

Chapter 8

International Comparisons of Models of Innovation Models: What is to be learned about the New Zealand Situation?

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8.1 Introduction

This paper focuses on cross-cultural comparisons of innovation identity for selected nations. Through comparison with other nations, one can come to better understand the uniqueness of New Zealand's innovation situation. This work on innovation models may not be directly linked to user innovation but it is still relevant to the user innovation (TUI) situation in New Zealand. The comparison of innovation models across countries can tell us about what is distinctive about innovation in New Zealand, and it can provide 'take home' lessons for New Zealand innovation. These comparisons and lessons relate to innovation generally but, since TUI is part of our general innovation situation in New Zealand, they also inform our understanding of TUI in New Zealand.

8.2 Methods

A wide range of case-study countries were considered for study and we've chosen four in addition to New Zealand to discuss in this paper. We will look at Sweden, Finland and Denmark as well as Australia. Sweden, Finland and Denmark were chosen as these nations have been rated by Pro Inno Europe as being leaders in innovation and, thus, may offer unique insights into the types of innovation identities that are needed in order to lead in innovation. Australia was chosen for inclusion because it shares a similar cultural heritage with New Zealand, namely European, but has had significantly more success with respect to innovation.

Qualtrics was used to survey respondents from the selected nations. Qualtrics was hired to solicit volunteers from each of these countries to fill out a survey consisting of 18 open-ended questions about culture, national identity and innovation identity as well as 9 demographic questions. Respondents were also asked a series of Likert-type questions but these questions were not used to formulate respondent models of innovation and are thus not discussed here. The survey can be found in Appendix 1. Qualtrics was asked to obtain at least 20 respondents from each of two different age groups-20 to 40 years old and >40 years old. We asked the approximately equal numbers of men and women be obtained and that respondents be citizens of the nation. In the end, we often obtained from Qualtrics more survey responses than the initial 40 agreed upon, in many cases obtaining over 100

usable surveys. It should be noted that Qualtrics was not always able to provide us with the age distribution and gender distributions we asked for although each sample represents a wide range of ages and at least 20 males responded to each of the surveys.

Table 1 shows the demographic breakdown of our sample. Surveys were translated prior to being loaded into Qualtrics and all respondents had the opportunity to take the survey in their native language if they so chose. It was estimated that the survey would take respondents approximately 30 minutes on average.

Table 1- Demographic Information for Qualtrics Sample

	New Zealand (n=108)	Australia (n=101)	Austria (n=71)	Denmark (n=38)	Finland (n=90)	Sweden (n=164)	South Korea (n=40)
Gender							
Male	36	41	21	24	44	54	20
Female	72	60	50	14	46	110	20
Age							
20-29	14	28	40	23	50	39	6
30-39	37	25	25	10	30	29	15
40-49	30	9	6	3	10	59	14
>50	27	37	0	2	0	37	5
Education							
University Degree	57	43	23	13	19	70	36
Trade/Vocational/Technical	26	36	17	10	23	23	0
Upper High School	23	21	28	12	20	59	4
Lower High School			3	1	20	10	
Less than High School	2	1	0	2	8	2	0

Text from the open-ended interview questions was analyzed via discourse analysis. Ideas relevant to six main areas of innovation identity were noted. The areas of innovation identity were: industries, beliefs about innovation, limits to innovation, reasons for success, prominent figures and prominent companies.

8.3 Innovation Models

The models presented below are largely self-explanatory. In order to avoid being repetitive, the discussion following each model will focus on the most important aspects of each model and any overarching conclusions about a nation’s national innovation identity that can be garnered from the model.

By comparing New Zealand innovation identity with those of other nation’s lessons can be learned. I’ll highlight points of similarity and divergence between New Zealand and the

nation’s covered in this report and any potential messages regarding New Zealand’s innovation landscape that might be garnered via comparison.

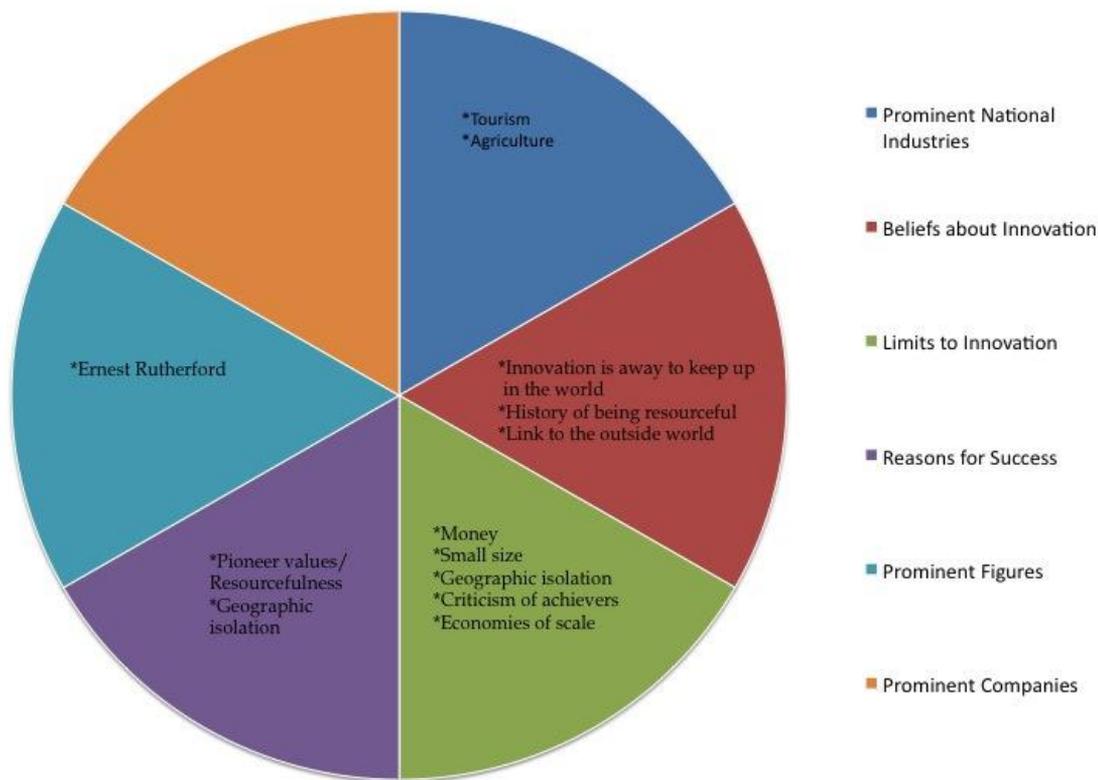


Figure 1: New Zealand Innovation Identity

New Zealand’s model of innovation identity highlights the belief that New Zealanders are resourceful. This resourcefulness comes, in part, from the isolation of New Zealand. New Zealanders had to modify available resources to suit their own needs as getting new materials wasn’t always easy. New Zealand’s distance from other nations was seen as both a positive for innovation and a negative. In the past, being inventive was necessary for survival thereby breeding a culture of people willing to think outside the box. However, in the present day New Zealand’s geographic isolation is seen as a detriment to innovation. The small size of the country coupled with its distance from other trading nations is viewed as a hindrance to innovation success. The national market is too small and the international market is too far. Economies of scale don’t work in New Zealand’s favour with the consumer base of the nation being too small to allow for the price of production to be minimized by increasing the scale of production.

Respondents saw innovation as a way for the country to keep up in the world and also as something that links them to the outside world. With the advent of the internet and improved telecommunications, some of the isolation felt by New Zealanders was assuaged.

Unlike many of the countries to be discussed in this chapter, respondents named few prominent figures who were either inventors or known for being innovative in some way.

Ernest Rutherford, the man who split the atom, was the only person frequently named. The absence of high profile figures in science, technology and innovation is an interesting point to note given that respondents thought that New Zealanders were an inventive group of people. It suggests that many inventors may not make it to the commercialisation phase where their names would become known and that prominent scientists and technologists may not be getting the national recognition that they deserve. It is also important to note that the category for prominent companies is blank in the New Zealand model meaning that no companies showed up as significant for New Zealand’s innovation identity. This is a sharp contrast to many of the countries we’ll be looking at later in the paper where several companies contribute to innovation identity. The absence of any companies in this category indicates the innovation landscape as measured by innovative companies is either small and/or not particularly visible in New Zealand. If companies aren’t visible by the national community, it’s also likely that they aren’t visible by the international community.

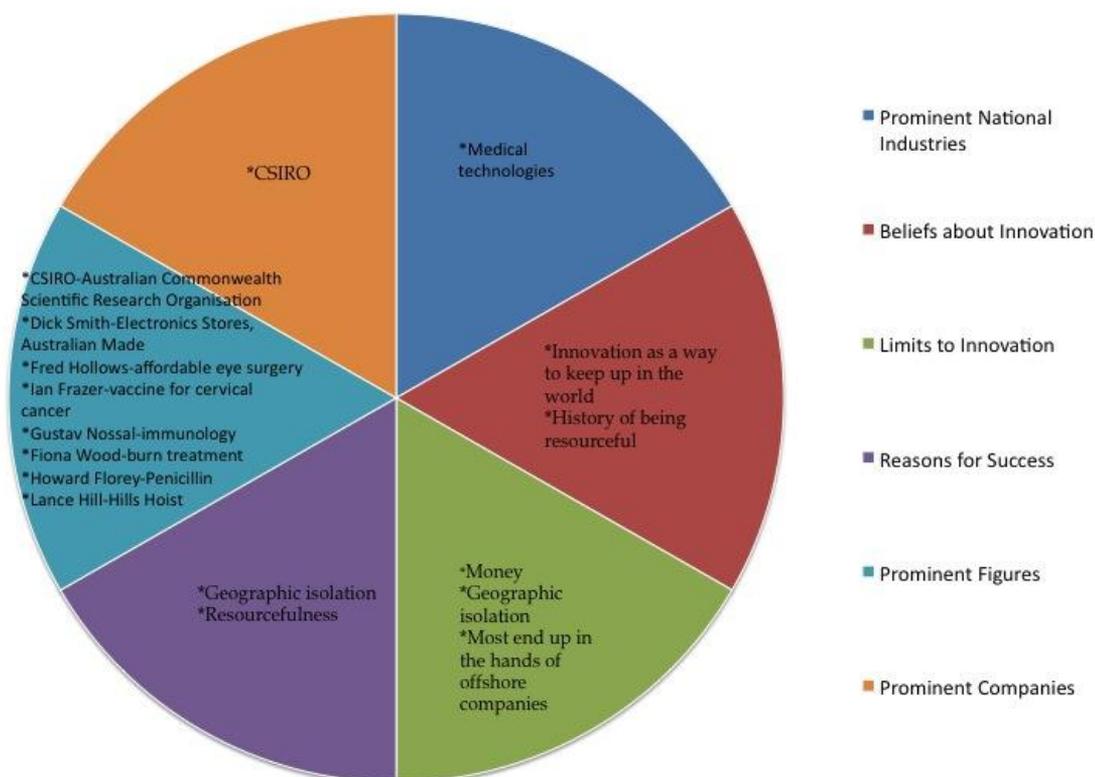


Figure 2: Australian Innovation Identity

Australia’s innovation identity is similar to New Zealand’s in many ways. Like New Zealand, innovation is seen as a way for Australia to keep up with the world and respondents believed Australians were historically quite resourceful. Further, geographic isolation is seen as both a plus and minus with respect to innovation. It helped drive Australian’s to be inventive but also serves to limit the nation’s current innovative potential.

Unlike New Zealand respondents, Australian respondents name a number of innovative Australians as prominent figures for the nation. Names ranged from entrepreneurs to a host of medical scientists, thus, indicating a greater public awareness of those prominent in

science and technology within Australia. It should be noted that only one organization, CSIRO (The Commonwealth Science and Industrial Research Organization), was named as a prominent Australian company known for innovation. CSIRO is a government funded organization promoting national innovation. The absence of any private companies in this category indicates the innovation landscape as measured by innovative companies is either small and/or not particularly visible in Australia.

Takeaway Points for New Zealand

- With a similar innovation identity to New Zealand, New Zealand policy makers may want to consider how Australia manages its innovation policy. Currently, Australia could arguably be considered to have a slightly healthier innovation identity than New Zealand
- Respondents saw CSIRO, a government sponsored organization similar to New Zealand’s Crown Research Institutes, as being representative of Australian innovation. CSIRO is a centralized organization focused on science and industrial research. Perhaps, it is this centralization that is giving the organization the visibility it has among Australian’s. In thinking about policy, New Zealand’s innovation landscape might be better served by consolidating its many diverse crown research institutes into fewer, larger organizations with higher visibility and thus prominence within the public sphere.

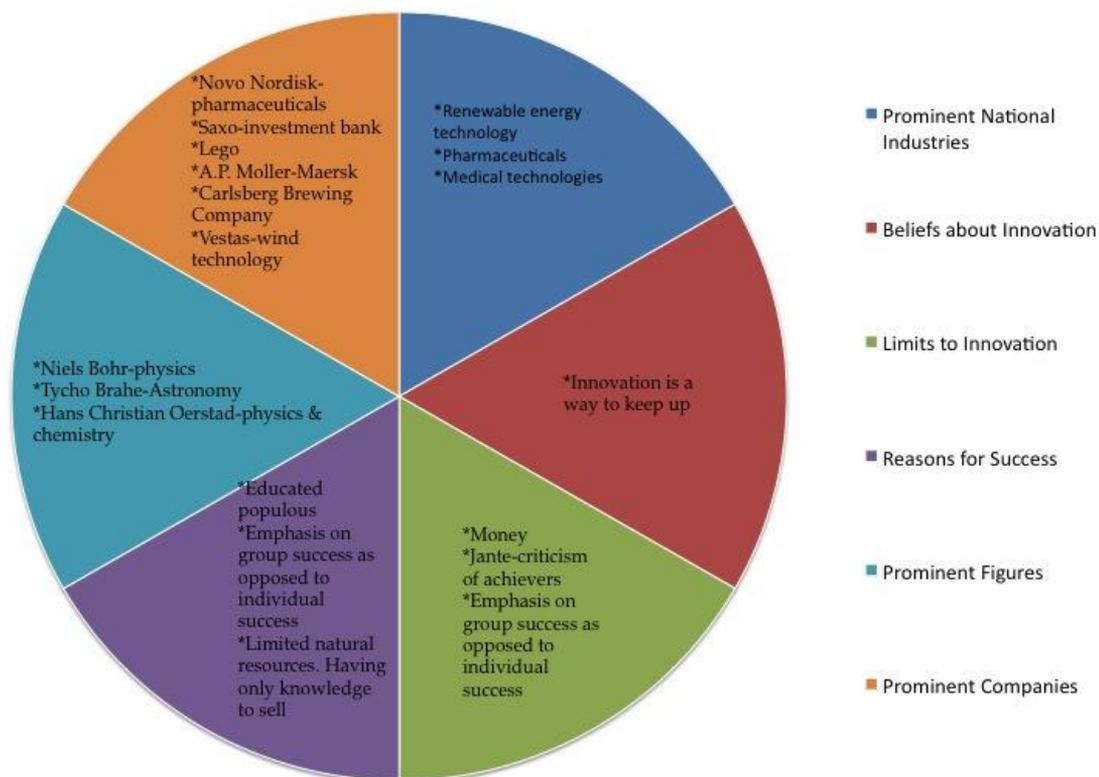


Figure 3: Danish Innovation Identity

Like New Zealand and Australian respondents, Danish respondents saw innovation as a way for Denmark to keep up with the world.

Similar to New Zealand, Danish respondents mentioned criticism of achievers as being a limit to innovation. They also mention that a cultural emphasis on group success as opposed to individual success may limit innovation but they also considered this as a feature that supports innovation.

Danish respondents saw the nation's limited natural resources as playing a role in spurring national innovation. Respondents believed that Denmark had only their knowledge to sell.

Respondents routinely mentioned three figures as being prominent Danish innovators and all three are arguably well-known internationally as significant figures in their respective fields.

Danish respondents mentioned a number of Danish companies they saw as innovative. These companies ranged from a pharmaceutical firm (Novo Nordisk) to one that brews and sells beer (Carlsberg). The fact that respondents routinely mentioned several of these companies during their interview suggests that the companies have relatively high visibility within the national community and that the innovation landscape as measured by the prominence of innovative companies is healthy. It is important to note that a number of the companies mentioned by respondents are internationally known companies.

Takeaway Points for New Zealand

- Denmark has a reputation as an environmental nation and has capitalized on this reputation by developing renewable energy technology. A country which markets itself to tourists as clean, green and 100% Pure is well placed to be known for environmental-type technologies. This could be an area where New Zealand really stands out in the international community and one that already fits with the international image the nation has. Although there are number of green technology companies in New Zealand, it can be argued that New Zealand is currently selling itself as green rather than as having the technology for being green.
- Danish respondents mentioned 'Jante' or criticism of achievers as a limit to Danish innovation and this idea is similar to the tall poppy syndrome in New Zealand. Given that Denmark is considered more successful than New Zealand with respect to innovation (as measured on several innovation indices), policy makers may want to assess ways Denmark has worked to overcome issues of jante (if any).
- Danish respondents believed Denmark offered a high caliber of education for its citizens. Education is not mentioned by New Zealand respondents as a reason for success and this might be an area where improvements could be made in New Zealand. Culturally, there is a certain amount of anti-intellectualism among New Zealanders.

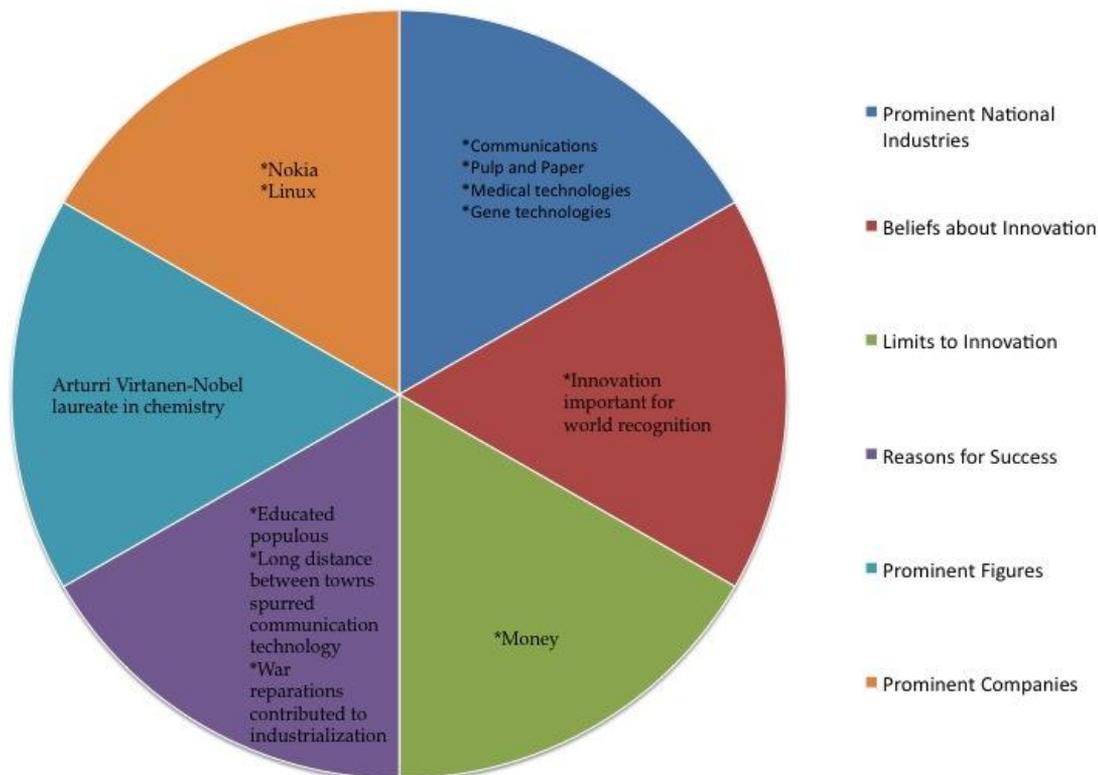


Figure 4: Finnish Innovation Identity

Finnish respondents saw innovation as a way for Finland to receive world recognition. The only limit to Finnish innovation was money. It was believed that innovation in Finland was spurred in part by the war reparations Finland was required to pay following World War II. Further, the long distance between towns was thought to have stimulate innovation, particularly in the communications sector where Finland is known to be an internationally dominant figure.

Like New Zealand, Finnish respondents could routinely name only one figure, Arturi Virtanen, a chemistry laureate as a significant figure within Finland. Two companies were routinely named, Nokia and Linux, as being innovative. Although only two companies were named the companies, particularly Nokia, contribute significantly to Finnish GDP. Nokia has a significant market share in communications internationally. Other research by Rinne and Fairweather on Finnish cultural and national Identity revealed that Nokia is even considered to be a national symbol of Finland.

Takeaway points for New Zealand

- New Zealand and Finland share many features in common yet Finland has had significantly more success in the innovation realm than NZ. Innovation and

education policies within Finland are known to be quite pioneering and given the similarities between the countries, policy-makers may want to look at how Finland has managed education and innovation as these policies may prove a good fit for New Zealand. Lacking a history of science, technological or innovation achievement need not be a detriment to current achievement as demonstrated by Finland. Similarly, being small is not an excuse for not achieving innovation success.

- A large, highly visible multinational like Nokia can serve as a cornerstone for a nation as they build their innovation landscape. Such a cornerstone can make the nation internationally recognizable as being innovative and can give the national community a symbol of their success in this arena.
- Finnish respondents believed Finland offered a high calibre of education for its citizens. Education is not mentioned by New Zealand respondents as a reason for success and this might be an area where improvements could be made in New Zealand. Culturally, there is a certain amount of anti-intellectualism among New Zealanders.

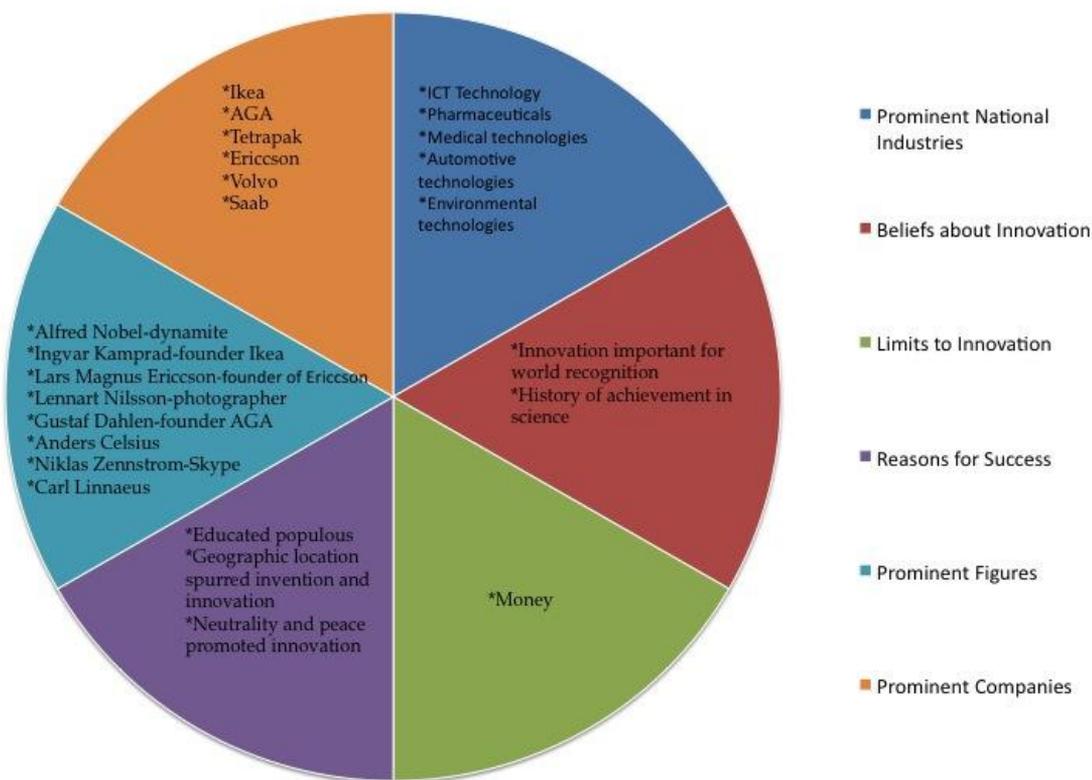


Figure 5: Swedish Innovation Model

Swedish respondents saw innovation as a way for Sweden to receive world recognition. The only limit to Swedish innovation was money. It was believed that neutrality and peace during the World Wars helped promote innovation within Sweden as well as Sweden’s northern location which limited food production and required Sweden to trade other goods.

Swedish respondents could name a number of prominent figures involved with science and innovation. Figures ranged from the historical, Alfred Nobel, to the current, Ingvar Kamprad, the CEO of Ikea. Respondents also identified a number of Swedish companies they believed to be innovative—these ranged from the aforementioned Ikea, a furniture and home furnishing company to Volvo, an automotive company. In other research Ikea shows up as a national symbol for Sweden.

This model shows Sweden's innovation identity to be well developed and diverse. Sweden is not innovative in one area but many.

Takeaway Points for New Zealand

- Sweden has a reputation as an environmental nation and has capitalized on this reputation by developing environmental technologies. A country which markets itself to tourists as clean, green and 100% Pure is well placed to be known for environmental-type technologies. This could be an area where New Zealand really stands out in the international community and one that already fits with the international image the nation has.
- Sweden has a significant amount of diversity with regard to innovative fields and companies that dominate in the nation. Having such a diverse portfolio is very healthy from an economic standpoint. Areas where New Zealand could shine include environmental/renewable energy technology, agricultural technology (this is already an area that is quite good in New Zealand although the visibility could be significantly improved), and ICT. New Zealanders already think ICT is important as it helps them connect to the world and relieves some of the isolation that comes with being situated so far from other nations so it makes sense that this might be an area where New Zealanders can be innovative.
- Swedish respondents believed Sweden offered a high caliber of education for its citizens. Education is not mentioned by New Zealand respondents as a reason for success and this might be an area where improvements could be made in New Zealand. Culturally, there is a certain amount of anti-intellectualism among New Zealanders.

8.4 Conclusions

- Within New Zealand there is a lack of awareness of innovation. Prominent figures and companies aren't known. One could argue that the people of a nation must first recognize the nation as innovative before the world is likely to give the nation any recognition in this regard.
- Respondents from the top innovation performing countries mentioned the quality of the educational system as being key to their success. While the New Zealand education system performs highly in international comparisons and is likely on par with these top performing nations, pride in education and educational achievement could be greatly improved within New Zealand.
- Within the prominent figures categories for all the countries analyzed, technology user inventors were infrequently mentioned.

8.5 Future research

Based on the findings from this report there are a number of areas for future research.

- A large part of the New Zealand economy is centred around agriculture. Research on other countries that once had an agricultural focus but have diversified would be useful. A potential country of interest is Ireland.
- This study suggests that New Zealanders are unaware of the innovators in New Zealand. A comparative media study looking at how often and in what context, innovation is discussed in newspapers and on T.V. across multiple nations could prove enlightening. Perhaps the press in other nations do a better job of highlighting national innovation. Furthermore, as mentioned in the conclusion section, user inventors were infrequently mentioned as prominent figures for a nation. How user invention is characterized by the media and the volume with which it is discussed could prove enlightening.

Appendix 1: Open-Ended Questions for Qualtrics Survey

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Dear Respondents,

The study in which you are about to participate is part of a research programme at Lincoln University in New Zealand in which innovation is being studied across multiple nations. The following interview is divided into four sections. The first three sections ask about culture, national identity and innovation, respectively. In the fourth section, a series of scales are given and you are asked to indicate either level of agreement with, or importance of, a given statement. None of the questions posed in any of the four sections have a right or wrong answer. We are merely seeking your opinion.

We appreciate you taking time out of your schedule to aid us in our research.

Sincerely,

Dr. John Fairweather and Dr. Tiffany Rinne.

Instructions:

1. You may respond in your own language or in English.
2. Please complete this computer-based interview in one sitting and keep track of the time spent in completing the interview. At the end of the interview we ask you to record this time.
3. We ask that you do not use additional resources (friends, the internet, reference books) to answer any of the questions. We are seeking information about your opinions and thoughts—things that are on the top of your mind.
4. Please take care to answer each question completely. Some questions have multiple components.
5. Please answer each question as comprehensively as possible, keeping in mind that the researcher analysing the interviews is not a citizen of your country and therefore will not necessarily be aware of the significances of certain events, people, or ideas.
6. If you have any questions about the interview, please e-mail tiffanyrinne76@gmail.com for clarification.

7. Upon completion of the interview, please e-mail the interview as an attachment to tiffanyrinne76@gmail.com .

Culture - A culture is a way of life of a group of people--the behaviours, beliefs, values, and symbols that they accept, generally without thinking about them, and that are passed along by communication and imitation from one generation to the next.

1. Please name five popular people that you consider represent your country's true values or ideals. After each name please describe what values or ideals each person represents.
2. Please name five important symbols used in your country's culture, as a whole. What do each of these symbols represent?
3. Please give five examples of important historical happenings that have influenced your country's culture. Include a brief statement of the significance of each historical event for culture.
4. What role does technology play in your country's culture? Please explain why you think technology is significant or not significant.
5. Who are important people in science and technology within your country? What are they known for?
6. If you had to describe your country's culture using five words or phrases to best characterize it what would they be?

National Identity - National identity derives from the image citizens have of their country and the nation's perceived or actual international image in world opinion.

7. How would you characterize your country's national identity?
8. How do you think your country is identified internationally?
9. What are the things you like most about living in your country? Please name at least five positives about living in your country.
10. What are the things you like least about living in your country? Please name at least five negatives about living in your country.
11. What are achievements in science and technology that are important to your country's national identity? Why are these achievements important?
12. What kind of political influence do you feel your country has in the international community? Is this an important factor in national identity? Why or why not?

Innovation - A new idea, system, method, or device that is brought to market

13. How important is innovation and technology to your country? Please explain why it is significant or not significant?
14. Has your country's history influenced your country's innovation in any way? Please explain.
15. How easy would it be for an individual with an invention to bring it to market? What impediments would they face?
16. What are the main factors that would drive a person to invent something and bring it to market?
17. Do you think other countries consider your country to be innovative? In what way?

18. Please name the five countries that you consider to be the most innovative in the world. Taking each country in turn, why do you consider each of these nations to be innovative?

Demographic Questions

19. Are you Male or Female?

_____ Male

_____ Female

20. What is your date of birth? _____

21. What is the highest level of education you have completed?

_____ Less than high school

_____ Lower High school

_____ Upper High School

_____ Trade/Vocational/Technical

_____ University

22. For you alone, what is your approximate monthly income? (please include the currency) _____

23. What is your approximate household income? (please include the currency)-

24. What is your primary language/mother tongue? _____

25. To which national culture do you most identify? _____

26. How long have you been living in the country where you now live? _____

9. How long did it take you to complete this computer-based interview? _____

