Terry Quilty
*Faculty of Business & Information Technology, Manukau Institute of Technology, Manukau New Zealand, and*

Lyn Murphy
*Faculty of Health and Environmental Sciences, AUT University, Auckland New Zealand*

**CONSIDERATIONS IN THE DESIGN OF AN ACTION RESEARCH PROJECT**

**Abstract**

**Purpose:**
To create a growth strategy in multiple locations for a Whanau Ora service provider, and, to determine the costing and performance measurement methodologies to apply within and across the resultant distributed network.
 To describe the first steps in developing a business model for Whanau Ora delivery to form the basis for the determination of appropriate costing and performance methods.

**Design/methodology/approach:** The research is in the scoping phase. The outcome of this phase are the design criteria for the distributed network.

**Findings** An integrated business model for community health with multifunctional delivery across diverse locations creates a complex system requiring standardization of systems and centralized administration to meet objectives and to be capable of cost and performance measurement. Where there are manifold options and the existing structure does not provide a base we suggest criteria specific to the project to build a 'straw man proposal as an iterative model. The ongoing research will be applied to the straw man to determine the final business model.

**Originality/value** The paper describes an action research project in a community health group employing a culturally derived concept of holistic health care funded from within mainstream capitation funding. This provides a novel and unique opportunity to evaluate the impact of that concept to the services provided and to the integration of those services in a structure that is not currently employed in New Zealand.

Key Words

Action Research, public sector, integration, research design, straw man, model, Whanau Ora, performance measurement, indigenous health, healthcare.

**Ethical Considerations**

The research is in the design phase. It does not involve any human participants as subjects of the research. The ethics process is not triggered. The research may require data to be gathered from staff in the clinics, community members and government agencies. An ethics approval would then be sought if human subjects are participants.

**Introduction**

This paper documents the initial stage in a project to assist a community health provider develop a strategy and plan to provide a range of integrated health care and social services to high needs communities in New Zealand. In New Zealand primary health care is funded on a capitation basis with differing rates based on need.(Ministry of Health, 2014) The highest needs are quintile five. This grouping is the focus of the provider. The health provider (the partner in this project) applies a delivery model described as Whanau ora. This is a delivery model that aims to provide a holistic approach which focuses on the family and wider community. (Durie, 2013) The services delivered are general practice medicine, social services, counselling, substance abuse, smoking cessation, and, restorative justice facilitation. The partner is growing with new clinics and partnered clinics in a range of locations. A strategy and implementation plan is needed to facilitate this growth and meet resourcing needs in new locations. Some locations have capability and capacity limitations.

The need defines the problem. That is developing the strategy that will operationalise the Whanau Ora delivery over the resultant wider network to deliver a full range of services to high needs communities. To develop this strategy and implementation plan an action research approach is to be applied.

The second aim of the research is to evaluate the impact of Whanau Ora delivery on health and clinic outcomes. The benefit of Whanau Ora may be seen in the performance of Whanau Ora clinics in comparison with other delivery, however, that assumes there is a difference in the delivery. A well run Whanau Ora clinic may simply mirror best clinical and administrative practice.

The ultimate question is whether there is a marginal value in Whanau Ora as a distinct delivery mechanism. In addition the organisation that is being created is a group requiring

measuring the performance as a group.

Three separate areas arise. The first is the strategy development, the second the measurement of inputs and third performance measurement of Whanau Ora. The aims of the organisation are known. The intended network is known. A structure that will link that network to achieve the aims and embody the Whanau Ora concept is not known. Consequently the questions of costing and performance remain theoretical. The complexity of the services and their integration is such that the development must be incremental, however, the raft of possible solutions led to the decision to utilise a straw man proposal to test options and serve as the basis for pilot implementation for specific purposes. This paper documents the process undertaken to develop the straw man. With a straw man in place costing and performance methodologies may be considered. These will modify the straw man in the iteration process.

**Background: Whanau Ora**

The Whanau Ora task force was established by Cabinet in 2009 (Office of the Auditor-General, 2015) to establish a whanau centred approach to health. The central themes being empowerment and a focus on the whanau rather than the individual (Durie, 2013)

The resultant framework was intended to be cross-government work programme jointly implemented by the Ministry of Health, Ministry of Social Development and Te Puni Kōkiri: The Ministry of Maori Affairs (Ministry of Health, 2011). This would require multiple government agencies to work together, a facet reflected in the definitions of Whanau Ora provided by the government departments described below.

Whanau Ora must also be reflected in the District Health Board (DHB) Annual Plan with the expectation that DHBs support and engage with local Whānau Ora provider collectives to foster Whanau Ora service delivery and support the building of mature sustainable operations. This includes a range of specific requirements for the DHB annual plans(*National Health Board Annual Plan Guidelines 2014/15*, 2014)

The mechanism for funding this structured application of Whanau Ora is via three commissioning agencies that allocate funds to a range of providers and collectives. To achieve the cross government agency access there are navigators. Navigators are persons with a role similar to a broker finding a set of services to match the client requirements and working with providers. They are expected to work with agencies and clients and contextualise the services(Te Puni Kōkiri, 2015) . A related and key aspect of the Whanau

Ora system is the development of whanau plans(Te Puni Kōkiri, 2015). Whanau plans engage the client in planning their health, social, employment and other relevant life aspects.

The first phase of Whanau Ora was 2010-1014 at which point there were reports by the Office of the Auditor General (OAG) (Office of the Auditor-General, 2015) and Te Puni Kokiri (Te Puni Kōkiri, 2015) .There are subsequent reports by the Minister responsible for Whanau Ora Honourable Dame Tariana Turia in July 2014 (Turia, 2014) and Ministry of Health (MOH) Report March 2015 on the general practices of Whanau Ora collectives (Ministry of Health, 2015)

Performance of Whanau Ora as a delivery mechanism was considered by the OAG. The OAG resulting report on the first four years of Whanau Ora (OAG 2015) praises Whanau Ora as an example of 'innovation and new thinking in service delivery' (p4) and 'a success for many families' (p4) but also identifies the challenges in Whanau Ora implementation. Specifically the OAG is critical of: inconsistent articulation of the aims, roles, and responsibilities, accountability and reporting systems in the Whanau Ora process, and poor financial planning and management including excessive spending on administration.

The OAG criticisms are of the systems and not of the health outcomes. However, as the aim of Whanau Ora is linking the concept to the health aims there is an inferential question mark raised on the capability of Whanau Ora to deliver.

Whanau Ora is a concept, but is also used to describe the funding process outlined above. Although, the mechanisms developed as a result of the task force result in funding allocations via the commissioning agencies to collectives, this does not, and has not, precluded other providers from pursing a Whanau Ora approach and describing their service as Whanau Ora.

Issues identified in the OAG report were in relation to the Whanau Ora funding model. The reports noted do not address the specific issues of other practices described as Whanau Ora.

The common aim of the providers is in the aims of Whanau Ora, the central tenants of which are the family centric approach, the cross agencies sourcing, and the integration of the delivery of services. The performance measurement questions for this delivery mode apply whether utilising the government specific Whanau Ora funding or not.

Those services which are not Whanau Ora funded operate health delivery services under the general funding utilised by the majority of New Zealand medical practices. This is a mixture of capitation funding and consultation fees. The payments per enrolled patient vary according to the health quintile of the patient.(Cumming & Gribben, 2007)

The reports noted did not provide metrics which allow a consideration of Whanau Ora as a unique input, or given the criticisms, are they sufficient in terms of performance measurement. They are a consideration of a grouping of providers and their ability to meet health outcomes.

**The Action Research Partner**

Selection of an action research partner was not a structured process. The opportunity to engage with a provider occurred and a structured approach to the design of the research was then to be determined.

The partners are not funded under the Whanau Ora funding mechanism directly or indirectly. They are funded under the general funding mechanisms for Medical practices provided via the relevant Public Health Organisation (PHO). The funds received are predominantly quintile 5 capitation funding.  The practices span multiple PHOs. Services provided include general medical practice (Doctors), restorative justice under contract to the Ministry of Justice, domestic violence counselling, general counselling, smoke cessation programs and a number of ancillary activities in support such as emergency housing. The demographic includes Maori, Pakeha, Pacifica and other ethnicities. It also includes Iwi and Marae.

**The Objectives**

This research is aimed at underpinning the development of;

- A model for replication and scaling of delivery of wrap around services in a Whanau Ora model on multiple sites.
- Systems necessary to ensure consistent clinical and administrative practices.
- A strategy to build capability and capacity in smaller sites and community.
- A strategy to identify, create and exploit channels for community engagement.
- A financially sustainable growth model recognising the phases and projected growth modes.
- A Governance model for the group delivery.
- Key Performance Indicators for the group and for the practices.

In conjunction with the strategy development would be the implementation strategy and plan.

**Method: Understanding the Business Model.**

The first thought was to develop a model of the business .Models clarify thinking, explain data, provides the opportunity to analyse and run simulations. We can understand our organisation, develop strategy and decision processes, rank and identify levers. We can apply techniques to extrapolate or use retrodiction and counterfactuals to change our assumptions and see outcomes looking backward or forward. They have been applied extensively in health for population modelling, segregation and decision making, statistical analysis, quality control and articulating the business model itself. (Brailsford, Harper, Patel, & Pitt, 2009) The models can be applied at multiple levels. The policy level, the management, the health delivery mode, specific activities, patient mapping, business and health chain value. Some of these are immediately valuable to the partner. The reasons to model are clear but must be based on the intended outcomes not the current delivery. As a result what to model is not so clear?

**The choice of modelling tools.**

The first thought was an analysis of the current activities and an extrapolation for the network with the aim of creating a scalable replication model applying a Theory of Change framework approach (Fulbright-Anderson, Kubisch, & Connell, 1998). We could also apply classic grounded theory (CGT) for the development of a theory for the integration of the medical, social and justice services in the community clinics. This follows the classic grounded theory approach wherein 'CGT generates a substantive theory to be used to explain and abstractly account for a pattern of behaviour'(Glaser, 2014). Data will be collected to modify the theory. The data would be qualitative and quantitative. Qualitative analysis on a thematic basis using Atlas. ("ATLAS.ti: The Qualitative Data Analysis & Research Software," n.d.)

The cross functional issues are central and so a consideration of causal interactions was also considered. The project focus on network performance and the synergistic benefits of multi service delivery using Whanau Ora is analogous, if not the same as, sufficient cause interaction studies which look to the need for two events to occur to produce an outcome. Used in epidemiology to determine the impact of levels of two different risks(Sjölander, Lee,

Källberg, & Pawitan, 2014), the risks, referred as 'components' together produce a binary outcome. Whanau Ora can be considered a component. However, it is not a cause in itself. Moreover the component data would need to be the different services and relate to the same patient.

Another option is to analyse specific functions focused on the core objective. This would involve applying a health chain value analysis (Porter, 2010). The value chain is correlated to the organisation capability and separately to the organisation capacity. This analysis is repeated on the acquired clinics and a composite developed based on comparison with best practice and efficiency and efficacy of compliance with regulatory and clinical obligations. Costing could be applied on an activity basis or aligned to the patient records leading to life quality adjusted life year (Klarman, John O'S. Francis, & Rosenthal, 1968) performance indicators. This is very useful in specific disease targets such as diabetes.(Schmittdiel et al., 2007) Equally useful would be a work flow analysis applying Suttons Law (Koubek, Harvey, & Leichter, 2001), or Queuing theory using a Markov model for patient time and staff utilisation (Jiang & Giachetti, 2008) and as part of the problem solving ethos Plan-Do-Study-Action (PDSA cycles) (Walley & Gowland, 2004)

There are many options. The choice of the modelling technique itself needs to be appropriate to the aims at each level. Do we the granularity and do we have valid selection criteria for this? Are we simply selecting tools that we know, have analogous application or support in the literature? We do not have the structural granularity needed, nor an understanding of the inter relationships of the levels, and, if honest we inevitably look to known tools.

A consideration of 28 modelling tools applicable to health broken down across the multiple levels within heath organisations with the aim of developing a selection tool was conducted in 2011. (Jun et al., 2011). That study had used a breakdown by models, simulation, applications and life stages, which we found useful in highlighting the need to have at least a skeletal business model developed that supports the vision of the organisation, before considering tools.

The modelling approach is also impacted here by asking whether this development will be change or transformation. First order change is incremental. Second order or transformational change is fundamental and may result in a complete reinvention of the organisation. We have

a choice whether to structure the change incrementally or to suggest a fundamental change in the network. This is a question of organisational structure and is discussed later in this paper. In the background, the health system and recently the Ministry of Health have and are undergoing institutional change. The ability of the organisation to effectively transform in the light of institutional change must be factored in. Newman's (Newman, 2000) argument that too much institutional change will inhibits organisational transformation by limiting the organisations ability to learn strikes a chord, particularly in the context of community engagement, supporting an incremental approach.

The conclusion of this stage was the realisation that we were reviewing literature across a broad range of modelling options aimed at different layers, different outcomes and requiring different data sets. We would be randomly perforating the organisations data to draw a composite view without composite data and without the ability to triangulate with the vision, and no structure tool to assess outcomes with. We needed to redefine the problem.

**Re-defining the Problem: Finding the purpose of the research.**

Initially a simple approach was envisaged: In essence action research applied to develop a multi-site and multi-party growth strategy (the business model) would couple with research into the most appropriate costing and performance methodologies to apply across the group, and with standardised or reconciled measures, to allow a determination of the marginal value of the Whanau Ora delivery mode.

The consideration of action research was based on the existence of a problem. The problem is the need to understand and articulate the core elements of the business to enable replication (or scaling) and growth of a network of clinics operating on a standardised basis. This entails mapping the delivery of health care and related services as well as their interaction. The aim being to establish a best practice benchmark, understand costs, measure performance on a uniform basis, and, reconcile the clinics and network performance to Ministry and District Health Board objectives [insert reference].

A benchmark coupled to standardized delivery and reporting, could then potentially provide a meaningful comparison of cost and performance of the clinics and a 'valuation' of the Whanau Ora model by comparison with non-Whanau Ora clinics. This clearly assumes the

clinics are comparable, a question which turns on the standards, processes, metrics, and related data being comparable.

Ultimately, when coupled to the network development, this would lead to a mechanism to provide and measure a working Evidence Based Practice regime across the networks. Evidence Based Practice developments is an aim of the project as it enhances quality, enables feedback and audit. It is also valued by practitioners and Ministry of Health objectives.(Ministry of Health., 2016)  Facilitating EBP is an integral aspect of the organisational aims.

### i.    The Questions

Initial inquiry raised fundamental issues and highlighted the need for definition, delineation and articulation of both the Whanau Ora delivery model, and, what the growth model and multi-party network would be. Without an understanding of both, the choice of the costing methodology, and the identification of the data would be very questionable. Without standardisation comparisons would be at the macro or meso levels at best, at worst, meaningless.

What we mean by 'benefit' in relation to Whanau Ora is a problematic question.  At one level this is a marginal benefit question. Can we determine the costs and performance of Whanau Ora "on" and Whanau Ora "off", and possibly create a cost benefit curve to assist with Whanau Ora specific funding decisions at a clinic, network, DHB, and policy level. is this a purpose?

A difficulty arises when we ask how Whanau Ora fits into the organisations delivery and culture. Is it a delivery protocol, a cultural input, an organisational culture, a connection to the patient/client, the creator of a 'community' or other?  Is it all of these things and others?

Another question asks where does Whanau Ora fit into clinical practice? Does it modify 'normal' delivery, create a different delivery model, apply only to some groups, apply to some or all clinical procedures, apply predominantly in creation of relationships to facilitate delivery of services, or something else?

One view is that Whanau Ora is an infusion at all levels (this is the impression gained from initial discussion with providers) that manifests in the relationship with patients/clients as opposed to a clinical or delivery procedure/protocol. In this sense Whanau Ora is a bridge. It

spans all aspects of the clinical practice to engage with the individual, family and community to link the needs to the services.

Can we break this down into finite elements, to borrow an engineering approach for analysing complex interconnected, interdependent and anisotropic systems, which we suggest multiservice delivery is or at least analogous to? The elements are the discreet measurable units and generally exhibit isotropic properties. They can therefore be measured and modelled to provide predictable responses. This approach would mean we could measure the element and the element to element effects, the positive and negative synergistic outcomes and thus the overall efficacy of the structure? However, this approach may be the antithesis of the cultural import, and in itself destructive of the concept. It also relies on clear articulation of the 'elements' and identifying their interaction. A structurally dependent proposition.

While the on or off comparison may be possible in a clinic to clinic comparison, subject to qualifications of comparability, it is not possible at a macro level within a clinic unless the clinic converts to the model allowing a before and after analysis. One of the clinics in the group is a 'conversion', however, that clinic is itself associated with Maori delivery and could not be considered a control group. A more activity based analysis of Whanau Ora requires the concept to be embodied in each activity as a discreet input or considered an environmental /background factor or facilitator; a very challenging task.

The clinics involved in this study are physically separated, have differing delivery capability and capacity and deliver some or all of the range of services. As the intent of the scaling is to provide a full range of services to these communities and support EBP the ability to centrally administer, supplement or compliment both administrative and clinical services is seen as central.

The network collaboration leads to a consideration was whether the cost and performance questions must also be viewed and measured from the network perspective. This is on the assumption noted above that the Whanau Ora model, in high needs populations, must operate in a collaborative basis to provide the range of services needed to underpin a genuinely 'whole of person' treatment. This assumption is recognised as requiring justification. It is initially put forward based on anecdotal evidence provided by participants in the clinic and the project assumptions. It is not based on any metric or health outcome analysis showing

improved performance achieved via such collaboration applied to the Whanau Ora model. (At the time of writing such a study is being undertaken with a newly created clinic).

The final issue that arises is the interaction with government agencies. Medical and social services practices operate from within a regulated environment. The study clinic(s) engage with Ministry of Health, Ministry of Social Development, Ministry of Justice directly as well as the PHO, and the DHB. In addition government agencies carrying out their roles such as CYFS (Children, young persons and their family service), Welfare, Court and justice officers including supervising judge, the prison service, police, education and others. Non-government agencies including charities, housing and refuges also interact.

Each external organisation has an impact. The regulatory agencies have their specific objectives and the question of their integration impacts how Whanau Ora may operate. Whether Whanau Ora is a delivery model that can work effectively within this amalgam of competing interests adds another dimension. However, it is certain, that Whanau Ora must operate within a conflagration of systems. The interoperability of government agencies is considered beyond current scope. The requirement that the clinic and network structures must address dealing with the agencies is not. In other words, the development assumes the agency integration is non-existent and endeavours to build a structure that integrates the services internally with the reporting requirements of the agencies must therefore draw from a common database to 'fill' required reports. This could be as simple as filling a spreadsheet, as is required by Justice for the restorative justice program, or online submission of data.

**ii.    An illustrative example.**

An illustration of the issues is seen in a project is being undertaken by the authors running alongside this study and dependent in part on its outcomes.  The project is a proposal for integrating health, social services and restorative justice provision. It is in early stage but has received positive response at ministerial level. The details are outside the scope of this paper, however, the generic scheme illustrates the issue.

Restorative justice is part of a therapeutic courts approach. It is a process to bring offender and victim together in a restorative and cathartic meeting. Outcomes include agreements and follow up actions by the offender. The outcomes are part of the sentencing and subsequent judicial supervision process for the offender. Supervision can be for up to two years. The offender is in effect under a suspended sentence during this time.  The process only applies to offenders who plead guilty to one of a range of offences. They are referred to facilitators who

bring the offender and victim(s) together in a controlled environment. The offences to which restorative justice may apply includes domestic violence.

The proposal is aimed at domestic violence and utilises restorative justice court processes, conferencing and agreements as a distribution channel for health, social and other services, and, to address issues directly affecting domestic violence.

The core feature, for present purposes, of restorative justice is that it provides direct access to the family as victims and offender, providing access to address the 'family unit' needs. This include issues of empowerment, monitoring, health, truancy, dependency, housing and a raft of other issues. The integration with the judicial supervision and judicial powers coupled to an offender and family needs/risks assessment would be a very powerful mechanism to put in place a holistic care plan targeting a high needs group. The plan is referred to as the family care plan.

The integration required to achieve this outcome is critical to success and it is complex. It spans multiple agencies, information systems, legislation, and practical requirements. Logistical issues dictate that medical services are close to the family unit in high needs communities, whereas the ability to provide facilitation is limited by availability of trained staff and related to court process. The sensitive nature of this delivery and confidentiality of court, criminal, health and other matters further complicates processes. To deliver this service in a family centric manner requires the use of an integrated network to allow delivery of functions across multiple sites.

This example spans all the issues.

- ❖ The range of services – potentially includes all services
- ❖ Physical dislocation – delivery of RJ is usually city located. Family are often located elsewhere.
- ❖ Necessary network integration – the services in a family care plan must link to court reports. The prioritisation and case management must cover and report on a client basis, not clinic basis.
- ❖ Network performance underpinning success – the ability of the network to 'talk' and co-ordinate underpins success.
- ❖ IT integration – the database must span all locations, services and maintain security levels and security of data. This is particularly important with patient data

for family who are not in the justice system, and, for police reports which are provided to RJ facilitators which include current and prior criminal history.

- ❖ co-ordination of multiple roles – co-ordination and prioritisation of roles, case management, notifications
- ❖ Capacity and capability – ensuring the services needed are available on site or by referral.
- ❖ Agency integration – reporting by agency and separation of agency data.
- ❖ Centralised administration (legally required) – Health and justice both approve and contract providers. Satellite provision is possible but subject to specific regulation.
- ❖ The role of Whanau Ora as a determinant of outcomes – how does Whanau Ora impact performance of Restorative justice.

### iii. The Outcome: Articulating the purpose.

The result of the reconsideration is that the project has two distinct but highly inter dependent parts. The first, being to operationalise the aims of the organisation, which is the development of a growth strategy that embodies the Whanau Ora concept for delivery to high needs communities across multiple sites. This is, based on the discussion above, a form of divisional structure with specific functional replication in locations coupled to centralised administration and reporting for health and other regulatory purposes. A hybrid and matrix management structure.

The second part is to determine the impact of the Whanau Ora delivery model as a distinct input into meeting the specific needs of those communities. This brings with it the need for meaningful metrics to measure costs and outcomes that uniquely identify that input. To determine whether the Whanau Ora delivery model was in itself an input to improve outcomes would require a method to differentiate Whanau Ora delivery against a non-Whanau Ora model. Further, it requires understanding how Whanau Ora fits within a single clinics operation, an 'on' and 'off' comparison within the organisation, or to identify marginal benefit.

An application of the second part requires articulation of the first part; the business model. The purpose of this paper is to articulate that business model. The business model that results will be treated as a 'straw man'.

### iv. What do we mean by a 'straw man?'

The classical view is of a fallacious argument (the straw man) put forward as a debating technique wherein a debater takes a position which they do not hold but is similar to that of the other debater.(Lewiński, 2011) The person will then argue against the straw man to debunk the opponent's position. The straw man argument will be easily undermined and thus undermine the adversary's argument being substantially the same. This is not the meaning we adopt.

More recently a straw man proposal is seen as a useful tool in problem solving. Mckinsey (McKinsey Consulting, 2013) describe "a *"straw man" as a **draft version** of something that a team can debate, pick apart, and improve …(and being) **hypothesis-driven** it enables an **iterative process** for getting to increasingly better solutions. Like anything else hypothesis-driven, the team should be prepared to discard it if necessary and resume work with a new straw man"*. They also list three primary reasons to use a straw man

- **Lack of common understanding** of the problem and/or potential solutions results in miscommunication, frustration, and wasted effort
- An **infinite solution space** can leave teams stuck in the brainstorming phase without making progress toward a solution
- Without a straw man to test and discard, teams could end up **wasting valuable time** developing and refining solutions that are suboptimal or incorrect

The level of development of the straw man varies. Mckinsey identify four levels:

- **Initial hypothesis** for the overarching answer for a client engagement
- **Preliminary outline** ("dot-dash") for a PowerPoint presentation (deck) storyline
- **Draft version** of a PowerPoint page for making a particularly challenging point
- **Simple, working model** in Excel that will eventually require more complex functionality

This approach can be also be seen in information technology proposals (Ginsberg, 2015). Giles(Prof. Mike Giles & Giles, n.d.) pragmatically state that *An IT strategy is a hard thing to write. On the one hand it runs the risk of being too vague, making general declarations about the importance of IT but leaving the details to be decided upon later. On the other hand, if it is too specific it runs the risk of becoming obsolete far too quickly due to advances in IT*

*technology* and concludes that a straw man proposal of sufficient detail is the only effective option.

In health the level of detail seen in straw man proposals is variable from basic statements of principles to detailed proposals.

Illustrating the former in health is the 'straw man' to produce a national roadmap for developing clinical decision support (Osheroff et al., 2007) to *"ensure that* **optimal, usable** *and* **effective** *clinical decision support is* **widely available** *to providers, patients, and individuals* **where and when they need it** *to make health care decisions"*. A detailed example is American Veterans Health Association review of veterans access to health (Blom, 2016) for a transformational change in the face of numerous issues and challenges.

The decision to develop a straw man proposal was substantially influenced by the process being used to develop the business architecture. Business architecture is used to refer to organisation structure, vision, objectives, IT structure, data needs, and the underlying business and IT platforms used. Integration requires the sharing, and management of, a range of patient, offender, victims, service providers, counselling and other information that impact on the family unit, in addition to a common business model including operational and administrative functions. The architecture used will determine how those functions work together in each clinic and across the network.

Information technology is an important element but it is only one element. Our aim is a community outcome and we agree with the statement that "*A fundamental requirement for achieving continuity of care is the seamless sharing of multimedia clinical information* (Tsiknakis, Katehakis, & Orphanoudakis, 2002). Tsiknakis discussed only integration of health care records. The issues are magnified with the integrated delivery of multiple services over multiple sites. The records between clinics are one level. Integration, or even compliance, with government agencies is another. We would suggest that the need extends beyond sharing of clinical information to standardised operating and reporting systems.

Governments have their interoperability aims expressed in policy frameworks. These government interoperability frameworks aim to join agencies but are focused on data exchange, human readable formats, common web based formats, and use of open standards, while being largely silent on organisational issues.(Ray, Gulla, Dash, & Gupta, 2010). Similar observations are found in comparisons of US and European Government

Interoperability Framework initiatives (Guijarro, 2007). The clinics will be a distributed network and while the internal and network interoperability and standardised organisational structure are the project aim, we must also recognise the need for interoperability with the NZ GIF, if and when, this develops. However, the GIF does not provide any guidance for the clinics.

These requirements and the view that a rigorous, standards based and peer reviewable approach at all levels to create common building blocks is necessary, results in seeking an appropriate architecture standard. This is an enterprise architecture approach. The decision to use enterprise architecture is based on that need to develop a repository of common building blocks in standardised format, the need to take a design intent approach to architecture and the IT interoperability needs of the project. Which enterprise architecture framework is the question?

Enterprise architecture spans a range of prescription from its origins in computer architecture of the Zachman (1987) framework, acknowledged as the foundation of the discipline to the very prescriptive Department of Defence Architectural Framework (DODAF.(Chief Information Officer: US Department of Defence, 2010)

A comparison of an extensive range of frameworks by Lopez (Lopez & Blobel, 2009) specifically for an application to health concluded with the need for *"an architectural approach for analysing, designing, implementing, and maintaining advanced, sustainable, semantically interoperable HIS"*.(p.102) HIS is the health information system. They further suggested that *"The evaluation of architectural approaches for HIS development demonstrated a lack of a formal and comprehensive **architecture development methodology** covering the complete architecture lifecycle, and clearly defining activities, artefacts', roles, workflows"* (p.102)

The article concluded with a suggested framework that focused on Information technology. We concur with the statements noted but for the project see the need for an ADM (Architectural Development Method) to dominate. Semantic interoperability is, in our view, the most important issue across the clinics. An IT focused framework, would we believe, divert focus from the operational needs. The IT must follow the function.

In the final evaluation the decision was made to use the TOGAF standard. (The Open Group Architectural Framework). TOGAF is an open source project of The Open Group (The Open Group, n.d.-b). TOGAF is based on the Archimate standard.(ArchiMate® 2.1 Specification)

Its aims are stated to be boundary less information flow and alignment of business and IT architecture.(The Open Group, 2010). This standard meets the requirements discussed by Lopez.

The decision to use enterprise architecture and specifically TOGAF is based on the need to develop a repository of common building blocks in standardised format, standardise semantics, achieve the design intent across a broad range of services and ensure the IT interoperability needs of the project. TOGAF. TOGAF also contains a 9 step Architecture Development Method. An ADM is a method to develop the enterprise architecture and is closely linked to the Enterprise Continuum. The Enterprise Continuum is a framework within the framework for categorising and storing the repository of common documents and a set of relevant industry reference models.(The Open Group, n.d.-a)

It is also a standard which we have familiarity and experience with. The literature reviewed for this purpose support TOGAF but we acknowledge the bias and that other frameworks could equally be considered.

The project, as illustrated by the Restorative justice proposal, is one with multiple if not infinite solutions. It should be guided by design intent, requires detail to be clearly articulated to be piloted. Leaving detail to be decided later will not allow critical evaluation in the planning and 'selling' process. The risk with restorative justice proposals is that an implementation which lacks detail will have that detail 'filled in' at the provider level. This results in inconsistent delivery and the inability to evaluate the performance.(Triggs, 2005)  It will also not allow a consideration of the costing methodologies to be adopted. The need is not for a transformational change, but the detail must be sufficient to meet these objectives.

Describing the proposal as a straw man and subject to iteration or discarding is less likely to pre-empt the outcome, or, create a perception of such. This is seen as important in a development phase that engages with numerous stakeholders. The proposal has therefore been designated the "straw man".

**The Role of Action Research**

Action research from its origins with Lewin's three core elements of planning, action and searching (Lewin, 1946) has been an inquiry, design, reflection and iteration process.  Action research is possibly at its most useful in complex problem situations which do not lend themselves to a simple structural, functional or network analysis.

Complex problems lead to synergistic effects. Health is a system comprised of operational, structural and organisational issues that interact in a political environment. The system is affected by the nature of the work, the privacy questions, the ethical issues, and the large range of similar and dissimilar disciplines that co-exist in that system, many of whom have differing and conflicting objectives. This is compounded by the policy aims of multiple government agencies.

A literature review for criteria and acceptability of action research was undertaken for comparison with the organisations needs and to establish a set of applicable principles to inform the design of the process.

Five principles and 31 criteria are proposed by Chapman, Pederson and Medves (2011). A table of the principles and criteria is contained in the article schedule 1. The principles are Researcher/client agreement, cyclical process model, Theory criteria, Change through action criteria and Learning through reflection criteria. The criteria are used to validate the acceptability of the action research and are used as a guide in design. As a form of post moderation they cannot be assessed initially.

A second set of criteria articulated as best practice has been adopted for this research. The five best practice elements suggested by PDH Education[1]
"Five of the best practices may be outlined as follows:

- Seeking the strengths of an organization and improving said practices (Cooperrider & Whitney, 2004; Koshy, 2005; Stringer, 2014)
- Conducting an exhaustive literature review and collecting data on a cyclic basis (LeBlanc, n.d.; Osborne, (ed.), 2008; Riel, 2013; Stringer, 2014).
- Ensuring a participatory and collaborative effort (LeBlanc, n.d.; Stringer, 2014; riel
-  (ed.), 1991)
- Investing in people at the local level while still addressing ethical issues (Locke, Alcorn, & O'Neill, 2013; Stringer, 2014)
- Reflecting, sharing and reporting creatively (Furtado & Anderson, 2012; Mills, 2007; Stringer, 2014)"

---

[1] (PHD Education http://pdhed.com/ed-leadership-and-management/action-research/action-research-a-definition-and-synopsis)

The project objectives meet the first best practice. Analysis for replication includes identification of best group practice, modularisation and standardisation.

The literature review(s) are based on the stage of the project with an overview strategy document which has been designed and agreed. Health integration and delivery model integration are separated to focus the project on the composite organisation.

The partners are committed at director level and senior operational staff to participate in the project. Regular meetings occur typically fortnightly. The authors are invited to key meetings with relevant stakeholders subject to client and confidentiality issues.

Data is reviewed in terms of regulatory issues. Meetings are scheduled for review of the research process, requirements and findings and measured against the growth strategy aims.

**Literature Review to develop the straw man**

*Scope of the review:*

A detailed coverage of the literature review is not intended in this paper which describes the first phase of the research. A brief targeted literature review is included.

The needs of the partner at the initial phase is to develop a vision of the structure in which the network of clinics will operate that facilitates a Whanau Ora delivery. This following discussion follows the path of developing a 'straw man' of that integrated model.

The growth strategy is one of replication and iteration. The aim to replicate successful modalities of delivery across the network of providers. The culture of the organisations is also different. These two primary elements are discussed. In addition the network platform also requires consideration in building the straw man as systems must be put in place with new clinics and those where expansion of services will occur over a short time frame. Franchise structure is considered as a result of discussions where comparatives were made.

Other significant factors in the initial 'straw man' design include reporting, consistent operation practice, consistent administrative practice, sharing or resources and experiences, professional development of staff and critical mass. Critical mass provides the ability to support smaller less resourced clinics.

A further aim of the project is to integrate DHB level health initiatives. The proposition, which is unsupported, is that such action will be greatly enhanced by consistent interpretation, practices and reporting run on a common platform

The organisational structure of the straw man is at once both a consequence of the evaluation and a determinant of meeting the health outcomes. It also impacts the costing methodology question and performance measurement.

*Targeted Brief Literature Review*

Bill Clinton in a public address on education commented that to him the "most frustrating part or working in education is that every single problem has been solved by somebody somewhere. And we simply have to do a better job of replicating success"(Clinton, 1999). Health care, particularly in community models, is populated with good works in isolation. The question is why they are not simply replicated by copying.

Bradach (2003) looking at forms of replication for social services commented on the effect of complexity of the organisations on the ability to replicate. The more complex the more difficult leading to a conclusion that a 'minimum critical specification, defining the fewest program elements possible to produce the desired value' should be used, and that identification of these core elements is achieved by asking 'whether varying an element would diminish the value the program creates'. The conclusions were based on a consideration of D.A.R.E[2] (drug abuse resistance education) a drug education program for children which was replicated but varied at different locations in length of the program from 15 to 5 weeks, target identification, and who taught it. Time and who taught the program were critical elements to its success.

Franchise models have been used successfully in health care (Beyelar, York De La Cruz and Montagu, 2013). Success and observation of commercial success make the model very alluring, however, replication is successful in commercial examples often due to its slavish dedication to standardization and modularisation, supported by very clear objectives and a uniform platform. Any food franchise bears witness to the power of a clearly articulated theory of change based on standardization.

Fast food franchises proliferate by iteration of every aspect of the business model. They do not acquire an existing food outlet and reconfigure it. Franchises come in many forms. At one extreme the franchisor owns the intellectual property and owns, directly or indirectly, the

---

[2] D.A.R.E is a national organisation of police officers which started in Los Angeles. http://www.dare.org/

physical location. They license the business format, lease the property and link the contracts in a cross default whereby the breach of either automatically breaches the other. This arrangement creates a replication which is very consistent and very controlled. Breach means termination and loss of the asset. Replacement management and staff can be put in place at short notice protecting both the brand and the cash flow.

Franchises may not have this level of control particularly where the franchisee owns the property and may own the operational equipment. They are separate businesses that utilise a common brand and perhaps buying economies. This style of franchise suffers from many of the same issues as community health. The locations apply procedures differently, have differing objectives, report inconsistently, and may have wildly variable performance. (Forward & Furlop, 1993)

Studies on social franchising and franchising in health care reflect the commercial reality. The health care franchises exhibit the same mixed success rates being both better than and worse than other models (Beyelar, Montagu, & York De La Cruz, 2013). The very successful franchises in fast food rely on near identical replication, rigid inflexible rules and punitive contractual terms to protect the brand. This is not in our view, a workable model for a community health care delivery. The 'loose' franchise model of linked businesses with a common brand does not promote an integrated model, and, has a high risk of failure in terms of operationalising the Whanau Ora concept and lacks any mechanism to ensure consistent delivery or reporting.

**Culture**

The role of the culture of the organisation as a determinant of successful health is not clear. The Literature reviews does not provide clear causal but where the culture emphasised attributes more causally linked to performance then a contingent relationship was suggested. (Scott, Mannion, Marshall and Davies, 2003). In another revview of the literature which considered the causal link an concluded that the embedding of core values of professionalism, ethics, commitment to care and strategic thinking were key determinants in quality care delivery (Carney, 2011) This correlates with the Bradach's (2003)summation of core elements. Identification of key attributes as core elements is required. The role of organisational culture being one factor.

An alternate approach is to consider whether culture may act as a barrier. Carney (Carney, 2006) in considering whether culture in health delivery by non-profits was a determinate of successful strategy implementation makes a point which is salient to this projects implementation aims. The study sample was 860 middle managers in not-for-profit health organisations in Ireland. The managers included clinical and non-clinical middle manager in operational line management roles. The response rate resulted in 352 responses which was further divided into 66% clinical, 34% non-clinical. The clinical included 50% nurse or midwife manager. The conclusion supported the literature on the impact of middle managers on the successful deployment of strategy in the health environment. Engagement of middle management in the strategy development is essential in community health.

A related element of design and implementation in health networks is the role of the individual as a champion. Business transformation theory (Land, 1993) suggest champions to be valuable. In the health field this has been found to be consistent in the 'distinct subsets' of the clinical practice(Hendy & Barlow, 2012) but less effective in a wider context. Extrapolated to a group the caution of the authors of that study in placing reliance on a few individuals is amplified.

The importance of the culture in a single delivery of a single service leads to the question of the impact across a group and multi-site delivery. This is further compounded by the differing team cultures that may exist in the disparate services delivered in pursuit of a whanau or holistic health care. Research specifically on point was not found, however, the authors suggest that the additional impact would be not be linear.

**The Platform:** *Why a platform approach.*
Integration can be viewed from macro, meso and micro levels (Curry, Ham, Sugarman, & King Edward's Hospital Fund for London, 2010). This discussion is at the meso level. This is not government integration and it is not micro level integrated health care. The meso level is focused on populations and specific groups. The integration is of a range of services delivered to targeted groups at different locations. This requires integrating the locations into a single network on a platform for consistent delivery and reporting.

Knowledge management is key to consistent, professional and current best practice delivery. Clinics are busy places, clinicians are not always full time, social workers often work out of the clinic and across clinics, and the clinics are geographically and demographically separated. In a 2015 scoping review of the barriers to the application of Evidence based

practice, Williams, (Williams, Perillo, & Brown, 2015) noted that filtering down to the clinician could take 10 years to occur. One of the barriers they identified was fast easy access to information. This conclusion begs the question of how the clinics, with varying levels of resources can have access to such data, or other data.

*Platform vs Network: Whats the difference?*

Platform and network are not interchangeable terms for the purposes of this discussion. Although often used interchangeably by users of IT, they are also separate concepts when considering design intent.

In the information technology world a good network is the outcome of a flexible platform. This is the same in health care. The network is the aggregation of multiple community clinics, subnetworks of the replicated systems within each clinic, and the coordination and integration of those separate units. The platform is the infrastructure that supports the network.

In addition to determining the IT attributes, thinking of the business platform as analogous with a good IT network provides useful starting propositions to determine design intent. McDonnell (McDonnell, McLoughlin, Pretty, Slater, & Smith, 2005), p.121) identify the characteristics of a flexible networking platform:

- Supports high network speeds.
  The network avoids, where possible, multiple layers of multiplexed infrastructure
- the cost of delivering the network needed to be minimised and greater flexibility in configuration provided
- the core network needed to be capable of delivering differentiated quality of service, to allow preferential treatment of key applications,
- client segregation should be effective
- the network needed to be standards based to allow further evolution … this eases the development of higher levels of capability


In relation to each parallels can be seen: Network speeds are simply about efficiency of data transfer. Reduction of multiple layers certainly has application in health. In IT terms multiplexed infrastructure is concerned with sending multiple data in a single stream which is 'de-muxed' on receipt. Combing health and restorative justice will lead to multiple data channels that are mixed in the family care plan noted and then 'demuxed' for the reporting

requirements of each. Ideally there would be a single data collection and distribution for multiple services. Amalgamation of data internally using a single database with selective access to generated reports could achieve this and allow flexibility in the design of reports, while allowing a single interface reducing training costs. The EBP would also tie in here. Cost reduction will always be an aim in any business as is flexibility. Quality of service refers to prioritisation of data traffic often seen in how your ISP will priorities voip over gamers needs. This has direct correlation to this discussion. Which services should dominate and be priorities in a family unit with domestic violence, immunisation, diabetes, truancy? How should warning 'flags' be incorporated into the integrated data system where there are issues of dependency, medication and mental health issues.

Detailed discussion of the network architecture is beyond the aim of this paper. It does however need brief consideration as it will impact on both performance and the ability to measure and manage performance. In particular the question of the network platform has arisen when considering the performance of the clinic network.

The design intent of the platform is one issue. The platform itself another. The IT infrastructure used in the clinics is a major part of the business platform and will impact performance evaluation. The IT platforms will vary. The software used will also vary. The variations includes clinical proprietary software and administrative software as well as online third party reports. A set of separate systems in a single business network is inherently problematic for data exchange, standardised procedure, staff training, and transferring resources across the network. Should we therefore make our platform application independent? Platform independence in computing has two facets; the ability of software to run on any operating system and a browser based interface. The internet is the ultimate expression of platform independence.

If we employ a platform independent aim then if, for example, our design intent is to enhance knowledge management we want platform independence so staff on any system with a web interface will have full functionality with the centralised system. How this is structured affects costs, replacement, contracting and support. In high needs and financially constrained situations a consideration of open source applications may be factored in.

Conversely we may prefer that we use a common platform philosophy. Growth will put strain on the IT systems, require capital, ongoing training and support, and while platform

independence may be one solution it is essentially creating another step (often by writing the interface software) in the system. An example of an alternate system is in what HP call their Flex network architecture[3].  It purports to provide a potentially ideal platform: open standards based, scalable, secure, agile and consistent. This approach suggests we can have a segregated network at lower cost, open standard commonality, and platform independent applications and scalability to meet change. We can also provide an array of installations that allow far greater granularity in the network, meaning, greater administration rights at lower levels. In addition the flexibility to change applications, adopt applications, and discard, which will be a function of both the IT structure and any contractual and software licensing arrangements.

.

Fast and significant growth is probable. The growth mode will not be linear. It follows that the IT and platform issues will become apparent early. This is why the question of platforms and IT architecture become central to the design of the performance measurement systems.


**Measuring Network Performance**.


Measuring the performance by health outcome and delivery by clinic is done by the DHB on an entity basis. This allows monitoring of outliers and remedial action or identification of high performance. This does not provide any information of how a network will perform.


Provan and Milward's 1995 study aimed at providing a theory of inter-organizational effectiveness focused on mental health networks. Referring to a number of studies they commented (Provan & Milward, 1995 p.21):

> *The prevailing view among many service professionals, policy makers, and researchers is that by integrating services through a network of provider agencies linked through referrals, case management, and joint programs, clients will gain the benefits of reduced Network fragmentation and greater coordination of services, leading to a more effective system*

Their study also considered the question of whether network effectiveness was affected by network integration. This was done by analysis of the network on its density, centralisation,

---

[3] http://h17007.www1.hp.com/nz/en/networking/solutions/flexnetwork/index.aspx#.Vlp_0fkrK00

core agency centrality, concentration of influence and interviews with key personal. Mental health has a core agency, whereas the clinics under this study do not, nor is there at present a concentration of influence. The network structure that results and its governance will create that concentration.

Provan and Milward (1995 p.25) conclusion on creating a preliminary model was to say
> *"we propose that networks will be effective under structural conditions of centralized integration and direct, non-fragmented external control, but that effectiveness will be highest when the system is also stable and environmental resources are reasonably munificent."*

It is also notable that their study did include diverse organisations providing a range of services to a common population group, a situation which mirrors the Whanau Ora clinics. This centralization facilitated both integration and coordination, and, provided for reporting and control over outcomes. They further state that *"Such control may be critical for encouraging the otherwise autonomous to act in ways that lead to system level, as opposed to agency goals"* (Provan and Milward, p.26). While satellite and owned clinics in the group are not autonomous, their history and culture may mean they may act autonomously, and, there will be contracted network partners who are autonomous. In addition divisions of an organisation do not necessarily have the same goals.

The network at the time of writing includes a start-up clinic operated as a satellite. The new clinic was established in the network in late 2015. The satellite clinic has strong community links and has driven new enrolments in a high needs area. The hospitalisation on first visit to the medical practice has been high. The level may exceed 10% (anecdotal evidence of the practitioners which is the subject of an ongoing evaluation). This is a high rate and reflects those persons previously being outside the health system. The doctors indicate they would expect these people to enter the health system via emergency admissions to hospital as a result of conditions they present with. The resources employed, medical, administrative and logistical are network resources. The unrecognised performance of the network relates to avoided costs to the DHB in emergency admissions, ambulance use, bed nights, and reduced readmissions due to early intervention, follow up monitoring and reduction in lost work time. The approach has provided resources where they didn't exist. The costs are known in delivery as they are simply medical (not integrated). However, the performance is currently not measured.

The value of avoided costs is not easily identified or quantified. Using the above clinic, and using the practitioners' estimates, gives an impression of the impact. The effect would be to avoid emergency visits, replaced by health centre cost. The cost per visit for tertiary care (assumption is that will be tertiary and not primary care) is estimated by the World Health Organisation at $160.28 NZD, with Hospital costs per day are given at $349.50 , whereas Health centre tertiary care consultations are $46.99 (WHO, 2005). In comparison Middlemore hospital charges $437.90 plus clinical costs for non-funded emergency visits in and $800 per day plus treatments for admissions.(Middlemore Hospital, 2016). We will use the lower figures. The emergency admissions at the 10% estimation was, at the time of the estimate, 80. First visit bed nights taken at 2, readmission at 20% and 1 bed night. The readmission is assumed to be by emergency. The non-subsidised charge, taken to be full costing, of an emergency ambulance from the clinic to the emergency department is $800.(St John). This gives 96 emergency consultations, bed nights, and ambulance. Applying the lower WHO figures and St John ambulance full costing gives $217,925. If we assume that those 80 people would present to the health centre as tertiary with 5 follow up visits as primary care consultations and use WHO full costing the health system cost this gives 80 visits at $446.99 and 320 visits at $43.56 totalling $17,698.  The net position is $200,226. This dramatically increases if the hospitals charges, assuming they reflect full cost recovery, are used.

In this comparison treatment costs are excluded as the variation due to the condition cannot be realistically estimated. The calculation is flawed in the assumption that those presenting to the clinic would have averted the hospital admission if presenting earlier.

These effects may flatten over time as the population enrolment increases, however this cannot be assumed. More complex examples occur in integrated services. For example, interventions in domestic situations avert the removal and placement of children by child services. This cost averted is neither known nor recognised. These are hard and measurable costs. The ability to recognise this kind of performance can be achieved with an integrated network. Using these figures and the estimates of the clinic we can get, are at best, an impression of the impact. This is proffered simply to indicate a network performance measurement issue.

**Organisational Structure: Implications for the Straw man.**

The organisational structure is central to design. It will influence the strategies available to meet the objectives. It will also affect data gathering and choice of costing and performance measurement methodology.

The structural options for the organisation include all of the traditional structures; functional, divisional, hybrid and matrix. The services offered could be considered as separate functions. The locations are geographically separated suggesting a divisional structure. A hybrid structure utilising centralised support and control with limited functional autonomy implementing the centralised planning for clients also has application. A matrix structure appeals as the basis for managing multifunctional groups, the core of the multiservice Whanau Ora model.

Considering the restorative justice example introduced earlier raises questions on the choice of structure. It requires a centralised oversight of the offender, the family and the range of services to be provided, selection and management of those services, and integration with external agencies. Integration and separation must coexist due to the nature of the information, persons and risks.  In any two cases the package of services comprising the family care plan, the agency involvement, and the reporting obligations will vary. The interdisciplinary requirements coupled to the need to tailor the family care packages points to a matrix structure that will facilitate the essential interdisciplinary discourse and case management. However, the confidentiality and agency integration amalgamated in a cross functional approach are problematic.

While matrix structures are appealing they are not without their issues. Matrix structure are themselves complex to administer and as Bartlett notes *while companies have avoided the trap of one-dimensional strategic responses…many of them have fallen into a second, structural trap and adopted elaborate organizational matrices that actually impair their ability to implement sophisticated strategies* (Barlett & Ghoshal, 1990 p.138). In their discussion the authors point to companies being '*organisationally incapable of carrying out sophisticated strategies'*, often reverting to '*simple static solutions to complex and dynamic problems'*. Recognising complexity leads to complex organisations, themselves requiring sophisticated management. The unmanageable matrix results from the multiple channels of communication and reporting, the span and overlap of control, physical and functional separation and divergent cultures in multiple locations.

The adoption of matrix models in health is not new. The reasons to adopt matrix models in business was suggested as unrelated to complexity (Burns 1989), however the opposite has also been found for hospitals in an study by the same author of 315 hospitals adopting a matrix approach (Burns 1993). In each situation, whether complexity was the reason or not, '*political considerations shaped the matrix program adopted*' (p.132). The ideals are readily subverted by the practicality.

Overt matrix strategies in community health have been undertaken in Brazil which parallel aspects of Whanau ora. Brazil's strategy, the *istema Único de Saúde* (SUS -Unified Health System) employs a decentralised approach and the use of non-clinical facilitators, called community health agents, to bring together cross disciplinary health teams. Family health teams cover approximately 1000 households based on an exclusive geographic area. The program has been successful in accessing communities and bringing people into the system. From 1998 (inception) to 2014 the initial 2000 Family Health Teams increased to 39,000 using 60,000 community heath agents assigned to 150 houses each. Coverage of the population increased from 4% to 62%.(Macinko & Harris, 2015). The program has had a number of financial difficulties and has been criticised for national funding issues and also efficacy of the agents (Traebert & Schuelter_Trevisol, 2015). A review of 20 years of the program by the World Bank highlighted funding alignment and management issues, particularly in delivery and governance (Gragnolati, Lindelow, & Couttolenc, 2013). The data discussed in that assessment shows a high level of penetration in the community, a 70% increase in consultations, and "convincing evidence" (p.8) of improved health outcomes. The qualifications include a lack of data on quality and efficiency of the service.

The Brazilian experience is useful for this study in two regards. It utilizes the family health agents and employs a matrix structure. The agents are analogous to the Whanau Ora facilitators (in the government funded Whanau Ora collectives), and, in the micro level targeting of communities. The agents visit their 150 houses once per month regardless of need, collect data, monitor for violence, disease, truancy and other issues, and report. This is the lynch pin to the Family Health Team. The UCLA study reported that "*This cost-effective way of delivering health care costs about $50 per person per year and has led to dramatic reductions in infant mortality rates, decreased hospitalizations due to complications of chronic conditions, and reduced deaths from stroke and heart disease, among a host of other benefits,*"(Macinko & Harris, 2015 p.7)

The use of agents appears valuable. This will, and does, form part of the strategy of the clinics. The question is how to manage the multiple levels of engagement and integrate with clinical and specialist services. The wider questions of whether untrained or semi trained personal should make health assessments is not being considered. We are interested in the efficacy of a matrix structure at a community health level for engagement with high needs populations.

The Brazilian system works as a matrix structure with the agents as the link to the community. The ability of the agents to link the professional teams is critical. Only two studies were found specifically addressing the agent work process within Brazils SUS. The first considering the efficiency of agents in terms of the government policy (Bareto et al., 2012) and the second a qualitative study in 2015 looking at work process for the matrix agents. (Soares & Ferreira De Oliveira, 2016). The latter study focused on the use of multidisciplinary teams for mental health in Florianopolis which agent coverage of 400,200 people. This was a qualitative study on reception of the method by system participants, the managers, nurses, doctors, psychiatrists and psychologists. Interviews revealed divergent experience and highlighted the need for consistency. The process of bringing professionals together had a positive effect, however, practical issues of getting the team to meet, the willingness to share information (power), and conflict between local and centralised managers undermined the matrix. Responses provided in the paper included comment on the development of rules, protocols, communication and meetings, and, the subsequent failure to follow the rules.

What can we take from this? At one level the matrix approach is desirable for the cross functional integration. The more complex the issues, the more complex the structures. Modifying the structures, or undermining them, will be the existing culture. Consistency cannot be guaranteed with geographically and functionally separated units. Some professionals will work together, others will seek to maintain their power. The management literature, and the limited health literature, on matrix for community health provide a need to address the organisational cultures when making transformational change.

Perhaps we defer to the position of Barlett (Barlett & Ghoshal, 1990) that matrix management is not a structure but a frame of mind, a perception and acceptance in the managers mind of the need and value of interaction. Matrix management is, in their view, built on vision, consistency, training, with selection and co-opting as needed. This correlates

with the Brazilian experience noted. On that basis we should design a simple, but not simplistic, structure and concentrate on the training and culture of the teams within. This is a safe option whereby we can create an environment to allow the matrix structure to grow out of the project, or specific projects,  an approach suggested by an earlier literature review of matrix structures.(Ford & Randolph, 1992). This accords well with a pilot implementation of discreet projects such as the restorative justice proposal noted.

**Conclusion: The Straw Man**

A number of considerations have arisen from the review. Key design inputs include;

- ❖ Operating and regulatory environment
    - ❖ Cross functional requirements. While cross functional delivery underpins the holistic delivery, only part of that delivery involves multiple disciplines. Clients may require only medical consultation, however identification of related issues in consultations must factored into the process via checklists or dissemination of client information across relevant parts of the network. This is subject to confidentiality and the data system must recognise access limitations.
    - ❖ Multi layered and separated agency relationships and reporting are required. Single database is intended which supports current agency reporting. Multiple overlapping data sets are to be avoided in favour of a database with multiple report functionality.
    - ❖ The differing focus of agencies suggests a bottom up design.
    - ❖ Geographical separation impacts logistic and resources issues.
    - ❖ Demographic variations impact funding by quintile and determining community engagement. The use of Brazilian style community agents is indicated, but qualified by the matrix management risk.
    - ❖ Case management – Matrix structures have a significant risk of failure if implemented quickly, however they are indicated for complex case management to engage multidisciplinary teams. A single case management nexus is required. This will focus on identified persons as opposed to managerial positions in the development phase to address the committee issues identified.
- ❖ Practical issues
    - ❖  capability and capacity variations across clinics

- ❖ physical resource logistical co-ordination
- ❖ organisational culture
- ❖ Contractual structures – this is not directly addressed in the paper, however the ownership, leasing, employment contracting and a range of tied arrangements will impact network implementation. The design is to be agnostic on ownership. The network requirements to translate to the contractual terms where required.

❖ Risks

- ❖ Clinical risk – this is a regulatory risk. Clinical audit will be conducted on the network design. The design must incorporate industry standard clinical audit practice. The sensitivity of the area, data issues, exposure to physical risk, and the population focus will require a risk management assessment at each stage of design and implementation.
- ❖ Matrix structure development must be incremental over time. The implication is that the initial business model will be a traditional hierarchy with centralised control of core functions and administration, with divisional and functional structures by location. This model must evolve to a matrix structure for cross functional delivery. It does not need to be matrix for all functions. A time frame for transition is required without which a locked in structure may develop.

Management of services

- ❖ Case management – The risk associated with vulnerable persons require a clear allocation of responsibility. Within a network this requires a hub and centralised case supervision structure.
- ❖ Standardised delivery. Standardising delivery of services must be addressed on a core elements approach to accommodate the growth anticipated and the growth mode. The level of prescription is not currently known.
- ❖ Integration with, and of, IT systems.
- ❖ Multi layered reporting – by person, by activity, by site, and network. Specific projects may require separation.

Growth

❖ The growth model will require delineation of the core element. The aim is scaling and not duplication or replication. The centralised data, case management with limited functional and divisional autonomy supports this.

❖ Transformation issues to matrix management incrementally by addressing culture, training, and recruitment. This must be a core element the vision factored into the enterprise architecture method.

Design principles

❖ Standardise ADM for development using TOGAF. This is a sufficiently rigid to produce standardised and reviewable decision processes and business model. It has the flexibility to allow a range of best practices and body of knowledge to be drawn on, while maintaining the architectural vision.

❖ Creation of repository of core elements, policies and documentation to create an enterprise continuum.

❖ Flexible architecture with operating system independence. Analysis of partner software may be required. Choices based primarily on interoperability and semantic consistency. The ability to script data exchange between systems is required.

Costing and Performance Methodologies must be factored into the design and correlated with the structure. This will be a matching process for alignment. It is anticipated this will modify the straw man.

The model requires sufficient detail to simulate the path of a number of clients engaged in current multiple service delivery for comparison with current single site delivery, and, to identify network related issues in growth. This is particularly aimed at capability and capacity for resource shortfalls in the network components needed in cross functional multi-site delivery.

The effect of the need to meet current diverse reporting obligations and build an integrated network requires two clear structural comparisons. The current reporting, and, elements derived from in the network. Two parallel models are anticipated. Risk identification is a central aim with this approach.

In summation the straw man requires a clear articulation of the core elements to create a common set of building blocks to apply in each location, standardized and replicated across a uniform platform with consistent culture and ongoing centralised support and control.

ArchiMate® 2.1 Specification. (n.d.). Retrieved May 18, 2016, from

    http://pubs.opengroup.org/architecture/archimate2-doc/

ATLAS.ti: The Qualitative Data Analysis & Research Software. (n.d.). Retrieved May 19,

    2016, from http://atlasti.com/

Bareto, A., Romera, A., De Oliveira, A., Duarte de Sa, L., de Ammeida, S., & Nogueira, J.

    (2012). The matrix supporter's work in the family health strategy | Directory of Open

    Access Journals. *Revista Da Rede de Enfermagem Do Nordeste*, *13*(1). Retrieved

    from https://doaj.org/article/e50326325f414af68645355636193979

Barlett, S., & Ghoshal, S. (1990). Matrix management: not a structure, a frame of mind.

    *Harvard Business Review*, (July-August 1990). Retrieved from

    http://europepmc.org/abstract/med/10106795

Beyelar, N., Montagu, D., & York De La Cruz, A. and D. (2013). The Impact of Clinical

    Social  Franchising on Health Services in Low- and Middle-Income Countries: A

    Systematic  Review. *PLOS ONE*. Retrieved from

    http://www.plosone.org/article/metrics/info%3Adoi%2F10.1371%

Blom, D. (2016, March). Proposed-Strawman-Assessment-and-Recommendations.pdf.

    Retrieved May 15, 2016, from

    https://commissiononcare.sites.usa.gov/files/2016/03/2016.3.18-Proposed-Strawman-

    Assessment-and-Recommendations.pdf

Bradach, L., J. (2003). "Going to Scale: The challenge of replicating social programs".

    Stanford Social Innovation Review, available at. *Stanford Social Innovation Review*,

    (Bradach). Retrieved from http://ssir.org/articles/entry/going_to_scale/

Brailsford, S. C., Harper, P. R., Patel, B., & Pitt, M. (2009). An analysis of the academic

    literature on simulation and modelling in health care. *J of Sim*, *3*(3), 130–140.

Ministry of Health. (2014, July 8). Capitation funding | Ministry of Health NZ. Retrieved

 May 19, 2016, from http://www.health.govt.nz/our-work/primary-health-

 care/primary-health-care-subsidies-and-services/capitation-funding

Carney, M. (2006). Understanding organizational culture: the key to successful middle

 manager ...: EBSCOhost. *Journal of Nursing Management*, *14*, 23–33.

Carney, M. (2011). Influence of organizational culture on quality healthcare delivery.

 *International Journal of Health Care Quality Assurance*, *24*(7), 523–539.

 http://doi.org/10.1108/09526861111160562

Chapman, C., Paterson, M., & Medves, J. M. (2011). The QUIPPED Project: Exploring

 Relevance and Rigor of Action Research Using Established Principles and Criteria.

 *The Qualitative Report*, *16*(1), 208–228.

Chief Information Officer: USDepartment of Defence. (2010, August). DODAF - DOD

 Architecture Framework Version 2.02 - DOD Deputy Chief Information Officer.

 Retrieved May 19, 2016, from

 http://dodcio.defense.gov/Library/DoDArchitectureFramework.aspx

Clinton, W., J. (1999). *Public Papers of the Presidents of the United States:* Retrieved from

 http://quod.lib.umich.edu/p/ppotpus?key=title;page=browse;value=w

Cumming, J. D., & Gribben, B. D. (2007). *PPDF Evaluation Progress Report - phcse-

 final.pdf*. Wellington, New Zealand: Wellington Primary Health Care Research.

 Retrieved from https://www.health.govt.nz/system/files/documents/pages/phcse-

 final.pdf

Curry, N., Ham, C., Sugarman, J., & King Edward's Hospital Fund for London. (2010).

 *Clinical and service integration: the route to improved outcomes*. London: King's

 Fund.

Durie, M. (2013, September). *Whānau Ora: Flourishing Families. Presentation to APAC Quality     Improvement & Innovation in Healthcare 2013*. Presented at the APAC Quality Improvement & Innovation in Healthcare 2013, Auckland.

Ford, R., C., & Randolph, W. . (1992). Cross-Functional Structures: A Review and Integration of Matrix Organizatio...: EBSCOhost. *Journal Of Managemen*, *18*(2), 267.

Forward, J., & Furlop, C. (1993). Elements of a Franchise: The Experiences of Established Firms. *Service Industries Journal*, *13*(4), 159–178. http://doi.org/10.1080/02642069300000067

Fulbright-Anderson, A., Kubisch, A. c., & Connell, J., P. (1998). *New approaches to evaluating community initiatives: theory, measurement and analysis.* Washington D.C.: Aspen Institute.

Ginsberg. (2015). Knowledge Interchange Format: the KIF of Death | Ginsberg | AI Magazine. Retrieved May 15, 2016, from http://www.aaai.org/ojs/index.php/aimagazine/article/viewArticle/903

Glaser, B. G. (2014). Choosing grounded theory. *The Grounded Theory Review*, *13*(2), 3–17.

Gragnolati, M., Lindelow, M., & Couttolenc, B. (2013). *Twenty Years of Health System Reform in Brazil: An Assessment of the Sistema Único de Saúde*. The World Bank. Retrieved from http://elibrary.worldbank.org/doi/book/10.1596/978-0-8213-9843-2

Guijarro, L. (2007). Interoperability frameworks and enterprise architectures in e-government initiatives in Europe and the United States. *Government Information Quarterly*, *24*(1), 89–101. http://doi.org/10.1016/j.giq.2006.05.003

Hendy, J., & Barlow, J. (2012). The role of the organizational champion in achieving health system change. *Social Science & Medicine*, *74*(3), 348–355. http://doi.org/10.1016/j.socscimed.2011.02.009

Jiang, L., & Giachetti, R. E. (2008). A queueing network model to analyze the impact of parallelization of care on patient cycle time. *Health Care Management Science*, *11*(3), 248–261. http://doi.org/10.1007/s10729-007-9040-9

Jun, G. T., Morris, Z., Eldabi, T., Harper, P., Naseer, A., Patel, B., & Clarkson, J. P. (2011). Development of modelling method selection tool for health services management: From problem structuring methods to modelling and simulation methods. *BMC Health Services Research*, *11*(1), 1–11. http://doi.org/10.1186/1472-6963-11-108

Klarman, H. E., John O'S. Francis, & Rosenthal, G. D. (1968). Cost Effectiveness Analysis Applied to the Treatment of Chronic Renal Disease. *Medical Care*, *6*(1), 48–54.

Koubek, Ri. J., Harvey, C. M., & Leichter, S. B. (2001). Work flow analysis: Applying Suttons Law in the diabetes care workplace. *Clinical Diabetes*, *19*(1), 17.

Land, G. (1993). Grow or Die: The Principle, of Transformation. *The Journal of Creative Behaviour*, *7*(2), 77–132.

Lewin, K. (1946). Action Research and Minority Problems. *Journal of Social*, *2*(4), 33–46.

Lewiński, M. (2011). Towards a Critique-Friendly Approach to the Straw Man Fallacy Evaluation. *Argumentation*, *25*(4), 469–497. http://doi.org/10.1007/s10503-011-9227-6

Lopez, D., & Blobel, B. (2009). A development framework for semantically interoperable health information systems. *International Journal of Medical Informatics*, *78*(2), 83–103. http://doi.org/10.1016/j.ijmedinf.2008.05.009

Macinko, J., & Harris, M. J. (2015). Brazil's Family Health Strategy -- Delivering Community-Based Primary Care in a Universal Health System. *The New England Journal of Medicine*, *372*(23), 2177–2181.

McDonnell, E. G., McLoughlin, M. J., Pretty, S. G., Slater, R. J., & Smith, E. A. (2005). BT Transform—an IP-enabled business platform. *BT Technology Journal*, *23*(3), 121–136.

McKinsey Consulting. (2013, July). Working With McKinsey: The Straw Man - An Important Tool for McKinsey-Style Problem Solving. Retrieved May 15, 2016, from http://workingwithmckinsey.blogspot.co.nz/2013/07/McKinsey-straw-man.html

Middlemore Hospital. (2016). Middlemore Hospital • Healthpoint. Retrieved May 18, 2016, from http://www.healthpoint.co.nz/middlemore-hospital/?solo=supportServices&index=1

Ministry of Health. (2011). *Ministry of Health. (2011), Whānau Ora: Transforming our futures. Wellington: Ministry of        Health.* Wellington, New Zealand: Ministry of Health.

Ministry of Health. (2015). *Report on the Performance of General Practices in Whānau Ora Collectives as at June 2015.* Wellington, New Zealand: Ministry of Health.

Ministry of Health. (2016). *New Zealand Health Strategy: Future direction - new-zealand-health-strategy-future-direction-apr16_.* Wellington, New Zealand: Ministry of Health. Retrieved from http://www.health.govt.nz/system/files/documents/publications/new-zealand-health-strategy-future-direction-apr16_1.pdf

*National Health Board  Annual Plan Guidelines 2014/15*. (2014). Retrieved from http://nsfl.health.govt.nz/dhb-planning-package/previous-planning-packages/201415-planning-package/planning-guidelines-201415-0

Newman, K. L. (2000). Organizational Transformation During Institutional Upheaval. *Academy of Management.the Academy of Management Review*, *25*(3), 602–619.

Office of the Auditor-General. (2015). *Whānau Ora: The first four years available at*. Office of the Auditor General NZ. Retrieved from http://www.oag.govt.nz/2015/whanau-ora/docs/whanau-ora.pdf

Osheroff, J., Teich, J., Middleton, B., Steen, E. B., Wright, A., & Detmer, D. E. (2007). A Roadmap for National Action on Clinical Decision Support | Journal of the American Medical Informatics Association. *Journal of the American Medical Informatics Association*, *14*(2), 141–145. http://doi.org/http://dx.doi.org/10.1197/jamia.M2334

Porter, M. E. (2010). What is Value in Health Care? *New England Journal of Medicine*. http://doi.org/10.1056/NEJMp1011024

Prof. Mike Giles, & Giles. (n.d.). ICTstrategy:astrawmanproposal. Retrieved May 15, 2016, from http://www.ict.ox.ac.uk/strategy/worktasks/j/strawman.pdf

Provan, K. G., & Milward, H. B. (1995). A Preliminary Theory of Interorganizational Network Effectiveness: A Comparative Study of Four Community Mental Health Systems. *Administrative Science Quarterly*, *40*(1), 1. http://doi.org/10.2307/2393698

Ray, D., Gulla, U., Dash, S., & Gupta, M. P. (2010). A critical survey of selected government interoperability frameworks - ProQuest. *Transforming Government: People, Process and Policy*, *5*(2), 114–142. http://doi.org/10.1108/17506161111131168

Schmittdiel, J., Vijan, S., Fireman, B., Lafata, J., Oestreicher, N., & Selby, J. (2007). Predicted quality-adjusted life years as a composite measure of the clinical value of diabetes risk factor control. - PubMed - NCBI. *Med Care*, *45*(4), 315–21.

Scott, T., Mannion, R., Marshall, M., & Davies, H. (2003). Does organisational culture influence health care performance? A review of the evidence. *Journal of Health Services Research & Policy*, *8*(2), 105–117.

Sjölander, A., Lee, W., Källberg, H., & Pawitan, Y. (2014). Bounds on sufficient-cause interaction. *European Journal of Epidemiology*, *29*(11), 813–820. http://doi.org/10.1007/s10654-014-9953-9

Soares, S., & Ferreira De Oliveira, W. (2016). The matrix approach to mental health care: Experiences in Florianopolis, Brazil. *Journal of Health Psychology*, *21*(3), 336–345.

St john. (n.d.). Ambulance charges. Retrieved May 18, 2016, from http://www.stjohn.org.nz/What-we-do/St-John-Ambulance-Services/Part-Charges/

Te Puni Kōkiri. (2015). *(2015), Understanding whānau-centred approaches: Analysis of Phase One Whānau Ora research and monitoring results.* Wellington, New Zealand: Te Puni Kōkiri.

The Open Group (Ed.). (2010). *TOGAF Version 9* (9. ed. [Nachdr.]). Zaltbommel: Van Haren Publishing.

The Open Group. (n.d.-a). Introduction to the ADM. Retrieved May 19, 2016, from http://pubs.opengroup.org/architecture/togaf8-doc/arch/chap03.html

The Open Group. (n.d.-b). TOGAF®, an Open Group standard | The Open Group. Retrieved May 15, 2016, from http://www.opengroup.org/subjectareas/enterprise/togaf

Traebert, J., & Schuelter_Trevisol. (2015). Brazil's Family Health Strategy. *New England Journal of Medicine*, *373*(13), 1277–1278.

Triggs, S. (2005). Evaluation of the Court-Referred Restorative Justice Pilot: Technical Report. *Crime and Justice Research CentreVictoria University of Wellington. Preuzeto S: Http://www. Justice. Govt. nz/publications/publicationsarchived/2005/evaluation-of-the-Court-Referred-Restorative-Justice-Pilot-Technicalreport/documents/rj-Tech-Report-Full. Pdf (1.2. 2015.).* Retrieved from http://www.justice.govt.nz/publications/publications-

archived/2005/evaluation-of-the-court-referred-restorative-justice-pilot-technical-

report/documents/rj-tech-report-full.pdf

Tsiknakis, M., Katehakis, D. G., & Orphanoudakis, S. C. (2002). An open, component-based

information infrastructure for integrated health information networks. *International

Journal of Medical Informatics*, *68*(1), 3–26.

Turia, T. (2014). *Turia,T (2014), Minister Responsible for Whanau Ora Whanau Ora

Achievements Report available at*. Wellington, New Zealand: Parliamentary report.

Retrieved from https://www.tpk.govt.nz/.../834/tpkwo-whanauoraachivements-

2014.pdf

Walley, P., & Gowland, B. (2004). Completing the circle: from PD to PDSA. *International

Journal of Health Care Quality Assurance*, *17*(6), 349.

http://doi.org/10.1108/09526860410557606

WHO. (2005). WHO | New Zealand. Retrieved May 18, 2016, from

http://www.who.int/choice/country/nzl/cost/en/

Williams, B., Perillo, S., & Brown, T. (2015). What are the factors of organisational culture

in health care settings that act as barriers to the implementation of evidence-based

practice? A scoping review. *Nurse Education Today*, *35*(2), e34–e41.

http://doi.org/10.1016/j.nedt.2014.11.012

Zachman, J. A. (1987). A framework for information systems architecture. *IBM Systems

Journal*, *26*(3), 276–292. http://doi.org/10.1147/sj.263.0276