

Chapter 17

Cultural Limits to Innovation in New Zealand

Tiffany Rinne

Agribusiness and Economics Research Unit
Lincoln University

17.1 Introduction

In a world that has moved swiftly to global trade, innovation rates have become one of the tools by which nations and businesses achieve success in the world. In many cases countries, businesses and organizations have an 'innovation imperative' in which innovation is deemed necessary for both growth and survival. These imperatives are paralleled by government policies, which seek to encourage innovation in order to achieve economic and other goals (e.g. Oram 2001; OECD 2005). In contributing to knowledge about innovation, researchers have contended that culture is a significant factor influencing national rates of innovation (e.g. Nakata and Sivakumar 1996; Shane 1992; Shane 1993). Understanding culture is, therefore, becoming increasingly important in efforts to support innovation. We utilized discourse analysis and cultural consensus analysis to build models of New Zealand culture, national identity and innovation identity in order to gain insights into the wider social context in which New Zealand innovation is situated. In this way New Zealand's strengths and weaknesses with respect to innovation can be identified.

Culture is hard to conceptualize and definitions abound. For the purposes of this research, which uses methods from cognitive anthropology, we define culture as '...a conceptual mode underlying human behavior' (Goodenough 1957, quoted in Keesing 1972:300). It is a means by which people make sense of reality, that is, understand and organize objects, events and experiences.

Discourse analysis and cultural consensus analysis were used to examine New Zealand national identities and innovation identities. National identity derives from the image New Zealanders have of their country and the perceived or actual international image of the nation in world opinion (Rusciano 2003). National identity is important to study in the context of innovation because this is one area where culture manifests itself and becomes globally visible. In a global world, how a nation sells itself to and is perceived by the international community can have significant impact on the nation's economy. We defined innovation identity as how New Zealanders recognize themselves as being innovative.

17.2 Combining Cultural Models and Cultural Consensus Analysis

Understanding culture and innovation requires a method that can record the dominant and shared characteristics of culture. We chose to use a combination of methods — cultural models and cultural consensus analysis — that would achieve this goal in a relatively

straightforward and efficient way. Cultural modeling is a qualitative method based on discourse analysis while cultural consensus is a quantitative method. The use of two different yet converging methods can aid in the development of '... a more complete and representative model than is possible through the use of only one approach' (Garro 1988:99).

Cultural models are those presupposed, taken-for-granted models of knowledge and thought that are used in the course of everyday life to guide a person's understanding of the world and their behaviour (D'Andrade 1984). Cultural models systematically draw on personal discourse and allow researchers to get the insider's perspective on participant knowledge, thought and word meaning.

Cultural models are composed of linked and embedded schemata. By first analyzing and then organizing the schemata identified via discourse analysis, cultural models of the world can be built (Strauss and Quinn 1997; Blount 2002). According to Blount (2002:9):

Once a text is created from discourse, one works 'backwards,' asking questions about how the text was created, in effect asking what the conceptualizations are upon which the text is based. The conceptualizations are the raw materials of the analysis. They reflect the agent's underlying mental models, the framework with which the world is engaged. The reconstructed mental models of an individual constitute the cognitive architecture upon which the discourse is generated.

In essence, the task of discourse analysis is to identify the key components of thought and serialize, embed and hierarchically organize them into a coherent model. While models can be built based on findings from discourse analysis it is useful to obtain some measurement of the degree to which aspects of culture are shared. For this task we turned to consensus analysis.

Cultural consensus analysis is a quantitative-based methodological tool. It asks three primary questions (Romney et al. 1986). First, consensus analysis asks if shared knowledge of a specific cultural domain exists within a group of informants. Second, consensus analysis assesses the relationship of each informant's knowledge of the domain in question with the aggregate knowledge of that domain. Third, consensus analysis determines the 'culturally correct' answers to the survey questions without knowing or assuming the correct answers ahead of time. In other words, consensus analysis does not compare subject's responses to survey items to an established answer key. Rather, the answer key, the content of 'culture', is estimated mathematically from the patterns of data. Consensus analysis employs a kind of reliability testing, but on participants rather than on survey questions.

Consensus analysis allows the researcher to operationalize findings by estimating the social distribution of knowledge, the culturally correct answers to the questions, and the average knowledge possessed by each member of the informant pool. Thus, consensus analysis can contribute to cultural modelling by measuring the degree of sharing of the cultural knowledge. In particular, it enables a researcher to determine if there is sufficient sharing in response to structured questions within and among groups to make it reasonable to infer that participants are drawing on a single cultural model (Romney et al. 1986).

17.3 Sampling and Procedure

In order to use discourse analysis and cultural consensus analysis to construct models of culture, national identity and innovation identity we obtained a convenience sample of adult New Zealanders by approaching high schools in both Christchurch and Auckland and offering a payment of \$450 NZD in exchange for soliciting adult volunteers and providing a venue. A convenience sample was adequate for our needs because beliefs about culture and national identity are domains of investigation that should be widely shared across the nation, the extent of which we measured using consensus analysis. We chose schools from the largest cities by population on the North and South Islands of New Zealand—Auckland and Christchurch—as our research sites in order to account for possible cultural differences that might exist between the two islands.

Schools were selected from the mid-tier income bracket (New Zealand Decile 4-7). Contact with prospective schools was made by telephone and school representatives involved with fundraising were sought. The school representative was directed to source prospective participants, an equal number of men and women if possible, from people involved with the school or who lived in the local area. Table 1 shows the demographic and socioeconomic breakdown of our sample. Most participants were over 40 years of age and classified themselves as New Zealand Europeans. No ethnic background was specified to schools for recruitment and our sample has only one Maori participant, one Indian and one Pacific Islander participant. Such a sample means that the results reflect the cultural viewpoint of New Zealand's majority population, New Zealand Europeans, rather than showing variation by ethnicity. As of the 2001 census, New Zealand Europeans comprised 69.8% of the population. Future research can build on this initial contribution by exploring variations in cultural expression in New Zealand's minority ethnic groups.

In our research we obtained participant discourse using either computer-assisted self interviews (CASI) or face-to-face interviews (FTFI). Both CASI and FTFI were utilized because a secondary objective of our research was to assess the quality of data obtained via FTFI and CASI to see if they were similar. Our findings, presented in (Fairweather and Rinne) et al. (under review) show that both methods of obtaining participant discourse produced identical cultural models.

Table 1: Participant Demographic and Socioeconomic Information

	Christchurch	Auckland
	N = 20	N = 20
Age		
20-29	-----	3
30-39	1	1
40-49	13	10
>50	6	6
Education		
University Degree	5	10
Some University	1	4
Trade	3	3
High school	11	3
<High school	-----	-----
Total Income		
<49,999	1	1
50,000-99,999	9	9
>100,000	6	8
Ethnicity		
New Zealand European	19	18
Maori	0	1
Pacific Islander	1	0
Indian	0	1

The qualitative interview portion of our research took on average one and half hours and was scheduled in advance at a designated time and place (namely onsite at the schools) and outside of normal daily activities. The researcher began each interview by clarifying its purpose and explaining that participants would be asked questions about three domains: culture, national identity and innovation within New Zealand. Participants were assured that there were no right or wrong answers to any of the questions and we asked that they speak freely about their beliefs and opinions.

A total of 50 open-ended questions were asked. For each domain of interest we asked a breadth of questions. For the domain of culture we asked about important cultural symbols, important figures representing true New Zealand ideals, historical happenings that have influenced culture, words one would use to describe New Zealand culture, colloquial

sayings of cultural relevance, the importance of science and technology within New Zealand culture etc. For the domain of national identity we asked about how participants believed New Zealand was identified internationally, how they would characterize national identity as a citizen of New Zealand, in what ways they believed New Zealand was better than other nations and also not as good, achievements on the world stage that have influenced New Zealand national identity, words they would use to describe national identity etc. For the domain of innovation we asked about how New Zealand's history has influenced innovation, what characteristics of New Zealanders made them good at innovation, ways in which their workplace was innovative, where most innovation in New Zealand occurs, ease of bringing an invention to the market, factors which would drive a person to innovate, to name significant sectors, companies and products which have been innovative etc.

In order to analyze the discourse obtained during the interview process (either computer based or personal interviews), each interview text was imported into NVivo 7 and coded according to key words and phrases. It was then inductively analyzed for patterns, structure and linkages of schemata. The resulting cultural models demonstrate how our participants perceived New Zealand cultural, national and innovation identities.

Following the open-ended questions, participants were asked to complete a series of Likert scales. Cultural consensus analysis of Likert scale data was carried out using ANTHROPAC 4.0 statistical software (Borgatti 1997; Romney et al. 1986) and the data obtained provided a quantitative base for the cultural models and allowed us to assess if there were grounds for a single cultural model. The Likert questions dealt with generalized aspects of culture and national identity. Regarding culture, participants were asked 'For New Zealanders as a whole, how important are each of the following items of New Zealand culture?' Items included: religion, culinary traditions, music, dance, technology, outdoor activities (tramping, fishing etc.), playing sports, viewing national and international competitive sports, rural living, urban living, fashion, inventiveness, a common language, a shared set of values, environmentalism, ethnic identity, the arts (painting, literature etc.), architecture, and shared history. These elements were chosen as they represent commonly studied aspects of culture within anthropology and reflect a range of cultural elements. For national identity, participants were asked 'For New Zealanders as a whole, how important are each of the following items to New Zealand's national identity?' Items included: achievements in sports, the way democracy works, achievements in the arts, economic achievements, the armed forces, political influence on a world stage, scientific achievements, technological achievements, fair treatment of ethnic groups, contribution to world history, international peacekeeping efforts, environmental consciousness, the natural landscape, and unique cultural values. These elements were chosen based on a review of the national identity literature. Each element represents a key way in which a nation can differentiate itself from others in the world.

Our research goal was to obtain 20 participants from each of the two high schools, one in Christchurch and one in Auckland. Consensus analysis, unlike more conventional statistical methods, requires very small sample sizes to reach statistical significance. These initial sample size goals were tentative estimations of a sample size thought necessary to achieve informational redundancy within the discourse analysis. Had information redundancy not been achieved with this sample size, further sampling would have been conducted.

17.4 Models of cultural, national and innovation identities

The discourse and consensus analyses yielded models of New Zealand culture (Figure 1) and national identity (Figure 2) as well as a model of New Zealand innovation identity (Figure 3). These three models were used by the researchers to form a fourth model: cultural limits to innovation (Figure 4).

At the base of participants' view of their culture was the idea of New Zealand as multicultural (Figure 1). Participants often mentioned the signing of the Treaty of Waitangi as a significant historical event for New Zealand with the treaty seen as linking Maori and Pakeha into an uneasy union. Pakeha participants spoke of Maori/Pakeha disputes over land and needing to be politically correct in dealing with the Maori due to past injustices against the community. Although the relationship was characterized as uneasy, participants often mentioned Maori symbols, such as the koru and tiki, as being important symbols for New Zealand. The Maori were seen as very much a part of general New Zealand culture.

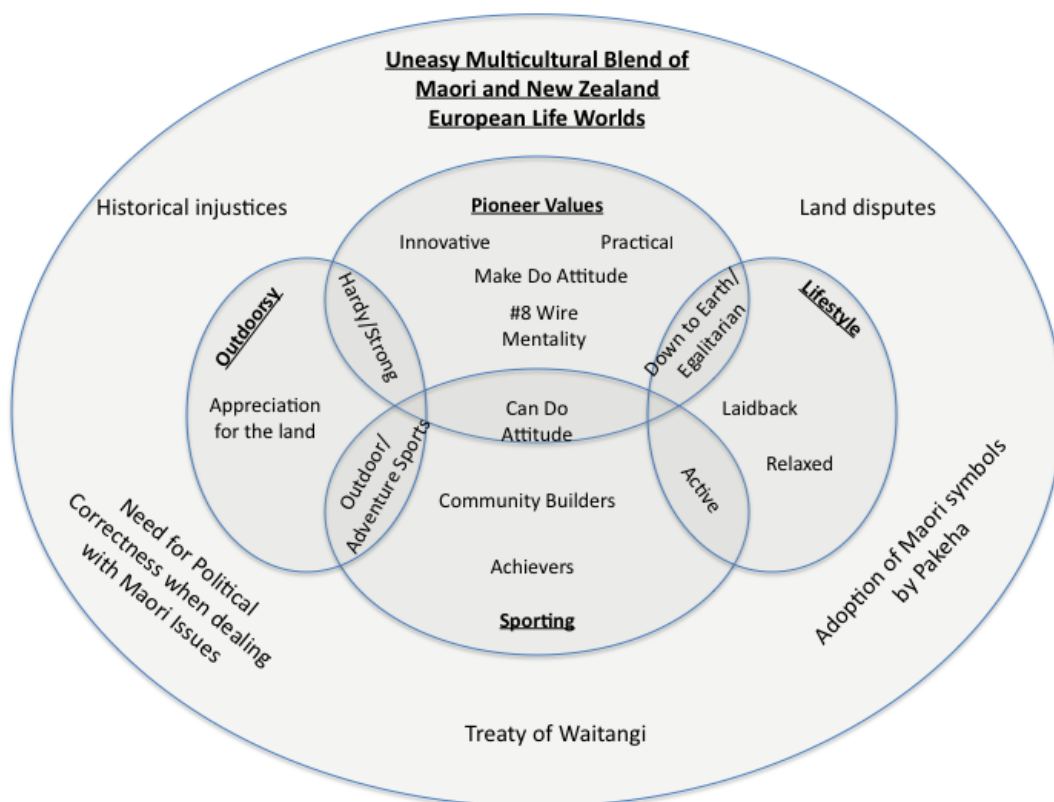


Figure 1: New Zealand Cultural Identity

In addition to this idea of an uneasy multicultural blend, participants saw themselves as a culture in which emphasis is given to lifestyle, sports, an outdoorsy orientation and pioneer values. Regarding lifestyle, New Zealand was seen as a playground with beautiful scenery and place where everyone was treated equally. Sports such as rugby and other outdoor activities like tramping and sailing were seen as particularly important to New Zealand culture. They were seen as community builders and a way for New Zealanders to get out and enjoy New Zealand's beautiful landscapes. With respect to the outdoor orientation,

participants felt a close connection to the New Zealand landscape and felt it was important to get out in nature and do things like hike, sail etc.

Participants saw their culture as being inventive/innovative and this was linked to their days as a pioneer people. New Zealand is small and geographically isolated. Early pioneers were strong and had to make do with what they had available in order to survive and thrive. The small size and isolation of New Zealand is believed to have been responsible for the inventive/innovative nature of New Zealanders to the present day. For example, participants said:

There's a #8 wire mentality. People had to cope a long way from home. They lacked resources and infrastructure and had to find a way to do what they had to do. I'm sure that mentality is still hanging around. (Male, 51 years of age)

So there are all those things that have come out because of necessity and there not being equipment and that's created innovation and that all comes back from being so far removed from the rest of the world. (Female, 76 years of age)

The results of cultural consensus analysis provided additional support for the findings from discourse analysis. Cultural consensus analysis of the Likert exercise data indicates that outdoor activities, playing sports, viewing competitive sports, environmentalism and a shared set of values were very important for most New Zealanders.

At the base of participants' perceptions of New Zealand national identity was the image of New Zealand as a small, isolated island nation with a low population (Figure 2). Being small, both in population and land area, as well as isolated, made sports, lifestyle and landscape all the more significant for the New Zealand participants. Sports were seen as a way to be present on the world stage. Participants believed that New Zealanders 'punched above their weight' in sport, and had a high level of achievement for such a small country.

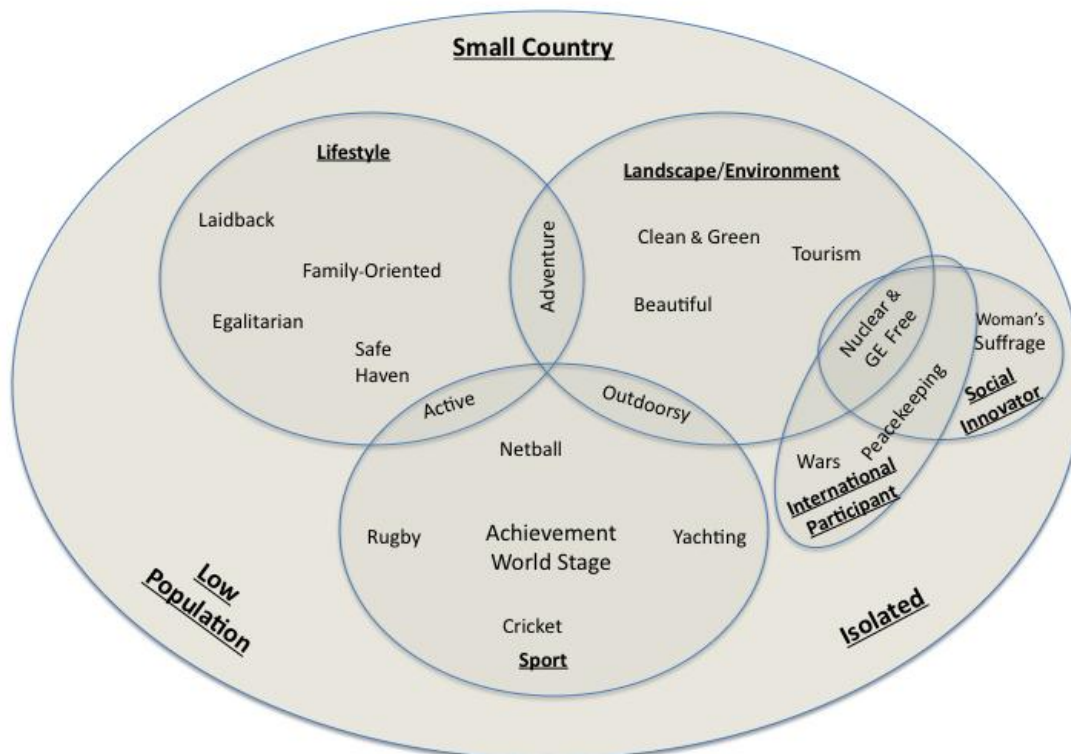


Figure 2: Model of New Zealand National Identity

Sports were considered an important source of national pride. A representative comment is:

Very significant as it shows us off to the world stage that we are so little but can compete against countries that have more money and players and sometimes we even beat them which gives New Zealanders a great sense of pride (Female, 32 years of age)

The lifestyle afforded to those living in New Zealand and the landscape were also sources of significant pride for participants. The New Zealand lifestyle was believed to be relaxed and family-oriented. Participants appreciated the egalitarian nature of New Zealand society and felt that no one stood above another. Being isolated afforded participants a sense of safety. New Zealand was considered far removed from many of the world's problems and a safe place to raise children. The close proximity of the ocean and mountains also contributed to the New Zealand lifestyle by serving as playground venues for 'outdoorsy' New Zealanders. They were seen as places for adventure. Participants appreciated New Zealand's beautiful, clean and green landscapes and it was seen as one of the factors, which set New Zealand apart from other nations—made it unique. Tourists came to see a landscape only New Zealand could offer.

Although not as significant as sport, lifestyle and landscape/environment, participants also believed part of New Zealand national identity was New Zealand as social innovator and New Zealand as international participant. With respect to being a social innovator, participants were very proud of the nation's no nuclear stance, previous prohibitions and

overall level of cautiousness in dealing with genetically engineered food and crops, and the fact that New Zealand was the first nation in the world to grant women the right to vote.

In addition to their role as a social innovator, New Zealanders were proud of the nation's conduct within the international community. Participants often spoke of the nation's peacekeeping roles abroad and although a small nation, participants felt pride that New Zealand was involved in the international community.

The results of cultural consensus analysis provided additional support for the findings from discourse analysis. Cultural consensus analysis of the Likert exercise data for national identity indicates that achievement in sports, natural landscapes, and environmental consciousness are the three top elements of national identity. It should be noted that innovation and being inventive were not considered a significant component of New Zealand national identity as identified by participants in both the discourse analysis and on the likert scales.

In terms of innovation identity, discourse analysis of interview texts showed that participants believed most Kiwi's had a 'Can do attitude', could make something out of nothing (#8 Wire Mentality), and were good at 'Thinking outside the square' (Figure 3). Participants believed a majority of invention/innovation in New Zealand occurred in the backyard shed—a man tinkering in his spare time—as opposed to in businesses or at universities. The 'man in his shed' image was viewed as a hold-over from the country's pioneering days. The drive to invent or innovate is believed to be based not in monetary gain but rather in seeing a need and being able to do something about it. Regarding innovation within New Zealand, participants said:

We're down to earth with a can do attitude. Isolation of the immigrants who colonized New Zealand required a creative sense of living and self preservation. Our fore fathers relied on innovation to survive in country many miles from any other civilisation. (Female, age undisclosed)

I think the main factor driving someone to innovate is seeing a need. Either a personal need or a business need. To see the possibility of it being innovative. (Female, 51 years of age)

For me to invent something would be for the benefit of others and sometimes , in some people, that is more satisfying than the money. (Male, 68 years of age)

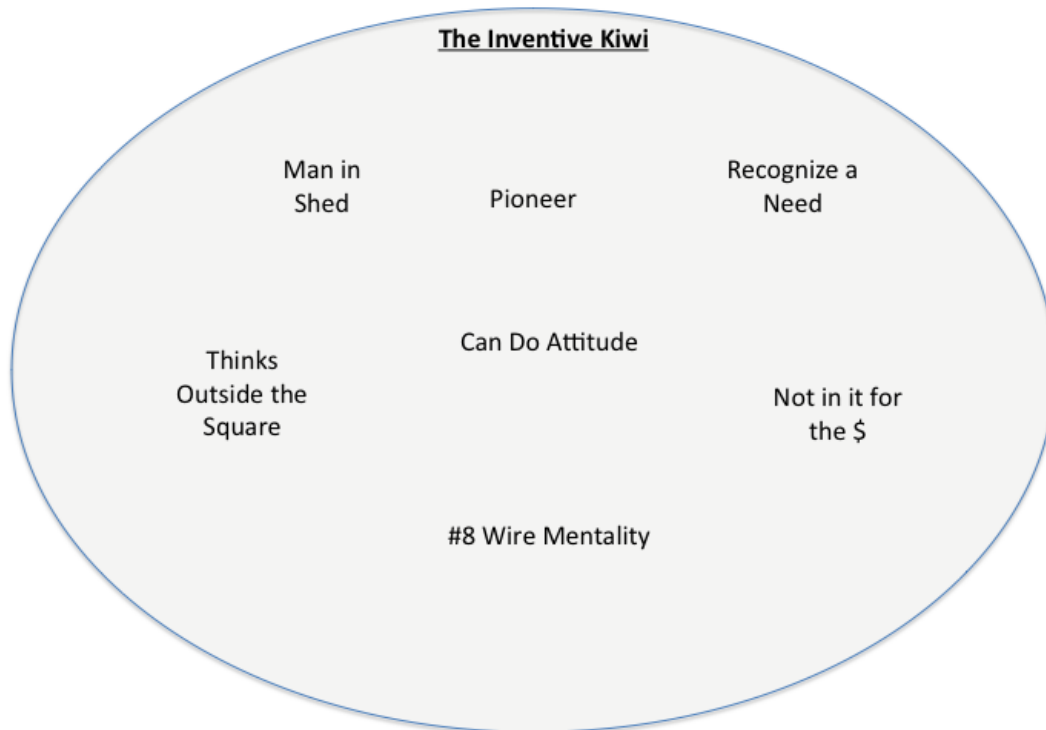


Figure 3: Model of New Zealand Innovation Identity

17.5 Cultural limits to innovation

Participants believed that pioneer values dominated within New Zealand. These values included ‘a can-do attitude,’ ‘egalitarianism,’ ‘#8 wire mentality’ (ability to make something out of nothing), practicality and strength. Given the cultural belief that New Zealanders are indeed inventive, why then does New Zealand not do better internationally with respect to innovation? We believe the answer to this question lies, in part, with the national culture of New Zealand. We make two sets of observations about the results. The first relates to a simple comparison of the models of New Zealand culture and national identity, while the second builds on this comparison to derive a model of cultural limits to innovation.

A comparison of the model of New Zealand culture and the model of New Zealand national identity shows that there is an absence of inventiveness and innovativeness in New Zealanders’ model of national identity except with respect to social innovation (e.g. women’s suffrage, nuclear-free etc.). Despite believing themselves to be inventive, as part of their pioneer value set, participants did not include invention or innovation (defined as a new system, method or device that is brought to market) as a component of how they, as citizens, viewed their national identity. Inventiveness was seen as part of culture but not national identity. What is more relevant to national identity is sport, lifestyle and landscape/environment. Perhaps this is because many inventions do not make it successfully to market and are instead utilized only by the inventor for his/her own personal needs. New Zealand sport, lifestyle and landscape are seen as areas where New Zealand excels in the world (stands above others). Participants did not believe New Zealand excelled

with respect to innovation. New Zealanders were inventive but products often did not reach the market and did not have wide recognition.

By analysing models of New Zealand cultural, national and innovation identities, we were able to identify aspects of New Zealand culture that may limit innovation (Figure 4). First, as part of New Zealander's pioneer value set, there is widespread belief that people can make something useful out of anything but are also willing to make-do with less than the best. However, a make-do attitude need not be beneficial for innovation as it can lead to production of products to a subpar standard and can lead to the abandonment of innovation ideas if too many obstacles arise during the innovation process. As previously mentioned, inventors may be satisfied with using the invention only for their own needs. Second, egalitarianism and a general down-to-earth attitude are highly valued in New Zealand. The result has been a reaction known as the Tall Poppy Syndrome in which 'tall poppies' or those standing above the crowd are frowned upon or cut down. We believe this syndrome may be linked to a brain drain within New Zealand in which high academic or business achievers, those that are likely to be successful innovators, leave the country, in part, because they are underappreciated, thus, decreasing the pool of New Zealanders with the necessary skills to bring an innovation to its end stage. A third limit to innovation is New Zealand's lifestyle orientation. New Zealanders tend to value time spent with their families and in leisure activities more than they value business success or money. Thus, they limit the time and money they are willing to devote to innovation activities. Related to this is the idea that many innovators are not in it for the money. Money is a form of reward one receives when an innovation reaches the market. With the end goal not being a monetary reward, inventors may feel little drive to take their product to market, instead being satisfied to use it for their own purposes and perhaps distribute it to friends and neighbours.

These cultural beliefs suggest that New Zealanders may be good at technology user innovation (modifying existing technology to suit one's needs) and small-scale innovations (those that can be completed by a single person working alone with limited resources). However, aspects of New Zealand culture do not strongly nurture the process by which inventions become popular and commercially successful innovations. Further, it may be the case that these forms of invention go unrecognized on international innovation indices such as the GII, and III as they are hard to directly measure. For example, in reviewing the literature, we found no documentation of the prevalence of technology user innovation within New Zealand.

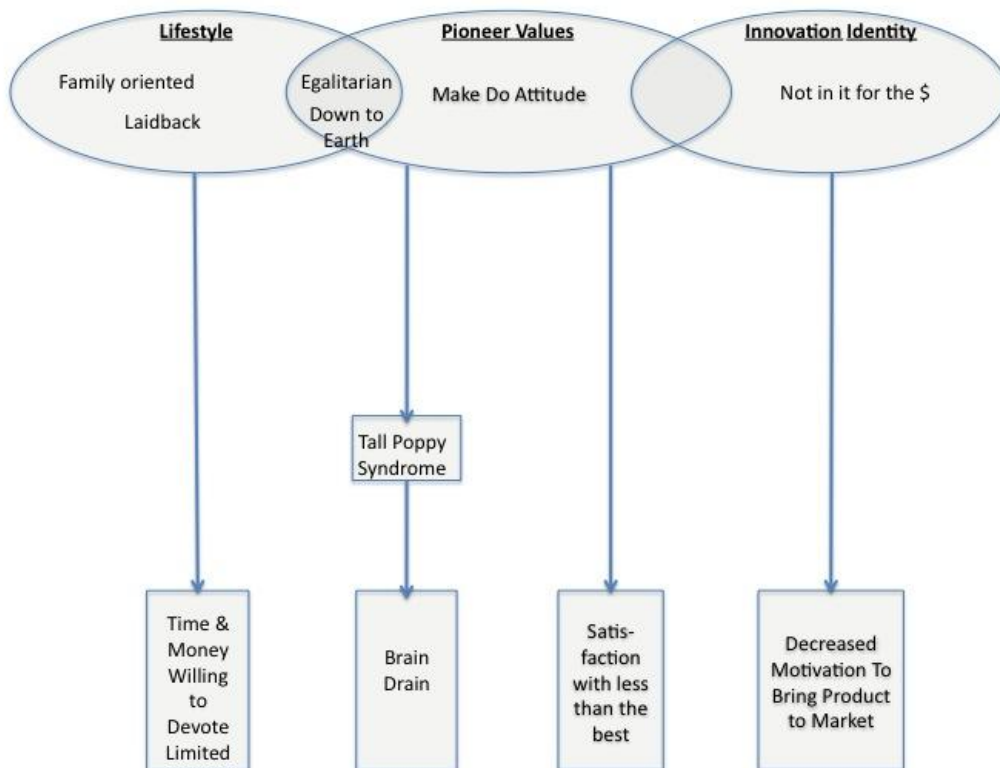


Figure 4: Model of Cultural Limits to Innovation

17.6 Conclusion

New Zealand’s innovation identity is rooted in the nation’s pioneering past and as such user innovation is deeply ingrained in New Zealand culture. Some of the same pioneer values that make New Zealand good at user innovation also serve to limit New Zealand’s larger innovation landscape. By identifying these factors, they can be targeted for improvement. Nations, including New Zealand, have the potential to overcome cultural deficits to innovation through public policy (Fukuyama 1995). The key is in identifying the deficit.

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