THE NEW ZEALAND VISION FOR INTEROPERABILITY

NZHIT
Enabling a Healthier New Zealand

INTRODUCTION

In April 2016, the Ministry of Health launched the New Zealand Health Strategy to set "the framework for the health system to address the pressures and significant demands on its services and on the health budget" (Hon. Dr Jonathan Coleman, Minister of Health).

The Strategy has been widely supported both here and overseas. Through its five strategic themes - people powered, closer to home, value and high performance, one team and smart system - it is addressing the challenges healthcare faces now and into the future.

Like other nations, our health system is a core aspect of society and as New Zealanders we are all involved, and healthcare plays an important role in our lives.

The Strategy has set the scene for what we can achieve to provide better health and healthcare in the future, but to do this our information systems (ICT) need to work together to be more effective and efficient.

This document sets out the New Zealand Vision and Charter for Interoperability. It is designed to **provide direction to all participants in the health and disability sector to work collaboratively** to build a fully interoperable ICT environment as a key enabler of quality healthcare services delivered as effectively and efficiently as possible.

The New Zealand Vision and Charter for Interoperability is purposely designed to establish the first step in what will be a collaborative and on-going process that will draw on the goodwill, expertise, knowledge and investment of a wide cross-section of stakeholders.

It is acknowledged that this first step is not exhaustive. However, it does focus on establishing a leadership position and it is a "call to action" that must be heeded if interoperability in New Zealand's health system is to be achieved.

The development of an interoperable ICT environment requires everyone involved in the health and disability sector to work together as there are multiple factors to be addressed in order to be successful. Most importantly, the future needs of "health customers" (consumers, patients, clients) must be central to this process so that interoperability supports the models of care that are essential for the delivery of quality health and disability services.

Hence, whilst the NZ Health IT Cluster (NZHIT) Industry Partners have taken an initial lead role in the creation of this Vision and Charter it is essential that key stakeholders join forces in providing ongoing leadership to ensure the successful creation of New Zealand's model of interoperability.

PEOPLE-POWERED
Mā te iwi hei kawe

SMART SYSTEM
He atamai te whakaraupapa

ALL NEW ZEALANDERS LIVE WELL STAY WELL GET WELL

CLOSER TO HOME
Ka aro mai ki te kāinga

ONE TEAM
Kotahi te tima

VALUE AND HIGH PERFOMANCE
Te whāinga hua me te tika o ngā mahi

CONTEXT

INTEROPERABILITY IS ESSENTIAL

In the New Zealand Health Strategy, the overarching vision is that "all New Zealanders live well, stay well and get well". Accurate health data and information is an integral component that plays an important part in enabling the success of this vision and is required to support safe, good quality healthcare. Valuable insights learned and recorded in one stage of the care process need to be available to inform decisions in subsequent stages and settings. Linking information sets for the process of research or insight is also an important purpose for health data.

Models of care are evolving rapidly, not only to keep pace with the current pressures and demands of the health and disability sector but also to be future-focused so they are relevant for all New Zealanders' health, disabilities and social care needs in 10+ years' time. This demands that ICT systems are connected in a way so data and information can be accessed by clinicians, patients, service users, carers and family/whanau "anywhere, anytime and anyhow" whilst ensuring relevant standards, privacy and security requirements are met.

In the provision of personalised health and disability care, there is almost always a team made up of a combination of registered and non-registered (trans-disciplinary and multi-disciplinary) healthcare providers who deliver care and support to a single person. Regardless of the make-up of the care team and the needs of the person there is always more than one information source involved in supporting them.

This demands that all relevant data and information about the person is available based on "single line of sight" to support clinical decision-making and enable the provision of the right care, in the right place, at the right time and by the right people. No one provider 'owns' a health consumer's data – that data 'belongs' to the person around whom the health system is collaborating to provide care.

Consumers of health services (and the unpaid care givers who support them), play a role by providing and generating health information to support their own care. When they interact with a health provider, they typically want and trust them to have all the information they need (that has been provided previously) and expect that information has been shared appropriately, in their best interests in line with the purpose for which their consent was originally given.

People understandably get frustrated when they experience instances where their information is either under or over shared. The former through a lack of interoperability and the latter when privacy is breached.

Achieving interoperability at a care process level requires change to the way providers work together. Achieving information interoperability to support 'joined-up' processes requires the customer(s) and supplier(s) to change the way they work together.

From a health funding and policy setting point of view, improved interoperability increases efficiencies and enables more effective services. It underpins the ability to design new health services based on the future needs of the population. Delivering efficient, sustainable, high quality, multi-disciplinary care in a range of settings from home to hospital makes interoperability one of the important foundation stones for the health and disability sector.

LEADERSHIP WILL MAKE THE DIFFERENCE

Just as models of care are changing to meet future demands, so are the commercial models that must be developed to support them. This heralds a move away from historic transactional, compliance focused ('master-servant') interactions to collaborative, long-term solutions based on relationships, partnerships and joint innovation processes.

During the consultation and engagement phase carried out for the development of this Vision and Charter it became clear that the majority view is that technology is not a constraining factor in terms of interoperability. In fact, the rate of technology evolution now means that virtually anything is possible at a technical level, now and more so into the future. Indeed, as has been seen in other industries, completely new ways of working have been successfully adopted that were not even thought of 3-5 years ago;

that have disrupted and revolutionised their respective industry groups through innovation, customer centricity and the willingness to take the risks that go with leadership.

Therefore, this Vision and Charter focuses on the leadership required to create changes in how people and organisations approach this challenge, the need for improved approaches to change management, greater understanding and management of risk factors, and the willingness to accept a collaborative approach.

Hence, interoperability is not a technical problem; it is more about people's willingness to accept it as the way forward, to support it and to make it happen. In the words of one DHB CIO involved in this engagement process: "our challenge is to recognise we operate a multi-system environment and then work together to make it hum".

A consistent theme is that standards and compliance are important and obviously critical when it comes to areas such as privacy and confidentiality of data and information. However, these are seen as enablers rather than the only way that interoperability can be achieved. It is over five years since the last interoperability framework was tabled and in this time healthcare challenges and costs have increased markedly whilst interoperability has not been achieved.

This places renewed focus on achieving the benefits of interoperability and generates greater motivation and support for an interoperable future centred on a leadership approach that places "people first", with standards, processes and structures to support them.

PROCESS OVERVIEW

To assist with making advances possible in our current level of interoperability, it is accepted that on-going leadership and governance of the ICT interoperability environment is required as well as "building blocks" to support its implementation and ongoing operation.

Along with the Vision and Charter for Interoperability, these "building blocks" are also introduced in this version of the Vision document. It is recognised that new ways of working will be required to achieve the desired

level of interoperability and these "building blocks" introduce potential structures for future discussion and development.

This Vision and Charter for Interoperability has been created in a process directly involving more than 40 "sellers" and 20 "buyers" in the healthcare and health IT sectors. It recognises the context in which interoperability needs to be achieved and highlights both the drivers and barriers that will need to be addressed.

Future work on this Vision will incorporate an increased level of engagement with 'health customers', clinicians, carers, family and whanau. This is clearly essential as any design process that will have such a far-reaching impact as health ICT interoperability must be centred on the outcomes that people value the most when it comes to their own health and wellbeing.

We all want to maximise the value from our healthcare sector and continue to deliver health and disability services that our citizens expect of us. The future of our healthcare is dependent on it.

In summary, this document focuses on:

- why New Zealand needs an interoperable health environment,

- what this environment means, and the

- principles required to make it happen and their enablers.

Based on agreement with the Vision and principles contained in the Charter, this forms the platform for the next iterations, which will determine how interoperability will be achieved.

The sector has a positive challenge ahead to determine and develop interoperability based on trust, collaboration and partnering, to do the right thing for all New Zealanders. This Vision and Charter sets out the immediate pathway and is a call to action for all concerned to make this happen.

VISION FOR INTEROPERABILITY

Fundamentally, interoperability enables data and information to be available anywhere, anytime and anyhow.

The HIMSS definition of interoperability is shown below and is adopted as the New Zealand definition:

"the ability of different information technology systems and software applications to communicate, exchange data, and use the information that has been exchanged."
(HIMSS Board of Directors, 5 April 2013).

Consumers of health and disability services tend to view the use and sharing of their data from a non-technical perspective, with one definition being:

"In line with privacy rules, I can access information that you have, and I can use it, I can change it, I know where it comes from, I know who's responsible for it and you can do the same". (Dan Haley, Vice President of Government Affairs, athenahealth (Watertown, Mass.), 15 August, 2015).

Creating a "one size fits all" vision for interoperability is extremely difficult due to the wide spectrum of people and society covered by the health sector. Hence, the following provides perspectives from specific stakeholders.

For consumers:

a) I am "known" to the system and information about me, that has already been provided, is available to me and my providers across the health (private and public) and social care continuum through a mechanism of our choice and systems that "speak" to one another.

b) I trust the quality and security of the information being used and have consented to the purposes for which it is being used.

c) I can see who has accessed my data, what was accessed, and when and why, and who has prevented my data from being accessed by another provider or authorised person.

For health professionals and healthcare providers:

a) The information I need about the person I am caring for is available whenever, wherever and however I need it, based on the level of authorisation that I have.

b) The "system" knows who I am at all times and does not make me repeat myself unnecessarily.

c) I trust the information I am provided and trust how the information I provide will be used.

For industry partners and people managing the delivery of ICT in the health sector:

a) I understand that I have a responsibility to provide IT solutions, applications and interfaces that support the interoperable environment.

b) I believe interoperability is best achieved in most cases by linking information systems via services in an environment of "trust".

c) I meet a minimum threshold in terms of user authentication and management, data storage, availability, performance and security and also trust other "NZ certified" systems to meet that threshold.

d) I utilise approved, trusted, functional and accessible centrally managed national information assets (including but not limited to directory services e.g. the National Health Index).

e) Subject to applicable legislation and consents, I can access and use any services or information in any system about any individual identified legally via approved identity services.

f) I play my part in providing an interoperable environment by making sure there are robust, well planned and considered commercial arrangements in place where everyone's investments are made based on long-term sustainability and return on investment (in the public and private sense).

INTEROPERABILITY CHARTER

As signatories to the New Zealand Interoperability Charter we subscribe to the overarching Vision for Interoperability and agree with the following Charter principles:

1. It is our responsibility to work individually and collectively to create an interoperable ICT environment that enables the delivery of quality health and disability services, supporting positive health outcomes provided as efficiently and effectively as possible.

2. A method for achieving common, standards-oriented and reusable interfaces[a] will ensure compliance is achieved whilst keeping barriers to entry low and encouraging the development of innovative solutions.

3. We are custodians of the data in our systems (not owners of it) and will make it available to others in a non-proprietary way.

4. A commercial model for the use of the interface will be agreed and parties will only enter into a contract that addresses the full life-cycle of an interface. This includes design and development, implementation, change management, operations, maintenance and ongoing support based on the agreed scope, and scale of use and performance expectations for the interface.

5. Preference will be given to engage commercially with New Zealand "certified"[b] industry partners. We accept that once certified, they meet a minimum threshold of technical and operational capability, use national information assets and comply with nationally agreed standards in relation to interoperability, without requiring repetitive and unnecessary due diligence processes that create additional costs to the health system.

6. Consumers of health and disability services can expect duly consented data and information to be shared effectively and only for its intended purpose, with any cases of under or over sharing being brought to the attention of the relevant bodies. These include (but not limited to) District Health Boards, Ministry of Health, the Health, Safety and Quality Commission and the Privacy Commissioner.

Important notes:

(a) The definition, development and operation of the method (for example, an interface 'exchange' or 'library') will be addressed in collaboration with industry partners, funders, policy-makers and especially consumers of healthcare services.

(b) The development of a "certification" process will be undertaken in tandem with the process described in note (a) above. We recognise that a balance needs to be found to make it robust and meaningful while not being onerous or costly.

WHAT DOES INTEROPERABILITY MEAN FOR NEW ZEALANDERS?

To illustrate interoperability we've developed five stories as they relate to the different strategic themes of the New Zealand Health Strategy. Whilst these stories are fictitious they are based on actual cases and experiences of the people involved (names changed for anonymity).

CLOSER TO HOME
Agnes - who is frail and elderly

ONE TEAM
Marama - Whānau Ora

VALUE AND HIGH PERFORMANCE
Ropata - Social Sector trial

SMART SYSTEM
Rob - Mental Health

PEOPLE POWERED
Rita - Family health and wellness coach

Refer to Appendix 2 for more details relating to these stories.

BUILDING BLOCKS FOR ACHIEVING INTEROPERABILITY

To enable ICT interoperability we need several building blocks, commitment to the Vision, hard work and persistence. Whilst this Vision establishes the "why" and "what" of interoperability it also expects people to think about "how" this will be achieved. Commitment to the Vision and Charter principles establishes a requirement that a construct is developed to turns these into a way in which interoperability can be built, maintained and improved over the long-run.

The following section has been written to provoke thought about to achieve an interoperable New Zealand health system. We recognise there is still a lot of work to be done to determine how best to operationalise the Vision and Charter:

Commissioning and delivering a new interface

The most important "currency" in building an interoperable world is creating a new interface, for which the following principles apply:

- **RE-USE** – while built to meet a specific customer need, the interface can be re-used by others in the sector.

- **STANDARDS** – standards will be used where they exist. Where they do not exist, or are not mature, the project will 'work to standardise', involving:

  - **PRAGMATISM** – interoperability is about sharing information in context between two information systems. To achieve interoperability we will use "agile" principles to develop standards – small, incremental releases and adaptation based on user feedback.

  - **MARKET DRIVEN** – The sector as a whole should set the standards agenda. Customers will prioritise the business problem they want solving, industry partners will work with each other, and the customer(s), to develop workable solutions, with standards bodies supporting the work being done.

  - **NO FEES** - the health sector will not mandate interoperability standards for which there is a licence fee payable to the

standard "owner" that is not recoverable by industry partners from the health sector.

  - **FIT FOR PURPOSE** – a multidisciplinary approach to standards development and adoption will be used with appropriate input from care professionals (end users) as well as technologists and other "experts".

- **COMMERCIAL MODEL** – the commercial model for an interface ("core use" or "new use") will take into account the end to end lifecycle of the interface (develop, maintain, support, operate, re-use), its likely scale, scope of use, read-only vs read/write, expected performance and support levels, and be agreed in advance of its development (regardless of funding source).

- **PUBLICATION FOR ACCREDITATION, RE-USE AND ADOPTION** – the 'product' of an Interoperability Project – the interface and the Interoperability Architecture – will be published for accreditation and re-use.

RE-USE OF AN EXISTING INTERFACE

Where an interface has been published for reuse, there will be:

- **NO RESTRICTIONS ON USE** – the supplier of a published interface will not constrain or restrict other certified suppliers' use of the published interface software, provided the commercial model is adhered to.

- **NO ADDITIONAL CHARGES** – the commercial model will reflect the costs for use of the published interface and no additional development charges for building the interface will be payable.

- **UN-ENVISAGED USE** – where a new use case for the interface arises, a new commercial model will be agreed.

- **IMPROVEMENTS BENEFIT ALL** – improvements made to the interface are available for all subscribers.

A "TRUST" ENVIRONMENT – MEETING A MINIMUM STANDARD

Interoperability involves using interfaces to aggregate multiple systems to fulfil a particular service or information need. In addition to creating and using the interfaces as described above, for interoperability to work, every link in the ICT "chain" needs to meet a minimum standard. These standards may be different depending on whether the data is read-only or read/write back into the pool of available data for reuse elsewhere.

If we take a simple scenario such as extracting some minimum data from several systems to create a Summary Care Record, there are several things we need to be confident in:

- Who is the person (patient) for whom the information or service is needed?

- Who is requesting the information (and their authorisation level in relation to the given consent by the person whose data it is)?

- Where is the data currently and where will it be when presented to the user?

- How long will it take to get there? (data 'hopping' several times from system to system may take a long time to arrive frustrating the user and/or 'time out' along the way)

- How reliable is it when it arrives? (what is its provenance – source system, author, level of currency etc)

- Are we making a copy of it/changing it to create new (derived) data or just "viewing" it?

- What happens to any "derived" data if the source data changes?

- Do we need to keep a copy of what was sent for medico-legal reasons?

- Is it secure throughout the transaction?

If it was appropriate to solve the business problem being addressed, and agreed that we are going to contribute an update to that information and write it back, we need to know the structure of the data and make sure the changes we make are in the same format.

An "interoperating environment" only works when there is trust. Trust is multi-dimensional comprising – identity, authorisation, security, performance, use, consent, data quality, visibility,

provenance, etc. With health information, like financial information, there is a high level of trust required.

Setting the minimum standard for systems participating in New Zealand's health system, and ensuring industry partners are certified to meet that standard, is an essential building block in achieving interoperability. Currently there is no agency with this mandate or capability.

Certification processes have pros and cons. Care needs to be taken that the process is not too onerous – particularly for participants that only want to read data. Certification also needs to come with benefits such as "one time certification" needing to trump repeated technical due diligence in procurement processes.

EASY ACCESS TO NATIONAL INFORMATION ASSETS

There are some core information assets, particularly identifiers, that need to be available to make an interoperable system work, for instance, the National Health Index for consumer identification and a reliable provider directory are two foundational components.

While the NHI is capable of interoperating (although not compliant with FHIR standards), the process of engagement for industry partners, who want to use it, is laborious and has a waitlist of several years. The process for accessing and engaging with centrally managed national information assets, needs to be reviewed and aligned to support the level of interoperability that is expected.

GOVERNANCE AND GOOD PRACTICE FOR INTEROPERABILITY PROJECTS

To be successful, an Interoperability Project will have the following minimum characteristics:

- A business need for interoperability will exist that can be specified in terms of use cases and processes. The business purpose, participating organisations, business process and agreed business rules, rationale and impact for change will be documented clearly to inform design and delivery of the interface. Without this clarity, the project should not proceed.

- A customer or customer proxy (representing several organisations) who can enter into a contract with one or more approved industry partners to create and maintain the interface.

- Governance – standard 'good practice' of governance for projects will apply, incorporating a Steering Group representing members of the interoperating organisations, with sufficient decision-making capability and insight, or breadth of coverage, to appreciate the implications of decisions.

- A budget and/or commercial model. Funding for the development, deployment, maintenance, support or operation of any supplier-developed interfaces should be provisioned through the contract with the customer(s), who are requesting the data to be shared to meet the business need.

- Recognition that the interface being developed is part of the New Zealand health sector Interoperability 'Vision' and must align with its core principles, including being reusable by others.

TECHNOLOGY, PROCESS AND COMMERCIAL CAPABILITY

Achieving interoperability – building an interface between one or more systems in the health sector requires high levels of skill in the following areas:

- Process – defining and simplifying how a manual process could and should work when electronically enabled.

- Technology – getting two systems to talk to one another consistently, meaningfully, securely and with a high level of performance.

- Commercially – achieving a sustainable commercial outcome for all parties while recognising they have divergent strategies and objectives.

Talent and skills to achieve a higher level of interoperability will also be needed across the sector. Examples of initiatives that may build sector capability include: "connectathons" with expert supervision and coaching, education programmes, targeted mentoring, an independent review and QA panel for interoperability involved in the design, build and test phases.

AN "OVERSIGHT AND ENABLEMENT" CAPABILITY

The following concepts have been identified as being important enablers of an interoperable health system and discussed in earlier parts of this section of the document:

- Setting minimum standards for systems accessing data from the health system and contributing data to the health system, and certifying industry partners against those standards.

- Making national information assets available for use when they are needed.

- Ensuring interoperability projects are well run and produce the deliverables that can be reused.

- Providing capability and support for improving interoperability.

- Promoting good practice and supporting customers to include interoperability considerations in all national, regional and local projects

In addition, the 'product' of successful interoperability projects is a growing 'library' of interfaces/API's and the associated contextual information that enables them to be reused and extended by "NZ certified partners".

A central "capability" to provide stewardship and curation of published interfaces, and support for interoperability efforts, provides a model to support achievement of the Vision for Interoperability.

Several functions need to be fulfilled in order to achieve the Vision and an interoperable ecosystem:

- Set a minimum standard for participating in a "Trust" environment – if a system reads data or reads/writes data.

- Accredit Industry Partners and maintain a list of approved and certified Industry Partners.

- Review and accredit interfaces for reuse by others.

- Curate published interfaces i.e. facilitate their reuse.

- Operate a Technical Sub-Committee (or similar) that provides technical and architectural input into interface design.

- Facilitate access to business model and process expertise to help ensure best practice is spread and resources are available.

- Streamline and operate processes to make national information assets available to Industry Partners.

- Operate an Interoperability Laboratory where:

  - Industry Partners test their new interfaces.

  - Customers and Industry Partners can access existing interfaces.

  - New inter-operability scenarios can be modelled.

  - Re-usable services can be maintained and accessed.

This capability needs to be "independent" of any one party, and owned and funded by the sector as opposed to any one part of the sector.

MOVING THINGS FORWARD

There are several actions required to push the interoperability agenda forward. These fall into two categories:

a) Building a number of interfaces using the Vision and Charter and its principles

b) Creating the "enablers" to improve the environment for interoperability

BUILDING NEW INTERFACES USING THE VISION AND CHARTER AND ITS PRINCIPLES

In each region, there are several candidate interoperability projects. These provide an opportunity to use the Charter as the basis for the engagement of the parties, and test the process for designing, building and publishing a new interface for reuse. These projects include (but are not limited to):

• Managed Medications List

• e-Referrals

• Shared Summary Record

Industry partners on both the "buyer" and "seller" side of the interoperability equation can use these projects to test the Charter and inform the development of the "enablers".

CREATING THE "ENABLERS" TO IMPROVE THE ENVIRONMENT FOR INTEROPERABILITY

In parallel, work needs to be undertaken to:

• Design and establish the "leadership and oversight" capability to fulfil its agreed functions (as outlined above in the Building Blocks section).

• Implement an accreditation process, including the updating of procurement processes and contracts to reflect Industry Partner certification.

• Raise consumer and health sector awareness about the importance of interoperability in a high quality health and disabilities system including clarifying policies regarding data privacy; making it explicit that interoperable or shared data is essential for the provision of high quality healthcare, and not the exception.

ACKNOWLEDGEMENTS:

Many individuals, organisations and public officials have played an important role in allowing us to present this Vision and Charter for Interoperability. Each one has provided input at workshops, spent time reviewing document drafts, been involved in many discussions and have shown their passion and enthusiasm. We believe this document provides a solid foundation for the future where we can provide the best collaborative healthcare solution for every New Zealander and that we can indeed, Live Well, Stay Well and Get Well.

The following logos represent those members of NZHIT who have made their contribution to the development of this inaugural version of the New Zealand Vision for Interoperability. They represent the majority of current Industry Partners operating in the New Zealand health sector and have made their commitment as signatories to this Vision and the Charter Principles through their support and membership of NZHIT.

ACKNOWLEDGEMENTS:

APPENDIX 1 -
WHAT DOES SUCCESS LOOK LIKE?

The test for the Vision and Charter will be noticeable change and validated improvement. The table below summarises the problems we are trying to solve for the different stakeholders and how we think this Vision and Charter helps:

PROBLEM WE ARE TRYING TO SOLVE	HOW ARE WE ADDRESSING IT?
For Industry Partners	
It is difficult to access data from other systems to deliver new solutions/meet customer expectation.	Publication of interfaces for reuse and commitment to interoperability from Certified Partners.
There is a high compliance cost of operating in a piecemeal, fragmented, low trust environment with repetition of many processes across 20 DHBs and other parties.	A certification process in a high trust environment should reduce the cost of demonstrating technical compliance repeatedly.
There is not always money set aside for on-going operation/maintenance of interfaces.	Requirement for a commercial agreement to take into account lifecycle costs.
There is a challenge accessing national information assets in a timely fashion even when it is mandated that they are used.	Review and simplify process and transfer to proposed Exchange.
There is limited reusability of interface work	Publication of interfaces for reuse.
Requirements are not clear/well thought through	Support for improved process/requirements definition.
Interoperability is not considered until after the fact in some significant projects and partners selected without consideration of integration capability e.g. Maternity system.	Commercial and implementation focus and procurement based on certification.
It is expensive and time consuming to innovate as data is not easily accessible.	Reusable interfaces and lower barrier to entry for "read only" access.
For CIO's and funders	
Proliferation of point-to-point interfaces leads to increased complexity and cost.	Re-usable and more transparent, standards oriented interfaces may reduce overall complexity.
There is a risk of "lock in/capture" with industry partners.	Interface publication and promotion of standards use should enable new entrants into market.
It is hard and expensive to innovate e.g.: mobile apps.	Accessible interfaces will lower barriers to innovation once published.
There are financial constraints and the cost of integration and non-integration are hard to quantify.	Improved definition of requirements and clarification of commercial model.
Most interface projects go over budget and over time due to complexity and limited capability/expertise.	Improved definition of requirements and support from technical and process sub-committee with review of design.
Industry partners do not always work well together.	Industry partner certification and commitment to improved co-operation.
Data in source systems is unstructured.	Use of standards in interfaces may encourage industry partners to improve their products or facilitate entrance of new products that use structured data.
Service levels, performance, support and monitoring of interfaces complex and poorly managed.	Improved definition of requirements and clarification of entire lifecycle including service levels, monitoring and maintenance scenarios.
For health providers	
Inefficient workflow and processes – manual 'cut and paste' to achieve interoperability.	Improved interoperability to support business need.
Low trust in systems and data.	Certification and minimum standards for trust.
Information needs not met.	Improved availability of information.

PROBLEM WE ARE TRYING TO SOLVE	HOW ARE WE ADDRESSING IT?
For consumers	
Optimal care not achieved as information not available where needed.	Reduced "perception-reality gap".
Limited visibility of data and uses.	Improved visibility of data sources and quality as by-product of interoperable/joined up systems.
For Ministry of Health	
Support/mandate standards but they are not implemented.	Commitment to use standards.
Inconsistent use of national information assets.	Commitment to improve access to assets and for them to be used.
Role of MOH in enabling interoperability agenda is unclear.	Multiple roles of MOH (customer, funder, architectural leader, custodian of national information assets etc) to be clarified/ aligned in implementation phase.
Not all national projects consider interoperability requirements	Commercial and implementation recommendations.

APPENDIX 2 - "HEALTH CUSTOMER" (CONSUMER) SCENARIOS

STRATEGY & SCENARIO	AT OUR CURRENT LEVEL OF INTEROPERABILITY	IN AN IDEAL INTEROPERABLE FUTURE
CLOSER TO HOME Agnes, who is frail and elderly	I am 83 and lived alone until one day I fell over and couldn't get up. Thankfully, I was found by a friend a few hours later. I have not recovered enough to go home. I am now in an aged residential care facility with regular support as I have lost my mobility and confidence.	I am 83 and live alone in my own house. My health and wellness is monitored remotely by my family, GP and pharmacist. One day I fell over and within minutes a family member came over, took me to the hospital and I was fine. The services I need are provided to me when I need them and I can choose who provides them.
CLOSER TO HOME Doug, who is chronically ill with one or more long-term conditions	I regularly visit the Emergency Department when unwell. My medications change frequently and my treatment is variable. Whenever I'm with a doctor or nurse, I spend most of the time giving the same information to help them fill the gaps in their knowledge. There's not a lot of continuity. I don't think the "left hand" knows what the "right hand" is doing most of the time.	I understand my illness and actively manage the factors I need to. My care team includes my GP, Pharmacist, Cardiologist, Physiotherapist and all understand my goals, plan of care, medication regime and we communicate regularly online about my health status. I have not been acutely unwell for several years. I'm glad everyone is on the same page and I'm really confident I will be able to travel to my daughter's wedding next year.
ONE TEAM Marama, Whānau Ora	My whānau assessment, plan and notes are visible to my Kaiarahi and whānau ora provider staff but the range of health and social service agencies I deal with have no knowledge of them. The members of my whānau members fall between the cracks of service provision and the good work we do at home is pretty much wasted.	My whānau assessment and plan is visible to my Kaiarahi and the range of health and social service agencies I deal with. Agency responses and inputs are co-ordinated and focused on achieving stability and resilience for my whānau. The whānau context is taken into account in all decision-making and we feel like we are all working together.

STRATEGY & SCENARIO	AT OUR CURRENT LEVEL OF INTEROPERABILITY	IN AN IDEAL INTEROPERABLE FUTURE
VALUE AND HIGH PERFORMANCE Ropata - Social Sector trial	Siloed funding allocation has driven siloed service provision. There is no ability to track how funds are being used across agencies by a small number of high needs individuals and whānau, except at a 'headline' level. We have "aggregated" data to identify where these people are and how to target them but are only at the start of breaking down the organisation, process, system, people barriers that prevent us using our "investment" productively. Outcomes based contracts are aspirational at best.	My whānau is working proactively with a number of public sector organisations, including healthcare, to implement our whānau plan. As individuals our "service use" is unique and aligned to our need but it is also considered in the context of the wider family. We feel we are supported and empowered and that the "system" is helping us get results. Communication across different parts of the sector happens as a matter of course. Everyone can see how the money is being spent.
SMART SYSTEM Rob and Mental Health	I am a teenager. I have been admitted to the same hospital twice within four months for drug and alcohol related suicide attempts. I am receiving services from DHB and community administered Mental Health services. Emergency Department and Emergency Services (Police and Ambulance) cannot see my history if I present acutely again. When I run out of medication I tell the DHB and the hospital faxes my prescription to a pharmacy but the pharmacy doesn't receive it. I have run out of phone credit and can't chase anyone up, so stop taking my medication. Never mind.	I am a teenager. I have been admitted twice to the same hospital for drug and alcohol related suicide attempts. On presentation at the Emergency Department, the second time, Emergency Department staff knew of my risk and tailored their response. My community mental health service team were notified of my admission immediately. Proactive reminders about my medications and a common view of my medications list mean that I am staying on track with it. I'm stoked so I make sure my phone's always in credit so I can keep in touch. It seems like I am in the middle of a team-based effort to get me well and I feel a part of it.

STRATEGY & SCENARIO	AT OUR CURRENT LEVEL OF INTEROPERABILITY	IN AN IDEAL INTEROPERABLE FUTURE
PEOPLE POWERED Rita - Family health and wellness coach	I have two small children under five, a teenager, a partner and a mother that I try to keep healthy. Everyone has their own needs and level of interaction with the health system. One of my children has asthma and my mother has early stage cognitive decline, but my teenage son is the picture of health and a competitive cyclist. It is a nightmare trying to keep track of all my family's health needs while also being a good Mum. I know I could be doing more to help them and I need it to be easier to do my "health manager" job properly.	I have two small children under five, a teenager, a partner and a mother that I try to keep healthy. I can go to one place to see what is going on with each of them. I have a shared calendar of events and there are sufficient reminders and alerts for me to know what is going on with everyone. It is easy for me to engage with the system. I have some discretionary budget for my high performance teenage cyclist son and I can order support services on-line for my mother through the NASC. I feel like I am doing a great job.

APPENDIX 3 -
THE NEW ZEALAND HEALTH STRATEGY 2016

To read the New Zealand Health Strategy 2016, please go to:

http://www.health.govt.nz/publication/new-zealand-health-strategy-2016

APPENDIX 4 - VISION FOR INTEROPERABILITY – WORKSHOPS ATTENDEES RECORD

AUCKLAND WORKSHOP #1: 12:00-2:30PM, 26TH SEPTEMBER, 2016 - SPARK CITY, 167 VICTORIA STREET WEST, AUCKLAND	
NZHIT Personnel: Scott Arrol, Talie Schmidt-Geen, Matt Hector-Taylor	
NAME	**ORGANISATION**
Accepted Invite:	
Frane Karaman	SpeakData
James Gordon	Wild Bamboo
Jodi Mitchell	NZHIT Chair
Malcolm Stenerson	MKM Health
Lance Kirschberg	Spark
Murray Polson	Erudite
Ruth Bruce	Kinross Group
Prishika Chandra	GSK
Boris Wilkitzki	CNS
Bronwyn Farnell	Geneva Healthcare
Joel Sutcliffe	GSK
Phillip Duncan	Pinnacle/Indici
Greg Mikkelsen	SecureCom
John Ross	Comprehensive Care
Rod Hall	Tranzsoft
Mike Stanbridge	Enigma Solutions
Kate Reid	Orion Health (NZHIT Board)
Greg Garrett	Medi-Map
Kate Rhind	HealthPoint (NZHIT Board)
Felicity Bonham	Atlantis Healthcare
Stephen McArdle	MEDICALL

AUCKLAND WORKSHOP #2:
10:00AM-12:00PM, 15TH NOVEMBER, 2016 - SPARK CITY, 167 VICTORIA STREET WEST, AUCKLAND

NZHIT Personnel: Scott Arrol, Matt Hector-Taylor, Jonathan Tudor (Storicom)

NAME	ORGANISATION
Accepted Invite:	
Jo-Ann Jacobsen	Whanau Tahi
Vidhya Makam	Whanau Tahi
Jodi Mitchell	NZHIT Chair
Malcolm Stenerson	MKM Health
Lance Kirschberg	Spark
Murray Polson	Erudite
John Ross	Comprehensive Care
Rod Hall	Tranzsoft
Mike Stanbridge	Enigma Solutions
Chris Wiltshire	Enigma Solutions
Kate Reid	Orion Health (NZHIT Board)
Vianney Chauvineau	Orion Health
Kate Rhind	HealthPoint (NZHIT Board)
Mark Haycock	Atlantis Healthcare
Shane Kerr	Augen Software Group
Ross Peat	HealthSoft
Bevan Russell	CCL
Eduardo Monzon	Vensa Health

Total of 40 participants over the 2 workshops

APPENDIX 4 - VISION FOR INTEROPERABILITY – WORKSHOPS ATTENDEES RECORD CONTINUED

WELLINGTON WORKSHOP #1: 9:00-11:00AM, 28TH SEPTEMBER, 2016 - VODAFONE OFFICES, ROOM 1.02, 160 LAMBTON QUAY, WELLINGTON CBD	
NZHIT Personnel: Scott Arrol, Matt Hector-Taylor	
NAME	**ORGANISATION**
Fiona Thompson	GPNZ
Lise Mackie	Vodafone
John Eastman	Oracle
Alistair McDonnell	Vodafone
Petrina Turner-Benny	Leecare
Tim Sillay	Oracle
Lance O'Sullivan	Navilluso Medical
Larry Lepper	Ronin Group
Jayden MacRae	Patients First
Gary Lewis	CSC
Russell Craig	Microsoft NZ
Tom Bowden	Healthlink
Ross Tanner	Medtech
Paul Claxton	CSC
Siobhan Bulfin	Melon Health
Trevor Beatson	Navilluso Medical

WELLINGTON: 9:00-11:00AM, 23RD NOVEMBER, 2016 – PATIENTS FIRST OFFICES, WELLINGTON CBD	
NZHIT Personnel: Scott Arrol, Matt Hector-Taylor	
NAME	**ORGANISATION**
Accepted Invite:	
Kim Moletta	IBM NZ
Paul Claxton	CSC NZ
Don Robertson	HHL
Jayden MacRae	Patients First
Gary Lewis	CSC

Total of 21 participants over the 2 workshops

APPENDIX 4 - VISION FOR INTEROPERABILITY – WORKSHOPS ATTENDEES RECORD CONTINUED

CHRISTCHURCH WORKSHOP #1: 2:30-4:30PM, 28TH SEPTEMBER, 2016 - CDC OFFICES, LEVEL 1, 99 CASHEL STREET, CHRISTCHURCH	
NZHIT Personnel: Scott Arrol, Matt Hector-Taylor	
NAME	**ORGANISATION**
Malcolm McCulloch	COMRAD
Sinclair Hughes	Incisive (NZHIT Board)
Gabe Rijpma	Microsoft
Hamish Franklin	Green Cross Health
Darryl Swann	CCL
David Carter	Stratos Partners
Bryan Clarke	Vicinity Solutions

CHRISTCHURCH WORKSHOP #2: 2:30-4:30PM, 23RD NOVEMBER, 2016 – ORION HEALTH OFFICES, CHRISTCHURCH	
NZHIT Personnel: Scott Arrol, Matt Hector-Taylor	
NAME	**ORGANISATION**
Matt Hemens	Orion Health
Sinclair Hughes	Incisive (NZHIT Board)
Malcolm McCullough	COMRAD
David Carter	Stratos Partners

Total of 11 participants over the 2 workshops

APPENDIX 4 - VISION FOR INTEROPERABILITY – WORKSHOPS ATTENDEES RECORD CONTINUED

HAMILTON WORKSHOP #1: 2-4:PM, 12TH OCTOBER, 2016 – BEST PRACTICE SOFTWARE OFFICES, HAMILTON	
NZHIT Personnel: Scott Arrol	
NAME	**ORGANISATION**
Frank Pyefinch	Best Practice Software
Lorraine Pyefinch	Best Practice Software
Mitchell Grotherr	Best Practice Software
Felicity Williams	Best Practice Software
Matthew Falconer	Wild Bamboo
Jo Scothern	Wild Bamboo

HAMILTON – WORKSHOP #2: 10AM-12PM, 28TH NOVEMBER, 2016 – BEST PRACTICE SOFTWARE OFFICES, HAMILTON	
NZHIT Personnel: Scott Arrol	
NAME	**ORGANISATION**
Peter Jordan	Patients First and HL7NZ
James Gordon	Wild Bamboo
Matthew Falconer	Wild Bamboo
Felicity Williams	Best Practice Software
Mitchell Grotherr	Best Practice Software
Lance Kirschberg	Spark Digital

Total of 12 participants over the 2 workshops

APPENDIX 4 - VISION FOR INTEROPERABILITY – WORKSHOPS ATTENDEES RECORD CONTINUED

MOH WORKSHOP: 2-4:PM, 30TH NOVEMBER, 2016 – MOH OFFICES, MOLESWORTH ST, WELLINGTON	
NZHIT Personnel: Scott Arrol, Matt Hector-Taylor	
NAME	**ORGANISATION**
Shayne Hunter	CCDHB, HVDHB, WDHB
Steve Miller	Central TAS
Ken Biswell	Compass Health
Jayden MacRae	Patients First
Sadhana Maraj	MOH
Alastair Kenworthy	MOH
Darren Douglass	MOH

STAKEHOLDERS ENGAGED WITH OUTSIDE OF THE WORKSHOP PROCESS	
NAME	**ORGANISATION**
Stella Ward	Canterbury DHB
Peter Jordan	Patients First & HL7NZ
Darren Manly	Northland DHB
James Edgar	Auckland DHB
Sarah Thirlwall	Counties Manukau Health
Wayne Pohe	healthAlliance
Stuart Bloomfield	Waitemata DHB
Lloyd McCann	Mercy Hospital and Private Hospitals Association
Chris Baty	Health Consumer
Owen Wallace	Bay of Plenty DHB
Steve Miller	Central TAS
David Hay	Orion Health & HL7NZ