

Interactive Visualisation on biodiversity conservation of Nicobar Islands

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Approval Sheet

This Interaction Design Project-3 titled "Interactive Visualisation on biodiversity conservation of Nicobar Islands" by Jaanhavi SP (Roll Number: 216330009) under the guidance of Prof. Jayesh Pillai, is approved for partial fulfilment of the requirement for the degree of "Masters in Design" in Interaction Design at the Industrial Design Centre, IIT Bombay.

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Declaration

I declare that this written document represents my ideas in my own words and where others' ideas or words have been included, I have adequately cited and referenced the original sources. I also declare that I have adhered to all principles of academic honesty and integrity and have not misrepresented or fabricated or falsified any idea, data, fact or source in my submission. I understand that any violation of the above will be cause for disciplinary action by the institute and can also evoke penal action from the sources which have thus not been properly cited or from whom proper permission has not been taken when needed.

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Abstract

Over the last few months, there has been a massive push for a mega development plan for Great Nicobar, the southernmost island in the Andaman and Nicobar group. The plan comprises an international container transshipment terminal, a greenfield international airport, a power plant, and a township complex – mainly new coastal systems and tropical forests. This project will severely impact the island's geological, ecological, and socio-cultural systems.

Kalpavriksh is a non-profit organization working on environmental and social issues and actively fighting to save the Andaman and Nicobar Islands. Prof. Pankaj Sekhsaria, Associate professor of CTARA IIT Bombay, is an active member of the organization who has written an archive of reports, information and documents named "Monumental folly" on the same. This NGO, along with several other NGOs, has filed petitions against this project and is trying to create awareness among the policymakers and those who could help them with the same.

The aim of the project is to provide Kalpavriksh organization with an interactive visualization tool that effectively communicates the impacts and consequences of the development plan in the Great Nicobar Islands. Additionally, the project seeks to raise awareness and reach out to individuals and communities to garner support in preserving the island's natural beauty and promoting its conservation.

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Introduction

The Nicobar Islands lie in the Indian Ocean about 800 miles (1,300 km) east of Sri Lanka and have an area of 711 square miles (1,841 square km). The Nicobar, along with the Andaman Islands to the north, constitute the boundary between the south-eastern Bay of Bengal (west) and the Andaman Sea (east).

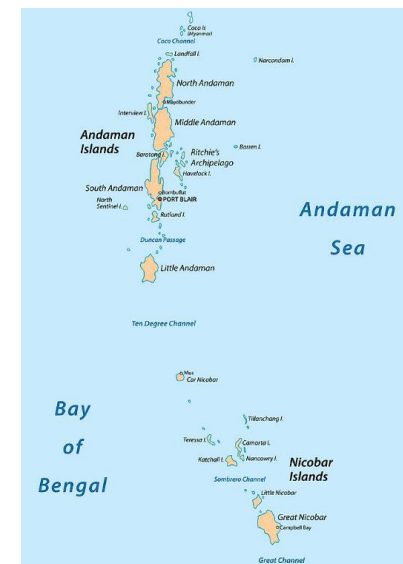


Figure 1 Map of Andaman & Nicobar Islands

Far removed from the mainland, the Islands support and nurture over a thousand species of animals that are exclusive to this part of the world, including some rare and endangered ones.

Shedding light on the 1,032 species, the Zoological Survey of India has surveyed and documented these species that are found

nowhere else on the earth, in the 2017 edition of the book *Endemic Fauna of Andaman and Nicobar Islands*.

Forming India's southeast border, the 572 lushly forested islands of the archipelago harbour a total of around 9,130 animal species straddling both terrestrial habitats and marine waters: a mosaic of mangroves, coral reefs and seagrass beds. The islands shelter important species such as whales, dolphins, the globally endangered dugong, saltwater crocodile, hornbills, marine turtles, seashells including the rare and endangered Trochus species, among others. Some of them, such as sea cucumbers, seashells, sharks, marine turtles, saltwater crocodiles etc.

In a set of developments that have unfolded with unprecedented speed and uncharacteristic coordination over the last few months, there has been a huge push for a mega development plan for Great Nicobar, the southern-most island in the Andaman and Nicobar group. The plan comprises an international container transshipment terminal, a greenfield international airport, a power plant and a township complex that will need an area of 166 sq. kms - mainly pristine coastal systems and tropical forests. The estimated cost of the project is a whopping Rs. 75000 crores.

The Andaman and Nicobar Island system lies at a very fragile and vulnerable intersection of the geological, ecological, and socio-cultural. "Great Nicobar Development Plan is deeply ignorant of these multiple realities even as it aggressively pursues a completely illusory agenda of economic growth and development." Says experts.

About the project

Aim / Objective

The project's aim is to create an interactive website, visualizing the story of leatherback turtles and the rise of threats to their species.

The project's scope is to explore the possibilities up to the point of effectively communicating the issues. To develop interactive and captivating visualizations and a suitable narrative that would create an impactful awareness among the viewers.

Target audience

The idea is to design for all those who the NGO wants to reach out to create awareness and seek help in any way possible. So, the possible audience would be as follows:

- Policymakers
- Whomever the organisation wants to reach out to seeking help.
- Common public

Primary research

Primary research aims to collect data about the island, the development plan and the effects of the plan. Once the study is completed, potential areas for visualisations and storytelling will be identified and ranked according to the impact and will be set for scope.

For primary research, data was collected majorly from 3 books and talk with expert. They are,

1. A Monumental Folly - Archive of reports, information, and documents

This book is a compilation of a dossier (and an evolving archive) written by Pankaj Sekhsaria that puts together all these published accounts and related information for quick and easy access. The first part is comprised of eight highlight stories. The second part, the more substantial one, is a set of 30 detailed annexures - meeting agenda notes, committee meeting minutes, administration notifications, call for proposals, the pre-feasibility report, scientific assessments, RTI responses and much more. This is the evidence on which the reports were based and the background of how the big story has played out. The book aims to help the reader get a quick and reasonably comprehensive account of what has happened thus far and help NGOs,

hopefully, to anticipate what one should be expecting in the coming months.

2. Frontline magazine by The Hindu, Jan 27, 2023, edition.

The topics Frontline covers range from politics, economics and social issues to the environment, nature, culture, and cinema. Its cover stories are comprehensive.

Jan 27, 2023, cover story titled “Nicobar Nightmare” written by multiple authors Pankaj Sekhsaria, Ishnika Ramakrishna, Ajay Saini, Anusha Mukherjee and few others. The stories talk about the mega infrastructure project planned in nicobar, the timeline of the entire clearance process so far, the threaten for tropical forests, mangroves, and various other biodiversity that is there in the island, the rights of the communities that has been living there for 1000 years and an interview with Ritwick Dutta, environmental lawyer.

3. Holistic Development of Great Nicobar Island at Andaman & Nicobar Islands

This is a pre-feasibility report that was published on March 2021 by an infrastructure consulting firm called AECOM India Private Ltd.

This report consists of the entire plan and data of the upcoming development plan.



Figure 4 A Monumental folly Book



Figure 3 Frontline Mag: Jan 27 ed

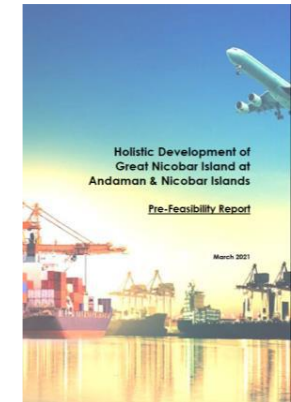


Figure 2 Feasibility Report- Mar 21

Talk with expert - Prof. Pankaj Sekhsaria

Associate professor of CTARA IIT Bombay, and an active member of Kalpavriksh, a non-profit organization working on environmental and social issues and actively fighting to save the Andaman and Nicobar Islands. His research interests lie at the intersection of science, environment, society and technology. He has also written extensively on issue of the environment and wildlife with a special focus on the A&N Islands. His books on the islands include his debut novel The Last Wave (Harper Collins India 2014) (Koneya Ale in Kannada), a story embedded deeply in the ecology, history and people of the place, Islands in Flux – the Andaman and Nicobar Story (Harper Litmus 2019), which is a collection of 20 years of his journalism about the islands and most recently Waiting for Turtles (Kardi Tales 2021) – an illustrated story book and his first for children on turtle nesting in the Andamans.

Key areas identified from primary research.

From the study the major areas/stories were identified, and they are as follows.

a. Micro habitats

The largest of nicobar group of islands at 910 sq. kilometres, has an astonishing number of microhabitats -Sandy & rocky beaches, bays & lagoons, littoral patches with mangrove communities, rural mosaic landscapes, monocultures, dense rainforests, coastal forest patches, riverine habitats, estuarine stretches. Each of these habitat types is home to an uncommon assemblage of species, including marine animals, reptiles, birds, mammals, trees, ferns, insects, crustaceans, and amphibians, of which several are endemic to Nicobar Islands and found nowhere else.

b. Flora & Fauna

The island houses a range of forest types, has one of the best-preserved tropical rainforests in the world, is home to 648 species of flora and hosts 330 species of fauna including rare and endemic ones such as the Nicobar wild pig, Nicobar tree shrew, the Great Nicobar crested serpent eagle, Nicobar paradise flycatcher and the Nicobar megapode.

- **The leatherback turtle:** the world's largest sea turtle, is a nocturnal nester. It spends its life at sea, but females

travel over 10,000 kms from foraging grounds to nest on preferably undisturbed shores. Galathea Bay Wildlife Sanctuary, that stretches along the southern coast of Great Nicobar Island, is the largest nesting site in the country and the Northern Indian Ocean.

- **Long tailed macaque:** The largest mammal on the island is the Nicobar long- tailed macaque, a vulnerable subspecies of the larger family of long- tailed macaques found across south – east Asia. This subspecies is distinct from its cousins in appearance, behaviour, and geographical location.
- **Nicobar megapode:** A medium-sized scrub fowl species found only in a few Nicobar Islands. The largest population is in Nicobar Islands. The Nicobar megapode is unlike any other birds, having a fascinating reproductive biology. It is also known as “temperature birds” locally. they collect soil, sand, leaf, litter, and the other debris from coastal for us to build mounds.

c. Mangroves

The great nicobar islands has a coastal line of 202 km, most of which is lined by mangrove communities which grow in clusters including the endemic pandanus. These thick belts of mangrove trees form a natural barrier against calamities like cyclones and tsunamis while supporting coastal and estuarine life including crabs, waterbirds, and saltwater crocodiles and providing a safe refuge for fish and marine animals in the early stages of their growth. These are also important for the local fisher community

since they play a role in replenishing the fish population. If expansive swaths of these littoral mangroves are lost, the island will become more vulnerable to natural disasters.

d. Tribal rights

Another key concern is regarding the rights and livelihoods of the two tribal communities for whom Great Nicobar has been home for thousands of years: the Nicobarese (about a 1,000 people) and the Shompen (About 200). The latter is classified as a particularly vulnerable tribal group (PVTG) and is a hunter-gatherer nomadic community critically dependent on the forests of the island for survival.

e. Disaster vulnerability

The main concern is the project's location on a major fault line. The risk this poses has not been taken into consideration that the islands had experienced nearly 444 earthquakes in the past 10 years and the plan for the container terminal here. Great Nicobar is not far from Banda Aceh in Indonesia, which was the epicentre of the December 2004 earthquake and tsunami that caused unprecedented damage. The coastline of Great Nicobar saw permanent subsidence of nearly four metres as evidenced by the fact that the lighthouse at Indira Point now stands surrounded by water.

f. Forest clearance

An estimated 8,52,245 trees are to be cut down in GNI's prehistoric rainforests. This has given rise to serious concern among academics, wildlife conservationists, and human welfare activists. The forests are home to rare flora and fauna, including the Nicobar crested serpent eagle, the Nicobar pigeon, the Nicobar tree shrew, the Nicobar sparrowhawk, the Andaman crested serpent eagle, the Nicobar imperial pigeon, and many more. Having evolved in the relatively undisturbed forests of tropical Nicobar, they are unlikely to be able to adjust to the drastic changes coming their way. Above are the major areas that are being affected due to the development of the plan/project. The idea is to take up a single story as the main narrative through which the other problems will also be addressed. This way is chosen to captivate the viewers by getting their attention to one particular story and helping them understand the possible other problems that would arise in future.

The leatherback turtle story is being taken forward as it has an emotional connection with people as it is the oldest known ancestor and threatens extinction. They are also global travellers – they migrate more than 10,000 km across oceans from breeding & feeding grounds. The turtles travelled in two directions across the Indian Ocean, southeast towards the western coast of Australia and southwest towards the eastern coast of Africa.

Secondary research

Secondary research aims to explore various interactive visualisations in context to

- *Narrative content and how they have approached it.*
- *Mediums used and the techniques they have followed.*

Also, to look into *social media and other platforms where they have addressed the nicobar island issue.*

Interactive visualisation stories with respect to the content:

1. Bear 71

<https://bear71vr.nfb.ca/>



Figure 5 Bear 71 Website

Bear 71 is an interactive documentary produced by the National Film Board of Canada that explores the relationship between wildlife and humans in the age of technology. The project centres around a grizzly bear named Bear 71, who was collared and monitored by park rangers in Banff National Park, Canada. The project uses a combination of documentary footage, GPS data, and interactive elements to tell the story of Bear 71's life and the impact of human activity on her habitat. Through the use of surveillance cameras and GPS tracking, users can follow Bear 71's movements and interactions with other animals in the park. The project also includes interviews with experts on wildlife

conservation and the effects of technology on the natural world. Overall, bear 71 is a thought-provoking and engaging project that invites users to consider the complex relationship between humans and wildlife in the modern world.

2. Species in Pieces

<http://species-in-pieces.com/#>

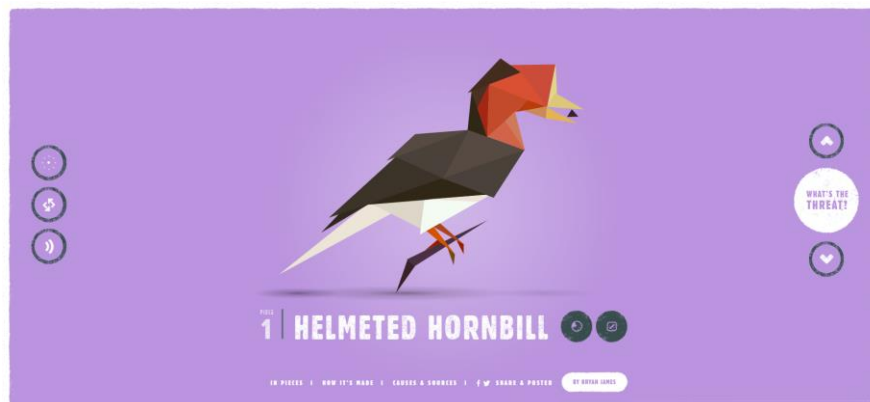


Figure 6 Species in Pieces website

Species in Pieces is a website that showcases the beauty and diversity of different species of animals through an innovative approach to digital art. The website presents a collection of 30 interactive, animated collages that are made up of fragmented polygons, each representing a different part of an animal's body. The polygons are arranged in a way that highlights the unique features of each species, creating a stunning visual experience that immerses the viewer in the natural world. Each collage is

accompanied by information about the animal, including its scientific name, habitat, and conservation status, as well as an audio recording of the animal's sounds.

3. Detroit wall by NBC news:

<https://www.nbcnews.com/specials/detroit-segregation-wall/>

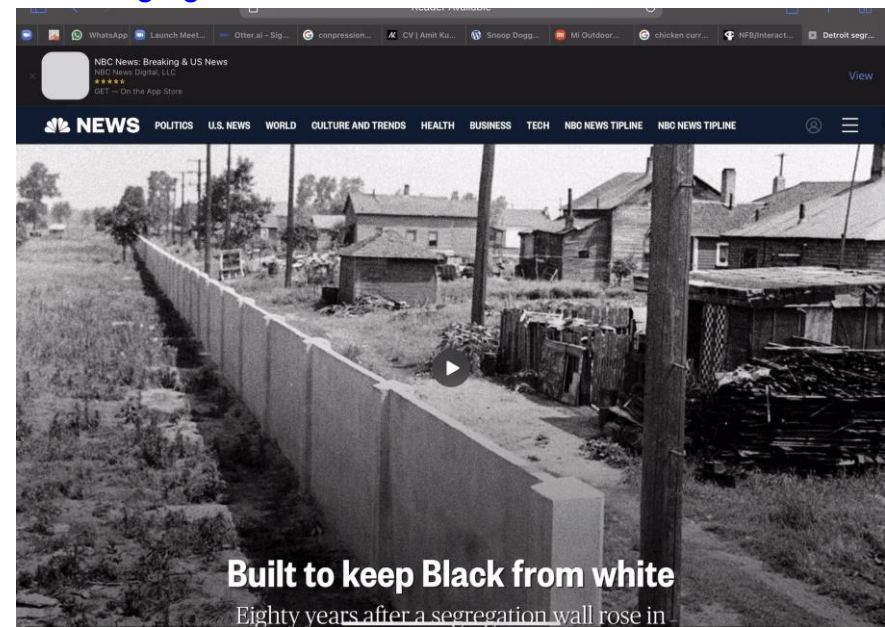


Figure 7 Detroit wall by NBC news website

The Detroit Wall, an investigative report by NBC News, explores the history and impact of a massive concrete barrier that separates an affluent white community from a predominantly black neighbourhood in Detroit. The report uncovers the origins of

the wall, which was built in the 1940s to enforce racial segregation and protect white residents from the perceived dangers of a changing city. Today, the wall remains a powerful symbol of the city's deeply entrenched racial and economic divides, and residents on both sides of the barrier are grappling with its legacy. Through interviews with residents, historians, and community leaders, NBC News examines the lasting effects of the wall on Detroit's social and economic landscape, and asks whether it is possible to dismantle the physical and psychological barriers that continue to divide the city.

4. Population map by "the pudding"

https://pudding.cool/2018/10/city_3d/

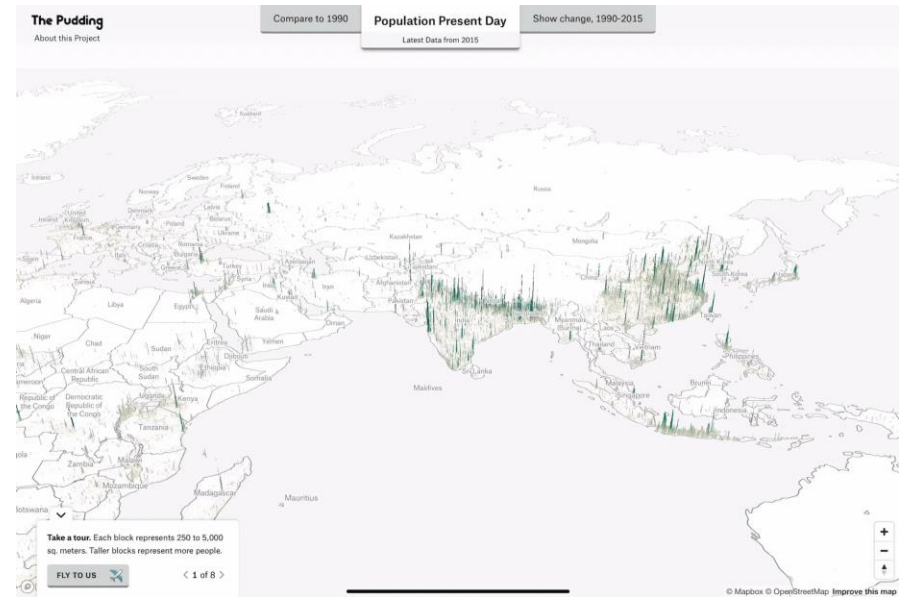


Figure 8 The pudding website

The Population Map, a data visualization project by The Pudding, provides a three-dimensional view of the population density of 10 major cities in the United States. Using data from the U.S. Census Bureau, the project presents a detailed picture of the spatial distribution of people in urban areas, highlighting areas of high and low population density in a unique and engaging way. The interactive map allows users to explore the cities from different angles and perspectives, and to compare population patterns across different neighbourhoods and regions. The project also includes detailed analysis and commentary on the social and

economic factors that contribute to population density in urban areas, such as housing availability, transportation infrastructure, and demographic trends. Through its innovative use of data visualization and storytelling, the Population Map offers a compelling and informative portrait of the complex urban environments that shape our lives.

5. History of web

<https://webflow.com/ix2>



Figure 9 History of web webflow website

The History of the Web is a comprehensive interactive timeline developed by Webflow that chronicles the evolution of the World

Wide Web from its origins in the 1960s to the present day. The project presents a detailed and engaging history of the web, tracing the development of key technologies, platforms, and innovations that have transformed the way we live, work, and communicate. The interactive timeline includes significant events, such as the development of the first web browser and the launch of major social media platforms, as well as lesser-known but equally important milestones in the evolution of the web.

6. Anne frank house VR

<https://annefrankhousevr.com/>



Figure 10 Snapshot of the video of Anne Frank VR house

Anne Frank House VR is an immersive virtual reality experience that takes users on a tour of the secret annex where Anne Frank

and her family lived in hiding during World War II. Developed by the Anne Frank House Museum in Amsterdam, the VR experience recreates the cramped living quarters of the Frank family and provides a powerful and emotional window into their daily lives. Through a combination of interactive storytelling and historical artifacts, users are able to explore the annex and gain a deeper understanding of the challenges faced by the Frank family and their fellow occupants during their two years in hiding.

7. Clouds over sidra – The Zaatari refugee camp

<https://www.with.in/watch/clouds-over-sidra/>



Figure 11 Snapshot of clouds of Sidra

Clouds Over Sidra is a virtual reality documentary that provides a powerful and immersive view of life in the Zaatari refugee camp in Jordan, home to more than 80,000 Syrian refugees. The documentary, produced by the United Nations and filmmaker Chris Milk, uses VR technology to transport viewers to the heart of the camp and to follow the daily life of a 12-year-old Syrian girl named Sidra.

Interactive visualisation stories with respect to the technique:

1. Every last drop:
<http://everylastdrop.co.uk/>



Figure 12 Snapshot of every last drop

Every Last Drop is a storytelling website that utilizes technical techniques to create a unique and engaging user experience like **Parallax scrolling** to create a sense of depth and movement as the user scrolls through the pages. This technique allows for a more **immersive and dynamic storytelling experience**.

2. Poor millennials:

<https://highline.huffingtonpost.com/articles/en/poor-millennials/>



Figure 13 Snapshot of poor millennials

Poor Millennials is a storytelling website that utilizes long-form content with a scrollable format, allowing users to read the entire story in one sitting. This technique is used to provide a detailed and immersive storytelling experience that keeps users engaged.

3. 360-degree spotlight stories – special delivery

https://www.youtube.com/watch?v=XiDRZfeL_hc



Figure 14 Snapshot of 360 video - Special delivery

Technical techniques used in 360-Degree Spotlight Stories – Special Delivery are carefully integrated to create a truly immersive and engaging storytelling experience. The use of 360-degree video, interactive elements, spatial audio, and VR headset compatibility work together to create a unique and powerful storytelling experience that engages users and transports them into the story's world.

4. Why do buses bunch?

<https://setosa.io/bus/>

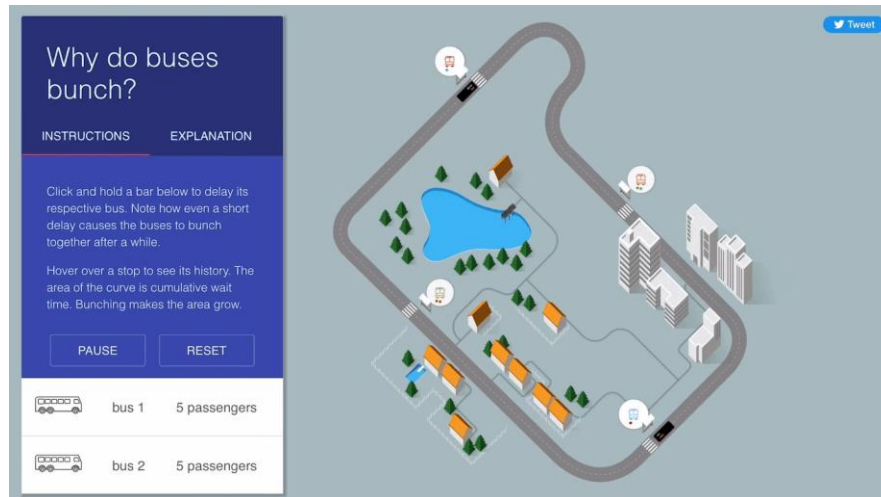


Figure 15 Snapshot why do buses bunch website

Notable technical techniques used in the website include:

- Interactive data visualizations – The website features interactive data visualizations that allow users to explore data related to bus scheduling and delays. Users can adjust variables such as bus frequency and passenger arrival time to see how they affect bus bunching.
- Real-time simulations – The website features real-time simulations that show how buses move and bunch in response to different variables. This technique allows users to see the cause-and-effect relationships between different factors that affect bus scheduling.

Ideation

Content

a. Characteristics

Leatherback turtles (*Dermochelys coriacea*) are the largest of all sea turtles, and they are found in oceans around the world, including the waters surrounding the Nicobar Islands.

Leatherback turtles are the largest of all sea turtle species, with adult males growing up to 6 feet (1.8 meters) in length and weighing up to 2,000 pounds (900 kilograms). Leatherback turtles are one of the oldest and most long-lived reptile species, with some individuals living for more than 100 years

The Nicobar Islands are an important nesting site for leatherback turtles, with hundreds of females coming ashore each year to lay their eggs on the sandy beaches of Galathea Bay. These turtles are migratory, traveling thousands of miles across the ocean to reach the Nicobar Islands and other nesting sites.



Figure 16 A leatherback Turtle on Galathea Bay's nesting beach

b. Nesting habit

The process of leatherback turtle reproduction begins when the females make their way onto the sandy beaches of the Nicobar Islands to lay their eggs. After arriving at the beach, the female turtle will use her powerful flippers to dig a deep hole in the sand, where she will lay her eggs.

Leatherback turtles typically lay around 80-100 eggs per clutch, and they may lay up to 7 clutches during a nesting season. Once the eggs have been laid, the female will cover them with sand and return to the ocean.

The eggs are left to incubate in the warm sand for a period of approximately 60-70 days, after which the baby turtles will begin to hatch. During the hatching period, the baby turtles will use a specialized egg tooth to break through the shell of their eggs and emerge onto the surface of the sand.

Once the hatchlings have emerged from their eggs, they will spend a few days in the nest chamber, absorbing the remaining yolk sac from their eggs. When they are ready to leave the nest, they will use their flippers to dig their way up to the surface of the sand.

Once they reach the surface, the hatchlings will use a variety of sensory cues, including the position of the sun and the slope of the beach, to make their way towards the ocean. Along the way, they may face a variety of obstacles, including predators and other hazards.

In the Nicobar Islands, the survival rate of leatherback hatchlings varies depending on a number of factors, including the density of nesting sites, the presence of predators, and the quality of the beach habitat.



Figure 17 Leatherback Hatchlings hatching out

Once the hatchlings reach the ocean, they face a number of additional challenges. They must navigate the waters of the Indian Ocean, avoiding predators and finding their way to feeding grounds where they can grow and develop.

Studies have shown that the survival rate of leatherback turtles from hatchling to adulthood is relatively low, with only a small percentage of hatchlings surviving to reach maturity. This is due in part to the challenges they face during their early life stages, but also to threats such as entanglement in fishing gear, habitat loss, and pollution.

c. Transshipment port

a transshipment port is planned to be built in the Nicobar Islands, which is a cause for concern among environmentalists and conservationists. The proposed location of the port is in Galathea Bay, which is a critical nesting site for endangered leatherback turtles.

The construction of the port is expected to have a significant impact on the environment and wildlife in the region. The project involves dredging the sea bed to create a deep channel for large container ships to access the port. This dredging will result in the removal of large amounts of sediment and marine life, potentially damaging the delicate balance of the marine ecosystem in the area.

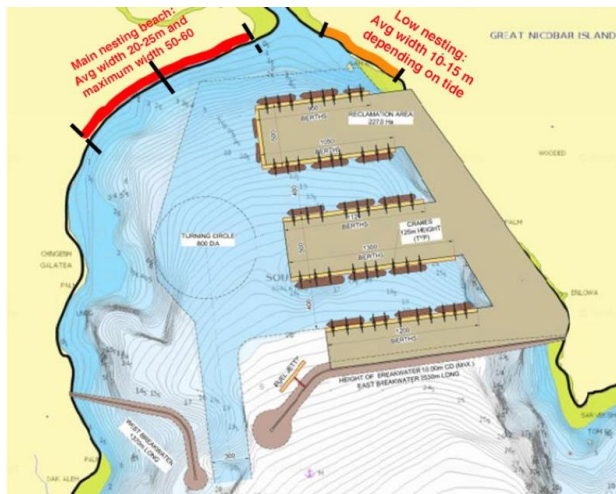


Figure 18 Proposed plan Transshipment Port

Here are a few ways in which the leather-back turtles could be affected:

- **Loss of nesting habitat:** Leather-back turtles rely on beaches for nesting, and a transshipment port development would likely lead to the destruction or significant alteration of their nesting habitats. The turtles would be forced to find new areas to lay their eggs, which could be challenging given the limited number of suitable nesting sites.
- **Disturbance from construction noise:** The construction of the port would produce a significant amount of noise, which could disturb the leather-back turtles during the nesting season. This could lead to the turtles abandoning their nests or choosing suboptimal nesting sites, which could negatively impact their breeding success.
- **Pollution and environmental degradation:** The construction and operation of a transshipment port would generate pollution and could lead to environmental degradation in the surrounding areas. The leather-back turtles and their hatchlings could be exposed to pollutants, which could have negative health impacts.
- **Increased boat traffic:** A transshipment port would likely lead to increased boat traffic in the area, which could increase the risk of accidental collisions with leather-back turtles and their hatchlings. These collisions could cause injuries or fatalities, and could further impact the population of the leather-back turtles in the area.

Technique

During the ideation phase of my project, I explored a variety of techniques to present my content, including

- 360 VR film
- VR narratives
- Digital Games, and
- Scrollytelling.

After careful consideration, I ultimately chose to use Scrollytelling, specifically a narrative that utilized parallax scrolling.

Scrollytelling is an interactive storytelling technique that combines text, visuals, and multimedia elements to create a compelling narrative that unfolds as the user scrolls down a page. The use of parallax scrolling allows for a sense of depth and movement, enhancing the user's engagement with the content.

There are several advantages to using scrollytelling for my project. First, it is a highly engaging and immersive experience that can hold the user's attention for an extended period. It also allows for the integration of multimedia elements, such as images, videos, and audio, which can enhance the user's understanding and emotional connection to the content.

Additionally, scrollytelling narratives are highly flexible and can be designed to suit a wide variety of content types and styles. They can also be optimized for mobile devices, making them easily accessible to a wide range of users.

In conclusion, while I explored various techniques for presenting my content, I ultimately chose to use a scrollytelling narrative with

parallax scrolling due to its engaging and immersive nature, flexibility, and ability to incorporate multimedia elements.

goonies.webflow.io/ is an example of scrollytelling.

Initial explorations

Concept 1: No way home

- This concept entails the use of a map to display the location of Galathea Bay and other areas of the Great Nicobar Island (GNI), highlighting specific regions of interest. The story of the leatherback turtle will be presented through a parallax scrolling narrative, allowing for an immersive and engaging experience for the user.

Furthermore, the narrative will focus on illustrating the potential drawbacks of constructing a port in the area, highlighting the impact on the local ecosystem and the endangered leatherback turtles. This approach allows the user to gain a deeper understanding of the potential consequences of such a project.

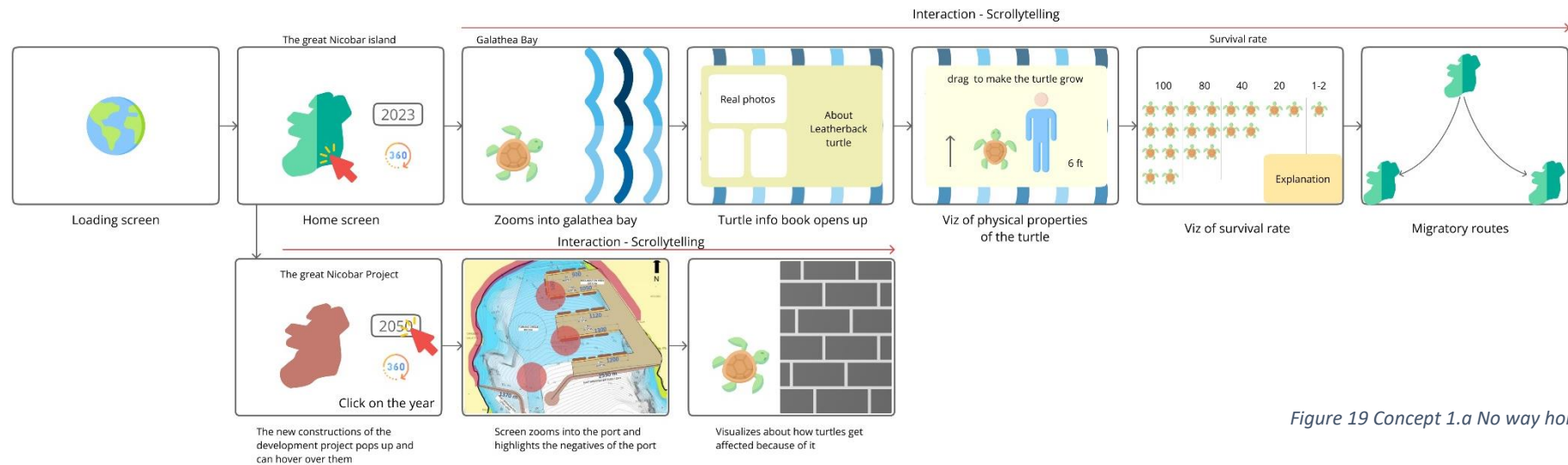


Figure 19 Concept 1.a No way home

- b. The narrative begins with the home screen map, which transports the user to the year 2050, where all the development projects have been implemented. The story starts with newspaper headlines highlighting the alarming news of the leatherback turtle's extinction and the drastic decline in their population. The user is cast in the role of an investigator and begins to delve into the cause behind this catastrophe. As the investigation unfolds, the facts and characteristics of the leatherback turtle gradually come to light, revealing one piece of information at a time.

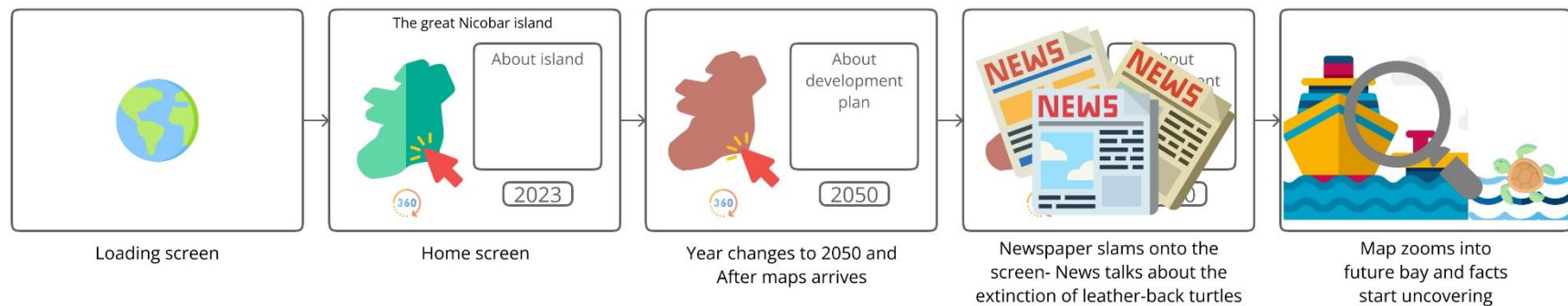


Figure 20 Concept 1.b

Concept 2: Turtle through the time

This concept aims to showcase the changes in turtle nesting areas over time, including the potential impact of the transshipment port development, by using a slider or timeline. However, there is a potential disadvantage to this approach as the linearity of the story may become unclear since we cannot predict which time period a user may select to view.

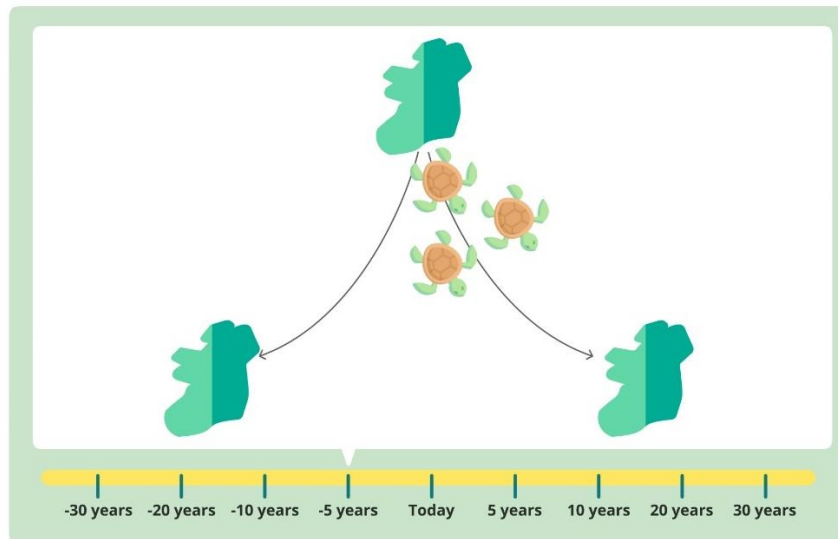
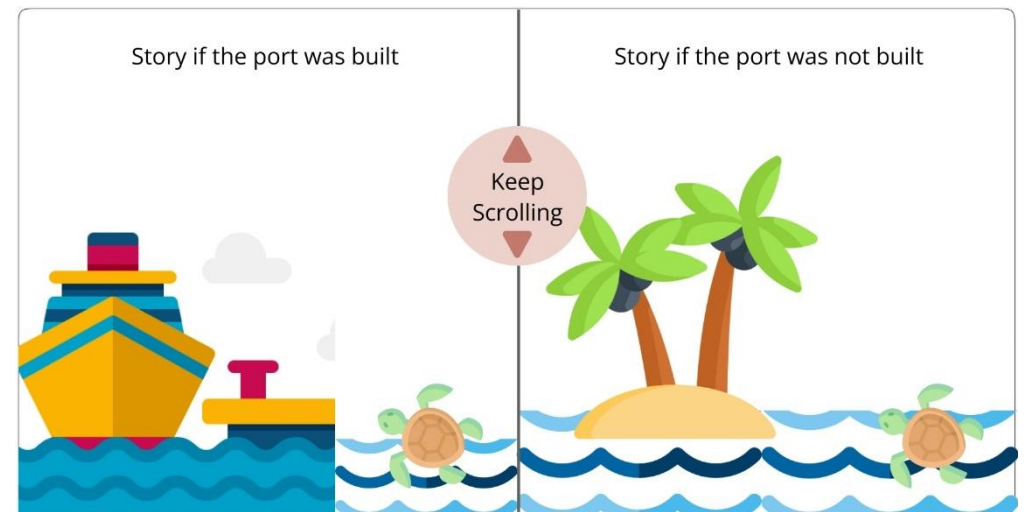


Figure 21 Concept 2 - Turtle through the time

Concept 3: The Parallels

Figure 22 Concept 3 - The Parallels

The objective is to use scrolly telling to visually depict the story of the leatherback turtles, both with and without the presence of a newly built port, in a split-screen format. However, it should be noted that presenting these parallel narratives may pose a risk of information overload and could potentially cause confusion or loss of important details.



Final Concept

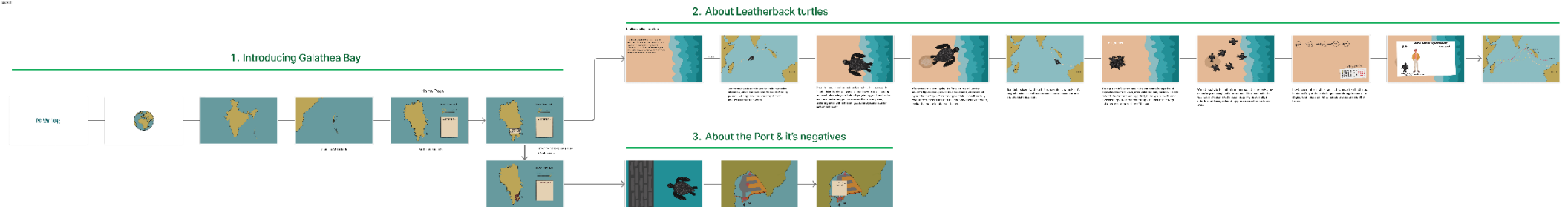


Figure 23 Story Boarding of final concept

The concept 1 a & b combined was taken forward.

In summary, the **No Way Home** concept utilizes a map to depict the location of Galathea Bay and other areas of GNI, while the parallax scrolling narrative showcases the story of the leatherback turtle. Through this approach, the concept sheds light on the potential drawbacks of constructing a port, providing insight into the potential environmental impacts of the project.

Story Boarding

The story begins by introducing the Great Nicobar Island and providing some background information on the leatherback turtle. Following this, the perspective shifts to that of the leatherback turtle, allowing us to gain a deeper understanding of its characteristics and significance as an animal. By doing so, the story aims to emphasize the importance and worthiness of the leatherback turtle.

However, the narrative takes a turn as a problem is introduced - the development project of the Great Nicobar Island and its

detrimental impact on the leatherback turtle. This highlights the conflict between economic development and environmental conservation, and the dire consequences that the former can have on the latter.

Initial click-through prototype:

A prototype was created solely for the purpose of storyboarding. It should be noted that the illustration styles used in the final deliverables may differ from those used in the prototype. Additionally, it is important to acknowledge that the data used in the prototype is not entirely accurate, and certain scenes may be abstract in nature.

[Prototype link](#)

Execution

Visual language

In terms of visual language, I employed two distinct illustration styles in my project. One style was utilized for mapping purposes, focusing on clarity and simplicity, while the other style was used to depict animals, plants, and overall ambiance, emphasizing imagination and engagement. For the maps, I adopted a schematic approach to facilitate comprehension, whereas for the animal illustrations, I opted for more organic and whimsical visuals to evoke a sense of wonder. In terms of colour, I employed bright and bold hues in the "before" illustrations to convey energy and excitement, while employing muted and earthy tones in the "after" illustrations to evoke a sense of industrialization.

Figure 26 Process of making Schematic map

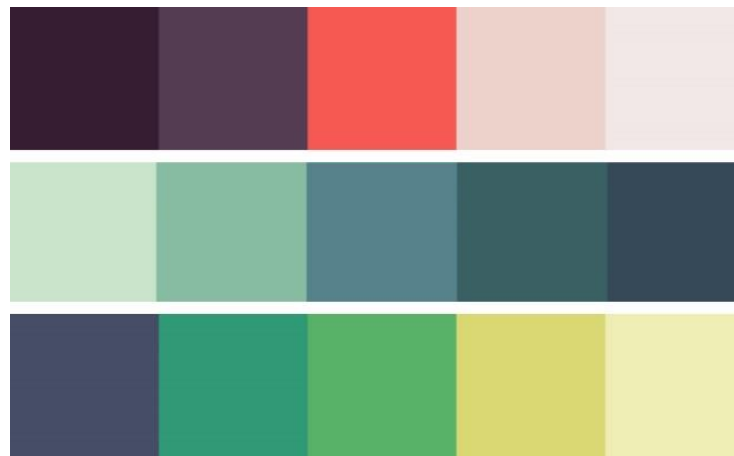
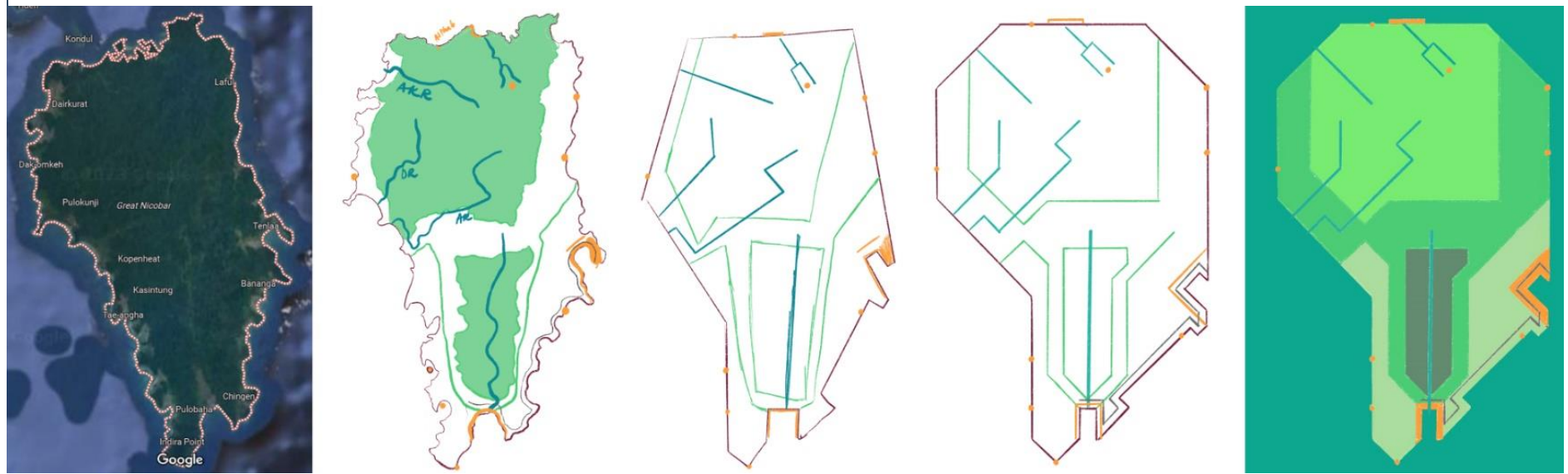


Figure 24 Colour palette



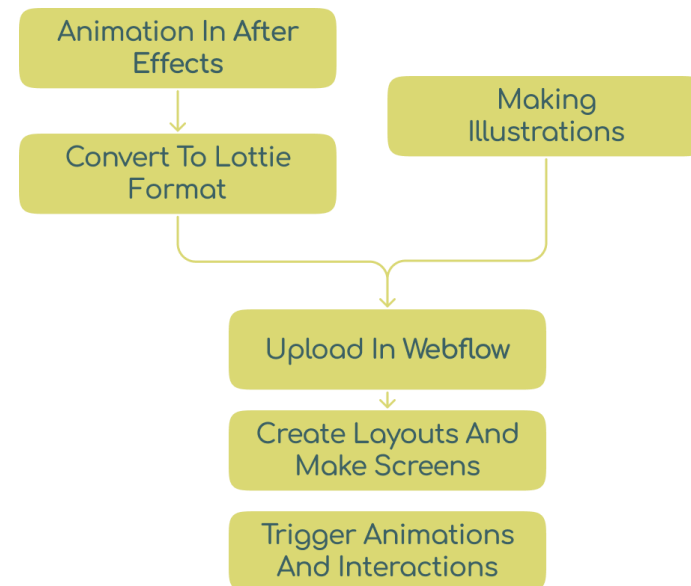
Figure 25 Illustration Inspiration

Few of the illustrations I made:



Creating the working prototype

I began by creating illustrations and integrating them into Adobe After Effects to develop animations. Using the Bodymovin plugin, I exported the animations in Lottie format. Afterwards, I utilized Webflow to design layouts and screens, implementing triggered animations, interactions, and coding as needed.



Webflow is a web design and development platform that allows users to design, build, and launch websites without coding. It provides a drag-and-drop interface, a visual CMS, and a set of design and development tools that make it easy to create complex and visual websites.

One of the key features of Webflow is its ability to create parallax scrolling and interactive storytelling experiences. With Webflow's interactions and scroll trigger features, I can create custom animations, reveal new content as the user scrolls down

the page, and create immersive experiences that capture the user's attention.

In this project, animations were created in **Adobe After Effects** and then converted into Lottie files using a popular extension called Bodymovin. Lottie files, which have a .json file extension, use still images and shapes to animate on the browser in a way that is incredibly smooth and seamless. This is possible because the animation is rendered directly in the browser itself, rather than relying on external software or plugins. Overall, this approach provides a highly effective and visually impressive way to bring animations to life on the web.

One of the main challenges encountered during this project was the need to learn two new software programs: Webflow and Adobe After Effects. Initially, it was a daunting task as Webflow requires some basic coding knowledge to navigate, which took some time to get the hang of. However, with perseverance and dedication, we were able to gain a better understanding of how Webflow works and create a successful scrollytelling experience.

The second challenge was learning After Effects in a relatively short period of time. Despite this, the software proved to be an interesting and rewarding tool to learn. With its extensive capabilities for creating dynamic and visually stunning animations, After Effects was an important asset in bringing the scrollytelling experience to life.

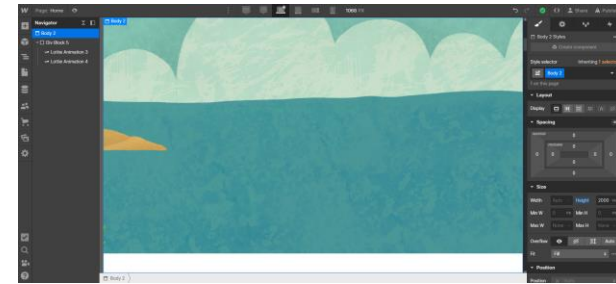


Figure 27 Working canvas of Webflow

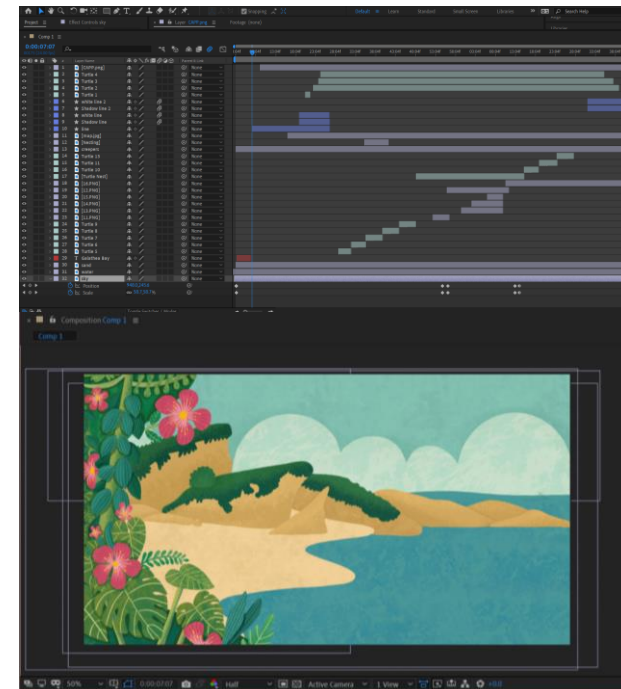


Figure 28 Working Area of After effects

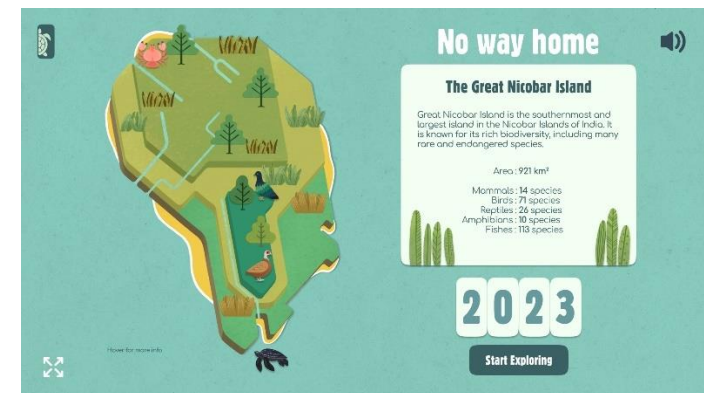
The Final Outcome

The final result has been published as a desktop-only website on Webflow.io. Please note that the website is optimized for screen widths ranging from 1200 to 1800 pixels.

You can access the final website at this link: <https://no-way-home-2.webflow.io/>

The website offers a scrollytelling experience, with the mother turtle serving as the narrator of her journey and her offspring. Here is the flow of the user experience:

1. Upon opening the link, the page loads, and the user is directed to the home page. The home page features a map of GNI with interactive elements that display information about the island and its fauna when hovered over. The island's details and the current year are presented, along with a button labelled "Start exploring" that prompts the user to proceed to the story.



2. Clicking "Start exploring" takes the user to the first scrollytelling animation, which provides context about the

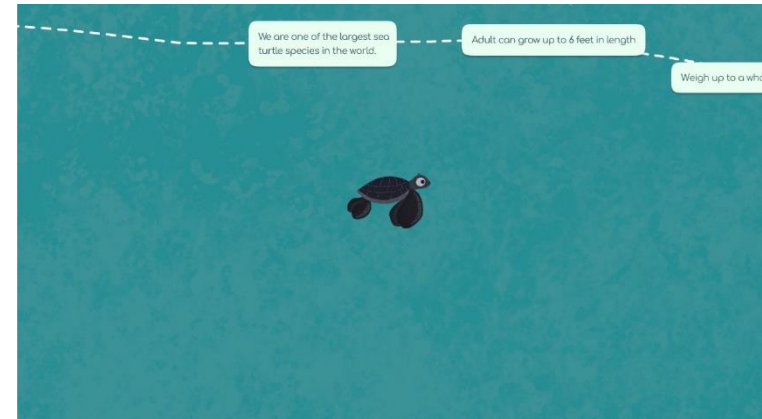
island and introduces the journey of a turtle from Madagascar to GNI to lay eggs. Once the animation concludes, the page automatically transitions to the next animation in the sequence.



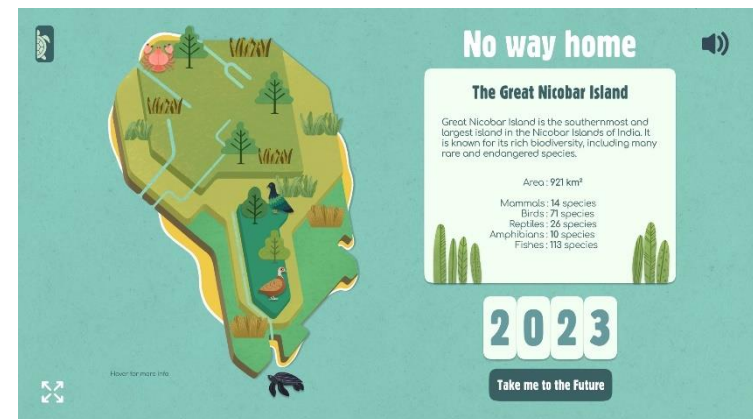
- The subsequent animation depicts the hatching of the hatchlings from their eggs and highlights the challenging survival rate of only 1 out of 100 turtles reaching adulthood.



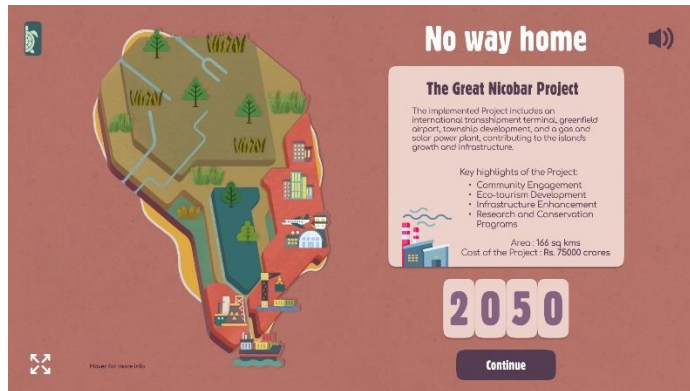
- The following animation showcases the physical characteristics of the leatherback turtles.



- The user is then taken back to the home page, but this time the button reads "Take me to the future." Clicking this button directs the user to the next page.



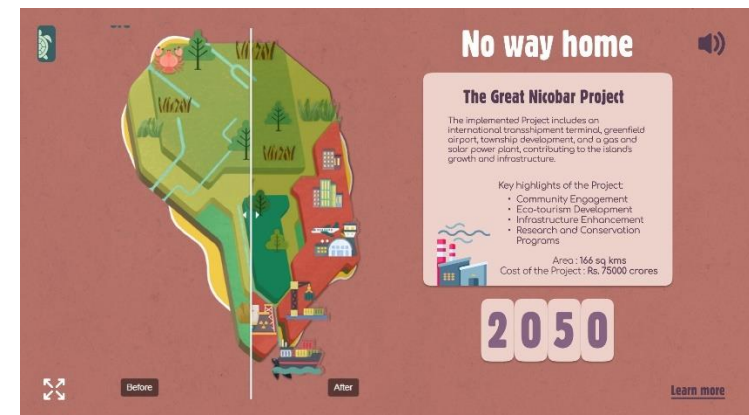
6. This page transports the user to the year 2050 in GNI, where the development plan has already been implemented. The map reflects the industrial changes, while the hovering interactions remain the same.



7. Continuing from there, the page presents an animation illustrating the consequences of the development plan, where the turtle struggles to nest due to the construction of the transshipment port. It then transitions to a screen featuring Galathea Bay in 2023, taking the user back to the past for the turtle to lay her eggs.



8. Once the scrollytelling animation concludes, the user arrives at the end page, which offers a before-and-after comparison slider for users to explore the changes brought about by the development plan.



Please note that this description provides an overview of the user experience flow within the website.

Evaluation plan

1. Expert Evaluation:

- **Purpose:** Assessing the content and information delivery of the interactive visualization website.
- **Method:** Gathering 2-3 experts in relevant fields providing them with access to the website and asking them to navigate through the content.
- **Evaluation Criteria:** Evaluating the clarity and accuracy of the information, the effectiveness of the storytelling and narrative, the visual presentation, and the overall user experience. Experts can provide feedback and suggestions for improvement.

2. User Evaluation:

- **Purpose:** Assessing the engagement and impact of the interactive visualization website on common users.
- **Method:** Selecting 5-6 common users who represent the target audience of the website. Providing them with access to the website and observing their interactions.
- **Evaluation Criteria:** Assessing the level of user engagement, including the time spent on the website, the interactions with the content, and any feedback or comments provided. Also, evaluating the impact of the website in terms of raising awareness, educating users, and encouraging action or further exploration.

Summary

In conclusion, the interactive visualization project for the Great Nicobar Islands serves as a tool to communicate the cause and effects of the development plan. The website, developed using Adobe After Effects, Lottie, and Webflow, takes users on a scrollytelling journey narrated by a mother turtle. It highlights the challenges faced by leatherback turtles and the potential impact of the development plan on their habitat.

The project's key highlights include the immersive storytelling experience, interactive map with hovering interactions, and visual animations. By engaging users and creating awareness, the website aims to inspire action and support in saving the island and its diverse ecosystem.

The evaluation plan involves gathering feedback from both experts and common users to assess the content, information delivery, engagement, and impact of the website. This feedback will be instrumental in refining the project and enhancing its effectiveness in conveying the message and raising awareness.

Overall, the project successfully combines storytelling, visuals, and interactivity to create an impactful experience that sheds light on the importance of conservation and the potential consequences of large-scale development. It is a valuable tool in promoting environmental consciousness and inspiring individuals to take action in protecting our natural treasures.

Limitations

There are a few limitations to consider in the project. Firstly, the use of Lottie files restricted the implementation of certain effects created in Adobe After Effects, leading to limitations in the number and complexity of animations that could be included as initially planned.

Secondly, a lack of coding knowledge resulted in spending additional time, approximately 2-3 weeks, in understanding and navigating the Webflow application. This led to some size issues within the project. However, these limitations can be addressed in the future with the assistance of an expert to optimize and refine the website.

Future scope

In moving forward with the project, there are several future steps to consider. Firstly, incorporating sound as an interactive sensory element would enhance the overall user experience and immersion. By adding appropriate audio elements, such as ambient sounds or narration, the storytelling aspect can be further enriched.

Additionally, it is important to address and correct any technical issues and sizing concerns within the Webflow platform. This includes optimizing the website for different screen sizes and ensuring smooth functionality across devices. Seeking expert assistance or further exploring web development resources can aid in resolving these technical challenges.

Expanding the visualizations to include stories of other animals within the Great Nicobar Islands would add depth and variety to the interactive experience. By exploring and representing the diverse fauna of the region, the project can educate and engage users with a broader understanding of the island's biodiversity and conservation efforts.

References

List of example websites for Parallax scrolling

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2. Weglot - <https://www.translate-wf.com/>
3. Creative south - <https://www.creativesouth.com/>
4. History of www - <https://webflow.com/ix2>
5. Moooi, Furniture collection - <https://www.moooi.com/en/a-life-extraordinary#talking-heads>
6. Delassus fruit shop - <https://delassus.com/en/>
7. Story of Jess & Russ - <http://jessandruss.us/>

List of example websites for Parallax scrolling

1. Human trafficking - <https://www.gegen-menschenhandel.at/?l=en>
2. Every last drop - <http://everylastdrop.co.uk/>
3. Bel arosa resort - <https://www.belarosa-chalet.ch/>
4. Poor millennials - <https://highline.huffingtonpost.com/articles/en/poor-millennials/>
5. Detroit segregation wall - Racial wall - <https://www.nbcnews.com/specials/detroit-segregation-wall/>

List of example websites for Immersive Storytelling

1. Bear 71 - <https://bear71vr.nfb.ca/>
2. why do buses bunch? - <https://setosa.io/bus/>

3. Misato - <https://www.town.shimane-misato.lg.jp/misatoto/>
4. Umami land - <https://umamiland.withgoogle.com/en>

List of example websites for 3js

1. <https://moments.epic.net/#home>
2. <http://www.ashortjourney.com/>

Other example websites

1. <http://www.thewildernessdowntown.com/>
2. <http://species-in-pieces.com/#>
3. <https://tabletopwhale.com/2014/08/27/42-butterflies-of-north-america.html>
4. <http://www.thewildernessdowntown.com/http://species-in-pieces.com/#https://tabletopwhale.com/2014/08/27/42-butterflies-of-north-america.html>
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Aftereffect Tutorials YouTube