, P. G., and Jones, K. (2016). Evaluation of the telephone and clinical NHS urgent dental service in Sheffield. *Community Dent Health, 33*(1), 9-14.

The premise of this design factor requires a design team to ensure that they have a clear specification as to where the service begins and where it ends. Parameters in health services refers to what the service is addressing as a user enters the system, and where the user is expected to benefit in experienced outcomes when transitioning out of the service. An outline of specifications is commonly specific to the pathway of a health service, with specific parameters set out to regulate the delivery pathways that may involve examples such as prescription procedures of medication, effective communication of guidance and advice to the appropriate patient referral to the right pathway of care.

Specifications are established when stakeholders already have a firm understanding in regards to the measures that emerge within the new specification, and may be informed by an evidence base of previous studies or reviews into specific aspects of service provision (Haste, et al., 2018; Ramsbottom, Rutter and Fitzpatrick, 2017). The service specification outlines explicitly to all stakeholder groups the statements about the service aims and objectives, of which influence the method of delivery, defining of staff roles, and measures to evaluate real outcomes against the specification. It is used to guide decisions relating to how the service is commissioned, and to resource the service adequately against specification measures (Walker, Leigh-Hunt and Lee, 2016). Evaluative measures put in place to continuously monitor and re-develop services would make effective reference of the specifications to help stakeholders assess if service outcomes satisfy, or fall short of the agreed measures (Seston, Ashcroft, Lamerton, Harper and Keers, 2019).

Institute measures to support putting innovation into practice

Literature map

Cole, A., & Towse, A. (2018). *Legal Barriers to the Better Use of Health Data to Deliver Pharmaceutical Innovation* (No. 002096). Office of Health Economics.

Crisp, N. (2015). Co-development, innovation and mutual learning—or how we need to turn the world upside down. In *Healthcare* (Vol. 3, No. 4, 221-224). Elsevier.

Davy, C., Bleasel, J., Liu, H., Tchan, M., Ponniah, S., and Brown, A. (2015). Effectiveness of chronic care models: opportunities for improving healthcare practice and health outcomes: a systematic review. *BMC health services research*, 15(1), 194.

Lopez, E., Gonzalez, J. L., Cordo, J. A., Janvier-Anglade, M., and Fitzpatrick, T. A. (2019). EntrepreNurses: Nursing's Evolving Role in Innovation Strategy. *Nursing Economics*, 37(3).

Rees, D., Y. Cavana, R., and Cumming, J. (2018). Using cognitive and causal modelling to develop a theoretical framework for implementing innovative practices in primary healthcare management in New Zealand. *Health Systems*, 7(1), 51-65.

Waring, J., Allen, D., Braithwaite, J., and Sandall, J. (2016). Healthcare quality and safety: a review of policy, practice and research. *Sociology of Health & Illness*, 38(2), 198-215.

Wolstenholme, D., Grindell, C., and Dearden, A. (2017). A co-design approach to service improvement resulted in teams exhibiting characteristics that support innovation. *Design for Health*, 1(1), 42-58.

The measures defined in this design factor's consideration encompass actions that will ensure the complete integration of new practice into the service. To ensure that new practice is adopted and implemented in a newly developed service sustainably, the stakeholder group is to ensure that the design process enables them to evaluate how the service is performing against the established criteria. This includes assessing immediate objectives, and to demarcate the long-term vision with the measures required to sustain such a vision.

In the context of care services, this may involve distributing patient questionnaires to user groups who have trialled pilot services to gain constructive feedback (Wolstenholme, Grindell and Dearden, 2017). This reveals whether innovative practices yield the desirable outcomes that were implemented to achieve. Measures can also refer to how the design process is reiterated in a manner that helps to appraise the introduction of innovative practice (Rees, Cavana and Cumming, 2018). During the test phase of the design process, new service touch points may be evaluated and analysed using previous design phases. These steps give stakeholders the opportunity to revisit and analyse if an idea legitimizes for further refinement and evaluation. This is also an opportunity to ensure that changes of a transitional nature are determined with clarity, so stakeholders can anticipate the extent of those transitions (Crisp, 2015).

The transitions may involve incremental adjustments requiring procedural changes within an existing service. On a higher scale, this may involve a radical systemic change from existing service practice. Establishing the scale of change involved with introducing innovative measures assists stakeholders in mapping out timescales for implementing new changes to an existing or new service.

Identify design tools that effectively generate service innovation

Literature map

Anderson, L., and Ostrom, A. L. (2015). Transformative service research: advancing our knowledge about service and well-being.

Batalden, M., Batalden, P., Margolis, P., Seid, M., Armstrong, G., Opiari-Arrigan, L., and Hartung, H. (2016). Coproduction of healthcare service. *BMJ Qual Saf*, 25(7), 509-517.

Beaunoyer, E., Arsenault, M., Lomanowska, A. M., and Guitton, M. J. (2017). Understanding online health information: evaluation, tools, and strategies. *Patient education and counseling*, 100(2), 183-189.

Berte, N. K., Pickham, D., and Shluzas, L. (2018). Design Thinking Pain Management: Interactive Tools That Improve Communication Between Patients and Providers.

Burke, C., Stein-Parbury, J., Luscombe, G., and Chenoweth, L. (2016). Development and testing of the person-centered environment and care assessment tool (PCECAT). *Clinical Gerontologist*, 39(4), 282-306.

Clark, K. D., Woodson, T. T., Holden, R. J., Gunn, R., and Cohen, D. J. (2019). Translating research into agile development (TRIAD): Development of electronic health record tools for primary care settings. *Methods of information in medicine*, 58(01), 001-008.

Donetto, S., Pierri, P., Tsianakas, V., and Robert, G. (2015). Experience-based co-design and healthcare improvement: realizing participatory design in the public sector. *The Design Journal*, 18(2), 227-248.

Epstein, D.A., Lee, N.B., Kang, J.H., Agapie, E., Schroeder, J., Pina, L.R., Fogarty, J., Kientz, J.A. and Munson, S. (2017), May. Examining menstrual tracking to inform the design of personal informatics tools. In *Proceedings of the 2017 CHI Conference on Human Factors in Computing Systems*, 6876-6888. ACM.

French, T., Teal, G., and Raman, S. (2016). Experience Labs: co-creating health and care innovations using design tools and artefacts. *Proceedings of DRS2016: Design+ Research+ Society-Future-Focused Thinking*, 7, 2965-2979.

Goodyear, P. (2015). Teaching as design. *Herdsa review of higher education*, 2, 27-50.

Ovretveit, J., Mittman, B., Rubenstein, L., and Ganz, D. A. (2017). Using implementation tools to design and conduct quality improvement projects for faster and more effective improvement. *International journal of health care quality assurance*, 30(8), 755-768.

Picard, R. (Ed.). (2017). *Co-design in Living Labs for Healthcare and Independent Living: Concepts, Methods and Tools*. John Wiley & Sons.

Robert, G., Cornwell, J., Locock, L., Purushotham, A., Sturmey, G., & Gager, M. (2015). Patients and staff as codesigners of healthcare services. *Bmj*, 350, g7714.

Simon, K.C., Munson, R., Ong, A., Gil, F.R., Campanella, F., Hillman, L., Lai, R., Chesis, R., Tideman, S., Vazquez, R.M. and Meyers, S. (2019). Design and Implementation of Structured Clinical Documentation Support Tools for Treating Stroke Patients. *Journal of Stroke and Cerebrovascular Diseases*, 28(5), pp.1229-1235.

Yang, Q., Zimmerman, J., and Steinfeld, A. (2015). Review of Medical Decision Support Tools: Emerging Opportunity for Interaction Design. *IASDR 2015 Interplay Proceedings*.

Design tools in the context of service development are concerned with methodologies and instruments that aid in the conception, illustration, and implementation of a new design proposal and specification (Picard, 2017). Identifying specific design tools that will support stakeholders in facilitating the design tasks within the design process is the premise of this design factor's consideration. Design tools are deployed under the consideration of stakeholder's ability to be competent in using these in the design process. Design tools enable stakeholders to establish appropriate mechanisms that expand on every design factor considered important for developing the service (Donetto, Pierri, Tsianakas and Robert, 2015). Thus, creative design and implementation tasks are guided and lead through the processes impinged upon from the tools that are devised for developing innovative measures.

4.3 Contribution of Factor Analysis Tool

Having identified and refined a list of design factors, the research contributes a healthcare design factors analysis tool (HCDFA).



Figure 4.1 - Healthcare Design Factors Analysis Tool

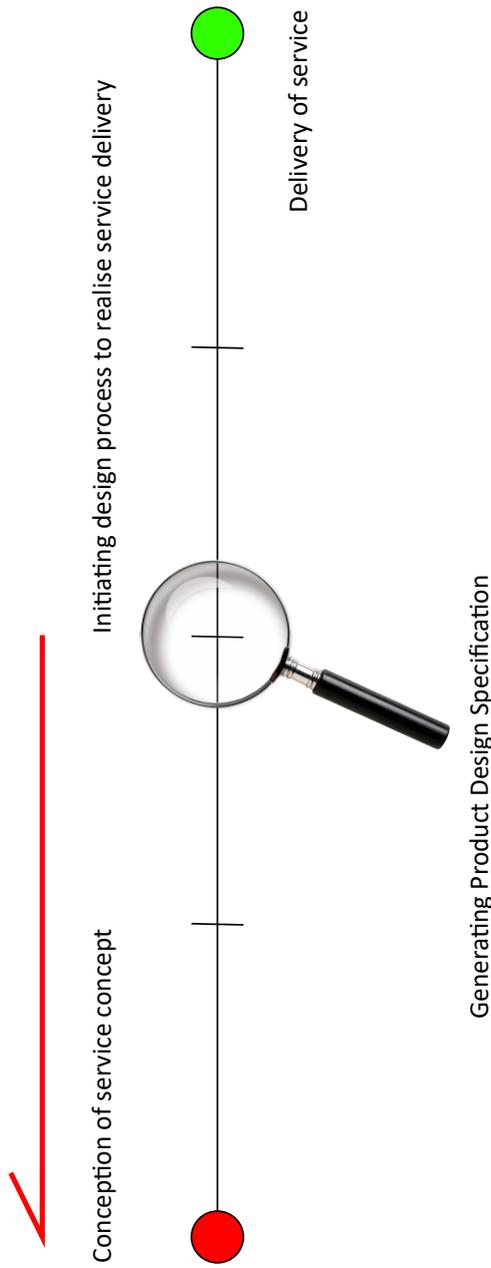
The tool illustrated in Figure 4.1, provides a set of permissive factors to appraise the developmental phrases for designing new services. Concurrently, the factors themselves translate into a set of criteria for evaluating generated ideas emerging from the design process. A series of eight selected design factors forms the basis of an analytical tool to benchmark the usability of service design processes.

It is helpful to expand on the role of the design brief and its design specification to clarify how the factors serve as an analytical tool.

To summarise from the beginning of the design process, a given service design project is sought by the generation of a design brief. The design brief is then used to extrapolate issues that need creative resolution, and thus require the creation of new innovative concepts. It states clearly an issue or a problem that require new solutions, and highlights specification-based parameters that stakeholders need to address with their new ideas. Considering this process, the design factors establish how the service design process can be conducive towards generating innovation regarding the service design specification. In this context, the role of the factors analysis tool serves as a benchmarking tool to define both the aim of the design specification, and the efficacy of the design process to successfully deliver the outcomes set forth from the design specification.

In theoretical terms, the design factors can be seen as permissive causal considerations that stakeholders would refer to generate innovation. In this context, addressing the design criteria establishes a benchmark for how well a given design process facilitates innovative outcomes. In a broader sense, the HCDFA can be used across the continuum of a cyclical process to continuously develop a service that undergoes transformation for the future, as well as evolving from past design and development specifications. An illustration for how the tool can be used across this continuum and used to benchmark specific touch points in the design process is shown in Figure 4.2.

The benchmarking tool may be used to reflect back on the origins of how an existing service began, and what it originally set out to achieve. This can help to understand how subsequent steps in the design process shaped the way a service is presently delivered.



The benchmarking tool may be used to specifically analyse methodologies and processes that have been adopted to further develop new ideas into feasible solutions. This thus helps stakeholders review a particular touchpoint of the design process before progressing further in a design project.

Figure 4.2 – Deployment of the Factor Analysis Tool across the conception, development, and delivery of a service design process

5 Deployment of Design Factors Analysis Tool

5.1 Introduction

This chapter reviews how the three selected service design models are tested in their deployment to a contextualised design exercise. The design exercise involves participants scripting an action plan to draw out ideas for a self-management programme, targeting patients with long-term conditions.

To ascertain what observations to generate in relation to how the three design models fare during the deployment exercise, a social constructionist inquiry method is introduced. The phenomenological stance of the method enables both researcher and test participants to share understanding of the development process, and to take into account the underlying theoretical assumptions and conceptualisations that both researcher and participant bring to the research exercise (Braun and Clarke, 2006). A briefing and introduction to the purpose of a design model process provides insight as to how it could help support addressing design brief's criteria requirements. This ensures that the research participants are at no point disconnected from insights gained and shared by the researcher facilitating the design process at the start of the exercise.

It is important to note however, that the design models are randomized for each participant before commencement of the exercise. This ensures no critical inference for promoting a model and more importantly, no pre-empting influence over how the participants use the given model in relation to be narrating their action plans.

The workshop participants are given a free choice as to whether the theoretical framework expressed from the models are deployed and could refer to it as they see relevant for completing the exercise.

5.2 Establishing the design brief and criteria

The generation of the design brief is initiated after the final eight design factors are established and incorporated into a newly formed factors analysis tool to benchmark and analyse the service design models. The design brief stipulates creating an action plan script to address the creative design challenges concerning a self-management program, targeting users with long-term health conditions. The context and issues raised in the design brief derive from primary information captured from dialogue between the researcher and a community resource team who specialise in delivering co-ordinated care for chronic obstructive pulmonary diseases.

A copy of the design brief used in the deployment workshops is illustrated in Figure 5.1. From thereafter, this section explains how the design brief was constructed with the help of professional healthcare therapists.

Create an action plan for designing a self-management programme aimed at patients with long-term conditions	
Introduction to exercise and briefing	20 minutes
Writing the action plan	25 minutes
Self evaluation	15 minutes
<p>The context:</p> <p>A community resource team is looking for ways to improve the lifestyle and health outcomes of patients whom are enrolled into a health self-management program. The program is to be designed for patients with long-term conditions that are influenced by their lifestyle or working environment.</p> <p>The goal of the program is to manage their conditions with the help of clinicians to reduce the number of severe relapses a patient might suffer due to poor management. The emphasis of the program is to coach patients to enable them to manage their condition alongside medical prescription and professional assistance, thereby reducing a dependence on acute in-patient based care. One of the primary benefits of this approach is it provides personalised care that satisfies the patient's individual needs and choices.</p>	
<p>The current problems:</p> <ul style="list-style-type: none"> ▪ When patients do not comply with their medical prescriptions or fail to heed the advice of clinicians, this can lead to exacerbations being poorly managed. This can result in extra interventions on behalf of the care team, and often re-admission into acute care (clinic or hospital admission). ▪ The coaching and lifestyle management commitments for the nursing team can be over burdening in addition to the requisite tasks they are obliged to do in their daily workload. Understaffing / need to share responsibilities across a wider pool of resources may be a relevant issue. ▪ Access to appropriate services can appear complex and not integrated enough for patients to know where specifically to go to address their health issue. 	
<p>Design task:</p> <p>Using the context and the problems highlighted, your task is to devise an action plan reflecting how you would creatively address the design challenges for developing a self-management program. The action plan will need to address eight key criteria recommended for planning the design project. These are:</p> <ol style="list-style-type: none"> 1. Defining program goals 2. Specifying service requirements 3. Strategy for researching the problem / issues 4. Identifying how new ideas will form 5. Understanding current shortcomings 6. Support for putting new innovations into practice 7. The program's economic impact 8. Selecting appropriate tools for development <p>It is important to note that you are only required to draft an action plan for how you propose to address those criteria. For the purpose of this exercise there is no requirement to actually design or develop the service. Enclosed alongside this brief is an action plan template for completing this task.</p>	
<p>Introduction to the service design development model:</p> <ul style="list-style-type: none"> ▪ For this exercise, you will be given a model that describes a design process for structuring activities that can help health professionals in developing a new service. ▪ The design process is broken down into stages, with each stage outlining in principle what occurs, and how the development team gets involved in a particular stage. ▪ The intended purpose of the model is as a guide to assist you in developing your action plan. 	

Figure 5.1 - Design brief for deployment exercise

To create a suitable exercise title that enable participants to grasp the nature of the program, the head of Respiratory Therapies for the Local Health Board, Hywel Dda, is consulted to refine the wording. From this consultation, it is apparent that the wordings of 'long-term conditions' creates more accessibility to what participants could write about and relate their ideas and experiences. This is opposed to the condition being defined specifically as one particular type, for example Chronic Obstructive Pulmonary Disease, and although COPD is a long-term condition that is prevalent within the Health Board's geographical population, it is seen as too specific for service developers with a broader knowledge base to generate ideas. The implications would potentially narrow the participant group to those who have specialist or experiential knowledge in the management of COPD. In order to create a suitable background context for the exercise, a Community Resource Team dealing with the management of respiratory diseases working in Port Talbot Resource Centre offered real time narrative experience of managing their inpatient, and outpatient services.

From this consultation, a series of current problems that the CRT face alongside their perspective of what a new self-management programme could do to benefit their operations is captured and compiled into constructing the design brief. This comes in the form of a section contextualising the scenario that communicate a need from the perspective of the community resource team to improve ways they could run their outpatient service through a self-management program. The aim of the program is to improve lifestyle and health outcomes by tackling poor management issues including compliance with medical prescription, and coaching patients towards healthy lifestyle choices.

A series of current issues raised by the resource team are recorded. In particular, the heavy reliance on acute inpatient services (services required of clinics and hospitals) to deal with unwanted exacerbations is an apparent issue. Furthermore, the lack of integration across boundaries of services has led to difficult accessibility to their front line services. These results in an overload of expectation placed onto acute services, as it is perceived by patients as the first pathway to approach about their condition related issues. These issues could be co-managed more effectively through a care service co-ordinated from the home using a combination of home visits and triage services. This approach would enable patients to address their own health issues co-operatively with health care expertise.

The issues discussed over the acute services provision are compiled within the design brief as a short three bullet point section about current problems, to help test participants broaden their view of what issues require addressing and to inform some, if not all the creative content of their written action plans.

The design task embodies in clear terms the instruction to devise an action plan reflecting how the participant would creatively address the design challenges for developing a self-management program. This section begins once the participant has read and understood the exercise context, in addition to the service issues before writing out the action plan. Participants were given specific instruction to write how they propose to address the design criteria, with no requirement to go into detailed specifics about the service components. The focus of the exercise is not about analysing the quality of the ideas, but rather on assessing how competently a design model enables participants to make sense of planning for a design process.

Participants had the creative freedom to script the action plan and relate it to their own extent, of expertise, speciality and experience with self-management services. How they related to using the design model was free to their discretion and preference for using it as supportive material.

In the last content section of the design brief, an introduction of the service design model discloses three bullet points outlining the intended purpose of the design model. It seeks to make sense of the design model process through diagrams placed along with project stages, and how the process could help to structure the participant's ideas and suggested activity. Participants could then refer to the model as frequently as they desire to support the scripting of their action plan, and to determine for themselves whether the design model can adequately support them in addressing the design criteria outlined for the design task.

The duration of the exercise was delegated over the space of one hour for every participant, and this was broken down into three digestible stages for participants to have adequate time in fulfilling the tasks of the design brief. Up to twenty minutes was delegated for participants to be introduced to the exercise and to be briefed in what is expected of them. An important element in briefing the design task was ensuring that they can grasp how the design criteria and the guidance structure of the design model may influence the way the action plan is written. It was possible for participants to interpret that once they have been given a list of design criteria to cover in their response through the action plan, that they must now identify how the design model precisely categorizes their response to each design criteria. Namely, this was assumed in the context of reading that the intended purpose of the model is as a guide to assist in 'developing' their action plan, and interpreting the term developing, as a direct connection to how the design criteria should specifically be made to *fit* the illustrated design process given to them.

The assumption made on the part of the participant could have persuaded them that the purpose of this exercise is to see how well the scripting of the action plan fits into their given design model, rather than testing how well the model supports the creative response writing that aims to address the design criteria outlined in the task.

When the participant first grasps the premise that the eight design criteria listed in the design task will be foundational to their action plan, they would be enabled in this understanding to first channel their creative insight and thoughts about how the self-management programme is broken down into the criteria components. When the participant had a good grasp of how the management programme itself could be articulated through the design criteria, the design model could then act as a supportive guide alongside for making sense of how the design criteria is addressed. The test in this frame of perspective is then correctly to determine whether the model is applicable and effective in supporting the participant's own response to the design criteria.

Through the exercise then, the design model was assessed as a methodology for how it facilitates the participant's creative response towards the criterion required by the design task.

The writing time delegated for scripting the action plan was twenty-five minutes, though this time could be flexibly extended to around thirty-five minutes if participants completed the self-evaluation form in less than fifteen minutes after the action plan was completed. From the duration of the writing time, the test participants would have been briefed on the purpose of the exercise and had a period to absorb and think through the context and issues that lay ahead for designing the self-management programme. The participants would have been able by the beginning of the design task to frame and envision what the service could be from an outcome perspective and an operational perspective with the briefing information derived from the healthcare professionals and community resource team.

Having acquired this knowledge, the participants could start drafting their ideas as to how the management programme could be designed; taking into account the eight design criteria recommended for planning the project in retrospective.

Each criterion could be applied in the action plan as subtitles and subject themes for the participant to use to articulate their responses. For example, to address the understanding of current shortcomings, the participant may wish to refer directly to the service problems highlighted in the design brief as part of their response. They may also refer from their own knowledge and experience in their working practice for a self-management programme or current service of that kind. Alternatively, a participant may categorize the planning of their action plan differently with their own themes and headings and may within those headings address several design criteria at the same time. One could refer to their given service design model and specifically structure the action plan around the design process and stages as illustrated, and thus make the connection of how each stage of the model diagram addresses specific design criteria. In the design exercise pack participants were given a double-sided template for drafting the action plan, and within is a note on the top row explaining that participants are permitted to reference specific processes or project stages outlined in their given design model as is relevant in their thinking.

This has been used to evidence the support a design model gave towards drafting the action plan and that crucially in one way or another, the action plan qualitatively references the design model's processes to addressing specific design criteria. Although the assessment of this evidence does not form complete conclusions as to how a design model has been applicable and effective to addressing the design criteria, it does demonstrate in terms of a written reflection of the thinking processes involved, that the model was applied and incorporated through the participant's creative engagement.

Aside from the design brief, the action plan template and one of three service design models assigned to each workshop pack, the final component included is a double-sided self-evaluation form. The self-evaluation form has the intended purpose of enabling participants to evaluate how the design model specifically supported their action plan in addressing each design criteria given from the design brief. This was conducted through a Likert Scale range of one to seven, assessing how the model helped the participant address each of the eight design criteria in the adjective terms of *in/applicable*, and *in/effective*. On each side of the page is a section asking participants having completed the action plan; had they referred to or followed the design model process given to them, to evaluate through a Likert Scale how applicable it was to addressing each of the given design criteria, and likewise how effective it was to write those ideas clearly.

Each design criteria are subsequently evaluated from a Likert Scale range by each participant of the design exercise to determine how their given model is appraised in the context of the two variables of applicability and efficacy. A completed evaluation form established two sets of non-parametric data for each design criteria and these were used as part of benchmarking how applicable and effective was a given design model in helping a participant to address in any way, the criteria within their action plan. A qualitative analysis of the completed results is commented in the next chapter explaining analysis of the written action plan narratives, in addition to an analysis of non-parametric data concerning the evaluation of the three design models.

5.3 Deployment of design models and the factors analysis tool

This section outlines how the exercise is conducted with the participatory groups. A flow diagram illustrating the model deployment process that includes the evaluation of the design model is shown in Figure 5.2. The process for testing the design models begins with disclosing an introductory invitation to all participating members, which consists of a one-page document outlining the purpose of the action-plan exercise. The parameters and requirements of what is expected from the design brief and the action plan is then introduced along with a paragraph explaining the inclusion of a service development model and how that may be used to help construct the action plan.

The final paragraph explains the purpose of the exercise, making clear about examining how the participant would assess the efficacy (quoted as 'impact') and applicability (quoted as 'relevance') of using a design model to visualise the nature of the design process for developing a self-management programme. The assessment of the two benchmarking variables is communicated through the rating of those variables in relation to a given design model, and this was to be done through the evaluation form after the action plan was completed during the exercise.

This document is addressed to two main participatory groups encompassing healthcare professionals, and non-medical professionals. The groups are differentiated through specific wordings in the opening line of the cover letter to produce two versions to address the two participant groups. However, the general content as explained about this document remains uniform and unchanged to ensure clarity and consistency about what this test exercise entails.

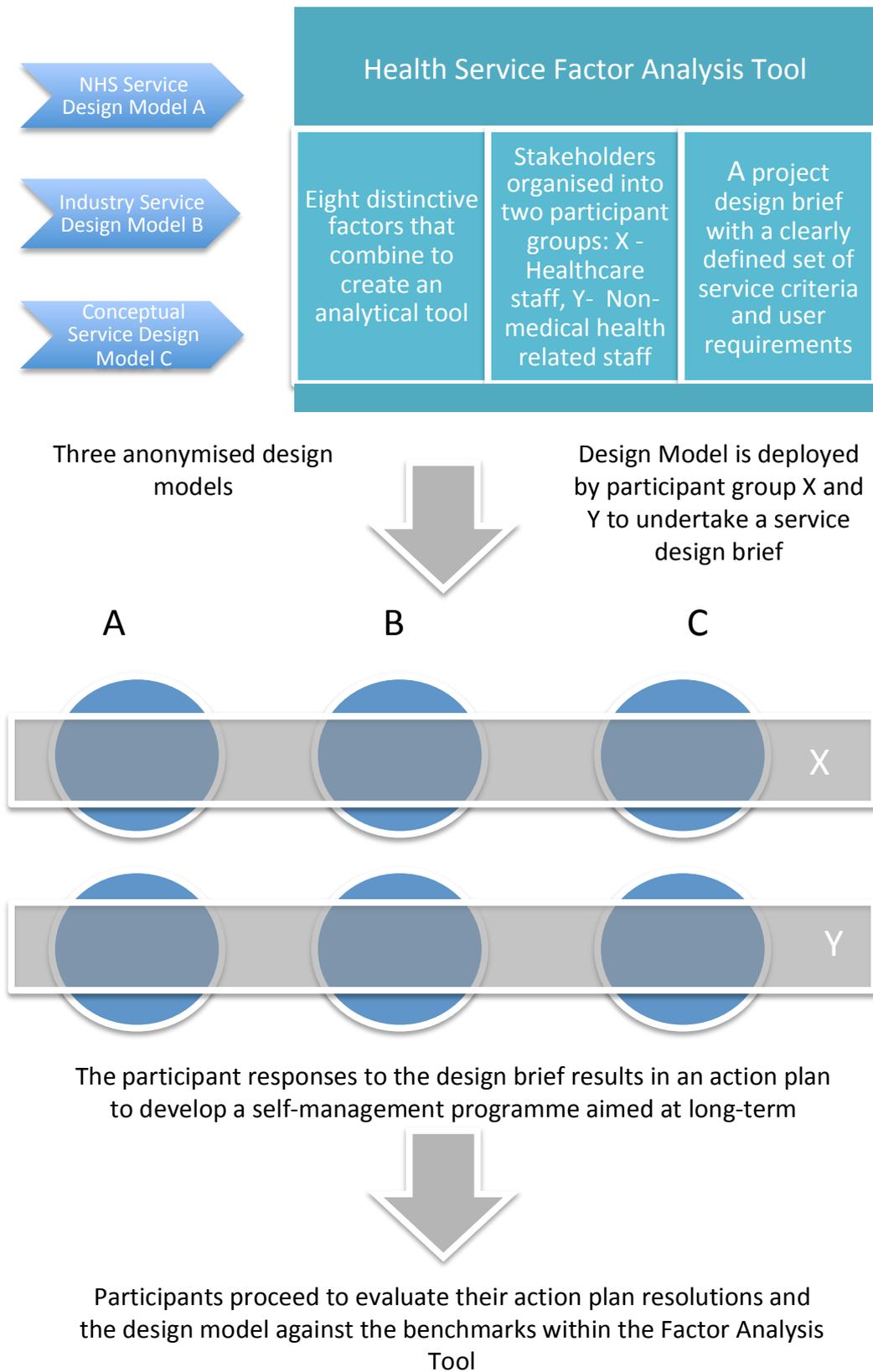


Figure 5.2 – Flow diagram depicting the deployment of the design brief exercise

The cover document is disseminated to participant members of the University Local Health Boards including Hywel Dda ULHB, and Abertawe Bro Morgannwg ULHB. Prior approval and selection of members is confirmed from a senior member of each Health Board. For Hywel Dda, this was through Keir Lewis who is the head of research and development and for Abertawe Bro Morgannwg, through Andrew Phillips who is Head and Director for Therapies. Healthcare Professionals within the Health Boards responded in kind having read the cover document, and those who were willing to partake in the exercise made individual arrangements for an available time to take part. The time required for preparing an available timeslot for every Healthcare Professional was a minimum of six weeks; a policy that applies to both University Health Boards regarding delegating time to undertake research conducted outside of the remit of NHS sanctioned research practices. For those invited to take part from the Abertawe Bro Morgannwg ULHB, a central venue within their Research and Development Department in Baglan, Port Talbot was booked to facilitate the action-plan exercise whilst for members from the Hywel Dda ULHB a similar venue was booked based in Prince Phillip Hospital in Llanelli, Carmarthenshire.

Concerning the non-medical professionals, the invitational cover document was sent through and the deployment was conducted in the members' worksites with the researcher visiting respective premises at arranged times to conduct the exercise.

To deploy the Design Models with the help and engagement of clinicians and non-medical professionals, an Ethics Approval Form was submitted and approved by the University. The form, which can be referred to in 11.1 of the Appendices chapter, sets out clear guidelines for handling primary data, which may contain confidential information. The ethics proposal for this research had to acknowledge and comply with specific ethical guidelines regarding healthcare research conducted within the NHS environment.

To begin the deployment, a workshop pack containing the design brief, action-plan template, evaluation form and the service design model is given to the participant and a briefing session from the researcher reiterates what the explanations in the cover document. Each workshop pack is given a unique code on every page of one pack containing a workshop pack number (starting with 110-1 and ascending to 110-2, etc.) to differentiate the responses of each participant, and a corresponding code to differentiate which participant group the candidate is classified.

For participants who are Healthcare Professionals, the corresponding code next to their participant number would be the initials 'WT – HCP' which stands for Workshop Test – Healthcare Professional. For non-medical professionals, the initial 'WT – NMP' is used, standing for Workshop Test – Non-Medical Professional.

A total time of up to twenty minutes is delegated to the participants to read the design brief and ask any questions they may have that needed clarity over the nature of the exercise. The written action plan combines with the evaluation form, as all participants complete the exercise once both aspects of the workshop pack are completed. A guideline time frame of one hour is applied as a general time frame to the exercise.

Completed workshop packs are subsequently organised and separated into the two participation groups, and the data extracts from each workshop pack undergo both thematic, and statistical T-Test analysis to underpin the findings in relation to the performance of each design model tested.

The first type of analysis involves investigating how the written content of a completed action plan use of the given service design model. This was analysed through searching for and highlighting written expressions of evidence that the model guided the thinking process and narration, on how a design project for a self-management programme ought to be planned.

In the case of action plans written by Healthcare Professionals, the evidenced written expressions may come in specific medical terms, and that they point towards specific design-related actions that demonstrate coherence or references to what a design model advocates at a stage of the design process. This can also apply for terms that may not be medical specific but contain their meaning in an activity or resource that the design model specifically advocates for in the planning of a new service.

Any qualitative references that are associated with the labels of the design stages as illustrated on the three design models tested, are recorded as qualitative evidence to addressing the design criteria within the action plan. This also applies to explanations illustrated in the breakdown of the design stages to articulate how the model's processes are used to address the design criteria as required by the design brief.

The second type of analysis involved investigating how the non-parametric data as generated by the Likert Ratings in the completed evaluation forms reflects on how supportive each design model was in addressing the design criteria for each participant.

In this case, the ratings regarding how applicable or effective the model was in helping to address each of the eight design criteria gives an indication whether the participant feels the criteria was addressed adequately or not. Where a design criterion was rated highly (given a Likert rating of between five and seven) for how well a given design model helped to address the factor, it was useful to further trace how that specific criteria was addressed in written form. This refers to the qualitative analysis of the written responses to identify the connection regarding how exactly the model was effective or applicable to address a criterion. Likewise, where a design criterion was given a low to average Likert score (a rating of between one and four), it is just as useful to investigate how that score links to how a criterion may not have been addressed as well qualitatively speaking compared with others.

The qualitative evidence pointing to a weak Likert rating may be associated with a lack of written content compared with other criteria in the action plan, or the lack of written associations to do with the actual design criteria.

In summary of this chapter, the process for testing and benchmarking the applicability and efficacy of three selected service design models requires participants to understand the context and requirements of the design tasks outlined in the design brief. This understanding is necessary in order to adequately respond and address the design criteria.

The test results from analysing both the qualitative written action plan and the non-parametric data is used to reflect how well each of the design models fared when benchmarked against design criteria. As mentioned, the design criteria established within the design brief are design factors considered important in the development of a new healthcare service as when a project is planned with the goal of delivering service-oriented outcomes.

Having used the design factors and translated them into requirements through the design brief, the focus of how applicable and effective the design models contribute to the addressing of these factors became assessable through the written responses of participants. The next chapter focuses on the analysis of the qualitative written texts and how the evaluation based non-parametric data combine to establish how each of the tested design models fare when benchmarked against each design criteria. Each design model is evaluated for how applicable and effective they are in addressing each criteria having analysed the two key sets of data, and seeks to establish whether or not a particular model is distinguishable as a stronger supportive model compared to the other two models tested in this research work.

5.4 Selection of participant groups

The selection process to determine which participants would have an interest in participating in the testing of design models commenced through consultation with senior directors of two local Health Boards covering South West Wales, namely Abertawe Bro Morgannwg University Health Board, and Hywel Dda University Health Board. Key members of contact within the ABMU Health Board included Hamish Laing (Medical Director) and Andrew Phillips (Director of Therapies and Health Science), whom assisted in forwarding a workshop briefing and invitation to Health Therapists, Health Scientists and psychologists working within the Health Board to participate in the exercise. Their referrals prompted interest from a range of specialists including learning disabilities services, ophthalmology pathways, and lymphedema clinical lead to partake the test. From the Hywel Dda University Health Board the director of Research and Development, Keir Lewis referred the briefing to members such as the Chronic Conditions Management team and specialists in the pathology department whom he determined to have an interest in innovating and developing their Health Boards' services.

In addition, Hywel Dda University Health Board were at the time of consultation (November 2014) seeking to re-apply for University Health Board status, and therefore were particularly keen to engage in research regarding the developing methods of creating healthcare services.

Having developed the design brief and established the design factors to benchmark the applicability and efficacy of selected service design models within the NHS Local Health Boards in South West Wales, it was important to involve them as participants in the context of their own efforts in developing services with high quality of care.

It had been established that both Health Boards were involved with developing better pathways for managing patient health and that these initiatives carried a necessary requirement for creating long-term development plans and strategies for reaching long-term service targets and improvements.

On-going projects include the Change for Better (C4B), part of an ABMU Health Board wide strategic programme and is one of twelve strategic initiatives designed to meet operational and corporate requirements for its services (Abertawe Bro Morgannwg University Health Board, 2013). The Change for Better project initiative encompassed two main pathways considered for service improvement and development, namely the Health Board's community health services and its hospital services. Both those types of services were given a project initiation document to enable the Programme Board and relevant stakeholders involved in those projects to understand their specific project briefs, their aims and expectations, and the tasks that would be required to develop and create the services expected. Like the nature of this research exercise for testing design models, the design brief follows parallel principles with what the Health Board disclosed to their Programme Board members. Examples include topics such as 'milestone objectives', 'project organisation and structure', and 'method of approach'; all of which are similar in principles with the design criteria that test participants have to consider when scripting the action plan for this research. It is therefore reasonable to presume that stakeholders taking part in the Health Board's projects have an appreciation of how important these tasks help in guiding through to the deliverables of a project.

Hywel Dda University Health Board have set out three yearly research and development strategies between 2009 to 2012 and 2014 to 2017 (Hywel Dda University Health Board, 2014).

Within the document covering the latter period, the Health Board has specifically stated that it will provide active support to research participants regarding training for research design that covers aspects such as research methodology, analysis techniques and handling different types of research data (Hywel Dda University Health Board, 2014).

This statement of support is tied to the Health Board's strategic direction for all of its research development practices and guiding principles, and to reiterate the collaborative nature of working towards its research aims and objectives together with the Welsh Assembly Government and the National Institute of Health and Social Care Research. Their goal for establishing all the encompassing research components centres on the commitment "to supporting high quality health and social care research to improve the health, well-being and wealth of the people in Wales" (Hywel Dda University Health Board, 2014). Based on the strategic directions outlining how research bridges the connection between service innovation and improving quality of life, the Health Board supports a desire to implement a positive research culture that appreciates the importance of laying appropriate research foundations. These foundations came in the form of a work plan to utilise best practice guidelines to inform service development, in addition to particular action plans linked to increasing the engagement of service users in the development of innovative research.

Across both participant groups, a total of twenty participants displayed interest and took part in the action plan exercise.

In the process of selecting participation groups, it had been observed that the contextual nature of the design brief would not hinder a participant with a non-medical background to take part. Given that the design brief outlines what a self-management program entails, in addition to a set of highlighted problems and issues, it was deemed as adequate information for a participant to respond to the requirements of the design task.

The explanations and processes as expressed within the tested design models do not contain specific terms relating to profession and has been written with generic terms such as the 'creative process' of generating, testing and delivering new ideas. It is worth noting that the discrete lettering given to the design models eliminates bias regarding any prior knowledge they may be able to recollect from an experience dealing with a similar ideation exercise.

Another critical element of the design task that potentially causes a disparity or differentiation in understanding the design task between healthcare professionals and non-medical professionals concerns the specific requirements relating to the action plan. In the instructions given at the bottom section of the design task, participants are instructed to write how they propose to address the given key design criteria, using a combination of their own experience or knowledge and the information given from the design brief. There is specifically no requirement to design and plan out what the service could conceptually be manifested, so a participant does not require a high level of knowledge how this self-management programme is going to be operated. Therefore, the focus of the action plan response magnifies how the design criteria are to be addressed, none of which carry terms or interpretations that is oriented towards a profession.

Nevertheless, addressing those key criteria can incorporate medical terminology if the participant so wishes. Specific terminology used within the action plan demonstrates a profession-led understanding of how key aspects of a healthcare-oriented service are planned, tested, implemented, or evaluated.

These specialist terms help create a holistic understanding from an outside observer for how a healthcare professional for example, is guided and lead in their creative thinking process.

They may use specific themes and labels to make critical connections between addressing the criteria in the design brief, and how a given design model supports the realisation of responding to a criterion deemed important in the creation of a self-management programme. An action plan that incorporates specific terminology demonstrates clear evidence of a knowledge base developed from a participant's profession.

The participant group of non-medical professionals consists of individuals who are part of the staff in research sponsor Med-Co Europe, or who are working in a design-oriented environment through a creative capacity. The rationale for the selection of staff personnel from the industrial partner is in part due to their importance in conceptualising the new design model.

Thus, their involvement in the design brief exercise enable the group to evaluate the conceptual model against the criteria of the design factors, and so therefore can assess the performance of the model having co-produced the processes that constitute the new concept. Their participation assists in developing the overall contribution to knowledge that in turn, could then be utilised to further develop their innovative capabilities and practices from both an operational, and enterprising perspective. On the other hand, participants who are not associated with the industrial partner have expertise with a creative design process, and are considered to be competent in making sense of the cognitive processes involved in the activities of designing services.

The next chapter presents the analytical findings of identified themes from the deployment exercise. The analytical report of the thematic analysis undertaken from the participant workshop data set establishes critical findings on thematic patterns and meanings that serve to theorize on the deployment of design models in relation to their applicability and efficacy.

The narrative reporting of the thematic analysis forms a logical and coherent analytical account of the identified themes that provides compelling causal explanations in relation to the performance of the design models. The assertions made about the theoretical factors contributing to effective deployment of the design models serves to validate the underpinning of the key contributions to knowledge, and that the methods used to produce the analytical claims justify the merits of the theoretical assertions being made about the applicability and efficacy of design model processes in the contextual domain of healthcare innovation.

6 Thematic Analysis of Data Extracts

6.1 Introduction

The previous chapter summarises the methods to establish how three selected design models influenced the ideation process in response to a product design specification within a design brief. The chief aim of the deployment workshops is to generate a qualitative narrative that assesses the influence and impact that design models have on the processes concerning healthcare innovation. The completed action plans are then coded within the data extracts for themes surrounding the permissiveness of causal factors that contribute critically to the service design process.

This chapter describes the analysis report of the themes that have been theorized and can thus interpret the thematic patterns from the extracts. The identified patterns and meanings contribute to assertions about the performance of the design models, as extrapolated from the participants' claims.

There are two key areas of analysis that is undertaken to generate themes and their assertions regarding the applicability, and efficacy of the design models. The first part identifies the determinants and causal explanations indicating evidences of positive support and guidance from the design model. The evidences are demonstrated within the action plans and their evaluation responses to the workshop process. The data extracts from those two sources form the basis for which coded themes highlight observations relevant in addressing the research hypothesis. The second part involves theorizing the data findings from the statistical T-Test, to identify the significance of the performances from each of the three design models under the deployment of the factors analysis tool.

The statistical significance findings help to underpin the participant's written comments about the design models and where applicable, how the model influenced their responses to the design brief requirements. The findings are used back up the observations made about the models considering the factors analysis. This then forms an overall assessment about their performance in relation to the research question.

The analytical narrative and thematic analysis over the participant responses from the deployment workshop is drawn from the following sources:

- Participant responses to the design brief through a written action plan that addresses the product development specification as outlined in the brief
- Participant evaluation of the workshop process and if applicable, feedback on the use of the design model in addressing the design brief

6.2 Coding process and development

The coding process is initiated when transcriptions of the action plans from the participant groups are collated and organized in a manner that separates the responses according to the design models tested. Definitions about how the transcribed data is organised therefore helps to make sense of the data structure, in which the interpretive process of theorizing the performance of the design models begins.

The *data corpus* is therefore expressed to describe the entire set of action plan responses across both participant groups, with twenty in total. Within the data corpus are *data sets* that organises participant responses according to the specific design model included within their workshop packs, and thus there are three data sets reflecting two models from the literature and the conceptual model. Within each data set are the individual responses from each participant and is referred to as a *data item*. The coding process thus ensures that each data item is comprehensively analysed considering the generated codes, as well as identifying the prevalence of each code between the data sets. In this way the themes that are developed from the codes are consistent with the analytical claims being made and can be evidenced using the illustrative extracts drawn from the data item.

The coding process aligns with the theoretical interpretative approach in explicitly coding with the research hypothesis in mind (Braun and Clarke, 2006, pp.89), as explicated in section 2.2c over the method of thematic analysis. Generated codes in this context refer to tendencies and patterns that illustrate factors affecting the design of services, as reflected from each of the participants having interpreted the data item and sought for prevalence across each data set. A list that outlines the generated codes used to theorize about the causal mechanisms behind the conceptualisation of ideas articulated within each of the data items is shown in Figure 6.1.

Generated codes
Code 1 – In control of wellbeing and decision making
Code 2 – Positive service outcomes
Code 3 – Defining service criteria
Code 4 – Stakeholder mapping and identification
Code 5 – Establishing user requirements
Code 6 – Conceptualisation of ideas
Code 7 – Appropriating project resources
Code 8 – Identifying current shortcomings
Code 9 – Referral to past and existing case studies
Code 10 – Testing potential solutions
Code 11 – Project and process visualisation
Code 12 – Creating a rationale and case for innovation
Code 13 – Iterative development of ideas
Code 14 – Locating underlying motivations and agenda
Code 15 – Evaluating new measures
Code 16 - Defining responsibility

Figure 6.1 – Table listing the thematic codes generated from the data extracts

A total of sixteen codes are identified from the coding process and thus interpreted thoroughly over each of the data items, which includes an analysis of their prevalence in demonstrating a patterned thread of meaning over data items across each data set. Each code represents a causal structure that when interacted by stakeholder agents, transforms or reproduces outcomes (Fleetwood, 2014) that are conducive to the development and realisation of innovative solutions.

Just as the design factors from the factors analysis tool are used to inform the analytical assessment of the design models, the generated codes in the thematic analysis are also driven towards an analytic interest about the performance of the design models from the transcribed data items. The themes developed from the codes are in one sense, another perspective alongside the analytical findings from the factors analysis that informs the causal explanations regarding the applicability and efficacy of the service design process. The theoretical explanations provided in the analysis of the themes and their underlying conceptualisations about the design process ensure the merits of analysing latent themes across the data corpus in relation to the research question is validated. The fully transcribed data extracts from each of the research participants can be referred in section 11.3 of the appendices.

6.3 Mapping of themes

The themes identified in the research explicitly examine the underlying causal mechanisms interpreted within the manifest content of data items across the data corpus. Each theme represents a broad interpretation over the theoretical explanations about the service design process demonstrated from a range of the generated codes. The codes are analysed to ascertain how they best fit towards the theoretical position of each theme, and this is undertaken by identifying how the extracts themselves delineate towards the interpretative level of the themes. The codes are then grouped according to the theme that corresponds to the themes' causal explanations, with the data extracts from each item arranged to establish a patterned analytic claim in the analysis reporting that evidences the prevalence of each theme (Braun and Clarke, 2006, pp.91). A visual representation of each theme and their associated codes from Figure 6.1 is shown in the thematic maps illustrating the categorized themes in the middle sphere of each map, from Figures 6.2, 6.3, 6.4, and 6.5.



Figure 6.2 – Refined thematic map for empowering of service users and providers

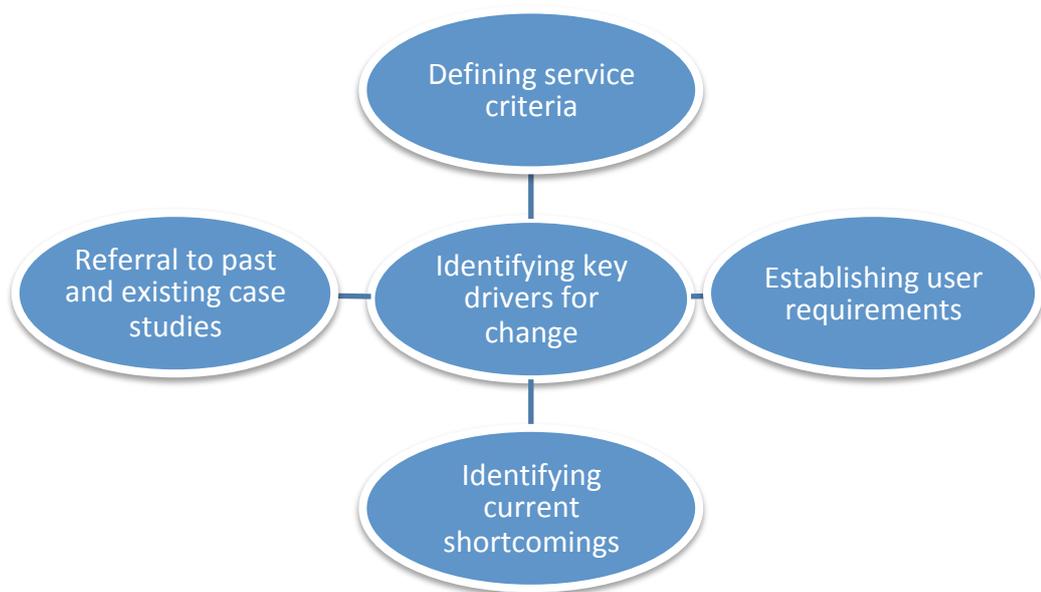


Figure 6.3 – Refined thematic map for identifying key drivers for change

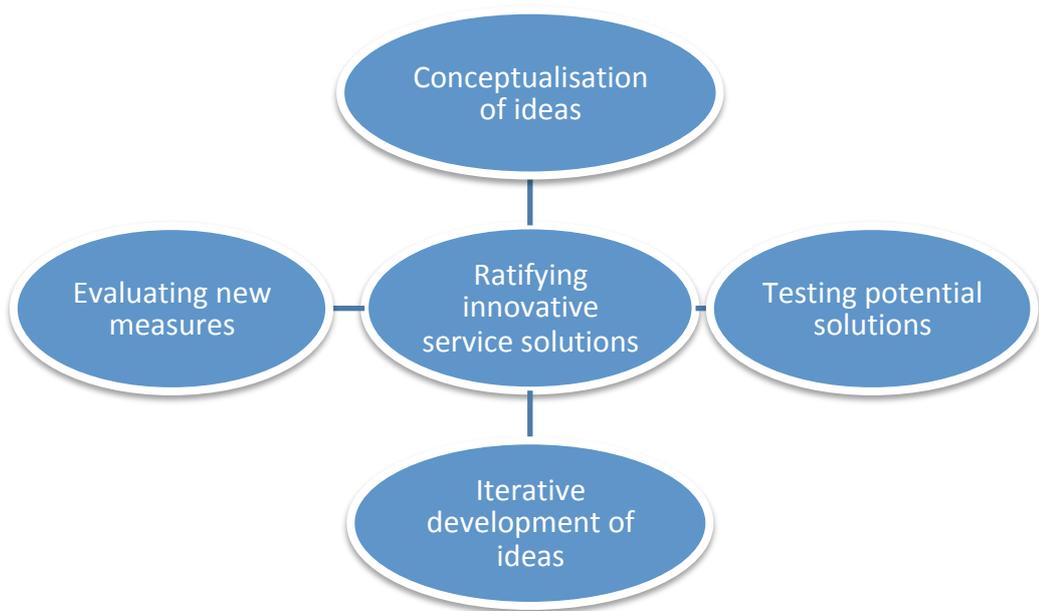


Figure 6.4 – Refined thematic map for ratifying innovative service solutions

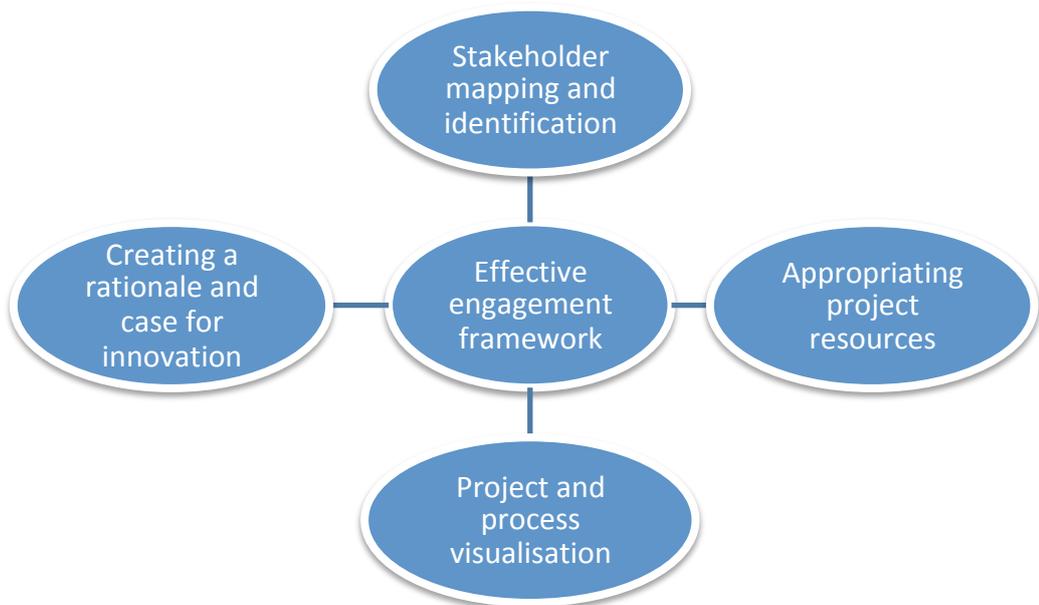


Figure 6.5 – Refined thematic map for effective engagement framework.

The thematic maps as illustrated in the figures have been refined to their current form by reviewing the coherence of the themes at the level of the coded extracts based on each data item, and also whether the maps reflect the patterns and meanings interpreted across the entire data corpus. Each of the themes defined in the thematic maps interpret the data extracts for what is of interest of them in relation to the applicability, and efficacy of the design process in assisting service innovation. The themes as defined and reviewed in relation to the data extracts and of the overall data corpus are listed sequentially below.

- Empowering service users and providers
- Identifying key drivers for change
- Ratifying innovative service solutions
- Effective engagement framework

Each theme is described and labelled succinctly to define what they are about in the context of the service design process, and to also denote its structure or agential impact to the design process. For example, the theme on effective engagement framework examines the structures that facilitate agential engagement in the design process as implicated within the data extracts. This theme forms an analytical narrative about the causal explanations as to why an effective engagement framework is important to the research participants, and how it then forms an assessment about how applicable and effective a given design process explicitly facilitates that kind of framework. Each of the themes also considers how its permissiveness plays across other case study influences that also consider the significance of its causal mechanisms. The four themes identified cohere to the predominant concept of creating a design process that is fitting for generating innovation in the healthcare context. Concurrently, each theme is distinct in the origination of its causal mechanisms and to the purposes of each mechanism towards different stages of the design process. The grouping of the codes within the themes gives clear indication as to the causal mechanisms that transform and impact upon the causal structures.

The mechanisms mentioned and explained within the data extracts then forms the focus of the analytic narrative, whereby the codes and themes extrapolated from each data set contributes to the theoretical assertions about each design model in regard to its performance in the design brief.

The subsequent sections contain the analytical narrative for each theme and are distinguished across four sections according to the design model used to inform the data extracts. Each thematic narrative contains an extraction and analysis of the theme across the three design models. A summary table that contain the key data extracts in relation to their coded categories is shown in the analysis of each design model. The purpose of the summary table is to also demonstrate the prevalence of a theme by including a range of prominent data extracts from across the data sets that highlight the significance of the themes' causal explanations. Each of the narratives tell about the broader theoretical assumptions regarding the applicability and efficacy of each design model in relation to the theme and refers to the thematic patterns found within the data extracts to explicate those theoretical claims.

6.3.1 Thematic analysis for the theme - Empowering service users and providers

The analysis of this theme concerns the causal structures that lend voice to the Stakeholder groups involved in the design process, with an emphasis on uncovering the agential influences that shape decision making and ownership over innovative solutions (Herzlinger, 2006). The prevalence of the theme apparent across the three data sets derive from the following codes found to interpret a consistent patterned response towards the theme across the entire data corpus:

- Having control over one's wellbeing and decision making process
- Conceptualising positive service outcomes
- Locating underlying motivations and agenda
- Defining and delegating responsibility

The generated codes grouped into this theme demonstrate causal tendencies and functional relations for expressing agential perspectives towards an innovative vision for the self-management programme. The coding process uncovers a range of initiatives that the participants envision would create the structures necessary to locate issues and opportunities within the design process. The critical aspect that is interpreted within the data extracts, is the primal consideration of the agent as an important influence in asserting what needs to be reflected and instigated upon to satisfy the requirements of the design brief. The transformative power of the users and providers for a service lies in the tendential impact for agents to challenge, and re-shape previously asserted ideas relating to conjunctions in best practices within the health service. The willingness to uncover and thus challenge underlying assumptions and conceptualisations about practices in healthcare is no more apparent than the approaches found in co-creating practices, giving increasing voice to the patient to understand the main focuses towards innovative interventions (Bertoni, Eres and Scanlan, 2014).

NHS Model Participants

Data extract	Coded for
<p>Where are we now and where do we want to be? (WT-HCP-110-2)</p>	<ol style="list-style-type: none"> 1. In control of wellbeing and decision making 2. Locating underlying motivations and agenda
<p>Ensure course ultimately improves clinical management of condition. (WT-HCP-110-5)</p>	<ol style="list-style-type: none"> 1. Positive service outcomes
<p>Create a task and finish group, agree to only meet a specified number of times and know what needs to be achieved in those sessions. (WT-HCP-110-5)</p>	<ol style="list-style-type: none"> 1. Defining and delegating responsibility
<p>Create a storyline of what has been successful or not. Is it economically feasible to continue? Are the benefits of the course, participant and provider worth it? Has it saved time and money, reduced admissions and given time back to clinicians? (WT-HCP-110-5)</p>	<ol style="list-style-type: none"> 1. In control of wellbeing and decision making 2. Positive service outcomes 3. Locating underlying motivations and agenda
<p>The self-management programme needs to be enacted within a co-creating health framework – it is not about ensuring compliance with clinician advice. SMS training will clash with medical consultation models. (WT-HCP-110-9)</p>	<ol style="list-style-type: none"> 1. In control of wellbeing and decision making 2. Locating underlying motivations and agenda
<p>Economic impact – Need to consider long-term impact and beneficial side. E.g. Impact reduced demand. (WT-HCP-110-9)</p>	<ol style="list-style-type: none"> 1. Positive service outcomes

Data extract	Coded for
An essential element would be to agree accountability of all stakeholders including patients, as well as outcomes and measures of programme benefits. (WT-HCP-110-11)	1. Defining and delegating responsibility
How often is medication not used from other reasons? (WT-HCP-110-13)	1. Locating underlying motivations and agenda
Need to appreciate benefits of patient compliance (WT-HCP-110-13)	1. In control of wellbeing and decision making 2. Positive service outcomes
Consult with patient regarding non-compliance of medical prescriptions / advice. This may be organised as a result of an admission to acute care. (WT-HCP-110-13)	1. In control of wellbeing and decision making 2. Locating underlying motivations and agenda
Create solution with patient with a view to allowing the patients to take control of their own care. (WT-HCP-110-13)	1. In control of wellbeing and decision making

Figure 6.6 – Codification of data extracts from NHS Design Model participants on the theme – empowering service users and providers

A summary table showing the relevant data extracts from the data set of the NHS Design Model process with their corresponding codes is shown in Figure 6.6. The patterns within the data set about having control of one’s wellbeing and their decision making can be ascertained firstly from the questions that are prompted in extracts from data items HCP-110-2 and HCP-110-5. Questions about where one wants the service to be, and about the benefits and feasibility of a developing concept are addressed from agential perspectives that have the power to determine how the development process generates

effective solutions. The underlying assumptions about the outcomes that are expected from innovative solutions, as suggested through the creation of a storyline in data item HCP-110-5, establishes the stakeholder requirements needed to ensure that decisions about wellbeing aligns with what the agents want. This thus uncovers the tendencies for the control of new outcomes, in that these must demonstrate a coherent specification that positively addresses implications, such as saving time and money, and reconciling time back to clinicians that may otherwise be lost through the inefficiencies currently prevailing. Secondly, the need for the programme to be deployed within a co-creating process as asserted in data item HCP-110-9 can be interpreted as a need for a theoretical structure to service development that aligns consistently to the objective of handing control and management of health back to the patient (Rygh, and Clatworthy, 2019). In relation to the model stages of the NHS Design Model, ensuring that stakeholder groups can adequately address ownership of wellbeing and of the decisions that affect wellbeing is especially important in the processes of 'exploration' and 'reflection'. These design stages will need to capture effectively the causal considerations and factors that tend towards empowering its agents to set standards for envisioning the new service.

The establishment of service measures that would innovate the outcomes delivered by a new service can be seen as a causal mechanism for defining the expectations of a service and therefore align towards the ownership of health and decision making. Identifying value driven outcomes such as with improved clinical management (HCP-110-5), and the consideration of both economic, and long-term impacts on service demand (HCP-110-2) will help inform the developmental phase for constructing the new service. For instance, the 'creation' phase in the NHS Design Model would consist of causal structures that enable positive service outcomes to emerge through effective conceptualisation and mapping of ideas.

The underlying motivations and agendas as interpreted from the data set explores underlying mechanisms that inform and affect agent actions and of their cognitive processes in making decisions about how issues highlighted in the design process can be adequately addressed. This could involve investigating existing structures and its conjunctions from questions leading to an assessment of the current state of service as proposed from HCP-110-2. It could involve challenging assumed practices that causally constrain opportunities to innovate health pathways, with a clear example being the opposing influences that the medical consultation model will have on a self-management-oriented approach to training and advice (HCP-110-9). The question regarding patient compliance is a clear causal mechanism towards empowering, or constraining stakeholder groups, with the data items in HCP-110-9 and HCP-110-13 implicating that compliance and non-compliance can have differing interpretations in relation to its enabling and constraining tendencies.

The extracts relating to the delegation of responsibilities for ensuring an effective engagement of the design process concern differing ideas about the structures put in place to ensure effective management of that process. The structures interpreted from the data set could include targeted expectations to frame engagement activities appropriately to ensure outcomes are achieved in the most efficient way (HCP-110-5). Another element would be accountability over the outcomes and measures that stakeholder groups must collectively take ownership over so that the service can be adequately monitored and further developed where necessary (HCP-110-11). This aspect of the theme would effectively empower stakeholder groups to deliver the measures of the new service in the implementation phase of the Design Model and reflecting on the measures to ensure an iterative cycle of development can be facilitated.

Service Design Model Participants

Data extract	Coded for
Understanding if your idea is what everyone feels needs to happen. (WT-HCP-110-8)	<ol style="list-style-type: none"> 1. Locating underlying motivations and agenda 2. Positive service outcomes
Engage with management – does this fit with strategic direction of the Health Board? (WT-HCP-110-8)	<ol style="list-style-type: none"> 1. Locating underlying motivations and agenda
Agreement from all stakeholders regarding – program goals, ownership, service requirements, agree the process of implementing, delivering and evaluating. (WT-HCP-110-8)	<ol style="list-style-type: none"> 1. Defining and delegating responsibility
Therefore, go back to the start of this model and understand – ensure stakeholder engagement remains positive, agreement remains, and further development of program continues. (WT-HCP-110-8)	<ol style="list-style-type: none"> 1. Locating underlying motivations and agenda
What makes them “stable” requiring no / less intervention. Asking clinicians and patients what “stable” means to them. (WT-HCP-110-14)	<ol style="list-style-type: none"> 1. In control of wellbeing and decision making
Look at current clinics – is there enough time for patients to be fully informed of clinical condition and importance of self-management (WT-HCP-110-14)	<ol style="list-style-type: none"> 1. In control of wellbeing and decision making
Support would need to come from management and full clinical team. Everyone needs to be on board and committed. (WT-HCP-110-14)	<ol style="list-style-type: none"> 1. Locating underlying motivations and agenda 2. Defining and delegating responsibility

Data extract	Coded for
Patient improving lifestyle / health and tackling their long-term condition - Depends on how important they find it – changes patient perception. (WT-NMP-110-15)	1. In control of wellbeing and decision making 2. Positive service outcomes
All stakeholders need to assess if or why patients do or do not concentrate on wellbeing. (WT-NMP-110-15)	1. In control of wellbeing and decision making 2. Locating underlying motivations and agenda

Figure 6.7 - Codification of data extracts from Service Design Model participants on the theme – empowering service users and providers

A summary table showing the relevant data extracts from the data set of the generic Service Design Model process with their corresponding codes is shown in Figure 6.7. The patterns within the data set about having control of one’s wellbeing and their decision making can be ascertained firstly in the mechanisms that would enable appropriate decision making, and mutual understanding in order to enable a controllable state of health (HCP-110-14). Another example from the same data item is the need to analyse existing structures and mechanisms that either enable or constrain factors that would help inform individuals about the importance of managing health. This assertion is similarly claimed from NMP-110-15, emphasizing the need to uncover causal explanations regarding why patients perceive their own health the way they do whether it enables or constrains having awareness of wellbeing.

The key pattern that is prominent in this data set concerns the underlying motivations and agendas. From data item HCP-110-8, there is an interpretative need for identifying agent agreement about how the service structure should be delivered.

The tendencies of agential agreement over the structure, can thus legitimise the adoption of ideas that lead to the outcomes desired from the causal structures that help unpack the service criteria in which causal mechanisms of agreement has been embedded. It is reflected also that the tendencies relating to positive stakeholder engagement and agreement over the design specifications would have enabling effects in developing the programme from the design brief further.

The assertions made from data item HCP-110-14 regarding the support and commitment required from the management, and clinical team in the design process can be interpreted as an indication of the causal powers within leadership level. The actions of leaders within the design process can influence commitment towards the development and delivery of a new programme, which also contributes to defining levels of responsibility towards championing the development phases required to support innovation.

How the leadership within the service influence the perception about managing health conditions is also a possible key mechanism for transforming lifestyle towards effective health management (NMP-110-15). This causal mechanism within the leaders to shape perception about managing health is helpful in the initial design model phases where the role and influence of stakeholders is being understood. Initial ideas that are generated can then be aligned towards the perceptions that the leaders advocate alongside patient and staff groups.

Med-Co Model participants

Data extract	Coded for
From organisation perspective, reduction in emergency admissions / episodes (WT-HCP-110-3)	1. Positive service outcomes
The Health Board wishes to enable and empower patients to best manage their own health and wellbeing, improving their quality of life and reducing hospital admissions (WT-HCP-110-4)	1. In control of wellbeing and decision making 2. Positive service outcomes
What are most patients' problems – what do they want to see or find more helpful? (WT-HCP-110-7)	1. In control of wellbeing and decision making
Who is driving this initiative? Where does the mandate come from? Is it in line with the Health Boards' objectives and the public health arena? (WT-HCP-110-12)	1. Locating underlying motivations and agenda
Patients understand clear guidelines and processes. They understand who they contact when problems arise. (WT-HCP-110-12)	1. In control of wellbeing and decision making
Set the programme running – consider who is monitoring the results and how they will be publicised. (WT-HCP-110-12)	1. Defining and delegating responsibility
Selecting the right personnel to deliver the new service and understand the evaluative process to continue improving and reviewing the new interventions put in place. (WT-NMP-110-9)	1. Defining and delegating responsibility

Figure 6.8 - Codification of data extracts from Med-Co Design Model participants on the theme – empowering service users and providers

A summary table showing the relevant data extracts from the data set of the Med-Co Design Model process with their corresponding codes is shown in Figure 6.8. The key observations about the patterns in regard to control of wellbeing and decision making come from exploring patient perspectives about the causal structures that affect their expectations. The data set further elaborates from this analytical claim towards the need to unpack how agential forces in the organizational structure define and make possible the desired service outcomes (HCP-110-3). Being informed of the guidelines and processes to access the right service pathways can help patients make informed choices about how best they can manage their health, emphasizing agential influence over the self-management of health.

In the context of interpreting motivations and agendas, the data set locates a need to identify tendencies that promote and facilitate the initiatives and mandates for service innovation (HCP-110-12).

Within the phase of delivering the program from the conceptual model, the interpretations from the data set focuses on the need to iteratively review and evaluate the structures that correspond to the desired outcomes (HCP-110-9). This would require the agents to familiarize with the tools and processes that enable the service to be evaluated, and further developed from the measures recorded.

6.3.2 Thematic analysis for the theme – Identifying the drivers for change

The analysis of this theme concerns the factors and processes required to explicitly locate the rationale for generating innovative specifications that lead to the further development of new measures. The prevalence of the theme apparent across the three data sets derive from the following codes found to interpret a consistent patterned response towards the theme across the entire data corpus:

- Defining service criteria
- Establishing user requirements
- Identifying current shortcomings
- Referral to past and existing case studies

The generated codes grouped into this theme relate to the underlying mechanisms and other external assessments of those mechanisms that help form a new criterion for conceptualising innovative measures. The coding process involved with this theme focuses on the creative domain where a wider picture of the potential in developing new solutions begins to emerge. The interpretations of the data extracts provide patterned meanings about specific measures that causally influence the conception stage in developing the service. A design process engaged in the conceptualisation of ideas will make reference to other similar iterations of the service model and use them as benchmarks if the criterion of a new service shares with it common goals. On the other hand, existing iterations of the service may be analysed for their shortcomings and issues that may, similarly, affect new services with the same causal mechanisms that contribute to barriers in service delivery. Therefore, the theoretical position towards the analytic narrative of this theme investigates both the enabling, and constraining mechanisms that inform factors supporting innovative practice in health service development.

NHS Model Participants

Data extract	Coded for
<p>How will we deliver this self-management programme – who will be involved? (WT-HCP-110-2)</p>	<ol style="list-style-type: none"> 1. Defining service criteria 2. Establishing user requirements
<p>Goal of customer and goal of service provider will differ. Identify both and have a clear list of priorities for both parties. (WT-HCP-110-5)</p>	<ol style="list-style-type: none"> 1. Defining service criteria 2. Establishing user requirements
<p>Every patient has contact of specialist nurse to assist in clinical aspects, but need one place where patient can contact regarding self-management (WT-HCP-110-5)</p>	<ol style="list-style-type: none"> 1. Defining service criteria 2. Identifying current shortcomings
<p>Attempt to have support from people already involved in delivering self-management course – identify their problems encountered and presume you will come across similar issues. (WT-HCP-110-5)</p>	<ol style="list-style-type: none"> 1. Referral to past and existing case studies 2. Identifying current shortcomings
<p>Need to understand existing self-management support programmes before designing a new programme (WT-HCP-110-9)</p>	<ol style="list-style-type: none"> 1. Referral to past and existing case studies

Data extract	Coded for
<p>Literature and caseload data highlighting poor management of chronic condition, data from outcome measures and service demand measures. (WT-HCP-110-9)</p>	<ol style="list-style-type: none"> 1. Referral to past and existing case studies 2. Identifying current shortcomings
<p>Purpose of the work from the service users' perspective – A mixture of questionnaires and semi-structured interviews will be developed to clearly ascertain users and their carer/family needs. (WT-HCP-110-11)</p>	<ol style="list-style-type: none"> 1. Establishing user requirements
<p>Entail studying current service demands. These will look at types and frequency of demand – They convey qualitative and quantitative elements. (WT-HCP-110-11)</p>	<ol style="list-style-type: none"> 1. Referral to past and existing case studies
<p>A wider stakeholder engagement would be the next step to ensure patients and staff from relevant health and social care, and valuable organisations could input to the development of the new design. (WT-HCP-110-11)</p>	<ol style="list-style-type: none"> 1. Establishing user requirements
<p>The problems of appropriate use of medication by the service user would be reviewed along with other aspects of “failure demand” that create more work for the service and reduce quality of life for patients (WT-HCP-110-11)</p>	<ol style="list-style-type: none"> 1. Identifying current shortcomings 2. Referral to past and existing case studies
<p>Anonymous questionnaire. How often is medication forgotten? (WT-HCP-110-13)</p>	<ol style="list-style-type: none"> 1. Establishing user requirements 2. Identify current shortcomings
<p>Work out what client wants / needs. What are the desired outcomes whether product, process or service, etc. (WT-NMP-110-1)</p>	<ol style="list-style-type: none"> 1. Defining service criteria 2. Establishing user requirements

Data extract	Coded for
<p>Visit clinics / places of work to get first-hand view of people's lives / problems / reasons for non-adherence to program. (WT-NMP-110-1)</p> <p>Identify the exact services required by the patient, and ensure the patient is well informed. (WT-NMP-110-13)</p>	<ol style="list-style-type: none"> 1. Identifying current shortcomings 2. Referral to past and existing case studies <ol style="list-style-type: none"> 1. Establishing user requirements

Figure 6.9 - Codification of data extracts from NHS Design Model participants on the theme – identifying drivers for change

A summary table showing the relevant data extracts from the data set of the NHS Design Model process with their corresponding codes is shown in Figure 6.9. The analysis of the data extracts within this data set focuses on the relational tendencies between agents whom transform a set of ideas about what a service needs to achieve, and the structures that synergizes benchmarks, literature claims, and stakeholder feedback to establish new service criterion and its requirements (Banerjee, 2008; Akenroye, 2012).

The task of uncovering both underlying and emergent factors in creating innovation can involve all stages of the NHS Design Model process, though from the theoretical interpretation of the data set the theme is prevalent over the three phases of 'exploration', 'creation' and 'reflection'. From the coded extracts it is apparent that methods for identifying agential interactions and perspectives such as questionnaires and structured interviews helps to conceptualise how the structures of criterion could be transformed (HCP-110-11). From the data item HCP-110-5, observation about the current structure may indicate a need to re-configure it to improve an important aspect of the service such as accessibility.

One factor put forward from the same data item suggests that the goals aimed for within the structure may be different and distinct from the goals set out by the agent. Thus, there is a possible need to search for causal explanations from mechanisms such as outcome evaluations, where data from outcome and service demand measures are used to evidence shortcomings in the existing delivery structure (HCP-110-9). Methods such as ethnographic studies into clinics and reviewing patient wants and needs provide appreciation for the underlying issues and factors that help to inform what the service requirements are, and what causal mechanisms are currently enabling or hindering the success of those requirements (NMP-110-1).

A prominent variable emphasized within the data set is the assessment of demand over a service that is an empirical observation over factors, such as a perceived increase in staff workload to satisfy the service requirements. An analysis of the demands placed on the current service, and how that informs future demand capacities is necessarily involved with reviewing the causal mechanisms that is driving demand towards sustainable levels, or to unsustainable levels (HCP-110-11)

The agent and their wants and desires are tendencies on a personal level that demonstrate causal influence over the criterion and requirements. Where the agent's voice and opinions are given appropriate disclosure within the design process, the transformational impact on the structures that define the requirements will be worth capturing effectively in the design process (NMP-110-1).

Service Design Model participants

Data extract	Coded for
<p>Identify issues that may impact the success, i.e. shift patterns, presentation of medication, and understanding of service user. (WT-HCP-110-1)</p>	<ol style="list-style-type: none"> 1. Identifying current shortcomings 2. Defining service criteria 3. Establishing user requirements
<p>What would be the issues to delivering given experience to date, or perceived problems? (WT-HCP-110-6)</p>	<ol style="list-style-type: none"> 1. Identifying current shortcomings
<p>Discuss with other areas and fields, who may already have a similar self-management programme; what they deliver, how they deliver, what were the solutions to problems and what problems remain?</p>	<ol style="list-style-type: none"> 1. Referral to past and existing case studies 2. Identifying current shortcomings
<p>Find information about other self-management programmes and what have been their problems and solutions? (WT-HCP-110-6)</p>	

Data extract	Coded for
<p>Engage with relevant people, i.e. those who have a chronic condition, carers both formal and informal, is there a program that can be used, people who understand and can identify with the health issues. (WT-HCP-110-8)</p>	<ol style="list-style-type: none"> 1. Establishing user requirements 2. Referral to past and existing case studies
<p>Find a baseline – identify the need, understand local issues, ask if it is necessary to make a change, undertake a literature review and within that understand the research and evidence that has already been done. (WT-HCP-110-8)</p>	<ol style="list-style-type: none"> 1. Identifying current shortcomings 2. Referral to past and existing case studies
<p>Questionnaire for clinicians and patients – Refer to clinical guidance such as NICE guidelines for example. (WT-HCP-110-14)</p>	<ol style="list-style-type: none"> 1. Establishing user requirements 2. Defining service criteria 3. Referral to past and existing case studies
<p>Prove that less clinical episodes equates to better use of resources. Needs auditing from perhaps a pilot study. (WT-HCP-110-14)</p>	<ol style="list-style-type: none"> 1. Referral to past and existing case studies 2. Defining service criteria
<p>Look at all clinical information that is collected. Does this give enough information for the clinician to advice patients adequately? (WT-HCP-110-14)</p>	<ol style="list-style-type: none"> 1. Identifying current shortcomings
<p>Management – understanding how to manage system to keep patients seen by same clinician through regular contact. (WT-HCP110-15)</p>	<ol style="list-style-type: none"> 1. Defining service criteria
<p>Management and Designers need to consider problems such as poor patient engagement, as some patients will not want the help provided. (WT-HCP-110-15)</p>	<ol style="list-style-type: none"> 1. Identifying current shortcomings

Figure 6.10 - Codification of data extracts from Service Design Model participants on the theme – identifying drivers for change

A summary table showing the relevant data extracts from the data set of the generic Service Design Model process with their corresponding codes is shown in Figure 6.10. The interpretative patterns for this theme across the data set similarly focuses on the causal mechanisms and agents to identify drivers towards innovative tendencies. Potential barriers to innovation through mechanisms such as shift patterns for staff, delivery methods for medication, and levels of engagement between patient and staff need to be sought in order for stakeholders to fully grasp the underlying issues that would need addressing (HCP-110-1). Using a baseline combining factors relating to demand, issues, innovating factors and review of the literature can help to articulate the tendential factors to innovate the service (HCP-110-8). From the same data item, there is prevalence in focusing on the experience and contingent perspective of patients who can identify with the health issues at hand. Their experiences can be captured and translated into transformative agents for example, in the form of interview transcripts and the transcribed content thus identifies drivers for innovation based on the captured experiences and first-hand accounts about the health condition.

The requirements for establishing new service criteria may not just involve referring to past and existing sources, but also the need for new research and studies to be carried out (HCP-110-14). For example, in order to demonstrate that having less clinical episodes as a patient equates to the better use of overall clinical resources. This would require devising a form of study that would uncover causal explanations that prove or disprove, the claims about better use of resources through a reduction in clinical incidences. A similar approach may also be needed to research other causal factors such as the sufficiency of information being disclosed to patients (HCF-110-14), or the efficacy in managing patients effectively to ensure regular contact with a clinician of the patients' preferred choice (HCP-110-15). The Model phase involving testing and simulating innovations as described a 'test and learn' phase in the design model is an important structure for stakeholder groups to

devise methods for testing discourses or hypothesis. This process generates effective explanations towards issues that would enable innovative criterion to be generated, and subsequently tested with the same hypotheses to measure the impact of the new criteria. According to data item HCP-110-15, the issue of poor patient engagement and the need to understand its underlying causes necessitates similar methods to be devised, to help consider what transformational mechanisms could alleviate a lack of engagement with staff in this instance.

Med-Co Model participants

Data extract	Coded for
<p>Resources to undertake assessment of need / demographic profile to inform future model / resource requirement. Innovative IT and information solutions included. (WT-HCP-110-3)</p>	1. Defining service criteria
<p>Patient questionnaires – what do patients and their carers want? (WT-HCP-110-3)</p>	1. Establishing service requirements
<p>Currently patients do not have a clear understanding of how to access appropriate medical care in a timely fashion. They do not have sufficient access to the nursing team to develop the necessary understanding on how to self-manage. There is evidence this results in poor compliance and additional hospital admissions. (WT-HCP-110-4)</p>	1. Identifying current shortcomings
<p>The current method for delivering, support and training is inadequate and either involves increasing nursing capacity or looking at different methods. (WT-HCP-110-4)</p>	1. Identifying current shortcomings
<p>Identifying other health care providers who have looked at this problem, and whether they have developed method of delivery. Visits to other providers may be helpful as well as literature around quality improvement initiatives. (WT-HCP-110-4)</p>	1. Referral of past and existing case studies

Data extract	Coded for
<p>Identify the patients' needs as to why they are failing to comply with the advice. Looking at re-admissions to hospital. (WT-HCP-110-7)</p>	<p>1. Identifying current shortcomings</p>
<p>Questionnaires or telephone surveys with patients to understand their experiences and what was happening prior to admission. (WT-HCP-110-7)</p>	<p>1. Establishing user requirements 2. Identify current shortcomings</p>
<p>Looking at quality assurance processes, peer reviews, national teams' input. Refer to other similar pieces of work developed for benchmarking and guidance. (WT-HCP-110-7)</p>	<p>1. Referral of past and existing case studies</p>
<p>At what point do patients enter the services? What kind of interventions are provided to patients at each stage of the clinical process from: Entry > Assessment > Engagement > Treatment > Outcome What do the outcomes look like? (WT-HCP-110-10)</p>	<p>1. Defining service criteria 2. Establishing user requirements</p>
<p>Present vision for the service and establish how this fit with the current state. This needs to be an appreciative and reflective process. (WT-HCP-110-10)</p>	<p>1. Defining service criteria 2. Establishing user requirements</p>
<p>Project lead engages service leads in realisation of new service model. Identification of what is required (define) is crucial at this stage. Concurrently develop methods and processes to do this. (WT-HCP-110-10)</p>	<p>1. Establishing service user requirements 2. Defining service criteria</p>

Data extract	Coded for
<p>Accessible information should be made available to all stakeholders defining vision, service change, and what everyone involved requires. (WT-HCP-110-10)</p>	<p>1. Defining service criteria</p>
<p>Arrange focus groups to ensure all views are heard – what are the issues? (WT-HCP-110-12)</p>	<p>1. Identifying current shortcomings</p>
<p>What is the vision for the self-management programme? What are the programme goals (can change at this stage)? (WT-HCP-110-12)</p>	<p>1. Defining service criteria</p>
<p>Look at numbers concerning how many patients with this chronic condition have exacerbations and are admitted to hospital? What are the projected costs if things continue the way they are at present? (WT-HCP-110-12)</p>	<p>1. Identifying current shortcomings</p>
<p>Need the answers from the stakeholders themselves as to why patients do not comply? In response, what does the new programme need in order to address lack of compliance? (WT-HCP-110-12)</p>	<p>1. Identify current shortcomings 2. Define service criteria 3. Establish user requirements</p>
<p>Review research literature and research strategies, covering what is currently out there – talk to other Health Board groups as to positives and negatives of similar groups. (WT-HCP-110-12)</p>	<p>1. Referral to past and existing case studies 2. Define service criteria 3. Establish user requirements</p>

Data extract	Coded for
Each of the stakeholders will or may interpret their service requirements differently, looking at different goals. (WT-NMP-110-9)	1. Defining criteria
Establish what the shared goals are between the stakeholders to develop delivery propositions. (WT-NMP-110-9)	1. Establishing user requirements

Figure 6.11 - Codification of data extracts from Med-Co Design Model participants on the theme – identifying drivers for change

A summary table showing the relevant data extracts from the data set of the Med-Co Design Model process with their corresponding codes is shown in Figure 6.11. The interpretative patterns being analysed in the data set focus primarily on the causal explanations over a range of shortcomings identified across the data set. These vary from causal explanations linked to poor compliance and associated admissions (HCP-110-14), inadequate support and training for nursing staff leading to unsustainable staff capacity demand (HCP-110-14), and understanding patients’ experiences prior to admission within the service (HCF-110-7). The phase ‘define’ within the Med-Co Design process is especially important from the coding process to establish project parameters to the new service, to present the new vision and what it requires from the service, and to determine the programme’s chief goals. Design tools for identifying causal mechanisms at the user journey level emerges within the data set and maps out from the perspective of the patient how stages within the service affect health outcomes. These tools are particularly useful to define and clarify the user requirements within the ‘discover’ and ‘define’ phases of the Med-Co model. Other tools such as data projections (HCF-110-12) and engagement with local Health Board groups assist in providing predictive indicators involving clinical incidences, and a wide perspective about what the service criteria means from the Health Boards in relation to particular strategies or studies conducted within their contexts.

The patterns of prevalence about the application of design tools is especially relevant within the 'develop' phase of the Med-Co design model, as these methods develop the initial criteria into service specifications.

6.3.3 Thematic analysis for the theme – Ratifying innovative service solutions

The interpretative patterns over the data set within this theme concerns the validation of innovative service propositions that have been proposed, presented and put forward for implementation. The prevalence of the theme apparent across the three data sets derive from the following codes found to interpret a consistent patterned response towards the theme across the entire data corpus:

- Iterative development of ideas
- Evaluate new measures
- Conceptualisation of ideas
- Testing potential solutions

From the coding process, the codes in large part facilitate creative input and its generative mechanisms that drive towards the development of innovative ideas. The theme alludes mainly towards the causal explanation of structures that gather, synergize or deploy useful design elements that make up the composition of specific solutions and models of service. From the data set are patterned meanings that express the agential interaction with structures used to create and test new measures. This theme is clearly distinct from the causal explanations behind drivers for change, as the theoretical position of this theme assumes that the design criteria and its user requirements have been clarified and used as a basis for beginning the conceptualisation and implementation of ideas.

NHS Model Participants

Data extract	Coded for
<p>Run a pilot of the self-management plan with a small group of patients then re-run the design model processes as previous again. Use satisfaction feedback surveys to get information within every design stage. (WT-HCP-110-2)</p>	<ol style="list-style-type: none"> 1. Iterative development of ideas 2. Evaluate new measures
<p>Using patient satisfaction surveys and other criteria such as exacerbation rates, continue to monitor the delivery structure. (WT-HCP-110-2)</p>	<ol style="list-style-type: none"> 1. Evaluate new measures
<p>Workshops including clinical management, project design and patient experience to determine service requirements. (WT-HCP-110-5)</p>	<ol style="list-style-type: none"> 1. Conceptualisation of ideas
<p>Understand and have a system in place that will allow anyone to communicate a suggestion, or a new idea. (WT-HCP-110-5)</p>	<ol style="list-style-type: none"> 1. Conceptualisation of ideas
<p>As a working group decide whether this will be something to try and implement, and a method for how to go about that. (WT-HCP-110-5)</p>	<ol style="list-style-type: none"> 1. Testing potential solutions
<p>A wider stakeholder engagement would be the next step to ensure patients and staff from relevant health and social care, and valuable organisations could input to the development of the new design. (WT-HCP110-11)</p>	<ol style="list-style-type: none"> 1. Conceptualisation of ideas

Data extract	Coded for
<p>The development of a steering group and implementation group would oversee the piloting of agreed approaches and the development of appropriate measures against the agreed purpose. (WT-HCP-110-11)</p>	<ol style="list-style-type: none"> 1. Testing potential solutions 2. Iterative development of ideas
<p>An essential element would be to agree accountability of all stakeholders including patients, as well as outcomes and measures of programme benefits. (WT-HCP-110-11)</p>	<ol style="list-style-type: none"> 1. Evaluating new measures
<p>Patient / Client / Professional interviews to ascertain scope of problem, to drive creative solutions. Work with design team brainstorming ideas / notes / sketches / plans as an ideation exercise. (WT-NMP-110-1)</p>	<ol style="list-style-type: none"> 1. Conceptualisation of ideas 2. Iterative development of ideas
<p>Present to client for constructive feedback with enough time before deadline to address any changes required. Refinement of solutions and propositions to ensure best possible solution is reached. Assess results with client, and redesign as necessary. Larger scale testing of the process to refine delivery before final implementation. (WT-NMP-110-1)</p>	<ol style="list-style-type: none"> 1. Testing potential solutions 2. Iterative development of ideas 3. Evaluating new measures
<p>Consult with patient periodically to reassess their needs in terms of the solution originally created and develop accordingly. Development and amendment to solution over time, to reflect a patient's on going / challenging needs. (WT-NMP-110-13)</p>	<ol style="list-style-type: none"> 1. Iterative development of ideas 2. Evaluating new measures

Figure 6.12 - Codification of data extracts from NHS Design Model participants on the theme – ratifying innovative service solutions

A summary table showing the relevant data extracts from the data set of the NHS Design Model process with their corresponding codes is shown in Figure 6.12. The data items highlight frequently the structures used to test a new programme, such as in the form of a pilot study, and organised workshops. On the other hand, structures that relate to the evaluation of the programme in the form of patient satisfaction surveys are closely linked alongside within the data items to stress the importance of monitoring the new structure as it is being implemented. Within the data set are causal explanations for the agreement of outcomes and measures used to evaluate all potential benefits of the new programme (HCP-110-11). These structures are engaged upon with various stakeholder groups and contexts within the service delivery in order to activate the agential influences that would continue to transform the service (HCP-110-15).

The structural tendencies that facilitate the emergence of innovative ideas require mechanisms that encourage openness and inclusiveness, so ideas are shared and extracted in a fluid manner. Specific mechanisms or tools such as interviews and brainstorming methods help to ascertain the scope of the issues at hand in addition to conceptualisation of ideas. The solutions within a health service should be developed with a clear understanding of the aetiology behind specific clinical conditions (NMP-110-13 / NMP-110-15) to ensure that the measures can be re-assessed and developed towards a continuous pathway that is the end goal of the processes within the theme.

Service Design Model Participants

Data extract	Coded for
Other safeguards could be developed as necessary, e.g. Protocols, guidelines, risk assessments and audit.	<ol style="list-style-type: none"> 1. Testing potential solutions 2. Evaluating new measures
Ensure consistency of approach and enable a route where problems / issues can be raised and dealt with rather than ignored. (WT-HCP-110-1)	
Has the service user benefitted and has the intervention been effective from the CLDT point of view. (WT-HCP-110-1)	<ol style="list-style-type: none"> 1. Evaluating new measures
Test programme to pilots. Evaluate pilots – What went well? What are remaining issues? Take back findings to working group and address remaining issues through redesign as required. (WT-HCP-110-6)	<ol style="list-style-type: none"> 1. Testing potential solutions 2. Iterative development of ideas 3. Evaluating new measures
Identify pros and cons to implementing this program. (WT-HCP-110-8)	<ol style="list-style-type: none"> 1. Testing potential solutions 2. Evaluating new measures
Implement agreed plan for training of trainers. Implement program review – review design, delivery and evaluation. (WT-HCP-110-8)	<ol style="list-style-type: none"> 1. Conceptualisation of ideas 2. Testing potential solutions 3. Evaluating new measures
Identify what worked well and what didn't work so well. Agree to adapt and change as required. (WT-HCP-110-8)	<ol style="list-style-type: none"> 1. Iterative development of ideas 2. Evaluating new measures
Prove that less clinical episodes equates to better use of resources. Needs auditing from perhaps a pilot study. (WT-HCP-110-14)	<ol style="list-style-type: none"> 1. Iterative development of ideas 2. Evaluating new measures

Data extract	Coded for
<p>Arrange focus groups involving clinicians and patients where appropriate. Introduce questionnaires to gain relevant feedback. (WT-NMP-110-15)</p>	<p>1. Conceptualisation of ideas</p>
<p>New ideas to be rolled out as 6-month pilot schemes – advertised to patients in a GP/Clinician referral. (WT-NMP-110-15)</p>	<p>1. Testing of potential solutions 2. Iterative development of ideas 3. Evaluating new measures</p>
<p>Arrange new protocols and policies, set up new information systems to support a continuous care pathway for trying to solve patient long-term condition. (WT-NMP-110-15)</p>	<p>1. Iterative development of ideas 2. Evaluating new measures</p>
<p>Take on feedback, possible issues to re-do design plan. There needs to be ways of improving or implementing new / different options if initial scheme doesn't work. (WT-NMP-110-15)</p>	<p>1. Iterative development of ideas 2. Evaluating new measures</p>

Figure 6.13 - Codification of data extracts from Service Design Model participants on the theme – ratifying innovative service solutions

A summary table showing the relevant data extracts from the data set of the generic Service Design Model process with their corresponding codes is shown in Figure 6.13. The data set considers the causal mechanisms that play an important role within the wider design process, by considering measures at the level of causal structures adaptable to continuous reproduction and transformation. Different measures are introduced within the data set that concern how the new programme is reviewed against the benefits and ongoing issues (HCP-110-8). The use of focus groups and pilot schemes are part of the broader structures for testing the new programme, where more specific mechanisms such as new protocols and information systems (NMP-110-15) provide the tangible structures for accommodating new measures within the programme.

Med-Co Model Participants

Data Extract	Coded for
<p>Repeat engagement event to test out hypothesis and ideas for further development. Draw upon information gathered to present a design brief – require sign up by the organisations’ board to mandate further implementation of the new service design brief. (WT-HCP-110-10)</p>	<p>1. Iterative development of ideas</p>
<p>Are there savings to be met that could resource the new programme? How will we know if these savings are being met? How can we ensure benefits are true benefits? Could other departments work together to be more efficient? (WT-HCP-110-12)</p>	<p>1. Evaluating new measures</p>
<p>Must ensure diligent steps are in place to see if the new self-management programme is working – what would the indicators be that it is working? (WT-HCP-110-12)</p>	<p>1. Iterative development of ideas 2. Evaluating new measures</p>
<p>Follow up stakeholder groups and make sure data / evaluation collected is rigid and robust. Ensure that effectiveness / efficiency / economic measures are noted for long-term vision setting. (WT-HCP-110-12)</p>	<p>2. Evaluating new measures</p>

Figure 6.14 - Codification of data extracts from Med-Co Design Model participants on the theme – ratifying innovative service solutions

A summary table showing the relevant data extracts from the data set of the Med-Co Design Model process with their corresponding codes is shown in Figure 6.14. The analytical focus from this data set is to identify the primary agents and tendencies that lead to effective implementation of the code's mechanisms. In the iterative development of ideas, the requirement is of agential commitment towards the implementation of a new programme.

The transformative agential tendencies towards producing innovative solutions from stakeholder groups who are mandated or vested into developing the programme is regarded as an important mechanism in relation to the theme. Financial tendencies and causal indicators towards successful and long-term outcomes make consideration of efficiency and economic measures [that would be continually evaluated to inform the long-term vision (HCP-110-12)].

6.3.4 Thematic analysis for the theme – Effective engagement framework

The interpretative patterns over the data set of this theme concerns the causal structures that effect how stakeholder groups communicate and engage over the design phases and steps within a design process model. The data extracts provide processes and resource based mechanisms that help stakeholder groups to make collective decisions (and thus causal mechanisms), over how the new programme is resourced, how its design development is observed and recorded, and devising engagement mechanisms that would help drive effective decision making over the operation and development of innovative services. The prevalence of the theme apparent across the three data sets derive from the following codes found to interpret a consistent patterned response towards the theme across the entire data corpus:

- Stakeholder mapping and identification
- Project and process visualisation
- Creating a rationale and case for innovation
- Appropriating project resources

The codes that are grouped into this theme have common generative and causal mechanisms that bring agential influences and interactions together into an effective engagement framework towards co-producing innovative solutions (Batalden, et al., 2016). A planned and strategized engagement structure is a critical component that affects the whole sum of phases within the design process (Berte, Pickham and Shluzas, 2018) as agential interaction is still a core proponent to the manifestation of ingenuity and collaborative working within service development (Donetto, Pierri, Tsianakas and Robert, 2015).

NHS Model Participants

Data extract	Coded for
<p>Who will be involved in educating patients and giving patient advice, etc.? Who will deliver what? (WT-HCP-110-2)</p>	<p>1. Stakeholder mapping and identification</p>
<p>Having run a pilot cycle of explore > create > reflect, explore and create the new deliverables designing from the results of the previous design processes. (WT-HCP-110-2)</p>	<p>1. Project and process visualisation</p>
<p>How will we decide how best to research the issues? Use above data including admission rates to determine any potential cost saving and use health impact questionnaires with patients to assess health benefits and weigh up against cost of service. (WT-HCP-110-2)</p>	<p>1. Creating a rationale and case for innovation</p>
<p>Acknowledge current problem of poor management equals readmission to secondary care. (WT-HCP-110-5)</p>	<p>1. Creating a rationale and case for innovation</p>
<p>Service requirements will depend on population budget, facilities and actual “experts” to deliver course. Understand staffing issue? (WT-HCP-110-5)</p>	<p>1. Stakeholder mapping and identification 2. Appropriating project resources</p>
<p>Create a storyline of what has been successful or not. Is it economically feasible to continue? Are the benefits of the course, participant and provider worth it? Has it saved time and money, reduced admissions and given time back to clinicians? (WT-HCP-110-5)</p>	<p>1. Creating a rationale and case for innovation</p>

Data extract	Coded for
<p>Clear statement of intent is needed to understand what the course needs to deliver on. (WT-HCP-110-5)</p>	<p>1. Creating a rationale and case for innovation</p>
<p>Provide structured training to course tutors and ensure everyone is providing the same service. (WT-HCP-110-5)</p>	<p>1. Appropriating project resources</p>
<p>Need to understand mechanism and resources for delivery, i.e. trained staff, time, locations, E-learning and face to face. Decide how many patients will need training and how they are to be recruited. (WT-HCP-110-9)</p>	<p>1. Appropriating project resources 2. Project and process visualisation</p>
<p>Need to understand levels of patient activation – who is suitable for the programme, all or some? Need to understand levels of clinician activation – amongst different clinical groups some may support therapists whilst some may not. (WT-HCP-110-9)</p>	<p>1. Stakeholder mapping and identification</p>
<p>Support for implementation – Needs leadership support for finance and permission granting. Needs peer support from clinicians. Needs both patient, and patient group support. (WT-HCP-110-9)</p>	<p>1. Appropriating project resources 2. Creating a rationale and case for innovation</p>

Data Extract	Coded for
There would be a robust, scientific basis to the next phase – A workshop(s) would enable the stakeholders to verify system purpose and consider the demands placed on existing services. (WT-HCP-110-9)	1. Project and process visualisation 2. Creating a rationale and case for innovation
Support staff time, admin help, recall of patients (WT-HCP-110-13)	1. Appropriating project resources
Identify team and resources available, budget available and time frame available. (WT-NMP-110-1)	1. Appropriating project resources

Figure 6.15 - Codification of data extracts from NHS Design Model participants on the theme – Effective engagement framework

A summary table showing the relevant data extracts from the data set of the NHS Design Model process with their corresponding codes is shown in Figure 6.15. The thematic patterns interpreted across the data set consist on the one hand, narratives that form the underlying motivation and rationale required to mandate a valid case for generating innovation in the first place. Secondly, a thematic pattern regarding how the design process is congruently planned and engaged among stakeholder groups is delineated from the material requirements and cognitive processes used to construct the design process. Thirdly, the questions within the data sets posed about the roles potential stakeholders have over the design process explicitly implicates a need to understand what role each potential stakeholder group plays within the design model process. For effective stakeholder mapping, agents interact effectively with the structures involved in informing patients, so to create transparent dialogue between stakeholder groups. The relational linkages between clinical activation and levels of support for therapists can be interpreted as the identification of stakeholders according to a more complex level of relational backing and support, which can have an impact on stakeholder agreement over the proposed specifications of a new service. In the context of coding for

appropriating project resources, thematic patterns draw regard to the causal structures that help to support implementation of the new service. Examples of causal structures identified from the data sets include the use of financial models, budget scaling, and training provisions for staff. Resources aside from financial or material means also cover mechanisms such as permission grants that determine whether certain criteria or objectives can be fulfilled subject to external permission guidelines.

The interpretative patterns alluding to creating a rationale and case for innovation include acknowledgement of current issues that implicate the need to investigate alternative or new avenues to redressing the problems at present (HCP-110-5). Creating storylines or business cases allows for causal motivations and other factors to be analysed and evaluated for their merits in justifying innovative measures (Wolstenholme, Grindell, and Dearden, 2017).

Service Design Model Participants

Data extract	Coded for
<p>What does staff need to support service user? (WT-HCP-110-1)</p>	<p>1. Appropriating project resources</p>
<p>Training awareness > deliver strategies and tools involving staff > reduce input with clear expectation from staff > ensure supervision structures in organisation / staff team are in place.</p>	<p>1. Appropriating project resources 2. Project and process visualisation</p>
<p>Support mechanisms from Community Learning Disability Team as required. (WT-HCP-110-1)</p>	
<p>Has the service user benefitted and has the intervention been effective from the CLDT point of view. (WT-HCP-110-1)</p>	<p>1. Creating a rationale and case for innovation</p>
<p>Possibly identify a number of patients with the condition and ask them who is involved in their care usually. Ask clinicians, 3rd sector groups and relevant others, whom would be involved in the decision-making process and possibly the delivery process. (WT-HCP-110-6)</p>	<p>1. Stakeholder mapping and identification</p>
<p>Develop a working group of representatives from both potential deliverers of the self-management programme and recipients, budget holders, workforce planning, quality assurance and governance bodies. (WT-HCP-110-6)</p>	<p>1. Stakeholder mapping and identification 2. Appropriating project resources</p>
<p>Ensure there is a need to drive this forward. (WT-HCP-110-8)</p>	<p>1. Creating a rationale and case for innovation</p>
<p>Understand cost implications, and resource required (WT-HCP-110-8)</p>	<p>1. Appropriating project resources</p>

Data extract	Coded for
Identify who are the stakeholders – engage and communicate regularly within good time. (WT-HCP-110-8)	1. Stakeholder mapping and identification
Engage with health/social care professionals – do they see the ideas as effective ways for supporting people?	1. Stakeholder mapping and identification 2. Creating a rationale and case for innovation
Engage with management – does this fit with strategic direction of the Health Board? (WT-HCP-110-8)	
Agree a business case and funding avenues. (WT-HCP-110-8)	1. Appropriating project resources 2. Creating a rationale and case for innovation
Agreement from all stakeholders in regard to – program goals, ownership, service requirements, agree the process of implementing, delivering and evaluating. Need communication plans. Identify training needs for deliverers of the program and its delivery structure. (WT-HCP-110-8)	1. Appropriating project resources 2. Project and process visualisation
Ensure content of the program is correct and accurate, relevant, and interactive based on a learning theory. (WT-HCP-110-8)	1. Project and process visualisation
Understand cost effectiveness, resource implications and financial models. (WT-HCP-110-8)	1. Appropriating project resources
Look at current clinics – is there enough time for patients to be fully informed of clinical condition and importance of self-management (WT-HCP-110-14)	1. Creating a rationale and case for innovation

Data extract	Coded for
<p>Identifying solutions that are achievable needs to include an interim stage between conception and delivery. This will ensure that ideas are not only realistic but also are appreciative of stakeholder opinions. (WT-NMP-110-10)</p>	<p>1. Creating a rationale and case for innovation</p>
<p>The model needs to appreciate actual implementation costs and whether they are scalable within budget, before pilots can be run and analysed. (WT-NMP-110-10)</p>	<p>1. Appropriating project resources</p>

Figure 6.16 - Codification of data extracts from Service Design Model participants on the theme – Effective engagement framework

A summary table showing the relevant data extracts from the data set of the generic Service Design Model process with their corresponding codes is shown in Figure 6.16. The interpretative narrative of the theme over this data set deconstructs the support mechanisms and delivery groups that make up the deployment mechanisms of the new programme. The resourcing mechanisms for the design process includes the strategies and training structures that may be immaterial but are significant causal structures that play an important role in managing the delivery process. The preparation for planning piloting sessions and other test facilities to develop solutions should also consider costing factors that influence the scale of the resources required (NMP-110-10).

For visualising the process, the data set denotes of supervision structures that clearly mark out the roles and responsibilities of each member within the new service framework (HCP-110-1). Coding implies a need for interactive features that enable stakeholders to make sense of the training material, and data visuals would form part of an effective visualising strategy for the design process. An emphasis on engagement mechanisms for involving different user perspectives and considering over the strategy of deploying innovative models

highlights the importance of the mechanism in clarifying the methods and approaches encompassing the solutions (HCP-110-8).

Coding for the rationale and case towards innovation within the data set identifies both the relevant agents who would be relevant in the delivery and decision making factors, and their agential tendencies that also underpin the innovation rationale (HCP-110-1 and HCP-110-6). The impact of agential tendency is evidenced through the need to investigate causative factors that impinge upon the benefits and importance of user behaviour, and its consequences on health outcomes (HCP-110-14). The solutions themselves also factor as tendencies towards an agreement over its acceptance and rationale towards further implementation. The data set identifies the need to engage over ideas in ways that capture stakeholder views to inform solutions for their viability prior to implementation (NMP-110-10). This phase of engagement over presented solutions would also ensure that the solutions are supported by the needs identified from the research phase of the design process, and thus generate agreement amongst stakeholders that would drive further development (HCP-110-8).

Med-Co Model Participants

Data extract	Coded for
Project management approach to provide structure, clear leadership and engagement, timescales and potential costs. (WT-HCP-110-3)	1. Appropriating project resources
Support from public health, housing and social care. (WT-HCP-110-3)	1. Stakeholder mapping and identification
The process mapping exercise would need to involve key stakeholders: Patients, staff and to some extent commissioners. (WT-HCP-110-10)	1. Stakeholder mapping and identification
Appoint an engagement team to develop engagement opportunities with key stakeholders, including staff, patients and commissioners. (WT-HCP-110-10)	1. Creating a rationale and case for innovation

Data extract	Coded for
Stakeholder involvement – identifying those who can play a positive part and those that may hinder. (WT-HCP-110-12)	1. Stakeholder mapping and identification
Define stakeholder plan, define what would be the real benefits of creating a scheme. Would there be dis-benefits / what are the dependencies, constraints and risks, etc. (WT-HCP-110-12)	1. Project and process visualisation
What do we need – do we need a business case? What will be needed to get the programme running? Who needs to be involved? (WT-HCP-110-12)	1. Creating a rationale and case for innovation 2. Project and process visualisation 3. Stakeholder mapping and identification
What will the future state look like? How do we get there? Who leads this programme? (WT-HCP-110-12)	1. Project and process visualisation
Choosing the right relationship contacts and shared understanding of the service envisioned. (WT-NMP-110-9)	1. Stakeholder mapping and identification
Will the relevant stakeholders understand and appreciate the appropriate tools to be used for designing the new service? (WT-NMP-110-9)	1. Project and process visualisation

Figure 6.17 - Codification of data extracts from Med-Co Design Model participants on the theme – Effective engagement framework

A summary table showing the relevant data extracts from the data set of the Med-Co Design Model process with their corresponding codes is shown in Figure 6.17. The thematic patterns interpreted over appropriating project resources suggests approaches such as in project management, can be effective causal structures to assist in the engagement framework. The approaches involved would help to define resource implications and agential influences within the engagement process (Rees, Cavana and Cumming, 2018), and thus forms an important part of the initial phases in planning for how viable solutions are developed beyond conceptions on paper.

The most prominent mechanism towards creating effective engagement over the design process is the effort mapping out key stakeholders and of their involvement in planning, commissioning, and delivering new interventions according to their relevant roles. The data set considers mapping stakeholders according to specific sectors and of its services that could have direct influences over the new service (HCP-110-3), and also selecting the stakeholders whom would positively adopt and support the proposed innovative measures (HCP-110-12). The requirements for delivering the programme, in addition to the established rationale for pursuing innovative solutions could be considered also as determinants regarding specific stakeholders and of their involvement in the design process (Waring, Allen, Braithwaite and Sandall, 2016). The careful selection of stakeholder groups have an agential impact towards mapping the design process itself (HCP-110-10), which emphasizes the theoretical importance of their role in devising the design phases that forms the structures necessary for transforming engagement outcomes into service outcomes (Verma, Elg, Engström, Witell and Poksinska, 2012). The importance of stakeholder selection is interpreted as a factor in creating a shared understanding of the issues and solutions engaged over in the design process (NMP-110-9), with consequent causal effects over the agreement on delivery design and underpinning the rationale (Thakur, Hsu and Fontenot, 2012).

The effectiveness of the visualisation over the design process helps stakeholders to engage positively over factors that contribute towards the benefits of the new solutions (HCP-110-12). The visualisation tools adopted within the design process enables constructive engagement over the tendencies and variables that would delineate the true benefits and dis-benefits (HCP-110-12) over the new interventions proposed. On the other hand, specific tools used to execute the development of new conceptual ideas ought to be communicated and shown clearly to demonstrate their supportive role in the conceptualisation phase (Ovretveit, Mittman, Rubenstein and Ganz, 2017).

7 Statistical Analysis of the Design Models

7.1 Introduction

The Likert Ratings given from each of the participants reflect a design model's appositeness to help complete the design task, and how effective participants regarded the model's impact in addressing the issues highlighted in the design brief. These factors contribute to the statistical significance findings over the performance of the three design model processes in relation to the two main criteria proposed within the research question. The scores from the Likert Ratings allude towards the design model's applicability and efficacy in addressing the specified design brief in relation to their design criteria. Through the criteria elements the design models are then evaluated against the corresponding design factors within the contributed factors analysis tool. The significance findings reflected in this section provides further insight into the performance of the three design models, in relation to the theoretical interpretations regarding the causal mechanisms contributing towards the development of service concepts, as identified within the patterned responses of the thematic analysis over the participant action plans.

Although the themes identified in the research are distinct from the exact meanings and expressions explicated within the design factors, they nevertheless demonstrate powerful causal explanations into the underlying mechanisms within the design brief engagement (Braun and Clarke, 2006; Walsh and Evans, 2013, pp.3). According to Fleetwood (2014), explanation is the main goal of socially oriented qualitative research over the significance of predictions, especially within the critical realist position over the end goal of research endeavour. The analysis and interpretation of the themes within the data corpus help to link the theoretical basis of participant engagement with the models to the findings behind the statistical significance of the model process, and its impact over the design development phases.

Two data tables are shown in Figures 7.1 and 7.6 respectively outlining the Likert scores given by the research participants who completed the action plan and gave Likert ratings for their given Service Design Model on the self-evaluation sheet disclosed in the workshop pack.

The Likert Ratings range from a degree figure of one being least effective or applicable, and seven being most effective or applicable. Each of the design factors outlined in the design brief for the deployment exercise are labelled in the tables, with corresponding ratings given from each candidate designated with a workshop code and specific design model deployed.

From these two sets of data, a t-test analysis is undertaken to compare the average rating values from each of the design factors across two data sets (consisting of the values from two of the design models), and establishes a null hypothesis statement that the two mean values for each design factor variables are equal. The null hypothesis is rejected if the two mean values for each of the variables is significantly different. The t-critical value is used to benchmark against the calculated t-value to determine that the null hypothesis is to be rejected, or not to be rejected should the performance values between two given design models not differ significantly. The t-critical value derives from a two-tailed t-value distribution table taking into account the degrees of freedom in relation to the number of variables in each data set ($n_1 + n_2 - 2$), and a significance level of 0.05 (5%) to indicate a strong significance in the data. A t-value score that is greater than the t-critical value would indicate clear significance to reject the null hypothesis, while a t-value less than the t-critical value indicates insufficient significance to reject the null the hypothesis.

The T-Value scores from the design factors analysis between the data sets of two design models creates an assessment of the performances of the three tested design model processes compared against each other.

A breakdown of the t-value scores would help to produce insightful observations especially regarding the performance of the conceptual model, compared to the established design models from the literature. The comparative t-test score tables in Figure 7.2 and Figure 7.7 are separated according to the investigated variables of applicability and efficacy, and the design models labelled alphabetically for each comparative set of t-test data (Model A – NHS Design Model / Model B – Service Design Model / Model C – Med-Co Design Model).

As are differences in the variances and sample sizes within the three data groups, results between models with unequal sample sizes undergo a two-tailed t-test of unequal variance, while the two data sets with the same sample sizes undergo a two-tailed t-test of equal variance. The t-value for a test of equal variance is thus calculated in the following formula:

$$T\text{-value} = \frac{mean1 - mean2}{\sqrt{\frac{(n1-1) \times var1^2 + (n2-1) \times var2^2}{n1+n2-2}}} \times \sqrt{\frac{1}{n1} + \frac{1}{n2}}$$

Where *mean1* and *mean2* equals the average values across the two data sets, *var1* and *var2* equals the variance of each of the data sets, and *n1* and *n2* equals the number of data entries within the data set. The degrees of freedom in this test is express as = *n1* + *n2* -2 where, *n1* and *n2* equals the number of entries in each of the data set.

The t-test value for a test if unequal variance on the other hand is calculated in the following formula:

$$T\text{-value} = \frac{mean1 - mean2}{\sqrt{\frac{var1^2}{n1} + \frac{var2^2}{n2}}}$$

Where *mean1* and *mean2* equals the average values across the two data sets, *var1* and *var2* equals the variance of each of the data sets, and *n1* and *n2* equals the number of data entries within the data set. The degrees of freedom is expressed as:

$$\text{Degrees of Freedom} = \frac{\left(\frac{var1^2}{n1} + \frac{var2^2}{n2}\right)^2}{\frac{\left(\frac{var1^2}{n1}\right)^2}{n1-1} + \frac{\left(\frac{var2^2}{n2}\right)^2}{n2-1}}$$

Where *var1* and *var2* equals the variance of each of the data sets, and *n1* and *n2* equals the number of data entries within the data set.

The analysis of the t-test scores is underpinned further with radar plot graphs comparing the average scores over all the design factors between two design models. These graphs identify how the models compare according to their overall mean scores for each design factor, with spatial differences in the radar plots indicating evidences of performance differentiations. The analysis sections are divided over the results findings on applicability and efficacy.

7.2 Statistical analysis of significance test results on applicability

This section analyses on the results of the factors analysis over each of the three design models according to their relevance in being able to fulfil the design criteria as reflected within the design factors. An overall table of the relevant data set showing only the scores for applicability across the three models is shown in Figure 7.1. The score across each data item is compared with its mean score, and the total scores collated for each design model is recalculated for an average value across all data items within a set. Judging by the average score of the totals within each data item, the Service Design Model has the highest overall average total of 38.67, with the NHS Design Model with a total of 33.14, followed by the Med-Co Conceptual Model with a total of 32.14.

The T-stat values from Figure 7.2 indicates that the scores between the three design models in relation to its applicability to addressing the design criteria does not demonstrate significant differences between any two given design models over each of the design factors. With the exception of the values concerning the need for appropriate development tools between the Service Design, and the Med-Co Conceptual model showing near significance (t-value of 2.07 against t critical value of 2.20), the t-stat readings for all other design factors between the models do not indicate a significance in performance. The overall assessment of the evaluation scores concerning the applicability of the design models in addressing the criterion from the factors analysis tool indicates that the null hypothesis is not rejected on the basis that the t critical value is not exceeded by the t-values across the three comparative tables. The observations thus gathered from the significance test in regard to applicability is that the conceptual model performs similarly compared with the models deriving from the literature. However, the average figure of the total collected score suggests that the conceptual model may not have performed well in areas compared to the established models. An analysis of the radar plot graphs highlights where the conceptual model did not perform as well.

Workshop Code	Given Model	Evaluation of Applicability										Total	Average of the Totals	Overall Mean
		Goals	Requirements	Research Problems	New Ideas	Shortcomings	Innovation support	Economic impact	Development tools					
WT-HCP-110-1	Service Design	7	7	2	5	7	7	1	7	7	7	43.00		5.38
WT-HCP-110-6	Service Design	2	4	6	5	4	5	5	5	5	5	36.00		4.50
WT-HCP-110-8	Service Design	7	7	6	6	7	6	7	6	7	7	53.00		6.63
WT-HCP-110-14	Service Design	4	3	3	3	3	3	3	3	3	3	25.00		3.13
WT-NMP-110-10	Service Design	6	5	5	6	6	6	4	5	4	4	41.00		5.13
WT-NMP-110-15	Service Design	5	5	5	3	3	3	3	5	3	5	34.00	38.67	4.25
WT-HCP-110-3	MedCo	7	7	7	7	7	7	7	7	7	7	56.00		7.00
WT-HCP-110-4	MedCo	6	6	2	3	4	3	4	3	1	2	27.00		3.38
WT-HCP-110-7	MedCo	1	1	1	1	1	1	1	1	1	1	8.00		1.00
WT-HCP-110-10	MedCo	6	3	2	7	6	2	6	2	6	2	34.00		4.25
WT-HCP-110-12	MedCo	7	6	6	6	7	6	7	6	5	5	48.00		6.00
WT-NMP-110-9	MedCo	6	6	2	6	2	2	2	2	6	2	32.00		4.00
WT-NMP-110-11	MedCo	4	2	3	3	2	3	2	3	1	2	20.00	32.14	2.50
WT-HCP-110-2	NHS	5	5	4	6	6	4	6	4	6	5	41.00		5.13
WT-HCP-110-5	NHS	5	5	4	4	4	4	3	4	2	4	31.00		3.88
WT-HCP-110-9	NHS	5	2	2	5	5	5	5	6	1	5	31.00		3.88
WT-HCP-110-11	NHS	6	3	2	4	4	4	2	5	4	2	30.00		3.75
WT-HCP-110-13	NHS	7	7	7	6	5	6	5	6	6	6	50.00		6.25
WT-NMP-110-1	NHS	6	6	4	6	5	5	5	6	3	5	41.00		5.13
WT-NMP-110-13	NHS	1	1	1	1	1	1	1	1	1	1	8.00	33.14	1.00
Standard Dev		1.90	2.04	1.98	1.81	2.01	1.90	2.23	2.00	2.00				
Mean		5.15	4.55	3.70	4.65	4.40	4.35	3.65	4.00	4.00				
Variance		3.61	4.16	3.91	3.29	4.04	3.61	4.98	4.00	4.00				

Figure 7.1 – Likert Rating scores on the applicability for each design model

T-Test results on applicability scores between Model A and C	
Design Factor	T Stat – Value
Goals	0.26
Requirements	0.23
Research problems	-0.12
New ideas	0.13
Shortcomings	0.00
Innovation support	-1.05
Economic Impact	0.44
Development tools	-0.94
T Critical Two-tail	2.18

T-Test results on applicability scores between Model B and C	
Design Factor	T Stat – Value
Goals	-0.11
Requirements	0.67
Research problems	1.11
New ideas	-0.05
Shortcomings	0.69
Innovation support	-0.56
Economic Impact	-0.02
Development tools	2.07
T Critical Two-tail	2.20

T-Test results on applicability scores between Model A and B	
Design Factor	T Stat – Value
Goals	0.16
Requirements	0.97
Research problems	1.06
New ideas	0.11
Shortcomings	0.86
Innovation support	0.68
Economic Impact	0.47
Development tools	1.23
T Critical Two-tail	2.20

Figure 7.2 – T-Test cross comparative results on applicability scores between the three design models

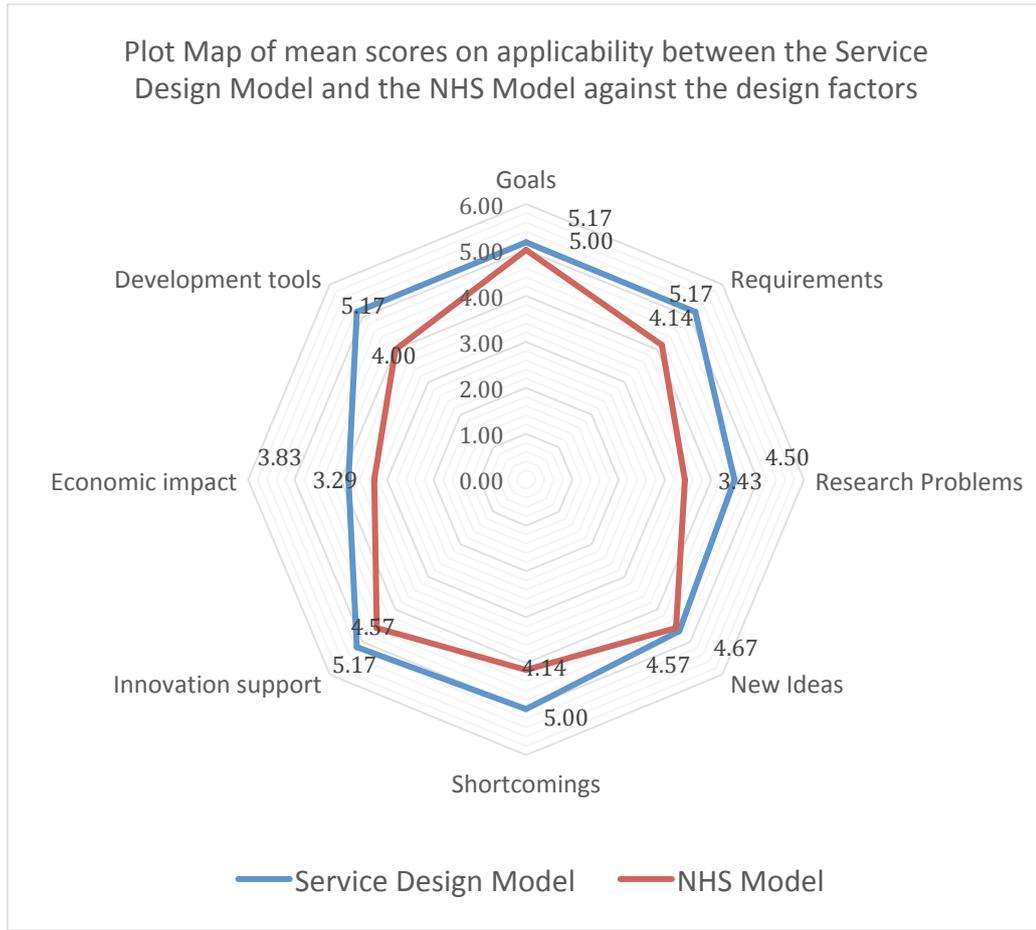


Figure 7.3 – Radar plot graph showing mean scores on applicability between the Service Design, and NHS Design Models

From Figure 7.3, it is clear from the radar plot graph that the Service Design Model performs best overall in terms of its relevance in addressing the design criteria. In comparison to the NHS Design Model, its mean scores across the data set are comparatively higher in every design factor.

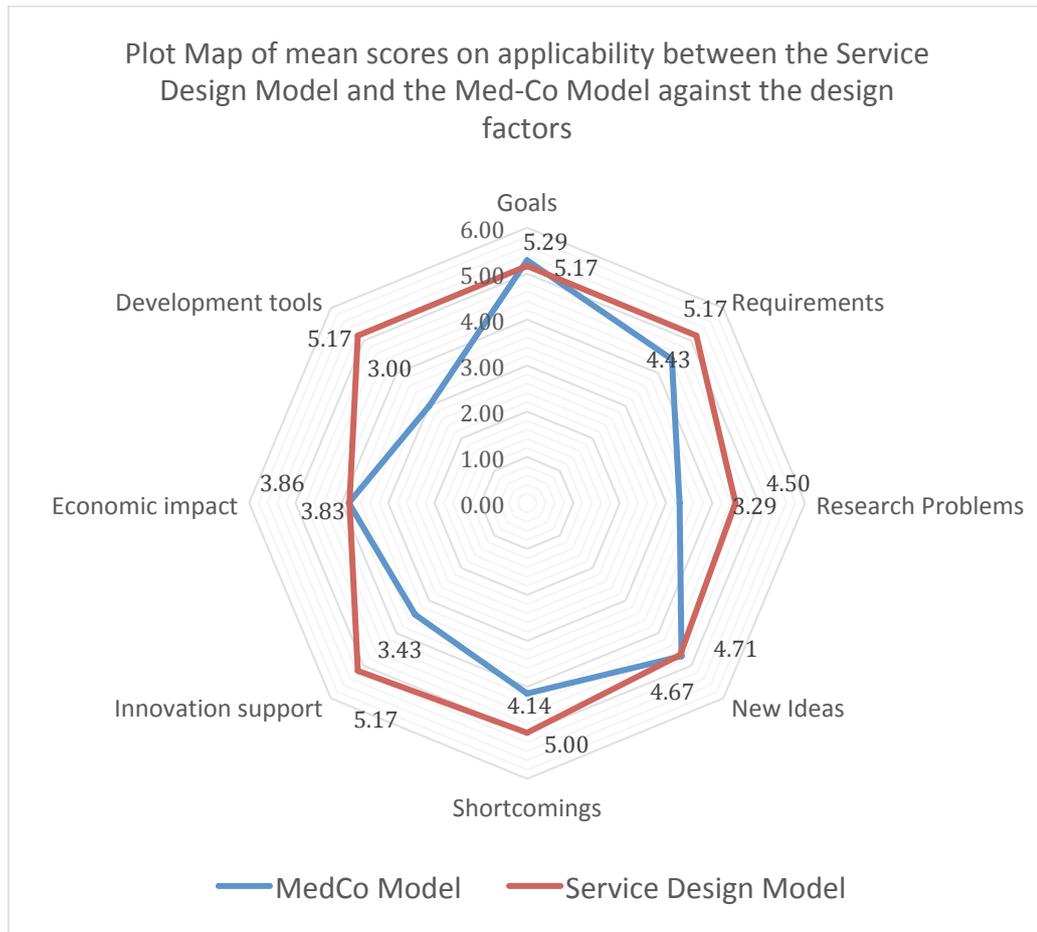


Figure 7.4 - Radar plot graph showing mean scores on applicability between the Service Design, and Med-Co Design Models

It can be shown from Figure 7.4 that there are marked differences in the two model’s performance over factors such as providing effective innovation support, and of the relevant tools to assist in the development of a new service. The mechanisms needed to research the issues around the self-management programme is accommodated better within the Service Design model, as well as in identifying potential shortcomings. A similar trend follows with the comparison of the conceptual model to the NHS Design Model in Figure 7.5 where the latter model is more conducive to providing the structures necessary for considering the appropriate tools and support required for developing solutions.

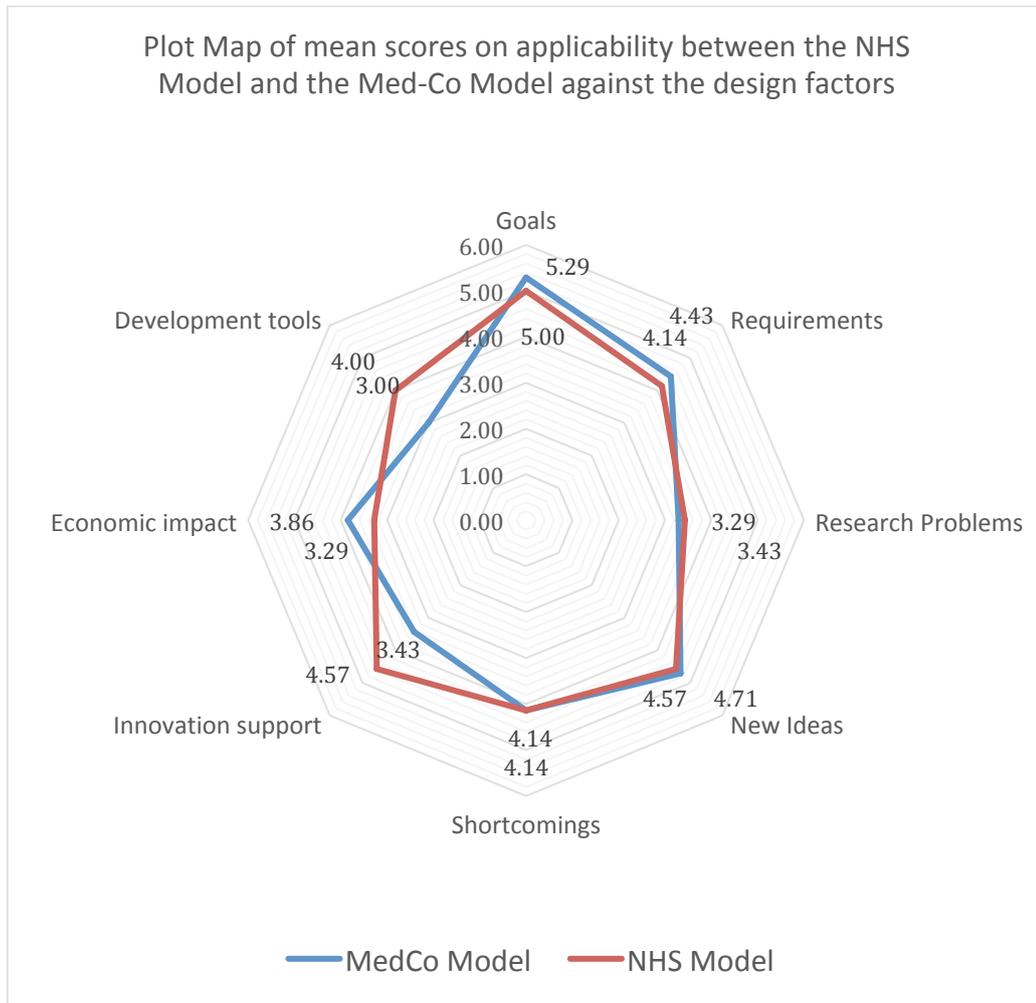


Figure 7.5 - Radar plot graph showing mean scores on applicability between the NHS, and Med-Co Design Models

7.3 Statistical analysis of significance test results on efficacy

This section analyses on the results of the factors analysis over each of the three design models according to their effectiveness in being able to fulfil the design criteria as reflected within the design factors. An overall table of the relevant data set showing only the scores for applicability across the three models is shown in Figure 7.6. The score across each data item is compared with its mean score, and the total scores collated for each design model is recalculated for an average value across all data items within a set. Judging by the average score of the totals within each data item, the Service Design Model again features the highest mean total score of 32.50 and this time followed by the Med-Co Conceptual Model with a score of 32.29 and lastly the NHS Design Model at 28.86.

The t-stat values in the comparative tables in Figure 7.7 indicate no significance in performance over each model's efficacy in addressing the design brief's criteria. The assessment of the three models from the factors analysis asserts that the values between the models are equal with no clear significant differences in efficacy to address the design criteria. The conceptual model is shown to be similar in performance compared to the two established design models in the area of efficacy. The null hypothesis statement over the efficacy values is therefore not rejected.

Workshop Code	Given Model	Evaluation of Effectiveness										Total	Average of the Totals	Overall Mean
		Goals	Requirements	Research Problems	New Ideas	Shortcomings	Innovation support	Economic impact	Development tools					
WT-HCP 110-1	Service Design	7	7	2	4	7	7	1	5	40.00	5.00			
WT-HCP 110-6	Service Design	2	5	4	3	4	4	5	4	31.00	3.88			
WT-HCP 110-8	Service Design	6	6	6	6	6	6	5	6	47.00	5.88			
WT HCP 110-14	Service Design	1	1	1	1	1	1	1	1	8.00	1.00			
WT-NMP-110-10	Service Design	5	6	5	4	3	4	4	4	35.00	4.38			
WT-NMP-110-15	Service Design	5	5	5	3	3	5	3	5	34.00	4.25			
WT-HCP 110-3	MedCo	7	7	7	7	7	7	7	7	56.00	7.00			
WT HCP- 110-4	MedCo	6	5	2	3	3	3	2	2	26.00	3.25			
WT HCP 110-7	MedCo	1	1	1	1	1	1	1	1	8.00	1.00			
WT HCP 110-10	MedCo	5	3	3	6	6	3	6	2	34.00	4.25			
WT HCP 110-12	MedCo	6	6	6	6	5	5	5	6	45.00	5.63			
WT-NMP-110-9	MedCo	2	2	6	6	6	2	6	6	36.00	4.50			
WT-NMP-110-11	MedCo	3	2	3	4	2	2	3	2	21.00	2.63			
WT-HCP 110-2	NHS	6	6	4	5	6	5	5	4	41.00	5.13			
WT HCP 110-5	NHS	5	5	4	4	3	4	2	3	30.00	3.75			
WT HCP 110-9	NHS	2	2	1	6	3	1	3	2	20.00	2.50			
WT HCP 110-11	NHS	5	5	4	5	4	5	3	3	34.00	4.25			
WT HCP 110-13	NHS	3	3	4	3	4	4	4	3	28.00	3.50			
WT NMP 110-1	NHS	6	6	4	6	5	6	3	5	41.00	5.13			
WT NMP-110-13	NHS	1	1	1	1	1	1	1	1	8.00	1.00			
Standard Dev		2.09	2.09	1.87	1.85	1.95	1.99	1.85	1.88					
Mean		4.20	4.20	3.65	4.20	4.00	3.80	3.50	3.60					
Variance		4.38	4.38	3.50	3.43	3.79	3.96	3.42	3.52					

Figure 7.6 – Likert rating scores on the efficacy rating for each design model

T-Test results on efficacy scores between Model A and C	
Design Factor	T Stat – Value
Goals	0.04
Requirements	1.06
Research problems	-0.14
New ideas	-1.16
Shortcomings	-0.23
Innovation support	1.06
Economic Impact	-0.98
Development tools	0.38
T Critical Two-tail	2.20

T-Test results on efficacy scores between Model B and C	
Design Factor	T Stat – Value
Goals	0.25
Requirements	-0.25
Research problems	0.83
New ideas	0.41
Shortcomings	0.54
Innovation support	-0.40
Economic Impact	1.29
Development tools	0.67
T Critical Two-tail	2.18

T-Test results on applicability scores between Model A and B	
Design Factor	T Stat – Value
Goals	0.27
Requirements	0.88
Research problems	0.71
New ideas	-0.82
Shortcomings	0.26
Innovation support	0.70
Economic Impact	0.19
Development tools	1.36
T Critical Two-tail	2.20 / 2.23 / 2.26

Figure 7.7 - T-Test cross comparative results on efficacy scores between the three design models

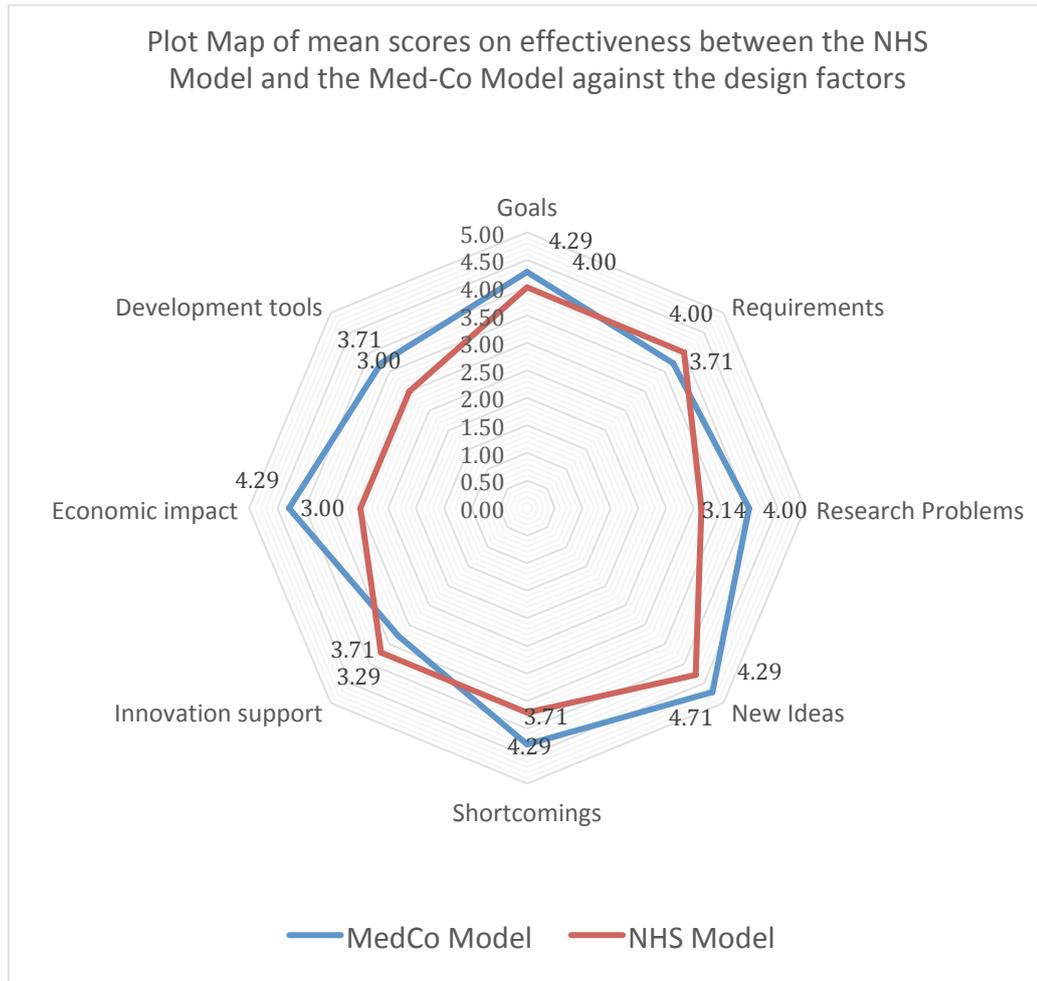


Figure 7.8 - Radar plot graph showing mean scores on efficacy between the NHS, and Med-Co Design Models

Figure 7.8 highlights the overall strength of the conceptual model in being effective at addressing many of the criteria, apart from providing innovation support and establishing service requirements in comparison to the NHS Design Model. The NHS Design Model scores comparatively lower in its effectiveness in providing a structure for researching issues and problems within the health service, as well as for factors concerning economic impact and providing appropriate tools for developing the service.

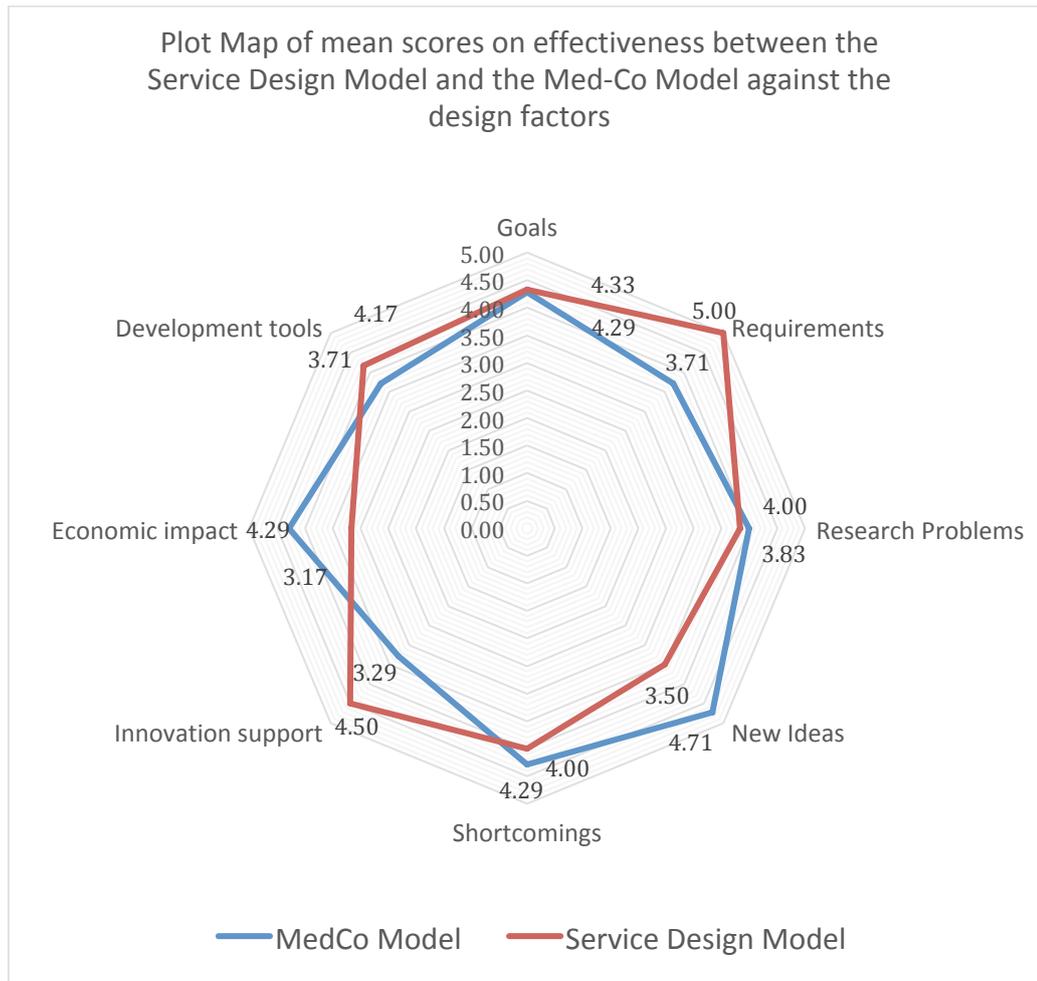


Figure 7.9 - Radar plot graph showing mean scores on applicability between the Service Design, and Med-Co Design Models

When compared to the Service Design Model, the Conceptual Med-Co Model has weaker values in factors over innovation support, providing appropriate development tools and establishing the requirements of a service that is arguably the Service Design Model’s strongest performing value. However, in other factors such as assessing economic impact, researching design issues and conceptualising ideas, the Med-Co Model arguably facilitates those mechanisms more effectively.

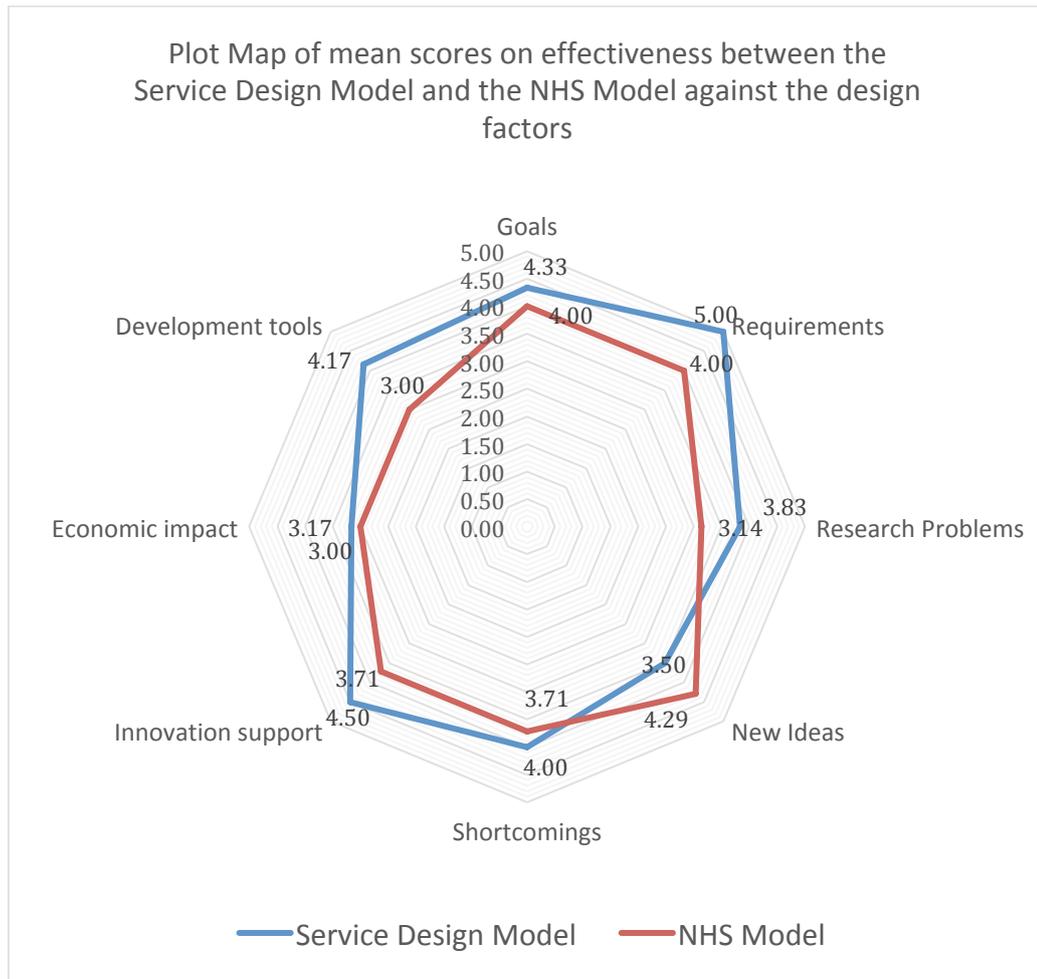


Figure 7.10 - Radar plot graph showing mean scores on efficacy between the NHS, and Service Design Models

The NHS Design Model demonstrates better effectiveness at conceptualising new ideas compared to the Service Design Model as shown in Figure 7.10, though is less effectively comparatively over factors such as providing innovation support, tools for developing the service, and establishing new service requirements. The NHS Design Model could be more effective in regards to providing a more effective ideation process compared to the Service Design Model, as the mechanisms and avenues for creating new ideas is embedded into a more contextually relevant framework (Burke, Stein-Parbury, Luscombe and Chenoweth, 2016).

The scatter plot graphs shown in Figure 7.11 and Figure 7.12 help to illustrate from across the entire data set of Likert Scale scores, the positioning of each design model in relation to their variable scores and the distribution of their individual data values. From Figure 7.11, the Service Design Model has the highest mean values across both applicability and efficacy variables. The NHS Design Model is second in terms of mean values for applicability, though it displays the lowest cumulative value in overall efficacy in addressing the design criteria. The conceptual Med-Co Design Model is comparatively the least applicable overall compared with the two literature-derived models, though its value over efficacy is like the Service Design Model.

The distribution of the values for each of the design models in Figure 7.12; show that the conceptual Med-Co Design Model has the widest distribution range among the three design models. The Service Design Model has the second widest distribution range, while the NHS Design Model has the most consistent range of value distribution, considering the data outliers at the bottom end of the graph. The Service Design Model values across both applicability and efficacy is cumulatively higher overall, with four of its five distribution plots at, or near the top right-hand area of the graph denoting high values across both variables. The other two models have similar distribution values apart from one of the outliers of the Med-Co Model, with the NHS Design Model values more consistent among its results compared to the wide range of low and high values across its data set.

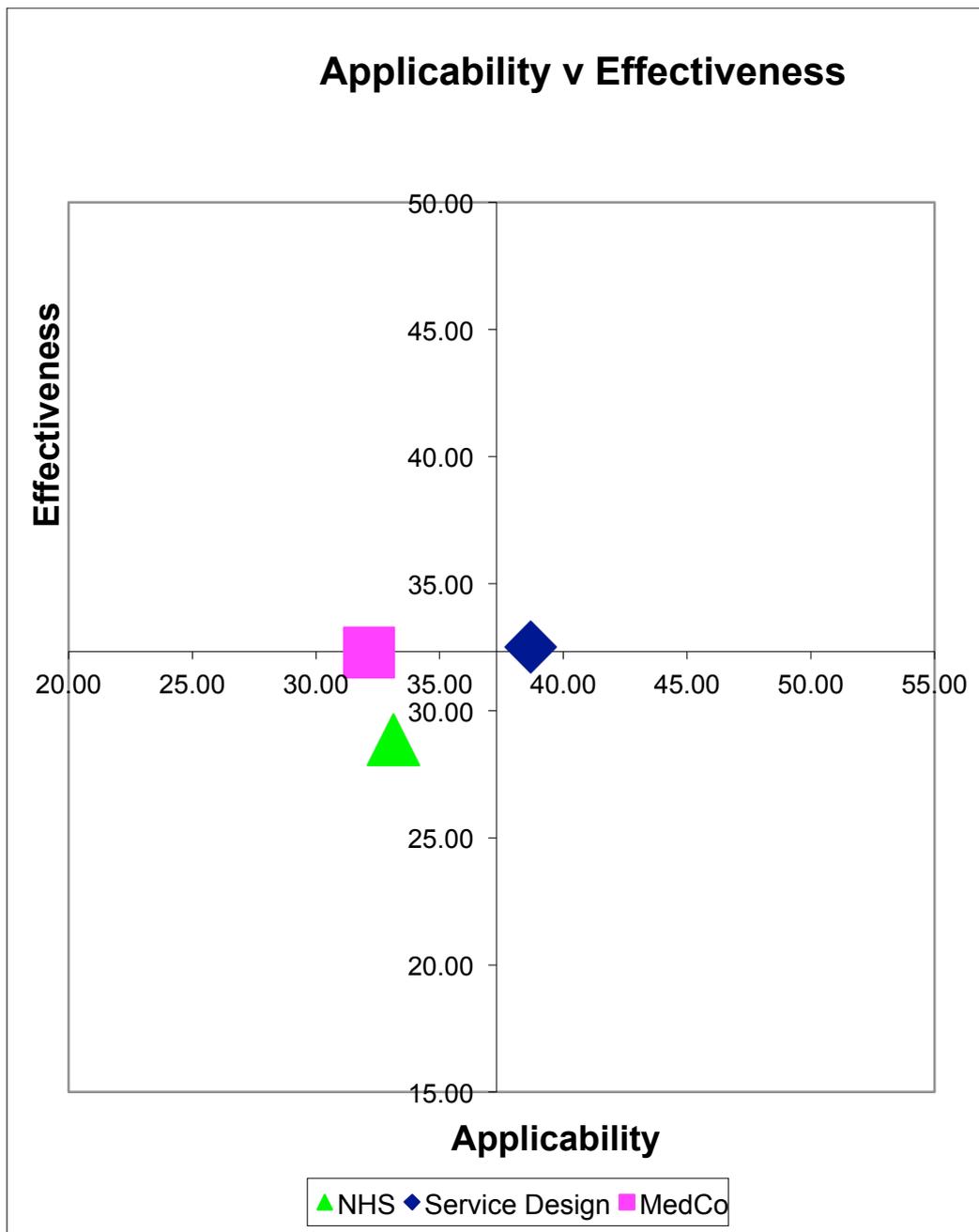


Figure 7.11 – Scatter plot graph showing average cumulative scores from design factors analysis across the design models

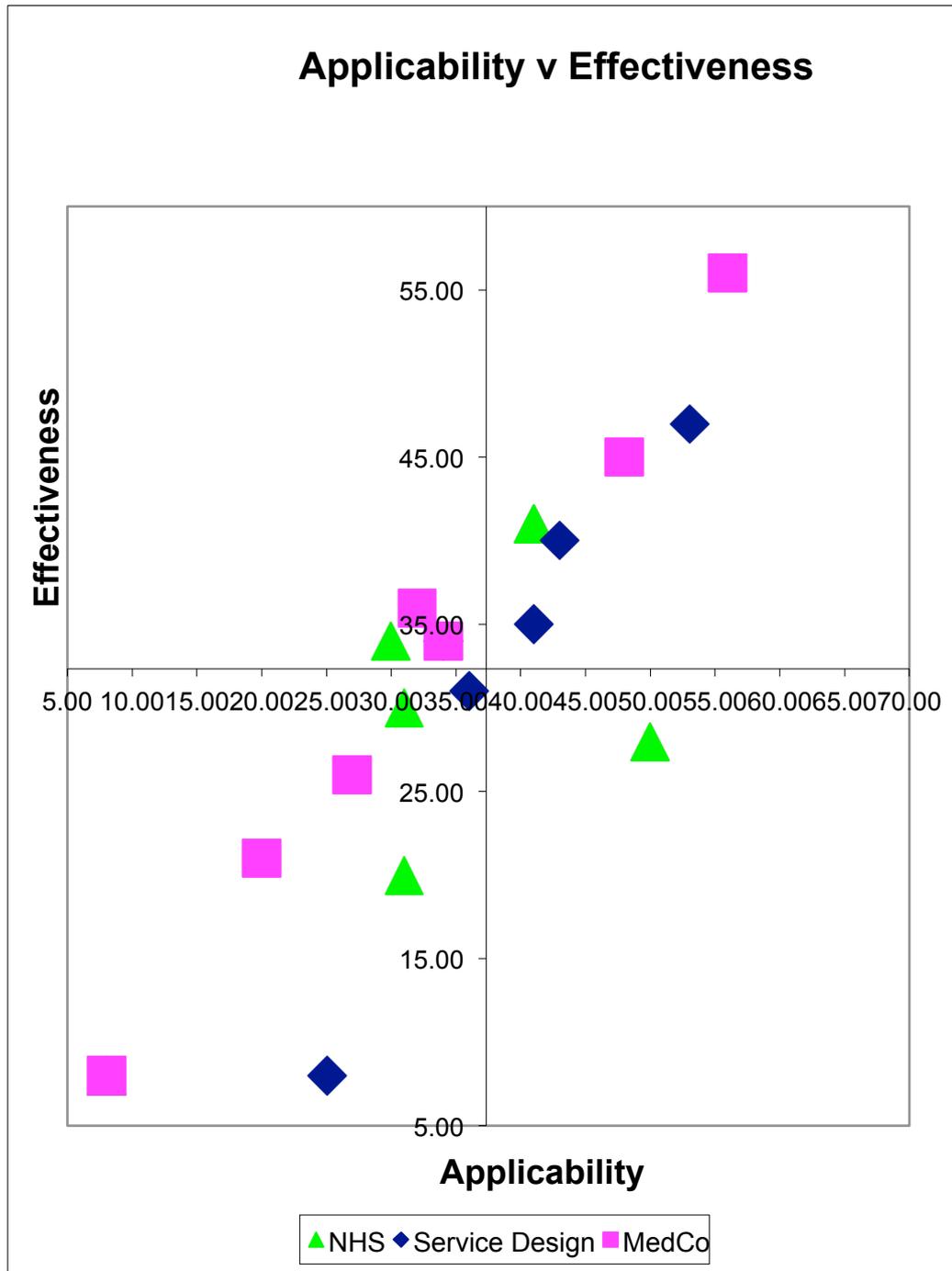


Figure 7.12 - Scatter plot graph showing distribution of average participant scores from design factors analysis across the design models

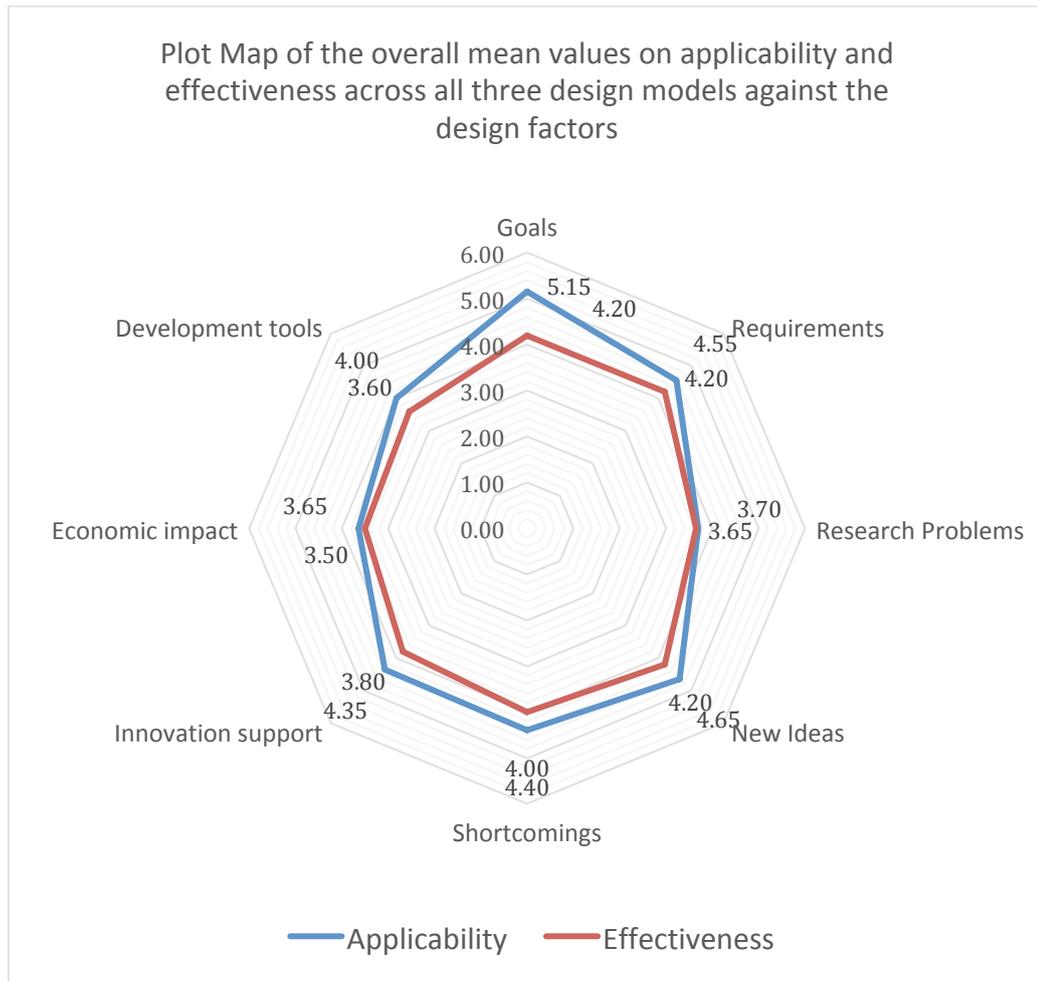


Figure 7.13 – Radar plot graph showing cumulative mean scores on applicability and efficacy from design factors analysis across the design models

A cumulative radar plot graph showing the values for both variables across all data sets is shown in Figure 7.13 that clearly shows higher values in overall applicability compared to efficacy for addressing the design criteria. This contributes to an indicator that although participants regard the design model as relevant in addressing the criteria of the design brief, their process may not be as effective in addressing the complexity and contextual factors present within the healthcare specification. Equally, the prevalence of the causal mechanisms deciphered from the themes in relation to the design models may indicate that participants understood specific measures that would be used to address criteria within the brief; however they may not have associated those measures as being effectively implemented specifically through the model process itself.

8 Conclusions

8.1 Introduction

The conclusions of the research considers the theoretical interpretations found within the themes identified from the data set and of the statistical significance of the Likert evaluation to propose recommendations regarding effective, and appropriate implementation of the causal structures inherently found within the design model process, into the context of health service innovation. The ensuing sections provides a review of the findings across both sets of the analytical framework to construct an evaluative narrative regarding the performance of the design models, underpinning the permissiveness of the themes especially back to the literature. The latter part of the section reiterates the original contributions by outlining a series of recommendations aiming to inform the main framework for developing healthcare services over two key conceptualisations over the application of design model processes:

- Recommendations for generating a model that is conducive to addressing service design projects with complex design factors inherent within the healthcare field.
- Integrating appropriate evaluation measures that facilitate thorough appraisal of design interventions in relation to specific design criteria.

The research aims to demonstrate the conception of the co-produced design model and of the analytical processes implemented through the methodology as constructive case studies that can be referred to from an academic perspective. It is envisaged that the researching findings will facilitate opportunities to further research the mechanisms of the design processes prominent within the health service design process (Rees, Cavana and Cumming, 2018).

8.2 Conclusions from the triangulation of thematic and statistical significance findings

The purpose of devising a latent thematic analysis into the qualitative data is to identify the causal mechanisms and underlying perspectives that play a key part in the effective engagement over the ideation process. Through that, the research generates the causal explanations regarding the performance of the design models within the wider analytical narrative that is framed within the criteria of the factors analysis tool. The theoretical assertions gained from the interpretation of the themes and of their generated codes focuses on a need to appraise and develop service design process models towards the four thematic areas and of their underlying mechanisms. These are namely, empowering service users and their providers; identifying the drivers for change; ratifying innovative solutions; and incorporating an effective engagement framework.

The need to facilitate a process that lends towards a transparent and patient empowering platform is considered a key proponent for creating service solutions that are focused on patient needs (Doull, O'Connor, Tugwell, Wells and Welch, 2017). The coding process has led to a directive for considering inter-personal mechanisms that would place agential needs highly on the agenda for innovative solutions, and to consider both the resource and clinical factors that contribute towards user needs being met in a satisfactory manner. The need to code for factors such as delegation of roles and uncovering underlying motivations has been evidenced within the data set from perspectives that call for research into the various impacts from within, and outside of the proposed service structure. It has been established from the data set about the importance of stakeholder buy-in and commitment towards realising potentially viable interventions, and this reiterates the power of agential influence in validating prospective ideas. The implications of the thematic explanations towards the application of design model processes, include the need to align process models towards the principle values of what

the wider service aims to deliver, and therefore should orient its engagement processes towards the system-wide strategy relevant to the stakeholder audience (Clarkson, Buckle, Coleman, Stubbs, Ward, Jarrett, Lane and Bound, 2004). Mechanisms and structures that already have the theoretical underpinning to inform the model also includes co-production principles that give weight to all stakeholder opinions across the delegation (Robert, Cornwell, Locock, Purushotham, Sturmeay and Gager, 2015). These aspects of user orientation within the service design proposals if considered and planned appropriately, would ensure that the ideas being explored and developed would be supported by a process that orients all ideas and approaches towards empowering the service users.

A process that enables stakeholder groups to use the appropriate analysis and research tools to identify the persuasive drivers for change would help healthcare providers to build further on the existing evidence base. The process would include paradigms and approaches that challenge underlying assumptions and methods for undertaking research about the health service, in order to identify potential barriers or constraining causal factors that prevent stakeholders from conceptualising solutions that would otherwise not have been thought of as a consequence of underlying mechanisms not being uncovered. According to Hollis, et al. (2015), external mechanisms such as the use of digital facilitators would become important considerations as to what the scope of potential transformation could be when the ideation process is addressed. The model process would need to incorporate a robust research framework that enables stakeholder groups to gain access and proficiency over a variety of methods and approaches that would enable a comprehensive mapping of the aetiology, and other specific clinical factors that would shape the delivery specification. Within the model process there would concurrently be a need for a capturing mechanism that effectively maps researching findings against the proposed design specification outlining both the criteria and user requirements that would need addressing in the new delivery outcomes.

This would enable stakeholders to discern clearly from the evidence base what the new service criteria should be, and to subsequently plan the conception and refinement processes from the design model according to the action points understood from the research stage.

Solutions that emerge from the conception stage of the model process naturally require the frameworks and measures to adequately evaluate, and further refine them towards implementation. The need to ratify ideas is to be incorporated into a cyclical process whereby the stages in generating, testing, and re-developing ideas are explicitly integrated into a coherent structure that stakeholders can follow and track the progress of the project (Akenroye, 2012). The agential perspective is again an integral part to the refinement of ideas where stakeholders revisit the evidence base and the criteria to ensure that the solutions align with the rationale, and is a reflection of what the stakeholders want as addressed during the design process review. As well as the process structure itself, the specific tools and visualisation aids (Stickdorn, 2010) that facilitate effective communication of ideas would need to be incorporated to assist the design process in validating proposals for further development.

Finally, the planning involved in setting up an effective engagement framework within the design process needs to encompass the end-to-end phases of the whole structure, to enable a coherent progression of the service design process and to conceptualise ideas in a way that is persuasive towards the established design criteria. The framework would consider importantly the stakeholder roles and of their responsibilities in the planning and delivery of the new service, considering the engagement criteria that ensures the service has the traction and necessary factors to move forward. The engagement dynamics between different stakeholders groups such as health professionals and patients for example, would need to be planned accordingly around existing clinical commitments with adequate space to consult over potential interventions without becoming disruptive influences to each other (Cooke,

Nancarrow, Dyas and Williams, 2008). It is also crucial that the engagement strategy within the design process effectively visualises in front of the stakeholders, the motivations and accompanying narrative that clearly sets out why the process is being initiated and what are the prevailing factors that drive the need to develop a new service pathway. A culture of mutual understanding and positive engagement with the project would therefore be made possible by aligning the transformational impact of the stakeholders to a design framework that channels this influence into the creation of innovative solutions (Haste, et. al., 2018).

The overall narrative of the thematic analysis calls for a comprehensive analytical endeavour to investigate the causal mechanisms and tendencies towards an effective construction of a design process. This takes on board the prevalence of the four themes to make sense of the causal explanation to an in/effective approach towards health innovation. It is by uncovering these causal explanations that a steering group or project team can start to plan a process that is conducive to the creative endeavour of conceptualising new services, long before ideas themselves are articulated onto the drawing board. As healthcare services deal primarily with people and of their health outcomes, the specifications for particular services are subject to continual transformation and change, and therefore the model process itself requires adaptive mechanisms that can guide stakeholders towards the iterative aspects of the design process (Eoyang and Berkas, 1999). It is likely that other established frameworks such as the value framework model proposed by Sculpher, Claxton and Pearson (2017) may need to be incorporated in some kind of structure to sufficiently account for service wide implications that potentially have varying degrees of impact over the development and implementation of innovative measures.

It is clear from the thematic interpretations of participant responses from the data set, that an effective model process would incorporate phases and causal structures that do not just interpret the design stages or action points as has been manifested such as with an interpretive structural modelling approach (Attri, Dev and Sharma, 2013). But as many underlying mechanisms, assumptions and conceptualisations should be expanded upon as possible in order to ascertain the scope of what questions need to be asked, and how the stakeholders know that there is a sufficient case to drive innovation forward.

In relation to the significance of the three selected design model's performance in the design brief exercise, the thematic interpretations have a constructive role to play in devising a design model process that is both relevant and effective in the context of developing healthcare services. The contribution of the factors analysis tool will help to evaluate the feasibility of the design model in relation to the specific aims and objectives that the stakeholders would establish before the design process commences. The statistical findings concerning the selected design models from both the literature, and a co-produced conceptual model in this research has demonstrated no significant differences between the model's results to the factors analysis variables. However, significances could nevertheless emerge given a different set of model processes are tested under the same analytical framework. What the data findings mean in the context of the co-produced conceptual model is that a comparison between two established models from the literature suggests that the newly created model is able to address design criteria up to the same perceived quality as the established design models. These data findings, however, should be elaborated further with the thematic analysis of data extracts to uncover the causal tendencies that the new model may be found deficient in adequately addressing. Thus, further refinement of conceptual model processes could incorporate both evaluation measures to ascertain their overall relevance and effectiveness in addressing specific project requirements, using a combination of the design factors analysis and a contextualist research approach to analyse the model.

8.3 Recommendations over the planning and implementation of service design processes appropriate to healthcare services development

It has been established from the literature and from the research findings that a wide selection of implementation frameworks helps to make sense of the complexities inherent within the operative out workings of healthcare services. These frameworks in the form of design model processes elaborate on the role of the structures involved in facilitating innovative practice, as well as the transformational agential influences that stakeholders have in the planning, design and delivery of new services. The research aims to devise a series of recommendations that would provide stakeholders with a conceptual underpinning for the planning of research and design projects that aim to deliver innovative health outcomes as the chief end of those works. The summation of the research contribution to both academic and practical implications regarding the applicable, and effective use of service design model processes in healthcare development are as follows:

- To enable service design methods and of their underlying rationale and approaches, to be scrutinised, adopted, and deployed appropriately among stakeholders
- To encourage transparent practices within the design process to generate innovation that is grounded in an appropriate evidence base, and considering also possible influences and drivers that may enable, or potentially constrain the innovative measures established in the design process
- To enable effective auditing and review of design methods and their stakeholder wide adoption into healthcare practice
- To encourage accountability and form a common understanding for how design approaches are engaged upon effectively among relevant stakeholders

9 Future work

9.1 Opportunities identified for further research and practice

The methodology and research approach towards the evaluation of design model processes forms a basis for further research to be carried out in order to expand upon other design factors, and thematic patterns that may emerge further from the analysis outcomes of this research. It is recommended that different design factors and live design models could be examined using the analytical framework in this research to clearly uncover previously under researched causal influences to justify specific design tools and approaches being implemented to address specific service criteria.

The industrial sponsor could further refine and develop the conceptual model by taking on board the analytical findings from the research, with further scope to gathering more research data through live engagement with their service provider partners. The research methodology used within this research could then be further implemented or developed upon by the industrial partner through the launch of live case studies incorporating contexts embedded in the auditing of services, or within commissioning reviews aligning to their business strategies. As a private sector company working collaboratively with the public sector, the industrial partner can thus play a more prominent role in healthcare services research through their active engagement with operating Primary Care services, which gives them access to the resources, and stakeholders whom are relevant to transforming the frontline operations within the services they operate. By incorporating a research led and analytical approach that is conducive to addressing the complex nature of healthcare delivery, the industrial sponsor can thus benefit from the research contributions in diversifying their business offerings towards insightful design and development of healthcare services.

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11 Appendices

11.1 Ethics Approval Form

ETHICS APPROVAL FORM

Before you complete this form, please take time to carefully consider the following questions:

Have you considered yet whether there are any problematic ethical issues in your proposed research project? If you have not you should talk to your Course Tutor or Supervisor.

Have you already completed an Ethics Approval Form? Yes – *then you do not need to complete this form*

No – please complete this form in as much detail as you can

Name:	Jeffrey Tang		
Project/Research Title:	An investigation into the application and efficacy of Service Design methods in Healthcare Service development		
Name of Supervisor:	Dr Ian Walsh		
School/Dept.	School of Industrial Design		
Faculty:	FADE		
Proposed Start Date:	01/10/2011	End Date:	30/11/2016

1. Summary of planned research (*please indicate below the purpose of your planned project/research, together with your aims, main research questions and research design – you should continue onto a separate sheet if necessary*)

This project aims to generate new knowledge by means of a grounded theory based research investigation. This knowledge will be used to produce a Service Design benchmark framework that will facilitate the development of innovative healthcare services in the long-term care sector.

The framework's main objective is empowering both users and operators to become core decision-makers in the service design process, and to introduce new care pathways in a way that best serves their health and management requirements.

The application of the framework within the relevant contexts of clinical provision; efficiency of service delivery; and the quality of intervention outcomes will establish and inform the most relevant design factors for supporting design decisions. Design factors will be established on the basis of best practice in the healthcare sector, and through consultation with an expert panel.

The premise of this research is to find out how service design processes and their considered selection will shape the future of healthcare development. The initial emphasis will be on establishing a benchmark against which the generated framework may be tested. The framework will be tested in Primary Care pathways (HMP based), Local Health Boards (Wales) and private health providers throughout the UK such as Tunstall, which have direct connections with Med-Co Europe (supporting company).

Results from the benchmarking analysis will be analyzed to determine the effectiveness of selected design models against identified design factors. Successive iterations of the framework will be tested, evaluated, and refined. It is envisaged that with a new framework and a new way of design thinking in design process adoption, a transferrable theoretical base will be founded.

The research is focused on understanding the use of service design methodology within the service development process that Health Boards in Wales currently adopt. The research paradigm is based on Constructive Grounded Theory where qualitative data on emerging practice is analysed and used to define a new theoretical service design framework. During the research process new theory will be generated by co-participation with relevant stakeholders during organized pilot studies.

The chosen research method at the heart of this research is based upon grounded theory described by Glaser and Strauss (1967). Grounded theory methodology has been chosen as the structural basis of this research as it is most suitable for supporting the gathering and subsequent theorizing of qualitative data.

The emerging nature of the service design discipline and the lack of established literature review for developments in benchmarking service design processes / models also makes grounded theory processes most suitable for this research in handling and interpreting emergent data. The study will adopt a constructivist approach to allow co-construction with participants in the service design process.

Primary data in this research will be conducted in the form of anonymised, surveys to be filled in for relevant feedback from patients and care practitioners.

The purpose of the survey is to elicit information on service users' views on adopted design models; what they mean to create desirable health services, and to what extent such service models satisfy the goals and outcomes of service development projects.

Research project breakdown and timeline

0-4 months – Introduction to the project

The start of the research project involves forming relevant networking contacts within primary health care provisions specific to Wales and England. Start building an existing knowledge base of service design development both in general terms and specific to health care.

0-6 months – Literature review

Overview of past pilot schemes justifying the use of service design field in their specific developments and reviewing current health care developments relevant to where service design is can play a role to introducing telehealth to the care system.

2-8 months – Formulation of researching methods and study planning

To start arranging pilot studies with a targeted sample size and preparation of equipment/procedures to commence the first stage of participatory research. Questionnaires are designed and sent to the public domain to gain data on perceptions of introducing telehealth to current care pathways.

8-18 months – Commencement of pilot case study

Undertake a study concerned with the implementation of telehealth through service design.

8-24 months – Development of theoretical framework

Methodologies in the design process are critically reviewed as a co-designing team. Views and opinions are recorded from all the different stakeholders involved.

10-24 months – Testing and prototyping

Implementation of the new framework takes place through multiple case studies where participants co-construct its development.

14-24 months – Refining the framework

Questionnaires and comparative analysis tools will be used to gain feedback and insight to further refine the generated theory and to ensure that rigor of audibility is being maintained throughout the process.

23-30 months – Final evaluation phase

Quantitative, and qualitative findings are discussed in the evaluation, and to justify the reasonable case for the emerging new theory from the case studies.

19-36 months – Compile thesis & Viva preparation

Detailed discussion of new service design theoretical framework and its implications on telehealth service testing, designing, planning and assessment.

2. Methodology (You need to be clear about the methodology you intend to use in your study; this could include any number of methods, so either tick those shown below (where appropriate) or put the details in the box marked *)

- | | | |
|--|---|--|
| <input checked="" type="checkbox"/> Interviews | <input checked="" type="checkbox"/> Participant Observation | <input checked="" type="checkbox"/> Use of personal data |
| <input type="checkbox"/> Focus groups | <input checked="" type="checkbox"/> Questionnaire | <input checked="" type="checkbox"/> Literature Review |
| <input type="checkbox"/> Performance | <input type="checkbox"/> Presentation | <input type="checkbox"/> Other (state below)* |

*

3. Participants - Does your proposed project/research involve human participants?

1. Yes, as a primary source* 2. Yes, as a secondary source* No- go to section

****If you have ticked yes, it is likely you will need an Advanced CRB check before undertaking your study***

If yes, indicate who your participants are:

Early years/Pre-School children Adults - *give details below*
 School age children Vulnerable people - *give details below*
 Young People aged 17-18 The general public and research participants of pilot studies
 Unknown at this stage

4. Ethical issues - you should tick all that apply

Administration of drugs incl. alcohol Deprivation
 Unpleasant stimuli in any manner or form Active deception or withholding information
 Collection of highly personal information Payment

5. Are there any ethical concerns other than those listed above? (*Continue onto a separate sheet if necessary*)

Ethical issues are primarily the maintenance of confidentiality in stakeholder-derived information. The Caldicott principles will be applied throughout the research, to ensure the correct handling of confidential patient information between the researcher, and research participants whom involve NHS employed professionals, and NHS officiated healthcare providers / resource teams. The basic recommendations outlined by the principles are shown below -

- Justify the purpose(s) of every proposed use or transfer of patient information
- Use only the minimum amount of disclosed personal information, where possible and make best use of identifying codes such as patient numbers wherever possible to avoid disclosure of unnecessary personal information
- Access to it should undertaken under strict guidelines that are clearly acknowledged and permissible with the utmost confidence from all who are agreed to handle and access the data
- Everyone with access to it should take responsibility for observing the protocols agreed upon
- Understand and comply with the law such as the Data Protection Act 1998

Personal information gathered during the research is data referring to their perception and experiences of using selected service design processes. The purpose of collecting this type of data is to determine how current design models operate and could improve through a benchmarking analysis based on established design factors to identify how effective / applicable a design process demonstrates within the healthcare context.

The research also involves observing the interaction of service development stakeholders as part of understanding the design process and procedures that operate between them (in the form of pilot studies). Observations will be recorded and serve to build up the broad picture of the adopted service design ecology by breaking it down to themed categories. Physical objects such as equipment and visualisation aids may be photographed if they contribute to a project interaction and stakeholder engagement to enhance visual stimulation for research participants.

6. If there are any ethical concerns, please state how you intend to minimise any risk of harm or distress that could be caused (*continue onto a separate sheet if necessary*)

A write up of a proposal outlining the nature of a pilot study will be produced and discussed with the main stakeholders involved in a particular study. Specific attention will be given to data confidentiality, access to the data produced, timescale of data retention, and deadlines for destruction of held data.

An ethical guideline for sharing personal information between stakeholders will be produced in line with best practice principles from the Caldicott Protocol. The framework covers up to six sections including:

Objectives of a locally agreed protocol –

- To set parameters for the sharing of information between agencies which contribute to the health or social care of an individual.
- To define the purposes for holding personal information within each agency.
- To define how personal information should be held within each agency and who should have access to this information.
- To define which information is designated as health services information and which is designated as social services information and to specify the rights of access to each for individuals as required by legislation.

General principles governing the sharing of personal information -

- Whilst it is vital for the proper care of individuals that those concerned with that care have ready access to the information that they need, it is also important that service users and their carers can trust that personal information will be kept confidential and that their privacy is respected.
- All staff has an obligation to safeguard the confidentiality of personal information. This is governed by law, their contracts of employment, and in many cases by professional codes of conduct. All staff should be made aware that breach of confidentiality could be a matter for disciplinary action and provides grounds for complaint against them.
- Although it is neither practicable nor necessary to seek an individual's specific consent each time that information needs to be passed on for a particular purpose **that has been defined within this protocol**, this is contingent on individuals having been fully informed of the uses to which information about them may be put. All agencies concerned with the care of individuals should satisfy themselves that this requirement is met.
- Clarity about the purposes to which personal information is to be put is essential, and only the minimum identifiable information necessary to satisfy that purpose should be made available. Access to personal information should be on a strict **need to know** basis.
- If individuals want information about themselves to be withheld from someone, or

some agency, which might otherwise have received it, the individual's wishes should be respected unless there are exceptional circumstances. Every effort should be made to explain to the individual the consequences for care and planning, but the final decision should rest with the individual.

- The exceptional circumstances which override an individual's wishes arise when the information is required by statute or court order, where there is a serious public health risk or risk of harm to other individuals, or for the prevention, detection or prosecution of *serious* crime. The decision to release information in these circumstances, where judgment is required, should be made by a nominated senior professional within the agency, and it may be necessary to take legal or other specialist advice
- Where information on individuals has been aggregated or anonymised, it should still only be used for justified purposes, but is not governed by this protocol. Care should be taken to ensure that individuals cannot be identified from this type of information, as it is frequently possible to identify individuals from limited data e.g. age and postcode may be sufficient.

Setting parameters for sharing personal information –

There should be a nominated senior professional, within each agency covered by this protocol, responsible for agreeing amendments to the protocol, monitoring its operation, and ensuring compliance.

If appropriate, service level agreements can be used to establish standards for sharing information, e.g. speed of response.

Specific consent is required prior to personal information being transferred for purposes other than those defined in this protocol, unless there are exceptional circumstances as outlined above.

Where individuals are unable to give consent, the decision should be made on the individual's behalf by those responsible for providing care, taking into account the views of patients and carers, with the individual's best interests being paramount. Where practicable, advice should be sought from the nominated senior professional and the reasons for the final decision should be clearly recorded.

Defining the purposes for which personal information is required –

- There will be a range of justifiable purposes to be locally agreed. This will likely include purposes such as for health services research, statistical analysis, accounting for service performance in care trusts, managing and planning of services, assuring and improving the quality of care and treatment, and delivering consistent personal care and treatment.

Holding personal information, access and security –

- Staff should only have access to personal information on a need-to-know basis, in order to perform their duties in connection with one or more of the purposes defined above. Clinical and professional details should be available to all those, but only those, involved in the care of the individual.
- Each agency (Swansea Metropolitan University and Med-Co Europe) will ensure that they have mechanisms in place to enable them to address the issues of physical security, security awareness and training, security management, systems development, site-specific information systems security policies, and systems specific security policies.
- Each agency (Swansea Metropolitan University and Med-Co Europe) will take all reasonable care and safeguards to protect both the physical security of information technology and the data contained within it.

- All information systems will be effectively password protected and users will not divulge their password nor leave systems active whilst absent.
- All personal files and confidential information must be kept in secure, environmentally controlled locations when unattended, e.g. in locked storage cabinets, etc.
- Only staff within Swansea Metropolitan University or Med-Co Europe, who requires regular access to the information they contain, should hold keys to lockable storage cabinets. Keys must be held in a secure place.

Ownership of information and the rights of individuals –

- Whilst written and computerized records will be regarded as shared between the agencies, an individual’s right of access to the information contained in the records differs when it has been provided by a health professional from when it has been provided by Social Services staff.
- Any health professional contribution to records maintained by Care Services staff, whether a letter, a case record or a report, must be clearly marked as such, and where practicable, kept in a closed part of the file.

A Consent form, and a Confidentiality and Indemnity form are to be signed upon before validating the research process. These two documents along with an Ethics Process Flow Chart and a Security Measures table for protecting personal information are disclosed separately along with this form for submission.

You should enclose any materials (e.g. questionnaire, interview schedule), plus the Consent Form, and the Debriefing Sheet when submitting the Ethics Approval Form to your supervisor.



Student Signature _____

Date 18.06.2012

Advanced CRB check required **CRB confirmation received - Date:** _____

Recommendation of approval given at Faculty Level

Approval not given at Faculty level – forwarded for discussion at the next meeting of the University Ethics Committee

Comments:



Signature: (Assistant Dean/Head of School) _____
Date: 18.06.2012

Faculty recommendation endorsed by the
Ethics Committee

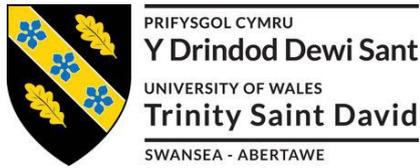
*Chair's
Initials*

K.P

Date

27.06.2012

11.2 Deployment exercise invitational letter



Invitation to participate in a service design workshop to script an action-plan for developing a healthcare management programme

Dear Therapists, Psychologists, and Health Scientists of the Health Board,

I would like to invite you to participate in a service design workshop where you will be given a short design brief outlining a scenario for designing a self-management programme to be implemented within primary care. This programme could be integrated in a way that is transferrable across different specialities across primary/secondary care, or it can be something condition specific if that is the idea you have in mind.

You will be given a brief that outlines a background context, a list of challenges the care providers face, and a task to write up an action plan for how you might creatively address the design challenges to developing the programme. The brief outlines a set of key criteria that you will be asked to address within the writing of your action plan. It is envisaged that around 25 minutes will be allotted to this briefing exercise.

Alongside the design brief, you will be given a guidance model, that has the purpose of helping you to make sense of the design process and to help you visualise how a development team designs the service from one particular stage to another. You may use this to help support the writing of your action plan, and to help structure your ideas.

The purpose for this exercise is to examine how healthcare professionals assess the impact and relevance of design models to assist in planning a new service project, and whether it supports facilitating innovative thinking. Part of this assessment involves you giving a rating of how well the design model helps you to address each of the design criteria outlined in the design brief, and this will be filled out in an evaluation form after the action plans have been completed. The evaluation forms should take no longer than 5 to 10 minutes to complete.

Many thanks,



Jeffrey Tang
PhD Student
UWTSD
Swansea

11.3 Participant extracts transcribed from the research workshops

11.3.1 Data extracts for the Service Design Model

Service Design Model participant responses

WT-HCP-110-1

Understand

Meet with managers of support staff – identify training requirements:

- Broader impacts on issue such as taking medication
- Environment
- Communication
- Consent
- Routines / working practice of staff team
- Needs / expectations of service user

Identify expectations of support staff – do they feel confident in their role and do they see the purpose in maintaining the plans / goals.

Identify issues that may impact the success – i.e. shift patterns, presentation of medication, and understanding of service user.

Meet with other community team members to identify issues and who might need to be involved.

Review good practice.

Conception

Address and negotiate regarding issues.

What does staff need to support service user?

What do service users need to be able to empower them to have more involvement? – I.e. Level of learning difficulties, accessible information, visual schedules, individual checkers, planners, appropriate routines and other strategies.

What does CLDT (Community Learning Disability Team) staff need to be involved in, and what is their role?

What would be achievable and realistic goals – break down plans and involve the service user where possible.

Set standards.

Manage and deliver

To be delivered as a whole team.

- Training awareness > deliver strategies and tools involving staff > reduce input with clear expectation from staff > ensure supervision structures in organisation / staff team are in place.
- Support mechanisms from Community Learning Disability Team as required.
- Governance responsibility needs to be clearly held by organisation.
- Systemic issues as well as individual clinical practice.
- Other safeguards could be developed as necessary, e.g. Protocols, guidelines, risk assessments and audit.
- Ensure consistency of approach and enable a route where problems / issues can be raised and dealt with rather than ignored.

Test and Learn

- From the developments of previous stage, identify if new ways of working are emerging.
- Encourage staff team to look more broadly for positive outcomes, e.g. effects of taking medication regularly means service user can go out more, do more activities, frequent the hospital less with visits.
- Discuss what hasn't worked – can this be adapted?
- Has the service user benefitted and has the intervention been effective from the CLDT point of view.
- Sustainability.

Service Design Model participant responses

WT-HCP-110-6

Understand

- Staff involvement
- Identify what is the goal of the self-management programme
- Who are the relevant stakeholders? Possibly identify a number of patients with the condition and ask them who is involved in their care usually. Ask clinicians, 3rd sector groups and relevant others, whom would be involved in the decision making process and possibly the delivery process.
- Group discussions, or mail out information gathering tool to gain an understanding of what would be wanted in the self-management programme. What would be the issues to delivering given experience to date, or perceived problems?
- Discuss with other areas and fields, who may already have a similar self-management programme; what they deliver, how they deliver, what were the solutions to problems and what problems still remain?
- Find information about other self-management programmes and what have been their problems and solutions?
- Develop a working group of representatives from both potential deliverers of the self-management programme and recipients, budget holders, workforce planning, quality assurance and governance bodies.
- Working group to come to some agreement regarding: 1. Potential content of self-management programme given the information gained from other areas already running similar programmes. 2. Delivery methods for example in groups, one to one, via telecommunications. 3. Achievements expected. 4. Perceived issues.

Address issues and agree on solutions in working group.

Formulate self-management programme.

Identify deliverables and agree on roles > appropriate training.

Test programme to pilots.

Evaluate pilots – What went well? What are remaining issues?

Take back findings to working group and address remaining issues through redesign as required.

Service Design Model participant responses

WT-HCP-110-8

Understand

Find a baseline – identify the need, understand local issues, ask if it is necessary to make a change, undertake a literature review and within that understand the research and evidence that has already been done.

Ensure there is a need to drive this forward.

Understand cost implications, and resource required.

Identify who are the stakeholders – engage and communicate regularly within good time.

Conception

Understanding if your idea is what everyone feels needs to happen.

Engage with relevant people, i.e. those who have a chronic condition, carers both formal and informal, is there a program that can be used, people who understand and can identify with the health issues.

Engage with health/social care professionals – do they see the ideas as effective ways for supporting people?

Engage with management – does this fit with strategic direction of the Health Board?

Identify pros and cons to implementing this program.

Agree a business case and funding avenues. Use appropriate evaluation tools to appraise new proposals.

Manage and deliver

Agreement from all stakeholders in regards to – program goals, ownership, service requirements, agree the process of implementing, delivering and evaluating. Need communication plans. Identify training needs for deliverers of the program and its delivery structure.

Ensure content of the program is correct and accurate, relevant, and interactive based on a learning theory.

Understand cost effectiveness, resource implications and financial models.

Test and learn

Implement agreed plan for training of trainers. Implement program review programme – review design, delivery and evaluation.

Identify what worked well and what didn't work so well. Agree to adapt and change as required. Therefore go back to the start of this model and understand – ensure stakeholder engagement remains positive, agreement remains and further development of program continues. Continue to use cycle to ensure program remains adaptable to changes. Needs to be sustainable.

Service Design Model participant responses

WT-HCP-110-14

Defining program goals – look at outcomes for patients. What makes them “stable” requiring no / less intervention. Asking clinicians and patients what “stable” means to them.

Look at specific areas of condition and ways of measuring stability. Could patients self measure to assist with compliance? For example – constant reinforcement for compliance with treatment should good results be manifest.

Questionnaire for clinicians and patients – Refer to clinical guidance such as NICE guidelines for example.

Look at results and stratify the important factors – look at what is achievable!

Look at current clinics – is there enough time for patients to be fully informed of clinical condition and importance of self management – Look at all clinical information that is collected. Does this give enough information for the clinician to advice patients adequately?

Support would need to come from management and full clinical team. Everyone needs to be on board and committed.

Prove that less clinical episodes equates to better use of resources. Needs auditing from perhaps a pilot study.

Appropriate tools would be questionnaires, patient feedback, and audit trail.

Didn't use model. Perhaps this is the way I work anyway!

Service Design Model participant responses

NMP – 110 – 10

Current status of care < > Ideal outcomes

This would cover points 1 and 2. I don't think the model structure allows for enough cross-referencing and is too linear perhaps. It is clear that a level of self care exists and so it is crucial for a continual cross check of points 1 and 2 will allow a thorough analysis for progress going forward.

Research and Development < > Patient / Clinician Feedback

Identifying solutions that are achievable needs to include an interim stage between conception and delivery. This will ensure that ideas are not only realistic but also are appreciative of stakeholder opinions. Patients are the end-user and arguably, their input is critical at this stage.

Test and Learn < > Understand costs

Based on research and development coupled with extensive feedback, a theory for service delivery can be put in place. I agree with the model that 'test and learn', and cost understanding is fundamental; but understanding costs should be a preamble to testing. NHS funding is continually up for question and so the model needs to appreciate actual implementation costs and whether they are scalable within budget, before pilots can be run and analysed.

Regular follow up < > Economic review

On the basis that delivery stages 6 and 7 are economically viable before the pilot is implemented, patients will need to be consulted in terms of the

difference made and to review how it has helped clinicians better manage patients. This would form part of their continual professional development requirements.

Service Design Model participant responses

NMP – 110 – 15

Understand

Program goals – Patient improving lifestyle / health and tackling their long-term condition > Depends on how important they find it – changes patient perception.

Clinicians make it efficient / viable to help re-educate patients to improve lifestyle / health issues.

Management – understanding how to manage system to keep patients seen by same clinician through regular contact. Have patients actively going through process.

Conception

Ideas for service delivery – arrange focus groups involving clinicians and patients where appropriate. Introduce questionnaires to gain relevant feedback.

New ideas to be rolled out as 6-month pilot schemes – advertised to patients in a GP/Clinician referral.

Management and Designers need to consider problems such as poor patient engagement, as some patients will not want the help provided.

Manage and deliver

Management to arrange the new workload of clinicians – Meetings required informing staff of new schemes upcoming. Arrange new protocols and policies, set up new information systems to support a continuous care pathway for trying to solve patient long-term condition.

Testing and learning

Roll out scheme involving a 6-month pilot. Review the pilot with patients and clinicians to see how they find the new system / management / hospital, and see how figures are stacked up overall. Take on feedback, possible issues to re-do design plan. There needs to be ways of improving or implementing new / different options if initial scheme doesn't work.

All stakeholders need to assess if or why patients do or do not concentrate on wellbeing.

Model C needs room for considering current / previous service first. Needs room for deciphering economic impact. Think Model C is perhaps too vague and could incorporate more historical research and economic impact.

11.3.2 Data extracts for the National Health Service Design Model

NHS Design Model participant responses

WT-HCP-110-2

Explore

Background issues – what is the problem and what are we trying to achieve.

How will we deliver this self-management programme – who will be involved?

Where are we now and where do we want to be?

How will we decide how best to research the issues?

Create

Need to come up with a model to deliver the plan – who will be involved in educating patients and giving patient advice, etc. Who will deliver what?

Reflect

Run a pilot of the self-management plan with a small group of patients then re-run the design model processes as previous again. Use satisfaction feedback surveys to get information within every design stage.

Use selected methodology after running cycle to choose which type of management training works best.

Deliver

Having run a pilot cycle of explore > create > reflect, explore and create the new deliverables designing from the results of the previous design processes. Using patient satisfaction surveys and other criteria such as exacerbation rates, continue to monitor the delivery structure.

Use above data including admission rates to determine any potential cost saving and use health impact questionnaires with patients to assess health benefits, and weigh up against cost of service.

NHS Design Model participant responses

WT-HCP-110-5

Exploration

Need to understand program goals with both service provider and service user equally. Goal of customer and goal of service provider will differ. Identify both and have a clear list of priorities for both parties.

Acknowledge current problem of poor management equals readmission to secondary care. Ensure course ultimately improves clinical management of condition.

Service requirements will depend on population budget, facilities and actual “experts” to deliver course. Understand staffing issue?

Look at other ways of releasing staff – Trained by tutors, video conferencing, and multiple sites with only one expert on one site.

Current shortcomings – lack of patient signposting and support. Aim to have one place for participants to contact and discuss about self-management needs. Every patient has contact of specialist nurse to assist in clinical aspects, but need one place where patient can contact regarding self-management > Telephone or website.

Creation

Workshops including clinical management, project design and patient experience to determine service requirements. Attempt to have support from people already involved in delivering self-management course – identify their

problems encountered and presume you will come across similar issues.

Understand and have a system in place that will allow anyone to communicate a suggestion, or a new idea.

As a working group decide whether this will be something to try and implement, and a method for how to go about that.

Create a task and finish group, agree to only meet a specified number of times and know what needs to be achieved in those sessions.

Reflection

Has it addressed the current problems identified in exploration phase?

Satisfaction feedback forms for participants and course providers. Dependent on results, we proceed to appropriate action, redefining goals, and what needs to be altered. Create a storyline of what has been successful or not. Is it economically feasible to continue? Are the benefits of the course, participant and provider worth it? Has it saved time and money, reduced admissions and given time back to clinicians?

Deliver

Clear statement of intent is needed to understand what the course needs to deliver on.

Provide structured training to course tutors, and ensure everyone is providing the same service.

NHS Design Model participant responses

WT-HCP-110-9

Need to understand existing self-management support programmes before designing a new programme like for example the Health Foundation Programme uses the Wagner Chronic Care Model.

Need to understand mechanism and resources for delivery, i.e. trained staff, time, locations, E-learning and face to face. Decide how many patients will need training and how they are to be recruited.

Need to understand levels of patient activation – who is suitable for the programme, all or some?

Need to understand levels of clinician activation – amongst different clinical groups some may support therapists whilst some may not.

The self-management programme needs to be enacted within a co-creating health framework – it is not about ensuring compliance with clinician advice. SMS training will clash with medical consultation models.

Action Plan template doesn't cover the integration of current knowledge.

Need to consider both physical, and mental health needs together.

Program goals

- Patient health literacy
- Patient understanding of health services and interacting with clinicians
- CBT to improve self-efficacy

- Patient / Clinician activation

Service requirements

- Training for clinicians in SMS and integrating within a co-creating health model of interaction.
- Training for patients in SMS
- Training will require appropriate resources and training methods involving both E-learning and face to face
- Staff time will need to be delegated for training
- Both clinicians and patients trained in SMS will need longer appointments to resolve complexities
- Needs leadership from the top
- Needs integrated physical and mental health teams
- Strategy for researching the condition / issues – using existing literature and review it within local context
- Stakeholder meetings to understand local context and constraints
- Determine if patients and clinicians would support such a programme

New ideas will form in line with training on SMS with patients and clinicians.

Understanding current shortcomings – literature and caseload data highlighting poor management of chronic condition, data from outcome measures and service demand measures.

Support for implementation – Needs leadership support for finance and permission granting. Needs peer support from clinicians. Needs both patient, and patient group support.

Economic impact – Need to consider long-term impact and beneficial side. E.g. Impact reduced demand.

Tools for development – Training in self-management support and co-creating health framework.

NHS Design Model participant responses

WT-HCP-110-11

Define programme goals – In the exploration phase, this programme will explore the purpose of the work from the service users' perspective – A mixture of questionnaires and semi-structured interviews will be developed to clearly ascertain users and their carer/family needs.

The next phase, which covers programme goals, will also scope the service requirements. That will also entail studying current service demands. These will look at types and frequency of demand – They convey qualitative and quantitative elements.

The next phase of my design will entail separating “value demand” from “avoidable demand”

The above phases engage the service user and the people who run the services like myself. A wider stakeholder engagement would be the next step to ensure patients and staff from relevant health and social care, and valuable organisations could input to the development of the new design. This encompasses the creation phase.

There would be a robust, scientific basis to the next phase – A workshop(s) would enable the stakeholders to verify system purpose and consider the demands placed on existing services.

Stated problems – The problems of appropriate use of medication by the service user would be reviewed along with other aspects of “failure demand” that create more work for the service and reduce quality of life for patients. Overburden of staff and alternate solutions such as Expert Patient Programmes

would be covered in these workshops. The qualitative and quantitative data would be collected and analysed following the workshop along with any other agreed areas that warrant further investigation to inform a solution.

The development of a steering group and implementation group would oversee the piloting of agreed approaches and the development of appropriate measures against the agreed purpose. A project team and project plan would require Board approval – This would encompass resourcing, timescales and measures /milestones.

An essential element would be to agree accountability of all stakeholders including patients, as well as outcomes and measures of programme benefits. A process of evaluation would support continuous improvement and evaluation of the program.

The categories in the design model are very general and lack elaborate detail on a few factors. Used own model principles to draft out action plan.

NHS Design Model participant responses

WT-HCP-110-13

Define goal – Patients using eye drops as expected to prevent visual loss

Requirements

- Opportunity to educate patient
- Plan given to patient
- Support in 1st month to direct progress
- Evaluation
- SOS plan if patient has difficulties

Research problem

- Anonymous questionnaire
- How often is medication forgotten?
- How often is medication not used from other reasons?

New ideas

- Discussions with team and patients

Current shortcomings

- Not enough time to discuss and support
- Not enough patient feedback
- Lack of continuity

Support

- Staff time, admin help, recall of patients

Economic impact (If medication is used effectively)

- Impact in further intervention made available

- In need for more costly procedures
- In sight loss and its consequent costs

Appropriate tools

- Need to appreciate benefits of patient compliance

Not really used design model to aid this.

NHS Design Model participant responses

WT-NMP -110-1

Exploration of problem

Work out what client wants / needs. What are the desired outcomes whether it involves a product, process or service? Identify team and resources available, budget available and time frame available.

Creation

Patient / Client / Professional interviews to ascertain scope of problem, to drive creative solutions. Work with design team brainstorming ideas / notes / sketches / plans as an ideation exercise. Visit clinics / places of work to get first hand view of people's lives / problems / reasons for non-adherence to program. Begin design phase with intermittent client meetings.

Reflection

Present to client for constructive feedback with enough time before deadline to address any changes required. Refinement of solutions and propositions to ensure best possible solution is reached. Propose focus groups of known non-adherence patients.

Assess results with client, and redesign as necessary. Larger scale testing of the process to refine delivery before final implementation.

NHS Design Model participant responses

WT-NMP-110-13

Consult with patient regarding non-compliance of medical prescriptions / advice. This may be organised as a result of an admission to acute care.

Create solution with patient with a view to allowing the patients to take control of their own care. Identify patient's goals, not the clinicians' only.

Identify the exact services required by the patient, and ensure the patient is well informed.

Consult with patient periodically to reassess their needs in terms of the solution originally created and develop accordingly.

Development and amendment to solution over time, to reflect a patient's on going / challenging needs.

Any missed medications or ignored clinical advice are consulted about at periodic reviews.

Evaluate the value of current medication prescribed but not taken (wasted) versus wastage value at each consultation.

The model did not help me to address the specified criteria.

11.3.3 Data extracts for the Med-Co Conceptual Design Model

Med-Co Model participant responses

WT-HCP-110-3

Goals

- From patient perspective, feels empowered and in control
- From organisation perspective, reduction in emergency admissions / episodes

Service requirements

- Resources to undertake assessment of need / demographic profile to inform future model / resource requirement. Innovative IT and information solutions included.

Strategy

- Support from public health, housing and social care. Patient questionnaires – what do patients and their carers want. How much health and social care money is spent on the client group.

New ideas

- Look at research models available
- New technology
- Set up small task and finish group with service users and carers
- What is available potentially in the 3rd sector?

Current shortcomings

- Research / identify current waiting lists, referral patterns, quality of life for patients (questionnaires), activity within primary care and acute sector.

Implementation

- Develop an integrated business case that has robust demographic data including future projection, risk assessment of the service if nothing changes, options appraisal of new model ideas, costs associated, conclusions and recommendations, and identify route for approval.

Economic impact

- Should be included under implementation. Wider economic impact from health and social care perspective for present and future.

Tools for development

- Project management approach to provide structure, clear leadership and engagement, timescales and potential costs. Engagement with wide multi-disciplinary agency group will help generate new ideas. Crucial in involvement of patients and carers, as well as clinicians.

Med-Co Model participant responses

WT-HCP-110-4

Assessment

The Health Board wishes to enable and empower patients to best manage their own health and wellbeing, improving their quality of life and reducing hospital admissions

Discover

Currently patients do not have a clear understanding of how to access appropriate medical care in a timely fashion. They do not have sufficient access to the nursing team to develop the necessary understanding on how to self manage. There is evidence this results in poor compliance and additional hospital admissions.

Key to improving this situation will be looking at new and innovative ways at providing support, information and training to patients to improve compliance and appropriate access to clinical care.

Define

The current method for delivering, support and training is inadequate and either involves increasing nursing capacity or looking at different methods.

Resource

Identifying other health care providers who have looked at this problem, and whether they have developed method of delivery. Visits to other providers

may be helpful as well as literature around quality improvement initiatives. A workshop of patients and nurses may be helpful in identifying approach.

Development

A team of healthcare providers and patients can appraise different delivery methods.

Deliver

Different approach can be introduced. Possibly using PDSA methodology and evaluation from patient satisfaction survey, and data regarding compliance with medication and hospital admittance.

Med-Co Model participant responses

WT-HCP-110-7

Programme goals / Assessment

Looking at current problems to identify the patients' needs as to why they are failing to comply with the advice. Looking at re-admissions to hospital. Questionnaires or telephone surveys with patients to understand their experiences and what was happening prior to admission.

Service requirements

This would be based on criteria 1 as to where the need is. What are the majority of patients' problems – what do they want to see or find more helpful?

Strategy for researching the problem / issues

Evaluations / Questionnaires / Patient Stories / Hospital records on admissions.

Identifying where new ideas will form

Evaluation of the problems, what outcomes have come from criteria 3, involving other staff groups, research into other self-management services.

Understanding current shortcomings

Looking at what staff is currently doing in relation to workload and their coaching roles. Identify areas for staff to do coaching only – can this be a programme delivered by volunteers and non-clinical staff.

Support for putting innovations into practice

Using a developed programme, pick the programme and undertake evaluations of the programme. Look for external funding and support from other areas of self-management.

Economic impact

The difference of cost for a clinical staff member to deliver and a non-clinical / volunteer staff member to deliver. Changes in number of admissions to hospital – have they been reduced from the benefits of the new programme?

Selecting appropriate tools for development

Looking at quality assurance processes, peer reviews, national teams input. Refer to other similar pieces of work developed for benchmarking and guidance.

Didn't find the development model useful.

Med-Co Model participant responses

WT-HCP-110-10

Establishing the relationship between patient behaviour, experience and attitudes, and draw upon acute services. In order to do this I would begin with a process map to define the clinical process. This requires the project lead to undertake this task.

Key questions

- At what point do patients enter the services?
- What kind of interventions are provided to patients at each stage of the clinical process from: Entry > Assessment > Engagement > Treatment > Outcome
- What do the outcomes look like?

The process mapping exercise would need to involve key stakeholders: Patients, staff and to some extent commissioners.

Draw up themes generated to conduct further engagement events at each stage of the clinical process.

Appoint an engagement team to develop engagement opportunities with key stakeholders, including staff, patients and commissioners.

Present vision for the service and establish how this fits with the current state. This needs to be an appreciative and reflective process.

Analysis of data and presentation to the project team

Repeat engagement event to test out hypothesis and ideas for further

development. Draw upon information gathered to present a design brief – require sign up by the organisations’ board to mandate further implementation of the new service design brief

Implementation phase

Project lead engages service leads in realisation of new service model. Identification of what is required (define) is crucial at this stage. Concurrently develop methods and processes to do this.

Delivery

Delivery of new services will require clear methods and evaluating criteria. Accessible information should be made available to all stakeholders defining vision, service change, and what is required by everyone involved.

Med-Co Model participant responses

WT-HCP-110-12

Assessment

What are the problems / issues / ideas for future?

What are the real problems faced from the stakeholders (patients, their families and carers) (clinician and nursing staff)? Arrange focus groups to ensure all views are heard – what are the issues? Why do they not self-manage properly?

Who is driving this initiative? Where does the mandate come from? Is it in line with the Health Boards' objectives and the public health arena?

What is the vision for the self-management programme? What are the programme goals (can change at this stage)?

Review existing data – look at numbers concerning how many patients with this chronic condition have exacerbations and are admitted to hospital? What are the projected costs if things continue the way they are at present?

Discover

How can we do better?

Stakeholder involvement – identifying those who can play a positive part and those that may hinder.

Set questionnaires / one to one interviews / focus groups.

Need the answers from the stakeholders themselves as to why patients do not

comply? In response, what does the new programme need in order to address lack of compliance?

Review research literature and research strategies, covering what is currently out there – talk to other Health Board groups as to positives and negatives of similar groups.

Define

Define stakeholder plan, define what would be the real benefits of creating a scheme. Would there be dis-benefits / what are the dependencies, constraints and risks, etc.

Resource

What do we need – do we need a business case?

What will be needed to get the programme running? Who needs to be involved?

What will the future state look like? How do we get there? Who leads this programme? How much will it cost the Health Board? Are there savings to be met that could resource the new programme? How will we know if these savings are being met? How can we ensure benefits are true benefits? Could other departments work together to be more efficient?

Develop

Ensure that processes are followed, that frameworks are set, and that all stakeholders know how to deliver the capabilities. Must support staff for putting future new ideas / innovations into practice.

Must ensure diligent steps are in place to see if the new self-management programme is working – what would the indicators be that it is working?

Create a quality assurance review to ensure things are happening as expected.

Highlight shortcomings covering risks, issues whether good or bad. Clear guidelines and processes are understood by patients as to who they contact when problems arise.

Deliver

Set the programme running – consider who is monitoring the results and how they will be publicised. Follow up stakeholder groups and make sure data / evaluation collected is rigid and robust. Ensure that effectiveness / efficiency / economic measures are noted for long-term vision setting.

Med-Co Model participant responses

WT-NMP-110-9

Assessment

Each of the stakeholders will or may interpret their service requirements differently, looking at different goals.

Discover

Will we get the right information back from each stakeholder?

Choosing the right relationship contacts and shared understanding of the service envisioned.

Define

Need to capture the correct / true information from each of the stakeholders.

Resource

Will the relevant stakeholders understand and appreciate the appropriate tools to be used for designing the new service?

Develop

Establish what the shared goals are between the stakeholders to develop delivery propositions.

Deliver

Selecting the right personnel to deliver the new service and understand the evaluative process to continue improving and reviewing the new interventions put in place.

Med-Co Model participant responses

WT-HCP-110-11

Everyone is looking for different end goals. I think that by following the model it would address all of the eight design criteria in question. It involves many stages that would mean most points are covered. The points can fit in to the model as prescribed below:

Assessment

- Specifying service requirements
- Identifying how new ideas form

Resource

- Selecting appropriate tools for development

Define

- Understanding current shortcomings
- Defining programme goals

Develop

- Support for putting new innovations into practice
- Strategy for researching the problem / issues