MINISTRY OF SOCIAL DEVELOPMENT
TE MANATŪ WHAKAHIATO ORA

Ministry of Social Development – Te Haoroa Implementation Business Case

Preventing failure of critical services to clients: Data Warehouse Replacement Project – Te Haoroa

Implementation Business Case (ImBC) – **contains commercially sensitive information**

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Version	Issue date	Changes
0.1	22 September 2021	Draft for Programme team review
0.2	24 September	Broad feedback following initial review Draft content from Finance included
0.3	28 September	Feedback from Rob Hodgson, Lena Sapunova, Nic Blakely, Finance team
1.0	30 September	Draft issued to PMC
1.1	7 October	Updates to Financial Case, Updates following PMC
1.2	13 October	Updates table and commentary in Economic Case
1.3	14 October	- Updates following Treasury feedback & discussion - Mana Ōrite alignment updates - Submitted to TIC
1.4	22 October	- s 9(2)(b)(ii) ███████████████ ███████████████ ████████████ - Final updates from GCDO in Management Case.
1.5	27 October	- Incorporating comments in Economic Case Benefit section following discussion with Treasury - Minor additions to Programme Assurance under Management Case following discussion with GCDO - Version submitted to Chief Executive
1.6	2 November	Minor formatting adjustments
1.7	3 November	- Added comments to Economic Case Benefits section, specifically related to efficiency gain baselines.
1.8	10 November	- Updated Benefits recap following discussion with Treasury
1.9	11 November	- Updated Finance cost model
1.10	1 December	- Updated Finance cost model

Document Review

Role	Name	Review Status
Product Manager	Mike Rankin	Completed
Strategic Finance Manager Strategic Finance	Anna Brice	Completed
Programme Management Committee	Nic Blakeley Jason Dwen Kelvin Watson Marissa Whight Pennie Pearce Mike Rankin Rob Hodgson Lorna Bunt Tracy Voice	Completed
The Treasury – IMAP GCDO	s 9(2)(a) Ivan Esler Martin Watson	In Progress
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Document Sign-off

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Contents

Executive Summary

Programme purpose

Te Haoroa is a multi-year programme to modernise the foundations of the Ministry of Social Development's (MSD's) data analytics capability. It is a core enabler for both reducing risk in one of our most critical systems as well as delivering our Te Pae Tawhiti strategy.

Our current data technology platform, known as the Information Analysis Platform (IAP), is an on-premise suite of technologies, managed in-house by MSD. It also provides data warehouse capability for Oranga Tamariki. It is over twenty years old and used by hundreds of staff across both MSD and Oranga Tamariki daily, serving all our business units, informing decisions which directly impact the lives of New Zealanders. We spend significant effort on maintaining this system (which has become increasingly expensive as it ages) and making changes due to core system updates (which are beyond the warehouse's control). With the advent of Te Haoroa, we will retire this system and its associated running costs.

Te Haoroa will modernise our technology by migrating to a fit-for-purpose, flexible, cloud-based solution. As of December 2020, Oranga Tamariki's data warehouse requirements have been de-scoped from the original business case submission. This mitigates implementation risk to respective organisations as they both have differing data capability requirements.

The new cloud-based data platform will be operated and supported by SAS, our incumbent data technology provider. s 9(2)(b)(ii)

Te Haoroa is funded through both Budget 2019 and MSD baseline.

Current status – progress to date

The main progress since our last update to Treasury, '*Second draw-down from the "Reducing risk in critical systems and implementing legislative change" contingencies*' in July 2020, is as follows:

- Establishing a preferred way forward with a cloud-based data warehouse solution, provided as-a-Service, following our options analysis. This will be provided by our incumbent supplier, SAS, ensuring we de-risk technical capability uplift. s 9(2)(b)(ii) It removes the need for MSD to play the role of IT system integrator as part of the implementation.

- The development of a programme delivery approach, including how we will both de-risk our critical platform risk at the same time as introducing new data capabilities for the future.

- The de-coupling of Oranga Tamariki's data warehouse requirements from this programme.

- Confirming Whole of Life Costs (WOLC) are within the original business case funding request and are affordable for MSD ongoing.

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Constraints since our last Treasury update:

- The programme experienced less progress than anticipated during parts of 2020 and 2021 due to staff being reallocated to work on the MSD's contribution to the COVID-19 response.

- Our initial approach posited MSD as assuming the role of System Integrator in the data warehouse replacement programme. We have pivoted from this position and will de-risk delivery by outsourcing this to data platform technology experts – SAS. Managed services for data platforms have become more prevalent in the market than they were in 2019.

This paper's objective

This Implementation Business Case seeks formal approval from the Chief Executive of MSD by Cabinet Ministers to:

- draw-down on BC19 case funds for MSD's data warehouse replacement

- enter into commercial contracts with the preferred technology supplier

- proceed to deliver and implement the solution, which includes the phased retirement of the legacy system.

This document should be read in conjunction with the *Reducing risk in critical systems and implementing legislative change* bid to replace the IAP, which was approved and funded in contingences established in Budget 2019, 30 April 2019, Cabinet [CAB-19-MIN-0174.36 refers].

This document conforms to Treasury guidelines for Better Business Case development. It follows the five-case model and assumes awareness and understanding of the original business case as referenced in the Annex.

We have summarised the content of this document below.

- The **strategic case** provides an overview of the programme and an update on progress. It summarises the case for change. *There are no material changes to the strategic case for Te Haoroa. We have provided an update and brief recap of the strategic case in this Implementation Case and how Te Haoroa programme will deliver both its data warehouse replacement objective <u>and</u> lay foundations for Te Pae Tawhiti.*

- The **economic case** describes the requirements of the future data warehouse system and what is required to deliver and run it. *The economic case for Te Haoroa has been updated with estimated costs and funding sources.*

- The **commercial case** outlines the products and services required to implement the data warehouse including the commercial arrangements in place with SAS. *We summarise the process followed to appoint SAS and outline our approach to source a delivery partner*.

- The **financial case** indicates sources of funding for the programme. *This has been updated and aligns with our Te Haoroa implementation approach.*

- The **management case** has been updated**,** *describing the governance and management arrangements for the implementation and outlining the high-level change management approach, key considerations, constraints, and risks throughout delivery.*

Strategic Case

There are no material changes to the Strategic Case for Te Haoroa.

Recap:

The data warehouse is an integral part of MSD and Oranga Tamariki's operations. The warehouse stores and integrates complex administrative data from over one million New Zealanders and enables MSD and Oranga Tamariki to perform a wide range of, in some cases critical, functions, including frontline case management, advanced analytics, reporting and business intelligence. The Ministry of Housing and Urban Development also depend on the data warehouse for the latter two functions using MSD data.

However, the demands placed on this system now far exceed what the platform was originally designed to deliver. The combination of increasing service demands, and poor governance has meant the system has evolved in an ad-hoc way, requiring short term, quick-fixes. The consequences of this have built up over time and led to an increasingly complex, brittle, and an ultimately unsustainable platform for delivering core functions. This accumulation of "technical debt" has reached a tipping point. The system is now in a state that not only limits our ability to develop new insights for supporting MSD's key strategic shifts, but also presents a critical and imminent risk to performing MSD's most basic, business-as-usual activities. The system is now prone to regular outages that directly impact front line staff and the services clients receive, creates risks to client privacy, lacks the resilience needed to respond to inevitable disruptions and new service demands and is no longer cost-effective to maintain. If unaddressed, these problems will get worse.
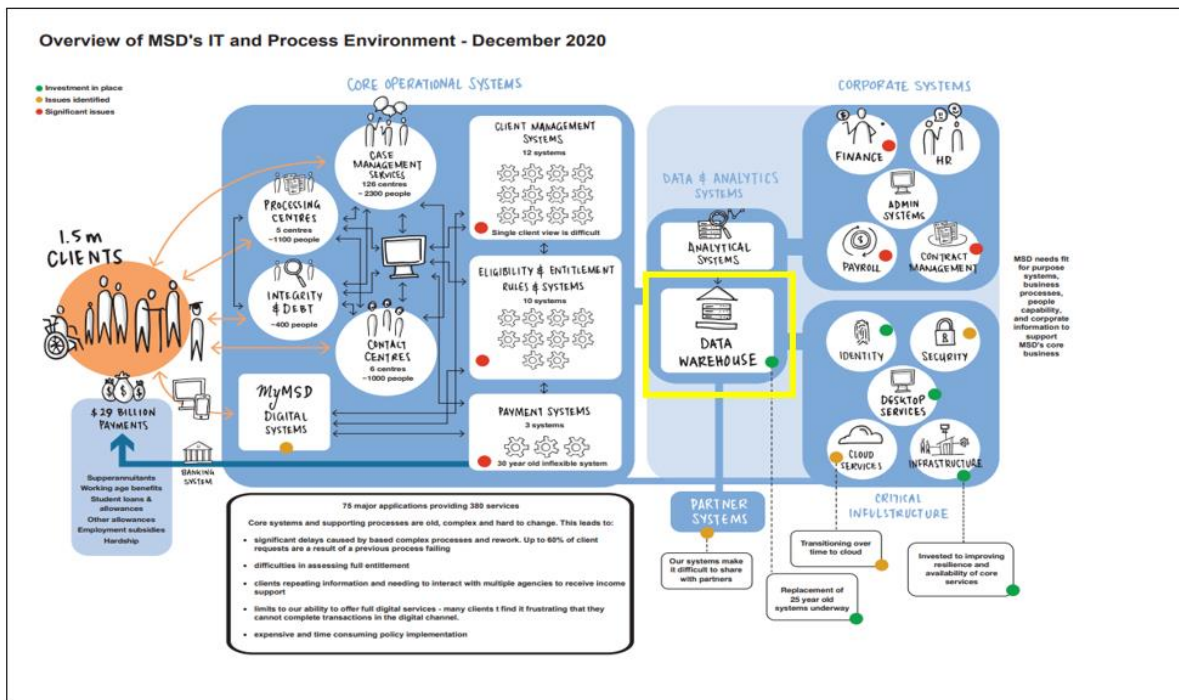
Fig 1: Conceptual Business Architecture - Data warehouse (bordered in yellow) in context of MSD's core services.
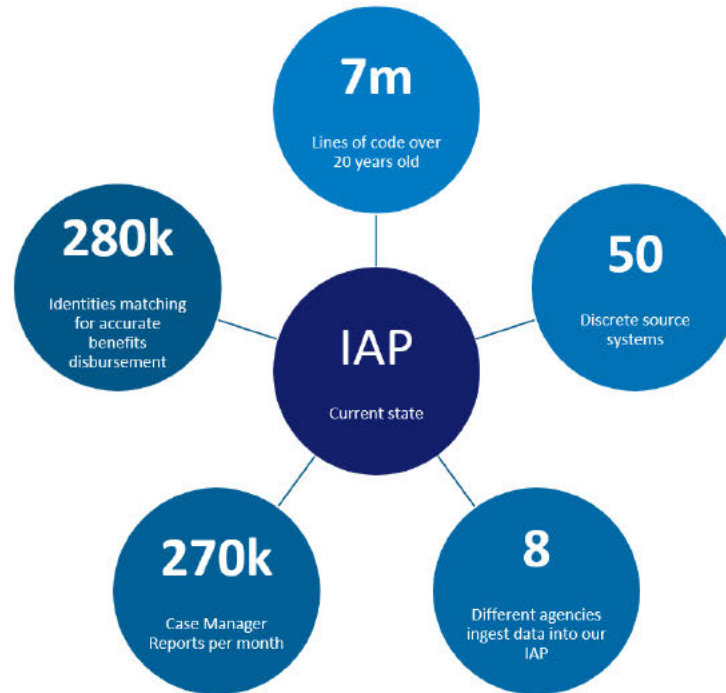
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7m
Lines of code over 20 years old

280k
Identities matching for accurate benefits disbursement

50
Discrete source systems

IAP
Current state

270k
Case Manager Reports per month

8
Different agencies ingest data into our IAP

Fig 2: The existing IAP – in numbers

Update:

With our proposed delivery approach, we will mitigate the critical platform risk. However, as part of our phasing out of IAP, we will not simply migrate 'like for like' data products bringing sub optimal engineering and data product governance habits to our new platform – transferring technical debt.

We will triage data products before investing effort into re-engineering to ensure that those that are brought across are of business value, built to be reusable, scalable, traceable and secure.

Note:

The programme assumes creating a smaller quantum of data products on the new system, as existed on the old. As we analyse our existing products with engineering in mind, we anticipate discovery of significant duplication and redundancy. 'New' data products that enable business change and new products and services that are identified will need to be funded either from MSD's baseline capital or other sources for example Te Pae Tawhiti Programme Business Case.

Update for Implementation Business Case:

The following table summarises how Te Haoroa will enable strategic initiatives at MSD.

Strategy Initiative		How Te Haoroa enables
Te Pae Tawhiti - Mana manaaki	A positive experience every time	Te Haoroa will provide us with foundational capability that combined with improvements in analytics capability will better enable us to understand which clients need greatest support, allowing us to make more efficient, informed, and personalised decisions as part of our service delivery to New Zealanders.

Te Pae Tawhiti - Kotahitanga	Partnering for greater impact	Te Haoroa will deliver a fit-for-purpose, scalable cloud-based technology platform, which will facilitate quicker, more secure information sharing.
Te Pae Tawhiti -Kia takatū tātou	Supporting long term social and economic development	The foundational capabilities we introduce through Te Haoroa combined with improvements in analytics capability will ensure that we can identify emerging system-wide issues and opportunities quicker and with greater accuracy.
GCDO Cloud First		The preferred way forward for Te Haoroa includes the provisioning of a cloud-based data warehousing platform, moving off our on-premise solution. We will continue to engage with GCDO during the course of this programme.
Mana Ōrite		MSD is committed to the Mana Ōrite work programme, which includes the co-design of a Māori data governance model that reflects te ao Māori aspirations, needs, and data interests. Our proposed data platform will make transparency into the data we store and how it is used easier and will be a core for te Tiriti o Waitangi governance.
AOG Strategy for Digital Public Service		The Programme contributes to this strategy by having a modern, secure, and fit for purpose data warehouse and associated data capabilities.

Te Haoroa will also enable MSD to progress our commitment to Māori as outlined in Te Pae Tata, our Māori strategy and action plan.

This programme presents a significant opportunity to partner with Māori and give effect to the Mana Ōrite agreement. A key feature of discussions with Māori, for example in partnership agreements and social accords, is governance of, and access to, data and insights.

The new platform will keep data (raraunga Māori, kōrero) safe and secure and be an enabler of te Tiriti o Waitangi governance.

Our commitment to Māori is to understand and include these requirements into the fabric of the new data platform. For example, the architecture of the new platform will make reciprocal sharing with iwi and hapū possible and allow for data to be provided that will enable better decision-making more broadly.

The development of new data architecture will consider how to represent Māori in structures that are more fitting with te ao Māori concepts.

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Economic Case

The main update related to the economic case has been the de-coupling of Oranga Tamariki scope from Te Haoroa, following analysis and a Programme Management Committee (our Governance Committee) decision in December 2020. The preferred option, designed to maximise public value is to replace the on-premise, aging data warehouse with a cloud-based managed service for MSD.

Options recap:

Our current data technology, known as the IAP, is an on-premise ecosystem of technologies, managed in-house by MSD staff. It is over twenty years old yet used by scores of analysts across both MSD and Oranga Tamariki daily, serving all our business units and informing service delivery and policy decisions. We spend significant operational budget on maintaining and running this system (which will become increasingly expensive as it ages and data volumes increase). The methods we use to build data products is also constrained by the age of the technology, which in turn limits our ability to re-use and makes changes slow to implement.

In the last five years, cloud data platforms have become mainstream and transformed how organisations manage and run their data practices. It means functionality is continuously deployed (upgrades occur frequently) and non-functionals (such as data security controls) stay up to date. These are tasks that we will no longer have to carry out in the new solution.

Summary of options:

Option	Description	Pros	Cons
1	**Status Quo**: Accept the burning platform risk, continuing to sweat our asset until it is no longer fit for purpose.	- No immediate impact to either OPEX or CAPEX	- Does not mitigate our current risk - Continued siloed approach to data product development, limiting any reuse and efficiency opportunities.
2	**New or upgraded on premise, MSD operated data platform**	- Mitigates technology risk	- Higher Total Cost of Ownership over time - Platform failure/security risk controls still held by MSD - No ability to 'stay current' without major technology change programme
3	**Cloud-based data warehousing, provided as-a-service**	- Cost effective over time - Scalable, flexible, ability to introduce analytics in future - Assurances on security, service levels and upgrades	- Higher programme cost for MSD in relation to change (ITC, Business)

Option #3 was approved as the preferred way forward in the original business case. Its description has since been refined and reaffirmed by our Governance Committee. Our strategic options analysis is included in the Annex. We outline the implementation approach for the preferred way forward and key considerations in the Management Case within this document.

Programme benefits & costs update

Costs recap and update:

Programme cash flows have been updated following the selection of our technology partner and subsequent negotiations.

The estimated Whole of Life Costs (WOLC) for the for the preferred way forward new system replacement is $116.1m ($89.3m after discount) over an 8-year period. This includes both operating and capital costs for:

- Provisioning and operating a new cloud-based data platform, as a managed service for a period of 8 years;
- Operating the existing system in parallel with usage gradually reducing over six years;
- Security Certification and accreditation for the new system;
- The rebuild of required data products on the new platform using modern sustainable engineering capabilities, such that the old system can be decommissioned;
- Change management costs related to the transitioning of data capabilities from existing to new platform.

In addition to the WOLC for the new system, Table 1 below highlights the economic cost required to support the remaining life of the current systems as well as the new system until the end of its estimated life. This table further contains a reconciliation of economic costs to accounting costs which is used in the Finance case in Table 2 as a basis to review funding affordability (See the Finance case).

Table 1 – Economic case for the new data warehouse

Economic case (Current and new system accounting costs) $m									
$millions	Y1 (21/22)	Y2 (22/23)	Y3 (23/24)	Y4 (24/25)	Y5 (25/26)	Y6 (26/27)	Y7 (27/28)	Y8 (28/29)	Total 8 Years
WOLC (Economic Case)									
New System									
Operating costs (excel Depn and capital charge)	1.375	6.041	7.760	10.628	11.178	15.944	15.247	15.503	**83.676**
Capital costs	2.168	7.233	6.063	3.550	4.300	3.100	3.000	3.000	**32.414**
New System WOLC (Economic Cost)	**3.543**	**13.274**	**13.823**	**14.178**	**15.478**	**19.044**	**18.247**	**18.503**	**116.090**
Total WOLC Discounted	3.441	12.163	11.950	11.563	11.908	13.822	12.494	11.952	**89.292**
Current System (Until end of Life)									
Operating costs (excl Depn and capital charge)	13.253	9.490	8.149	7.475	6.757	-	-	-	**45.124**
Capital costs	2.800	2.285	1.748	-	-	-	-	-	**6.833**
Current System WOLC (Economic Cost)	**16.053**	**11.775**	**9.897**	**7.475**	**6.757**	**-**	**-**	**-**	**51.957**
Total WOLC Discounted	15.592	10.790	8.555	6.096	5.198	-	-	-	**46.231**
Reconciliation to Accounting costs (Financial Case):									
Combined systems (Current and new)									
Capital costs	4.968	9.518	7.811	3.550	4.300	3.100	3.000	3.000	**39.247**
Operating costs									
Operating costs (excel Depn and capital charge)	14.628	15.532	15.909	18.104	17.934	15.944	15.247	15.503	**128.800**
Add other accounting operating costs									
Depreciation	3.270	4.396	5.209	5.619	5.093	4.747	3.302	3.677	**35.314**
Capital charge	0.281	0.684	0.806	0.806	0.806	0.806	0.806	0.806	**5.803**
Total Operating costs	**18.179**	**20.612**	**21.925**	**24.529**	**23.834**	**21.497**	**19.355**	**19.986**	**169.918**
Total Accounting costs	**23.147**	**30.130**	**29.736**	**28.079**	**28.134**	**24.597**	**22.355**	**22.986**	**209.164**

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Benefits recap and update:

The table below summarises the benefits with an update on timing. These benefits were endorsed by MSD's Transformation and Investment Committee in June 2021.

The programme has identified operational baseline metrics which represent current platform performance and the areas Te Haoroa will address. The intention is also to obtain a qualitative baseline through surveying existing platform and reporting users. This approach has been agreed with Treasury.

The proposed metrics below will inform granular benefits baselines in the following categories:

Benefit	Proposed Measure Description	Baselined metrics	Implementation Business Case Comment (Oct 2021)
Reduced number and severity of data platform failure incidents	We will count the number of times per month data was not current in the IAP. Without up to data our case managers, contact centre and processing staff can be prevented from making accurate and informed decisions affecting clients.	Q1 FY2021: In this quarter data supporting our frontline and backroom processing people to make informed decisions was inaccurate (out of date) for a total of 53 hours.	
	We will count the number of data product development work hours lost when the SAS Analytics is unavailable. This impacts the ability of end users to provide key insights to MSD business units.	Q1 FY2021: During this quarter the Ministry's SAS Analytics tool was unavailable to end users for a total of 7 hours.	
Reduced Risk Profile of the data Platform Solution	Reduced technology systems risk and ratings, improved resilience. The new platform will reduce user reliance which will be tracked quarterly.	Q1 FY2021: a total of 540 users remain reliant on IAP platform to produce data products.	We will establish additional baseline metrics for this benefit category by February 2022.
	We will update our Risk and Controls Application	Risk level as at June 2021 is 'Very High'.	

	(#2471) likelihood and consequence as our quantum of data products are rebuilt on the new system.

We will count our data product migration to inform this risk and lower consequence/likelihood.

We will count our user numbers on the existing IAP to inform this risk.

We will count the number of reports we generate that emanate from the IAP to inform this risk.

We will count the number of new ingestion patterns from source to data warehouse (it should be considerably less than current, simplifying our data landscape). | This is the key metric that we are looking to mitigate through the development of the new platform. | |
| Increased business value contributed through higher quality product delivery | Business satisfaction survey quarterly (focused on business value and quality)
(Input from Portfolio Manager)

We will issue survey to Business Owners and end users either after each data product release (on new platform) OR quarterly

Established data governance and data delivery operating model. Terms of Reference and annual schedule for data governance and data | | Te Haoroa programme will conduct a satisfaction surveys with appropriate stakeholders during November 2021 and publish baseline metrics by February 2022 |

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	delivery working groups or committees		
Increased efficiency in delivery and maintenance of data products	Business satisfaction survey quarterly (focused on efficiency and maintainability). We will issue survey to Business Owners and end users either after each data product release (on new platform) OR quarterly Measure the <u>actual</u> time and effort to build and/or change data products on the new data platform e.g. effort taken to maintain data source ingestion path X	Q1 FY2021: 95.7% of OIA, 95.3% of PQ, requests delivered within the agreed timeframes	Te Haoroa programme will conduct satisfaction surveys with appropriate stakeholders during November 2021 and publish baseline metrics by February 2022 Time to build/change calculation methodology tested and in place by Q4 FY2021

Intangible Benefits:

Other Value (non-ROI) areas:
- We will implement a data governance and data product engineering framework which will open more cross agency collaboration opportunities. We will be better placed to know what we have, where we use it and why we use data products. This will greatly improve overall trust in data – used for myriad reasons such as Parliamentary questions or responses to Official Information Act requests.
- We will inform operational models that MSD will likely require on a grander scale in the future – for example Cloud adoption models.
- Fortifying our data foundations (i.e. the warehouse) will lead to a better ability to embrace data analytics capabilities as they become mainstream in future – prescriptive modelling, machine learning and advanced analytics in general. All these techniques are premised on sound data.

Over the course of the programme delivery, we will establish baseline measures for efficiency gain related benefits. During the first year of the programme and will define these and incorporate into our annual reporting to Treasury, as well as MSD's benefits realisation management.

Risks and uncertainty:

We maintain a risk register as part of programme management. The core assumptions we have made with respect to cost and benefits are outlined below:

- There is a risk that we need to keep our existing IAP system in operation for longer than anticipated. We have assumed we will need to run parallel systems for five years.

- Related to the above, there is a risk that some of our existing data platform workloads are not suitable for migration to the new data platform and require other technology components. We know that the IAP currently undertakes functions such as integration between source systems. Please see the Management Case section for our proposed mitigation approach.

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Commercial Case

Sourcing the services and products required for delivery.

Updates to the Commercial Case as set out in the previous business case.

Technology platform partner

Technology infrastructure and software, design and implementation services are required for delivering MSD's new data warehouse capability.

SAS will provide a managed service which will include security and version control, operating and software system patching, software integration (there are various components on our proposed platform). SAS have similar engagement models in place with both Inland Revenue and ACC which have been in operation for several years.

***Selection principles*:**

The principles we have worked to are as follows:

- our solution should be a secure, cloud-based and provided as a service or a managed service

- our WOLC should be affordable, provide value for money and within our available funding sources

- our proposed solution provider should enable us to retire IAP as quickly as we can (burning platform risk).

***Process for the appointment of SAS*:**

The key products and services we require are available from our incumbent provider, SAS.

- The commercial case for delivery and implementation as set out in the previous business case was reassessed by our Programme Management Committee in November 2020 with no material changes.

- A technology selection options paper was endorsed and approved by the Programme Management Committee in December 2020.

- Details of how Oranga Tamariki and MSD would share the funding in relation to BC19 were agreed in December 2020. This resulted in a 75/25 percent split between MSD and Oranga Tamariki, respectively, and reduces the delivery risk for both agencies.

- In March 2021, MSD (with agreement from the Programme Management Committee) issued a single source Request for Proposal (RFP) to our incumbent provider.

- The rationale for the single source RFP was based on the following;

  - the existing data warehouse at MSD is operated on software tools licensed to MSD from SAS

  - MSD applied Government Rules of Sourcing, Rule 14.9 (c) and (d)(i) and (ii) 'Exemption from open advertising, only one supplier, procurement related to the acquisition of rights to intellectual property' as the basis to enter direct negotiations with this supplier

  - the construct of the MSD data warehouse includes its SAS code base and SAS software (intellectual property)

- the MSD personnel that build and operate the warehouse and its workloads comprises approximately 200 staff, specifically trained in use of SAS tools and code

- this rationale was ratified by our independent probity assurance team and approved by the Governance Committee.

- s 9(2)(b)(ii) ████████████████████████████
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- s 9(2)(b)(ii) ████████████████

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Delivery partner

Context:

In some cases, MSD's data practice and assets are decades old. As we retire our existing platform, we will need to rebuild relevant, business value driven data assets on the new system. Many of our existing data products are not constructed for efficiency, security or sustainability. Some of our existing data products will be redundant. As part of our migration to the new cloud-based service, we will triage before we invest effort in migration or re-engineering. We want to ensure we are building the right foundations for the future – enabling reuse, providing better assurances on security and our ability to scale. We also want to ensure that products we do migrate are of tangible, current business value.

As such, we will require expert services from a delivery partner to help us get to this outcome. These services will include:

- data governance services – to ensure we set up and operate the right framework for governing our data and data products
- data engineering strategic advisory – to ensure we build data products on our platform in a sustainable manner
- business change & delivery services to help with the above
- resource augmentation to maintain our existing IAP and data products in parallel.

To secure these services, we will:

- draft an RFP, with our overall implementation plan driving our professional service market request
- ensure our Governance Committee approve our market request
- run a secondary procurement process via the All of Government Professional Services panel, which comprises 13 suppliers
- appoint a supplier and negotiate terms
- ensure our external probity assurance team are part of both planning and reviewing the process once it is complete.

s 9(2)(j) ████████████████████████████
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Financial Case:

Based on current estimates, the anticipated costs for the investment proposal over its intended life span are set out in the table below.

s 9(2)(b)(ii)

s 9(2)(b)(ii)

The following assumptions have been made in determining these estimates.

1. s 9(2)(b)(ii)

2. s 9(2)(b)(ii)

   - s 9(2)(b)(ii)

   - s 9(2)(b)(ii)

   - s 9(2)(b)(ii)

3. **Other IT costs:** Other IT costs are assumed to remain static until year 6. Any cost reductions from decommissioning in this period will be offset by other consumption-based cost increases. A minimal uplift is expected however in network costs year-on-

year. Other IT consumption costs for the new system are included in software licence costs.

From year 7, the cost reduction reflects the decrease in storage and other hardware services no longer needed and now represent the ongoing IT overheads that are not able to be otherwise eliminated from MSD IT.

4. **Deprecation**: Assets for the new system has been assumed to have an 8-year life. The current system investment in DMaID/IAP expected to continue to the treated as capital until 2023/24. The current system is expected to remain in full use until the end of year five.

   All current system assets are depreciated over four years. Depreciation is assumed to be incurred in the year after spending occurs.

5. **Other assumptions:**

   – No contingency has been provided for the new system operating or capital or to cover any significant unexpected outages in the current system in line with the original business case.

   – Surplus funding from earlier years' budgets can be shifted in full to out years

Estimation confidence

A change in the programme estimation has the potential to drive a change in the:

- effort estimates (up or down)
- duration of the programme (to retire the existing data warehouse)
- level of cloud service compute or data storage required
- s 9(2)(b)(ii)

We consider that the overall set of assumptions to refine the financial case for this Implementation case are reasonable and balanced. There is inherent estimation risk with any financial forecast. We are projecting opex cost pressure in later years of the programme but we feel this will be manageable. The drivers of cost will be in the complexity of the data products that we need to migrate and the solutions we create to re-build them. There will be efficiencies in some areas and challenges in others.

This programme's objective is to change the way we build data products, which will mean we focus in identifying and realising engineering efficiencies where they exist. The programme will run to MSD's SAFe framework which will mean we can surface any cost management discussions and pivot our approach, if necessary, during the term.

Overall affordability

The proposed accounting cost of the combined current (DMaID/IAP) and new (DAP) systems is $209.2m over an 8-year life. Over this timeframe $39.3m of capital funding and $169.9m of operational funding is estimated to be required.

Operating and capital costs are funded from a combination of baseline funding and that provided through BC 19 Budget bid for Critical Systems Risks. A component of this funding has already been drawn down with the remainder still in contingency.

The Treasury funded costs address the critical risk described in the BC 19:

		management system Curam SFM.
4.	**Data Warehouse Re-platform**	The Ministry's data warehouse has a high risk of breaching of privacy rules. It is also at high risk of operational failure resulting in clients' benefits and service to clients being disrupted and the inability to deliver organisational strategic goals due to the unusually high maintenance, unplanned work, recovery, and support load.
5.	**Digital Capability**	To meet increasing client demand arising from hardship, client complexity, national

It is assumed $16.1m of the capital cost will be funded from the BC 19 Budget bid. and that the remainder can be funded from the allocation of MSD's capital baseline to the development of data products (built on the new platform).

There is a minor operating cost gap of $1.8m identified in year 5 (2025/26). The next zero operating funding gap shown over the 8-year life however reflects that MSD expects to be able to manage the costs estimated from within its baseline.

Operating costs will require careful monitoring and management as the program progress and will be tracked as part of routine programme management reporting, with any significant shifts in position escalated to programme governance committee.

Management Case

Ensuring successful delivery.

This section describes the governance and management arrangements for the programme. It also outlines the delivery approach and sequencing of activities during implementation. Te Haoroa programme is 'investment ready'.

Programme governance

Our governance board, the Programme Management Committee, comprises a blend of knowledge and experience from across MSD as well as an external advisor. The Terms of Reference are included in the Annex. As the implementation phases move from technology build to business change, we expect the composition of the Governance Committee to change accordingly.

We also *envisage engagement with the Portfolio and Executive Committee, Design Committee and Technical Design Committee during implementation. We anticipate data product specific decisions as part of our triage approach. This is to ensure that we keep the new platform 'fit for purpose' and do not use it as a workaround for enterprise IT architecture gaps*, incurring new or transferring old technical debt.
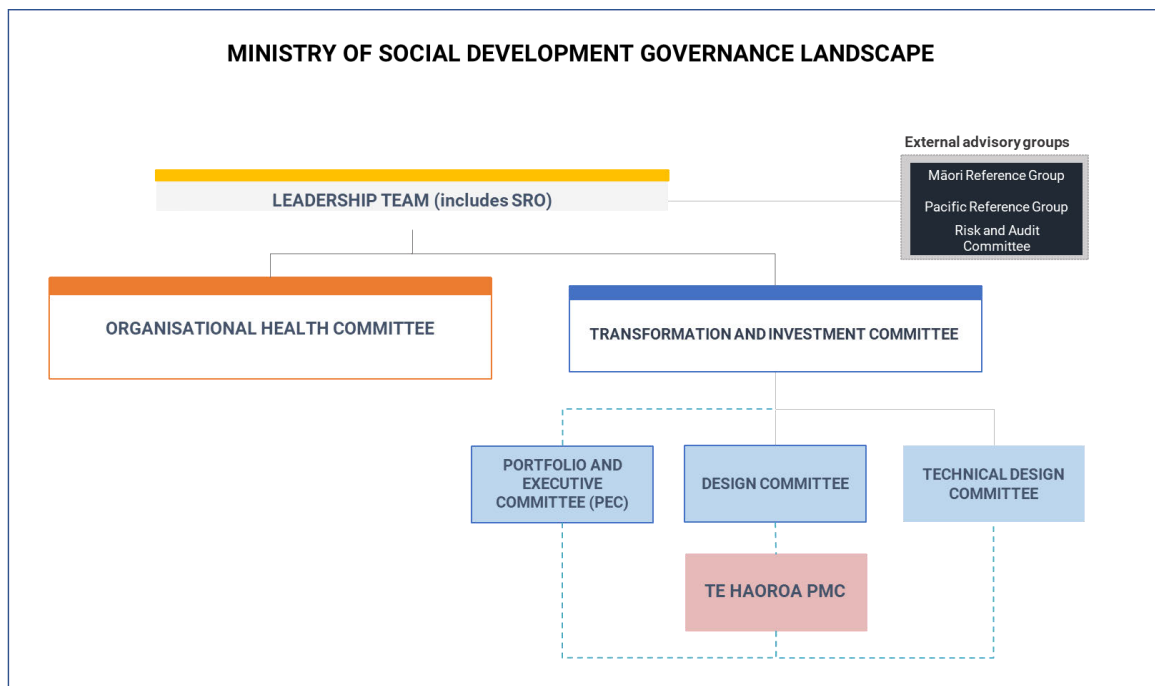
Fig 3: PMC in context of wider governance at MSD.

The Māori Reference Group is an external advisory group that we have met with twice during the development of Te Haoroa. The Māori Reference Group provides us with an opportunity to engage on the requirements for data governance and the platform in order to uphold MSD's commitment to Māori. An outline of the key implications of Te Haoroa for Māori and a timeline of meetings with the Māori Reference Group to date is included in the Annex.

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The programme board currently meets once every month.

Name	Role	Business Unit
Nic Blakeley (Chair)	Deputy Chief Executive, Strategy & Insights	Strategy & Insights
Rob Hodgson	Group General Manager, Insights MSD	Strategy & Insights
Mike Rankin	Operations Manager Data and Information	Strategy & Insights
Tracy Voice	Group General Manager, Systems & Technology	People & Capability
Jason Dwen	General Manager, Data Management and Information Delivery	Service Delivery
Pennie Pearce	General Manager, Information	Organisational Assurance & Communication
Marissa Whight	Policy Manager	Policy
Lorna Bunt	General Manager, Planning & Analysis	Service Delivery
Janet Green	General Manager, Workplace Integrity	Workplace Integrity
Kelvin Watson	External Advisor	External

Programme management & Resourcing

The programme will be resourced by MSD staff, contractors, SAS as our technology partner and a to be determined delivery partner. The key programme leadership roles have been filled.

MSD Staff Resources:

Strategy & Insights -> Data Management and Information Delivery

The majority of the internal resources required to deliver the programme are within our Data Management and Information Delivery (DMaID) team within Strategy and Insights. This team currently:

- maintain data assets in the legacy system (Information Analysis Platform)
- act as an integrator with IT
- enable access to data
- manage incidents for the IAP
- develop and deliver data products for use by internal and inter-agency partners.

Our cost model for Te Haoroa assumes that the DMaID team will continue to develop data products, but using the new technology platform <u>and</u> new, engineering oriented methods rather than 'bespoke point to point'. This new approach to building data products will be led by our delivery partner.

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MSD IT

Our model of operating the data warehouse platform will change considerably. Migrating to a cloud managed service will mean different tasks and activities to ensure integration with source systems and the implementation of security controls within IT. The level of effort will primarily lie in year one of delivery and will be managed as part of MSD's agile delivery methodology.

Other MSD Staff

As we start to develop products on the new platform in earnest (anticipated to be mid 2022), we will require a level of subject matter expertise from other areas of MSD. Principally these will be immediate 'customers' of DMaID outputs. The level of effort required will vary depending on the data product and be managed as part of MSD's agile delivery methodology in Programme Increments.
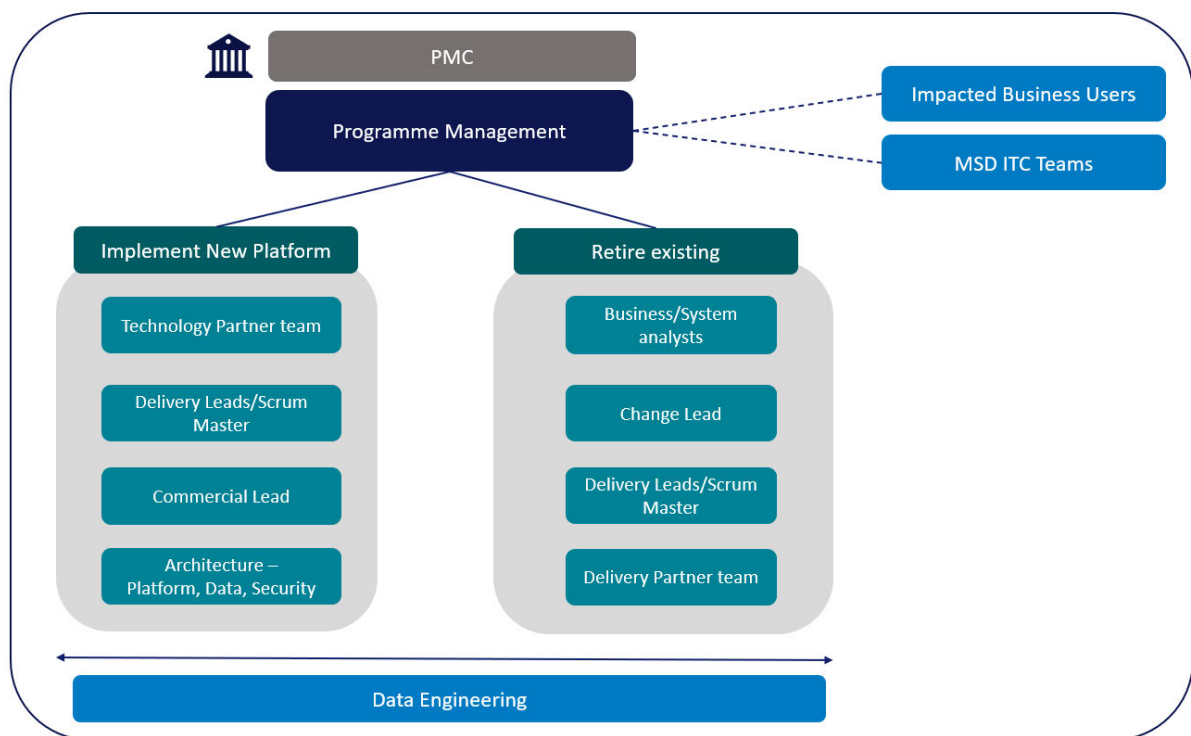
Fig 4: Programme Structure

Supplier management

Supplier management (applicable to both Te Haoroa technology and delivery partners) is the responsibility of the programme management team. Both suppliers will be assessed against a balanced scorecard which tracked performance across several dimensions such as engagement effectiveness, cost effectiveness, and delivery and scope management over the life of the programme. These scorecards will be completed by key stakeholders in MSD (within the programme team) monthly.

Programme assurance

The overall assurance approach for the programme can be summarised as follows:

- We will introduce an agile assurance plan for the implementation phase of the programme. KPMG have been appointed as our external provider for all quality assurance activities, including the development of the assurance plan. This engagement is currently in the mobilisation phase and will be in place by October 2021.
- A core input to this assurance plan will be ensuring alignment with GCDO guidance for programmes of this size and nature. We will continue to engage with GCDO as part of programme reporting and stakeholder management.
- We have factored in team capacity and provisioned budget for conducting assurance activities as part of our planning.
- KPMG will conduct periodical Independent Quality Assurance (IQA) and Technical Quality Assurance (TQA) reviews of programme health, providing confidence to the Governance Committee and other senior stakeholders that the programme is on track to deliver on its commitments. This review will form part of our Treasury reporting.
- KPMG will also provide services to ensure that we evaluate the effectiveness of our Governance Committee.
- As required by Cabinet, this project will report back to Cabinet within 12 months of the in-service date on the actual level of benefits achieved compared with those outlined in the Cabinet approved investment.
- Further, we will commence a post technology implementation review with GCDO in 2024 to ensure that:
  - the new managed service is operating as intended,
  - it remains aligned with Te Pae Tawhiti,
  - any lessons learned that can be applied to future projects or potentially at other agencies,
  - We understand the approach for the way forward post year six,
  - We understand any migration opportunities/approach to a SAS New Zealand based cloud service (anticipating an MS Azure data centre will be online at that point) which could better facilitate data sovereignty requirements.

We will provide annual programme updates for Treasury, ensuring visibility of delivery progress, updated spend and costs, benefits and any material changes to the programme.

Programme reporting:

Programme progress will be reported fortnightly to the Governance Committee. We will use the ten keys reporting framework during the implementation phase.
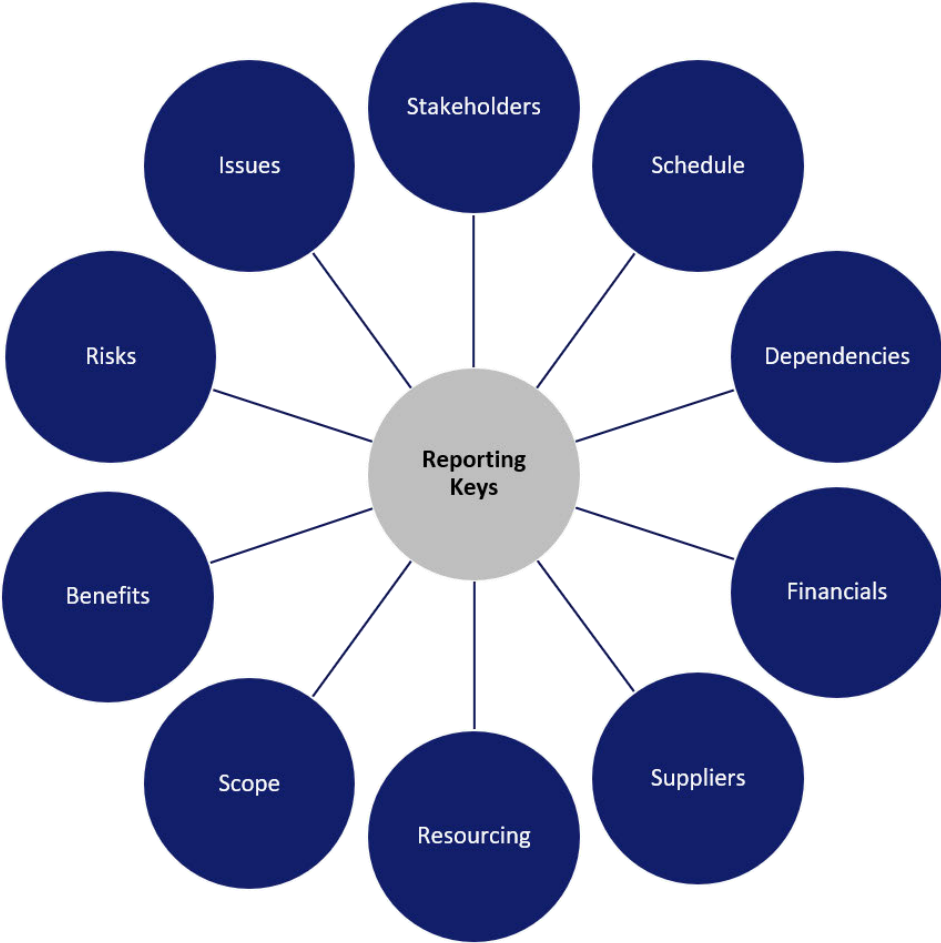
Fig 5: Reporting Keys for Programme Updates

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Programme roadmap & sequencing

Approach

To describe how we will deliver the scope of Te Haoroa, we have developed an abstract view to show our stakeholders 'what is changing' with the advent of Te Haoroa.

At the highest level, we will be 1) introducing a new technology platform and 2) retiring the existing data warehouse.

New technology platform:

The implementation of a new technology platform is largely straightforward and follows a precedent set by other agencies in New Zealand, but we need to ensure that its design will keep our data secure and support our data warehousing needs while being flexible to cater for the future as well.

Decommissioning the Legacy IAP:

Most of the effort required for Te Haoroa will be how we can pragmatically retire the existing IAP platform, without affecting core MSD frontline services. Our data products in some cases are over twenty years old, with little documentation and are not necessarily engineered for efficiencies. As part of migration, we want to address technical debt, discard data products which we don't use and ensure that we rebuild new data products in a sustainable manner. These activities are the key to realising Te Haoroa's agreed benefits.
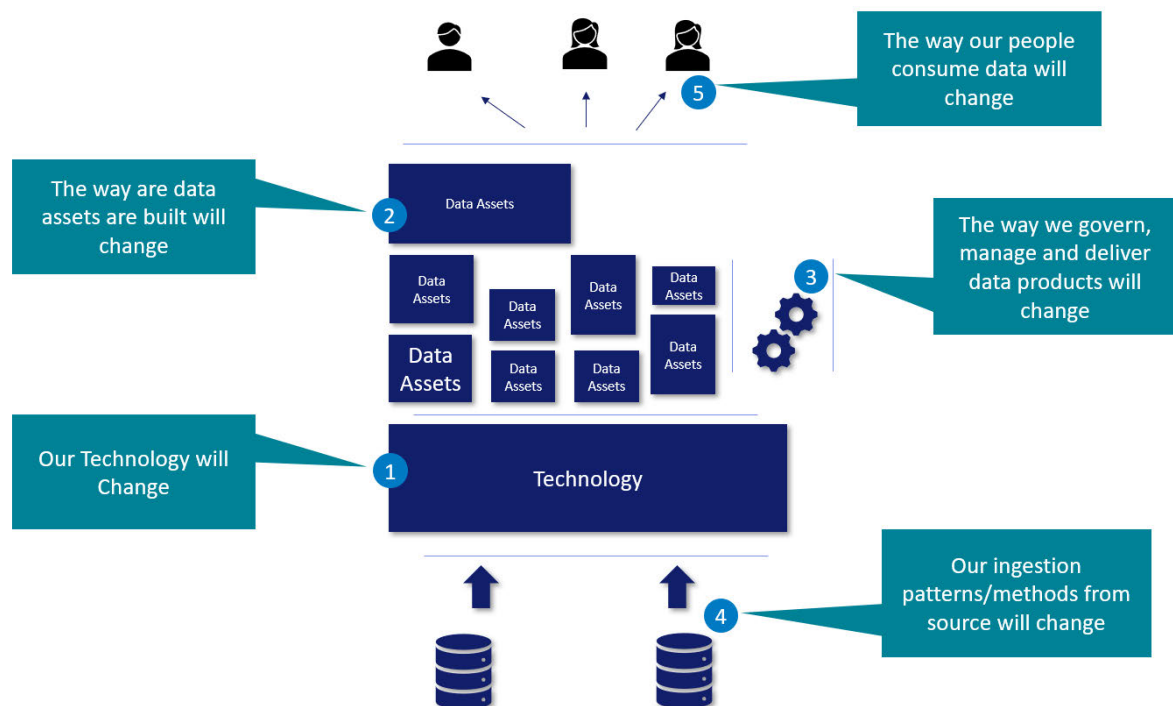

Fig 6: What is changing with Te Haoroa? (See annex 2 for more detail)

Roadmap

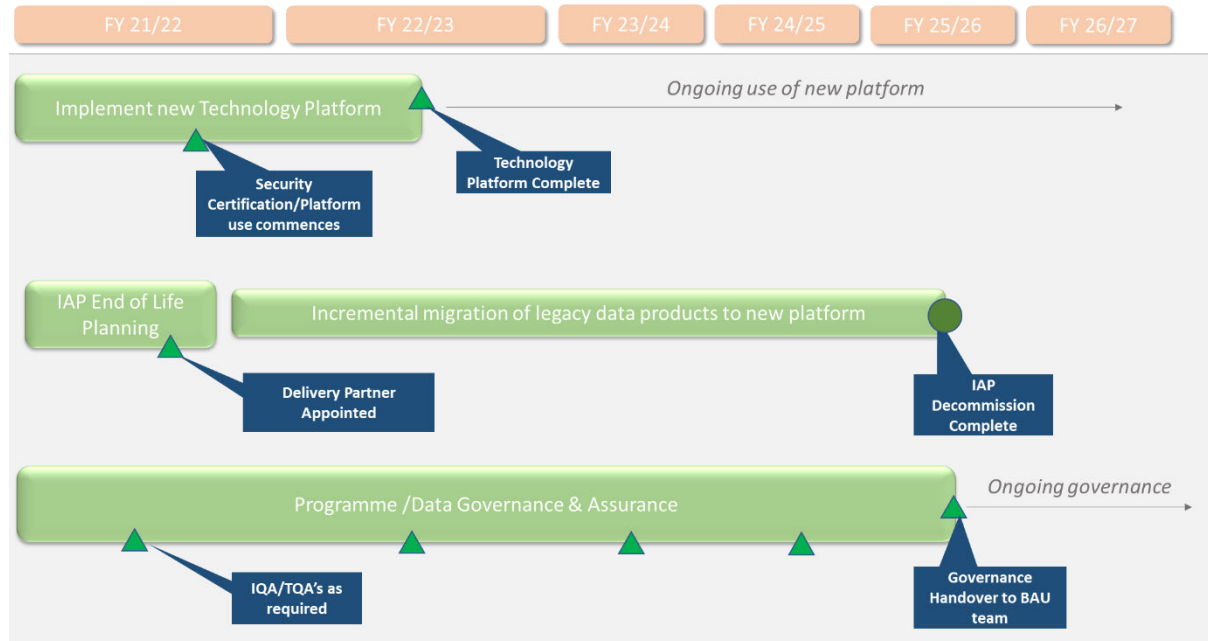The below diagram outlines our six-year delivery timeline.

Fig 7: High Level Schedule

FY 21/22

Technology Platform Implementation

We will start by provisioning our new platform. We have critical milestones such as security certification and accreditation, Privacy Impact assessments, architecture governance approvals and data ingestion/integration patterns to establish before we can start to use the platform to develop data products of business value.

Note on milestones:

We are targeting our first data product rebuild (i.e. item of business value) in 'minimum viable product' mode between April and June 2022 in Figure 8. At this point, our platform will be security certified and accredited, infrastructure and software provisioned in at least one of our technology environments and ready for 'development' use.

We target 'Platform Build Complete' in Figure 7 by June 2022. This milestone means that the operational model is agreed between SAS and MSD and we move (from the supplier's perspective) from 'project' into 'Business-as-usual' mode. All the technology and environments are in place.

We take this approach to ensure that we inform our final operational roles and responsibilities through actual delivery, while being aware that this hosted managed service is new for MSD. This approach has been successful at Inland Revenue, which has a similar data warehouse technology managed service.

Capability Implementation: Developing a pragmatic plan to retire the IAP

There are many ways we can approach the migration of legacy data products from the existing system to the new, for example, by bulk migration, 'scream' tests, user by user and so forth. In order to know where to start, we will carry out a business focused top down analysis (understanding which data products are most critical to deliver MSD's core services) and a technical oriented bottom up analysis (understanding data usage schema by schema, table by

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table, user by user) to guide our triage process, working to the following set of guiding principles:

- We will triage our data products and ensure we do not migrate anything which is not of business value. We will keep a decision register to ensure our product by product migration rationale is recorded and auditable.

- We will not build 'new business'-oriented data products under the scope of this programme. If required, we will seek funding from PEC or Te Pae Tawhiti, (assuming it is approved) to do this.

- We will ensure we deliver a slice of measurable business value on the new platform within the first twelve months of its operation.

- We will re-engineer products in a sustainable, scalable way on the new platform.

- We will create a robust data governance framework to ensure accountability for data products and their use across the organisation and beyond its borders.

Year 1 Te Haoroa outcomes:

| Item	Milestone	Description
1	Security Certification & Accreditation, including Security Risk Assessment Document	All data and platform security risks detailed with appropriate controls based on platform architecture and designs.
2	Privacy Impact Assessments	Ensuring that MSD's privacy authority approves of discrete data sets ingested into the new system.
3	Platform provisioned	A new cloud-based platform, security certified and ready for data analyst use.
4	Detailed migration plan for Year 2	Based on business engagement and technical inventory analysis a pragmatic plan for the first set of data products to be built on the new platform. Including high-level change management approach.
5	Delivery partner appointed	Delivery partner with key personnel embedded (eg release train engineer, data architecture) as part of the wider Te Haoroa programme team.
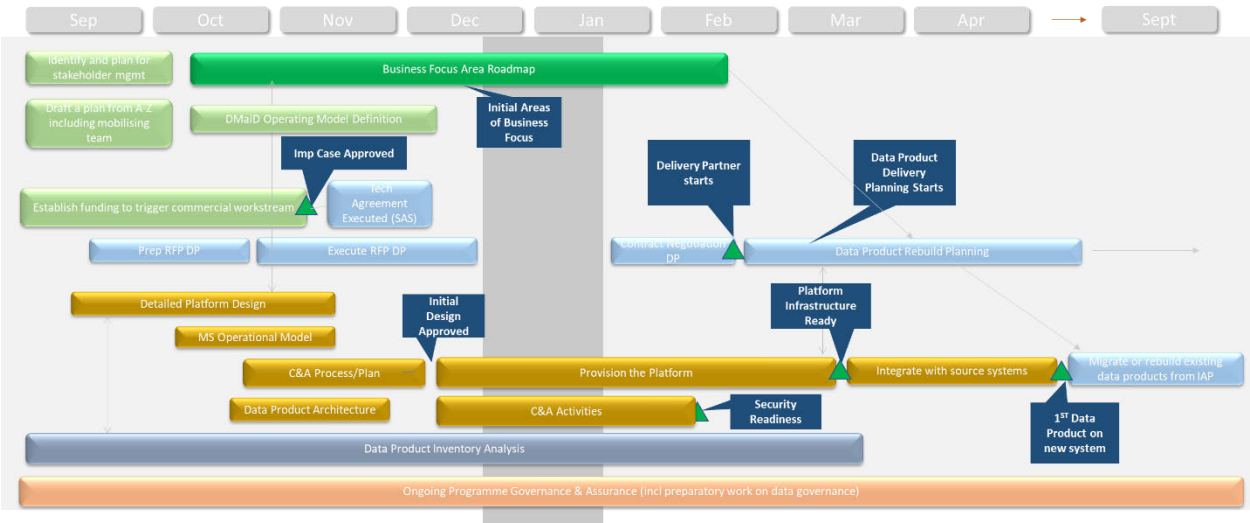
Fig 8: Year 1 Activities & Schedule

FY 22/23 – Focus on capability uplift

Our delivery partner will be selected during year one. This will enable us to expedite the migration and building of data products on the new platform. We will do this by ensuring we are leveraging external experience with the use of such platforms, as well as supplementing our programme/data BAU teams for skills we know we need to keep the current platform in an operable state. The outcomes from year two will be a significant portion of data products built on the new platform (and associated users now exclusively using the new platform) with further refinement of the plan for the migration of the remainder. During the delivery of these data products we will stand up a new data governance structure and data analytics practices.

Year 2 Te Haoroa Outcomes:

Item	Milestone	Description
1	Data products rebuilt on new platform	First set of data products built and consumed from the new data platform.
2	Reduced number of users of IAP	As we shift data products, we will have fewer active users on the IAP.
3	Reduced maintenance, incidents on IAP	As a corollary of above, we will have less incidents on the IAP to manage.
4	Data governance	A refreshed data governance framework will be in operation, reflecting our new data platform and processes.
5	Refreshed delivery and operating model for data products	We will facilitate reusability and ease of maintenance by implementing a refreshed delivery and operating model for data products.
6	Roadmap for data analytics at MSD & alignment with Te Pae Tawhiti	Te Pae Tawhiti will have progressed by 30 June 2023. Assuming it is approved, we will ensure that data capabilities at MSD are in step with strategic direction. We will produce a roadmap for data practices at MSD.
7	Oranga Tamariki de-coupled	Oranga Tamariki will no longer be dependent on MSD for data warehousing capabilities.

Te Haoroa Subsequent Years

Our work and lessons learned during the first two years will inform the plan for the remainder of the programme. We want to exit the existing IAP as quickly as we can but ensure that we uphold IAP business outcomes and build data products on the new platform in a way that is sustainable and scalable.

- Te Pae Tawhiti, assuming it is approved, will likely ramp up activities during this time and these workstreams may have dependencies on the capabilities that Te Haoroa will introduce as well as DMaID (our BAU data team). We have included a conceptual perspective on how Te Haoroa might accelerate and complement Te Pae Tawhiti capabilities in the future.

- New data products enabling new areas of business value may be required. These are out of scope and will require separate funding.

- There will also likely be complex data products to analyse and deconstruct – instances where the existing system, IAP, is one part of an operational business solution. These instances will require enterprise business architecture guidance and be raised as risks as they are identified during the programme. The inventory analysis and triage work we do in the first two years will also inform this.

- A level of support will be required for Oranga Tamariki so that they can safely migrate their data products from the IAP to a new platform.
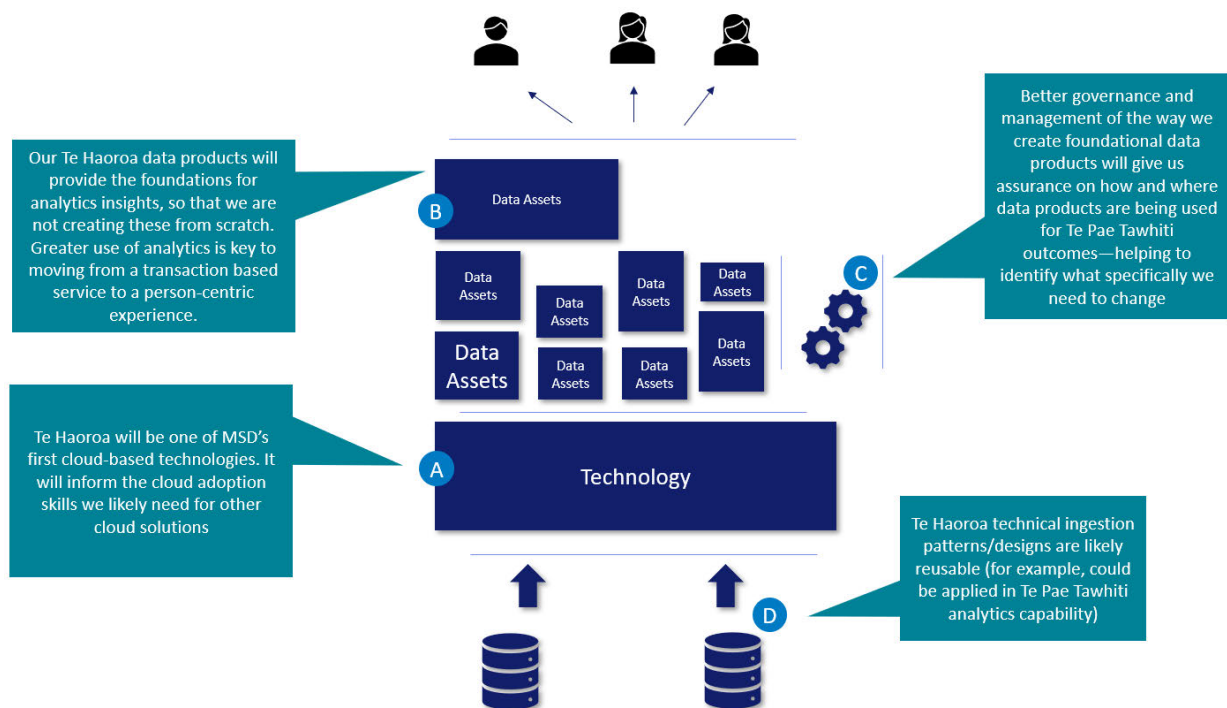
Fig 9: Te Haoroa areas of change

Change Management

We will develop a high-level change management approach during our first year to support and embed changes.

This will include a detailed stakeholder analysis and impact assessment of outlined changes, a bespoke comms and engagement plan, and tailored transition plans for impacted stakeholder groups.

As our data practice matures - reuse of data products, data governance model, cataloguing of products – we will have greater assurance and confidence to make data driven front line decisions. This will be a key enabler of 'self-service' data analytics, and a change in the level of change impact across business units. For example, understanding of what a data product is comprised of among our non-data warehouse users will increase, which will mean more use of data products that emanate from the new data warehouse. As our appetite to become more 'data literate' across the organisation increases, the change level of impact will move to 'High'.

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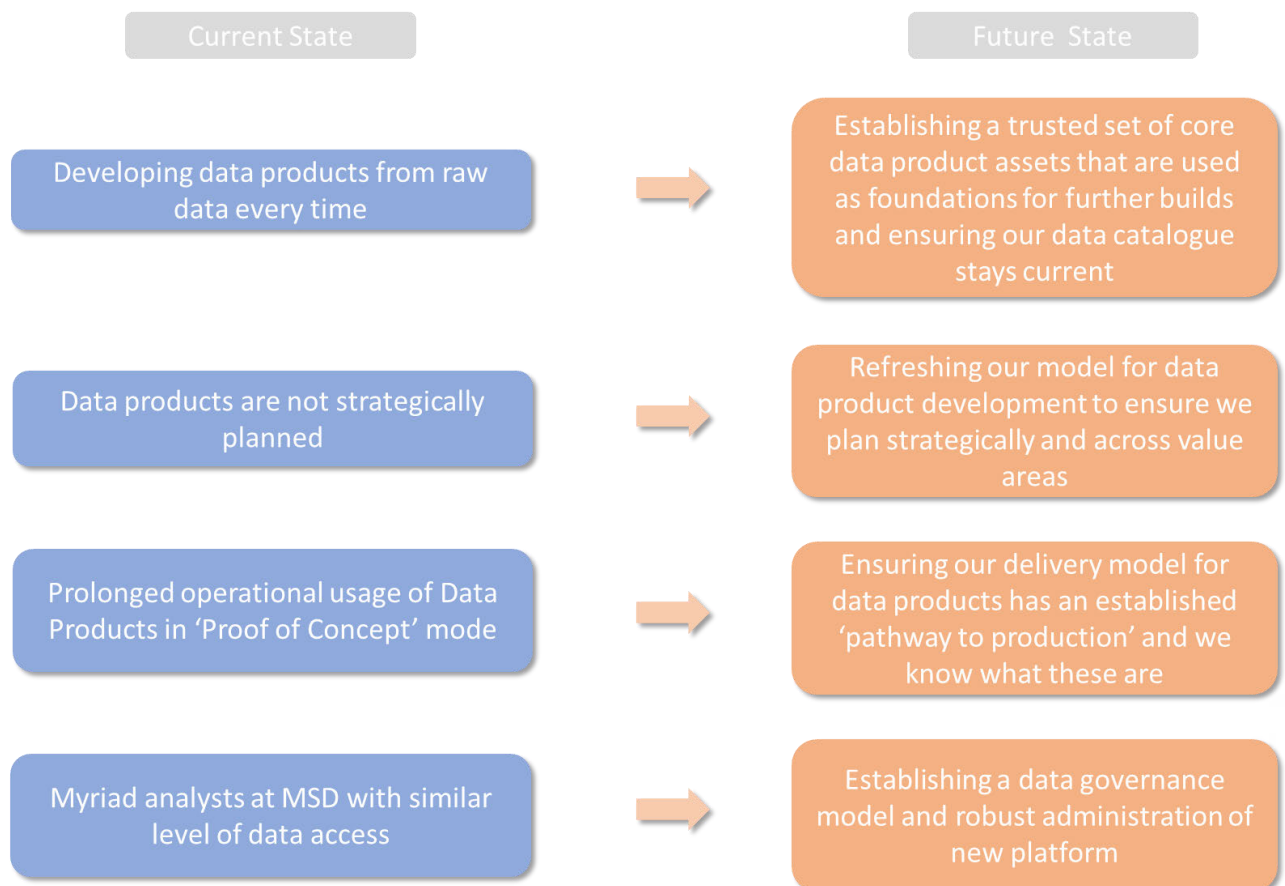| Group	Initial Level of Impact	Rationale	When Te Haoroa Change will impact
MSD Customers	Low	Te Haoroa will introduce capabilities which will make MSD's frontline services better. Specific plans for data products will dictate the level of change impact required for customers.	FY 24
MSD Service Delivery (non-data warehouse users) Eg Centralised Services Processing Units, Housing Processing Unit, Specialised Processing Services, Youth Service Support Unit, Studylink, Income Review.	Low	Per above.	FY 24
MSD Service Delivery & other business units e.g. Planning and Analysis, Intelligence Unit (DW users outside of Strategy & Insights).	High	The delivery model for data practices at MSD will change. There will be a focus on reuse and likely less need for data analysts to access raw data.	FY 23
MSD Data Analysts (Strategy & Insights)	Very High	See Below. The delivery model for data practices at MSD will change. There will be a focus on reuse and less need for data analysts to access raw data. We will likely start change management activities with this group.	FY 22
MSD ITC Operations & Architecture	Very High	MSD will consume data technologies as a managed service, a material change from the existing mode of operation. Change management activities will be required here.	FY 22

Oranga Tamariki	Very High	Oranga Tamariki will no longer depend on MSD to provide data analytics technology. Support will be required from Te Haoroa to ensure this de-coupling.	FY 23
Other agency partners	High	Other agencies, data shares etc. will be impacted by Te Haoroa. Change impact will depend on specific data products.	FY 24

MSD Data Analysts 'Very High' – The shifts we need to make:

There will be strong focus on change management throughout the programme. One of the 'Very High' impacted cohorts will be our current IAP users, which number over two hundred.

Data products have grown organically at MSD, as well as the methods we employ to create them on the IAP. Our delivery partner will be instrumental in driving a change in decades old habits and behaviours and bringing fresh perspective and new ideas. We want to ensure that we re-build our data products in a way that ensures they are flexible, reusable and easy to maintain. Our new platform comes with lots of new functionality to allow us to do this. Alongside this, data engineering as a capability has matured. We will benefit from outside expertise (via our delivery partner) as we implement this step change.

Our change management focus will look to address the following behavioural shifts (this list is not exhaustive and will be refined as the programme progresses):

Current State		Future State
Developing data products from raw data every time	→	Establishing a trusted set of core data product assets that are used as foundations for further builds and ensuring our data catalogue stays current
Data products are not strategically planned	→	Refreshing our model for data product development to ensure we plan strategically and across value areas
Prolonged operational usage of Data Products in 'Proof of Concept' mode	→	Ensuring our delivery model for data products has an established 'pathway to production' and we know what these are
Myriad analysts at MSD with similar level of data access	→	Establishing a data governance model and robust administration of new platform

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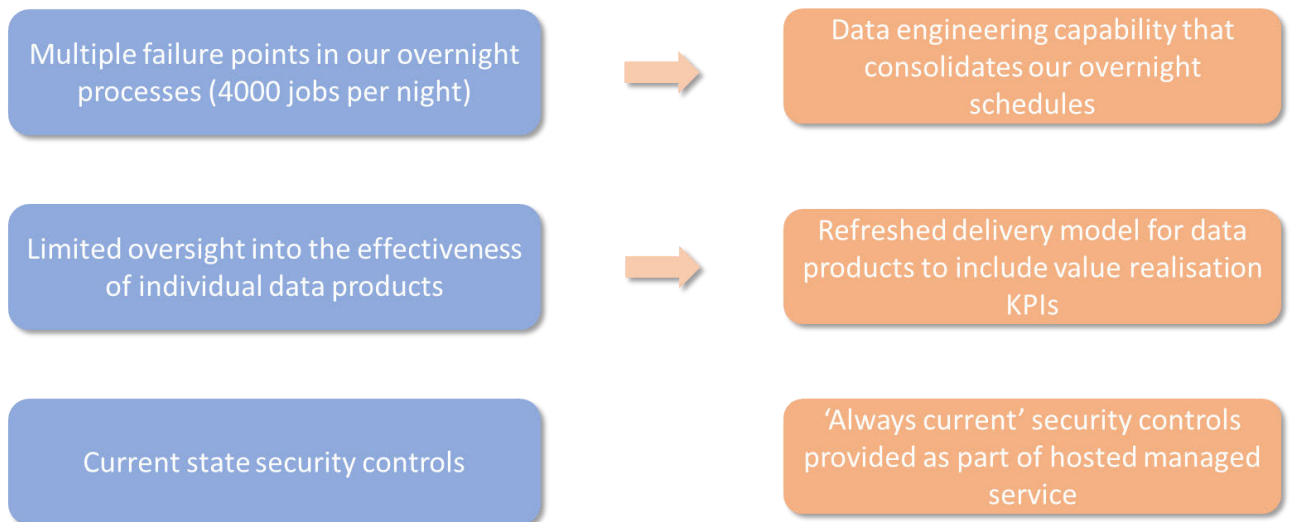| Multiple failure points in our overnight processes (4000 jobs per night) | → | Data engineering capability that consolidates our overnight schedules |
| Limited oversight into the effectiveness of individual data products | → | Refreshed delivery model for data products to include value realisation KPIs |
| Current state security controls | | 'Always current' security controls provided as part of hosted managed service |

Fig 10: Change Management shifts

Maturity Model

We will also develop a maturity model for data product development and consumption as part of our change management activities.

An indicative model is shown below, this will be refined as part of the programme as we set specific measures for our maturity over time:
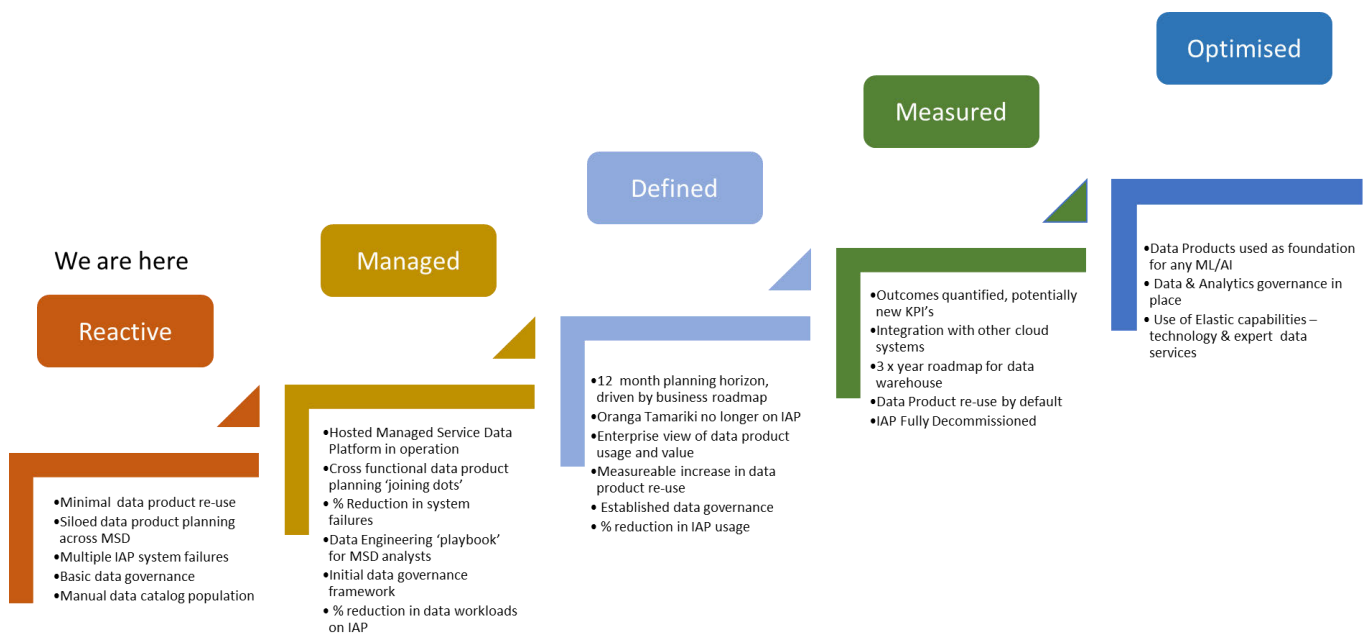
We are here

Reactive
- Minimal data product re-use
- Siloed data product planning across MSD
- Multiple IAP system failures
- Basic data governance
- Manual data catalog population

Managed
- Hosted Managed Service Data Platform in operation
- Cross functional data product planning 'joining dots'
- % Reduction in system failures
- Data Engineering 'playbook' for MSD analysts
- Initial data governance framework
- % reduction in data workloads on IAP

Defined
- 12 month planning horizon, driven by business roadmap
- Oranga Tamariki no longer on IAP
- Enterprise view of data product usage and value
- Measureable increase in data product re-use
- Established data governance
- % reduction in IAP usage

Measured
- Outcomes quantified, potentially new KPI's
- Integration with other cloud systems
- 3 x year roadmap for data warehouse
- Data Product re-use by default
- IAP Fully Decommissioned

Optimised
- Data Products used as foundation for any ML/AI
- Data & Analytics governance in place
- Use of Elastic capabilities – technology & expert data services

Fig 11: Data Practice Maturity Model

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Management of delivery risks

Considerable emphasis will be placed on managing and mitigating risks and issues over the course of delivery. The major areas of risk that decision makers should be aware of are:

- expectations may change with the advent of other strategic work at MSD; this will be mitigated by on-going engagement to ensure expectations are understood
- resources needed may not be available; this will be mitigated by the appointment of a delivery partner and effective recruitment and retention
- staff may not embrace change as we shift to focus on the generation of reusable data products as outlined above; this will be mitigated through proactive change management and communication
- uncertainty on the scale and nature of 'complex' data products as part of our retirement of the IAP; this will be mitigated by regular reviews, active scope management and check-in points with the Governance Committee
- uncertainty on the level of support required for Oranga Tamariki. Their platform and capability delivery will likely run in parallel to Te Haoroa but is a key dependency for MSD to retire the IAP; this will be mitigated by regular engagement with Oranga Tamariki and the definition of specific dependency points and timings.

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Annex 1: Documents supporting this business case

The Senior Responsible Owner and Business Owner of the agency attest that:

- the planning and control documents summarised and referenced in this Implementation Business Case (listed below) are in place or substantially under development and will be the basis for management of this (project/tranche).

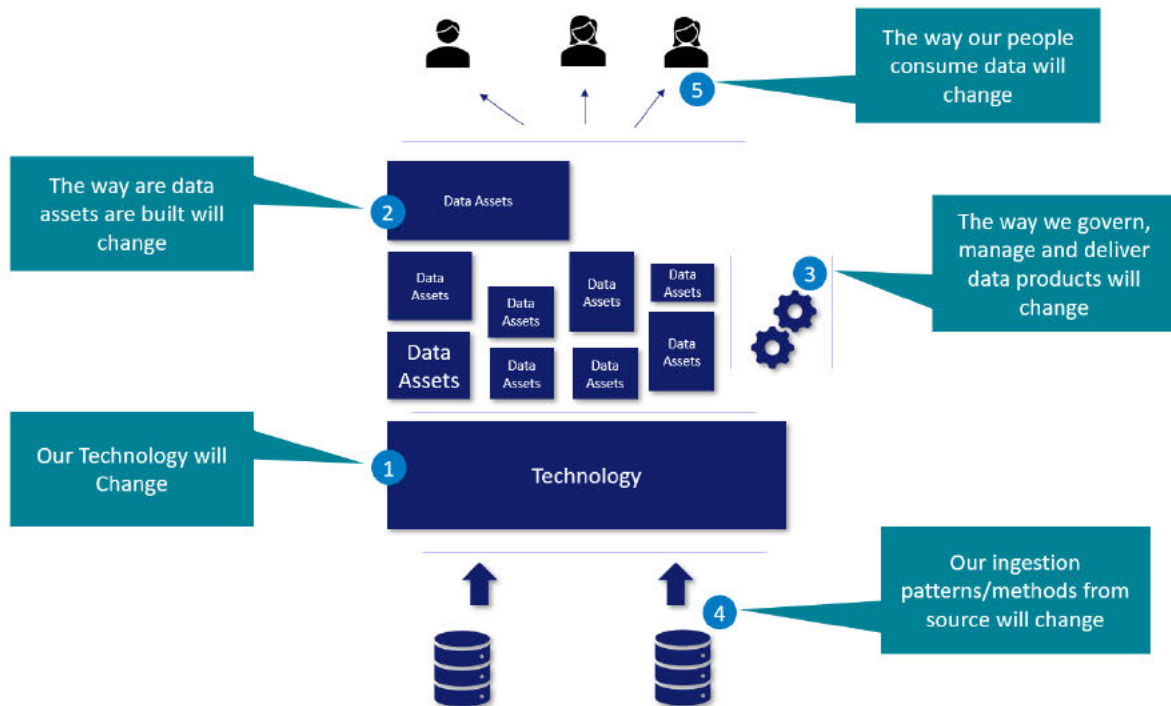- the agency has project management structures, plans and processes in place to ensure successful delivery.

These documents are available to decision makers, Monitoring Agencies, Central Agencies and Functional Leads for review.

Contact Te_Haoroa@msd.govt.nz

#	Title	Version	Date	Comment
1	Te Haoroa Business Case 19 Summary – update for GCDO	1	8 June 2021	
2	Technology Solution Evaluation	1	10 December 2020	
3	Programme Management Committee Terms of Reference	2	3 November 2020	
4	Third draw down Memo	n/a	21 June 2021	Noting the de-coupling of Oranga Tamariki's data warehouse requirements
5	Preventing Failure of critical Services to clients Programme Business Case	1	8 February 2019	
6	BC19 Drawdown Memo #2	1	20 July 2020	

Annex 2: Te Haoroa Change Breakdown

The below table outlines the change-related activities required to implement the major components of Te Haoroa:

CHANGE	Activities that will require Change Management
1) Technology	• New Technology Partner (SAS) onboarded. • New operating model to support managed service platform. • Training to upskill staff in new technology. • Collateral updated – user guides, service and data catalogues, training materials, FAQ's etc • Privacy/security/storage policies to be updated. • People structure updated to reflect managed service • Updated Incident Management Process
2) Data Products (How Data Products are built)	• Triage process to determine which data products to Retire, Reuse or Recreate to be determined. • Engagement with key impacted stakeholder groups to understand how products are currently utilised to inform triage process and identify gaps between current to future state. • Decommissioning approach and timeline of data products to be determined.

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3) Data Product Delivery (The way we govern, manage and deliver data products will change)	• Delivery Partner Integration • New data practices, processes, principles, policies, structure, business change & delivery services to be determined • Transition plans to be created to transition data product delivery teams over to new ways of working • Supporting collateral –knowledge base, service catalogue, IAP data catalogue, intranet updates, training materials created, including LMS module etc. • SME's/Consumers of Data Products trained and allocated to lead and embed changes in their business groups • Data governance model established, including Māori data partnership/collaboration process to ensure we set up and operate the right framework for governing data and data products.
4) Data Source Ingestion patterns/methods	• Ingestion processes to be refreshed, re-engineered, documented and communicated to impacted stakeholders. • Any manual data ingestion processes will change • Training, Incident Management process updates
5) People Process Change (way our people consume data will change)	• Training session and training materials developed and led. • SME's appointed to embed changes within relevant business groups and provide 'go to' person. • Leader led comms to promote adoption of change in ways of working including stand ups, Doogle, MSD announcements etc • Incentive provided for people to change ie key messaging as to WHY behavioural change towards data usage is required. Regular, timely comms to keep stakeholders informed and 'bought in'. • Change champion network created to advocate change to internal stakeholder groups and promote adoption and ownership of new ways of working
Data Warehouse Decommissioning	• Phased change approach to be determined (resource augmentation from external delivery partner may be used to maintain existing IAP and data products in parallel) • Stakeholder groups to transition first-last identified and agreed as part of transition planning • Internal reference group/forum set up to understand decommissioning impacts for key stakeholder

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	groups. Group members can also advocate change, filter through key messages to teams and promote adoption of new systems and ways of working. • Governance group established to help determine key decommissioning decisions; including impacts and communication channels with impacted external stakeholders.
External party change	• The way our key external agencies interact with our data warehouse and consume data will change. (Oranga Tamariki, IRD, HUD etc) • Communication channels set up to create regular, timely feedback loops and feel part of change and well informed on journey. • Process changes for how to acquire data, delegations, access, frequency of reporting to be determined.
Oranga Tamariki Decoupling	• Tailored transition plan created to support a smooth decoupling transition • Engagement with Oranga Tamariki on their Data Product migration approach and integration points. • Feedback loops to best established for regular, timely input and feedback into transition plan

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