DETERRITORIALIZATION/RETDERRITORIALIZATION OF RARAMURI KNOWLEDGE:
WITHIN THE LANDSCAPES OF MULAKA

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by
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The undersigned, appointed by the dean of the Graduate School, have examined the thesis entitled

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Contributions of the Author:

The study is co-authored with my advisor Dr. Mark Palmer. I am the primary author of the thesis. I undertook the literature review, conducted interviews, analyzed all the research material, crafted the arguments, and wrote the thesis. Dr. Palmer provided supervision, guidance, and oversight concerning the structure of the thesis, the framing of the arguments. Dr. Palmer also edited the thesis and revisions intended for publication.
Abstract:

Independent video game developers are changing the game industry by creating new genres like Indigenous gaming using narratives that represent Indigenous groups. These representations form part of the video game production and provide an immersive gaming experience for the players. These interactions could be mapped into a video game assemblage of multiple actors: The game designer, game player, Indigenous knowledge, and the game itself. Deleuze and Guattari's rhizome serves as a model to study assemblage networks in a non-linear and non-hierarchal way. The study focuses on Indigenous knowledge traversing through a video game assemblage, encountering other actors. The thesis questions how Indigenous knowledge is shaped internally (digital space) and externally (distribution and game players) of the video game assemblage. And what changes occur within that knowledge, and how does it affect the other actors. The first chapter introduces rhizomatic concepts and applications in social science, game studies, and geography. The second chapter applies rhizomatic thinking in the video game production of *Mulaka*, examining the relationship between the Raramuri and the game designers. Moreover, the designers deterritorialized Raramuri oral stories to reterritorialize them into the game's digital landscapes, narrative, and mechanics. In addition, the paper looks at the game's use of platforms, creating pathways that connect non-native players worldwide. Finally, the paper concludes that Indigenous knowledge is constantly evolving even before the game. Once its part of the video game assemblage, the knowledge hybridizes further and changes the other actor's identity, including the game player.
Chapter 1: Introduction

On 25 January 1947, Thomas T Goldsmith and Estle Ray Mann applied for a patent application for their "Cathode Ray Tube Device," this is the oldest video game concept on record (Judge 2020). The patent was for a missile simulator game inspired by radar displays its very similar to the later 1980 Atari game "Missile Command," but the game was never made into production. However, in the 1950 and 1960s, the military labs experimented with video game applications like Spacewar! the problem was the technology and was not accessible to the general public due to the high cost and size of the video game systems (TEDed 2013). In 1972, Ralph Baer created the first video game counsel, The Odyssey, which would use a television as a visual medium, making it available for the home. The late 70s ushered in the golden era of video games kids were playing Space Invaders! Asteroids and Pac-Man at the arcades. In the 1980s, Nintendo introduced Super Mario becoming the most popular video game franchise in the market. In the 1990s and early 2000s, the home console gained popularity, with the PlayStation (PS) and Xbox Today, the video game industry can be played on consoles, PCs, and mobile devices. No matter what the medium, video games are part of our mainstream culture. However, video games have not been inclusive in terms of representation. Williams, Martins, Consalvo’s (2010) study looked at the representation of video game characters in over 150 video games released in 2005-2006, and their results showed that most characters were primarily white male adults, and the under-represented characters were female, Hispanics, Native Americans, children, and the elderly.

However, in the last decade, independent (Indie) game developers are changing the industry by creating new genres using alternative narratives that major video game developers often overlook. One of these genres is Indigenous gaming. This genre uses Indigenous narratives and partners with Indigenous communities to participate in the game production, either in a
consulting capacity or developing the game directly. Indigenous game developer James Edward Lewis (2014) argued that when Indigenous people participate in gaming, it can "expand the epistemological assumptions upon which those systems and structures are based" and "stake out our own territory in a common future" (63). With that knowledge spread, it exposes non-native gamers to a new perspective not seen in gaming.

1.1 Research Question

How is Indigenous knowledge shaped and integrated internally (digital space) and externally (distribution and game players) within the video game assemblage? And how does the exchange between the Raramuri, game designers, and game players affect identity?

1.2. Research Framework

To answer these research questions, I will use the Deleuze and Guattari concept of rhizome thinking. I briefly describe what a Rhizome is and explain why rhizome's thinking will be used in this study. Chapter 2 will go into greater detail what are concepts of rhizomes and how they are applied to social sciences like geography and game studies. Rhizomes are a way of viewing social structures as non-linear and non-hierarchal assemblages. These networks have multiple entry points and exit points (Deleuze and Guattari 1987). Rhizomatic thinking works well because video game structures are made up of multiple actors (human and non-human): the hardware (game console), software (digital platform market and game), game designers, and game players.

The study should be thought of as an exercise in identifying deterritorialization and reterritorialization routes within the rhizome. Gilles Deleuze and Felix Guattari frame
deterritorialization as movements by which one leaves a territory. It is followed by reterritorialization or control of territory by outside forces. Barney Warf (2010, 723) describes deterritorialization and reterritorialization processes as "spatial manifestations of contemporary changes underway in the relationship between social life and its territorial moorings." I will be looking for reterritorialization/reterritorialization patterns within the: Raramuri orals stories, landscapes, mechanics, sound, game distribution, and game players.

1.3 The Case Study

1.3.1 Raramuri

The case study revolves around the Raramuri. They are an Indigenous community based in the northern part of the country of Mexico in the state of Chihuahua. The National Institute of Indigenous Peoples (NIIP 2000) estimated that over 121,000 Raramuri live in the Sierra Madre Occidental in the western region of Chihuahua, a region locally called The Sierra Tarahumara or Barrancas del Cobre (Copper Canyon). This region is mountainous, rugged, isolated, and with poor road infrastructure; traveling by car can be difficult. The Raramuri communities are scattered throughout the region and reaching some of these communities can only be done by foot. In the 17th century, the Raramuri lost portions of their territories to the Spanish and escaped to the Sierras. This isolation helped preserve their culture and language to this day. The Raramuri are sometimes called Tarahumara by Mexicans, but they prefer the term Raramuri. They are known for their long-distance running abilities outside of Mexico, made famous from Christopher McDougal's book "Born to Run" Today. The Raramuri face many challenges are staying in the Sierra partly because of lack of economic development and climate change, and violence from the cartel. Many have migrated to major cities of Chihuahua, including Chihuahua
(capital), Juarez, and Parral. The Raramuri primarily speak two languages Raramuri and Spanish, but the Raramuri who reside in the cities speak Spanish.

1.3.2 Lienzo

Lienzo is a game studio in Chihuahua, Mexico, and they are the creators of Mulaka. Founded in 2012, the game studio's first game release was Hunters Legacy (Lienzo 2020). The creators collaborated with the Raramuri to create Mulaka, an Indigenous game based on Raramuri mythology. Lienzo met the Raramuri every few months of the production phase to update them on development progress and ensure that Raramuri culture was respected. In one of their meetings, they showed the main character fighting and killing a bear. The Raramuri found this unacceptable because the bear is viewed as a demigod and would never kill the bear intentionally (Kidwell, 2018). Lienzo was receptive to their mistake and removed that depiction. The game was released in 2018 and is played on Nintendo, Xbox, PlayStation, and PC. The game features 3-D landscapes that are based on real-world locations that are special to the Raramuri.

1.4 Thesis Outline

The remaining chapters are organized as followed. In Chapter 2, I will review the literature on Rhizomes. Followed by discussing how Deleuze & Guattari created a book that uses rhizomatic concepts as part of the book’s framework. Next will discuss how Rhizome thinking has been used in game studies and geography, then how that will translate to Mulaka. The data and Methods section will describe the sources used, including primary sources, secondary sources, interviews, and participatory observation. Then, overview the relationship between the Raramuri and Lienzo and how the Raramuri participated in the game's production. The following
section will break down the deterritorialization/reterritorialization of Raramuri oral stories. Followed by demonstrating how the Raramuri knowledge is incorporated within the visual landscapes, sound, and mechanics of the game, I do another deterritorialization/reterritorialization analysis of the visual landscapes, sound, and mechanics. The final section of Chapter 2 covers the game platforms distribution and gamer's perspective of the game and ends the chapter with the deterritorialization/reterritorialization analysis of the platform and gamers. Chapter 3 ends with a Conclusion that goes over the results of the study moves on to the limitations and final thoughts, and future research. Finally, the paper uses deconstructed and reconstructed as alternative terms to deterritorialization/reterritorialization
2.1 Introduction

Video games have advanced considerably in the last half-century as an assemblage of aesthetics, mechanics, and technology. Schell argued that these relationships are fundamental to game design (Schell 2008, 41-42). Game assemblages create digital space that allows players to explore, interact and react to their digital surroundings. As great as these reimaged spaces are, mainstream video games contain a western bias, and they cater mainly to a white male audience. James Edward Lewis described video games as "Hardware and software is culturally biased. Robotic epistemologies are caught in a 500-year bubble, a particular way of looking at the world" (Landry, 2018). However, in the last 20 years, there has been a rise of independent game studios creating virtual spaces for others to share their cultural knowledge. In the next few paragraphs, we are going to delve deeper into indigenous representation in two video games and examine the role indigenous groups played in influencing and shaping the virtual space of video games.

*Never Alone* (2014) and *When Rivers were Trails* (2018) are both independent (indie) games meaning the game is created by an individual or a small team of game developers. The designers for both games collaborated with indigenous groups to produce virtual environments and narratives for the games. *Never Alone* was formed in collaboration with the Inupiat in Alaska, and *When Rivers were Trails* emerged in partnership with the Indian Land Tenure
Foundation, Michigan State University's Game for Entertainment and Learning Lab with the support of the San Manuel Band of Mission (Indian Land Tenure 2018). Both games use indigenous-based narratives, *Never Alone* uses Iñupiat folklore to tell the story of an Iñupiat girl, and *When River were Trails* is about an Anishinaabeg tribal member who is forcibly expatriated from their homeland and travels west to California (LaPansee, 2019; Never Alone 2018). Both games bring social awareness critical to indigenous groups and present knowledge in distinctive ways. *Never Alone* is sold commercially on major game platforms like PC, PlayStation, Xbox, and smartphones. While *When Rivers were Trails* is only available for download for Mac/PC on the Indian Land Tenure website. Both games reach out to different audiences. *Never Alone* is on multiple platforms, including smartphones, and reaches a larger audience that includes non-indigenous game players. While *When River were Trails* was created in response to a lack of Indian land policy curriculum in the classroom, and targets educators and students (LaPensée, 2019). Finally, if we map out the overall process of making *Never Alone* and *When Rivers were Trails* from its inception to gameplay, the assemblage is a non-hierarchal network consisting of multiple connections that do not have a singular point of origin. For example, to create *Never Alone*, the game designers, the Inupiat community, and the oral stories converge to create virtual spaces. Their contributions come from different access points and not from a single source. This type of framework could be considered rhizomatic (Deleuze and Guattari 1987). David Martin-Jones supports this position by saying, “As far as gaming is concerned with the traveling, investigation, mapping and controlling of space, this idea of this rhizome as labyrinth can also be applied to video games” (Sutton and Martin-Jones 2008, 4).

*Mulaka* is a 3-D adventure produced by Lienzo, a Mexican indie game company based in Chihuahua, Mexico. The game took elements from Raramuri mythology to create a hybrid
narrative and making 3-D virtual landscapes that are based on the Raramuri homelands in northern Mexico. The story centers around Mulaka, a Sukurami (warlock) tasked with saving the world from destruction, collecting knowledge and help from the demigods along the way. The analysis is based on personally playing the game, interviewing the game developers, analyzing Raramuri oral stories, researching game platform distribution processes, and review online interviews related to Mulaka. "Raramuri" is the term the tribe uses to describe themselves. They are also known as the Tarahumara, but this term will only be used when quoting outside sources.

This paper will describe the video game Mulaka using rhizomatic analysis to follow the deterritorialization/reterritorialization of indigenous knowledge systems through video game production, dissemination, and gameplay. The first section will introduce the rhizome as a conceptional framework to describe the assemblage of humans and technology on a non-hierarchical lateral network that is constantly deterritorializing and reterritorializing. It centered on indigenous groups, game developers, gaming platforms, and game players. The second section will apply Rhizomatic methods to a case study that examines the relationship between the Raramuri and game producers. Through that relationship, the producers use Raramuri mythology to shape the virtual landscapes and hybrid narratives of Mulaka. In the final section, I will analyze the game's digital distribution process to spread the game and the critical role gamers have in determining where the game is played geographically.

2.2 Rhizome Concepts

Deleuze and Guattari (1987) used the term rhizome to describe a way of thinking that helps describe relationships, connections, and the formation of assemblages. The rhizome is a
non-hierarchal assemblage. That can connect in any direction. Rhizomes are about presenting multiplicity over singularity. If a single point of the rhizome is transformed, another one will emerge in its place. The rhizome has no defined structure but maybe conceptually mapped out. Tracing the lines of the rhizome map leads to multiple directions, possibilities (Waller 2019), and no beginning or end (IAAC 2001). Deleuze and Guattari (1987) presented the rhizome concept in the book *A Thousand Plateaus*. Like the rhizome, the book does not have a center. Instead, the book chapters are non-linear, diving into multiple subjects like politics, science, philosophy, and psychology, all connected by lines of thoughts and ideas going off in a multitude of directions. (Waller 2019).

The rhizome responds to a western model of thinking that is structured, hierarchal, and binary in its way of thinking. Deleuze and Guattari argued that this method of thinking could be missing the complete picture, and the rhizome may help view different perspectives. Jones used the forest analogy to explain the difference of thought as:

"In the forest, there is no single truth, no singular cause and effect, no one 'true' tree. Rather, the forest is a single entity made up of numerous trees or numerous truths… Anyone tree is the product of assemblage, of water, sunlight and soil" (David Martin-Jones 2008,3).

Rhizomes are in a constant state of transformation through the process of deterritorialization and reterritorialization. Deleuze and Guattari explained this process using wasps and orchids as an example:

“How could movements of deterritorialization and process of reterritorialization not be relative, always connected, caught up in one another" The orchid deterritorializes by forming an image, a tracing of a wasp; but the wasp reterritorializes on that image. The wasp is nevertheless deterritorialized, becoming a piece in the orchid's reproductive apparatus. But it reterritorializes the orchid by transporting its pollen. Wasp and orchid, as heterogenous elements, form a rhizome” (Deleuze and Guattari 1987).
The analogy demonstrates that the wasp and orchid and reterritorializes simultaneously. Furthermore, Martin-Jones points out that there is a power imbalance in such encounters, especially in colonialism "colonial power will often change as its rhizome comes into contact with another, the other rhizome is often absorbed, or forcefully reterritorialized by its culture" (Sutton and Martin-Jones 2008, 7). More likely is the scenario in which both cultures hybridize, and the idea of colonialism is only partially successful. By recognizing the deterritorialization/reterritorialization process, one can identify the changes within the territories. Power is not singular, and it is within the rhizome itself.

2.2.1 Rhizome use in Digital Media and Games

Researchers have used the rhizome approach in multiple fields of social science and humanities. Rhizomatic thinking can help interrupt oppositional binaries. Bryan Clarke and Jim Parsons wrote of its usefulness in research "rhizomatic could help researchers/teachers develop agency but step beyond personal agency to see research/teaching through multiplicities that arise then preplanned forged curricula" (Clark and Parsons 2013). In digital media studies, critical theorists have found it helpful to compare the internet to a rhizome because of its "changing digital landscape" (Spink and Zimmer 2008, 39). At any point, a person who uses the browser can enter and exit the internet, and the websites are interconnected with the user choosing to go in whatever direction they desire (Spink and Zimmer 2008, 40). Furthermore, Andre Lemos described the internet as a "plateau" that has interconnected links and multiplicities that "change the nature of the media such that it metamorphoses into a medium of contact" (Lemos 1996, 46). Simply put, the structure of the internet mimics the characteristics of a rhizome.

Rhizome methodologies have their use for analyzing digital media. One paper applied rhizomatic principles in describing video game structures (Martin-Jones 2008, 12). The book
*Deleuze Reframed*, by David-Martin Jones, dedicates an entire chapter to video games where he described video games as "labyrinth space," Martin-Jones used Pac-Man to map out space in the video game. He described Pac-Man as a "single level, on a single screen, seen from an aerial point of view," he acknowledges that this space is not rhizomatic because space is fixed, resembling a maze (Sutton and Martin-Jones 2008, 13). Nevertheless, player's actions are rhizomatic because the actions taken by the gamer can be interrupted as reterritorialization or deterritorialization space, all depending on how we map out the game. On one end, Pac-Man is devouring everything in its path, and some commentators have equated these actions to colonizing space. In another work, James Newman outlined that video game's only purpose is to create virtual space that will be "conquered" or "manipulated" by the gamers (Newman 2004). Instead of viewing Pac-Man as a colonizer, he is a prisoner seeking to escape, and through his movements, he deterritorializes space by avoiding the ghosts. Otherwise, if caught, he is reterritorialized. (Martin Jones's view of Pac-Man).

Colin Cremin used Super Mario Galaxy as a case study to explore "Deleuzian concepts" to identify "a series of formal qualities" he argued, "pertained to all video games" (Cremin,2012). The three qualities he identified were: "The role of the gamer in contributing to the finished form, the nature of the player's canvas, and the sensation that return to the player when traversing the video game field (Cremin 2012). Cremin is not analyzing the game from a technological assemblage. Instead, he is interested in the game's artist form. The art of the game does not come to life until the gamer plays it. The designer is the architect of the digital space Cremin describes as "nonrepresentational patches—a fluid architecture—generating the possibility for sensations." (pg 73). Furthermore, within the virtual world, the player can experience the sensations navigating their surroundings and, as Cremin labels, "otherworldly dynamics and enter into
proximities with it" (Cremin, 2012). Cremin ends by discussing how Deleuze used his concepts to "look critically at art and cinema." (pg 83) Furthermore, Deleuze's concepts can also apply to video games, particularly in analyzing nonrepresentation, affect, and movement. The above author suggests freedom of movement and imagination. However, how much freedom actually exists when engaging with digital computers and games?

2.2.2 Rhizome use in Geography

Rhizomatic thinking has also been used in Geography to study assemblage networks, such as Gillian Rose paper 'More on Big Things: Building Events and Feelings 'where they conceptualize buildings as part of an assemblage (Rose 2010), and Deborah Cowen and Neil Smith paper Assemblage of the Geopolitical Social' (Cowen and Smith 2009), to name a few. Ben Anderson and Colin McFarlane argued that assemblages allow the researcher to remain open to the "form of the unity, its durability, the of relations and the human and non-human elements involved" (Anderson and McFarlane 2011, 124). Geographers can also view the formation of assemblages as regions, scales, or territories (Anderson and McFarlane 2011). In geography, the term assemblage can be used as a descriptor to bring unity to connect differences. When used in this manner, it links an array of concepts as Anderson and McFarlane notes used for "in relation to any provisional structure" (Anderson and McFarlane 2011, 126). Alternatively, it can be used as a 'concept' that Anderson and McFarlane described as "takes on its meaning and function in relation to other concepts find conceptual problems" (Anderson and McFarlane 2011, 125). Framing assemblage as a concept more aligned with Deleuze and Guattari's use of assemblage. Anderson and McFarlane described this term as having "two axes." Anderson describes the first axis as "a machinic assemblage of desire and a collective assemblage of enunciation" (Anderson and McFarlane 2011, 125), meaning it shares various qualities. The
second axis is involved deterritorialization and reterritorialization. Anderson defines these assemblage movements as "heterogeneous parts that come together and come apart" (Anderson and McFarlene 2011, 126).

### 2.3 Data Sources and Methods

The primary sources used for this study consist of an interview I conducted with Lienzo, behind the scenes of making Mulaka documentary made by Lienzo. Field notes on the physical landscapes of Chihuahua, a list of countries that purchased Mulaka, were provided by Lienzo. Primary book sources include Cardenas Making Mulaka and Enrique Servin's book Aniurame (Raramuri oral stories). The oral stories come from Enrique Servin's Book Aniruame, text was written in Spanish, and I translated it to English for this case study. The preliminary data sets from SteamSpy and Playtracker provide estimates on the number of players who purchased Mulaka via Steam. Reports on gaming market reports (NewZoo 2020; Statista 2020). To understand video game landscapes, story plots, and the gamer's perspective, I played Mulaka and recorded and captured screenshots of the gameplay. Figures are images of the physical and virtual landscapes. The physical landscape photos use Wikimedia Commons that are royalty-free images. The remaining pictures are screenshots of the gameplay in Mulaka, and some images are from Lienzo.


Early in the introduction, I presented *Never Alone* and *When Rivers Were Trails* as examples of indie games produced in partnership with indigenous groups. The games were broken down into phases from inception to gameplay to demonstrate the interlinked connections of each entity, the indigenous community, the game designers, game players, and the technology, all forming part of assemblage networks. This case study will do the same for *Mulaka*, breaking down the game into two stages. Each stage will demonstrate an interlinked network constantly in motion disassembling, changing, restructuring, and recreating new rhizomes. Deleuze and Guattari demonstrated the wasp and orchid metaphor. The orchid deterritorializes "forming an image with tracing the wasp. The wasp reterritorializes on that image" (Deleuze and Guitarri 1987, 10). Then the wasp deterritorializes, becoming part of the orchid's reproductive system, but the orchid is reterritorialized by the wasp as it transports the pollen (Deleuze and Guitarri 1987, 10). It is indiscernible to separate between the orchid and the wasp with so much crossover between them.

The first stage will chronicle the working relationship between the Raramuri, game designers, and linguist Edgar Servin Herrera together; they deconstruct the oral stories and reshape them to create hybrid narratives and virtual landscapes that form part of the video production. The second stage will go over the global digital distribution and dissemination of the game. The paper uses the term actor to identify human and non-human elements that are a part of the assemblage. The actors in this process include the game itself, the platforms, and the game players. The digital distribution platforms are responsible for spreading a digital game with indigenous roots across the global stage, catering primarily to a non-indigenous population. From
the game designer's perspective, the game's popularity takes unexpected turns, having a more significant reception aboard than at home. Both stages reveal deterritorialization and reterritorialization paths that change the identities of the actants involved creating hybridized characterizes within the rhizome. For safety reasons, when I cite my interview, I will not include the interviewee's name.

2.4 Raramuri Oral Stories and Video Game Production

2.4.1 Connecting Lienzo and the Raramuri

The concept of creating *Mulaka* came from Edgar Serrano, one of the co-founders of Lienzo. Serrano chose to represent the Raramuri because other groups like the Mayans and Aztecs are often the only representations of indigenous identity known outside of Mexico. Unlike the Aztecs, the Raramuri are not extinct; they exist today. As Serrano describes it, "They are not unreachable or indecipherable, they are here among us” (Cardenas 4 2018). Although the game designers are not Raramuri themselves, they are from the same state where the Raramuri make their home in Chihuahua. The Raramuri are revered because they represent strength, endurance, and a culture that has resisted to a certain extent Spanish indoctrination. The Raramuri also attempt to maintain their language and long-distance running abilities. Enrique Servin, poet and linguist in Raramuri, describes why the Raramuri are essential to the state of Chihuahua

“The first thing that can be done is to change our vision not to see the Tarahumara as those rare exotic beings that are there as ornaments that are not part of the social body see them as Chihuahuas see them as one of the constituents of what we call the state of Chihuahua we are a plural nation and the state is a plural nation It is also a plural state, then one of the communities that make up Chihuahua number one with its own riches with its cultural richness with its richness of its cosmogony of its myths with the richness of its songs of its clothes of its traditional sports of its knowledge Herbalism is a community that has its own riches” (HMPD 2017).
The Chihuahuenses consider the Raramuri a part of the state's culture. Their images are reflected in the symbolism used on the state emblem that features a Spaniard and a Raramuri (Cardenas 2018).

The game developers sought out the Raramuri’s permission to develop a game based on their culture. Getting permission was difficult because the Raramuri political hierarchy is decentralized. The game developers reached out to various community leaders called 'Governors' to create an agreement. The game creators met with multiple Raramuri community leaders and explained that the game would celebrate their culture and teach about their traditions and legends to a broader audience (Cardenas 2018, 4). The developers received approval from several governors. Catalina Bautista explained why approval was granted, "They are people from here, but they move to Chihuahua (city), So it's in the city that youngsters grow up, and they don't speak Raramuri anymore they are losing all our culture… Whatever you can make to help us not to be forgotten, then that's good" (Lienzo 2020). Bautista's concern stems from the Raramuri, as roaming rhizomes migrate to the cities because they seek work, resources, are avoid climatic changes, and cartels. In rhizomatic fashion, the people often abandon traditions and do not teach Raramuri to their children. Instead, they assimilate into a Spanish-speaking mestizo society.

Servin described the importance of language in Raramuri culture:

“All languages are in their own way libraries and materials are a concentration of very complex cultural information, but they are an immaterial concentration that we cannot see, and we cannot feel that they are in the form of a mental system the mentalization system but when that system falls apart disappears is exactly the same as when a library burns in front of our eyes” (Servin 2018).

Sharing stories brings awareness of Raramuri struggles and assists in revitalizing their culture (Cardenas 2018). They viewed the games as a way to reconnect with young people, their own culture and recreate new representations that replace recycled tropes (Horton 2019). The
game designers promised to give a portion of the profits back to the communities. Creating the
game would be partially reciprocal for both the Lienzo and the Raramuri. Lienzo acknowledges
this:

"We try to make it so that it is a two-way street. We are taking something from
them, the stories and the characters, and the richness of the culture. And we
want to offer something in return, and that is something in return, the ability to
tackle problems that they might have then they might want to solve" (Interview
1 2021).

It would take Lienzo over two years to collect the Raramuri stories. They enlisted the
help of poet and linguist Enrique Servin, who spent 20 years with the Raramuri learning their
language and collected Raramuri oral stories translated to Spanish in a book called Aniruame:
History of the Tarahumaras From the Old Times (Lienzo 2017). Enrique Servin served as a
consultant helping Lienzo decode the stories and separating the stories that had Spanish
influence, only keeping the pre-Columbian fundamentals. In an interview, Servin explained the
process in a YouTube interview:

"Myths are difficult to interpret; they are living things, and they entail
different layers of meaning…the people of Lienzo were very open to my
suggestions so the myths could be as authentic as possible, so I think that is
one of the most attractive things of the whole game" (Lienzo 2017).

Servin attempted to detach Raramuri stories from a strong amalgamation of
the Spanish language, religion, behavior, and colonialism and create what he refers to
as a more authentic line of flight. In a similar fashion, video games and the internet
only connote free movement and creativity. Underlying such systems always resides a
master plan, at least in the human world. Lienzo involved the Tarahumara in part of
the early production phases of the game. For instance, the developers recruited
Raramuri poet and musician Martin Makawi to narrate Mulaka in Raramuri and
consulted on Raramuri music style. The designers checked in with the Raramuri every few months to show the progress of the production. On their last trip, they brought a Nintendo switch to show the community the game's progress. The designer was demonstrating the Basaseachi waterfall level that includes one of the mythological creatures, the Ganoko. Guillermo recalled an elder's reaction to the game; he said,

"This very old guy. He saw it, and he was like, without us telling him anything and he not reading because obviously, the game tells you, like he was like, oh, that is that's like a Ganoko. Right? We were like, holy shit" (Interview 1 2021).

The Ganoko’s physical appearance was an artist's interpretation as limited descriptions of the Ganoko's appearance can only be found in the oral stories. The artist had to take a line of flight and interpret the descriptions of the Ganoko and come up with a contemporary version. Interestingly, the Raramuri did recognize the contemporary Ganoko (IVIPRO 2020).

2.4.2 Deterritorializing/Reterritorializing of Raramuri Knowledge

Mapping out the initial development of Mulaka shows the multitude of deterritorialization/reterritorialization links between the Raramuri and Lienzo. The first link is Raramuri’s motivation to collaborate with the game developers. The mass migration to the cities, abandonment of Raramuri customs, and language loss all lead to the deterritorialization of their identity. Then they are reterritorialized within the constructs of mestizo culture. The second link revolves around the oral stories, but this process started before Lienzo. The oral stories were already a product of reterritorialization. Over the centuries, the Raramuri stories picked up
Spanish influence with Christian themes. This Spanish influence deterritorialized the older stories, replacing them with hybrids (reterritorialize). Servin then decodes (deterritorialize) the stories eliminating what he believed was Spanish. Still, at the same time, they are reterritorializing all over again because his decisions determine what is and is not Raramuri. Another way of looking at the deterritorializing/reterritorializing process is that the permission the Raramuri gave to the designers was a deterritorialized progression because there is a transfer of Raramuri oral knowledge between the Raramuri and Lienzo. Then the information was reterritorialized by Lienzo when incorporating some elements of oral knowledge within the game's fabric. The artist practices deterritorializing because he took the image and reterritorialized the Ganoko according to his interoperation, but it was recognized and accepted by the Raramuri. A lot of Mulaka's narrative focused upon Raramuri cultural practices and mythology. From the quotes that appear in the narration cards, character dialogue, and cutscenes (Horton 2019 55), the narrative is a Raramuri perspective of their worldview; an example is Mulaka, the main protagonist. He is a Sukurame, who is an essential spiritual leader in Raramuri culture. He can communicate with spirits and demigods, Sun and Moon. All who are essential figures in Raramuri cultural beliefs and myths.

Furthermore, the narrative uses the Raramuri perception of time as cyclical; in Mulaka's timeline, the world is in its fourth iteration, having gone through three cycles of destructions and creation. What is not part of the narrative is the character Mulaka himself. Lienzo explained why it was done this way.

“Mulaka's character and the journey that he has to this end is all fictional. And it was our way of we needed to find a way to weave together these other stories. Right. I mean, the cyclical destruction, like everything else that you encounter in the game, came from an actual story. But the only way of bringing all of those together into something cohesive was to create this fictional character that would, you know, go from place to place trying
to stop this destruction. And so that's where the fiction came. And that's where our job came of creating someone who could make sense to be in this position in all that. But, yeah, everything else outside of Mulaka himself is taken from one or two or three stories” (Interview 1 2021).

The narrative is the heart of Mulaka, and developing the narrative presented various Rhizomes that go through Deterritorialization/Reterritorialization. First, beginning with the way Raramuri mythologies conceptualize time. Time is not linear. Instead, it is an endless cycle of destruction and creation. That concept in itself is a form of the Deterritorialization/Reterritorialization process. Having read Servin's book Aniruame: History of the Tarahumaras from the Old Times, it is a collection of dozens of Raramuri short stories that lay out a total of three cycles of existence. The first destruction (deterritorialized) was caused by flooding; the first short story described it as

“It is said that those from above sent a lot of rain, so much that everything began to flood very soon. The valleys, the slopes, the colonies, the canyons were flooded, even the highest mountains were flooded. Then the Tarahumara started running to try to save themselves. People listened in despair, not knowing where to go. "Where can we take refuge from the water?". Everyone screamed and began to die in great numbers. But the water kept flooding all the places, and where it wanted people to go, the water kept rising, covering all things” (Servin 2018, 62).

However, with every destruction comes the creation (Reterritorializing).

“Then the water began to go down, and little by little, the other hills, the mountains, and the valleys reappeared. One by one, the hills and hills began to be seen until the whole Earth appeared. Then the two children came down... All the Tarahumara that now live in the world are descended from those two children” (Servin 2018, 68).

The second destruction is caused by fire, and the third by earthquakes, all decided by the Gods; as Serrano described, "when man was corrupt, they will be wiped out" (Lienzo 2017).

These narratives of destruction were incorporated within the story plot of the game. Mulaka must enlist the help of five demigods to prevent the fourth destruction of the world. At the end of the game, Mulaka travels to the underworld and defeats the cause of the destruction, "The Teregori,"
a creature representing Man's corruption, but in the end, the Gods tell *Mulaka* that man will always be corrupt, and the Terregori would return, as the Gods note "it is best to start anew." (Horton 2019). By creating a story narrative not indigenous to the Raramuri, the rhizome is deterritorialization/reterritorialization concurrently. The deterritorialization occurs when the designers pick what parts of the oral stories not to include in the rhizome while incorporating multiple oral stories with a fictional character *Mulaka* created by Lienzo within a bigger rhizome that become a hybrid narrative.

### 2.5 Rendered Landscapes, Mechanics, and Sound

The game is divided into eight playable levels (strata). Each location is based on real-world locations except for the final level, the underworld. However, all of them are significant to the Raramuri. Each strata have its own visual and audio themes: color palettes, music, and type of physical landscape. To capture these landscapes, Lienzo took multiple trips to these locations and captured minute details of the landscapes down to the type of flora and fauna by capturing photos, videos and sketching them out in drawings. Lienzo described the process.

> "And then phase two would be going back and sketching all of those. Right. Flora, fauna, and general landscaping. Just how we get an idea of, OK, what can we get and how can we transform this into something that's playable and then use those catches that we had of like these places in this general geography and translate it into the game. And for that, we had our conceptual art to just sit down two hours there, you know, just making a big landscape, drawing of everything, then coming back to the office and being like, OK, this helps…And we did that for pretty much everything or every level except for the last one, which is like the underworld, which of course, is totally fictional. But the rest of them are are are like that done on location” (Interview 1 2021).

The aesthetics of the digital landscape and the characters are designed in low-poly shapes that are pointy and jagged (Horton 2019). The design is not based on budget constraints; instead, it was meant to mimic Raramuri art, like the wood-carved figurines representing the Raramuri
and animals they find in nature (Cardenas 2018). The digital environments are essential to the gameplay, as Joshua D Miller explained

"Bringing these 3D worlds to life as synchronous screen images, enabling an active relation with the player: real-time rendering. The algorithmic production of digitally modeled bodies and environments, as an essential but masked element of video games, offers a territory where Indigenous developers, storytellers, and other creatives claim aesthetic presence in a procedural medium". (Miller 2019)

With this much attention to detail, an immersive environment can encourage players to explore the digital environments, interact with Non-Playable Characters (NPC), find hidden artifacts, and solve puzzles all elements found throughout the game. Moreover, if successful, the players are invested in the immersion of the virtual world. Miller describes this framework of immersion as the end goal:

“Rendering algorithms enable player and avatar to overlap during gameplay, through the visual, auditory, and haptic senses, as an active body-in-code. They determine digital embodiment through their processes of encoding and translation, where two different kinds of geometries—the actual-physical and virtual-physical—are mapped onto each other. We may view this sutured space as "a terrain stretching from the spirit to the human to the machine worlds" (Lewis 2014, 67).

Table 1 will give a short description of each of the eight levels that make up the game. Some of the levels have oral stories that explain how the landscapes were developed, the excerpts of the oral stories will be included in the description. Nevertheless, Cardenas summarized a layer in the design that communicates "the important cultural significance of these environments to the Raramuri people (Cardenas 2018).

Table 1. Description of each of the eight levels that make up the game. (Sources: Lienzo 2020)

<table>
<thead>
<tr>
<th>Name</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Samalayuca</td>
<td>The Samalayuca dunes are an expansive desert area located in the extreme north of the state of Chihuahua in Mexico, about 50 kilometers south of Ciudad Juarez. For the Raramuri, this area is significant because, in</td>
</tr>
</tbody>
</table>
their folklore, this area is where Jikuli (peyote), who is viewed as a god, made it their home to escape the Tree Wars. See Figure 2 for images of Samalayuca, both real and virtual.

So he spoke to them in perfect Raramuri: 'I'm going somewhere else. From now, I will no longer live where there are trees; I will no longer live where there are wars; I am going to look for a land where everything is calm'… Then he went up and looked out to see his new land, it was a large, lonely land, with plains, with thorns, full of stones and mountains of stone. I'll be fine here, he thought. "This will be where, from now on, I live." (Servin 2018, 48).

Samalayuca was never part of the Raramuri territory, but they would make the pilgrimage to collect peyote to use its psychedelic properties. Believing it could cure ailments, protect against enemies, and offer advice. At the beginning of the game, *Mulaka* is at Samalayuca, searching for wisdom.

Paquimé: in the 8th through 15th centuries, an indigenous community was a stopping point for indigenous trade between Mesoamerica and the Southwest. The city could thrive in the desert because they had built a water canal system that reached the Casa Grande river's mountains and valley. The Paquimé mixed water and Earth to construct their homes. It is believed to contain over 2,000 rooms (UNESCO). Paquimé is portrayed as a Raramuri town in the game, but it is unknown who were the original inhabitants of Paquimé. Of all the levels, Paquimé has the most NPC (Non-Playable Character), allowing the game players to interact with the NPCs and learn more about Paquimé and the Raramuri (Lienzo). The level features puzzles that incorporate the water canals; the players need to figure out the puzzles to bring back water
| **Reso Rekobi** | is a cave system located 30km outside Chihuahua's capital city; some caves feature paintings drawn in three different stages, 500 AD, 17th Century, and 19th Century. Scholars have debated whether the Raramuri or the Conchos drew the first two periods. The third period is attributed to the Apaches. The wall tells the story of one of the world's destruction in this myth of cyclical destructions; it represents just one of seven cyclical destructions in Raramuri lore. The plot for *Mulaka* is based on one of those cyclical destructions (Lienzo). |
| **Arareko** | is a lake that is U-Shaped, that is surrounded by rock formations and pine forests. The Raramuri still live in this region (Lienzo, 2020). The game feature’s locations like the 'Valley of the Frogs'; the frogs are portrayed as the enemy to *Mulaka*. In Raramuri mythology, the frog is viewed as a water messenger that tells the Raramuri when that rain was coming. (Herrera 2018) |
| **Guerachi** | is a tropical region located in a valley; the area is below sea level creating a micro-climate allowing tropical fruits like Mangos to grow. The valley is right next to the municipality of Guachochi (Lienzo 2020) |
| **Basaeachi** | Falls is located inside the National Park of Basaeachi in Camdama Copper Park. It is considered one of Mexico's largest waterfalls. In Raramuri lore, a snake created the waterfall, and all the water on the Earth originated from this place (Lienzo 2020). See Bakowala the physical features of Bakowala or Copper Canyon are gigantic reddish-brown ravines that look similar to copper. They are massive and spread over a good portion of the Sierra Madre Occidental. This area is vital to the Raramuri; a large segment of the population lives in this region and follows traditional customs. Raramuri mythology attributes the raven to creating the Canyons. |

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24
Then Raven flew down, spread his wings above the world, and sank his legs on the surface of the Earth. And from his footsteps, the ravines were born, the ravines of the ravines were born, the cliffs were born. And these are words from ancient times. (Servin 2018, 31).

Re'le Na'irale is the only level that is not based on a real-world location, instead in Raramuri lore, it is the underworld with evil creatures like the Teregori, who is a wolf-like creature whose source of power comes from man's corruption. Re'le Na'irale is also known as a place of battle every night when the sunsets; the Sun battles the creatures of the underworld, and for the Raramuri, they were never sure if the Sun would shine again. The level was designed to look like a dark, sinister place; the world is very disorienting, the topography is constantly shifting (Lienzo 2020).

2.5.1 Sound

It does not end at visuals; it was essential to capture sound for every individual location. Sound plays a critical role in gameplay; even the levels have their soundtrack. The game designers believe that it helps immerse the players further within the landscape. Cardenas explained how Lienzo captured the sound for each level. When Lienzo traveled to these landscapes, they made sure to capture the noise of the wind, the water, even the sound of fire crackling at a campsite. Although some sounds could be replicated in other locations, the game designers believed that capturing the sound of these locations makes the gaming experience real to the actual place. There is very little dialogue except for the narrator, who speaks in Raramuri (Lienzo 2020).
"Everything that you hear in the game, all of the ambient noise, is taken straight from the Sierra. We went out to all of the locations, the Copper Canyon, the Basaseachi Waterfall. To record the air, the birds, it is all taken from the mountains, from real life." (Cardenas, 2018)

When it came to arranging the music, the game designers incorporated Raramuri instruments but not the musical style because it did not blend with the game’s tone. Lienzo explained their decision further:

"The hard thing with the music is that traditional Tarahumara music gets very monotonous. It's not. It's not music that's up for a game. And so even though we tried at some point to put it there somewhere like the traditional composition, it just wasn't working. So, what we did at the end was, OK, let's make a normal or a common game soundtrack and then to make it, you know, flourish in a more interesting way. Let's add some of these sounds right. Some of these instruments, including that guitar, the church hierarchy, or which is basically a percussion instrument, the traditional drums, some flutes". (Interview 1 2021)

2.5.2 Mechanics

Within the landscapes, there are the mechanics, which in turn affect the gameplay. The mechanics in Mulaka are influence by the Raramuri culture. For example, Mulaka can run non-stop without slowing down, and this reflects one of the most recognizable attributes of Raramuri identity: their long-distance running ability. Laura Horton described other qualities of the Mechanics as "game mechanics were used to elicit cultural perspective-taking in players. Some of these include harvesting, crafting potions, spear fighting, sukurúame vision (or all-seeing eye), and "praying" save points" (Horton 2019, 57). The sukuranme vision Horton references are Mulaka’s ability to see within the spiritual realm in the rendered landscapes. However, the most crucial mechanic is "korima," Mulaka can heal himself, but he has to perform a "korima" dance that interrupts the gameplay. The player is vulnerable to attacks from enemies Korima is also used as points to enhance his spiritual abilities. In the Raramuri language, "korima" means
sharing; this term is used because the word for ownership did not exist in Raramuri. Korima was brought up in my interview with the game developers.

“The concept of Korima is basically that, right? This idea of sharing, of being in a shared world. And it's a tough one to use because locally, you know, whenever you encounter someone, it's an ugly example, but you know. Most of the time, you would see a member of the Tarahumara, and in the streets, you know, asking for money or asking for something, and they would use a word like 'my' rather would just approaching Korima and people had taken it or have understood the term to mean give me money or I'm asking for something. They are using it in the sense of shared with me what you have. But out of context for someone that's not close to that, like understanding the term, it just sounds like, oh, It's a begging term, and it's so far from that. And so, we wanted to use the term in the game. And look, this is what it means. for us, we used it, you know, ironically, as our currency in the game, and it's basically because you are taking from the Sierra… You know, part of that respecting the culture meant you cannot have something like that… you have some sort of ritual that comes along with it's not as easy as eating the herb, and that is it. It is this whole process. And so, we wanted to portray that. And even though we get some flack for it, it's something that we wanted to have thereby designed” (Interview 1 2021).

To summarize, Mulaka gains these abilities through korima points, but achieving this ability is not easy. It must be earned through a ritual, which is dancing. It flips the notion of what korima is meant by non-Raramuri to connect the word with begging or "give me," which is not what it means in Raramuri. By using mechanics in this manner, players gain a new appreciation of Raramuri culture by reframing their view on korima. Miller described the mechanics of Mulaka as

“It becomes clear that the environment is designed such that a cultural world has been sutured to the game's mechanics, where all objects in the intentionally sparse game world provide an opportunity for exploring Tarahumara ecology, ethnobotany, and other cultural practices. This situates Mulaka within an expansive, culturally inflected environment that strips gameplay of visual hierarchies” (Miller 2018).

2.5.3 Deterritorializing / Reterritorializing of Landscapes, Mechanics, and Sound
Creating the landscapes requires deterritorializing the physical landscapes; this was achieved by capturing images and sketching out the physical landscapes. In return, the landscapes, with the help of non-human actors, in this case, is Ubisoft, a video game-making software it reterritorializes the landscapes recreating the space in a virtual realm. The game designers, writers, software engineers, and artists are all part of the reterritorialization of the landscapes. Additionally, Raramuri mythology deterritorialized the landscape by presenting an alternative explanation to how the landscapes were formed. Sound experiences Deterritorialization/Reterritorialization, when sound is recorded, it is duplicated and saved in the recorder's digital storage space. The sounds are then reterritorialized by layering them within the digital landscapes of Mulaka.

2.6 Platforms and Game Players

2.6.1 Platforms

Another actor that plays an integral part in the spread of indigenous knowledge is the gaming platforms. They provide a marketplace where game developers can sell and distribute their games. The game formats can be sold in physical or digital form (online games and downloadable games). The platforms feature popular mainstream games, but there is space for indie-game developers like Lienzo. Each game platform has developed programs that allow indie game companies to apply to have their games featured on the platform; (Cardenas 2018). For Xbox, their Indie program is called Xbox ID @ Xbox Program is, as they describe, it "enables qualified game developers of all sizes to unleash their creativity by self-publishing digital games" (XBOX 2021). Game developers start the process by registering online and submitting the game online; once the developers and Xbox reach an agreement, the developers have access to Software development kits (SDK) approved by Xbox if needing to create a Build. Once the
game is released, the developers can then publish it on the Microsoft Store. PlayStation's Indies and Steam Direct are other programs that allow game designers to self-publish on their platforms and the sign-up process mirrors Xbox

For Lienzo, they wanted to place *Mulaka* on all the major platforms, including Nintendo. Fortunately for Lienzo, they had experience publishing their first game, Hunter's Legacy, on Steam, Xbox, and PlayStation 4 (Lienzo 2021). With a polished game at this point, it did not take much convincing for Xbox and PlayStation to get the project approved (Cardenas 2018). However, Nintendo was not looking for indie games, and Lienzo would have to wait. At the time, they were busy transitioning between consoles from the Wii to the Switch. However, when the Nintendo Switch console was released, Nintendo's Indie developer Program reached out to Lienzo, who agreed to work together (Cardenas 2018). Lienzo was invited to the "Ninides," a Nintendo-sponsored event that promotes indie games that would be featured on the Switch—potentially giving the game exposure at an event that had millions of viewers on social media (Cardenas 2018).

### 2.6.2 Reception from Game Players

In 2018 *Mulaka* became one of the first Mexican games to have a major release on prominent game counsels (XBOX, PS, Nintendo). At the time of the release, the consoles' generation was the Xbox One, PlayStation 4, and the Nintendo Switch. The three platforms account for 240 million units sold worldwide; on the PC side of things, Gamers can purchase *Mulaka* through Steam. According to DFC Intelligence, PC gamers make up 1.5 billion of the 3 billion players worldwide. It is hard to determine the actual number of games, given that there may be double counting of multi-platform consumers. However, given the large numbers of PC
gamers and counsels sold, game makers have access to a vast array of game players worldwide.

Table 2 features the total number of consoles sold.

<table>
<thead>
<tr>
<th>Total Global Game Counsels</th>
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</thead>
<tbody>
<tr>
<td>Counsel</td>
</tr>
<tr>
<td>Xbox One</td>
</tr>
<tr>
<td>PlayStation 4</td>
</tr>
<tr>
<td>Nintendo Switch</td>
</tr>
</tbody>
</table>

Table 2: Total number of Consoles sold (Source: Statista 2020)

*Mulaka* is second only to Never Alone indigenous-based game to have a wide multi-platform release. Capturing an exact number of units sold can be complex because only Lienzo and the Platforms have that data. Still, a non-disclosure agreement between both parties seals the accurate numbers. The best can be achieved to estimate how many units were sold by utilizing game tracking websites and interviews with Lienzo. In this case, the estimate only accounts for Steam; the other platforms have not published any data units sold for *Mulaka*. The game tracking websites used to gather the estimate came from Playtracker.net and Steamspy. These websites rely on Web API (Application Program Interface) to extrapolate data from Steam user profiles; this data contains games bought on Steam, daily play use, weekly play use, and geographic location of players (SteamSpy 2020). It should be noted that recently released games and game samples of less than 30,000 may have inaccurate numbers (Steamspy 2020). As for *Mulaka*, the game was released in 2018, so its release should not play a role in the estimates. However, there is a difference in the number of players. SteamSpy estimates that *Mulaka* has over 20,000 players. No other details were given Playtracker gave a higher estimate with 38,000 players, and
of the amount, 8,000 were active players. There is no set definition of what constitutes an active player on Playtracker (Playtracker).

Lienzo did not disclose detailed figures on how many units have been sold for this case study, but they did reveal the estimate was higher than the estimates of 20,000-50,000 given by the game tracker websites (First Interview 2021). Given that game tracking data accounts for only one Platform (Steam), the estimated number of players would be higher if the other platforms were included in the overall number of players. Furthermore, Lienzo gave a breakdown of the demographic age group and geographic makeup of the players. Lienzo found that the game is popular among 20-30 age followed by 40-50. The data shows that Mulaka, the typical play is an older adult between the ages of 20-50. (Lienzo 2021). Mulaka's age demographics mirror the Video Games are often thought to attract the youth from children to teenagers; a 2020 study by the Entertainment Software Association (ESA) broke down the U.S video game players by age, it found that 18-34 age group account for 38% of the total of players followed by 35-54 age group at 26% together they account for more than half of the players in the U.S. And the average age group was 35-44 (ESA 2020). The creators of Mulaka believe part of the appeal for older players is that Mulaka's design and gameplay are reminiscent of older Nintendo video games, "We wanted to have a little bit of that retro gaming aesthetic just to make the game unique… it's something that might remind you of an old era of gaming that people, you know, still find very dear."

Since Mulaka's is sold on multiple digital marketplaces, it has a wider global reach, and the game studios can track where the games are purchased. In Lienzo's case, sales figures have shown that the game's Top 10 countries with the most units sold are North America, Europe, Mexico, South
Africa, and Australia (Lienzo 2021). Table 3 presents the list of the top 10 countries with the copies of *Mulaka* sold.

<table>
<thead>
<tr>
<th>COUNTRIES</th>
<th>RANKING</th>
</tr>
</thead>
<tbody>
<tr>
<td>United States</td>
<td>1</td>
</tr>
<tr>
<td>United Kingdom</td>
<td>2</td>
</tr>
<tr>
<td>Spain</td>
<td>3</td>
</tr>
<tr>
<td>France</td>
<td>4</td>
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<tr>
<td>Italy</td>
<td>5</td>
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<td>Germany</td>
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<tr>
<td>Canada</td>
<td>7</td>
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<td>Mexico</td>
<td>8</td>
</tr>
<tr>
<td>South Africa</td>
<td>9</td>
</tr>
<tr>
<td>Australia</td>
<td>10</td>
</tr>
</tbody>
</table>

Table 3: Top 10 with *Mulaka* Copies (Source: Interview 1 2021)

While *Mulaka* is based on Raramuri culture in Mexico, it was developed by a Mexican game studio. The game has found popularity outside of Mexico, only reaching eighth of the top 10 countries. The rankings raise questions like why the game is popular in North America and Europe? Furthermore, why does *Mulaka* underperform in Mexico? Lienzo shared their thoughts on the ranking "Opposed to what we originally thought, you know, being a game, that's Mexican about Mexican lore done by Mexican people. Our main audience is nowhere near Mexico" (Lienzo 2021). Two factors that could account for Mexico's rating are accessibility to the
technology that allows video gamers to play games. Second, what is the perception Mexicans have of Mulaka? Mexico’s video gaming industry is on a smaller scale than the top two video game markets, both in terms of the number of players and revenue for the year 2020. China tops the list with over 665 million players and a $44.2 billion revenue, followed by the United States with 150 million players and 42.1 billion dollar revenue (New Zoo 2020). In 2020 Mexico had over 72 million players making it the largest gaming market in Latin America, and terms of video game revenue reached 1.9 billion dollars (CIU 2020). Mexico’s video game market is similar in size to other European countries accessibility to the game may not be the issue. Instead, what type of games do Mexican players gravitate towards. A 2018 report by Qore look at the game purchasing trends in Mexico and found that the most popular genres were Shooter games, followed by sports games like soccer, and third place open-world RPGs. At the time of the report, the most popular games were The Legend of Zelda, FIFA 18, GTA 5, Resident Evil VII, and Mario Kart 8 Deluxe; all of these games were created by multi-national game studios (Qore 2018). This would mean Mexican gamers have a penchant for games made overseas over domestic games. The Lienzo team created a video series on YouTube that discussed the current trends in the Mexican gaming industry, on the subject of why Mexican players do not play Mexican games, they recalled:

“It is not only the support on investment and development of the project, but there is also the support from consumers, support by purchases, and that is an area where many Mexican studios have issues and complain frequently about. The rate between exposure and purchases, the rate is terrible in the Mexican market. It is terrible compared to other markets because the Mexican audience does not seem to care about purchasing Mexican video games… However, they buy FIFA every year, Call of Duty, Gears of War, and criticize that Mexican video games are bad”. (Interview 1 2021)

To explain the reasoning of the buying habits within a particular segment of Mexican consumers, the Mexican colloquial term "Machilismo" refers to someone who dislikes products
produced in their country, believing it is inherently inferior in quality to products made overseas (Cardenas 2018). However, Mexican video games' production has only been around for a decade. The early days of game development started with mobile games, expanding to other platforms. Today Mexican game production has grown to over a hundred registered game studios in Mexico (Uribe 2020). Game studios like Lienzo hope that more Mexican games will expand their audience base and hopefully become mainstream.

*Mulaka* sales abroad have performed well beyond Lienzos expectations. Particularly in North America and Europe, not know precisely why the game has performed well abroad, but Lienzo believes it's because indigenous oral stories are new to the consumer base. It is refreshing in a market that lacks diversity. Lienzo explained:

“For whatever reason, you know, Europe, it's a really, really big for us. And we don't really know why, but it's in the U.K. it sold like crazy. And the only thing that we can kind of surmise or get from that is that people are hungry for different types of adventures, especially when it comes to mythology. Right. We always have to try it out. The Greek and Roman and the like, the samurai's and the ninjas and the Norse mythology and the force and insues and what not. And that's it. There's no more mythology is being used. And so, we we were fortunate enough to bring a new one into the table” (Interview 1 2021).

Having the game available in other languages may have helped in the popularity of the game. The only spoken language in the game is Raramuri, but the written dialogue is available in English and Spanish. A secondary edition was later released for the Asian market in Simplified Chinese, Japanese, and Korean.

2.6.3 Deterritorialization/Reterritorialization by Platform and Player

In the previous analysis of the assemblage network between the Raramuri and Lienzo, the game designers played a significant role in shaping that rhizome. However, in this analysis, the platforms and the game players play a more meaningful role in influencing the rhizome between
Lienzo, the platforms, and the game players. First, the platform determines who is qualified to publish on the platform, and the game designers must follow the guidelines the platform has set to self-publish. In this exchange, the game must be deterritorialized to be accepted in the platform market in return. The game is reterritorialized by the platform when it distributes the games globally.

On the other end of the platform are the game players. In the rhizome, they should not be considered collective. Instead, each player should be counted individually because their interactions with the game will vary, allowing for a more accurate analysis. However, the player must purchase the game. By doing so, the player becomes part of the rhizome. Moreover, it establishes a link with the game with the platform serving as an intermediary between player and game. The purchase of the game also helps in the reterritorialization of the game because the platform alone cannot distribute. It needs the player to be able to distribute the game globally.

Furthermore, the player decides where the links of the distribution will connect globally. The distribution network mapped out would show that more connections are created overseas than in Mexico because of how the players perceive the game. Another assemblage network to consider is the gameplay. The layout would be similar to the distribution network. The platform would be in the middle serving as the intermediary between player and game. As Martin-Jones and Sutton noted with Pac-Man, the gamer's identity is lost (deterritorialized) and replaced (reterritorialized) by the avatar, in this case, Pac-Man (Sutton and Martin-Jones 2008, 14). The same occurs with Mulaka, but I would argue that immersion goes more profound because the environment is 3-D and has a complex story plot. Pac-Mac is played in a 2-D space, and the only objective is to eat up all the dots while avoiding the ghosts. The immersive environment of
*Mulaka* allows the player to liberate themselves from their own identity and embrace indigenous ideology while viewing the world through an indigenous perspective.

**Ch 3. CONCLUSION**

The thesis used Deleuze and Guattari's rhizomatic thinking as an exercise to identify deterritorialization and reterritorialization processes with Raramuri knowledge structure when applied to the video game production of Mulaka. We first started with the game production process that began with the alliance between the Raramuri and Lienzo. Through that collaboration, Raramuri knowledge is applied in the game's visual aesthetics, narrative, and mechanics. Raramuri territorial landscapes are also captured on paper and converted digitally to create 3-D landscapes. However, the game is Raramuri, but designers bring their influences from creating a story arch that is not Indigenous based. The art style and gameplay are reminiscent of other classic Nintendo games like Zelda. The study then led us to how the platforms create a medium to disperse the game worldwide digitally, and it is unexpected to see the assemblage spread worldwide but not much at home in Mexico. The rhizomes within the game are fragmented, then reconfigured, and emerges hybrids from within storylines, aesthetics, and identities of the actors. Particularly when it comes to identity, using rhizome can be challenging to categorize the origins or define what is "authentic," making it challenging to trace all the lines within the rhizome. I do not discount Raramuri identity but acknowledge that even the Raramuri culture had always gone through changes evident in their oral stories even before Mulaka came to the scene. Even the identities of the game designers, including myself (Mexican), are not clearly defined. However, we come from a culture that is all about hybrids (Spanish and Indigenous) but without the Indigenous lived experience. That is why I found it appropriate to
use rhizomatic philosophy because it views identity as constantly shifting. Martin Jones described identity as "Always in motion no matter how rooted it seems or how fixed. Identifications are in motion since any fixed state of an object is merely a stage of rest". He goes on to say, "It is the simple fact of becoming that is behind the creation of the Rhizome, since the Rhizome exploits and enjoys continual change and connection rather than seeking to fix or prevent it" (Martin Jones and Sutton 2008, 45).

### 3.1 Limitations

It should be noted that the current data on player demographics are limited to estimates, and those figures only represent Mulaka game purchases through Steam. Other platforms like Nintendo, Xbox, and PlayStation do not disclose sales figures or player data for Mulaka. The game designers were bound to non-disclosure agreements with the platforms and could only provide age demographics and the ten countries with the most downloads. The limited data on player demographics only provides a glimpse into the game's distribution process. Covid 19 created barriers as to how I could conduct interviews, limiting to only using Zoom. I only interviewed the game designers and ruled out the possibility of traveling to Mexico to interview the Raramuri. Instead, I had to rely on secondary interviews to capture Raramuri perspective when it came to the game. I had hoped to interview Enrique Servin, and he was instrumental in collecting the Raramuri stories used in Mulaka and served as a consultant for Lienzo. Unfortunately, Servin passed away early into the project, leaving only his books on Raramuri mythology.
3.2 Final Thoughts

Part of what drew me to this game is my family roots in Chihuahua, so when I came across Mulaka on my Nintendo Switch, it was remarkable to see a game that uses the physical landscapes of Chihuahua and taught players about Raramuri culture. For a long time, these types of representations did not exist in the video game industry. Still, today independent game developers are cropping up worldwide and creating content that uses narratives outside of western ideology. This includes working with Indigenous stories. Papers have been written on this type of genre, like LaPansee’s paper on how Indigenous-based games can be a teaching tool to promote Indigenous-based knowledge in a classroom to Joshua Miller’s paper on 3-D digital Indigenous spaces created by Indigenous developers offers a territory to claim a presence in video games. However, I have not found an article exploring what happens to Indigenous knowledge when it traverses through these digital spaces like video games and how it impacts the end user’s Identity (game players). This would be an opportunity for geographers to study this digital knowledge pathways further because the video game industry will continue to become more diverse. It is not to say geographers have not studied the impact video games have in our society. Cultural geographers Michael Longon and John Willis have looked at how nature is represented in video games (Longan, 2008; Willis 2002). Other studies focus on representation, production, and consumption, but these studies are often about mainstream games. The problem with only looking at mainstream video games is looking at dominant cultural influences. Instead, indie games switch power dynamics and give it to other voices to share their knowledge and influence us. Geographers could develop techniques that will allow us
to understand the complex interrelations between all social actors involved in producing and consuming video games.
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The%20Raramuri%20%20Tarahumara%20Indigenous

The%20Raramuri%20%20Tarahumara%20are%20an%20important%20Indigenous
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