Mahere Whakamahinga
Workforce Activation Strategy

Workstream D - Competency Mapping

Building interoperable standards and competencies.

ENERGY
ACADEMY

Contents

↗ **The infrastructure sector is not alone in facing the largest talent shortage in decades.**

Executive Summary

Our industries face unprecedented talent shortages brought on by an ageing workforce and the need to decarbonise our economy. These shortages have been exacerbated by the Covid pandemic, changes in immigration policy and now coupled with the Ukraine conflict impacting supply chains, have bought us to a crisis point for talent development.

While interventions such as the Reform of Vocational Education have the aspiration of a more unified vocational education system that will bring together industry, to fill immediate needs, most large energy and water organisations have developed their own internal training systems. These individual organisational systems have already begun to move beyond qualifications with bespoke skills pathways to suit their own needs.

These individual systems are effective, however, the disparate and fragmented nature of this capability development patchwork only makes it harder for workers to mobilise outside of defined roles, often sending them back to start of a new training pathways as their careers adapt and change.

The sector doesn't need to undergo a complete redesign. But it also can't afford to stay the same and wait for something to happen.

We have run out of time - in order to address the talent shortage and increase productivity, flexible and adaptable training mechanisms are required to mobilise the workforce.

Portability for workers will be key to filling the shortages both today and in the future.

In partnership with Waihanga Ara Rau, following the development of Re-energise: Ngā Mahi a Māui Workforce Strategy Report, Energy Academy was engaged to work on Workstream D: Competency Mapping, to explore a potential future where workers could take on learning and development pathways across industries with similar capabilities requirements.

To explore this future, we mapped learning pathways across two industries to find even minor commonalities between them. The experiment has highlighted that there are new approaches to recognise learning for the benefit of everyone.

Our exploration outlines a new trusted currency of 'skills', whereby universal skills mapping increases worker portability with an interoperable framework that augments what currently exists.

This approach would reposition the way the sector uses technology to track, verify and share knowledge and data. Make no mistake, accessing this new model would require a radical shift in the way organisations collaborate today, but at a time where doing nothing, or even doing the same as what we have always done, is no longer enough, the productivity gains would far outweigh perceived risks.

Our Brief

↗ WAIHANGA ARA RAU ENGAGED ENERGY ACADEMY TO COLLABORATIVELY EXPLORE:

An adaptable workforce where employees may transfer across roles across multiple industries through a standardised map of transferable technical skills that may become the core foundation of competency recognised by all.

There is probably a lot of overlap between existing qualifications, competency frameworks, unit standards, a company's ongoing training requirements - but what is the same, and what is different? How can they connect, so a worker doesn't have to start at the beginning each time?

Using two distinctly different roles, across two industries, this project aims to highlight the opportunities and problems to solve to achieve interoperability and skills portability.

Distribution Line Mechanic

NZ CERTIFICATE
LEVEL 2/4

Water Treatment Operator

NZ DIPLOMA
LEVEL 4-5

Two Industries, Two Models

ENERGY SECTOR

New Zealand's Electricity Supply Industry (ESI) is made up of five major electricity generators, one national transmission operator, and 27 Electricity Distribution Businesses (EDBs) - all who operate their own independent standards and requirements for training and competency.

An individual electricity supply contractor may carry out maintenance on 5 or 6 different EDB networks, and can be required to complete and refresh very similar training at each EDB. Workers transferring from one contracting company to another often need to restart competency training from the beginning with their new employer.

WATER SECTOR

Up until the recent Three Waters reform, New Zealand's water maintenance has been carried out across 67 local authorities. Over the coming years, responsibility will be transferred to four national Water Service Entities. The core focus of these entities is to improve the quality of service and safety of drinking water.

Both these essential infrastructure sectors face significant labour shortages, and with it, need to find solutions to attract, upskill and retrain a competent workforce. Capability building and processes to prove evidence of competency are seen as key barriers.

↘

While there may be shared skill sets across the sector, both industries currently deliver competency training independently.

Competency in specific technical, practical and regulatory skills are evaluated using different approaches across multiple organisations.

While it may work for individual organisations, there is minimal portability of skills or recognition of learning across industries or even organisations.

Our Hypotheses

↗ **The current method for recognising prior learning is ambiguous, subjective, not repeatable or scalable.**

There are many unit standards on different pathways with similar learning outcomes.

Qualifications are recognised universally. Localised competency pathways are bespoke to organisations, and although very similar learning pathways, they can be unrecognisable outside of that organisation.

Workers are often sent to the beginning of a competency pathway when they move from:

- Site to site

- Organisation to organisation (same job)

- Roles within different companies within the same industry

- Between industries or sectors

The Challenge

How might the sector build an adaptable workforce that recognises interoperable standards to make workers more portable across roles and industries?

Unpacking the problem space

01 UNTANGLING A COMPLEX WEB

For a sector that shares some universal capability needs, it is also fragmented, siloed and competitive, leading to discrepancies between organisations and institutions across the country.

The current model has limitations in the flow of data between all of the disparate training departments.

Currently the common language that is transportable across sites or industries is based on qualifications as the currency we understand. Yet internally, each organisation uses its own terminology for progression and learning pathways to recognise competencies..

02 JOBS OVER SKILLS

Talking in 'jobs' rather than 'skill sets' may diminish opportunities for skills transfers across multiple sites and sectors as it often can send workers back to the start of a training programme.

However, workers are demanding more flexibility in their careers, and seeking diversity in opportunities across multiple careers and industries.

Our Process

Two roles across two industries were mapped using unit standards as stepping stones along learning and experience pathways. Common skills clusters were identified across the learning journeys.

DISCOVERY STAGES

2.1 **Mapping of pathways**

2.2 **Identified commonalities**

2.3 **User journeys**

02
EXISTING ROLES
Distribution Line Mechanic and Drinking Water Treatment Operator

05
ORGANISATIONS'
technical competency frameworks

06
NZQA
qualifications
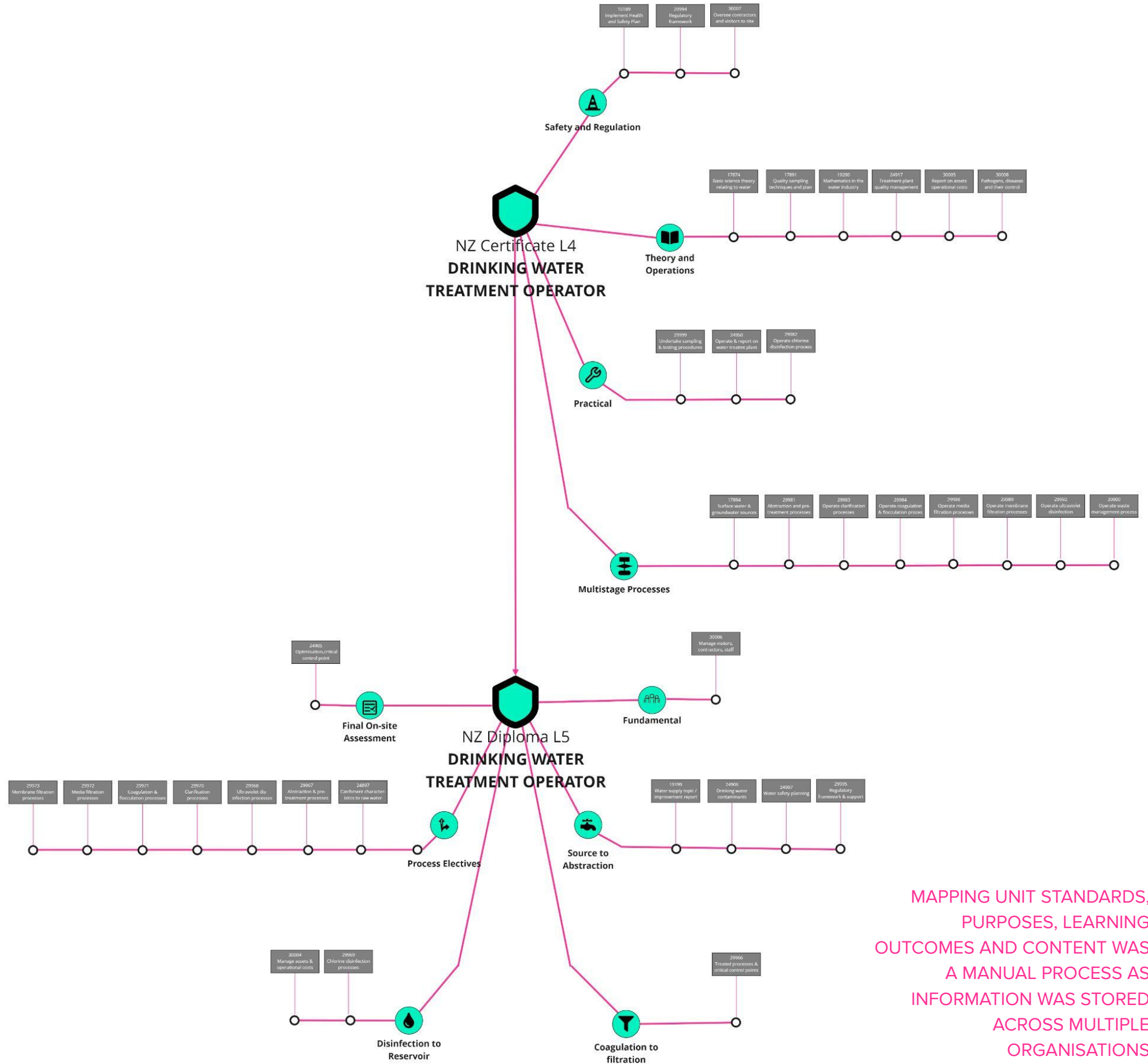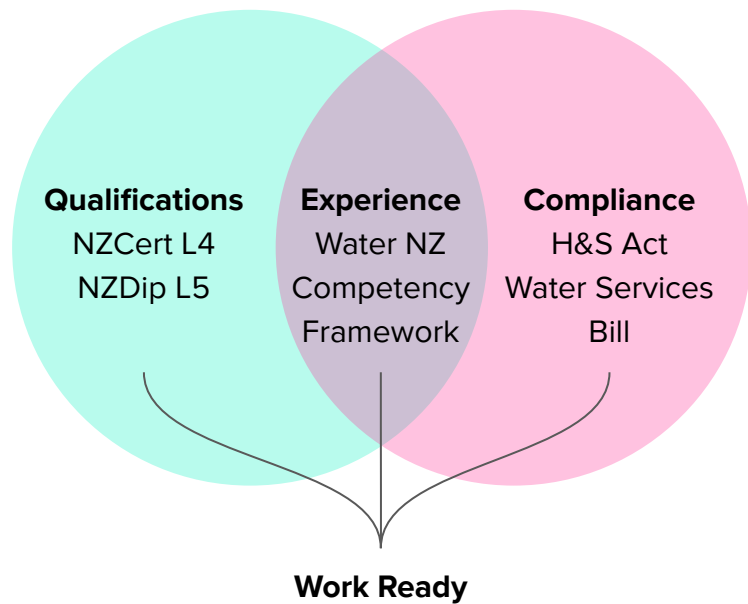
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UNITS STANDARDS

2.1 MAPPING PATHWAYS

Drinking Water Treatment Operator

Based on the current qualification pathway defined by Connexis, each module contains multiple unit standards.

For access to a publicly available link to zoom into the standards:

CLICK HERE

Qualifications
NZCert L4
NZDip L5

Experience
Water NZ
Competency
Framework

Compliance
H&S Act
Water Services
Bill

Work Ready

MAPPING UNIT STANDARDS, PURPOSES, LEARNING OUTCOMES AND CONTENT WAS A MANUAL PROCESS AS INFORMATION WAS STORED ACROSS MULTIPLE ORGANISATIONS
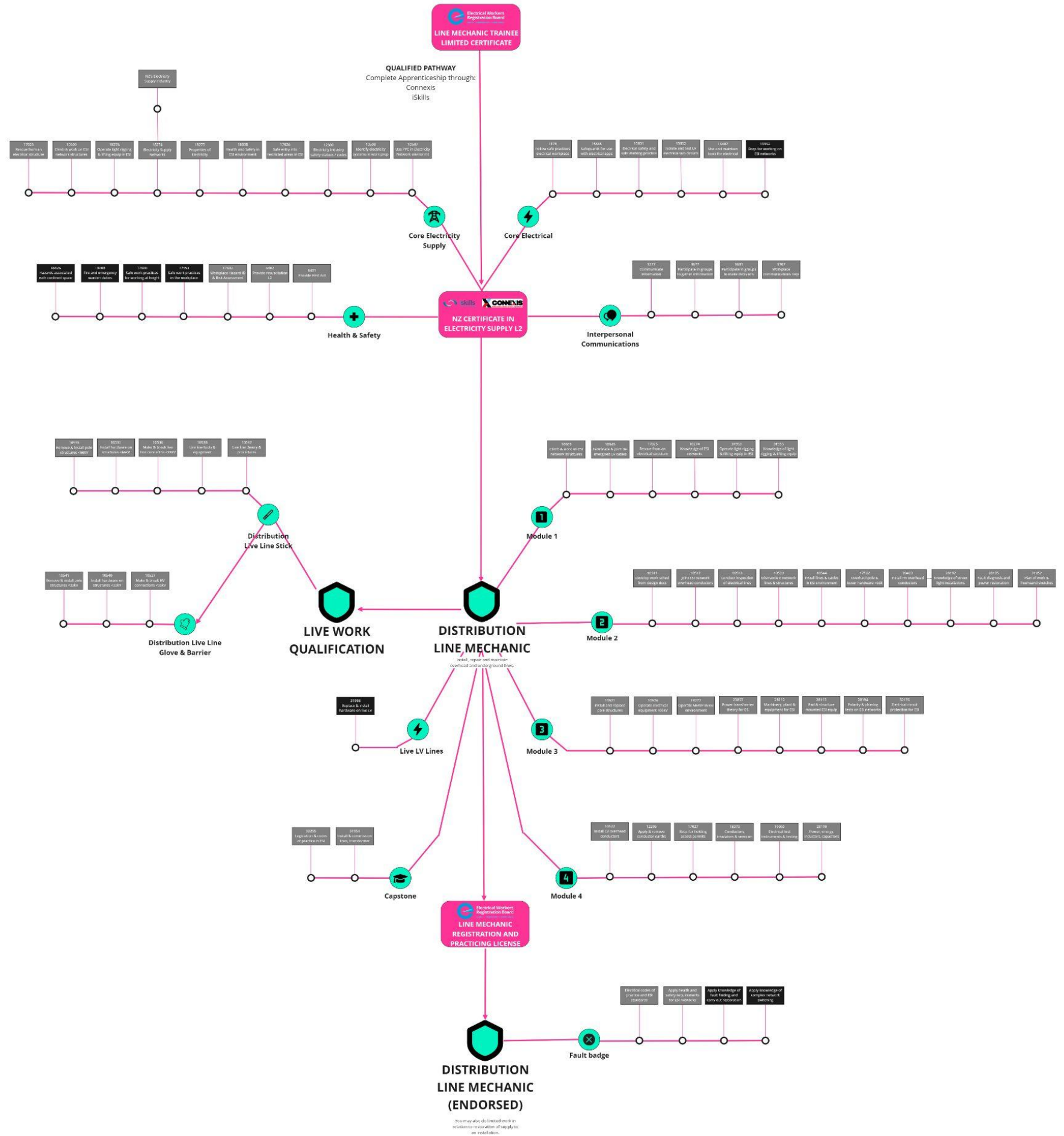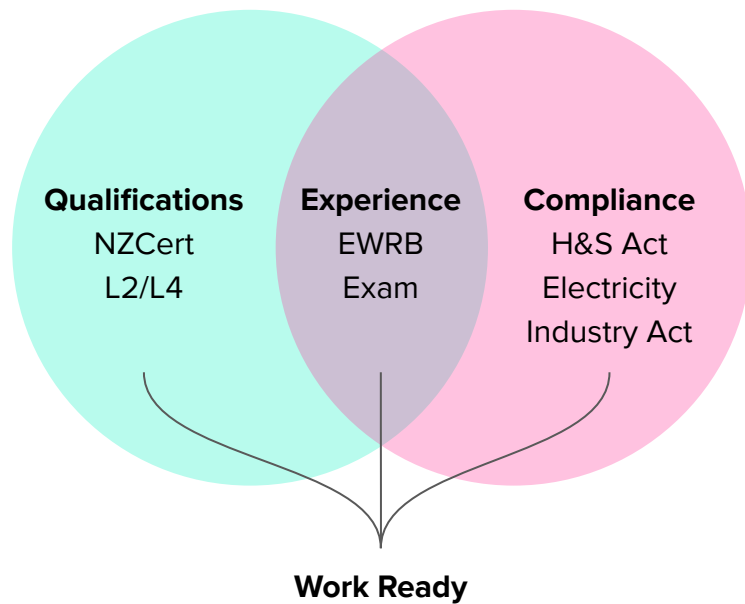
2.1 MAPPING PATHWAYS

Distribution Line Mechanic

Based on the current qualification pathway defined by Connexis, each module contains multiple unit standards.

For access to a publicly available link to zoom into the standards:

CLICK HERE

Qualifications
NZCert
L2/L4

Experience
EWRB
Exam

Compliance
H&S Act
Electricity
Industry Act

Work Ready

2.2 IDENTIFY COMMONALITIES

Unit Standards Side-by-side comparison

HYPOTHESIS: The current method for recognising prior learning is ambiguous, subjective, not repeatable or scalable

01 SKILLS CLUSTERS

While we found no exact matches for the same unit standard appearing on both pathways, there were similarities in skills clusters amongst the standards. In the current model and framework, these two similar unit standards would be required to repeat if you were transferring skills across.

02 COMPARISONS ARE MANUAL

Learning outcomes or performance criteria within each unit standard is only available via Word documents. This data is not easily extractable into a machine readable format. Therefore comparison is a manual and subjective task.

03 LACK OF PORTABILITY

These two pathways are visible because they form part of an NZQA qualification pathway. There are also hundreds of invisible competency pathways within organisations that are not interoperable between them.

COMMONALITIES ARE DISCOVERABLE THROUGH MATCHING SIMILAR UNIT STANDARD TITLES AND COMPARING THEIR OUTLINES

Distribution Line Mechanic	Drinking Water Treatment Operator
UNIT STANDARD	
17602 **Workplace Hazard ID & Risk Assessment**	15189 **Implement Health & Safety Plan**
LEARNING OUTCOMES	
2.3 Procedures for the application of H&S plan in accordance with org reqs	4.3 Documentation for hazard ID & risk compliance completed in accordance with org reqs
2.1 The requirements of the HSE Act are explained	1.1 Clauses in current legislation that address HSE issues are identified
4.1 Hazards are identified	4.1 Possible emergencies are identified

2.3 USER JOURNEYS

From work capable, to work ready

To further understand the current capability and competency model we explored four user journeys. Common barriers are shared across all four.

HYPOTHESIS:
Workers are often sent to the beginning of a competency pathway when they move from:
- Site to site
- Org to org (change jobs)
- Roles within the same industry
- Between industries or sectors

01 CHANGING ORGANISATION, SAME ROLE, SAME INDUSTRY

Currently when workers change from one employer to another, they will need to be assessed on many compliance requirements to be deemed competent. Time to work-readiness is the shortest.

03 SWITCHING INDUSTRIES

Commonalities in prior learning are not easily recognised when switching across industries. Even when skill clusters are comparable, there is currently no mechanism for recognition.

02 CHANGING ROLES WITHIN AN ORGANISATION

There is limited visibility of career progression pathways within existing organisations.

04 INTERNATIONAL IMMIGRANT, PREVIOUS EXPERIENCE

In the energy sector, skilled immigrants can be fast tracked through training to prepare for the EWRB examination. In some cases this can take less than two months – a fraction of the time of a qualified worker. **Could the same efficiencies be applied to people switching industries with relevant transferable skills?**

Additional findings and insights

While searching for commonalities we discovered a number of challenges that need to be addressed in order to create a an interoperable and portable competency model.

HYPOTHESIS:
- The industries operate on a low trust environment
- Qualifications are recognised universally. Localised competency pathways are bespoke to organisations, and mostly are very similar

01 COMPETENCY VS CAPABILITY

The word "competency" is highly nuanced, and means different things to different people in different sectors.

The word "competency" in the Electricity Supply sector is often used to refer to an employer's legal obligations under the Health & Safety at Work Act (2015), and as regulated by the Electricity Act (1992).

In contrast, the Water New Zealand Competences Framework is provided as a guideline, and it is not expected that any one person at an organisations meets all the requirements for competency.

02 COMPETENCY FRAMEWORKS VS UNIT STANDARDS

Industry develop competency frameworks as an adaptable method for keeping qualifications current.

A number of organisations base their competency frameworks upon Unit Standards, without actually awarding the Unit Standards.

While NZQA maintain assurance for quality in the delivery of capability training through qualifications, there is no parallel mechanism for ensuring quality of competency.

03 BEHAVIOUR DRIVEN BY LEGISLATION

The current method of requiring a worker to complete competency training, even if they have just done the same training at another employer, is driven by the Health and Safety at Work (2015) legislation.

An employer is obligated to ensure any worker is compliant and safe before sending them out to do work.

Any new solution must give an employer the same or better assurance than the current method and keep workers safe, or it will not be widely adopted.

04 OWNERSHIP AND ACCESS OF DATA

Currently institutions and employers own the data related to skills and qualifications and where workers / learners may be on their learning journey.

Inside a new framework, data sharing would become necessary for all parties, This poses new questions around data sharing and the ethics of ownership.

Opportunities

Explore an augmentation of the current system that would enable inter-operable standards to make workers more portable.

Scaffolding for the future

3.1 JOIN THE DOTS IN THE EXISTING FRAMEWORK

The current system is already based upon common building blocks, with NZQA unit standards. Rather than adding a new framework, there is an opportunity to join the dots between what is already there.

Allowing industry to mix "playlists" with content relating to capability, competency and compliance, workers' skills can be refreshed and reviewed at a regular cadence, resulting in greater currency of learning.

3.2 A NEW COMMON LANGUAGE

If existing learning outcomes within Unit Standards were machine readable and tagged with meta-data, technology could be leveraged to find commonalities and make recommendations.

3.3 INCREASE LEARNER AGENCY

By transferring ownership of learning from organisations to individuals, workers become empowered to take their learning with them, resulting in a more portable workforce.

THE OPPORTUNITY
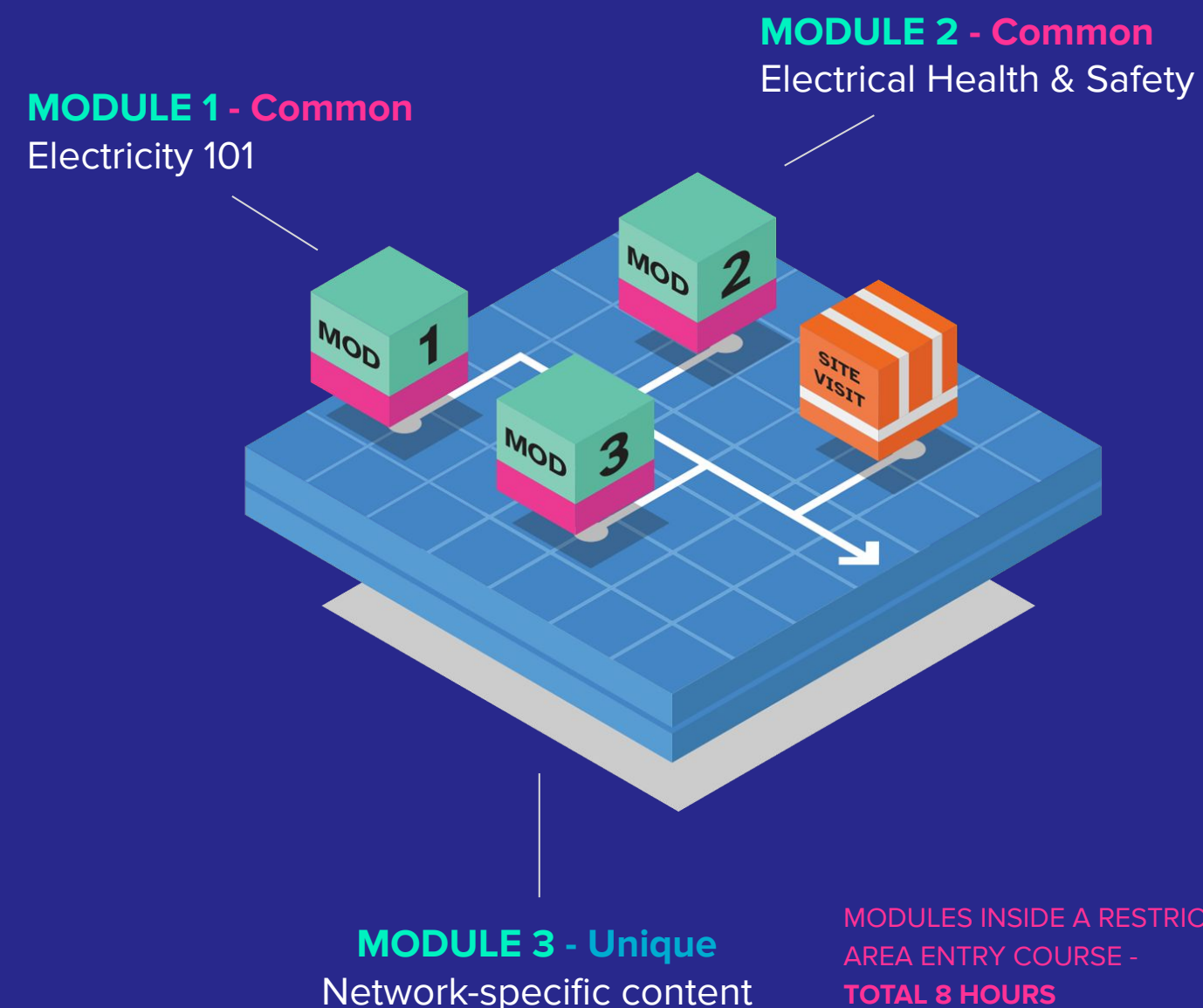
3.1 Join the dots in the existing framework

RESTRICTED AREA ENTRY - Case study

This case study is an example of common and unique building blocks based on learning outcomes. Joining the dots still enables organisations to have their own unique learning pathways, while recognising what is common.

Across 27 Electrical Distribution Businesses (EDBs) workers accessing a site are required to complete Restricted Area Entry certification.

Working together would enable EDBs to mix and match common modules (Electricity 101, and Electrical Health and Safety 101) with unique module (anything specific to an EDB network) for Restricted Area Entry training.

This would enable employers to create their own "playlist" of learning from a library of common and unique modules. This example shows a learning pathway that is 25% tailored and 75% common with the outcome of reducing the time off the job to duplicate training.

MODULE 2 - Common
Electrical Health & Safety

MODULE 1 - Common
Electricity 101

MOD 1

MOD 2

MOD 3

SITE VISIT

MODULE 3 - Unique
Network-specific content

MODULES INSIDE A RESTRICTED AREA ENTRY COURSE -
TOTAL 8 HOURS

THE OPPORTUNITY

3.2 Developing a new common language

The current model and framework does not recognise similar skills clusters across unit standards (or other competency pathways).

There may be a way to recognise similar skill clusters via metadata tagging learning outcomes, rather than creating an entire new framework.
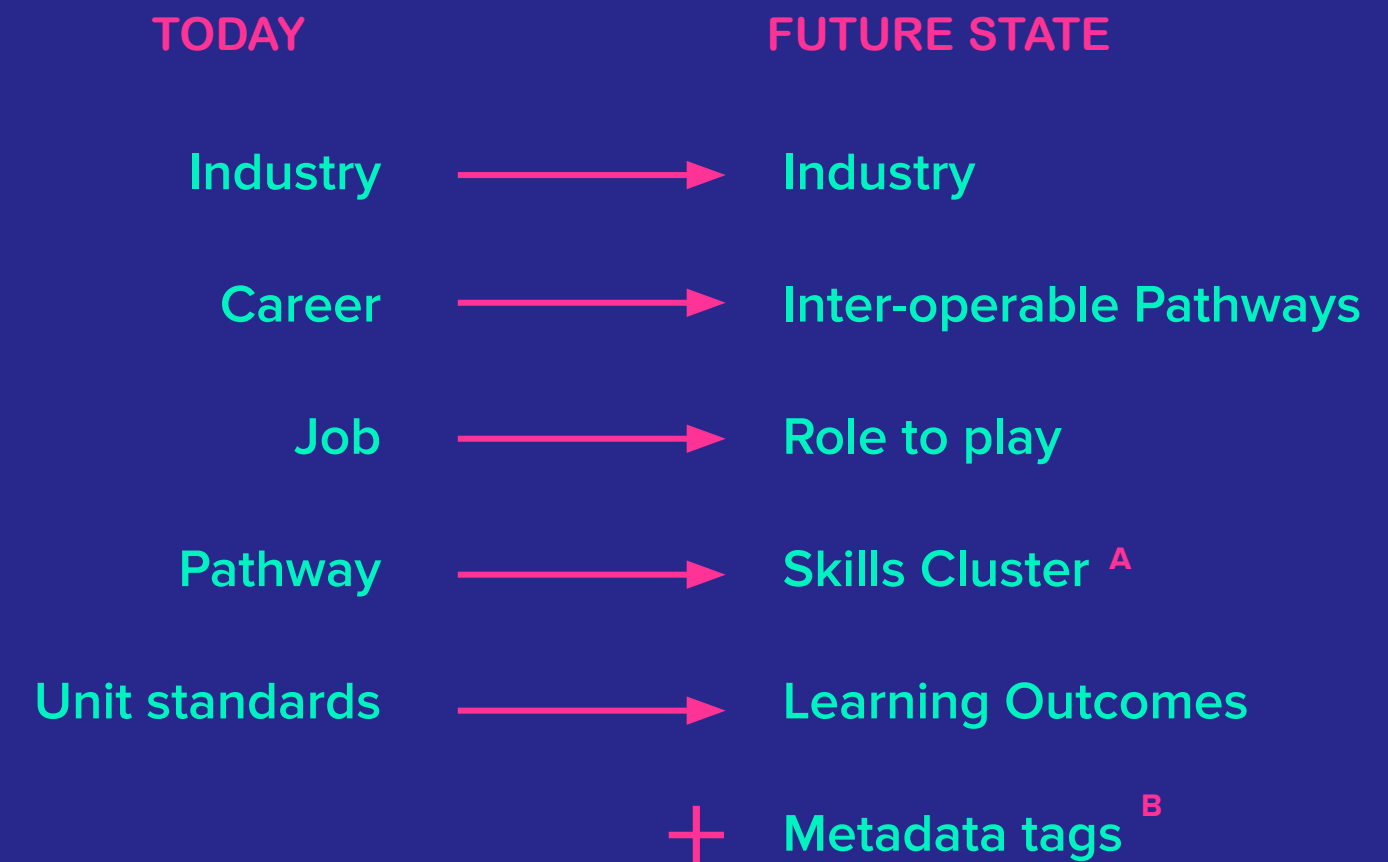
A SKILLS CLUSTER

A skill cluster relates the skills earned to skills connected to alternative pathways, therefore opening up opportunities to have an impact in other roles or industries.

B METADATA TAGS

Critical to managing standards, and the content within them, is to be able to efficiently manage, extract, index and retrieve information. Metadata tags are the building blocks of an interoperable system.

Reframing the data points

TODAY	FUTURE STATE
Industry	→ Industry
Career	→ Inter-operable Pathways
Job	→ Role to play
Pathway	→ Skills Cluster [A]
Unit standards	→ Learning Outcomes
	+ Metadata tags [B]

3.2 DEVELOPING A NEW COMMON LANGUAGE

Data driven mapping

The content within unit standards, including learning outcomes, assessment criteria and learning activities are not accessible within a single data set. In fact, most potentially relatable content is stored within discrete Microsoft Word documents, or on independently operated learning management systems.

Unit Standard titles and purpose statements are not enough to efficiently map commonalities. Organising content into machine readable data is a critical next step towards understanding skills clusters.

AS SHOWN IN THE INDICATIVE DIAGRAM TO THE RIGHT, WHILE THE SKILLS WITHIN INDEPENDENT ROLES MAY NOT BE DIRECTLY RELATED, MANY WILL BE OF CLOSE PROXIMITY WITHIN THE SAME SKILLS CLUSTER.

Drinking Water Treatment Operator

Multistage Processes

Skills Cluster

Image: Skillscape, Ahmad Alabdulkareem

Distribution Line Mechanic

Core Electricity Supply
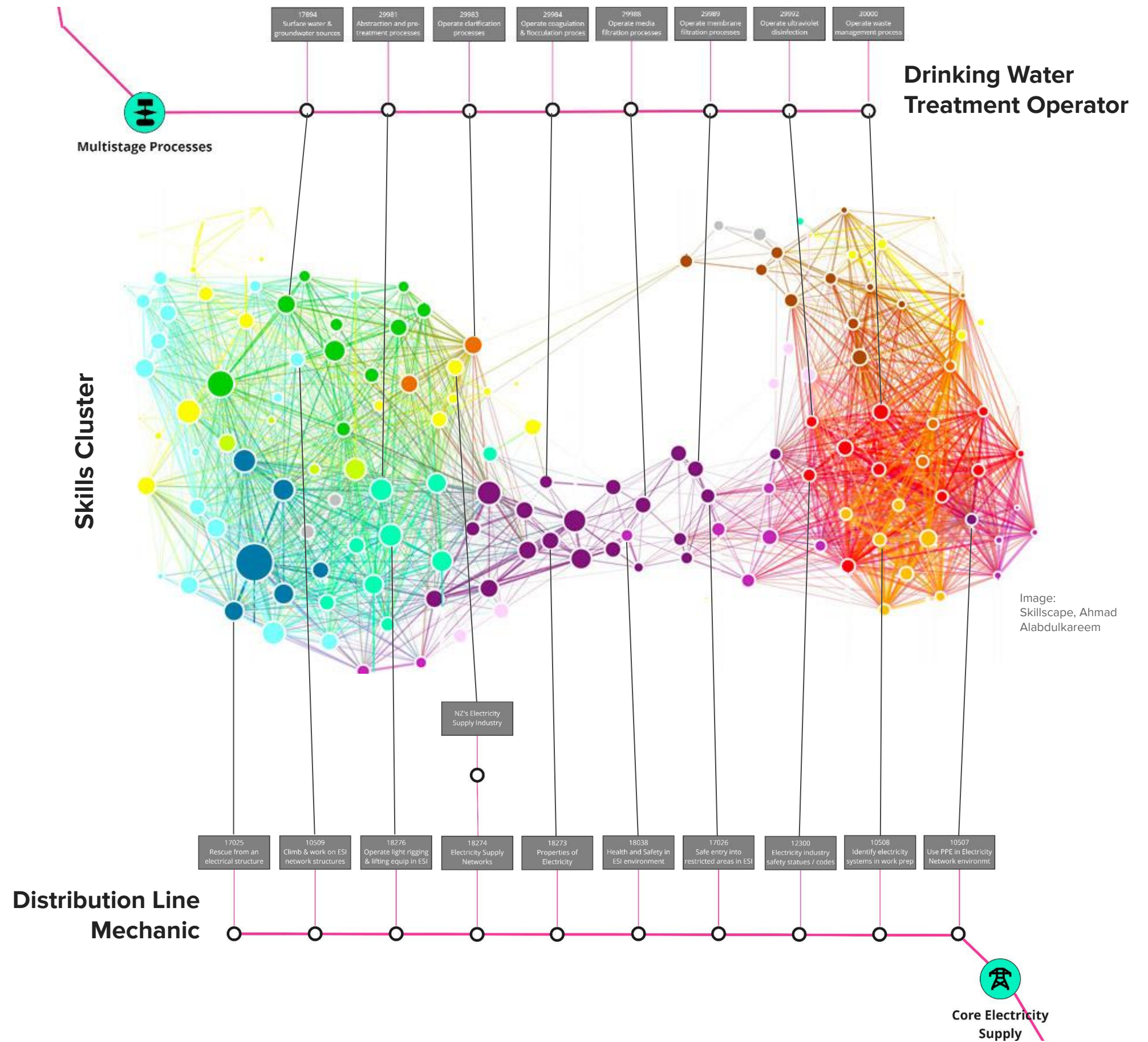
TOKONA TE RAKI

Skills rather than jobs

NAU MAI TE ĀNAMATA Tomorrow's skills report prepared by Tokona Te Raki - Māori Futures Collective describes the shift away from qualifications being the key determinant for employment towards a focus on skills, particularly interpersonal or human skills which are transferable.

Of note was how a skill clustering framework can be used to move beyond thinking of careers in terms of industries (different jobs grouped by the sectors of society they serve e.g: manufacturing, hospitality and retail, energy, construction, corporate etc.) towards understanding the actual work undertaken in those jobs and the skills they require.

The skill clustering framework allows grouping of jobs by the similarity of skills, showing how certain skills can move across industries within a skill clusters, identify a key skill set and/or what opportunities there may be to move into a different skill cluster (industry).

Source: Skills-Report-April-2022

WDC

Skills standards and skill clusters

Workforce Development Councils have indicated an eventual move to Skills Standards. Skills Standards are only at the beginning of a consultation process, with no current indication of when they will be ready for implementation.

In the short term, a solution will need to accommodate for these known future developments, or even act as a bridge to enable them. Adding an extra layer of context to current unit standard (i.e. meta data) may allow for mapping of old unit standards to new skills standards.

By capturing all relevant learning content within a single dataset or across relatable databases, skill clusters could be mapped to show the close relationships of transferable skills.

**THE OPPORTUNITY**

3.3 Increase learner agency

When multiple organisations agree on universal skills pathways, workers may give permission to future employers to view which relevant skill clusters they have gained.

FROM PATHWAYS TO PLAYLISTS

Organisations could set their own learning pathways like playlists where they can add modules, standards and learning outcomes from an agreed stack and create their own sequences.

Workers would then be empowered by having access to multiple fulfilling opportunities across sectors.
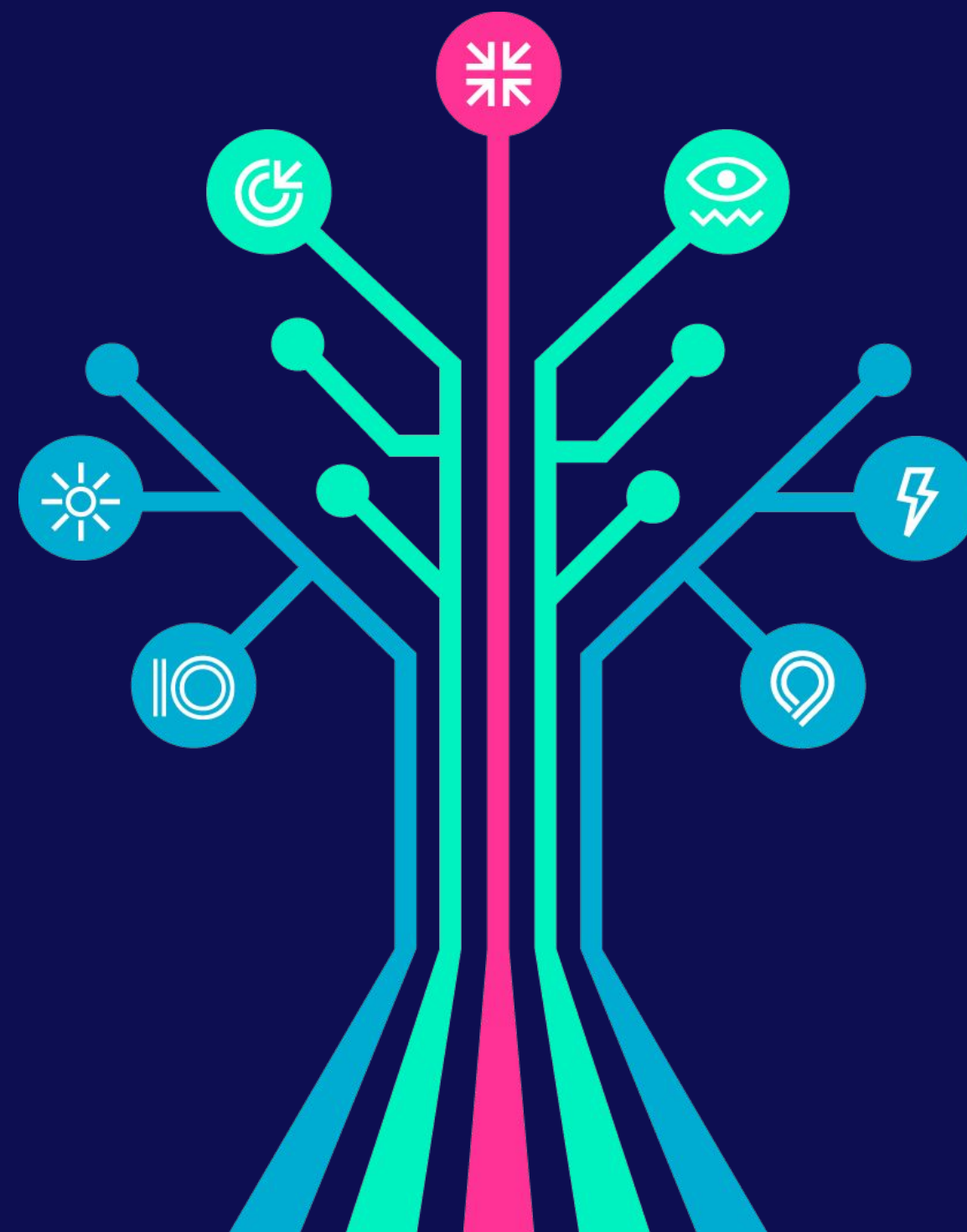
NEW LANGUAGE
Game Theory

Very similar to completing 'quests' in role playing games, skill clusters are progression systems, starting from common basic trunk(s), and expanding into more specialized skill clusters.

Players can easily review their progress through sophisticated maps which highlight the skills they've picked up during the game and make decisions on new skills they can gain to achieve maximum impact.

Alongside skills, players are recognised through points, badges, levels, roles and more. Agency is augmented through clarity of choice and optionality.

A system like this could enable workers to move from careers and jobs based on the impact they want to create in the world - charting their own course and subsequently cross-pollinating their knowledge.

VISUAL: Wolcen: Gate of Fates (passive skill tree)

SOLDIER

CAPABLE

- +25% Maximum Health
- +3% Rage Cost Reduction
- +3% Willpower Cost Reduction
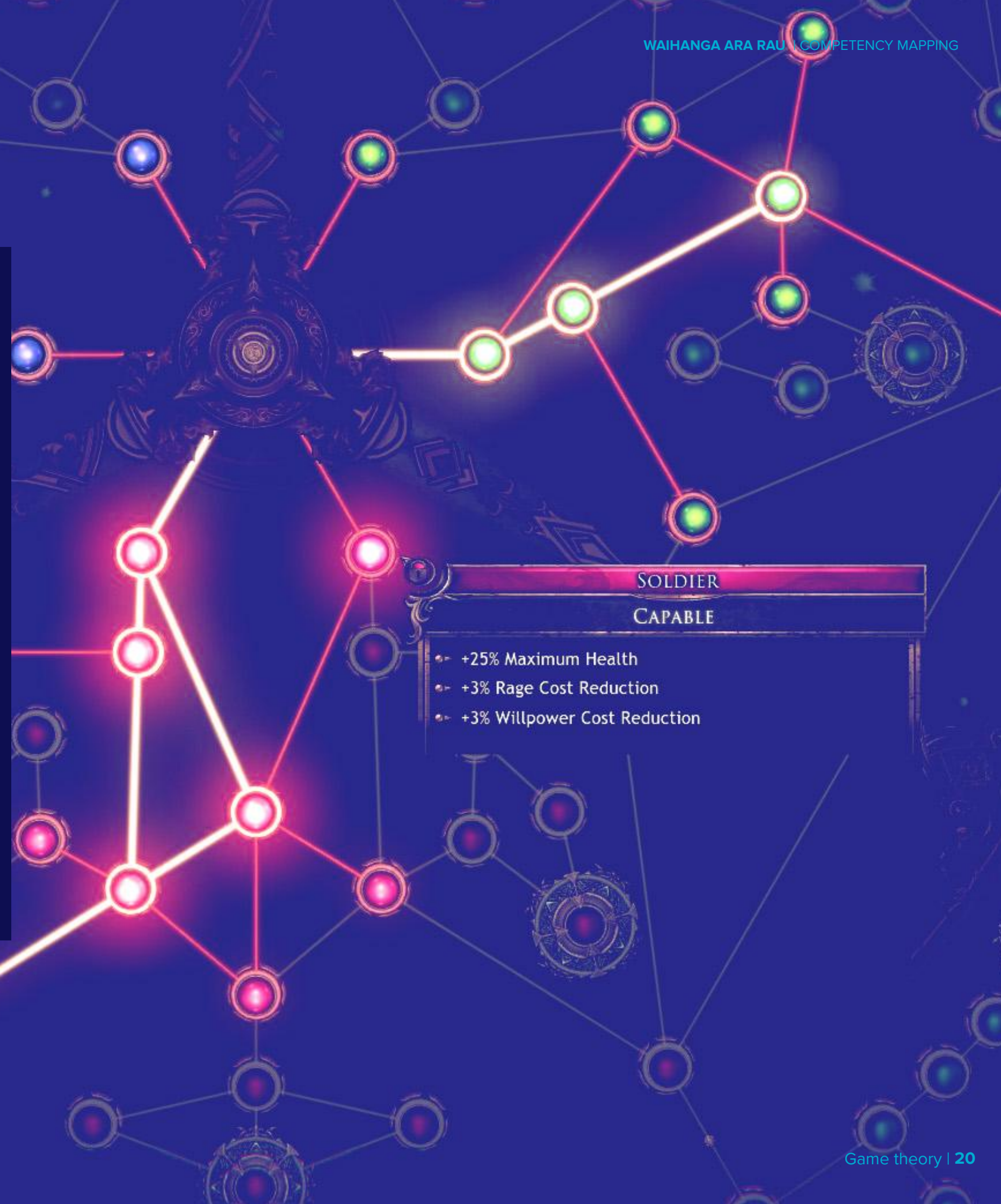
Summary of Opportunities

A trusted framework, connected by a common language of recognised skills clusters to make workers more portable.

Current state

Hundreds of internal self directed training departments that don't currently connect, resulting in workers retraining where they don't need to.

Future state

Understandable and verifiable skill clusters that increase worker opportunity.

Huge productivity gains for industry

Outcome Statements

UNIFIED SECTOR

A coordinated framework would increase mobility across industries, and see best practice being exchanged and evolved.

Visibility beyond a fixed career pathway becomes an attraction story for industry.

EMPOWERED WORKFORCE

Workers are offered a level of agency that doesn't currently exist. The ability to easily demonstrate relevant skills, coupled with the ability to stack new learning gives workers a sense of ownership over their future.

ADAPTABLE ORGANISATIONS

Rapid recognition of prior learning would expand the talent supply, enabling organisations to focus on developing future skills, rather than reassessing current skills.

The Culture Shift

↗ ## What would it take to shift from the current state to the proposed future state?

01 RADICAL COLLABORATION

The NZQA qualification framework maintains credibility through uniformity, moderation processes and review.

The development of alternative skills pathways outside of qualification frameworks would require collective collaboration across sectors to recognise skills based portfolios.

Each organisation has their own system. What would it take for a learner/industry centric system to augment each training department?

02 A NEW RECOGNISABLE LANGUAGE

Many providers and organisations across both sectors have developed their own inhouse training to achieve skill outcomes that are universal across the country. There is very little mechanism currently for these universal skills to be recognised across organisations or industries.

The orchestration of industry to innovate collectively is required. This means a shift in scarcity for talent to ensure talent pools thrive.

03 AN EXPERIMENTAL MINDSET

Start small to test:

- New technology
- Alignment of universal skills
- Data sharing
- Worker mobility

Building trust over time through starting small on alignment and sharing the learnings. This will be key for success, rather than trying to build something that solves all of the problems at once and becomes rigid and authoritative.

Recommendations

Areas for shared exploration

Explorations to augment the current system for the advantage of workers, organisations, tertiary operators and the infrastructure sector would provide meaningful advances if learnings, progress and outcomes could be shared.

4.1 JOIN THE DOTS WITHIN THE EXISTING FRAMEWORK

TECHNOLOGY AUDIT

An exploration into tech platforms that already exist could enable data sharing, skill cluster granularity, alternative pathway mapping and industry endorsed learning pathways is needed. Energy Academy has experimented with a few platforms so far, but nothing has been designed perfectly.

INDUSTRY ORCHESTRATION

Each large organisation has designed their own internal learning pathways. A few willing collaborators (as opposed to the entire sector) could begin to agree to recognise pathways with very similar learning outcomes. Once they can track, hold the data and enable the worker to own their learning journeys, this would be the first step in increasing productivity and not having to send workers to continually retrain in areas they are already competent. Working with tertiary to credentialise these alternative pathways would also provide a new currency for workers to continually upskill and learn.

4.2 A NEW COMMON LANGUAGE

COMMON LANGUAGE AND METADATA TAGGING

How would metadata tagging come into play and what data points would industry need access to? Where do they sit right now? How large is the job and where would the information be housed? Could moderation groups of knowledge specialists be formed to work with continually adapting skill clusters?

4.3 INCREASE LEARNER AGENCY

APPLY GAME METHODOLOGIES TO LEARNING

There is a lot to learn from the gaming sector. Technology exists today that may help augment the frameworks the sector is currently operating in. Partnerships in collaboration with gaming experts could help to explore alternative ways to set career quests, highlight roles and learning pathways and recognise and reward workers through their journeys.

CO-DESIGN, REVIEW, LEARNER CENTRICITY

Research on worker / learner needs and user experience will be required for co-designing for best outcomes. Learner needs and user experience, Access, agency, mobility desires, impact pathways, usability, trust

DATA OWNERSHIP

Research into data ownership and the implications of such a system that can house workers data is required. Although most platforms give individuals the option of who sees their data, a thorough understanding of ethics and New Zealand law is required.

Conclusion

Skills, not jobs will be the currency of the future.

Organisations are viewing talent shortfalls as a war they need to fight on their own. Disparate attempts against something so large scale will unlikely fill the void.

Strategic cooperation as a collective has the potential to create a greater talent pool for all, with increased productivity gains. If successful, it would showcase the infrastructure sector as an attractive and fulfilling place.

Making the shift requires radical collaboration and a recognition of a new common language.

Whilst the mindset shift to work together may seem like a large task, the steps to build trust can be small.

It is the industry's role to create a sense of orientation where there is disorientation, and connection where there is disconnection, especially when leading through a transformation.

There is no need to boil the ocean or to completely replace the frameworks and systems in place today. With an experimental mindset and an openness for genuine collaboration, small steps could be taken to make progress towards a more mobilised, portable and interoperable workforce. The benefits far outweigh the risks.

Innovative technology exists today that could enable skills based portfolios giving greater flexibility and diversity for our workers,

This means that the sector can start this work **today**, with even a small number of organisations collaborating on a series of bite-sized experiments. Sharing what is learned, is the key to success - and helps to build a fundamental foundation of trust.

Who is Energy Academy?

New Zealand's energy sector is made up of complex networks that are collectively working towards a common goal of decarbonisation.

Energy Academy is piloting new systems that connect the sector to develop the capabilities we need to achieve our industries aspirations by:

01 Strengthening the network of community of energy workers

02 Enhancing the profile of energy through storytelling

03 Identifying and sharing impactful learning & skills pathways
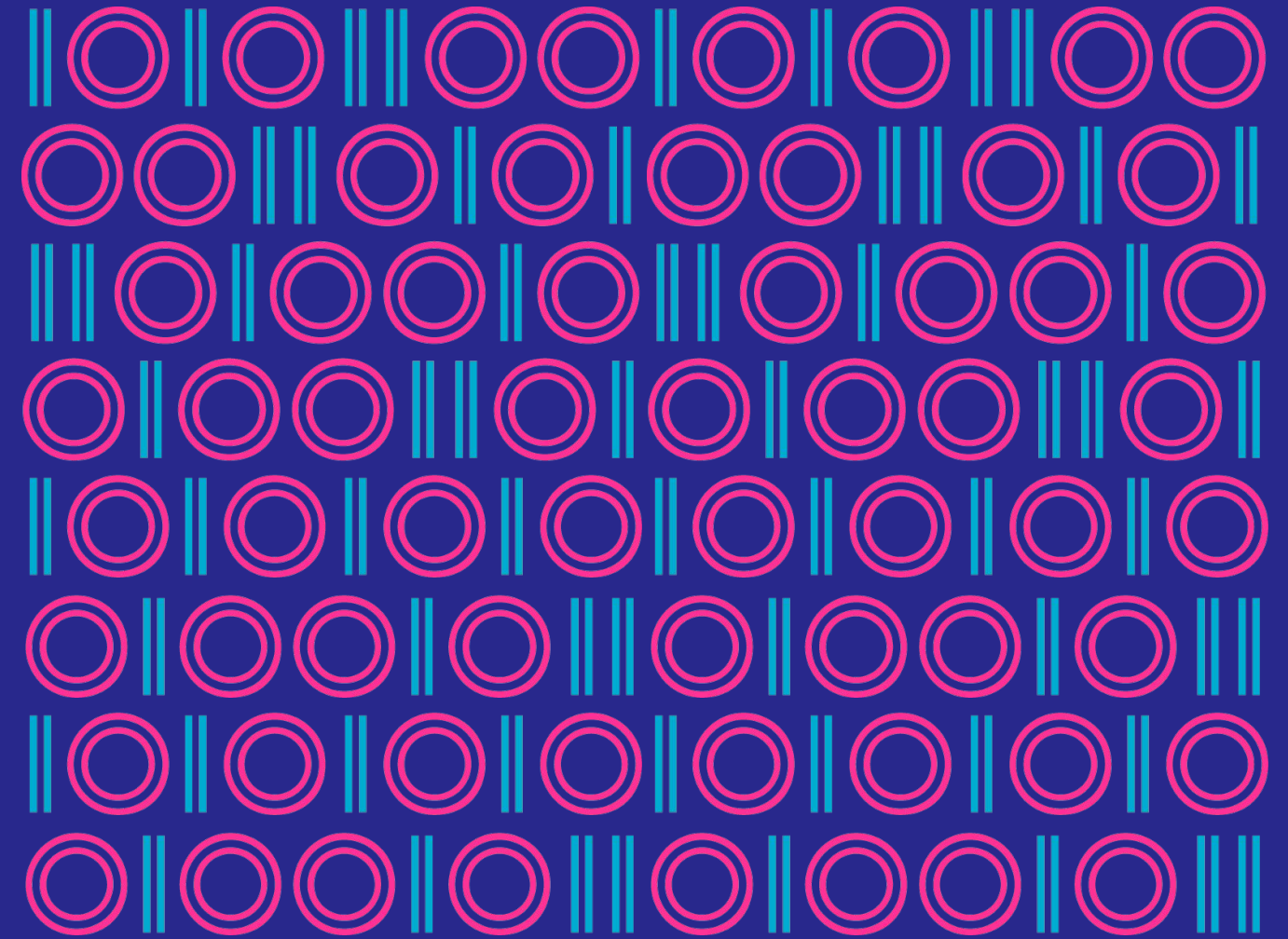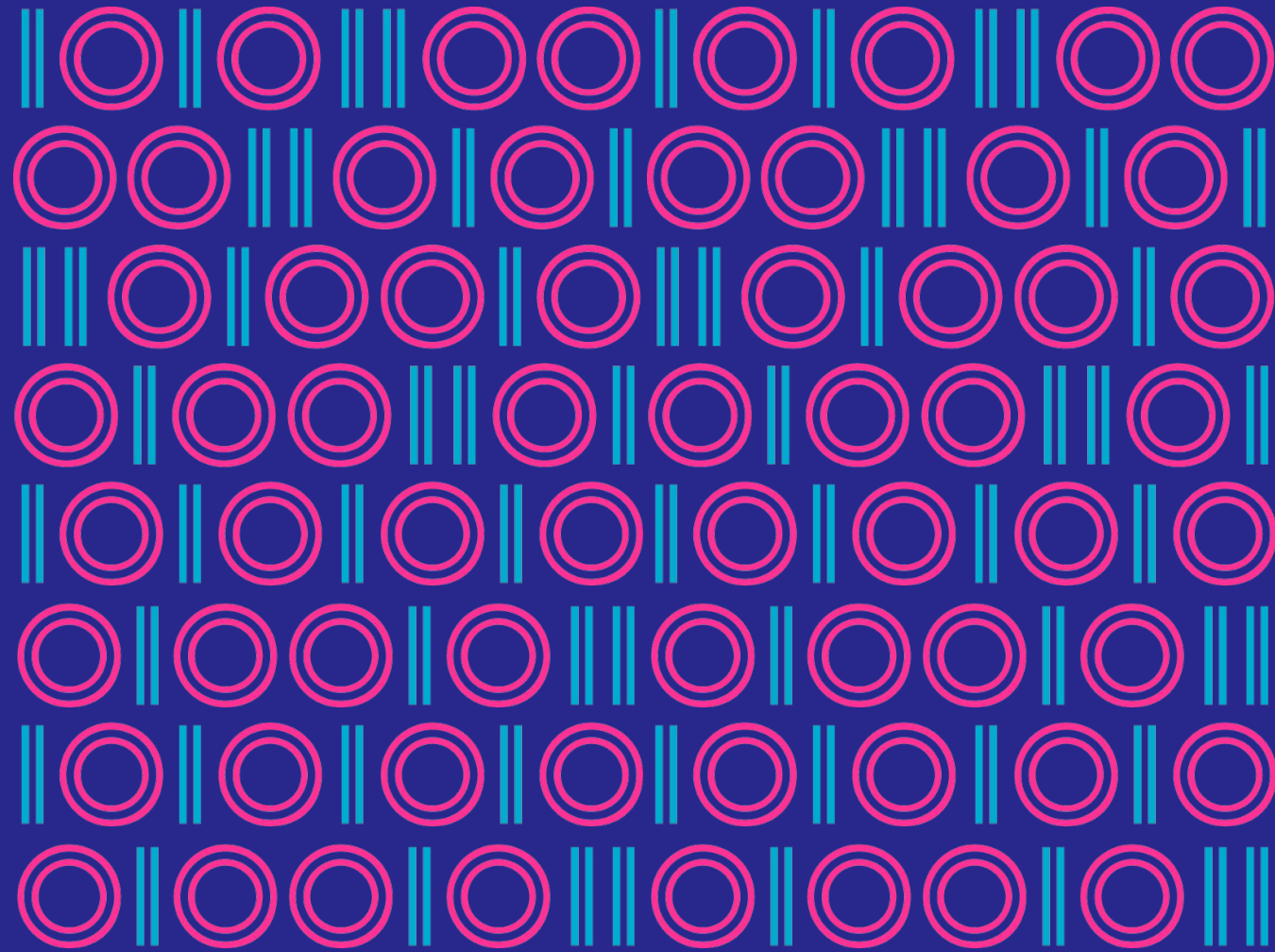
We wish to thank the following contributors

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