

Enigma Solutions Limited



Case Study:

New Zealand's Ministry of Health's
Equipment Modification Services (EMS)
'The Tool'

7 August 2015

Table of contents

Glossary of Terms	2
Section A: Referees	1
1. Referee: Phil Wysocki (MoH / EMS National Programme)	1
Section B: Case Studies – Enigma’s successful delivery	3
1. Track record and experience	3
1.1 Previous experience	3
1.1.1 Previous experience	3
1.1.2 Project Initiation Phase	4
1.1.3 Project Planning Phase	4
1.1.4 Project Execution Phase	5
1.1.5 Project Closure Phase	6
2. End to end programme delivery – Case Study: EMS	7
2.1 EMS - Stakeholders	8
2.2 EMS - Programme structure / approach	8
2.3 EMS - Infrastructure (assessment and provision)	8
2.4 EMS – Infrastructure expansion to connect to third party vendors.	9
2.5 EMS - Customisation	9
2.6 EMS - Integration	10
2.6.1 Integration Overview	10
2.6.2 Integration with: Enable NZ	10
2.6.3 Integration with: Kineo	10
2.6.4 Integration with: Ministry of Health, Health Identity Team (eSAM)	11
2.6.5 Integration with: accessible with Healthlink; Enable NZ with B2BE	11
2.6.6 Integration with: accessible and Enable NZ	11
2.6.7 Integration with the Master NHI Interface	11
2.7 EMS - Deployment	12
2.8 EMS - Reporting - OI	12
2.9 EMS - Support structure	13
2.10 EMS - Further enhancements and adjustments	14
3. Topological System / Platform diagram	15
Section C: Reference, Phil Wysocki - Ministry of Health	16

Glossary of Terms

The following terms are used with the described context within this document.

Term	Description
accessible	A NZ provider of modification services under the national disability services EMS programme
B2BE	A third party software vendor who additionally operated under the EMS programme
CAT	Customer Acceptance Testing
CDA	Clinical Document Architecture
CDR	Clinical Data Repository
CH	An abbreviation for Connected Health
ColdFusion	A web application programming language and service, sold by Adobe.
Concepts	Concepts are the individual data points collected from a population of patients.
Connected Health	A network of Health Users, provided within New Zealand, managed by the NHITB
Data Warehouse	A separate database instance often used to house data for reporting purposes, commonly holds data in a different (transformed) format to make it more directly suitable for reporting and further use
DMZ	Demilitarised zone within a network, commonly internet or external network facing, managed portions of which are deliberately made accessible to external users
EMS	Equipment Modification Service (Enigma held, SaaS contract from MoH)
enable	A NZ provider of modification services under the national disability services EMS programme
eNHI	Encrypted NHI
Enigma	Enigma Solutions Limited
ERMS	Enigma Referral Management System, the base platform for Enigma's referral systems, built on Predict
eSAM	The online address lookup and verification service, provided to health users by the MoH
FHIR	Fast Healthcare Interoperability Resources, a new specification based on emerging industry approaches but informed by years of lessons around requirements, successes and challenges gained through defining and implementing HL7 standards
FTE	Full time equivalent
HealthLink	A third party software vendor who additionally delivered serviced under the EMS programme
HIPC	Health Information Privacy Code
HL7	Health Level 7 – a set of international standards for transfer of clinical and administrative data

Term	Description
	between software applications used by various healthcare providers
HTML	Hyper Text Mark-up Language
HTTPS	Hyper Text Transfer Protocol (Secure)
IaaS	Infrastructure as a Service
MoH	Ministry of Health
MSSQL	Microsoft SQL Server
NAT	Network address translation - a networking mechanism to translate the address used within network packets to route, set routing response information as needed.
NHI	National Health Index - a patient identifier used through NZ to uniquely identify each patient
ORM	Object relational mapping – a programming technique for converting data between incompatible type systems
PCRMS	Enigma's Primary Care Referral Management System, applied to mental health services (and others), in Northland.
PIA	Privacy Impact Assessment
POCTConnect	An Enigma solution to join Point of Care testing hardware to Enigma's other software systems
Predict	A software platform, written by, and owned by Enigma
SaaS	Software as a Service (see https://en.wikipedia.org/wiki/Software_as_a_service) is a <i>software licensing and delivery model in which software is licensed on a subscription basis and is centrally hosted ... SaaS is typically accessed by users using a thin client via a web browser.</i>
SDLC	Software development life cycle
SLA	Service Level Agreement - Often outlines the support commitment offered by Enigma
SME	Small, medium enterprise
SQL	Standard Query Language, also sometimes refers to a type of Database
SSL	Secure Sockets Layer, a means of encrypting web transmissions between two points
TOB	Terms of business
UAT	User Acceptance Testing

Section A: Referees

Our Referee covers our existing and ongoing Ministry national programme. The Ministry programme has been delivered on time, to contracted requirements, in a collaborative manner with all stakeholders. The programme is a significant Ministry national programme which over time extends to multi-million dollar commitments.

1. Referee: Phil Wysocki (MoH / EMS National Programme)

Name of organisation:	Ministry of Health
Name of referee:	Phil Wysocki Manager, Service Access Team, Disability Support Services
Relevance of this referee:	
<p>Phil Wysocki is the business owner within the Ministry of Health for the Equipment Modification Service (EMS), a National programme designed to manage requests for funding from the Ministry of Health to deliver modification services for those with disabilities.</p> <p>The web based platform, 'The Tool' is used by a nationwide set of assessors who lodge applications and requests for funding. The Tool performs the role of pre-qualifying applications through embedded scoring mechanisms, filtering out those with less ability to benefit. Assessment areas include impact on quality of life and the potential benefit of the modification, funding / entry criteria.</p> <p>If approved, The Tool then links in with the National Providers of modification services and tracks the delivery of these services for the referring assessor.</p> <p>The key aims for The Tool are to provide standardised, consistent National access to finding and to deliver a prioritisation mechanism, capable of managing limited budgets; to streamline the application process once deemed eligible and to provide greater tracking and visibility of services delivered under the programme.</p> <p>This product has been deployed nationally and is mandated for all such cases. The embedded business rules have been refined iteratively over time to best meet the needs of the programme, as have the forms and workflow within the forms and data capture in response to concerns over some assessors attempting to 'game' the prioritisation process.</p> <p>This programme is based on a multi-year Ministry of Health contract and has been delivered by Enigma, involving collaboration with other vendors who operate Provider solutions. Enigma has delivered multiple points of integration within this programme including Single Sign On services to related, external web based systems, data movement and enrolment within the Provider systems, eSAM integration and NHI integration with the MoH.</p> <p>This successfully delivered programme illustrates experience in these key areas:</p> <ul style="list-style-type: none"> - Successful programme management. - IT infrastructure suitable and capable of providing hosted SaaS to NZ Health Providers (EMS Assessors) via Connected Health and Consumer based internet connectivity, jointly. - Successful IT integration with National systems (Ministry of Health – eSAM / NHI). - Successful IT integration and collaboration with third party vendors (B2BE, HealthLink). - Near real-time national Ministry reporting capability, including financial rolling cost and monitoring across all cost centres (enabling immediate Ministry action if required). - Successful project and change management to implement alterations / customisations to an 	

<p>existing platform to better fit the exact requirements.</p> <ul style="list-style-type: none"> - Successful nationwide implementation, training and deployment. - Successful account management and support structures. - An ability to negotiate and contract with the Ministry of Health for a similar scale programme / solution. - Collaborative working, with all stakeholders to plan future phases of work and programme development. 	
<p>A copy of Phil Wysocki's letter confirming Enigma's performance under contract is included at [Section C: - Reference, Phil Wysocki - Ministry of Health]</p>	
Address:	<p>Service Access Disability Support Services National Services Purchasing National Health Board Ministry of Health</p>
Telephone:	<p>DDI: 04 816 4336 Mobile: 021 824 192 Fax: 04 496 2050</p>
Email:	<p>Phil_Wysocki@moh.govt.nz</p>
Goods / Services provided:	
<p>Development, deployment (including training services and roll-out management), ongoing hosting, support and product maintenance of a national, web based tool for the management, and lodgement of applications for funding relating to the delivery of equipment modification services; a connected system (through the chain, including private sector supplier stakeholders) to prioritise requests for assistance, and to channel approved applications on to the service provider groups. Services delivered under a multi-year contract to the Ministry of Health.</p>	
Dates when provided:	<p>Contract services commenced June 2014 – currently contracted for 2yrs, with right of renewal for 3 years if exercised by Ministry.</p>

Section B: Case Study – Enigma’s successful delivery

1. Track record and experience

1.1 Previous experience

1.1.1 Previous experience

Enigma delivers software modification, development, and customisation as well as full hosting services and support (covering both implementation and on-going technical support services). Enigma’s skillset includes solution architecture, software development, system administration, customer services, project management, business analysis, sales, account management, administration and management. This balance of skills enables Enigma to deliver all aspects of the Software Development Life Cycle (SDLC) in-house.



To specifically address Enigma’s project management experience, Enigma has a proven track record of managing and delivering Public Health Programmes to national level, using a standard and well proven workflow for its modification, development and customisation projects. Enigma uses the Project Management software “Clarizen” for project tracking and management - see <http://www.clarizen.com>



Case Studies 1 and 2 below (current Ministry national contracts) provide specific examples of how this was followed successfully for both programmes. Before the case studies however, here are some background details of Enigma’s underlying project management processes.

1.1.2 Project Initiation Phase

Covers:

- Set up of the project
 - Creation of initial project documentation
 - Set up of the project within the Clarizen Project Management system
 - Identification of stakeholders, their roles and influences
 - Review of customer documentation eg requirements
 - Kick off meeting with all Stakeholders

When kicking off a project, Enigma’s Project Manager will prepare the baseline project documentation which would include the Project Initiation Document, a high level project plan, issue/risk logs etc. Following this, Enigma will meet with the key stakeholders for a kick-off meeting. This meeting is invaluable as it is often the first opportunity to meet the project team who they will be working with over the following few weeks.

This is also an opportunity for Enigma to further understand and confirm who the key stakeholders are - their roles in the project; their key requirements; their priorities and their concerns and who the influencers are. It provides an opportunity for Enigma to raise any **questions on the customer’s requirements; clarify communication channels; roles and responsibilities for both Enigma and the stakeholders. Timelines for delivery will be reviewed and the resources needed from the customer’s perspective will be discussed and agreed.** A clear understanding on the change control process will be discussed.

1.1.3 Project Planning Phase

Covers:

- Detailed project planning
 - Creation of a detailed project plan (draft project plan included in this RFP response)
 - Creation of a detailed implementation and training plan
- Confirming understanding of the requirements for the Registry
 - Confirming the key objectives
 - Creation of a functional and/or technical specification
 - Approval of the functional specification

Prior to the kick-off meeting (the timeframe would depend on the size of the project and would typically range from 1 week – 2-3 weeks), the customer will have provided their final, or near final requirements. Enigma will have reviewed these requirements and will typically have started to draft a functional specification based on these requirements, whilst collaborating with the customer over any details which require further explanation from the customer.

The functional specification is where Enigma describes how the solution will function once built. This is a key process as it ensures that Enigma clearly understands the requirements correctly and shows the customer how the solution will handle the requirement. The customer reviews the specification to ensure that they are satisfied with the solution described, or they may have other suggestions which are discussed.

For example:

Requirement: *Only one record per patient can be entered into the Registry*

Functional Specification: The user will enter the NHI for the patient. The system will perform an automatic search on the NHI to determine if the patient already exists.

- If the patient already exists, the record will be opened automatically
- If the patient does not already exist, a blank record will be opened

Depending on the project, there may be a need for a technical specification which as the name suggests, includes very specific technical details. An example of this is where Enigma was working with the EMS Provider, *accessible* (See [Section B:2 - End to end programme delivery – Case Study: EMS] below). One requirement from this project was to include single sign-on integration between the systems. It was therefore necessary for a technical specification to be created, which both Enigma and *accessible* were able to work with. Enigma had to ensure that the format of the data packages sent through to *accessible* were in exactly the format that *accessible* was expecting. Enigma created a specification based on *its* needs which *accessible* worked with and vice versa, for Enigma to work with.

Enigma’s Project Management process includes bringing the Solution Architect and/or Lead Developer to the kick-off meeting and to regular update meetings with the customer where practical. This has received favourable feedback from a customer that this greatly aids the discussion at this meeting, especially related to the questions which arise regularly such as “Ideally it would be great if the system could do X”. This also ensures that any technical requirements are understood at the time rather than translated later by the Project Manager, which reduces the risk or misinterpretation of the requirements.

For all projects that Enigma is engaged to deliver, using their business analysis expertise, they will **collaborate with the customer on the most appropriate solution to meet the customer’s requirements.** This covers two areas:

- The usability of the proposed solution: would this workflow make sense to a user; is it logical; does it flow well; does it minimise key strokes?
- **The underlying architecture of the proposed solution: does it fit within Enigma’s platform; does it meet security or privacy standards; is it robust; will it affect performance; is there a safer/faster/more secure way to deliver this?**

This information is then captured in the functional and/or technical specifications.

The Project Manager facilitates approval of the specifications by the appropriate parties and this forms a **baseline for the delivery.** Enigma’s experience has found that with functional specifications, as the solution delivery progresses, slight changes to the design will arise. This typically occurs once something has been built and is being tested or is being built according to the specification, and it becomes clear that a more suitable solution could or should be considered.

As part of this project planning phase, the Project Manager would collaborate with the customer to understand the training and documentation requirements for the project, to confirm that the requirements are as was agreed during contracting, or whether change control is required. The training and documentation requirements vary from project to project, from a simple user guide, to group training sessions run remotely using remote meeting technology or video conferences, to physical attendance at a single or multiple training sessions.

After the kick-off meeting, the Project Manager will then update and distribute the project documentation. The Project Manager will continue to update and distribute versions of documentation as appropriate throughout the lifecycle of the project. Regular status reports are provided to the customer - Enigma has found that status updates every two weeks seems to work well for customers. For some bigger projects, such as the Breast Cancer Registry, weekly or every two weekly teleconferences will also be held between **Enigma’s project team and the customer.**

1.1.4 *Project Execution Phase*

Covers:

- Creation of the solution:
 - Existing product base to start from
 - Specific project specific components
 - Integrations as required
 - Reports as required

- Data extract if required
- Hosting infrastructure
- Data migration if required
- Internal Testing
 - Creation of identified use cases
 - Creation of the internal acceptance test plan
 - Conduct of the end to end tests
 - Address any issues and retest
 - Handover to the Stakeholders for Customer Acceptance Testing
 - Addressing of any feedback
- Implementation:
 - User documentation
 - User training if required
 - User setup
 - Internal Enigma training ie for Customer Services
- Deployment:
 - Deployment of solution into a production environment
 - Hosting
 - Provision of tier 2 technical support
 - Change management

The Project Execution Phase is where Enigma creates the solution and delivers it into the production environment and the customer support and maintenance part of the project comes into play. The Project Manager collaborates with the Stakeholders throughout this process, with regular meetings / teleconferences; status update reports; clarifications and updates on actions from both Enigma and the customer’s perspective. **The Project Manager will regularly review progress with the internal Enigma team**, to ensure that tasks and activities are running according to the project plan. The Issue and Risk Registers, created during the initiation phase of the project, are reviewed and updated regularly. Any new issues arising during the course of the project are raised with the Customer and followed through to a satisfactory resolution.

The cost of making simple minor changes during this process is often carried by Enigma as these types of **‘tweaks’ are generally expected**. However, should any larger changes be requested during the project, a change control process will be invoked, which may incur additional costs. The customer would document the changes that are requested and Enigma would perform a scoping exercise, where appropriate resources will review the changes requested, perform analysis per the points listed previously with reference to usability and architecture and would provide the scoping details to the Project Manager. The Project Manager would then create the appropriate change request and provide it to the customer, whose decision it is to accept or reject the change request. If accepted, a mini round of system changes, internal testing, documentation updates and any other requirements as detailed in the change request are completed.

The training and user documentation will be written during the project execution phase of the project, with the training taking place during this phase, ideally within a short time prior to go-live.

1.1.5 *Project Closure Phase*

Covers:

- Finalise the documentation
 - Update all test results
 - **Issue ‘Go-live’ version of the functional and/or technical specifications**
 - Update and close the issue and risk registries
- Customer Support
 - Service Level Agreement activated
- Post project review

Once the project has been implemented and is live in production, the Project Manager would complete any final documentation and ensure that everything is filed appropriately on Enigma’s internal network. Any generally useful information would be added to Enigma’s WIKI, where it can be accessed easily by Enigma staff as needed.

As Enigma is an SME, once a project has been deployed to production, the Project Manager then fulfils more of an Account Manager for the customer. They will continue to be a point of contact for the customer, should the customer want to discuss any changes to the system, or have additional training provided etc. The Project Manager has visibility of all tickets logged through the Customer Support system and works closely **with the Customer Services Manager, to identify any ‘niggles’ that may arise in the early days of the system** being in a production environment. The Project Manager would continue to collaborate with the customer on items that perhaps arise on a regular basis, as it may be that there are some ‘quick wins’ that can be made to reduce the impact on support, thus reducing the hours used under the SLA.

An example of this would be in the early stages of the Ministry EMS system being in production. With a number of different integrated systems, some users were confused by which help desk they should contact for which purpose. Enigma created a workflow diagram, available from the login screen, which helped the user follow the workflow step by step, so that they knew who to contact.

On an ongoing basis ie both during a project and once the project has been completed and the system is in ‘maintenance mode’, Enigma uses a collaborative approach to work with a wide range of stakeholders which may include:

- National influences of clinicians – The Ministry of Health, CIOs, National Health IT Board
- DHB management
- DHB senior clinicians
- DHB users
- DHB treatment providers
- DHB IT staff / CIO
- PHOs
- Governance Groups / Steering Functions
- University of Auckland (UoA), Researchers e.g. Professor Rod Jackson, Dr Andrew Kerr, Dr Sue Wells
- National Institute of Health Innovation (NIHI)

Enigma will frequently consult with stakeholders to understand the factors influencing the needs and constraints of each and the potential impact that a change may have on them. This can include several discussions, highlighting the pros and cons of potential changes and helping to facilitate agreement by the stakeholders.

In summary, being an SME with a stable staff that Enigma is deservedly proud of, Enigma is able to provide a service more tailored to its individual customers, as the same team of people work with the customer through the project and beyond. As Enigma has a standard daily briefing every morning, the other staff within the organisation are also largely aware of the projects, the customers and activities that are in progress at any time, a situation which is not easy to achieve within a large organisation.

2. End to end programme delivery – Case Study: EMS

Equipment and Modification Services Prioritisation Tool ([Ministry Contract Reference 348055/00](#))

This is an automated prioritisation system delivered under SaaS for **The Ministry’s Disability Support Services**, implemented by Enigma as a New Zealand National Programme, under contract to the Ministry of Health. For this programme Enigma worked directly with a Programme Manager and Business Analyst within the Ministry of Health, with additional oversight from the Ministry.

This system is not a Registry, it is a national prioritisation system which all EMS Assessors, of which there are ~2,000, must access to ascertain whether or not funding is available for their Clients, based on their Client’s

needs and their ability to benefit from equipment or services supplied. Before the EMS Assessors are able to proceed with ordering equipment via the EMS Providers, they need to have confirmation that funding is available, in the form of a link directly into the appropriate EMS Provider’s system.

2.1 EMS - Stakeholders

The stakeholders for this project were/are the Ministry of Health (under Phil Wysocki, see [Section C: - Reference, Phil Wysocki - Ministry of Health]); all EMS Assessors, most DHB based but with ~20% working under all other non DHB organisations eg Talklink, Foundation for the Blind etc; the two national EMS Providers – *accessible* and Enable New Zealand and Kineo, provider of the Online Training System.

2.2 EMS - Programme structure / approach

The EMS programme was run by a dedicated Programme Manager contracted by the Ministry. Enigma’s appointed Project Manager worked in close collaboration with the Programme Manager and appointed Ministry Business Analyst, responsible for the requirements. An initial phase of requirements review and discussion led the process, where Enigma performed the roles of business analyst and solution architect, **working collaboratively with the Ministry, to ensure that the end solution successfully met the Ministry’s needs and requirements.**

As per ANZACS-QI above, for this solution Enigma contributed the IT solution into this programme; it was also built upon, and leveraged off the existing platform and base software solution, the PREDICT suite of tools.

2.3 EMS - Infrastructure (assessment and provision)

EMS assessors can often be small scale health provider organisations, sometimes with only a solo member or a few staff. As such EMS providers may not always have invested in a Connected Health connection, commonly their EMS work is only a small portion of what they might provide and so the Ministry felt it somewhat unreasonable to insist that they all become connected to Connected Health in order to use The Tool.

The Ministry required delivery of The Tool over both Connected Health (for those users who had a health network connection) and also over commodity based internet connections. This was the first dual-network hosting requirement which Enigma had to respond to.

Enigma had already provisioned a high standard, (UNI-5) compliant network service for ANZACS-QI, and increased the purchased bandwidth by 50% at this time to allow for the introduction of the EMS tool. There **were already two, segregated DMZ managed zones within Enigma’s production hosting environment and so** the base infrastructure required to host this service was already well established.

A further Ministry requirement stated that the Internet based users should also have access to the eSAM and NHI lookup services, both of these services are published by the Ministry, and are accessible only over **Connected Health. Enigma engaged with the Ministry’s Sector Architect and the Infrastructure team** within the NHITB over a network design which provided two, separately managed DMZ hosting zones, logically separated, with a shared, private back-end network containing private database servers etc.

In addition to this, Enigma designed an interface gateway service which sat behind the gateway firewall, on the production load balancers (one for each DMZ) which provides managed and private access from one DMZ, through to the other DMZ for a very few, selected web-services.

This intermediate interface service is specifically designated for services which one set of servers need to call within the other zone. Web traffic from one host, to the load balancer itself is the only traffic allowed to pass through this channel, it is then destination NAT’d and sent on to the required gateway web server in the other DMZ. This is all performed with high availability through the load balanced interfaces. These interfaces

are known as our ‘CH-INT-PIE’ or ‘INT-PIE’ services, meaning ‘Connected Health, Internal - Predict Interface Engine’ and ‘Internal - Predict Interface Engine’ respectively.

This carefully crafted approach allows Enigma to call, privileged, Connected Health web services, such as eSAM and the NHI interface, from either set of servers, while strictly adhering to the expectations of the Connected Health Connection agreement, which amongst other things requires no internet accessible computer can also be connected to Connected Health. It is through using this proxy based service that we are able to chain our requests for Internet based users, to request eSAM data from our Internet based servers, and for those servers to securely post a request through our CH-INT-PIE interfaces to a machine within the Connected Health DMZ, which then in turn requests the content from the Connected Health Ministry servers.

This style of service aggregation is known to the Ministry and is the expected type of solution in cases such as these where the end-user cannot possibly connect into the Ministry’s servers themselves.

All of this provisioning work had already been completed under the ANZACS-OI programme as the NHI development, testing and compliance work required this under-lying infrastructure to be in place for **Enigma’s staging environment (internet facing, UAT) to be capable of talking to the Ministry’s NHI compliance testing server, which is housed within Connected Health.**

This investment in network design, the Connected Health UNI-5 provisioned connection, the detail paid to **network zone segmentation between the DMZ’s and the additional work within the high availability web service proxy (CH-INT-PIE)**, appears to set Enigma apart from a number of other vendors operating in this space; this is the impression of the technical team at Enigma who felt that they were trail blazing through new work with the Ministry when they consulted over the network design and approach as answers had to be worked through rather than being readily available.

Given the prior work, little new infrastructure was needed, the majority of the new provisioning work for EMS surrounded items like DNS set-up, SSL certification procurement, web server configuration for a newly named site, configuration of the dual zones, code replication and deployment / distribution across dual hosting zones. This system administration style work was conducted in parallel with the customisation work which the development team performed and did not in itself hold any of the project up.

2.4 EMS – Infrastructure expansion to connect to third party vendors.

The prior work to establish connectivity channels between the DMZ hosting zones was further leveraged when creating additional points of integration, Connected Health based users required Single Sign On access through to an internet based website for the provider’s portal [2.6.5 - Integration with: [accessible with Healthlink; Enable NZ with B2BE](#)] to accomplish this the Connected Health based servers need to create an access token and session on the internet based servers – this could not be performed directly by the Connected Health based servers or it would violate a Connected Health connection principle; instead the Connected Health based **servers needed to pass a proxied call via the Internet facing DMZ’s web servers.** Creating this additional pathway was the only additional infrastructure required to service EMS’s second phase integration requirements.

2.5 EMS - Customisation

The EMS system was created by leveraging off of another Enigma product, its Enigma Referral Management System (ERMS). The bones of the EMS system were already available and Enigma then added the appropriate forms for capturing the data and added the workflow to meet the requirements. This was an ongoing collaborative process for a period of several weeks, as the system evolved. **Enigma’s experience** made them aware that this would be the case as it is extremely challenging for any customer to be able to think of absolutely everything at the beginning. As the system began to take shape, other scenarios arose which had not previously been thought of and a process of business analysis and solution design enabled

good design decisions to be made, which has been borne out through the lack of changes requested since the system went live.

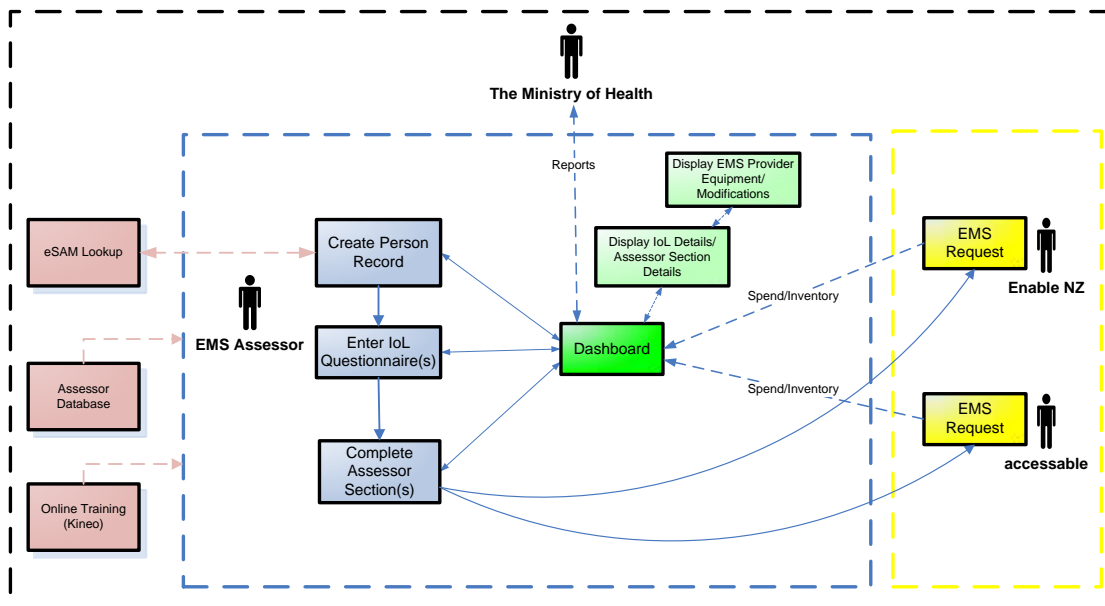
During a series of roadshows with the EMS Assessors in the weeks prior to go-live, one question on workflow arose multiple times (“how do provisional EMS Assessors log into the system and do the work themselves?”). Using Enigma’s business analysis skills, it was possible to understand the underlying issue and after consultation with Enigma’s solution architect, proposed a solution to the Ministry, which was well received and subsequently implemented.

2.6 EMS - Integration

The EMS solution incorporates a number of differing points of integration, both inbound and outbound, detailed below. Implementing each individually involved close collaboration with a number of organisations as each integration had its own set of requirements, its own touch points and its own technical challenges.

2.6.1 Integration Overview

EMS points of integration and data flows



2.6.2 Integration with: Enable NZ

EMS Assessor details, stored within Enable NZ’s Online Assessor database, feed through into the system on a daily basis, automatically creating, updating or retiring user accounts based on the user data received, all controlled by EMS Assessor Code. This means that no Assessor user accounts are updated manually within the EMS system, thus retaining the Enable NZ database as the source of truth.

2.6.3 Integration with: Kineo

All EMS Assessors are required to complete on-line training before they are allowed access into the Prioritisation Tool. The on-line training system was created by a company called Kineo. Enigma receives a real-time feed of data from the on-line training system which automatically updates the Assessor Code with confirmation that they have been trained. If the Assessor Code is not currently in the Prioritisation Tool at the time they complete their training, ie it has not come through in the above feed from Enable NZ, a retired account using the Assessor Code is created within the Prioritisation Tool which matches Assessor details when they are received via the above integration.

2.6.4 Integration with: Ministry of Health, Health Identity Team (eSAM)

eSAM address validation is used when adding new Clients into the system. This integrates directly within the user-interface templates using the MoH’s eSAM license and interface via Connected Health. When the EMS Assessor adds or updates a Client record, the eSAM address search facility populates the key address fields, plus a number of other hidden coded fields, which facilitates the Ministry’s data reporting. This is one of a number of Enigma’s products which uses the Ministry’s eSAM interface, with permission Enigma makes use of the Connected Health housed services, and provides this functionality out to authorised users through the Predict served product. At times these functions are extended and provided (with permission) via our internet served connections; extending a service which would normally be available only over Connected Health, to internet based users.

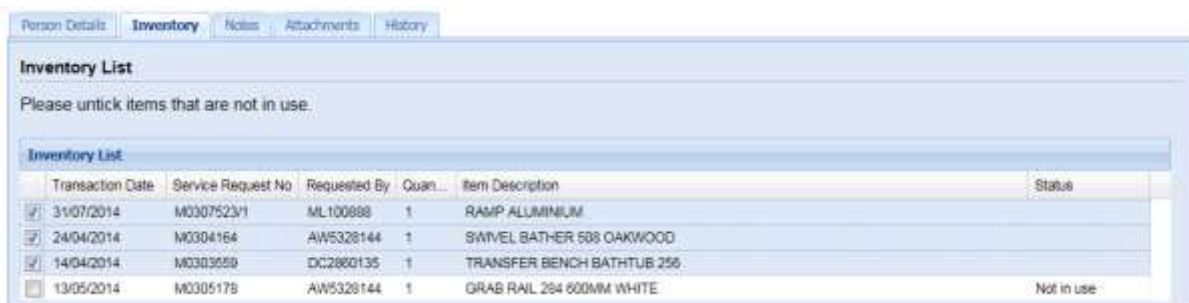
2.6.5 Integration with: accessible with Healthlink; Enable NZ with B2BE

Once the EMS system has provided the response to the EMS Assessor, eg Funding is available, a link is presented in the system, which when clicked, uses Single Sign-On to pass the Assessor’s credentials through to the EMS Provider (accessible or Enable NZ) via a token. The EMS Provider accepts the token and requests the specific data needed to create the Service Request (required to order equipment and modification services) to be provided by the EMS system. EMS provides all the required details and the Assessor then completes the process in the EMS Provider’s website. For these integrations, both EMS Providers contracted their IT development to IT specialists therefore Enigma collaborated with not only the EMS Providers but also their IT contractors.

2.6.6 Integration with: accessible and Enable NZ

At the end of the process, on a monthly basis, both EMS Providers provide a feed of ‘spend’ data per Assessor back into the EMS system. This enables reporting to be made available to all EMS Assessors, the Ministry and the EMS Providers, so that all parties can review the individual spend for an EMS Assessor and compare across the national averages. More details on this are shown in [2.8 EMS - Reporting - QI] below. This feed back into the EMS system also provides an inventory of equipment for a patient, as all spend data is itemised and matched with the appropriate NHI.

Inventory Details:



Transaction Date	Service Request No	Requested By	Quan...	Item Description	Status
31/07/2014	M0307523/1	ML100888	1	RAMP ALUMINIUM	
24/04/2014	M0304164	AW5328144	1	SWIVEL BATHER 508 OAKWOOD	
14/04/2014	M03039559	DC2880135	1	TRANSFER BENCH BATHTUB 256	
13/05/2014	M0305178	AW5328144	1	GRAB RAIL 264 600MM WHITE	Not in use

2.6.7 Integration with the Master NHI Interface

Leveraging off previous work completed within the ANZACS-QI programme, Enigma quickly completed development work against the Ministry’s National NHI (test) interface and delivered a working integration into the EMS Tool’s test environment within a few weeks of being given the go-ahead by the Ministry.

Further progress in implementing this interface within the live product is pending the Ministry’s Identity Management Team’s allocation of resource to engage over compliance testing, a step required before this code can be released into the production product. Delays in releasing this function were clearly communicated with the business owners at the Ministry and escalated internally within the Ministry but there remains no fixed timeframe for the Ministry to make compliance resource available to enable Enigma

to complete their required compliance testing process. (Note: Similar Ministry deliverables will be required for the Breast Cancer Registry Programme)

2.7 EMS - Deployment

To reduce the risk when deploying a national programme, the roll-out of the programme was a two phased approach, with the Northern Region of NZ going live first in January 2014, followed by the rest of the country in August 2014. This gave the Ministry and Enigma the opportunity to confirm how well the solution met the **Ministry’s requirements in reality; how well the requirements had captured the stakeholder’s views; how well all the integration points worked together** [[Section B:2.6.1 - Integration Overview](#)]; to iron out any potential bugs that had been missed and also to confirm that the prioritisation algorithm, provided to Enigma by the Ministry would enable the available budget to be accurately managed.

Prior to the go-live for stage one, the Ministry gained the buy in of a number of ‘Prioritisation Tool Champions’, who were keen to be involved and willing to learn more about the system to provide a first line of support to other users within their DHB or organisation. Enigma was able to leverage off the Champions to confirm items such as connectivity through Connected Health into the DHBs and ensure that there would be no firewall issues within other non DHB organisations when it came to going live with the system.

A series of contracted roadshows were held during the run up to the go-live date and this consisted of a trio of presentations from the Ministry on the background of, and the reason for the EMS system; an experienced Assessor explaining about the Online Training System and Enigma, giving a demonstration of the EMS system itself. The Online Training System was predominantly around the clinical process for the Assessors, it was not focussed on how to actually use the EMS system ie what buttons to press and when. Despite that, **very few queries into Enigma’s Support have been on usability, the vast majority have been related to forgetting passwords and locking their accounts.**

One week prior to the go-live date, Enigma received the ‘real’ data feed from Enable NZ from the Assessor Online database. The user accounts for Assessors in the Northern Region were created automatically and the emails with the details triggered automatically to the email addresses stored within Assessor Online. As **all usernames were the Assessor’s own codes, it was possible to send an email simply advising that the username is their code, provide the URLs (both Connected Health and otherwise) and their password.** As no Assessor Codes were included in this email, there was little risk of someone being able to intercept the email and log in.

2.8 EMS - Reporting - QI

Within EMS, there are a number of contracted and specified reports available including Key Performance Indicator (KPI) reports, varying types of data extracts and multiple Assessor Spend reports. All reports are intended to facilitate ease of analysis. Access to the reports is role based and the Ministry has access to all reports. The Assessor Section Outcome Report enables the Ministry to understand the demographic of Clients requesting equipment and services. They are also able to see at a glance the percentage of Clients who have not been allocated funding and they are able to perform further analysis by drilling down into the reasons why not, ie what are the common themes where Clients are missing out. This report also enabled the Ministry to make changes to the funding threshold to protect their budget and to date, the funding threshold has been changed twice during the lifetime of the programme.

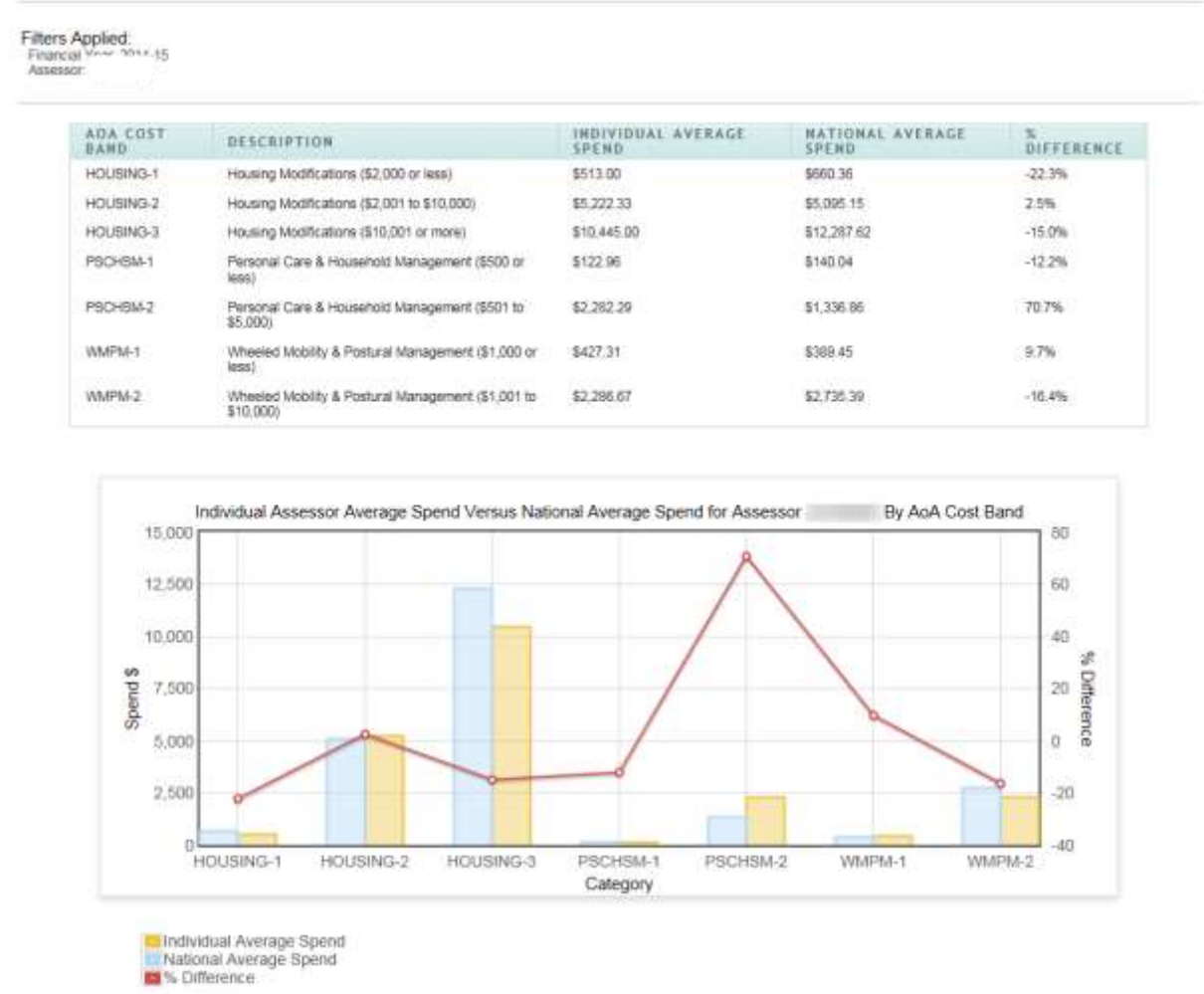
Extracts are also available to the Ministry giving them the ability to analyse the behaviours and data entry of the Assessors ie should there be an Assessor who repeats the process a number of times for the same Client until they get a positive result.

There is a variety of ‘spend’ reports, which shows the actual amount of expenditure allocated to an Assessor based on their Assessor Code. All Assessors have access to this report and they can see how they compare their own individual spend from the national average. This can be filtered down into like-for-like to provide

comparisons: an Assessor in Child Development Services in Auckland DHB can compare themselves to the average spend of all other Assessors in Child Development Services in Auckland DHB.

Below is an example of the format of the reports (data is taken from a test environment therefore the numbers are not real).

EMS Assessor Average Spend Report:



The EMS Assessors will see only the average spend however the EMS Providers will see the actual individual spend therefore if an Assessor’s average spend seems to be high, the EMS Provider can look at exactly what the Assessor has spent, to identify if there is an issue. All of this spend-reporting is possible due to the back end data feed received from the EMS Providers and imported into the EMS system by Enigma every month.

2.9 EMS - Support structure

EMS has a national user-base, with approximately 2,000 active users. Support for this user-base is provided through two tiers. For the first year of activity, there were system champions who were active EMS Assessors, willing to take on a local mentoring role within their DHB or organisation. If the Champion was not able to help, they would contact Enigma. For the last few months, this Champion role was disbanded and EMS Assessors are now asked to contact their Supervisor in the first instance, with the Supervisors contacting Enigma. With the varying points of integration with this system, there is a number of different help desk involved and it is often confusing for the user who to contact. Although not able to assist with these other systems, Enigma has enough knowledge on the component parts to direct users who call to the appropriate help resource, if their query is not directly related to the EMS system.

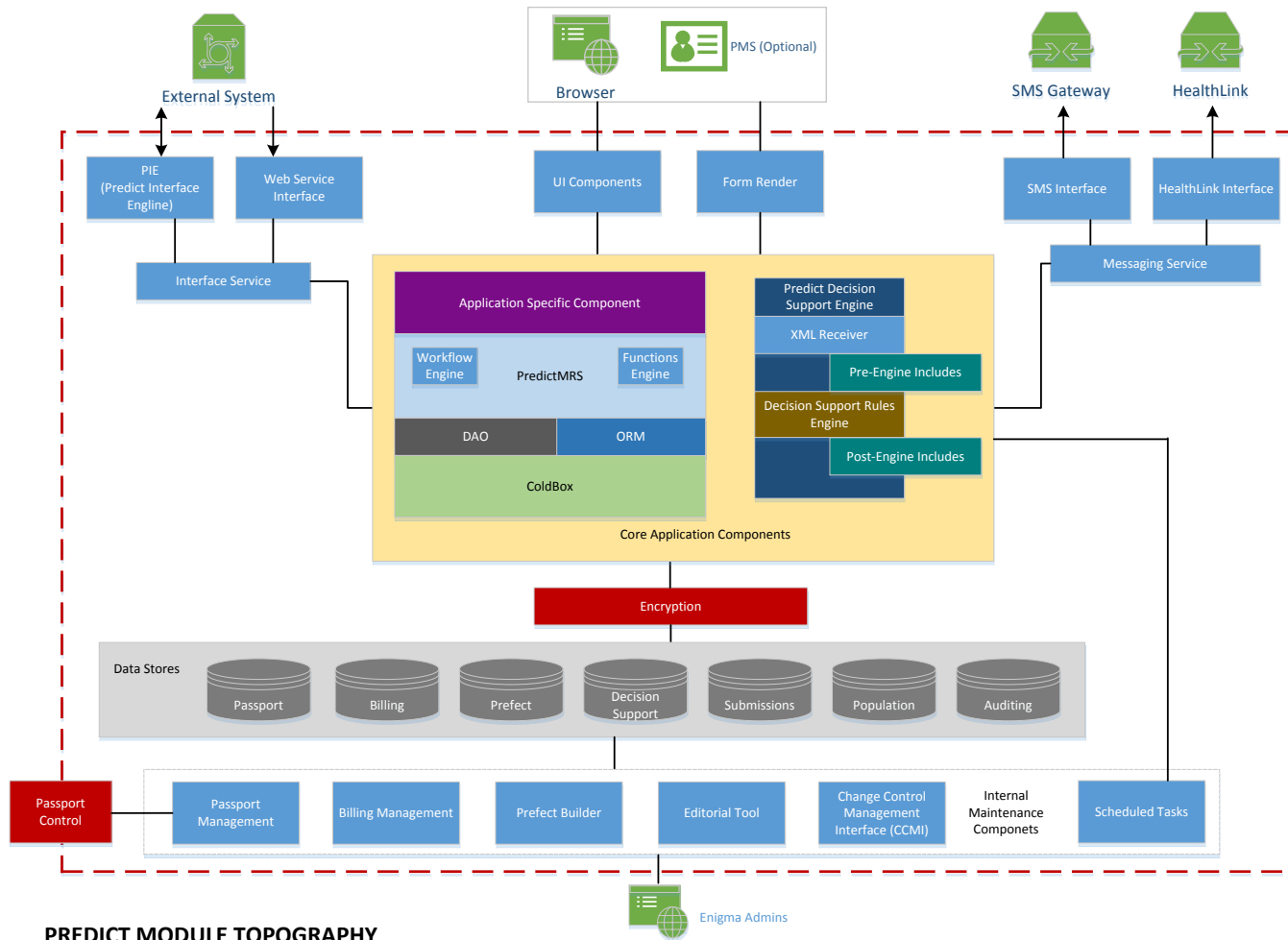
The same Enigma core helpdesk service described above under the ANZACS-QI case study is used for EMS.

Enigma estimated that the Ministry should contract 12 hours per month for this programme which the Ministry chose to amalgamate into a total pool of 144 hours per year. At the end of the first year, the project had used 146.3 hours, a difference of only 2.3 hours which was covered on Enigma’s account. **Fewer hours** are being used this year giving the Ministry some flexibility should they choose to make any modifications to the EMS system during 2015.

2.10 EMS - Further enhancements and adjustments

Within the first few weeks of production use, a couple of scenarios arose where the system was not able to handle minor requirements, which had not previously been identified. Enigma collaborated with the Ministry and provided suggested solutions for issues and in the most part was able to make appropriate modifications under the Service Level Agreement. On occasions, an EMS Assessor may make a request for a system improvement eg changing the label of a button to ease confusion, and these changes were made quickly and easily. To date no major bugs have been found and no major changes have been requested.

3. Topological System / Platform diagram



The above suite of on-line tools has been created and is served online using largely Microsoft technology. Enigma exclusively uses Microsoft Server operating systems for this version of Predict, it is currently being hosted using Windows Server 2012R2, Microsoft SQL Server 2005, IIS 7.0 for our web-servers.

Section C: Reference, Phil Wysocki - Ministry of Health

