The 7 Tribes Model for Troubleshooting an Innovation Economy: First Real-World Test in a 1-year Master Program

by
Ms. Sara Guyer

Reporting on experiences in the

Master of Science in International Management,
Responsible Management and Climate Action,
Track *Climate Action*

\MSIM

Master's program
Franklin University Switzerland
\FUS, Lugano, CH

as supervised by
and with modeling contributions from
the ***w****ide* ***i****nterdisciplinary* ***d****iversity****-e****ncouraging* *\wid-e*
pandemic research Marathon
of

Dr. *rer. nat.* Laurence Loewe
Evolvix Research Foundry
Middleton, Wisconsin
Loewe@evolvix.org

as of
2022-05-05
version 0 release 2 patch 0

Table of Contents

Abstract

Innovation is of paramount importance for the functioning of our world and in particular for adjusting to climate change. Yet how does innovation happen? Are there factors that limit how efficiently innovators can work? This report introduces the 7Tribes Model by L. Loewe, a model for a 7 Track role society that has all the essential ingredients of an innovation society if it can keep its information flows aligned with functional requirements.

This model is then submitted to its first real-life test in a scenario that draws on my experiences within the MSIM, the Master of Science in International Management at Franklin University Switzerland. This report first illustrates how the 7 track model can capture and describe the various roles of the diverse people who run the MSIM. Then the 7 Tribes are applied in a different way to the one person in the MSIM I know most about: me. I describe a wide range of my experiences in the program, which I can match to the perspective of any given of the 7 Tribes.

One can argue that more detailed analyses along these lines might help identify potential points of friction for improving the overall efficiency of the MSIM. Since the model is general, it might be much more widely applicable as well.

For convenience Appendix 4 contains an overview table of the 7Tribes model. This report is a collaboration between myself and L. Loewe, the relative contributions are detailed in the acknowledgements.

Section 1: Introduction: The importance of Innovation

The fruits of innovation are all around us. While innovation is often touted as a key to revenue and corporate success, its importance is also much more fundamental for the functioning of social systems in general. This has been becoming increasingly clear with respect to progress (or lack thereof) in climate change conversations. A major motivation of my work that led to this report was to advance innovation in that area.

The currently dominant model for innovation through research was born in the depth of desperation of WWII that pitted researchers in the US against researchers in Germany in a race for the most powerful weapons. What ended up happening is that the open-ended interest-driven approach that encouraged basic research in the US was more efficient than the demand-driven efficiency-oriented approach used in Germany. This old German approach was not so much driven by reality, but often reflected more the wish to comply with superiors or the fear of disappointing them by being 'unable to deliver'. After all, few in Nazi-Germany would be willing to disappoint Mr. Hitler, since that meant toying with their own lives. It wasn't as clear at the time, but in retrospect it became abundantly clear that the open-ended basic research approach of the U.S. was critical to winning WWII, thereby demonstrating the importance of basic research contributions for survival. Upon realizing the magnitude of this discovery, F.D. Roosevelt asked the leader of those research efforts, Vannevar Bush, to make specific recommendations for how to keep this innovation engine running even after the war. Roosevelt foresaw countless benefits for civilian life if such efficient research could be continued even without the pressures of world war. Bush described his recommendations in his 1945 book that led to the foundation of the National Science Foundation (NSF) some years later (see Bush, 1945). These experiences have served as a template for numerous other national and international efforts to start similar institutions aimed at stimulating existing university structures to develop innovative solutions to current or anticipated problems.

Thus, a new mega trend emerged. It transitioned the various economies increasingly into innovation economies. A stable innovation economy might be characterized as a process through which a population of individuals continually works together through different roles in order to produce an open-ended stream of individual innovations that solve countless problems, one innovation at a time. No individual innovation changes everybody's way of life or even anybody's life by much. Instead, it only aims to improve one particular aspect. Yet, taken together as a stream, these innovations have been rapidly transforming how things are being done on planet Earth – often for the better (see Factfulness, Rosling et al. 2018). Yet, for some time awareness has been increasing that not all innovations are free from downsides. Lately, these downsides have been accumulating into substantial avalanches which are creating new global problems of their own through their cumulative impact. How to mitigate such negative side-effects of innovations is at the heart of discussions aiming to avert climate disasters.

In this global context it is essential to have a firm understanding of how innovations are generated, checked, and prepared for broader adoption. Careful observations have revealed common patterns. For example, innovative insights from universities are/can/could be carried beyond their boundaries across society by interested students. Their individual perspective on particular needs allows them to incorporate innovative insights into solutions that facilitate their

adoption far beyond the walls of academic Ivory Towers. If those who leave the university do not become ambassadors for its approach to research, who will?

To simplify navigating fast changing landscapes of innovation, it has proven useful to describe some broadly recurring patterns, such as the diffusion process for new ideas (Beahl & Bowlen, 1957). It has been further refined by various descriptions of the innovation cycle, such as the *Customer Alignment Lifecycle* (High Tech Strategies, 2021), *The Pencil Metaphor* in educational technology (McKeown, 2007) and many others (e.g. Satell, 2017; Satell, 2019; Kotter, 1996). Such models have been helping innovators and adopters of new technologies to navigate a dizzyingly complex innovation landscape in which it is otherwise easy to drown in ever-changing waves of new information. Clearly, engaging in an innovation economy is bound to be more efficient and pleasant if all its participants share the same framework for innovation. If such a shared model of innovation adoption reflects how innovation actually works in the real world, then it much simplifies the life of those who contribute and those who are impacted by the innovations developed. Thus, refining a generic model of innovation adoption may contribute much value to many diverse situations. Such improvement could become critically important when the need for innovation spikes at crunch time, such as when aiming to avert global climate change disasters. Since the scale of innovation is almost irrelevant for a general model of innovation adoption, it is possible to reframe almost any question of research andOr learning as a question of innovation adoption.

This generality allows me to explore from a perspective of innovation adoption the experiences I had in the *Climate Action* Track of the *Master of Science in International Management, Responsible Management and Climate Action*, which I attended from August 2020 to May 2021 at Franklin University Switzerland, Lugano. From here on I will abbreviate this program as **MSIM**. The experiences I had in the MSIM have become an informal database, which allows me to test aspects of a general model of innovation adoption that L. Loewe has been developing. Such a test aims to show whether (or not) this generic model of innovation adoption can describe the specifics of my experience reasonably well, and whether it can suggest areas for improving the process (or not). The areas of innovation I have been mostly interested in are reflected in the two main reasons that motivated me to join the MSIM:

(i) Build a bridge for Indigenous and Native peoples to get better access to spaces where their knowledge and wisdom could contribute to climate-related action.
(ii) Learn additional hard and soft skills in order to become a more effective manager, not only for ‘getting results’, but doing so while nurturing the relationships with the people managed in the work-place – instead of sacrificing them for revenue-based efficiency.

I had been observing for some time how corporate productivity and societal demands are directly tied to the exploitation of natural resources of the Earth. The MSIM confirmed my observations and what I had learned so far. Such additional hard evidence was valuable to me as a reality check: the issues I saw were not imagined by me; such problems were also reported in studies cited by leading experts at an academic institution like FUS which values the expectations of rigorous academic scholarship.

This thesis aims to leverage my experiences in the MSIM and during my practical at NOLS NorthEast in order to shed more light on finding and removing obstacles to innovation. I did this by testing an unusual perspective on innovation adoption that L. Loewe has been developing under the label “7 Tribes model”, or briefly, 7Tr model. I had not previously known

about his work on modeling innovation adoption. His 7Tribes model is loosely related to widely known work on the technology adoption cycle cited above, but so far neither of us has found innovation adoption models that directly mirror the ideas behind the 7Tr model. Such models may exist, but this report examines whether the unusual view of his newly developed 7Tr model could describe my experiences and whether it could provide a useful frame for interpreting them. If the 7 Tribes were indeed as general a model for the flow of innovation information as L. Loewe guessed initially, then he expected the 7Tr model to be able to assist with describing and helping to interpret almost any bewildering array of diverse and confusing experiences related to innovation adoption. It should certainly include the experiences I made while participating in the MSIM.

Interest in the 7 Tribes model has been motivated by L. Loewe's aim to develop a century-stable core architecture for the Evolvix computer language for biodata that he has been working on (including using the current prototype of Evolvix for simulating general aspects of the Coronavirus pandemic, *to be published*; the most useful overview for our purpose here is Appendix 3 and Loewe *et al.* 2017). He found programming to be closely related to innovation. Thus, many innovation challenges faced by diverse open-source programming communities likely have equivalent challenges in other non-coding related real-world scenarios. In turn, working with more challenging real-world scenarios might be a useful test for the flexibility of a software development model, especially since artificial scenarios are often devoid of the gritty details that complicate things in the real world. Such expectations informed his interest in offering me to work on this report after he had learned more about my experiences in the MSIM. He assured me that the complexities of interpreting the experiences of software developers could easily appear as difficult to interpret as my complex experiences in the MSIM. Thus, we agreed to work on producing this report with the joint aims of

- (my interest) working through my experiences in the MSIM and
- (his interest) testing whether his 7Tr model could pass its first real-life test by describing and interpreting a complex innovation-related scenario in a useful way.

Results indicate that indeed the 7Tribes \7Tr model can describe the various situations we encountered as I revisited my experiences in the MSIM in our discussions. As this report suggests, a 7Tr perspective on innovation adoption can offer a fresh view pointing to useful indicators of common systemic shortcomings. These can easily lead to unnecessary rejections of innovation by withholding pivotal feedback from the pioneers of an idea, often when they are in the best position to resolve respective root causes of such problems if they manage to improve their innovations by integrating all key points from such feedback.

The remainder of this thesis is structured as follows. The next Section (by L. Loewe) describes the 7Tribes model for the first time, including brief comments on how it was developed. Section 3 interprets my experiences in the MSIM program and my practical in light of the 7Tribes model from the previous Section. Section 4 offers perspectives for future work, including a strategy for advancing my own personal development. Two more specialized discussions (by L. Loewe) were moved to their respective Appendix.

Section 2 The 7 Tribes Model and how it was built

Since the 7Tr model used here has never been described before, it falls on this text to provide a few initial remarks on how it was constructed.

2.1 Use of wide interdisciplinary diversity-encouraging (*wid-e*) research.

The 7Tr model draws on the strengths of *wid-e* research. This type of research is defined by drawing on both the breadth as well as depths of all available research to the degree that this is possible. This approach to interdisciplinarity has been developed by Laurence Loewe at the Wisconsin Institute for Discovery (2011-2019) in order to describe an approach to research that prioritizes finding the best available answers for a given complex question that touches many diverse disciplines, instead of narrowing the original question down to whatever disciplinary expertise is readily accessible.

It is not a distinct description of *wid-e* research to say that new expertise is learned as necessary, because that is what most scholars do anyway. It comes closer to say that:

> *At the beginning of a* wid-e *research project it is impossible to say how many other disciplines will likely contribute to the success of that project eventually.*

Technically, this is true of traditional research as well, but in practice the disciplinary boundaries for most academics are quite well established. In contrast, *wid-e* research crosses boundaries much more easily. If necessary, the topics included could be broader than those in Wikipedia, but a *wid-e* research project would do this in pursuit of the question it aims to answer or the problem it seeks to solve.

Such flexibility was originally developed by Loewe et al. (2017) in the context of developing Evolvix, a computer-language for mathematically rigorous modeling in biology (Ehlert & Loewe, 2014; Scheuer et al. 2017). Over the years it became clear that there is a much broader need for *wid-e* research skills, from research in industry to the solving of just about any complex practical real-world problem. Whenever high-quality solutions are required, the equivalent of *wid-e* research skills are pivotal for getting there. Since all the challenges of interdisciplinary research exist in *wid-e* research, only more so, it is important to develop skills for handling the big *wide* wild sea of the unknown. Such challenges suggest the need for differentiating between different types of researchers who share interests in an area. How the 7Tr Model might contribute to this remains to be seen; here the 7Tribes model is described not as a tool for facilitating *wid-e* research, but as the output of a broader *wid-e* research program, which became part of L. Loewe's pandemic research marathon (*details to be reported elsewhere*).

The biggest challenge in *wid-e* research is that from a personal perspective everything is new, even if it is not new to researchers in the respective disciplines. How to navigate this wild unknown ocean without wasting too much time on re-inventing the wheel, re-re-searching for it, or later resenting the lack of its contributions, that is much more challenging for *wid-e* researchers than for those in established disciplines.

Yet, when allocating to us the challenges of our time, nature didn't consult the directories of our existing departments and agencies to prepackage the problems accordingly. It rather expects us to adapt (or it will let us die if we keep ignoring challenges like climate change). The biggest *wid-e* research challenge on a practical level is to determine for each of the diverse questions addressed each day:

- *Is this a big or a small question?*
- *Is it new or old?*
- *Who knows most about it?*
- *And most importantly, how reliable is that information and does it merit further cutting edge research in the context of my broader challenge or are published results sufficient for the purposes of my current* wid-e *research challenge?*

To answer these questions, it helps to be more familiar with the broader innovation cycle that has enabled the phenomenal successes of scientific research.

2.2 Potential aims for using the 7 Tribes Model \7Tr

The 7Tr model helps by providing a base-line model for describing a static snapshot of a structured society. If taken to its static extreme this society would be so brittle that it would sooner or later collapse under the weight of its own complexity. On the other hand, if these roles are recognized, along with the typical pitfalls that come with them, it becomes much easier to counterbalance and avoid collapse. There is nothing wrong with the roles of each of these tribes *per se* – an important point to emphasize given the theological baggage that these tribes had been carrying in centuries past. However, such ancient complex history does not have to blind us to the insights hidden in the rather subtle hints passed down in the names of these tribes and the few stories that we still have about them. It might even be seen as a (very late) way of honoring their contributions to humanity.

Spelling out the role of each tribe makes it easier to both recognize someone as a member of that tribe and appreciate the strengths in the contributions of that person. It helps *wid-e* researchers to learn this, because it increases the likelihood of finding more reliable information by helping to know where to look. Paradoxically we live in an ocean of ever changing ubiquitous instant answers on each smartphone, which is sadly simultaneously located in the middle of a desert of information about the reliability of the answers from that ocean. Maybe a scheme like the 7Tribes model will be able to eventually help in safe-guarding information culture at a personal level. Over the long term it even might contribute to a broader approach for dampening misinformation.

2.3 Methodology used for constructing the 7 Tribes Model

Here is not the space to offer a full description of the origins of the 7Tr Model. The 7Tr Model started with the question whether there might be anything at all that could possibly gleaned from the names of the 7 tribes reported in the Hebrew Bible as having lived in the "promised land" before Israel "conquered their promised land". What started as a wild speculation (and a test for the Jonah Hypothesis) then began to develop a life of its own. To arrive at what is described as the 7Tr model in this report, L. Loewe did the following:

- Look up the lists of the 7 tribes as given in the Hebrew Bible (Alter, 2018; there are several varying lists e.g. Genesis 15:19-21, Exodus 3:8, Deut.7:1, Joshua 3:10, Joshua 24:11).
- Consult several naming dictionaries for how the meaning of the respective names have been interpreted so far (e.g. by following the "Strong's"-links given in https://biblehub.com/text/deuteronomy/7-1.htm – and a mix of others that don't add much to the discussion here other than saying that L. Loewe tried to avoid overly relying on any one interpretation – given how much they vary between lexica).
- Consult the original Hebrew names and compare to the meaning of similar looking Hebrew words from the Gesenius (1908) dictionary to get a sense for any meaning that might jump to the mind of an attentive Hebrew listener.
- Consider common knowledge about the archeology of the tribes.
- Ponder whether there might be any patterns in the resulting composition.
- Consult descriptions of modern societies, from personal experience as someone who has moved internationally and as seen by scholars (e.g. see Wright 2000).
- Consider which societal functions L. Loewe would include as a systems modeler if he had to develop a general model for describing the various social functions in a working society (not that he built that model, but thinking about it informed the translated names and definitions).
- Evaluate various criteria for how to organize the list in a cohesive way.
- Explore whether echoes of the 7Tr pattern could be found somewhere else (to avoid falling for an overactive pattern recognition mind); several other such echoes could be found, including in the letters to the 7 churches in the book of *Revelation* (chapters 2-3), the 8 Beatitudes from the Sermon on the Mount (*Gospel of Matthew* 5:3-12), and numerous others. These other patterns need to establish their usefulness on their own terms, but their existence lends some substance to the claim there exists some functional support for a model of the type that L. Loewe describes in the terms of his 7Tr model below.

As the model kept developing, discussions between L. Loewe and myself also helped to clarify some of the definitions; thus, while L. Loewe is responsible for developing and maintaining the 7Tr model, I contributed by providing crucial feedback on the clarity of various names and definitions. Thus, for the parts of the model below that are understandable, there is a good chance that this clarity was prompted in a discussion between us to which I contributed.

2.4 A brief summary of details about each of the 7+2 Tribes in the 7Tr Model

In Hebrew scriptures, *nomen est omen*, i.e. the names of people often reflect important aspects of their lives or their wider role in society. As detailed in the methods used above, the definitions below assume that the names are also significant for the 7 Tribes that had occupied the "promised land". Thus, their names might hold clues to a functional role they may have played in the larger "7 Tribe Society" they might have formed there. Translations for the meanings of their names are not widely known or discussed, but remain accessible through the dictionaries and methods described above to all who are motivated to look for them.

For all its interest in using historic and linguistic details to inspire the definitions of the 7Tribes model: let it be clear that most functional aspects in the definitions below do not claim to reflect equivalently detailed historic evidence. After such a long time it is doubtful that many functional details of the 7Tr model will ever be documented for those ancient tribes. Hence, in terms of hard sociological evidence, L. Loewe has been considering the historic and linguistic evidence that informed the 7Tr model *not* as evidence for the functional 7Tr roles.

For brevity's sake, the following definitions summarize much longer discussions of various possibilities for how to infer a potential English type definition and its functional meaning for each of the 7Tr names as they might have been perceived by attentive Hebrew ears of historically well-informed readers. See Appendix 4 for a related overview in a table. See Appendix 3 for a definition of how the backslash symbol is used below.

1 Amorite TopSpeaker**\PowerElite** type individuals: *the top influencers and thought leaders who most determine the direction of how the system evolves.*

2 Hittite FearHandler**\RiskReducer** type individuals: *courageous andOr sometimes fear-inducing policy enforcers who reduce defined risks and thus guard specified interests of the community.*

3 Canaanite ProfitTrader**\Distributor** type individuals: *merchants, service-providers, andOr other trading deal-makers who offer goods andOr services within the broader marketplace framework defined by the PowerElite and the RiskReducers.*

4 Pherezite OpenDecider**\PureExpert** type individuals: *hold the most knowledge and seek to excel in their discipline, carefully guarding critical information. In danger of acting like a KnowItAll.*

5 Jebusite Stampeder**\RoutineMarket** type individuals: *take the most established and risk-averse approach, which makes them predictable and inflexible but also reliable. The resulting stability is the key, not the size of the market of those who buy into the routines, whether few or many.*

6 Hivite RotatingTentVillager**\TempRotator** type individuals: *are very flexible and seek to make the most out of arising opportunities, but are not in a position to immediately establish*

something permanent in the present working space as they know that their rotation will end soon.

7 Girgashite\CrushedDust**IgnoredOthered** type individuals: *they contribute to the success of other Tribes, albeit at a significant disadvantage to their own success due to systemic inequalities, which can result in exploitation and thus a low sense of self-esteem and lack of vision for their own future.*

These 7 tribes above are sufficient for defining a fully functional innovation society in any given point in time. If each of these tribes would continue to ideally process and integrate relevant information such an innovation society could continue to innovate indefinitely. However, as experiences have shown time and again, such an ideal flow of information is extraordinarily hard to maintain over the long term. It's too easy for entrenched interests, historic privileges, and accidental oversimplifications to fossilize into information barriers maintained with a kill-all argument of "we have always done it this way". In order to prevent such an eventual fossilization of some past state of innovation, the same narrative that defines these 7 tribes also defined the following two "tribes", the Hebrews and the Israelites. For the purposes of constructing the abstraction that informs this (2+)7Tribes model, let's ignore in the understanding of most people these "two tribes" are merely two names for the same "tribe" (that was delivered from slavery in Egypt). In the 7Tr model these two aspects might be defined as follows:

Hebrew\Beyonder**AnyRoleWalker** type individuals: *these curious individuals do not occupy a special role that is separate from the 7 tribes defined above; instead, they will walk in the track of whatever tribe they find themselves in, however, without necessarily confined to that role; thus, they will naturally explore what is beyond the horizon in search for creative solutions that may or may not work, but will break up rigid walls between the other tribes through unconventional approaches*

Israelite\RealityWrestler**AllRolesRefiner** type individuals: *these individuals bring to their creative solutions all the strength of the Hebrew approaches of thinking-out-of-the-box; but instead of going for "anything that works", they show the restraint of superrational saints (not unlike Jesus) who will do what it takes in order to build solutions that are stable over the long term – because they work for everybody (not only a privileged majority).*

To achieve true sustainability over the long term, it would be ideal if everybody learned how to walk in this last abstract role of "Israelite" as defined above, because such individuals would be able to balance any biases an innovation economy might eventually self-induce over the long term. Those who have tried to get there have all realized that the training is challenging.

Section 3: Real-world innovation adoption analyzed by the 7Tr and 7Ch model

3.1 Introduction to testing the 7 Tribes model

The main objective of this Section is to investigate how well the 7 Tribes model introduced in Section 2 can describe specialized 21st century situations far removed from the original ancient texts that inspired it. There are myriad possibilities for defining such models, since almost anything might serve as an inspiration for inventing abstract naming schemes. Why might a particular scheme be preferable?

A model like 7Tr becomes useful when it can describe observable patterns more accurately and with fewer complications than other models, while suggesting novel approaches to problem solving.

Whether this is indeed the case for the 7Tr model remains to be seen, since it has not yet been tested by any detailed attempt to identify the 7 Tribes as definable entities at some depth in a real-life situation that might benefit from debugging. This section is about changing that by presenting the first attempt to use the 7Tr model in a real-world 21st century setting.

Below I will use different perspectives to explore how well the 7Tr model can describe various aspects of the MSIM program that I attended. This program is described next.

3.2 Testcase: the MSIM in Climate Action andOr Digital Transformation

The program I attended (August 2020 — May 2021) is abbreviated here as MSIM for the full title of *Master of Science in International Management, Responsible Management and Climate Action* at Franklin University Switzerland, Lugano.

I had chosen the *Climate Action* Track, but the same program also had a *Digital Transformation* Track, which was attended by 3-6 of the 15-18 students in my cohort, depending on how exactly that is counted.

The MSIM mostly explored the complex world of digital transformation. It aimed to correct the trajectory of businesses in line with principles of sustainability and responsible leadership.

The *Climate Action* Track was facilitated in partnership with United Nations staff, trained professionals from NGOs, governments, and business organizations.

The MSIM included a 6 week “practical experience” aiming to interweave what students learned in the lectures with their interests in a relevant professional working environment. The original idea was to work at some branch of the United Nations in Geneva based on student responses

to a questionnaire about their interests. However, due to the Covid-19 pandemic, that remained uncertain for too long to work with my funding. Thus, I found a different practical experience in the US with the National Outdoor Leadership School (NOLS) non-profit organization that allowed me to preserve the funds I would need to complete the practical experience and resettle wherever life would next lead me after my student visa in Switzerland would run out. At that time, my understanding was that the UN would not pay students from FUS who did practicals there. If I had joined the practical at the UN, I would have no funds left for getting back to the US and restarting there. Other non-privileged students will likely face similar dilemmas.

My intention in being in the MSIM program included a desire to elevate the voices and presence of Native American and Indigenous peoples in the global fight against climate change. Learning about responsible management seemed to be a bonus to me.

Below, I am using my experiences with this program in order to test the 7Tr model from the following two perspectives.

First, I will take a very general view of the Master's program in order to check whether all types of roles in that program can be assigned to the 7 Tribes in a meaningful way. If despite working with Laurence Loewe, the lead developer of the 7Tr model, I can find some aspect of the MSIM that neither of us can map to one of the 7 Tribes, that would indicate a failure of the 7Tr model.

Second, I will take a more personal view of an innovation I had hoped to develop in the program and will use the 7Tr model in order to explore how far I managed to advance. If the 7Tr model is useful in this case, it will give me some insights into how to take my idea further than I managed to do, or at least offer some insight into what could have been improved.

3.3 How well does the 7 Tribes model describe the roles required to run the MSIM?

The 7Tr model aims to capture a systematic overview snapshot of diverse systems of social interaction by mapping them to a common terminology. If successful, then it should not be difficult to look at any particular system, such as the MSIM program, in order to identify the roles of persons to be mapped to one of the respective 7 Tribes in that system. In smaller systems, we might also expect hybrid roles, where some individuals can be mapped to more than one of the 7 Tribes because their job descriptions include diverse aspects in their respective roles.

The following Tribes are reasonably straightforward to identify in the MSIM. Therefore, it appears that the 7Tr model can describe most or all roles required to run the MSIM. For more details on the MSIM, see Section 3.2.

Below a more explicit potential English name for each tribe is given after the backslash, followed by a brief summary of its function within a local social system. The example roles that follow were drawn from roles in the MSIM.

Amorite\PowerElite type individuals: *the top influencers and thought leaders who most determine the direction of how the system evolves.*

Examples: President of the University, Director of the MSIM, associated faculty leadership, and other MSIM faculty, because they were the founders and leaders of this program. Scholarship donors, because they may sometimes define funding conditions and thereby influence the direction of the program.

Hittite\RiskReducer type individuals: *courageous andOr sometimes fear-inducing policy enforcers who reduce defined risks and thus guard specified interests of the community.*

Examples: Admissions staff because they determine whether people get into the program or not. Visa and border authorities and the visa application support coordinator, because without them students cannot get into the country to participate. Cantonal authorities, because we had to call for compliance with the COVID-19 quarantaine requirements. The employers at NOLS, because they had to agree to my practical experience project proposal, which also needed final approval from the Climate Action Mentor faculty.

Canaanite\Distributor type individuals: *merchants, service-providers, andOr other trading deal-makers who offer goods andOr services within the broader marketplace framework defined by the PowerElite and the RiskReducers.*

Examples: Some teachers were hired as specialists from companies outside of the university (e.g. Kim Polman from RebootTheFuture.org taught a concentrated 3 day course on “Leadership in Nature”); other teachers were from United Nations staff in Geneva or from

different universities. Commercial arrangements also included a local gelato dealer who served discounted gelato to students when celebrating the 50th anniversary of Franklin University.

Pherezite\PureExpert type individuals: *hold the most knowledge and seek to excel in their discipline, carefully guarding critical information. In danger of acting like a KnowItAll.*

Examples: All faculty in the program taught there for their disciplinary expertise. In debates an artificial emphasizing of one's own expertise can easily be perceived as arrogant ('KnowItAll') irrespective of the actual expertise of an individual (especially in student debates).

Jebusite\RoutineMarket type individuals: *take the most established and risk-averse approach, which makes them predictable and inflexible but also reliable. The resulting stability is the key, not the size of the market of those who buy into the routines, whether few or many.*

Examples: Administrators of the program and the university, local employers of students who had to earn their living while enrolled, local grocery shop with American brands for students who liked a "taste from home". All these either offered routines others relied upon or benefitted from / served routines already established independently.

Hivite\TempWorkers type individuals: *are very flexible and seek to make the most out of arising opportunities, but are not in a position to immediately establish something permanent in the present working space.*

Examples: The 18 master students in the MSIM program, the guest speakers who would only come in for one lecture, city networking connections made by students in the program to consult for assigned projects.

Girgashite\IgnoredOthered type individuals: *they contribute to the success of other Tribes, albeit at a significant disadvantage to their own success due to systemic inequalities, which can result in exploitation and thus a low sense of self-esteem and lack of vision for their own future.*

Examples: Cleaning personnel who clean the lecture-halls, serve food, and do many other important background tasks every day. Members of other tribes who are consistently not being treated as equal within their tribe but instead 'othered' as if they or their contributions were less important or even alien to the area of a 7Tr system. Systemic inequalities are especially prone to such othering. Such systemic inequalities are different from random events of life that are inevitable in the diverse communities of a complex world. Such complexity makes it technically impossible to maintain perfect equality all the time. This is not a problem if these fluctuations are not allowed to grow into full-blown permanent systemic inequalities – which they unfortunately easily do. To prevent this requires feedback from possibly emerging Girgashites in order to counterbalance emerging inequalities before they produce serious problems. An important aim of the 7Tr model is to facilitate such feedback.

3.4 Tracing my journey through the program using the 7 Tribes model

This Section describes a more personal view of an innovation. Instead of assigning the tribes to different functional roles in the MSIM program I will use a “time-rotated” 7Tr model, which describes how changes get adopted. It describes the journey of a particular idea through time along with the challenges it must overcome in order to succeed.

The idea I will be tracking is an idea that I found exciting enough to motivate me to leave my job, take out new student loans, and move to a different corner of the world for 10 months in order to explore further how my idea might contribute to humanity’s broader struggle with adapting to climate change.

This section is focused on the initial stages of change-adoption, because those are the stages where my original idea was still alive. Due to unfortunate circumstances my idea never got the scrutiny I still believe it deserves. The reasons are too complex for untangling in the given space, some are due to me, some due to culture, some due to systemic influences.

Based on my preparations for the overview below I could also have included other ideas and experiences as examples for the different stages. Given enough scrutiny, interesting instances could have been described for all stages. In the end I decided to not do this in order to leave the focus on my original question:

> What critical insights might Indigenous cultures contribute
> from their centuries of experiences with sustainable land use
> for helping us to inform concepts for sustainability today?

It still seems to me that there are valuable insights to be gleaned from exploring that intersectionality, but as someone who descended from North American Indigenous ancestors, I can tell that we need a shift on how we engage with these historically grown cultures if we want to ever unlock their ancient wisdom for our time today.

Stage 1a: Being my own Amorite by Speaking up in Search of my Destiny

As introduced above, the Amorite Tribe represents the PowerElite of TopInfluencers who determine the direction of an enterprise by defining its vision and steering its implementation.

The Amorite\PowerElite of the MSIM will determine its destiny with or without input from students like me. In turn, I myself am in the role of an Amorite\PowerElite with regards to the executive decisions I take in my own life, such as whether to attend the MSIM, how to choose my practical internship experience, and what I will do with my experiences afterwards.

Below I describe my original motivation for making the Amorite\Executive decision to give my life a new direction by leaving the job I had in order to join the MSIM. The fact (quite obvious to those who observed my journey through the MSIM) that I didn't get very far with my original vision does not detract from its validity. It points to a sizable number of issues, some on my part, some systemic, which got in the way. Some of these challenges are emblematic of the struggles of those who wish to explore the question that brought me to the MSIM. It will not be possible to analyze the full picture here, but that doesn't mean it's not worth presenting some key aspects of these challenges and how I experienced them.

My core aim in joining the MSIM was to explore how we might elevate valuable input from Indigenous peoples in the global fight against climate change.

This aim was inspired by experiences in middle school, when my class watched Al Gore's film "An Inconvenient Truth", and I created an artistic project report on what I learned from the film and subsequent discussions in class. Reflecting on that experience impressed on me an awareness of the Earth as a precious resource that humanity as a whole was not stewarding well.

Previous professional experience showed me the impact of approaches to management and job facilitation that were far from ideal. Thus I have been seeking to grow to become a respected and respectful manager delivering quality services.

The holistic learning environment offered by the Climate Action Track of the MSIM, the *Master of Science in International Management, Responsible Management and Climate Action* seemed therefore to me to be an ideal way forward for combining both: contribute to positive change in climate action and learn more about responsible management.

Tribe 1b: Mission: mobilize marginalized voices for managing climate change

My career interest lies in working with non-profit organizations that focus on the protection of Indigenous Native lands, culture, and language. I care deeply about preserving and restoring both the lifestyle of Indigenous peoples and the Earth's resources. I have seen that Indigenous and First Nations peoples have an extensive history and knowledge of how to protect the earth. These cultures' respectful use of nature's resources provided sustainable ways of living for centuries, something that modern social structures and systems have not done. By bridging the gap between Indigenous people and systemic government policies, humankind might have a much stronger chance at healing and restoring health to the earth and society. This point might be more important than it seems at first glance.

For example, the COVID pandemic showed how much our current high-tech society struggles with disruptions that are perceived as existential. Here is not the space to explore the wide range of inadequacies in worldwide pandemic responses, but if this were done, the conclusions would be not much different from a New York Times column that discussed the COVID challenges as a minor pre-run of much bigger challenges - concluding that we failed that test (Tooze, 2021-09-01). Our modern western societies have not seen an existential threat for some time and struggle with keeping a consistent cultural memory. Such a memory is important for drawing strength in difficult times and for not committing the rounding error of hopelessness, which would convince everybody in a population of individuals to do nothing (because there is "no hope"), even though the population could very well defeat a threat like COVID if it decided to work together. Such working together across diverse levels of society seems strange/miraculous from a Western individualistic point of view. However, all traditional cultures that have survived for some time have found ways to incentivize behaviors and values for facilitating the collaboration required for ensuring survival in such situations. Needless to say, countless pandemics and disasters that have been plaguing traditional societies for a long time required the tenacity of individuals to work toward survival despite overwhelming odds that would have caused the demise of that society.

Tribe 1c: Development of professional skills in digital transformation and management

In my previous professional experience, I had become part of a larger digital transformation in the organizations that employed me. I have been experiencing digital transformation from an end user perspective who has to wrangle the daily stream of data into the types and categories provided by the digital systems set up or changed by others.

For example, the development of technologies since a 2018 conference I was employed to work on required focused troubleshooting on site for the next conference in order to provide in-depth details on issues for developers. This required coordination with multiple parties, because throughout the planning process, my team conducted site visits to meet with the various venue vendors with which we partnered. To do this, I had to learn the registration vendor's user and administrative systems to manage unique and confidential registration cases. Working with a different system at the same company, I had the core responsibility to work with the National Support Services director to evaluate and enhance our in-house systems, including our mailroom software and hardware.

Managing people has been another important part of my previous professional experience and is likely to remain important if I want to pursue my vision of bringing together Native people's wisdom with more technologically-minded approaches to managing climate change. In my experience, conferences can provide a highly efficient environment for exchanging novel ideas by exploring informally whether they might be worth pursuing at more depth. Thus, I hoped to receive as much education as possible on how to navigate the human relationships and the systematic operations of an organization in an effective and meaningful way, i.e. to be equipped with the skills and knowledge to become good managers.

I had experienced both good and poor management in previous employment positions that I have held. For example, in a previous office setting, I was able to adjust and optimize how several existing electronic systems worked together to implement some internal process for our team; this made the overall system more efficient despite limiting personnel resources. I did this by managing up in order to adjust expectations in order to find solutions that were more kind and reasonable for supervisors, customers, and myself. This required establishing new fluid processes and softening the rigidity of existing ones, as well as building bridges for clear communication and trust among my colleagues.

Elsewhere, I collected experiences with supervising volunteers in a camp site that served as a retreat and training center. For almost two years I trained, supervised, and coordinated the work-plans for groups of first-time and returning volunteers who worked in the kitchen, dining hall, and dish room. In this position I took initiative to develop new workplace management skills and extend my active listening capabilities. As a result, I eventually served as co-manager of the kitchen and dining hall facilities.

Tribe 1d: Exploratory venue design

In order to bring Native peoples ideas together with high-tech solutions for managing climate change, there will always be the question of where to do this. One attractive possibility is to organize corresponding conferences. In my previous work, I have started to collect experience with a part of the diverse challenges of event management.

For example, in a 5 day December 2018 conference with more than 10,000 participants, there were about 200 vendors that had to be accommodated. To do so, I was part of a team of 3-5 to manage the registration of all vendors. I was also part of a group of approximately 10 that met at the venue itself with various partners of the venue over several months. These meetings helped us envision the spaces of the exhibition hall in which the conference would take place. My capacity for managing the various moving parts for a project of this size grew significantly during this time. At the conference itself, I was responsible for a team with about 3 others, who managed over 40 staff who walked the exhibition hall with the ~200 vendors and their onsite booth staff in order to proctor the space and answer questions or point booth staff elsewhere. While many other people filled the various teams to organize everything else at this large conference, I gained significant insights into important aspects of conference planning, such as why preparation matters long before events start, e.g. in order to establish trusted business relationships with other stakeholders (like venue representatives, vendors, team of organizers); this also included input to creating useful maps of the exhibition hall and developing strategies for organizing how the various vendors would best be placed in the hall.

Tribe 1e: Overall expectations

I expected the Master's degree at Franklin University Switzerland would equip me to advocate for a role for Native peoples in solving the international climate crisis. From engagement with current global issues to working alongside top global executives, I expected this program to shape and refine my skills to mindfully engage in advocacy with persons who hold positions of influence and power.

My customer service and administrative work experience shaped the foundation of how I envision my career; my experience in organizing conferences might open opportunities for bringing Indigenous people and their wisdom in contact with other ongoing efforts to mitigate climate change.

I expected the executive mentoring and career coaching at the MSIM to support my work to develop my mission for including Indigenous wisdom in climate change discussions and to build a network that might facilitate such contributions from Native peoples. I expected the holistic learning environment at the MSIM would be well-positioned to assist me in starting to actualize my goals in light of their broad interdisciplinary reach and other aspects of my professional career.

Tribe 2a: Being my own Hittite by managing my own financial risks

After making the decision to join the program, there were practical requirements to be met.

Applying to the MSIM for the Fall 2020 term was not my first attempt to study at FUS. I had applied to a broader program at FUS for the start term of Fall 2012 and to the MSIM for Fall 2016. On both previous occasions, I was admitted into the program, but unfortunately had to withdraw due to lack of funds. Therefore, I was determined to pay close attention to the financial aspects of my plan to study at FUS. The importance of such attention to non-scholarly details has been pivotal for my academic career, because my family is not independently wealthy, and I always had to pay for my own education. This importance has been growing as I have been advancing in my career. Thus, working out the funding required me to be my own Hittite in order to overcome the funding hurdles that would keep me from studying.

Timelines. After my decision in July 2019 to join for Fall 2020, I applied in Aug 2019, was accepted by Nov 2019 with the requirement of paying the enrollment deposit of 1500 CHF by May 1, 2020. I confirmed acceptance of my spot shortly thereafter and started in Jan 2020 the 3-step process of applying for the federal loans I would need to confirm by July 2020 to become part of the program. In June 2020 the MSIM had organized a Zoom call for introducing all participants to the program. The semester started at the end of August 2020, while the funds became available to me in Sept 2020.

Loan Application and Budgeting. The first step was my FAFSA application in Jan 2020 indicating which types of loans I intended to apply to. In the second step, the school had to confirm that I was indeed an incoming student, which is why I had locked in my commitment to enroll at Franklin University Switzerland as early as I did. In the third step, I had to finalize the loans, which required me to estimate my annual cost of being in the program. This cost included

- travel (to, from, and within Switzerland, plus traveling to and from class-required places),
- educational expenses (tuition for two semesters in total 25000 CHF / year of which 6250 CHF was covered by an FUS scholarship; additional costs included computer, mandatory paywalls, and books which I had to leave in Switzerland because of weight restrictions on my flight back),
- mandatory health insurance (2040 CHF / year),
- housing (deposit, monthly rent) and personal living expenses like groceries,
- budget for maintaining my car that remained in the US,
- resettling back in the US,
- unforeseeable expenses due to limited experience with budgeting living expenses in Lugano, changes in international CHF-USD exchange rates, and the costs of moving money internationally.

All these complexities had to be taken into account back in March 2020, when I applied for the student loans, which were only adjustable until maybe July 2020 (but this didn't help much to improve the quality of my information).

My household items were stored with a family I was friends with that kindly supported me by allowing me to use their address as an official US mailing address while I was out of the country. This was required by FUS (for sending invoices) and the US Federal Government (student loans, visa, voting) among others.

Loan Summary. I had applied for in spring 2020 were for $20,500 (a Direct Unsubsidized loan, i.e. what any US graduate student would qualify to receive from the US Federal Government) and $26,000 (a Direct PLUS loan, i.e. requiring a sufficiently high credit score to assess whether I was likely to pay the money back based on my previous federal loan repayment history). While the first of these two loans has a fixed upper limit, the second required careful budgeting by me, because once its amount was fixed, it could no longer be adjusted without going through the whole (complicated) application and review process again (over-budgeting was not really an option either without risking early repayment penalties).

Delay in accessing the federal funds was surprisingly complicated and rigid, since the Federal Government starts to disburse student loans to the schools only once the Fall semester starts. Schools are obliged by federal regulations to only access the funds two weeks after classes start to ensure that students are actually enrolled in the courses. After paying tuition and any other outstanding costs on the student's account, the remaining difference is deposited to the account holder as a lump sum for the semester[1]. In my situation, the remaining funds of about $12,000 were deposited directly to me. The spring deposit in Jan 2021 was similar but shorter. As an overall result, I had to finance the first four weeks of my time in Switzerland from my private funds. Similarly, I had to pay in May 2020 the Enrollment Deposit of 1500 CHF ($1612 with exchange fees), even though the loan disbursement only arrived in Sept 2020.

Cost of accessing the federal funds. I tried to get a Swiss bank account to minimize international transaction fees, but could not, because I am not a Swiss citizen. In practice this meant that all my US student loan dollars were converted to CHF on their way to the university to pay for tuition, etc. before they were deposited by the school back on my USD bank account in the US from which I kept paying my CHF bills for living in Switzerland. Thus, my living expenses went through three international money conversions.

From my point of view I did not know how to avoid the resulting high cost of accessing my funds. From the start I knew in principle that three international money conversions would be required to access my funding. However, it turned out to be quite disheartening to observe how this drained my resources day-in day-out since I could see no other viable options.

It is difficult in retrospect to calculate the precise rates; to convey a rough idea of the magnitude, between about 12% and 26% were lost on the long journey from my approved loans to paying for transactions using my card in Switzerland. It was even more frustrating to realize how this sponsored some large financial corporations, some of which have been known to invest in industries that increase climate challenges. Thus, I stopped calculating the conversion efficiency. This also reduced my motivation to keep tracking my expenses in as much detail as I

[1] Account holders can also be a parent or guardian of the student who would receive the difference in funds and then issue them to the student as the semester progresses.

would have otherwise done. This situation added a considerable amount of stress that reduced my ability to focus on the learning for which I had come in the first place.

Other funding contributions. My acceptance letter for the program in Nov 2019 came with a 6250 CHF Tuition Scholarship from Franklin University ($3125 for each semester towards tuition costs at 12,500 CHF per semester and a mandatory health insurance of 1,020 CHF per semester).

In addition, a friend in the US bought me the plane ticket (ca. $1700) for my trip to Zurich from where I reached Lugano by train a couple of hours later (as border travel from the Milan airport was not an option due to COVID-19 travel restrictions).

Overall success in funding. With the additional donation and the tuition scholarship, the federal loans covered the remaining costs of schooling beyond paying for tuition. However, this required careful budgeting, frugal living, and quite a bit of luck given various unpredictably changing costs and unexpected expenses. This included my re-entry into the US and the costs of transitioning into a post-graduation job after my internship at the NOLS position in New York State.

Other Hittite challenges included applying for an appropriate VISA for Switzerland and renting a flat locally. Both came with the well-known usual hurdles for someone who organized such transitions for the first time – and for transitioning between rental-cycles as different as the one where I lived in the U.S. and the one in Lugano, CH.

Accommodation was offered by the school at a cost beyond my budget and including the requirement to leave during the winter break (as initially stated, albeit later changed during the first semester to help students cope with COVID restrictions). The inflexible move-in move-out dates and visa regulations made it infeasible for me to use the official accommodation recommended by the University, even if I would have been able to afford it. Hence, I reached out to other students and decided to rent a flat together with two of them.

This arrangement came with the ups and downs that are characteristic of living together with coworkers – an extra challenge that did not always increase my ability to focus on my intended learning outcomes.

Tribe 2b: Being my own Hittite by Speaking up as a minority

As important as the technical arrangements above were for allowing me to join the MSIM program, none of them advanced any of the conceptual challenges humanity faces in responding to the climate change crisis. As detailed above, it was my goal to contribute to these larger challenges by elevating experiences that only Indigenous voices could bring to that discussion based on their centuries of experience with sustainably managing their lands. My hope was to learn in the program how to do that. I found it difficult to talk about this hope of mine in these terms because there didn't seem to be a place for that - or so I felt. My naive notion was that people would be interested beyond their own work in order to also connect over new topics and ideas that others brought to the discussion. In retrospect, there are various things that I could have done better if I knew or if I had known how to better prepare for the MSIM, but given where I was at, here are my experiences with introducing my idea into the group. Part of my challenge was that my idea was at a rather early stage and thus not sufficiently well formed for me to introduce it well and defend it where necessary. Everybody else seemed to already have an agenda, whereas I came to learn and was hoping to develop an agenda. Thus, I struggled to articulate my "agenda".

Early in the program one of the professors organized a "World Cafe" discussion-group. This format is particularly open-ended and thus well suited for sharing a broad range of ideas and to brainstorm solutions in a diverse group setting. I decided to use this opportunity to introduce the idea I wanted to explore further during the MSIM: elevating Indigenous voices in climate crisis conversations. The World Cafe was organized as a conversation where everybody in the group could contribute by entering a "stage" with a few chairs to present their point to which others could then respond while the rest of the class sat as an audience in a semicircle. The discussion opened with brainstorming about global issues and eventually turned to asking, "How can we address these seemingly impossible problems by beginning to solve them at such a large scale?" The next contributor mentioned the need to listen to voices that are crucial to this conversation but who are currently not being heard for some reason. So the question arose, who was presently missing from those discussions. Suggestions included:

- **The youth**: younger generations, who are more digitally inclined because they more or less grew up with the Internet and thus more easily navigate digital spaces. These digital spaces bring their own advantages and challenges, since they enable so much more communication in so much more data-rich spaces.
- **The elderly:** older generations carry general wisdom and historical knowledge of what *not* to do based on their lives' and collective life's experiences.
- **Other voices** that need to be listened to were also mentioned.
- **Indigenous peoples' experiences:** given the long time over which Indigenous cultures have been managing natural resources sustainably and with proven success, chances are that they might be aware of critical lessons on sustainability that could be generalized to improve our best strategies for moving forward over the long term.

The last point was touched on by someone and I then further elaborated on it in my own contribution to the discussion. Given the inherent challenges of making progress on that point, I

will next detail some of the challenges I faced with first making that point at all and then with how the discussion subsequently developed.

Background to my challenges in speaking up. As a first-generation student, introvert, and outside of my natural comfort zone, I find it difficult to speak up in front of an audience. Being someone connected to Native people contexts[2] further complicates it for me to communicate Native insights in light of the commonly perceived superiority of ideas and approaches based on “Western technology”. Thus, I was hesitant to add my point to this World Cafe discussion. I was encouraged to take a seat on the stage by a peer sitting beside me who noticed that I had something to share. Eventually I worked up the courage to do so and joined the conversation at an appropriate juncture to share my ideas.

Specifically, I noted that one of the most underrepresented groups of voices that needs to be heard are those of Indigenous and First Nations people because

A. They are the people who originally took care of the natural lands (at least in the Americas).
B. They had to learn how to rejuvenate and care for the earth in order to survive (this proves their long-term track record or else we wouldn’t have heard of them).
C. To care for their lands over such long historic times, they learned to work the land in healthy ways while maintaining its fertility.
D. The youth of Indigenous populations need to develop a vision for learning and carrying forward the most useful practices in order to be able to insert them into corresponding global debates.
E. The elderly of Indigenous populations need to transmit their experiences to the young and work to record their insights for posterity while they still can.
F. To share their insights, both the young and elderly of Indigenous populations struggle with extraordinarily difficult barriers caused by cultural mismatches, lack of funding, and thus lack of access to discussion spaces like this class or United Nations committees, where their contributions might leave the most positive impacts.

However, after I made my points, the conversation was immediately taken in a different direction. Hence, I attempted to redirect the discussion back to the Indigenous/Native peoples’ perspectives I was highlighting. Yet, the conversation was derailed again. This whole time, the facilitator of the conversation was keeping track of key points made by students by noting them on a flipchart. As if aiming to demonstrate the challenge I was highlighting, he completely skipped taking any notes from the contribution I made on both occasions. Observing this erasure of my contribution not only surprised me at the time, but it also made me question myself unnecessarily after that class and thus was not conducive to improving my learning experiences in the MSIM. Experiences of others (Goward, 2018) show that I am not the only

[2] As people familiar with the discussions will know, the precise classification of ‘Native peoples’ can sometimes get complicated. For example, one of my grandmothers is Mayan (an Indigenous people of modern-day Mexico), I was born on First Nations land (in the US, but not on an official reservation), and as a US citizen I am Mexican-American while also qualifying as a full Latinx and Hispanic person. Thus, I have connections to Indigenous people, but I do not currently consider myself to qualify as a spokesperson in any official sense. In my mind the complications of detailing my precise links did not make it easier to speak up in this discussion as I feared having to justify why I might be qualified to represent any Indigenous insights.

person who has seen such incidents add to a long history of self-doubt, which first generation students from non-privileged backgrounds like me tend to grow up with. Only after observing that facilitator for some time did I realize that this particular situation had nothing to do with me and that he might not even have been aware of what he was doing.

It might seem overblown to spend as much time on the nuances of my experiences as I contributed to one particular session of only one of several lecture series in the MSIM. Was there not a whole year that I had dedicated to further explore this question in the MSIM? Unsurprisingly, that seemingly long year consisted of a finite number of opportunities, many of which did not easily lend themselves to introducing my ideas.

Reviewing my experiences, I could recall about five other occasions than the one I described in detail above. These five touched or could have touched on the importance of Native people's contributions – or seemed to offer open ended opportunities for bringing up questions I was interested in. On each occasion I engaged in ways that I deemed appropriate at the time. Yet, none of these opportunities led to any significant developments.

Each course in the MSIM offered multiple opportunities to present my ideas in the presentations I prepared (like all other students, as woven into the required coursework along with exams and essays to submit). However, these presentations were always in response to topics related to the syllabus of the course and it would have felt inappropriate to suddenly talk about the potential role of Indigenous voices in mitigating climate change.

Finally, one might think that the practical experience, an important part of the MSIM, would offer a tangible opportunity, but this was much complicated by the ongoing COVID-19 pandemic. For financial and visa reasons I could not afford the prolonged uncertainty, which allowed other students to eventually become part of a practical at the UN in Geneva that was organized by the school. The best option I could find at the time for fulfilling the formal school requirements (also enforced by the loan), was to work at NOLS for my practical (see description below). This work had nothing to do with elevating Indigenous experiences and aimed to focus instead a bit on sustainable forestry and more on bulk food supply chain organization in how it was initially envisioned.

By an odd quirk of chance, writing this report turned out to be one of the more significant experiences of progress – however small – along my goal to elevate Indigenous experiences. It involved a review of my goal and the opportunities I did or did not have to take steps towards it by forcing me to take a hard look at the challenges faced by anybody from a less privileged background coming into such a program. Anybody with a vision for engaging with global issues that require input from many diverse populations will face similar terrifying structural, financial, intellectual, educational and psychological challenges, unless they have somehow overcome them already. It may be tempting to claim that less articulate people don't have important aspects to contribute if they can't clearly describe them. However, from a data-flow perspective, it could also be that they hold vital information that just happens to be stuck behind "soft" barriers with ultimately very "hard" consequences. Yet, unless such information-flow barriers are effectively removed, it is impossible to know. Maybe the 7Tribes model captures some hard-won long-lost insights about how to create a sustainable culture.

Tribe 2c: Challenges in overcoming limits in standardized education

The MSIM has been designed to provide many opportunities for contributing ideas and developing visions. It seemed to me that its structure was more beneficial for people who had ideas that were more closely aligned with the syllabus of the respective courses, or who had more experience in how to express their ideas in diverse contexts (e.g. on popular online platforms or elsewhere). Obviously, the faculty and lecturers on the MSIM had worked hard to offer their students an experience that was as broad, deep, and valuable as possible. There was nothing wrong with any of the exams, essays, and presentations I ended up preparing to ensure that I would graduate successfully. Yet, they left little room for developing my own vision – so it was crushed under the combined avalanche of requirements. It is not clear to me how to resolve this tension between standardizing (as required for accreditation in higher education) and the potentially very diverse learning-paths that individual students necessarily have to follow to achieve their goals (like in my case).

The MSIM seemed to me to welcome imaginative and creative ideas up to a point. My goals did not (yet?) promise a tangible path to immediate income through likely funding, nor a reasonable chance for income-driven promotion, nor a hint at how to generate revenue through a self-sustaining business model. And yet, such ideas might hold important clues for solving the climate crisis.[3]

To me the ideas that motivated me to join the program seemed new and imaginative and untested and raw. They still do. Are they important or even essential? Perhaps not. Will they work? Not as-is, for breaking new ground is inherently risky. Are they an inefficient waste of time? Very possibly. As I experienced it, the MSIM did not help me to answer those questions. Could I have advocated more clearly and forcefully for exploring those ideas? Probably, but only with the benefit of hindsight. When I joined the MSIM I did so with whatever capabilities I had or had not yet acquired on my individual learning path through life.

The many challenges I faced as a first-generation student from a non-privileged background are likely also well known to students from Indigenous and Native peoples' backgrounds. Individually, most of these challenges are not big enough to qualify as prohibitive. Yet, their combined effect on new ideas might well be described as death by a thousand needles. As tragic as this may be on a personal level, might this matter on a larger scale?

[3] Given its dramatically increasing urgency and difficulty, academic research has an essential role to play in developing the innovative solutions we need and in reviewing and refining potentially viable proposals. However, to do so more efficiently it might be useful to explore a broader set of approaches for advanced interdisciplinary education and research.

Tribe 2d: How the global higher-education system can accelerate climate disaster

If global warming is a runaway process, a switch-like threshold will exist that will be the make-or-break for the existence of human life on earth. If Indigenous cultures hold key insights without which it will be impossible to avert such a runaway, then we will only ignore their insights at our own peril. If access to higher-education is hampered by the availability of sufficient funding for Indigenous people and nobody ever asks that question, then – tragically – higher-education could indeed end up causing climate disaster. It would certainly not be the only cause for it, but holding a solution to averting a run-away process and only delivering the greater majority of it is insufficient, because the missing small amount would still allow the runaway to proceed.

There are mechanistic reasons for arguing this case, as detailed in Appendix 1 by L. Loewe. It argues for learning how to survive through integrating the values of diverse Indigenous cultures through the sharing of stories. The core idea described there is inspired by a parallel to how post-genomic biology explores the staggering diversity of genomes in biology.

My decision to join the MSIM with a vision to elevate Indigenous and Native peoples' voices in climate change discussions came with many more risks for me than I had anticipated. Thus, from my personal perspective this chapter of my life might as well be called:

How dare I?

The Hittite tribe in the 7Tribes model has the handling of all sorts of fears and risks at the core of its contribution to broader society. Maybe the 7Tr model, if introduced from the start, might even help other Indigenous people to be more efficient in overcoming their fears than I was.

Tribe 2e: Why academia can be scary

There are good reasons for why many universities have started to pay attention to first-generation students. These students have no access to a lived example of a close relative who has been through the scary and confusing roller-coaster that is often a natural part of open-ended research-intense learning programs in higher education.

If not overdone, some such challenging situations can help to stretch the mind of students, so they can build confidence by eventually realizing that they can actually do more than they would have originally thought. However, as any lecturer knows, it is easy to overdo the challenges, pack too much content in the lecture or ask too hard a question in an exam. People who have some working intuition of how modern universities work, will know that such accidents are bound to happen occasionally; they're not nice, but they are not a systemic problem as long as all students have somehow acquired such an understanding of how universities work (often from their parents).

Unfortunately, for students without such personal and educational background, such incidents can have catastrophic consequences, because they often naturally assume that the teacher is right and that everybody else can and should follow, and that there really must be something wrong with them if they're not as good as they or someone else expects them to be. As a result, the students may beat themselves up emotionally, which can easily lead to a vicious circle of self-fulfilling prophecies, where they tell themselves that this subject is something "they're obviously not good at" or similarly damaging self-talk until they completely lose hope and give up. These effects are cumulative and are particularly pronounced in mathematics, where the learning curves are particularly steep. Many studies have been documenting math-phobia as a real problem (e.g. see references in Dowker et al., 2016). Unfortunately, it is mostly ignored, maybe precisely due to overwhelming levels of math-phobia.

Such fears are bad enough as they are, since fear is known to be a powerful inhibitor of rational thought and innovation (see Edmondson, 2019).

However, for many non-privileged students these fears are compounded by requirements that will cause their loss of funding, if they don't succeed sufficiently well with their formal class assignments. As a result, they adopt a mindset of "whatever the professor says" and "fall in line behind what they're supposed to do" – even when professors wish they'd think for themselves.[4]

In addition, most courses go over their materials so fast and with so many assignments, that students have almost no time to process the material at any depth. Most of them still tend to complete assignments and pass exams "just fine", because that is what they have learned to do very well in most of our educational systems. However, how much they will have actually absorbed as working knowledge for later use in life is a very different question.

Unsurprisingly, for students from minority cultural backgrounds, added challenges of feeling rejected or undervalued or over-noticed easily multiply *in their own perception*, even in

[4] This experience of Ms. S. Guyer from the student-perspective echoes the experience of Dr. L. Loewe from his experience of teaching biology students at UW-Madison for several years as an assistant professor.

cases where they are suffering like everybody else. Unfortunately, for the learning outcomes of students, it is not the good intentions of their environments that matter, but the self-perception of the students. If they can't believe that they can do something, nor have any credible hope of ever getting there, what chance do they stand? Such self-confidence can only grow by itself in its own time. Testing too early and too often tends to be counterproductive, as if the blades of wheat that just came out of the ground were to already have mature wheat ready for harvest.

To illustrate, below is a raw, direct, and unedited paragraph, which I wrote at near typing speed near the end of some writing session, somewhere in the middle of my work with Laurence at a moment when I wasn't sure whether I would ever get to the end of completing this paper. He had asked me to describe how I feel. The following quote captures that moment and obviously doesn't reflect how I felt all the time, as like all people I have ups and downs as well. Yet, it might serve to capture some of the struggles that are difficult to imagine for students from a privileged background (and even more so for many professors).

Anxiety about this thing (unedited):

"I'm afraid that this paper will not be good enough, rejected immediately when I submit it and I don't have the energy to give it another go. To try and rewrite the whole thing...or even part of it, really. My energy is barely enough to finish it this first time and that brings us to - here. Now. Today. This paper as it stands with many notes and ideas and spread all over the place without coherence or logic it seems. It's all over the place. I just anxiously await it being done but I have no patience for the process that it takes to get there because it is a process after all, is it not? I fear I wont be able to string all these thoughts together to an acceptable final paper. And even as I write...as we talk...and brainstorm and as Laurence gives me ideas and stimulates my thoughts and gives me new perspectives...even as my paradigms creak and groan with the shifting...I worry it's not enough and it's going no where. How am I to weave this all together to tell a story that teaches and demonstrates my process? As I dip back into those mental spaces, my heart grips and my muscles tense with the carried memory of the stress I was under and the anxieties [that] *constantly plagued me day in and day out. I carried the stress in my shoulders and head, down my back and across my gut. My very intestines rejected almost all food I put into my body. I was tense all the time. My sleep was tormented and creeping shadows stalked me at every corner in the dreamspace. I never had rest. All this clouds my thinking and pushes my memory to the edges where the frizzes of memory barely hang on, just out of reach and outside of my grasp. What was that memory? What was that thing I know is there but won't quite come to mind to formulate a full thought? They elude me like a fox in the night.*
I'm frozen."

Comment by L. Loewe:

The statement above speaks for itself. I doubt I would have been able to accomplish much of what I did academically in my life if I had felt often in the way described above by Ms. S. Guyer. I know well the confusion that results naturally from getting lost in a research project, however, I have always somehow been fortunate enough to find someone who helped me to see the light at the end of the tunnel, or helped me to get unstuck on those few occasions where I truly was stuck and would have given up if there hadn't been someone who encouraged me to go on and who showed me that things weren't as bad as I had thought. Most of the time I had the good fortune of having extraordinarily good supervisors from whom I learned a lot.

By walking alongside Ms. Guyer as she worked towards completing this report, I have merely tried to share with her what others had graciously shared with me.[5]

Ms. Guyer has impressed me with her determination in her efforts to complete this study and to make it count. As described in the Acknowledgements Section, she did all the hard parts of collecting the experiences in the first place. Then she re-lived quite a few difficult memories, while explaining to me how she had come to see some crucial moments in her year of learning how to maybe help avert climate disaster – half-across the world, early in the CoViD-19 pandemic. She did what was possible and more as she unpacked her story by drafting text for this report, checking data, – testing the 7Tribes model against her experiences, further refining it, – structuring content for this report, editing sentences, critically discussing important nuances I would have missed, and more. By comparison, my contributions are only minor; I introduced her to the interpretative frame of the 7Tr model, I assisted as we both tested it against the real-world data of her experiences; like any imperfect mentor would do, I sent her down some rabbit-holes and kept her out of others; I kept the forest in view while we were looking at a great many trees; occasionally I reminded her that the forest was still there and the report's outline hadn't disappeared because the details of a tree became overwhelming. Neither of us could have individually completed a report that tests my 7Tribes model against Ms. Guyer's data. Even with perfect access to all of Ms. Guyer's data I could not have produced a report of this quality and clarity – such was the importance of Ms. Guyer input on all matters big or small.

Ms. Guyer maintained editorial control at all times and was not shy to use it; if she found an issue, she was usually right; little escaped her keen eye. For a non-majority, first-generation student like Ms. Guyer to dare to share some of her struggles as openly as above only underscores her courage, her leadership, and her many substantial academic and other achievements, which this report represents.

On a broader scale, if a significant fraction of students that leave academia have similarly confusing experiences, then the rise of anti-academic sentiments comes as no surprise.

[5] *To my own surprise, I had to be called to University of Wisconsin-Madison as an Assistant Professor in Medical Genetics to eventually realize that I, too, had been a first-generation student and had struggled with the corresponding challenges more than I had realized in my research career.*

Tribe 3-7: Overview of some challenges with other Tribes 3-7

After describing in some detail how the first two of the 7Tribes also applied to myself, there is much more that I could say in how the other tribes also mirrored aspects of my life in the MSIM. I collected some notes in discussions with L. Loewe to check whether this was indeed the case. In the end, it would produce a similar text to what I presented about the first two tribes. Given the overall length of this document, I decided to omit those details. To hint at where such a description would go, here are some brief highlights:

- **Canaanite/Distributor:** This applied in the most obvious way to my NOLS practical. Not only because I was literally distributing food, but also because my choice of this practical was a deal that I negotiated at the time under tight pandemic, visa, and financial constraints.
- **Pherezite/PureExpert:** This obviously applies to all students as academia is geared towards training the next generation of experts (even if the majority of students do not end up becoming experts in the areas their professors specialize in).
- **Jebusite/RoutineMarket:** Like all people, I organized my day around routines and a structured schedule as best as I could manage. Of course, there was variation in this, as FUS observed local holidays, some lectures had special schedules, and most all courses had schedules different from the last. This is where it is important to not blindly follow routines, a challenge for Jebusites, a group who naturally functions in ‘autopilot’.
- **Hivite/TempRotators:** One of the ways that I worked through the program was compartmentalizing each course. Functioning in this way helped my process of completing assignments for courses one at a time. Each assignment therefore became such a rotating job, and was not directly linked to a defined larger project in my life that I was actively working towards.
- **Girgashite/IgnoredOthered:** Many times, my strategy for learning how to better perform in the MSIM was to assist others in refining their projects or practicing their presentations, so that I could observe and learn from their approach to the work, because I viewed others as more knowledgeable and capable than myself. Often, this led to unintentionally overcommitting myself and consequently neglecting my own workload.

There is more that could be said about each of these but the examples above should suffice to show that my life as a student in the MSIM reflected roles that can be mapped to each of the 7Tribes in some way.

Section 4:
Discussion and future perspectives

4.1 Cases of Use for a 7 Tribes Model

The analysis presented in the previous sections aimed at testing whether the 7Tr model from Section 2 can formally describe the complex real-world experiences of the MSIM program in a useful way.

As Section 3.3 shows, it appears that all the roles required for running the MSIM can be formally assigned to one or two of the 7 Tribes by matching their characteristic features.

In Section 3.4 I explain in more detail how my work towards participating in the MSIM was reflected in the Amorite\PowerElite and the Hittite\RiskReducer roles. Based on my observations, I could do the same for all the other roles as well and I outlined some topics for such an expansion.

After working with this model for some time, it seemed hard to find examples of situations where a social interaction did not fit in one of the generic roles described by the 7Tribes model. That does not mean that such examples do not exist, but it seems to imply that the 7Tribes model might indeed be worth examining further in more diverse societal interaction scenarios. Maybe it can even contribute to handling cultural challenges in climate change discussions.

The great challenge for any 7 track society is the slow speed or lack of information flow. Each tribe is systemically walled off or otherwise distanced from each other tribe, which reduces opportunities for naturally sharing information. This leads to unnecessary friction because each tribe struggles to understand members of ‘those other tribes’. Such brittleness can eventually lead to the collapse of such a social interaction system, which could be much smaller than a whole society.

Can such calamities be prevented? In the 7Tribes Model the problem is conceptually solved by the Hebrew Tribe that tends to explore what is “Beyond” its boundaries and thus becomes an AnyRoleWalker. People with such a mentality may work in any of the roles defined by the 7 Tribes, but their go-beyond mentality refuses to be defined by only that role. Hence, they reach out to people from other tribes and can, for example, diffuse unnecessary tensions by placing themselves in the shoes of some other tribe. A few instances of such behavior were observed as well.

Is a formal classification of roles and behaviors into a 7Tribes\7TrackRoleSociety useful? In order to explore that, it is essential to distinguish between different potential ways of using the 7Tr model. This is explored in Appendix 2 by L. Loewe. More work will be necessary for determining the precise nature of interactions that cause unnecessary friction, possibly from systemically conflicting priorities. This is complicated because conflicts arise from inner expectations that people bring to an MSIM role. Even if that MSIM role is correctly identified with one of the 7Tr roles, different individuals may still experience it in different ways based on their background. For example, I cannot speak for my peers in the program and which 7Tr role they might have identified with most in a given situation.

Ultimately, the value from a more in-depth 7Tr analysis would come from a thorough investigation of pressure-points that create unnecessary friction and their systemic causes. It is

always possible to conduct such analyses without the 7Tr model, e.g. by using personality tests like Myers-Briggs or by analyzing specific types of behaviors (eg. Turgeon 2018). However, a strength of the 7Tr model is precisely the option to ignore such details like personality traits. For example, introverts and extroverts will exist in any 7Tr or MSIM role, but such personality traits etc. will say little about what systemic challenges students bring to the course due to the 7Tr role with which they have been most closely aligning so far.

A specific value of such 7Tr analyses is that they inevitably will bring their spotlight to a topic that is notoriously difficult to handle for all parties: fear. Mere awareness of this problem will often not be sufficient to overcome it. Yet, doing so is essential in higher education, since fear is one of the most potent inhibitors of rational thought and effective learning. Incidentally, it is also linked to how humanity as a whole might approach challenges such as the climate disasters.

4.2 A Pivotal World Challenge for Mitigating Climate Change

Writing this report with a little bit of distance from the year in the MSIM has given me the opportunity to reflect on the good, the bad, and the ugly of my experiences. I had many wonderful opportunities, some of which I benefited from, but I also missed many chances due to getting stuck behind seemingly irrational fears. It is easy to say from the outside, or in retrospect, that I should have done this, or could have done that.

However, reflecting on those experiences, I eventually started to notice a rather big elephant in the room: in some surprising way, my experiences in the MSIM mirror current global experiences in discussing climate change. There were many opportunities that the world had and it can draw from many experiences good, bad, and ugly. Some opportunities it made the most of, others it missed, often because of seemingly irrational fears. It is easy to say from the outside or in retrospect, that this or that should have or could have been done, but it is difficult to imagine what politicians or other decision makers might have been going through in the pressure of the moment, where they have to decide without the benefit of hindsight.

The MSIM experience has shown me first hand how difficult it can be in the moment to apply my own beliefs and knowledge to myself. If we struggle to apply what we know to ourselves, how can we apply it to the world? I hope that I will be able to work through whatever the remaining issues are that I have to deal with in order to improve the strategic decision making in my own life. I also hope that I will be able to emerge with a message of hope for addressing the desperate needs of the coming climate disaster, because if my MSIM experiences are an indication of the roller coaster that a majority in the world still has ahead of them, then they will need all the hope they can get in order to make it. In such desperate situations, it is important to hear a variety of voices that represent diverse stages of these struggles with ourselves. If we only talk about the success stories, who will find the courage to attack problems where there is no such thing as guarantee for success. As a super wicked problem, climate disaster is in that category and it would be lethal to abandon hope.

4.3 Conclusion

This study has tested the newly developed 7Tribes model for the first time in order to explore whether it may be able to successfully capture the many moving parts of the MSIM program as well as critical moments for me as a student in the program. Whether such an analysis is useful, depends much on what else might be done with it, and how determined the people are to implement potential emerging insights. It seems to me that in our global quest to avert climate disaster, there is a need to listen to a much greater variety of voices in search for the innovative solutions needed. Since climate disaster is as much a problem of the mind as it is a problem of chemical gasses, there is a substantial chance that more carefully listening to a wider variety of voices, Indigenous cultures included, could be critical for turning around the fate of this planet.

As a student of the MSIM, I am in a privileged position to be able to recognize issues easily overlooked by faculty. In case the MSIM might be motivated to address issues as raised in Appendix 1, I would be delighted to work with them in order to extend this present analysis for the purposes of elevating Indigenous people's voices in climate change discussions. It may not be the most straightforward way to get there, but not all who wander are lost[6], and growth of innovation is rarely, if ever, linear – as the seasoned ChangeMaker Greg Satell (2021) has been pointing out.

[6] Satell, G. (2021-10-03), *Not All Who Wander Are Lost – (an essay on the haphazard nature of where the most important changes come from).* DigitalTonto.com: https://digitaltonto.com/2021/not-all-who-wander-are-lost/

Acknowledgements

My participation in the MSIM program was supported by a merit scholarship for which I am grateful to FUS and the MSIM director for organizing. I am grateful for the tremendous amount of work the leaders and lecturers at the MSIM put into making the MSIM what it has been. I much appreciate their efforts, and nothing I say in this report detract from the many things that worked well. I would like to thank the NOLS organization for providing opportunities that influenced me as a young person and continuing to be flexible with new opportunities where I had a chance to work on my master's program in the summer of 2021.

I would like to thank the Kirks, who supported me in more ways than I can possibly fit into this paper, including babysitting my car while I was in Switzerland. Gloria Olberding, for supporting my interest in the program and gifting me the plane ticket that carried me to the starting point of this leg of my academic journey and who supported me throughout. Rachael Peterson, for being a voice of love and encouragement during times of transition and adjustment and when I struggled to envision the coming together of this paper. Bob Grahmann, for being a constant friend and gentle spiritual influence during the last years. LaShawn Wanak, for meeting with me to reflect on ideas and offering encouragement in the process. My mother, Maria Guyer, for always being a voice of well-intended encouragement and sender of care packages while I have worked through various stages of my academic career. My siblings, for staying in touch while half a world away in a pandemic and across quite a jetlag of timezones out of sync. Many thanks to Maria Finkbiner for cheering me on from the sidelines and advocating for me. Finally, thank you to all the many other kind people who encouraged me in one way or another on this journey.

L. Loewe: I would like to thank Ms. S. Guyer for the courage to engage with such a strange-at-first-sight idea like the 7Tribes model – and for pulling it to completion – despite working a full-time job. Also, a big thanks to all those who have enabled, encouraged, informed, or otherwise contributed to my *wid-e* pandemic research Marathon; without it there would be no Jonah Hypothesis\JH, nor my attempt to use the 7Tribes as a hard test case to refute the JH, nor my attempt to refute the 7Tr model, nor my interest in trying to see whether Ms. Guyer's complicated experiences might refute the 7Tr model, without which I'd never have offered to work on this, without which this report would have never been written. Finally, I remain indebted to the great multitude of persons of all sorts, from whom I have learned whatever *wid-e* research skills I happen to have, and without whom my pandemic research Marathon would have never started (that list is too long for here; may it be reported with the results from that Marathon).

Summary of Relative Contributions and Responsibilities

Ms. Guyer: The core of this report, Section 3 (p. 12-32), is based on Ms. Guyer's observations and experiences. Ms. Guyer drafted the actual text of Section 3 (except for the contributions by L. Loewe to Stages 2d-2e in Section 3.4, p. 28-29, see below); she led the refining of the text until it was finally reviewed by her and L. Loewe.
Ms. Guyer and L. Loewe: Both contributed to Stages 2d-2e (p. 28-29) in Section 3.4, to Introduction (Section 1), Discussion (Section 4), to References, and Acknowledgments.

L. Loewe: The abstract 7Tribes Model that was tested in this report was contributed by L. Loewe as described in Section 2 and Appendix 2-4. He also contributed Appendix 1 after taking a step back from the observations reported by Ms. Guyer and combining them with his expertise in evolutionary systems biology. All these texts were drafted and revised by L. Loewe, while Ms. Guyer contributed to drafting and revising, thereby improving overall quality.
Text finalizing: Ms. Guyer and L. Loewe both read each section interactively before declaring it "pre-finished". After completing all sections in this way both read the whole text in a final check. Ms. Guyer exercised overall editorial control.
Modeling responsibility: Ms. Guyer is ultimately responsible for the MSIM observations and for how they are used to test the 7Tr model. L. Loewe is ultimately responsible for constructing, contributing, and refining the abstract 7Tribes model as well as for defining all methodological aspects of how it was qualitatively tested in this report. He also developed the model behind the 'meta-meme-omics' described in Appendix 1.
Overall: Ms. Guyer had ultimate intellectual and operational responsibility for how this report was developed through the strategic decisions made along the way and whether or not L. Loewe's modeling contributions would be included (and if, then *how*). Ms. Guyer exercised ultimate editorial control. She is responsible for choosing to use the 7Tr model in this work, but not for defending how it was constructed in detail (which is L. Loewe's responsibility).

Relative Contributions and Responsibilities in Detail

Why so long? For some time, L. Loewe has been searching for more accurate & meaningful ways of describing the diverse contributions to diverse types of academic work, especially when interdisciplinarity complicates descriptions as disciplines develop mutually incompatible attribution subcultures – complicating *wid-e* research and hence the solution of a great many practical problems. We need more efficient ways of working together. Maybe better attribution can help facilitate this. L. Loewe is not familiar with the attribution traditions in the MSIM; hence descriptions below may err on being overly detailed. How to resolve attribution problems without crippling *wid-e* research efficiency remains an open problem for now.

Ms. Sara Guyer developed the vision to bring Native people's wisdom to climate discussions, which motivated her interest in MSIM. As a first-generation student with no independent wealth, she assembled the complex funding tapestry required to join MSIM (see Section 3.4, Tribe 1, Tribe 2 for details).

Collecting basics. To collect the 1-year longitudinal observation data she used here for a qualitative test of the 7Tr model, she traveled for the first time across ~half the world to a country with a different language and culture – during the (then perceived) height of the CoViD-19 pandemic and while coping with a new, challenging medical diagnosis. She proactively organized her own internship-practical experience as required by the MSIM at a time when it wasn't clear what the MSIM would be able to offer due to pandemic restrictions beyond its control. Working with the NOLS organization in New York State (see comments throughout Section 3), she completed 5 of the 6 practical experience weeks required by MSIM. She spent much more than the equivalent of her last internship week by engaging with the *wid-e* pandemic research marathon of L. Loewe (leading the Evolvix Research Foundry, Middleton, WI) in order

to leverage the data she collected from her MSIM experiences for testing the newly developed 7Tr model for the first time (as far as L. Loewe can tell; details see below and in main text).

Timeliness, complexity, challenges. Her contributions were particularly timely; empirical tests under real-world conditions are essential for determining whether a theoretical model like the 7Tr model might be worth pursuing further. Testing the 7Tr model required an unflinching, challenging analysis of a wide range of details in the MSIM and how it was experienced as an innovation environment. In particular, it is essential for such a test to describe (to the best of one's ability) how experiences were and really felt like (not how they could/should have been). If this can be complex “when everything works”, complications tend to multiply under pressures of challenging non-ideal situations. This is what Ms. Guyer experienced. After pulling through, the writing of this report did not seem to grant her much relief. In addition to working a normal job for most of the time, continuing with this work involved re-facing many of the difficult past MSIM situations and frustrations in discussions with L. Loewe in order to arrive at the overall analysis presented here.

Hardest part of this study: organizing a small datageddon into an informative overview: **(i)** collect the necessary data for a first gritty real-world test of the 7Tr model in a challenging complex social interaction scenario; **(ii)** do so by living in the social microcosm defined by the MSIM; **(iii)** build an informal, personal in-memory database for readily exploring a broad range of experiences potentially relevant for 7Tr testing, also while storing supporting electronic documents; **(iv)** continue to manage the data from these earlier first-hand observations, in order to leverage them in a long series of discussions with L. Loewe about many diverse aspects of the 7Tr model; **(v)** continue to frankly discuss observations as they were made while holding the tension that the 7Tr model might or might not behave as “we’d like”; **(vi)** accumulate informal notes while a year’s worth of potentially relevant experiences were extracted, re-aggregated, re-organized to aligning with 7Tr aspects presented by L. Loewe; **(vii)** make executive decisions about which of the potential approaches and examples to pursue in order to connect the MSIM to 7Tr aspects – without overwhelming readers; **(viii)** deciding when to stop – to not overwhelm readers – albeit without biasing the sample (ie. determine that some of the events could have been described in much more detail – yet including only a high-level summary to limit the overall size of this report; **(viii)** co-deciding on experimental design (with L.Loewe), to determine that 1 credible mapping between each of the 7 tribes and an MSIM role (while also ensuring that each discernible MSIM role/activity could also be assigned to at least one of the 7 tribes; no left-overs were found after this double matching procedure).

Text production. In producing the actual text Ms Geyer wrote drafts and refined them for Section 3, the main body of this work (pages 12-32); similarly, for Section 4. In addition, she significantly contributed to other texts, like the personal parts of the introduction and occasional additions to L. Loewe’s Section 2 and Appendices. In addition to writing drafts and researching refs to cite (e.g. on innovation cycles) which L. Loewe didn’t already have at hand, Sara was also a vocal editor insisting that obscure language by L. Loewe be clarified; she provided L. Loewe with interactive writing support (a new model he had been developing for improving clarity, precision, and speed of writing in a team of people who can somehow write efficiently in this way; conceptually, it’s a bit like pair-programming). At times, L. Loewe also provided interactive writing support to Ms. Guyer to assist her in focusing her own thoughts (while L. Loewe took care of the sometimes distracting mechanics of typing); overall, it seemed that Sara

provided more interactive writing support for L. Loewe's texts vs receiving it for her own (but times were not measured).

Editorial control and final edits. Ms. Guyer (and L. Loewe) did read each finished section right before declaring it "pre-finished" (to keep fixed until before the big review at the end). For each such 'pre-finish', as well as in the last final check, Ms. Guyer exercised editorial control to ensure overall consistency.

Dr. Laurence Loewe initially introduced Ms. Guyer to his independently developed 7Tribes model; this overview gave Ms. Guyer the details she needed for deciding if she wanted to structure her report around testing it. After initial feasibility assessments, both agreed to proceed with the understanding that refining the 7Tr model and all methodological aspects would remain L. Loewe's responsibility, even though Ms. Guyer improved 7Tr model clarity (eg. by paraphrasing tribe definitions; improving clarity of some 7Tr Explicit Names by reviewing L. Loewe's naming efforts; and wider discussions of Tech Adoption Curves, benefitting from Ms. Guyer's input, stimulating what eventually became the 7ChangeStages over time, an ergodic transform that echoes 7Tr models; *to be described elsewhere by L.*). Thus, Ms. Guyer's main focus was to manage, summarize, & describe all MSIM data used by both for testing the 7Tr model (see Section 3, the main body of work here); thus, Ms. Guyer enabled L. Loewe to test his just-envisioned (still raw, embryonic) 7Tr model for the first time in a non-trivial real-world context.

Challenges delegated. To clarify the importance and difficulty of such work, and to appreciate the magnitude of such 'data-handling' benefits for L. Loewe, consider that in this study Ms. Gyer completely handled the equivalent of the typically ~80% research time consumed by 'data handling' & 'data cleaning' efforts, which many data scientists must invest in before efficient hypothesis- testing code can be written. Now, Ms. Guyer is not a data scientist in any classical sense and the 7Tr test data used here is not formally structured, so not 1:1 comparison is possible. Yet, the substantial academic achievements of Ms Guyer in handling with care the detailed data complexities become more apparent when considering the equivalent stages in a data science study. Such stages informally included:
(i) discover potentially relevant data (but without fishing expeditions to "confirm" results),
(ii) assess which data is sufficiently complete for use in a meaningful way (without biasing),
(iii) develop various types of views on the data for exploratory data analysis (no fishing!),
(iv) select those further refined into a final high-quality report (and represent it in a fair way).
In this study Ms. Guyer handled all the data-management needs for all these aspects as requested by L. Loewe; the only difference to more classical data science studies is that her results are reported as qualitative results in a narrative text (see Section 3). At this point it is not even clear how one could possibly define typical stats tests & plots for more data intense 7Tr models. He has no doubt that such tests can/will be defined eventually, but cautions against skipping careful qualitative analysis in order to gain speed (that can easily be misdirected if the qualitative direction is 'wrong').

Qualitative testing without stats. Yet, the current lack of advanced stats for testing 7Tr models does not simplify any aspect of the data handling work Ms. Guyer did as part of this study. Hence, L. Loewe's explanation of the substantial data science benefits he has been deriving from Ms. Guyer's work in this study. Without her determination, her remembering,

checking details, and managing all sorts of other data-related operations required for the analyses represented in this report, L. Loewe would not have been able to test the 7Tribes model in the real world by exploring an independent context (from L. Loewe), yet still willing to share in-depth insights (as Ms. Guyer did).

Permissions to share personal data. Last but not least, Ms. Guyer implicitly acquired the permissions to share the person-related data included in this report, because she has only included data derived from her own personal experiences (no claims are made about whether others in the MSIM, students, teachers, andOr abstract organizations like FUS might or might not agree with either the 7Tribes model or any particular derivation from it).

By including her own views and memories she is approving them for inclusion in this report. As far as L. Loewe is aware, the design of this study does not pass thresholds that would require approval from an Institutional Review Board. L. Loewe explained to Ms. Guyer that many would hesitate to share experiences as openly as she did here; yet, this did not change her decision to include the aspects that she did.

7Tribes Section Text production. L. Loewe wrote a very early draft of the 7Tr model; Sara contributed her definitions of the 7 Tribes; L. Loewe much expanded the early draft in light of the questions raised by Ms. Guyer 's definitions; L. Loewe then produced a more pared down description of the overall model for the purposes of this thesis, which integrated all of Ms. Guyer's input (through interactive writing support while editing the 7Tr definitions). The result is now in Section 2; since no authoritative reference for L. Loewe's 7Tr model exists yet and it is such an important consequence for this work, it would have been inappropriate to expect from Ms. Guyer definitions for a model that is nowhere described or defined precisely, yet is somehow used here, there has to be some source of input. Here, L. Loewe was that input by sharing the various early drafts of the 7Tr model with Ms. Guyer, explaining them as needed while conducting the analyses, and in the end by summarizing an overview of the 7Tr model in Section 2 (and Appendix 4). Thus, L. Loewe is ultimately responsible for all descriptions of the 7Tr models, and for testing methodology aspects (Section 2, some parts of the introduction). L. Loewe produced the 4 Appendices.

Contributions by both: The overall outline of this thesis was developed collaboratively in discussions between Ms. Guyer and L. Loewe, which required several rounds of iteration until a reasonably clear structure emerged from the input both provided (neither of them could have done that alone). Overall, L. Loewe remained responsible for all abstract aspects of the 7Tr models and all questions about testing methodologies, just as Ms. Guyer remained responsible for all observations as used to test the 7Tr model.

Ms. Guyer did some research on references, while L. Loewe added those he already had. Both contributed by formulating thoughts for the text; at times by using interactive writing support (see above for who did what); at times directly typing up an idea seemed to be easier.

To move the manuscript from draft to submission stage, both Ms. Guyer and L. Loewe reviewed the whole text, section by section, before reading the whole manuscript in the end; and in both cases, edited as necessary.

References

Aghion, E., et al. (2021), *Moses, Noah and Joseph effects in Lévy walks.* New Journal of Physics **23**: 023002 ; https://iopscience.iop.org/article/10.1088/1367-2630/abd43c/pdf

Alter, R. (2018), *The Hebrew Bible: A Translation with Commentary*. https://wwnorton.com/books/9780393292497/: W. W. Norton & Company. 3500 pages.

Beal, G.M. and J.M. Bohlen (1957), *The diffusion process. —— (one of the oldest descriptions of the innovation adoption process based on 35 studies in the 20 years prior to publication)* Agricultural Extension Service – Iowa State College, University Library Archives **Special Report. 18**: http://lib.dr.iastate.edu/specialreports/24

Boers, N. (2021), *Observation-based early-warning signals for a collapse of the Atlantic Meridional Overturning Circulation.* Nature Climate Change **11**: 680–688.

Billings, L. (2013), *Fact or Fiction?: We Can Push the Planet into a Runaway Greenhouse Apocalypse – A new study suggests human activity could, in theory, bring about the end of most life on Earth.* Scientific American: https://www.scientificamerican.com/article/fact-or-fiction-runaway-greenhouse/

Bush, V. and United States. Office of scientific research and development. (1945), *Science, the Endless Frontier - a Report to the President on a Program for Postwar Scientific Research*. Washington D.C., : U.S. Government Print. Off. https://archive.org/details/scienceendlessfr00unit 184 pages.

da Silva, S.G. and J.J. Tehrani (2016), *Comparative phylogenetic analyses uncover the ancient roots of Indo-European folktales.* R Soc Open Sci **3**(1): 150645, doi:10.1098/rsos.150645.

Dowker, A., A. Sarkar, and C.Y. Looi (2016), *Mathematics Anxiety: What Have We Learned in 60 Years?* Front Psychol **7**: 508, doi:10.3389/fpsyg.2016.00508.

Edmondson, A.C. (2019), *The fearless organization : creating psychological safety in the workplace for learning, innovation, and growth*. Hoboken, New Jersey: John Wiley https://www2.mvcc.edu/shn/pdf/presentations/fearless-organization.pdf

Ehlert, K. and L. Loewe (2014), *Lazy Updating of hubs can enable more realistic models by speeding up stochastic simulations.* J Chem Phys **141**(20): 204109, doi:10.1063/1.4901114.

Edwards, J. (2014-08-27), *The Future Programming Manifesto: It's time to reformulate the principles guiding my work – Inessential complexity is the root of all evil. Complexity is the total learning curve. Our institutions, culture, and psychology all foster complexity. Think outside the box. Programming for the people. Simplicity first; performance last. Disciplined design evaluation.* Dispatches from the User Liberation Front, https://alarmingdevelopment.org/?p=893 ; https://news.ycombinator.com/item?id=8233954

Gesenius, W., et al. (1962), *Wilhelm Gesenius' Hebräisches und Aramäisches Handwörterbuch über das Alte Testament*. 17th edition, unchanged since 1915 ed. Berlin: Springer. xix, 1013 pages

Gödel, K. (1930, 1931), *Über formal unentscheidbare Sätze der Principia Mathematica und verwandter Systeme, I.* Monatshefte für Mathematik und Physik **38**(1931)173–198. —— and: *Die Vollständigkeit der Axiome des logischen Funktionenkalküls.* Monatsh. Math. Phys. **37**(1930)349-360

Goldblatt, C. and A.J. Watson (2012), *The runaway greenhouse: implications for future climate change, geoengineering and planetary atmospheres.* Philos Trans A Math Phys Eng Sci **370**(1974): 4197-216, doi:10.1098/rsta.2012.0004.

Goward, S.L., *First-Generation Student Status Is Not Enough: How Acknowledging Students with Working-Class Identities Can Help Us Better Serve Students.* About Campus: Enriching the Student Learning Experience, 2018: https://doi.org/10.1177/1086482218817534

Helmreich, R.L., A.C. Merritt, and P.J. Sherman (1996), *Research project evaluates the effect of national culture on flight crew behaviour.* ICAO J **51**(8): 14-6.

High Tech Strategies (2021), *Customer Alignment Lifecycle —— (a newer innovation cycle).* Website: https://www.hightechstrategies.com/customer-alignment-overview/alignment-lifecycle-infographic/

Khan, M.A.M. (2019), *Islam and good governance : a political philosophy of Ihsan*. New York, NY: Nature America Inc.

Knuth, D.E. (1974), *Structured programming with go to statements.* Computing Surveys **6**(4): 261-301.

Kotter, J.P. (1996), *Leading change*. Boston, Mass.: Harvard Business School Press. 187 pages

Lazarus, R. (2009), *Super wicked problems and climate change: restraining the present to liberate the future.* Cornell Law Rev **94**: 1153–234.

Leconte, J., et al. (2013), *Increased insolation threshold for runaway greenhouse processes on Earth-like planets.* Nature **504**(7479): 268-71, doi:10.1038/nature12827.

Lenton, T.M., et al. (2019), *Climate tipping points — too risky to bet against – The growing threat of abrupt and irreversible climate changes must compel political and economic action on emissions* Nature **575**: 592-595.

Loewe, L. and B. Charlesworth (2006), *Inferring the distribution of mutational effects on fitness in Drosophila.* Biology Letters **2**(3): 426-430.

Loewe, L. and J. Hillston (2008), *The distribution of mutational effects on fitness in a simple circadian clock.* Lecture Notes in Bioinformatics **5307**: 156-175.

Loewe, L. (2009), *A framework for evolutionary systems biology.* BMC Systems Biology **3**: 27.

Loewe, L. and W.G. Hill (2010), *Introduction: The population genetics of mutations: good, bad and indifferent.* Phil Trans R Soc B **365**: 1153-1167, doi:doi:10.1098/rstb.2009.0317.

Loewe, L. (2016), *Systems in Evolutionary System Biology*, in *Encyclopedia of Evolutionary Biology*, Richard M. Kliman (Chief) and Hiroshi Akashi (Section), Editors. Academic Press (Elsevier): Oxford. pp. 297-318 (http://evolutionarysystemsbiology.org/pdf/Loewe-2016-evosysbio.pdf).

Loewe, L., et al. (2017), *Evolvix BEST Names for semantic reproducibility across code2brain interfaces.* Annals of the New York Academy of Sciences **1387**(1): 124-144, doi:10.1111/nyas.13192.

Mandelbrot, B.B. and J.R. Wallis (1968), *Noah, Joseph, and Operational Hydrology*. Water Resources Research **4**(5): 909-918 ; https://courses.physics.ucsd.edu/2019/Spring/physics235/Mandelbrot_Wallis-%20Noah,Joseph,et%20al.pdf

McKay, D.A. (2020-05-20), *Fact-Check: will 2°C of global warming trigger rapid runaway feedbacks? —— (The risk of tipping points grows significantly above 2°C, but this is an uncertain precautionary boundary and not a sharp definite threshold. Most feedbacks are long-term ...).* ClimateTippingPoints.info: https://climatetippingpoints.info/2019/10/14/fact-check-will-2c-of-global-warming-trigger-rapid-runaway-feedbacks/

McKeown, L. (2007), *The Pencil Metaphor —— (a newer innovation adoption cycle).* Website: https://web.archive.org/web/20070128192012/http://www.teachers.ash.org.au/lindy/pencil/pencil.htm

Mills, C.W. (2000), *The power elite*. New York: Oxford University Press. 442 pages.

Parkinson, C. Northcote (1958). *Parkinson's Law, or the Pursuit of Progress*. John Murray. ISBN 0140091076. See also https://en.wikipedia.org/wiki/Law_of_triviality

Racheva-Iotova, B. (2020-05-06), *Be aware, adapt, innovate – or what we learn from Mandelbrot, Noah, and Covid-19 —— (Reflections on Risk and Investment Management, Risk Categorization and the Joseph and Noah Effects).* FactSet.com: https://insight.factset.com/be-aware-adapt-innovate-or-what-we-learn-from-mandelbrot-noah-and-covid-19

Ramirez, R.M., et al. (2014), *Can increased atmospheric CO2 levels trigger a runaway greenhouse?* Astrobiology **14**(8): 714-31, doi:10.1089/ast.2014.1153.

Rosling, H., O. Rosling, and A.R. Rönnlund (2018), *Factfulness : ten reasons we're wrong about the world--and why things are better than you think*. First edition. ed. New York https://archive.org/details/FactfulnessByHansRosling/: Flatiron Books x, 342 pages

Satell, G. (2017), *Mapping innovation: a playbook for navigating a disruptive age*. New York: McGraw-Hill.

Satell, G. (2019), *Cascades: how to create a movement that drives transformational change*. New York: McGraw-Hill Education, 267 pages, https://ssir.org/books/excerpts/entry/how_movements_create_transformational_change

Satell, G. (2020-08-30), *Why Consensus Kills Innovation.* DigitalTonto.com: https://digitaltonto.com/2020/why-consensus-kills-innovation/

Satell, G. (2021-10-03), *Not All Who Wander Are Lost – (an essay on the haphazard nature of where the most important changes come from).* DigitalTonto.com: https://digitaltonto.com/2021/not-all-who-wander-are-lost/

Scheuer, K.S., et al. (2017), *FlyClockbase: Importance of Biological Model Curation for Analyzing Variability in the Circadian Clock of Drosophila melanogaster by Integrating Time Series from 25 Years of Research.* BioRxiv.org https://doi.org/10.1101/099192

Schlaile, M.P., ed. (2021), *Memetics and Evolutionary Economics: To Boldly Go Where no Meme has Gone Before – Combines memetics and evolutionary economics. Shows how network science and agent-based modeling can be used to analyze memes. Offers suggestions for future research.* . Economic Complexity and Evolution book series (ECAE). Springer Nature Switzerland: Cham, CH https://doi.org/10.1007/978-3-030-59955-3 205 pages.

Tarski, A. (1931), *The concept of truth in formalized languages*, p.152-278, in *Logic, semantics, metamathematics; papers from 1923 to 1938. Translated by J. H. Woodger 1956*, A. Tarski, Editor. Clarendon Press: Oxford.

Tooze, A. (2021-09-01), *What if the Coronavirus Crisis Is Just a Trial Run? —— (an essay adapted from the book "Shutdown: How Covid Shook the World's Economy" by Tooze, an economic historian).* The New York Times: https://www.nytimes.com/2021/09/01/opinion/covid-pandemic-global-economy-politics.html

Turgeon, H. (2018-08-21), *Which Is Better, Rewards or Punishments? Neither – Rewards and punishments are conditional, but our love and positive regard for our kids should be unconditional. Here's how to change the conversation and the behavior. — (Look Underneath, Motivate Instead of Reward, Help Instead of Punish, and Engage the Natural Hard Worker).* New York Times: https://www.nytimes.com/2018/08/21/well/family/which-is-better-rewards-or-punishments-neither.html

Appendix 1
Learning how to survive climate change through 'meta-meme-omics':
Integrating the values of diverse Indigenous cultures through the sharing of stories.

Introduction

There is likely no shortage of people in the higher education, industry, and government of the more powerful nations, who would outright dismiss the importance of listening to what Indigenous cultures have to say about surviving climate change. The question posed here is not whether they are right or even likely to be right. The question explored below is whether there is a scenario in which they cannot afford to be wrong, because they hold an important key for the survival of Life on Earth as we know it. The analysis below draws on the experiences of biologists in analyzing complex genomic information across a wide variety of taxa. By comparing such sequence-based information, biologists have made great leaps in understanding all sorts of functional aspects across the tree of life. It is suggested that similar approaches might be able to help decipher values that have been cultivated by Indigenous cultures in order to help them survive. Such stories may not apply in the most direct way, but according to the analysis below it would be a regrettable mistake to not listen to what Indigenous and Native peoples and their traditional cultures might have to say about impending disasters like climate change.

The following analysis is based on a thought experiment that makes two assumptions, both of which are difficult to dismiss:

1. If global warming is affected by some runaway processes, a switch-like threshold will exist that will be the make-or-break for the existence of human life on earth.
   The existence of such a threshold is realistic and cannot be excluded (Billings, 2013; Leconte et al., 2013; Goldblatt & Watson, 2012;McKay, 2020; Lenton et al., 2019; Boers, 2021), even though details are difficult to prove definitively (e.g. Ramirez et al., 2014) and it is unclear how close we are (McKay, 2020). Given the catastrophic outcomes of various runaway disaster possibilities, it would be foolish to push our luck and ignore the problem (McKay, 2020; Lenton et al., 2019; Boers, 2021).

2. Let's imagine for a moment that among the many diverse Indigenous and Native cultures of the world there exists one or more *essential key* ideas for avoiding climate disaster. Let's suppose that these would be overlooked by the global community that tries to avert climate disaster and that no other approaches exist to replace these Indigenous ideas and that no 'improvements' in other areas will be able to compensate for omitting these ideas – which is why they are defined as *essential key* ideas above.

Now, let's imagine that Indigenous insights were prematurely discarded, e.g., by not developing efficient approaches for including contributions from Indigenous cultures in climate change discussions. In that tragic case, humanity will have prematurely voted for destroying its Earth, the only spaceship it has been able to use reliably so far.

If such lack of inclusion was facilitated by institutions of higher education, then, even more tragically, higher education would negate its true mission by becoming a critical link in the long causality chain that would ultimately lead to climate disaster through preceding information disasters. Note that it would certainly not be the only cause for such a disaster. However, for a run-away disaster to occur it is sufficient to fail delivering 100% of whatever solution is capable of averting it. Thus, only delivering 'most of' those 100% will be insufficient, because the missing small amount would still allow the runaway to proceed.

If risk is defined as the product of the probability of a disaster and the impact of that disaster, then even remote possibilities will justify serious attention to exploring the importance of such flows of information.

Various systems science arguments suggest that such a disastrous possibility is not as remote as it might seem in the minds of most people, because the intuitions of most people rely too much on linear predictability. For example, the widespread existence of sudden non-linear transitions in many complex systems, such as the catastrophic Noah effect and others[7], strongly suggests that we seriously consider this possibility. It would be a shame if Earth would become uninhabitable, because motivated Indigenous peoples found it impossible to share their crucial insights because they were never given the chance to express their wisdom in ways more easily incorporated into the broader discussion.

Main unquestionable points based on parallels to genome biology

Reality is complex and as centuries of research have shown, each culture sees different aspects of it. Therefore, there is a non-negligible chance that inspiration for such critical insights would remain hidden among the extreme diversity of lesser-known Indigenous cultures. Why? Obviously, the cultural views as carried in their stories, values, and myths about the world around them allowed them to survive through some challenges. Even if the insights of any particular Indigenous culture are easily dismissed as myths irrelevant to the mechanistic views of our scientific age, it is not as easy to dismiss the following mechanistic evolutionary argument. It arises from these unquestionable points:

1. **Culture is key to survival.** Some cultural values are more conducive to long-term survival than others, if only by governing the willingness of a society to adapt to its surroundings.

2. **Bias towards surviving cultures.** We only know about cultures that have somehow survived for long enough to transmit information about their culture to us somehow, e.g., through witten records or storytelling.[8]

[7] For some references about the Noah and Joseph effects first described by B. Mandelbrot's analyses of complex systems, see eg. Mandelbrot & Wallis (1968), Racheva-Iotova (2020), and Aghion et al. (2021).

[8] This biases the sample set accessible to us to only include cultures with somewhat viable cultural values (all others never existed or went extinct fast enough to not merit consideration for the big question of how we plan to survive).

3. **Bias towards values that help survive.** Due to (1) and (2), at least some values held by the cultures of surviving Native and Indigenous people groups have contributed sufficiently to their survival and thus hold valuable lessons on survival.

4. **Values that kill exist but are likely rare**. Not all values found in such cultures are likely to increase chances for survival, since some of these cultures may in fact have been observed just before their natural decline (i.e. when they already lost the values they would have required to survive if they didn't die out due to independent factors beyond their control). Yet, for cultures that survived for long enough to develop some cultural identity, suggests that they likely were carrying more constructing cultural values than destructive ones – at least at some point in their past. This is based on applying a very generic argument also to human cultures: it is easier to tear things down than to build them up. This very generic argument holds over a wide range of systems across many scales in biology (e.g. Loewe 2009 & 2016); there is no reason why the same would not be true also for engineering, arts, etc.; for example, it is much harder to build a car than to crash one.

5. **Building a cross-cultural meme database** enables comparing cultures in statistical analyses. The basic building blocks of such comparisons are individual artifacts that are deemed important by their culture because of the values they transport. Such basic blocks can be stories, proverbs, songs, practices, and more. They spread by communicating, like memes – as long as they are deemed useful. The spread of such memes shares much in principle with the spread of genes, except memes replicate in the minds of a population, not in germline DNAs. How memes and genes evolve is described by remarkably similar mathematical structures. The sum of all genes in a population forms its meta-genome ('genomes of all its individuals'). Likewise, a "culture" is a "meta-meme-ome" that can be defined as the sum of all memes in the headspaces of its individuals. It's possible to study how it evolves (Schlaile, 2021). Statistical analyses of such a growing cross-cultural database can eventually infer how values and other insights from Indigenous cultures are distributed across Earth's cultures. Phylogenetics, population genetics, and recently population genomics, each led to their own revolution in gene-oriented biology. Why not develop similar disciplines in order to study the Indigenous cultures of the world while we can?
   Analyzing the cultural diversity of Earth is certainly complex, but unlikely to be more complex than analyzing Earth's genomic diversity. Since meta-genomics has arrived, maybe it's time to develop the tools and concepts for "**meta-meme-omics**". Why not invite the Indigenous cultures of the world to contribute what they deem most worthy to represent the values of their culture in the global human struggle to avert climate disaster? Integrated in a well-organized global database for meta-meme-omics such cultural value-information will have its best chance of reasonably informing intercultural efforts to avert climate disaster. A step in that direction has been taken by comparative phylogenetic analyses of Indo-European folktales (da Silva & Tehrani 2016).

6. **Mechanistic investigations of values** will likely reveal – at least sometimes – whether they contributed more to the survival or demise of a culture. Such analyses can obviously be complicated, but it seems doubtful that their complexity exceeds the challenges functional genome biology has been wrestling with in determining functions of genes in diverse genomes in the post-genomic era (eg. Loewe, 2016). To improve chances of recovering clear pointers to key insights sufficient numbers of cultures with sufficient diversity will have to be included, which will make it valuable to pursue such efforts systematically and at a large scale (building on experiences with analyzing diversity in genome biology). Given these analogies, it would be surprising if no valuable insights were to emerge from such studies once they include a sufficiently large number of diverse cultures – even while many open questions will likely remain.

7. **Support for Native voices is of critical importance.** None of the potentially enormous benefits above can materialize, unless we find *much* more efficient approaches for including potential insights into building sustainable cultures from Indigenous and Native people. This necessarily requires supporting them in their efforts to cross the cultural divide as they develop their insights to articulate them in modern, rigorous academic environments, where they are treated with respect[9].
   This likely requires supporting them in overcoming many of the hurdles I have also been facing. These will likely often include many typical struggles of first-generation students and the challenging cultural divide between majority vs. non-majority cultures.

8. **Added benefits of investing in respect.** If done respectfully for all parties involved, the cultural communication bridges built by such an initiative can likely ease the challenges of implementing climate mitigation strategies that require the cooperation of the respective communities.

[9] For an example of some of the difficulties reported by a respectful academic aiming to learn more about the insights of some spiritual leaders, see notes of encounters during his research for the book by Khan (2019).

Discussion

Who knows if such a research program will make a difference in the end? Unfortunately, that question can be asked about almost any approach these days.
All research appears necessarily inefficient at first especially if it is truly groundbreaking. Thomas Edison had to find about 10,000 ways of how to *not* make a lightbulb, before he could illuminate the rest of us. It will likely take much less attempts to design an efficient *wide interdisciplinary diversity-encouraging (wid-e*) Master's program for facilitating the respectful sharing of sustainability insights from Indigenous and Native peoples who are motivated to share the historic insights of their cultures in order to help all cultures to survive, including their own.

Such a Master's program can build on much sociological and cross-cultural expertise on how to stimulate the development on innovative ideas (e.g. the need for removing all fear of failure from an innovation environment) (Edmondson, 2019) or approaches developed by international organizations in order to overcome the challenges of cross-cultural communication (Helmreich, 1996). Since blind-spots in research interests can be strongly influenced by the background culture of a researcher, it is likely that majority-culture universities will have to invest substantial work to implement a strategy to bridge the cultural divide. Given the socio-economic constraints of most students and researchers from Indigenous and Native peoples backgrounds, such a program will critically depend on majority-culture investments into supporting the development of respective non-majority culture brain-power.

The chemist Kekulé is said to have had a major break-through in his search for the chemical structure of benzene after he dreamt of a snake that bit its own tail. His dream didn't remove the need for independent evidence, but it did accelerate his overall rate of making important discoveries. Hence, the historic lack of analytical mathematics and mechanistic sciences in many Indigenous cultures is really not an argument for not listening to them. Maybe they hold the equivalent of dreams as important for scientific breakthroughs as Kekulé's very non-scientific dream allegedly was for his scientific research.

If we know anything about the current climate crisis, then it is that we are running out of time fast for solving this super-wicked problem (Lazarus, 2009). Hence, the idea to improve the inclusivity of various climate-change discussions in the MSIM and elsewhere may be timelier than it might seem from a first glance.[10]

> *May the full spectrum of all the best in the diverse Indigenous cultures of our beautiful blue marble: arise and shine!*

[10]For bibliography, see the main references list.

Appendix 2

General cases of use for a 7 Tribes model in a defined social setting

Introduction

The analysis in the main text aimed at testing whether the basic pattern of the 7Tribes model (see Section 2) can formally describe the complex real-world experiences of the 1-year MSIM program without the need for many exceptions. This appears to be the case: all roles required for running the MSIM program can be formally assigned to one or at most two of the 7 tribes by matching their functional features. However, is such a formal assignment useful? In order to explore that, it is essential to distinguish between different potential cases of using the 7Tr model. Each Case of Use assumes some underpinning 7Tr specific Axiom that comes with a 7Tr specific Danger that must be avoided if innovation is to be kept alive through the flow of relevant information between the 7 tribes. Here these *Cases of Use*, their *Axioms*, and the resulting *Dangers* are discussed for each of the 7 tribes.

Each of the following 7 troubleshooting cases of use are like types of focus that orient attention to different key aspects of innovation, which are usually represented by one of the 7 tribes as their main stake-holder. Together all these types of foci aim to develop structures for sustainability over the long term by eliminating emergent instabilities.

This is in contrast to 'just finishing' a 'quick fix' – which, more often than not, turns out to be either a significant detour or a dead end. Such short-cuts exist for each of the 7Tribes; falling for one of them is sufficient to kill innovation over the long term. Therefore, the combination of these 7 different debugging cases of use can also be described as an echo of the 7 Tribes. Both also link to a 7ChangeStages Model that is being developed by L. Loewe in parallel; *to be described elsewhere*). How the 7Tr model might interface with other, previously used models for change is beyond the scope here.

We explore next, how echoes of the 7Tr model may be leveraged to describe key aspects of a journey to transformative innovation by overcoming risks that commonly threaten a slow increase of danger – until it's too late to stop falling down a cliff. Reigning in the next danger is like reaching the next respective innovation milestones. Here are the 7 cases of use for troubleshooting, along with their 7 Axioms and 7 Dangers:

1. **Descriptive Use:** the first step of every 7Tr analysis is a description of things as they are, not as they ought to be. Without an unflinching analysis of the present situation, it is impossible to identify the next step that would best help us in transforming the system at hand into the system we'd like it to be. The 7Tr model offers a surprisingly nuanced and rich baseline for describing the status quo under the assumption that nothing ever really changes. After all, the 7Tr are distinct recognizable tribes because it is either technically impossible or socially extremely unlikely for members from one tribe to behave as members of a different tribe. Thus, the underpinning assumption of the Descriptive Use is:

Descriptive Axiom: *The initial vision can always be improved by those who fully grasp it and share the same values. All others must either proceed in small steps (test for success as if blind) —– or heed the advice to "never change a running system". Blind meddling in complex systems usually further dis-improves what is already a questionable status quo. Such blindness always causes the eventual collapse of info-flow between different tracks as walling-in starts to fossilize the 7Tribes in their Role-Tracks. Fossilizing continues until Society stumbles and falls over its own confusion. Lucan in ancient Rome aptly described this process in 4 words 2 millennia ago* (Pharsalia 1:81): *"*In Se Magna Ruunt" \ *"great things carry in them already the seeds of their own destruction". This risk is so important to manage that ISMR has been designated a keyword Evolvix, solely to facilitate the identification and reasoning of this deadly risk in language design discussion.*

Descriptive Dangers: Ignoring the Descriptive Axiom turns innovative visionaries into "KnowItAlls" who confuse truth with their personal opinions – leaving their successors only the stark choice between (i) tiny incremental improvements with many tests, or (ii) no changes at all, or (iii) catastrophic changes. While the past cannot be changed, the future is fundamentally unpredictable – and hence fossilizing information ecologies always collapse eventually. Hence, it would be an abuse of a 7Tr analysis to describe a working system once only to conclude that "*what is, is also what ought to be*". Such null-change conclusions require even more rigorous evidence to show that a system at hand has indeed reached long-term stability (vs some Amorites are merely kidding themselves). If the status quo is celebrated in such a self-congratulatory way, even the best 7Tr analysis will gradually turn into a fossilizing straight jacket that stifles rather than stimulates information flow.

Which transformative steps are feasible, reasonable, and sustainable – that depends on the scope of the system described, its current *status quo*, technical requirements, and its current dynamics. It can be very tempting to jump to conclusions – or to advocate for radical revolutions if frustrations abound yet no immediate next step jumps to mind. Yet, these are misplaced.

The next best idea for change is often *not* the best idea, unless the system is new and immature and much low-hanging fruit is still available. Revolutions have indeed more potential for change than evolutionary improvements, but it can be easy to forget that blind big sudden changes also include an overwhelming potential for things to go wrong. This is a general feature of complex systems as experiences and theoretical analyses of complex evolving systems have shown time and again (see e.g. work on distributions of mutational effects Loewe 2016 & 2009, Loewe & Charlesworth 2006, Loewe & Hillston 2008, Loewe & Hill 2010).

Sometimes an obvious need for change can be met by delegating the hard part of proposing the next steps to a commission of experts. Such change commissions and various other approaches for managing change have been used for some time and much can be learned by studying change management more systematically (e.g. Satell 2017 & 2019; Kotter, 1996). However, this merely moves the problem; commissions only help insofar as they can find ways of keeping the lifeblood of innovation flowing, which is

unbiased information about the aspects of reality that matter most in a given moment. The 7 tribes scale extremely well up and down, such that the efficiency of any new commission will eventually either be slaughtered by the 7 tribes – or it will have found a way to overcome the walls they tend to build.

2. **Testing Use:** Before starting a transformative innovation journey it is essential to locate the starting point (see Descriptive Use) and the goal (see Transformative Use) on an abstract map of the territory defined by the system described in the 7Tr model. Change is not necessarily always a good thing, especially in complex systems that depend on many dynamic equilibria. Hence any transformative journey must start with an unflinching look at what works well (and is hence to be protected from change, at least for now), and what needs to improve (sooner or later). The goal of a Testing Use of the 7Tr model is to identify what is best changed next in order to help focus attention (and avoid spreading limited resources too thin or increasing risks too much by biting off more than can be chewed).

   Testing Axiom: *There is always something that can be tested and further refined in a complex dynamic system, even if that system stands firm on a long-term stable foundation. Hence focus is essential for making progress.*
   There is only one important, but very limited class of abstract exceptions to this principle: As Kurt Gödel (1930, 1931) and Alfred Tarski (1931) have shown, it is not possible to further refine the following theoretical abstractions:
   (i) Systems that are closed – where rigorous mathematical evidence can demonstrate that such systems are still complete and sound (i.e. as free from contradictions as Gödel showed in his Completeness Theorem for Boolean logic).
   (ii) Languages of the finite order for which truth can be formally defined as Tarski showed by excluding languages with self-referential statements (the latter create infinite logic loops that can never be resolved, like e.g. "this statement is wrong").
   These systems allow for the definition of strictly limited, well-defined data structures and first-order logic statements (i.e. all important for storing data), but defining names for any details of these abstractions is not included. Why? Systems are no longer closed as soon as they include natural human language or even elementary arithmetic, as Tarski (1931) and Gödel (1931) respectively showed. Hence, perfectionism is usually misguided. Mercy must triumph – or innovation stops.

   Testing Dangers: Overeager testing easily leads to paralysis of analysis. Overwhelming requirements for change risk stifling the most meaningful *next* change because nobody knows where to start if all get overwhelmed. Hence, the focus of testing must be on identifying the most important next points of decision on the strategic map to transformation. As described by the *Law of Triviality*, groups discussing diverse requirements for change often tend to start with less important aspects if only because these appear less challenging (Parkinson 1958). Such consumption of valuable decision-making time can thus easily derail great opportunities for change unless there is no more time for the critically important aspects. Therefore, it is essential in testing *to*

keep the main thing the main thing by holding on to a rigorous understanding of the core values that must not be compromised in order to reach the next transformative goal.

3. **Negotiating Use:** Using the strategic clarity produced by the Testing Use enables meaningful negotiations about how to best get there in the most efficient way. Since complex systems always present myriads of ways on how they might be tweaked, the main focus of the Negotiating Use is to rank the various implementation opportunities in order to find the most efficient compromise for moving forward, realizing that compromises will have to be made. However, while negotiating which compromises to make, it is essential to explore a wide diversity of options – even if mutually incompatible. More diversity in potential solutions will simplify subsequent analyses of which solutions work best in different contexts. Thus, at this stage removing minor imperfections is less important than generating sufficient diversity in the potential solution avenues in order to cover the problem space as well as possible. This facilitates subsequent recombination to bring together the best ideas from diverse approaches. Imperfections are most easily removed not while negotiating, but rather while recombining (see all other Cases of Use below).

   Negotiating Axiom: *There is always a next best compromise that represents the next best step forward on a long-term transformation journey.*

   Negotiating Dangers: It is easy to confuse the existence of an ideal long-term goal with the next best step forward, which might very well include imperfections to be removed later. Allowing for imperfections during early negotiating can help to avoid paralysis of analysis and the type of premature optimization that has been widely recognized as ‘the root of all evil’ in diverse programming scenarios (e.g. Edwards 2014, Knuth 1974). However, it is still essential to follow the roadmap to long-term sustainability at strategic forks in the road. Without a firm grip on a sustainable vision the overall transformation process will be rendered into a directionless random walk, moving back and forth, unnecessarily wasting energy. Marking known imperfections at this stage already can much simplify and accelerate the corresponding recombination processes.

4. **Guiding Use:** After the Negotiating Use highlighted the most promising ways forward, independent implementations facilitate the collection of practical experience for facilitating in-depth reviews that will reveal many aspects which may be worth adopting for long term use (and many other not so mature aspects too).

   Guiding Axiom: *Long-term stable systems above some non-trivial levels of complexity always have abstract andOr specific features that are worth keeping and should never be changed. It will require recombining these with other features to keep the insights learned - while still continuing to refine other insights still worth learning.*

   Guiding Dangers: It is easy to confuse *abstract requirements* (e.g. semantics, i.e. the meaning stored *inside* of an abstract container) with their *current implementation details*

(e.g. syntax, i.e. the specific label or name that we put *on* an abstract container to help us find it again). Often core features of abstract models in a research community stabilize faster than it is possible to develop user-friendly formal rules for implementations that integrate well with systems used productively. Constant tinkering in productive systems quickly frustrates both tinkerers and users. Hence, batching such changes may facilitate further maturing of the system. However, regardless of strategy, experience shows that it is challenging to define formal requirements for dynamic systems in a long term stable and scalable way – mostly because of the thoroughness with which a system's complexity must be understood in order to enable this. Frustrations with identifying long-term stable abstractions can pull some to conclude prematurely that no (best) solution exists. Yet, statements of non-existence tend to be very hard to prove, especially in an open world, such as ours. Hence, the greatest danger at this stage is to close the modeled world in one of a myriad subtle ways, instead of managing the discomfort that comes from supporting the open-world assumption. Practically this means that unexpected feedback is welcome, especially, if it leads to significant improvements. Some bugs are like 'missing forms of nothing' and hence particularly intangible. However, their intangible nature does not make them any less real. It is the task of the OpenDeciders who lead the Guiding Use stage to help all others to keep an open mind. That is especially important for the next stage that is even more in danger of falling into the trap of assuming a closed world.

5. **Crystallizing Use**: Here the consensus of the Guiding Use is deliberately crystallized into one or more forms that each aim to improve the overall efficiency (sometimes by competing). The Crystallizing Use of the 7Tr model focuses on minimizing the space used by compacting, maximizing overall productivity, and ensuring that all conditions of use are easily handled well by all potential users, weak and strong. This use may collect evidence for deciding if potential improvements are worth the expected cost of more optimizing. Sometimes major disagreements about the Guiding Use meet the resources necessary for contrasting and comparing different ways to crystallize new 7Tr consensus options at larger scales. Eventually recombining the best aspects from different crystallizations (see Transforming Use) tends to further improve integration and productivity within a single tangible form that is often kept long-term.

   Crystalizing Axiom: *For every useful long-term requirement, there exists a sufficiently accurate formal way to implement it for testing how stable, efficient, extensible, and user-friendly it is during practical use (even if the test itself cannot be made user-friendly due to the volume of data to be handled).*

   Crystalizing Dangers: The need for speed in production use is a coin with two sides. There is no better way of stress-testing a system than expecting it to produce results efficiently, reliably, in time, and while using minimal resources. On the flip-side, these pressures also quickly erode any ambitions and extras that have not been well-packed into thoroughly *tested* code that comes ready-prepared for every eventuality, like a well-designed computer application. While that is a tall order, test-driven software

development can by now automate much of the repetitive work in testing source code to ensure that features are not broken during development of a code base. Since teaching programs like the MSIM are defined in principle by a given set of entity roles, operations, and expected outcomes they can in principle be mapped to formal computing operations. However, the MSIM is run by people, not computers; hence, a much larger variability is expected, especially in cohorts as small as the MSIM size. Thus, fully automated feedback questionnaires would have to be extraordinarily well-developed in order to provide insights that are not already obvious to the faculty who lead the program. In contrast, directly listening to all involved likely generates most data and possibly also most insight, albeit is also most time intensive.

Improving feedback efficiency and quality: It is conceivable that the various uses detailed here for 7Tr modes might facilitate a particularly efficient collection of focused feedback during Crystallized Use of a well-understood 7Tr model. Such a sufficiently developed 7Tr MSIM model would allow focusing most attention on the areas of greater need – where paying close attention to in-depth feedback is more likely to provide the crucial insights required for initiating specific actions to most efficiently improve outcomes in meaningful ways. If the 7Tr model in use has been constructed and maintained with enough care, the program's ~80% 'business as usual' can likely be handled much more efficiently than in approaches where one-size-fits-all. Such uniform approaches easily drown out the key feedback for identifying the most urgent issues from a strategic perspective. Yet, how much effort might it take to define a "well-understood 7Tr model" that could be useful for focusing feedback collection? This is difficult to predict and might well be worth its own independent study. How much of that effort improves 7Tr generally vs adjusts it to a case at hand like the MSIM? Also, analyzing feedback near event times to improve its quality is not a trivial logistical challenge if a whole cohort is to be tracked. It is clear that these and other questions require more in-depth analysis than is possible here. These questions may best be explored in a real-world example use-case that is complex and detailed enough to be interesting but not too much to postpone scaling problems.

6. **Exploring Use**: The potential splintering of consensus during Crystallization Use is turned into a method under the 7Tr Exploring Use. It mirrors the core idea of the scientific method by always also trying to explore opposing points of view on any hypothesis. Such work often requires a greater flexibility than typically available during the other previous 7Tr Uses; these were rather focussed on understanding the 7Tr system well enough to resolve a fairly obvious major issue. However, since continuous evolution is the real revolution, it is important to create spaces for the research required to inform such further improvements. Without them even the most dynamic movements can grow stale by slowly developing in-groups that get accustomed to how things are because they were useful back then, even though they no longer are. There is something innovation-destroying about never taking a good look at new perspectives or asking hard questions (see Satell, 2020). Hence, it is generally useful to venture beyond the horizon in search of innovative perspectives. The Exploring Use of the 7Tr model is like a built-in starting point for such further explorations, especially after learning the

system at hand from the other 7Tr Uses above, which are an excellent starting point for a researcher heading into the unknown.

Exploring Axiom: *There is always a next-most-important aspect to explore about how a complex dynamic system might be improved most in respect of a given feature. This is especially true for models of groups of people like 7Tr.*

Exploring Dangers: When is a good time to stop? It is easy to get overwhelmed by drilling into details, surveys, and statistics of a large 7Tr population. However, it might also be enough to understand the diverse 7Tr roles in general in order to ask useful questions – no formal surveys or statistics needed. The answer depends on the context.

7. **Transforming Use**: However, many of the Uses above someone may engage in, the Transforming Use is a useful marker for ending a cycle of innovation by noting major lessons learned for the record, updating the key models to integrate all new data and insights, and generally integrating data and insights that may have accumulated in places too scattered for practical use. Reasoning through such data in order to integrate it can take more time than expected. In return, documenting data to free it from its moment's oblivion often creates new possibilities over the long term.

   Transforming Axiom: *Integrating scattered data by reasoning through it and defining its uncertainties provides value by sharing awareness for open questions.*

   Transforming Dangers: It is tempting to not integrate the datasets available or to merely copy and paste them into one place without reasoning through them (at the cost of losing lessons learned). While that requires some time, it is also important to learn when to stop in order to start the next innovation cycle. This requires deliberate engaging with the serendipity of the discovery process. This may be risky and unnerving but is ultimately worth the innovation it produces. Any sustainable innovation economy will need to learn to invest in these counter-intuitive phases of innovation. *Not all who wander are lost* (Satell, 2021).

It is obvious that the 7Tr analysis of the MSIM as presented in Section 3 is not detailed enough to serve in each of these 7 uses of a 7 Tr model.

However, it is also clear that it might serve as a starting point for facilitating further discussions on how to improve the MSIM and thereby improve the chances of contributing in a positive way to resolving the Gordian Knot presented by the ongoing climate crisis and other compounding crises that are caused by a lack of innovation about how to implement innovations.[11]

[11]For bibliography, see the main references list.

Appendix 3

The Backslash: \ Evolvix syntax for naming in discussing the 7Tribes\7Tr

A reasonably complete overview of the Evolvix effort is not yet available, but for the purposes of this thesis Loewe *et al.* (2017) introduces enough of its core challenges and approaches (other references include Ehlert & Loewe 2014; Scheuer *et al.* 2017; etc.). Most of this work does not need to be understood for the purposes of this study; yet there is a feature of the redesigned Evolvix syntax that is so useful for simplifying discussions of the 7 Tribes model, that it is worth introducing it here. The Evolvix BEST Names model (Loewe et al. 2017) was developed to simplify the readability, annotability, and consistency of names in complex systems biology models. It allows code to better serve diverse readers by defining different – perfectly synonymous – dialects for naming the same set of entities in order to highlight different views, eg. via Brief, Explicit, Summarizing, or Technical names that can all be used interchangeably and are only separated by a backward-slash. The same syntax can also be used for introducing any other synonyms that might help readers. Conceptually, a name is a label on a container that describes its contents. Then the core idea is easily described as follows:

> Different synonymous Names such as X \Y \Z are merely different Labels
> that *all point to the same* container with the same content.

Here the backward slash in “X \Y \Z” separates different names that are by definition referring to the same entity. In Evolvix such entities could be anything; in this report they tend to stand for a person, a functional role, or a model. For example, these 3 labels:

> 7Tribes \7Tr \“The innovation model defined by Loewe as used here”

all refer to the same general 7Tr model tested below. Such labels merely emphasize different aspects in order to improve readability in a local context. Such notation helps to simplify the tracking of ‘which is what’, in discussions of how MSIMroleA \7TribeX relates to MSIMroleB \7TribeY, or when associating

Brief	\Technical	\Explicit	symbols like
AMO	\Amorite	\PowerElite	

in order to ease new readers into discussions of 7Tribe roles. For all tribes the Brief Names are defined as the first 3 letters of their Technical Names, which are defined by the transliterations given here (which were chosen such that they don’t conflict with a related series of 7 Change stages for adopting innovation; beyond the scope of this study, hence not given here).

Appendix 4

Overview table of 7Tribes Model names as used for the 7(+2) tribes in this thesis

This thesis uses the following development snapshot of the 7Tr model (version QQr1p1):

	Brief 7Tr	**Technical** Name	**Explicit Name** Synonyms MoreLiteral \MoreFunctional	**Strengths** Weaknesses	**Cases of Use** Axiom, Danger
1	**AMO**	Amorite	TopSpeaker **\PowerElite**	**Awesome ideas** Manipulative	Descriptive
2	**HIT**	Hittite	FearHandler **\RiskReducer**	**Courageous** Awful or fearful	Testing
3	**CAN**	Canaanite	ProfitTrader **\Distributor**	**Resourceful** Corroding	Negotiating
4	**PHE**	Pheresite	OpenDecider **\PureExpert**	**Excels** WorldClosing	Guiding
5	**JEB**	Jebusite	Stampeder **\RoutineMarket**	**Reliable** Blind	Crystallizing
6	**HIV**	Hivite	RotatingTentVillager **\TempRotator**	**Flexible** Wobbly	Exploring
7	**GIR**	Girgashite	CrushedDust **\IgnoredOthered**	**Humble** Doubting	Transforming
	HEB	Hebrew	Beyonder **\AnyRoleWalker**	**Creative** Unruly	
	ISR	Israelite	RealityWrestler **\AllRolesRefiner**	**All the good OLT[1] without the bad.** Takes longer, no shortcuts!	

[1] **OLT** \ **O**ver the **L**ong **T**erm