

Submission to the NZ Productivity Commission, 5 February, 2021
re- “New Zealand firms: reaching the frontier. Draft report”
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***Explanation.** - This submission comprises an initial comment on the Draft Report and continues with a set of personal observations of some of the key differences between the innovation behaviours and systems of New Zealand and those of other SAEs; together with a short paper that further illustrates these differences with respect to Finland, and a recommendation for what we, as New Zealanders might profitably do, to begin to close the gap between us and those enjoying greater economic success. The use of Finland as a model for us to emulate is relevant as they evolved from an agrarian society akin to present-day NZ and their people were similar to NZers in their values.*

COMMENT ON THE DRAFT REPORT

Effective innovation is central to the achievement of high productivity. Regrettably, this issue is only addressed by this report in the most general way. This emphasises how poorly we understand this subject. Surely, it should be the beating heart of the present document. At best, a review of the country’s innovation processes is recommended as ongoing work.

Understanding this omission is critical to understanding the failure of our national innovation processes to deliver better productivity. Relative to the innovation processes and systems of the economically-successful North American, North European and Nordic SAEs our own systems and processes are substantially the converse of the former in their key elements. If we were better than them, this might be acceptable. As the results clearly demonstrate that our way is not working, our need is to understand why and how they are better. This will not be easy, as such information is not shared lightly – contrary to our naive expectations. Developed nations take seriously their individual economic survival.

Our core problem is that we as New Zealanders are mostly well-educated, but not well enough. We do many things well, but others do them better. Our challenge is to identify the reality of these differences and propose a pathway towards the capability that we need.

It is also insufficient for just a few to have this insight. Our present system is too well entrenched and too many people are benefitting from it to let it easily go. Our need is to have a sufficient group of individuals, with personal knowledge of how we could be better and the passion to pursue this, to spread out across our different commercial sectors and lead the necessary revolution of ideas.

At the outset of my career, I enjoyed the respect that the northern hemisphere countries had for the potential of New Zealand. Sadly, this respect is no longer offered. We could have done better, and still could.

INTRODUCTION

The **following observations** result from my full career in the development of technological innovation for the capital- and technology-intensive national and global paper industry against all odds and from a provincial-NZ base; principally through an industry-Government partnership.

My work contributed to changes in the way the world makes paper and was awarded the best-in-the-world Arne Asplund Medal of the Swedish industry – the single such global medal received within the NZ forest industries. Over the years, my activity afforded me privileged insight at the highest levels to the innovation processes and practices of the North American, North European and Nordic nations. These observations evolve directly from my paper and forest industry interaction, while being extended by my broad overview of general innovation, industry and university activity in New Zealand and world-wide.

The **appended article** *We can learn from success* was published in the *Boardroom* Journal of the Institute of Directors of New Zealand in September, 2008. It was written with the intent of similarly stimulating discussion leading to improved national productivity from an awareness of critical and substantial differences between the behaviours of New Zealanders and the Finns. This article remains as relevant today, as it was when published; and is underpinned by a more substantial, unpublished document.

Generally, my experience is that, as New Zealanders, we broadly lack

- the technological depth and aspiration to succeed through high value-added innovation, as other successful nations do.
- appreciation of, and concern for the magnitude of this gap.

Whilst our occasional successes confirm that we are capable of world-class innovation and delivery, your report reminds us that these are too few. We have significant social and institutional barriers to success that must be addressed. My observations indicate that it is transformational change that is necessary, not simply a re-focusing of business-as-usual.

It is also unfortunate that the behaviours and systems of New Zealand's contemporary innovation system are now so deeply embedded that there is no apparent appetite for an alternative approach. This is our greatest challenge.

Ultimately, there is no rule guaranteeing that success is either easy or guaranteed.

RECOMMENDATION

As New Zealanders, we need a formal programme of collective learning by a select group of aspirational persons with commercial and technological aptitude, that enables us to

- better understand what the citizens of more successful economies know and do on a daily basis; and how they think inside their heads.
- accept that the achievement of this is likely to require an inter-generational programme of some decades duration.

This programme will involve the selected persons living and working in target environments amongst the SAEs for some years and the ongoing communication of their experiences to a larger group networked as a learning community. Variations of this type of programme have been integral to both the earlier activities of the presently-successful economic nations and those of New Zealand. A detailed framework for the delivery of this engagement is available.

OBSERVATIONS

Being good enough

1. World-class

The *world-class* performance necessarily required of *world-class* frontier companies, requires persons who really are amongst the few, perhaps just a handful, who are at the global leading-edge. These persons provide thought-leadership in their field. They will have envisioned and practically demonstrated path-breaking steps in critical mechanisms, processes or systems and be networked amongst their peers.

New Zealand can and does generate such persons who “punch above their weight”, but not as many as broadly claimed. It is insufficient to be simply be knowledgeable of frontier activities and to participate in international fora. Exceptionalism in an echo chamber is unhelpful in this regard. Too frequently we allow boosterism to cloud our better judgement.

2. Standards of delivery

World class innovation, no less than in the fields of sport that New Zealanders better understand, requires the highest standards of delivery. These standards cannot be compromised. Those capable of world-class performance will rise most easily from broad populations aspiring to work to the highest standards, just as specimen flowers do not readily flourish from poorly prepared ground.

Societal needs to “include all in the team” and “leave no-one behind” cannot be achieved at the cost of performance standards. Rather, if success is to be realised, it is important that all involved know what is required of society as a whole. For those for whom the pathway ahead may seem intolerably long, it is important that they be offered a sense of participation and achievable steps in the understanding that they are only on part of the journey. Overall, it must be appreciated that the more productive economies already have their people predominantly at elevated levels on this pathway and that such standards are possible for the educated and motivated. Our question is “do we really care”?

Achieving innovation

3. Innovation initiated within the private sector

In the northern American and European economies, innovative steps are most commonly initiated within the private sector. The role of the universities is to provide understanding of the technology (applied science) around these steps. Frequently this will involve post-graduate thesis projects performed by a student who, on graduation, will subsequently take his/her acquired knowledge to a position with the initiating company. This is in marked contrast to the New Zealand expectation that universities and CRIs should identify and demonstrate innovative opportunity.

4. Academic integration within the private sector

Integrating the deep intellectual knowledge of university academics within the innovation processes of private sector companies can take many forms in the international arena.

(a) It may simply and commonly involve reduced-term employment contracts that cover just nine months salary out of any year, or two/three days out of a five-day week – this provides the opportunity for the individual to arrange supporting employment appropriate to their knowledge within the private sector. In this way, the academic can participate in strategic company discussions of technological opportunity, bringing an awareness of the contemporary science/technology and take ideas of commercial interest back to his/her university for further exploration through post-graduate thesis study. Such joint positions command respect.

(b) A more formal mechanism appropriate to the NZ CRI's is the Swedish model of the 1970s and 80s for its applied research institutes, in which a sector-research committee chaired by a senior industry executive (usually at the Technical Director level) is responsible for research performed as post-graduate thesis study under the guidance of senior professorial and other academic staff. Again, on graduation, the individual students (who will have been on industry-level salaries) are invariably given employment by the particular company that provided their research topic. In this way, the applied institute's research staff is constantly refreshed by local students with state-of-the-art understanding of the science and technology of their subject and industry gains knowledgeable and useful graduates.

5. University sabbatical leave

The North European and Nordic academic understands that their primary loyalty is to their national industry and that their personal bread-and-butter results from this. Whilst they do arrange sabbatical leave with foreign companies and in foreign countries they will be guarded in their conversations of strategic national knowledge and of their personal research. The tighter integration of the NZ universities within a national innovation system should consider this issue.

6. The necessary scale of R&D investment

It is attractive for New Zealand to think that there is a linear direct return on investment in R&D, particularly for those seeking increased funding. In reality, countries spend on R&D what they can afford. It is those economies with a high value-added component that can afford higher proportions of R&D investment relative to those, like New Zealand, who predominantly produce commodities. A review of now successful economies will show that they invested more modestly as they began their transformation from low-value exports. Their transformation evolved from their determination to succeed, their smart use of available knowledge (mostly of others) and emphasis on appropriate education.

Knowing what they know

7. Performing as they do

NZ's direct copy of the innovation structures of other, more successful economies will, on its own, be insufficient. Rather, if we wish to achieve their successes by implementing their systems, we must bring to our discussion the same agendas, aspiration, depth of understanding and tacit knowledge that they do. The achievement and refinement of this capability will be a lifetime work for those participating.

Broadly, we need to be humble in our appreciation of the deep maturity of knowledge of the successful economies. While our country's freshness of youth may provide energy and flexibility, age provides wisdom.

In the extreme, the experiences accumulated along the lifetime of Europe's largest paper company, the Finnish *Stora Enso*, which had its origins in what was possibly the world's oldest industrial company, *Stora Kopparberg*, chartered in Sweden in 1347 AD, should take our breath awayand if doesn't, we should seriously consider why.

8. Competitor awareness

Detailed awareness of the innovation processes and systems underpinning foreign competitors and suppliers is almost, if not wholly, non-existent amongst NZ private sector management. The recently acquired culture of risk-aversion and emphasis on cost-reduction has severely weakened any resolve to implement any new technological step that cannot be fully demonstrated. As such, the innovation practices of foreign companies and how they achieve these is generally of no interest. Foreign-ownership of NZ companies does not appear to provide any local benefit in this regard.

9. The tyranny of distance

It is too easy to accept that it is our distance from world markets that is our problem. True, distance is a limiting factor but arguably is not the defining reason for our present demise. Where distance does challenge us is in our easy, regular, personal, commercial and professional interaction with our peers in the northern hemisphere that would allow us to learn from them. Culturally too, our eagerness to interact on superficial levels may be at the expense of our ability to listen and observe more deeply.

For all that we travel, how much do we learn? How many New Zealanders who have enjoyed packaged canal boat tours on the Rhine could say anything of the commercial practices of the industries that line the lower river banks?

Whilst the traditional New Zealand OE has the potential to provide insight to successful industry practice and the foundation for individual life-long professional networks, these appear rare amongst the technologically-inclined. Also, our choice of London as our prime destination is arguably not be the best place to develop capabilities appropriate to New Zealand's need.

In contrast, the North European/Nordic post-graduate degree will invariably require a minimum of one year's approved study or project work in a foreign country. In many situations, home country funding is available to provide or supplement the student's salary and assist with travel.

Planning for transformation

10. Strategic change should be confidential

If New Zealand is serious about achieving productive change, it will keep its key conversations and strategic planning confidential within national boundaries, just the SAEs have in moving along their own change pathway. Serious players do not share their strategy with competitors.

The understanding that New Zealand seeks from others won't be willingly shared by those best able to give it. It certainly won't be garnered on any two-week whistle-stop tour. If aspects of a particular nation's innovation systems are readily available, we can be certain that other critical components are kept well hidden.

11. Achieving skill through migration

The advanced economies of the North European and Nordic countries have been achieved by developing the necessary skills within their own people. If others find contributing roles, they will be peripheral. In this way, continuity is maintained in national values and aspiration to succeed. If this suggests shades of nationalism, these countries have long histories and are determined to be part of the future. On the other side of the Atlantic, the North Americans have been more open to migrants, but they are also bigger and develop companies more easily to dominate on the world stage



We Can Learn From Success

Reprint

New Zealand's need to improve its productive capacity is unquestioned by those concerned with our economic wellbeing. Our greatest challenge is to identify what we might additionally do, that successful economies know and practice. Directors, with their charge for strategy, have a particular responsibility to lead this search.

Doing more of the same won't be sufficient, even with the policy refocus urged by Kerry McDonald in June's *boardroom*. Our present processes have had ample time to demonstrate their potential for success. Yet there is little indication of the necessary performance lift. A circuit-breaker is necessary. We must extend our horizons and look beyond our imperial-scale Anglo-US role model to other wealthier countries of our size and values to find their modus operandi.

Finland, an appropriate model

Finland is the obvious country to look to. It is the economic success that we would like to be. It has:

- transformed itself into a leading global economy, in just the last 50 years from being a poor agricultural country with no advantages and many disadvantages
- succeeded through its own domestic business base and self-contained actions - not by the investment and technologies of others, as Ireland did
- achieved its success as a welfare state

- a similar population to us - around 5 million, if we include our diaspora.

As New Zealanders, we are considered to be more like the Finns in our values and qualities than any other nationality and have similar social and innovation systems. We should be able to learn from them and be as effective. Our broad understanding of *how they do what they do* could provide transformational insight. In practice, Finland's actual economic pathway is unlikely to be any more appropriate to us than that of any other country.

Finland's success

Finland's economic platform is staggering. Globally, it leads mobile phone technology and open-source software development. Nokia, its crown jewel, operates within an informational economy cluster of around 3,000 ICT companies. Its wider portfolio encompasses global activities in paper manufacture and papermaking systems, industrial automation, electrical and mechanical engineering, shipbuilding and biotechnology.

Three aspects of Finland's economic achievement are of particular importance to current debate in New Zealand. Finns have:

- improved the quality of life for all their people, as they have advanced economically. They exercise strong ecological responsibility and nurture their arts. Internationally they are renowned for their architecture and design.
- progressively reinforced their welfare state to ensure no-one is left behind. Their model contrasts with that of Silicon Valley, that leaves behind those it doesn't need.
- transformed their agrarian economy to a multi-sector global platform with an R&D investment similar to our present spend. It is only now, in their position of leadership that they can afford to invest over 4% of their GDP in R&D, having proven their ability to prosper from

earlier, lesser investment.

While Finland's position on the edge of Europe might be considered a market advantage, similarly located countries, from Albania to Portugal have proven this proximity to be no sinecure.

The Finns

Understanding the Finnish achievement requires an understanding of their bio-economic and politico-cultural histories of survival. Harsh winters have brought famine and widespread death. Lying between the West and East, the political survival of Finland has never been guaranteed. It has been a poor country for most of its existence. Economic strength and freedom from debt provides defence against the insecurities of life. Debt is regarded as giving control to others and costing more.

Socially, the Finns have a history of working together to survive: the 1939 winter war against Russia, reconstructing the country after 1945, building their information society as a pathway out of their deep recession of the early 1990s. Finns have a globally unique character. Active listening, reflection, strong technological competence and a massive determination to succeed are combined with the general behaviours of the Northern Europeans and our New World. State-of-the-art technology is utilised within a framework of age-old rural values of commonsense, directness, reliability,

simplicity, tenacity and hatred of bombast. In an interesting contradiction, they have both a strong respect for social cohesion and rules while displaying a simultaneous desire for independent thinking and choice.

Mainly silent people, Finns think deeply. Silence stimulates vision, imagination and calm judgment. Shunning hype, Finns let the technical story do the talking. An ability to summarise is prized. Beneath their deceptive reticence, Finns are formidable people – perfectionists¹.

Key elements of innovation

The Finnish model emphasises excellence in technology. The private sector determinedly focuses on the techno-commercialisation step at the leading edge of innovation. Industry and the technology universities are seamlessly interfaced. Industry need and opportunity drives comprehensive education, research and enrolments in the technology universities.

This model evolved within national postwar strategy to profitably transform their

¹ Observations on Finnish character summarised from *Finland, Cultural Lone Wolf*, Richard Lewis, 2002.

agrarian economy, by advancing beyond their principal export of raw materials.

Lacking any natural advantage, the Finns have maximised their personal potential to give them their best chance of surviving as a small, sovereign nation. From limited beginnings, they have relentlessly pushed towards higher-value products and services and expanded their dominance of the processes and systems for the delivery of these. Typically, they now globally supply advanced paper grades and the complex machines and control technologies necessary for their manufacture. These evolved from their earlier manufacture - using foreign technologies - of basic paper and timber grades from their slow-growing forests.

Specific features of their model are:

- 1. High-value, technology.** Deep technology knowledge runs through their companies from the board down. Processes and products are continually improved and diversified. Decision-making is quick and effective. Strategy is carefully thought through. Risks are not taken. Commitment is frequently given to transformational change even when the technology pathway is unclear. They have proven their ability to resolve issues as they arise. Mistakes happen, but are quickly recovered from.

- 2. Technology-qualified people dominate the company executive.** Boards have technology-literate directors to lead the interrogation of innovation strategy and performance. Continuous learning is practised by all. New knowledge is ceaselessly inquired from colleagues and visitors alike. Always alert, they seek to identify and act on indicators about the future before others do. The present informational society model that seamlessly links market opportunity and capability between companies is a natural extension of their meritocratic companies.
- 3. Industry-university partnership.** Industry staff at all levels participate extensively in university research, planning and implementation. Senior academics may have part-time positions within industry to link them to market opportunity, practical need and industry culture. The country's new University Act requires institutions to 'act as a driver of positive change in society, a development-driving machine, a generator of new realities'.
- 4. Technology education.** Tertiary education seeks to attract and comprehensively educate all students capable of succeeding in the technology disciplines. Finland produces twice as many (27%)

engineering, mathematics and science graduates as most EU countries. A minimum of eight years' study is required for the widely-achieved Technical Licentiate degree (similar to our PhD). Research theses for this degree commonly address current industry opportunity and are the main technology-transfer conduit from university to industry. Joint technology-MBA qualifications are increasingly common. Students work and study in foreign countries as part of their degree requirements. The Finnish school system is unashamedly competitive, but uniform and supportive of all. A Finn's status is largely determined by their educational achievement.

How New Zealand compares

New Zealand's conundrum is that many of its social and innovation strategies are similar in structure and aspiration to those of Finland, but Finland is achieving so much more economically.

While individual New Zealand businesses do shine, our success is not at the level of Finland's.

Viewed from the Finnish perspective, New Zealand enterprise generally:

- lacks a deep technology dimension in deference to commercial practice. Technological competence and interest at the leading edge of global practice is rare amongst governance

and senior management. In its absence, there is no one to inspire and sustain the dialogue necessary for technology-based profitability. Resource may be exploited and companies expanded with more of the same, or managed down the cost curve and restructured. Rarely are companies lifted beyond delivering time and service.

- does not know technologically what it does not know — that its international competitors frequently do know. Widespread reliance on the ‘risk-free’ and “proven” technologies of others severely limits awareness of innovation opportunity and disruptive change.
- gives little practical direction to, and is weakly integrated within the national science system. Most national research follows its own agenda to contribute science knowledge rather than technology profit. Much applied R&D supports low-value commodities reliant on energy-intensive delivery-lines.
- doesn’t question and is too busy “doing” to think and really question. Often doesn’t see the future until it happens.
- employs staff with familiarity to perform competently and safely

rather than those with capability that allows innovation.

Our dairy sector has come closest to emulating Finland’s technology strategy, in its sustained integration of market-research-milk processing in the latter half of the last century. The present success of dairying testifies to the value of this investment.

Whilst technologically-educated people do share in leading our businesses, our commercial culture invariably forges the dominant style. It is the expertise offered by technologists successful within the innovation process that is of importance, rather than their working knowledge of a functional discipline per se. An ability to nurture new value propositions by asking sharp technological questions and weighing the merits of the answers given is fundamental to the leadership of a technology culture.

Achieving awareness

Most New Zealanders are unfamiliar with Finland. For us to gain from any transformational lessons Finland might provide, we must begin to observe them in practice by living and working there. This will not be easy. Both the Finnish language and climate are challenging. However, most Finns are fluent in English and their environment livable.

Kiwis traveling to Finland should be well briefed and be prepared to observe quietly

and with humility. They will find the Finns hospitable, once friendships develop. When accepted, they will invariably be energised by the stimulus of people who continually act “to make tomorrow better than today”. People wanting to be involved must be attuned to the unique behaviours and mechanisms that Finland has and New Zealand does not. They will necessarily have joint technology/commercial instincts. Selected undergraduates could be included to perform part of their study in Finnish universities.

This learning process should be centrally organised if it is to achieve early impact. In the manner of other successful countries, the Finns withhold insight to their critical processes from outsiders. However, they do wish to expand their understanding of the world’s diverse cultures. In return, we could offer them some insight to this. Once a critical mass has returned to our shores with insight to Finnish behaviour and practice, it will have the scale to stimulate critical improvement in our wealth creation processes.



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