



CONCO>E
TŪHURA

The Next Generation Of Construction
& Infrastructure Vocational Education

Institute of Quarrying New Zealand (Inc)

Fit-for-Future Quarrying Research Project



Foresight

Strategic Thinking

FORESIGHT



Foresight is the capability to anticipate, prepare, and strategically plan for future developments, challenges, trends, and opportunities. It involves the exploration of possible and probable futures to make better decisions in the present.

It can be taught!



What it is not:

- Fortune telling or crystal ball gazing
- Static
- Detached from strategy
- Reactive

STRATEGIC THINKING

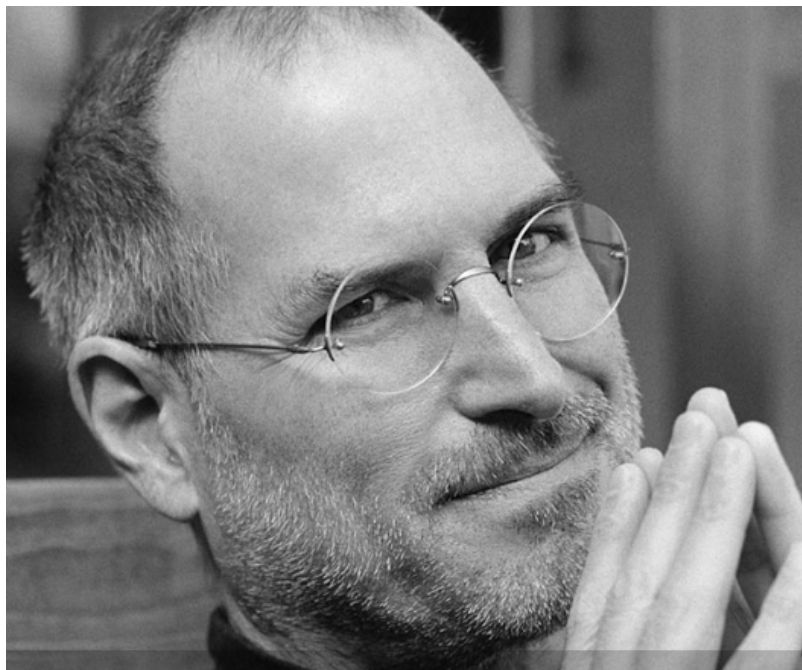
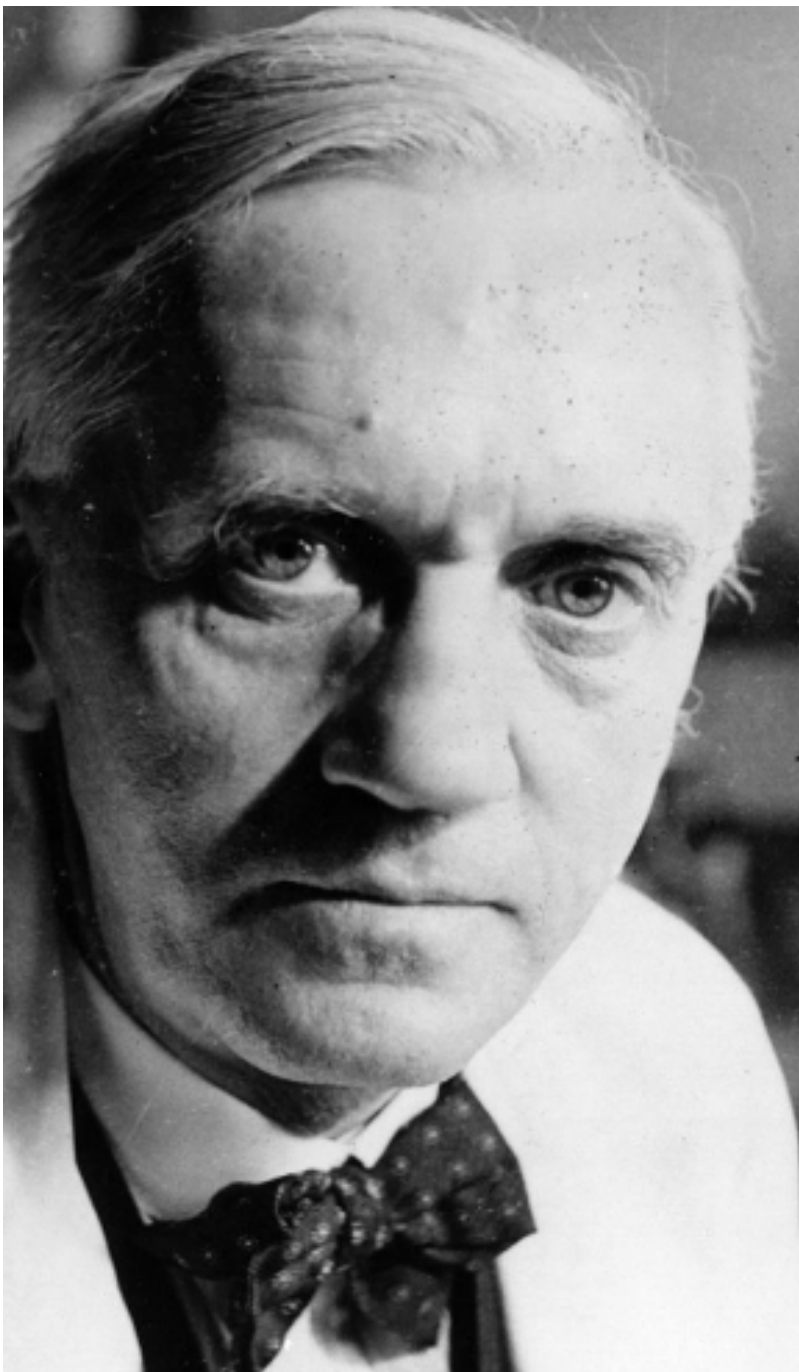


Strategic Thinking takes the work of foresight to create competitive advantage.
It can be taught!



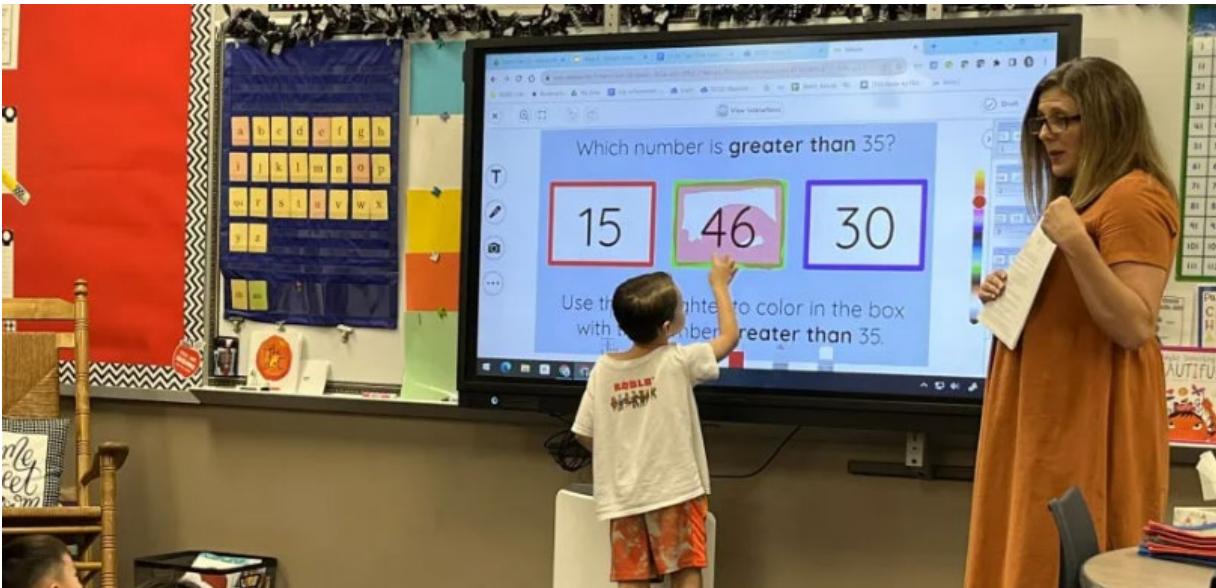
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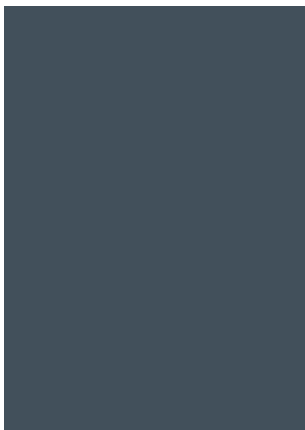
- Immediate results
- Reactive
- Narrow focused
- Guesswork
- Avoiding change













Used **foresight** and **strategic thinking** processes to answer the following questions:

1. What are the possible futures of the New Zealand Quarry Industry by 2030+?
 2. What are the drivers of the future that will impact the future of the New Zealand Quarrying Industry by 2030+?
 3. What recommendations must be actioned by the New Zealand Quarrying Industry to address these drivers by 2030+?
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Undertook 4 stages to deliver the project:

1. DELPHI

2. PESTEL

3. SCENARIOS

4. RECOMMENDATIONS

Stage 1 - DELPHI – industry experts – responded to 3 rounds of questions – responses to each round were synthesised to ‘dig deeper’.

Professionalism

- Do we need a leadership qualification in quarrying?
- How do we define career pathways and role competencies within the quarrying industry?
- Is our industry on the right path to rebuild trust within our communities? Do we authentically engage?
- Should we be moving toward international recognized credentialing?

Future Thinking

- How do we respond to globalisation and its impact on the New Zealand quarrying industry?
- How do we address the capabilities of strategic thinking and futures thinking?
- How do we respond effectively to emerging technology and Artificial Intelligence?
- How do we take all the new issues on board and still operationalise a quarry?

Innovation

- How do we address the need for innovative leadership to meet current/future needs and challenges?
- Are we addressing diversity and inclusivity effectively?
- Do we need to explore new quarry business models to meet the needs of the new world order?

Stage 2 - PESTEL – research of what are the current/predicted/probable drivers impacting on the industry in New Zealand and other parts of the world.

Political

Economic

Social

Technological

Environmental

Legal

Political

Issues

- Political perceptions
- Changes in government
- Community perceptions and awareness
- The 'woke' movement
- World conflicts

Positive

- Quarries do not fear a change of government as governments, communities and quarries are collaborating on regulations related to health and safety and land management.
- Quarries are viewed by all stakeholders as 'welcome guests' due to a reputation of responsible usage and rehabilitation..

Negative

- Unresponsive quarries are being taken over by those quarries who demonstrate proactive engagement; therefore, limiting market competitiveness.
- With limited competition in the quarrying market the price for quarry products is increasing which is having a large impact on the affordability of infrastructure projects.
- Quarries are always viewed as 'bad tenants'.
- An increased influence of community groups on local quarry operations is impacting on ongoing and future quarry operations.

Economic

Issues

- Economic growth and its impacts
- Inflation
- Infrastructure spend fluctuations

Positive

- Quarry planning is aligned to commercial objectives with sustainable goals managing the economic cycle.
- Increased confidence in the industry is permitting increased investment by government and private sectors in infrastructure spend.

Negative

- Quarries not ready to manage the growth period in the economic cycle is resulting in many quarrying operations unable to meet the demands of economic growth negatively impacting on current and future infrastructure projects.
- Quarries not prepared to manage the decline period in the economic cycle are declaring bankruptcy which is negatively impacting on unemployment figures and the local economies.
- Infrastructure spend is dictating the viability of quarrying businesses. During periods of low infrastructure spend, quarries are needing to look for other business opportunities to keep their doors open increasing competitiveness between quarrying businesses. This competitiveness is leading to unethical behaviour.

Social

Issues

- Perceptions of the industry
- Resistance to change – exacerbated by the recent pandemic
- The next 'new' generation

Positive

- A sound blend of age-groups represented in the industry.
- Improved public perception of industry practice; an industry that is attractive in the job market.
- Workforce is embracing change given the consultative approaches evident in quarry operations.

Negative

- A poor workplace health and safety culture placing all workers at risk.
- Not being able to recruit and retain talent due to a poor workplace health and safety culture and negative public perception.
- An increased industry regulator interest in quarrying operations where workplace health and safety practices are below industry standard (over-regulation).
- A workplace culture where resistance to change is dictating the speed and adoption of innovative operations to ensure business viability.
- Unable to recruit and retain talent due to a poor workplace culture dominated by a resistance to change.

Technological

Issues

- Innovation
- Automation
- New technologies
- Artificial intelligence

Positive

- Innovation is integral to daily practice and has improved resource efficiency, extended product lifelines and waste production.
- Technological innovations adopted at NZ quarries are globally recognised and endorsed.
- Artificial intelligence is helping efficiency apportion the use of resources among competing priorities ensuring the conservation of critical resources.
- New jobs have been created to manage automated and semi-automated practices with our people retrained and remaining in the industry.

Negative

- Quarries are not evolving through innovative practice and are going out of business, while others are adapting, innovating, seizing opportunities and thriving by taking advantage of the new environment.
- Displaced workers, given advances in technology, are unemployable in the quarrying industry and are searching to be reskilled to be redeployed to new opportunities within the work environment.
- Quarries not embracing new technologies continue to use outdated operational practices which is resulting in declines in productivity, productivity, safety, and corporate social responsibility.

Environmental

Issues

- Environmental politics
- Rehabilitation
- Emissions targets
- Influence of lobby groups

Positive

- Rehabilitation practices are evident throughout the lifecycle of a quarry i.e. cradle to the grave.
- Government, communities, and quarries are working in partnership to manage the environment for a sustainable future.

Negative

- A quarry's licence to operate are being revoked thereby ceasing all production which is impacting on levels of unemployment and the local economy.
- Permits continue to be under scrutiny due to sub-standard practice.
- Poor community perceptions of the industry continues and, in some cases, placing increasing extra pressure on quarries.
- Government regulatory interventions increase placing increasing extra pressure on quarries.
- The cost to rehabilitate a quarry site is increasing substantially as rehabilitative practices are not started during the initial stages of operation.

Legal

Issues

- Regulations
- Role competencies and certification

Positive

- Certificates of Competency are fully embraced by the industry as the industry determines the competencies of each quarry role.
- Self-regulation is viewed as a viable option.
- Approval processes are streamlined and managed in partnership with governments, communities, and quarries.

Negative

- Negative regulator and community perceptions are increasing creating a negative impact on the quarry organisation's licence to operate.
- The permit process is delaying the delivery of quarry products as current reforms were not successful stalling infrastructure projects.
- Quarries continue to engage external consultants to complete regulatory reports dramatically increasing operational costs.
- Limited evidence of relevant continuing professional development having traction i.e. it's not hitting the mark.
- Certificates of Competency and renewals are not seen as integral to the leadership, managerial, and operational roles.

Scenarios

Leave Us Alone Quarry



Testing the Water Quarry



Future 2030+ Quarry





Recommendations for the Testing the Water Quarry.....

Future focused leadership

Diversity, empowerment, and inclusion

Rebuilding trust

Emerging technologies

Future Focused Leadership

An **immediate** development of an industry endorsed **future-focused quarrying leadership program (a suite of courses)** to equip **industry leaders/managers/career path employees** with the skills, knowledge and mindset needed to navigate an increasingly complex and dynamic quarrying business environment. **THIS WILL NOT REPLACE THE NEED FOR OPERATIONAL MANAGEMENT PROGRAMS/QUALIFICATIONS/COURSES.**

Topics (*not exhaustive*) to include:

- * Foresight and strategic thinking
- * Emerging technologies and digital transformation
- * Ethical leadership
- * Values leadership
- * Authentic Innovation
- * Understanding the need for pivotal talent with defined role competencies
- * Communication and influencing strategies
- * Risk assessment processes
- * Well-being practices

Learning Methods and Assessment Tools:

- * Active case studies – develop, implement, evaluate, and re-develop.
- * 360-degree assessments.
- * Industry talent for peer learning and assessment.
- * Resources and tools.

Diversity, Empowerment, and Inclusion

A **diversity, empowerment, and inclusion action plan** for the New Zealand quarrying industry that is **comprehensive, tailored,** and **industry endorsed** to address the specific needs and challenges of the industry.

Components to be included are:

- Authentic commitment from quarries and industry stakeholders.
- Authentic data collection and analysis to define next steps.
- Clearly articulated implementation timeline.
- Talent attraction and retention lead by the industry.
- Targeted and authentic professional development and training.
- Health, well-being and safety inclusion practices (not in isolation; embedded in daily practice).
- How to best use the mature industry talent to bring out the best in the young industry talent and vice versa – a culture of ‘internal industry respect’.
- Career paths need to be clearly defined and resourced.

Emerging Technologies

An **emerging technologies action plan** focusing on identification, assessment, and integration of cutting-edge technologies that can enhance operations, drive innovation, and improve efficiency. The action plan should address quarrying industry-specific needs while also considering broader technological trends.

- Technology roadmap awareness – What is so? Possible? Needs to happen?

For consideration in the action plan:

- Preparing for automation and robotics
- Artificial intelligence and its impact
- Cybersecurity
- Regulatory compliance – how does the new fit with the current?
- Monitoring, evaluation and review.

Rebuilding Trust

Rebuilding trust within the New Zealand quarrying industry will require a comprehensive plan that addresses concerns, enhances transparency, and fosters positive relationships with stakeholders and communities.

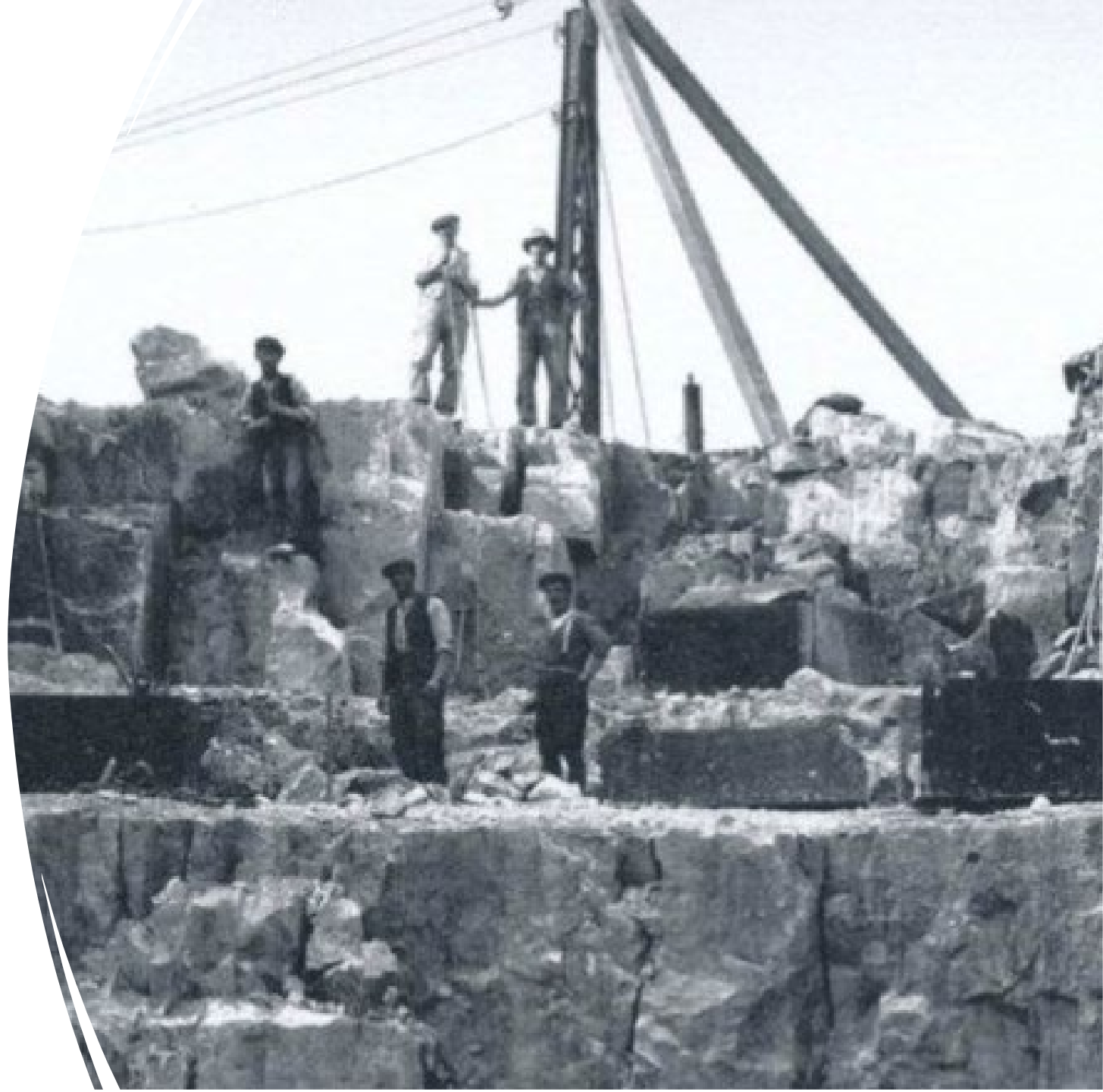
- A stakeholder and community education program focused on transparency and accountability – call out the lack of trust issues and address them head on i.e. environmental stewardship, corporate social responsibility, health and safety etc.
- Strategies and professional development program on how to achieve 100% commitment to ethical governance and operations.
- Monitoring, evaluation and review.

Key Message

Our industry needs to be in the driver's seat, using the capabilities of foresight and strategic thinking, to create our future receiving guidance and support from our industry partners and stakeholders. If we don't, an external will decide our future.



1932 Quarry



2024 Quarry



Where to from here?

Wednesday 25 September 2024
Wellington

Future Quarry

