Sustainable built environments responding to climate change risks: Digital-based illustrations

KOICA-ESCAP Joint Capacity Building Training Programme on
Digital Technologies for Addressing Climate Change Impacts in The Pacific
21 August 2025

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Talk Flow

1. Digital illustrations/Team exercise/Presentation (50-minute)
2. Team exercise (50-minute)
3. Presentation (50-minute)



1 Digital illustrations

1 Digital illustrations

2 Examples

Digital illustrations



- Digital illustration is the practice of creating artwork using computer software and hardware rather than traditional tools such as pencils, inks, or paints.



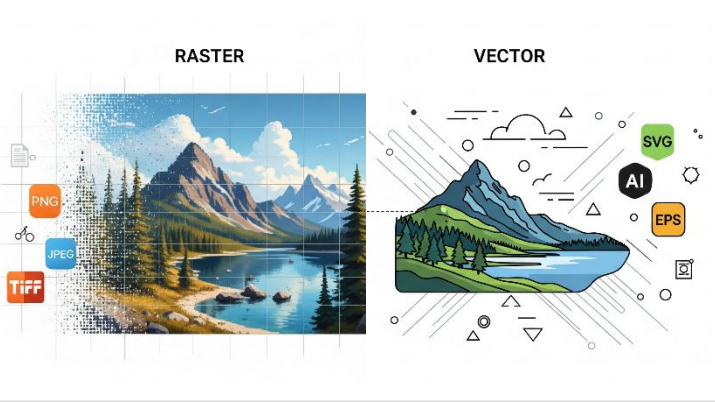
- Artists draw, paint, or assemble images on a digital canvas, using virtual brushes, layers, and effects.

Core elements

- The core elements of digital illustration are software, hardware, and file types.







Software

- Programs such as Adobe Photoshop, Illustrator, Procreate, Clip Studio Paint, and Krita

Hardware

- Graphics tablets, pen displays, styluses, and tablet computers

File types (formats)

- Raster (PNG, JPEG, TIFF) and vector (SVG, AI, EPS)

Raster vs. vector file types

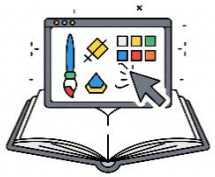
- Each file type has its own characteristics.

	Raster	Vector
Data structure	Pixel grids	Mathematical equations (lines and curves)
Scalability	Loss clarity when enlarged	Infinite scalability without loss
File size	Size grows with image dimensions and resolutions	Smaller than raster type
Common formats	PNG, JPEG, GIF	SVG, AI, EPS
Editing	Pixel-level adjustments	Point-and-curve manipulation
Typical uses	Photo retouching, digital painting, web images	Logos, technical illustrations, print materials, typography

Digital illustration – workflow

- From sketch to screen – the digital illustration workflow

1



Understanding the basics of digital illustration

2



Setting up your digital workspace

3



Beginning with a concept and sketch

4



Digitizing the sketch

5



Adding details and texture

Revising and refining

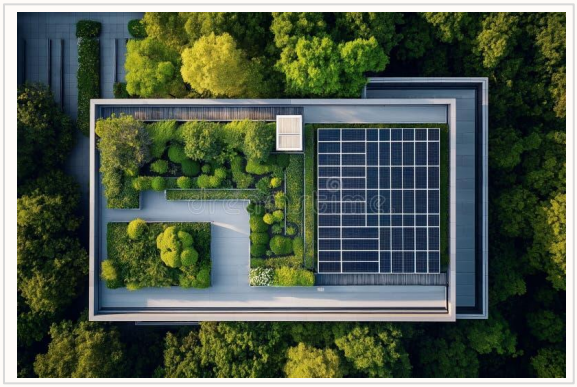
6



Finalizing the illustration

Digital illustrations – a powerful way

- Digital illustrations are a powerful way to visualize and promote sustainable built environments and nature-based solutions.



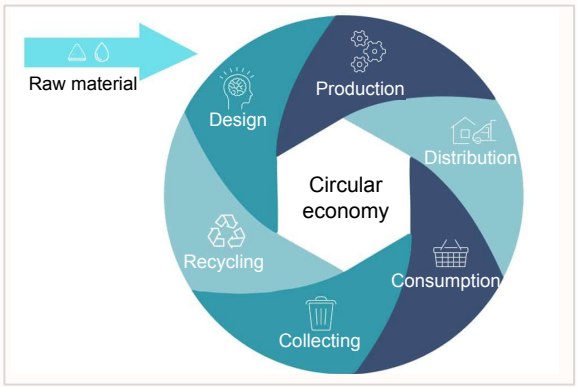
Green Architecture

- Buildings with solar panels, green roofs, and energy-efficient designs



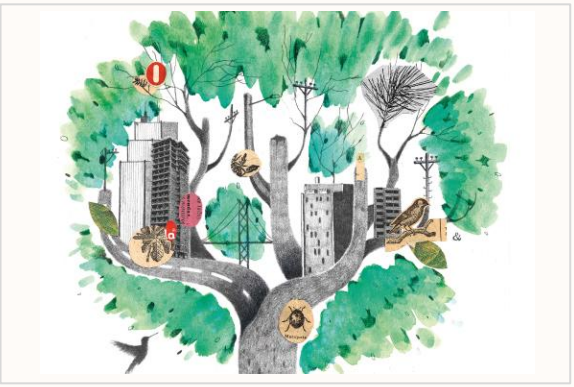
Smart cities

- Urban layouts integrating renewable energy, public transport, and eco-friendly infrastructure



Circular economy

- Visuals showing recycling, reuse, and sustainable cycles

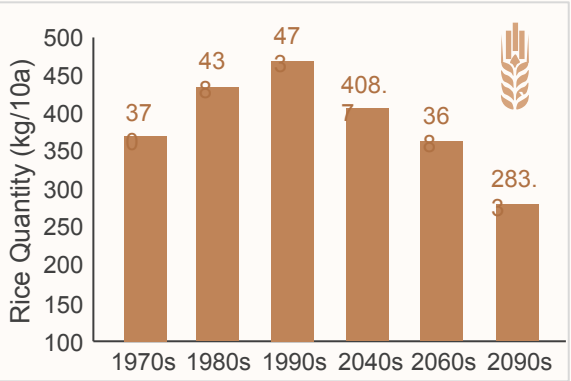


Nature integration

- Designs blending natural landscape with urban development

How are digital illustrations created?

- Digital illustrations can be created in several ways:



Vector art and infographics

- Clean, scalable visuals for education and advocacy



3D rendering

- Realistic models of eco-buildings and future cityscapes



Isometric illustrations

- Stylized layout of sustainable systems like water reuse or energy grids



Interactive media

- Web-based visuals that allow users to explore sustainable features

Where can digital illustrations be found?

- Digital illustrations can be found in several places:

  Getty Images and iStock offer thousands of royalty-free illustrations.

  Shutterstock has curated sets focused on sustainability and urban planning.

  Artists for Climate provides open-license artwork for climate action campaigns.

  Springer's research explores digital frameworks using building information modelling (BIM) and computational design for regenerative environments.

  AI tools (e.g., MS Copilot, ImageFX, Google Gemini) offer illustrations.

Artists for climate

https://artistsforclimate.org/



Artists for climate

https://artistsforclimate.org/.

- Artists for Climate began as a global open call seeking digital illustrations that address climate change, with a focus on hope and solutions.
- The project received 2,222 submissions from 1,432 artists across 95 countries.
- The outstanding works of 50 selected artists, 46 finalists, and 54 honorable mentions were chosen to join The Climate Collection – a unique vault of open-license visuals that inspire climate action.

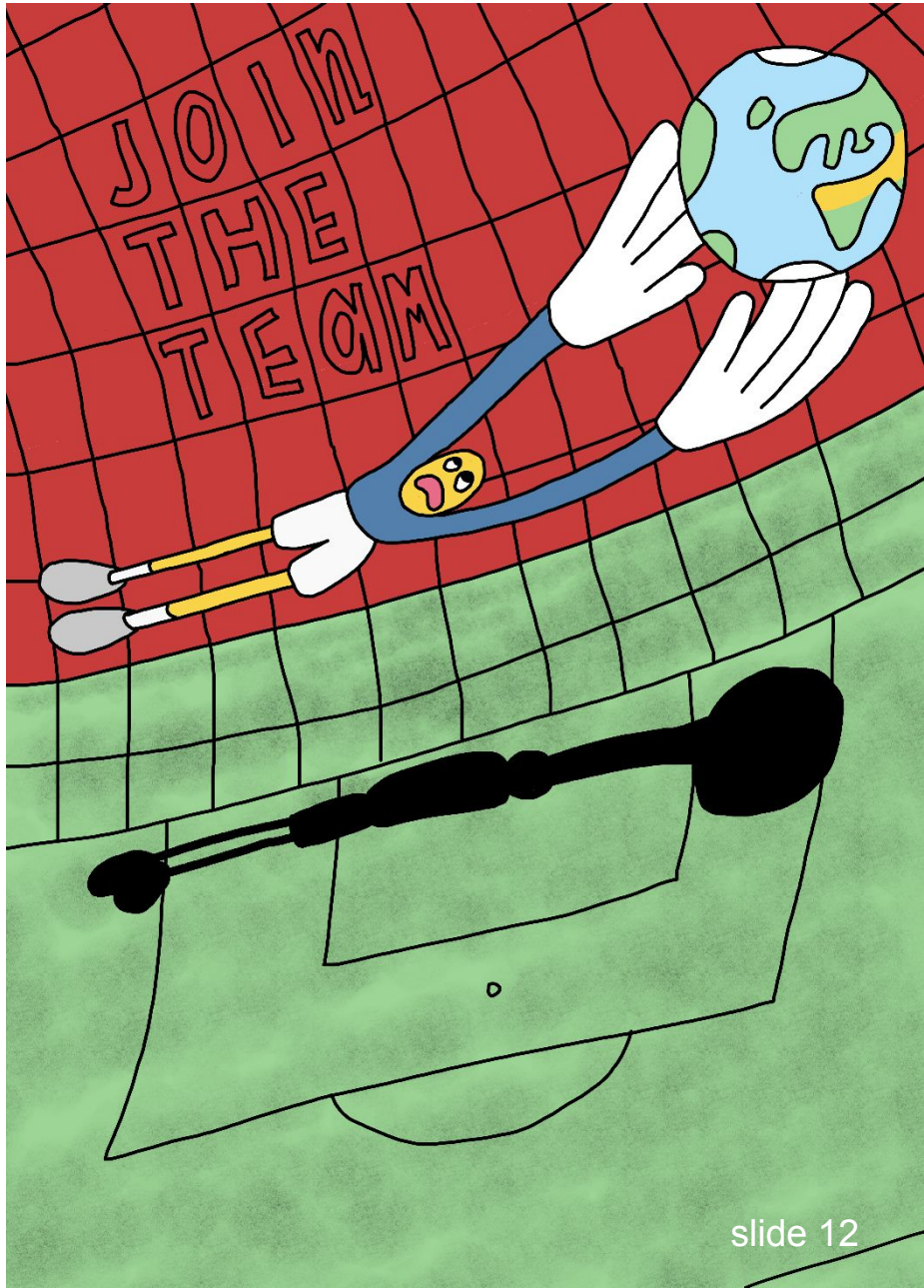
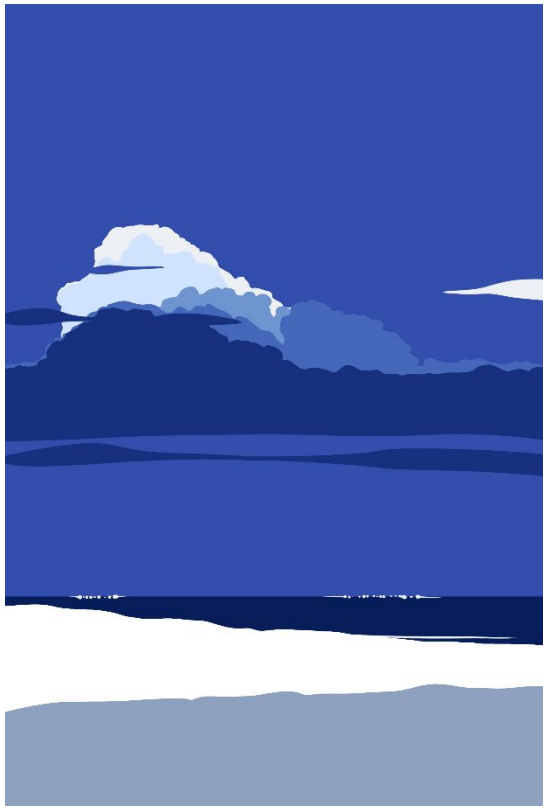


Illustration by
Yan Mikhelkis (Ukraine)

Ocean engineering students can create illustrations.

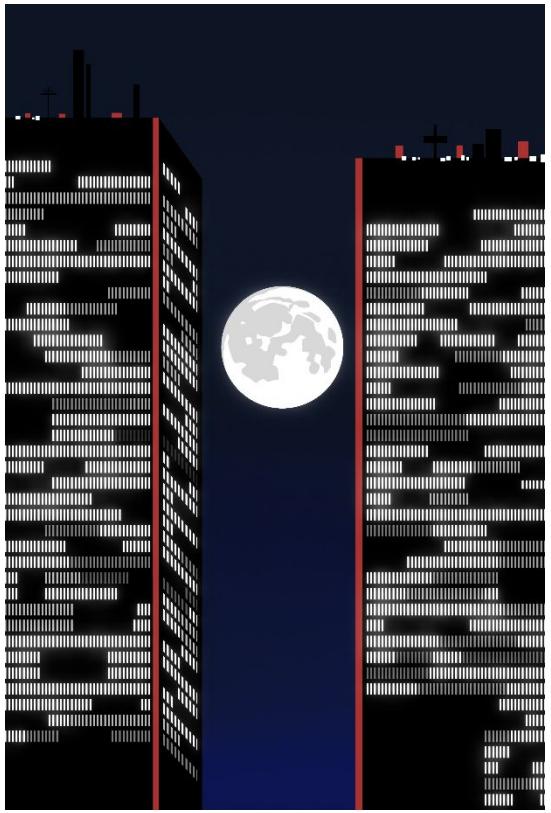
- Artist: Lyeowon Keem (OE, PKNU)
- Software: ibis Paint X



White sand coast



Wave



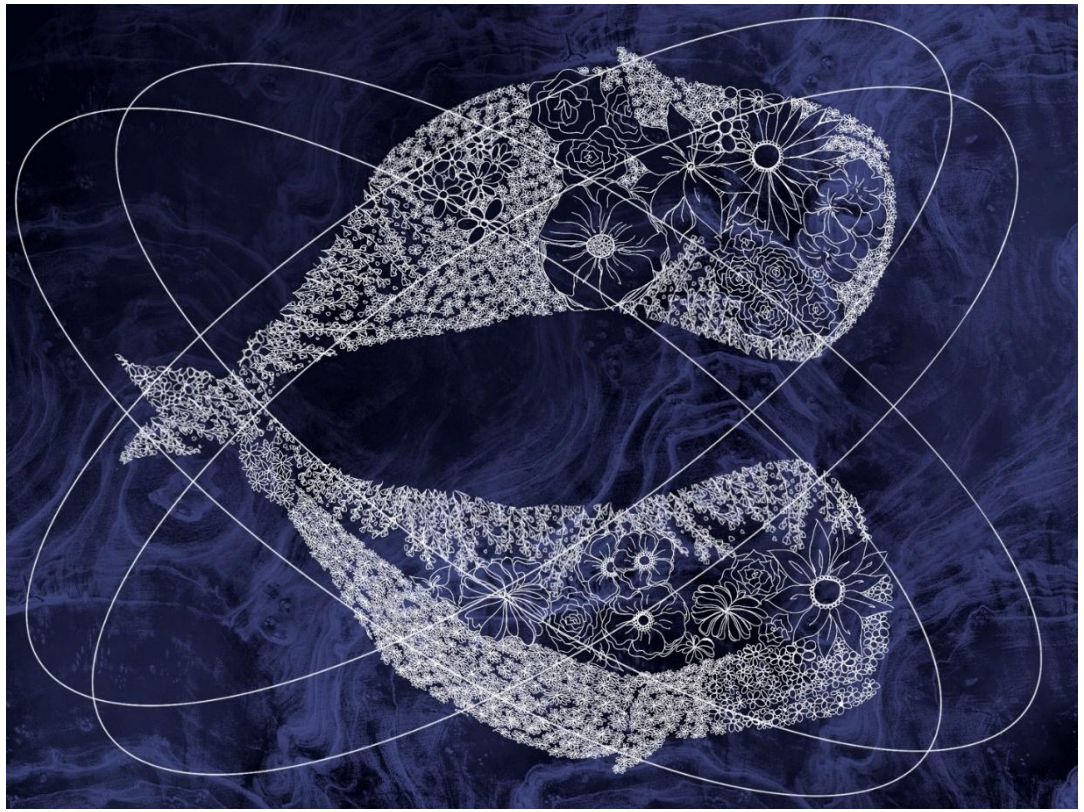
Buildings

Ocean engineering students can create illustrations.

- Artist: Sunyoung Kim (OE, PKNU)
- Software: Procreate



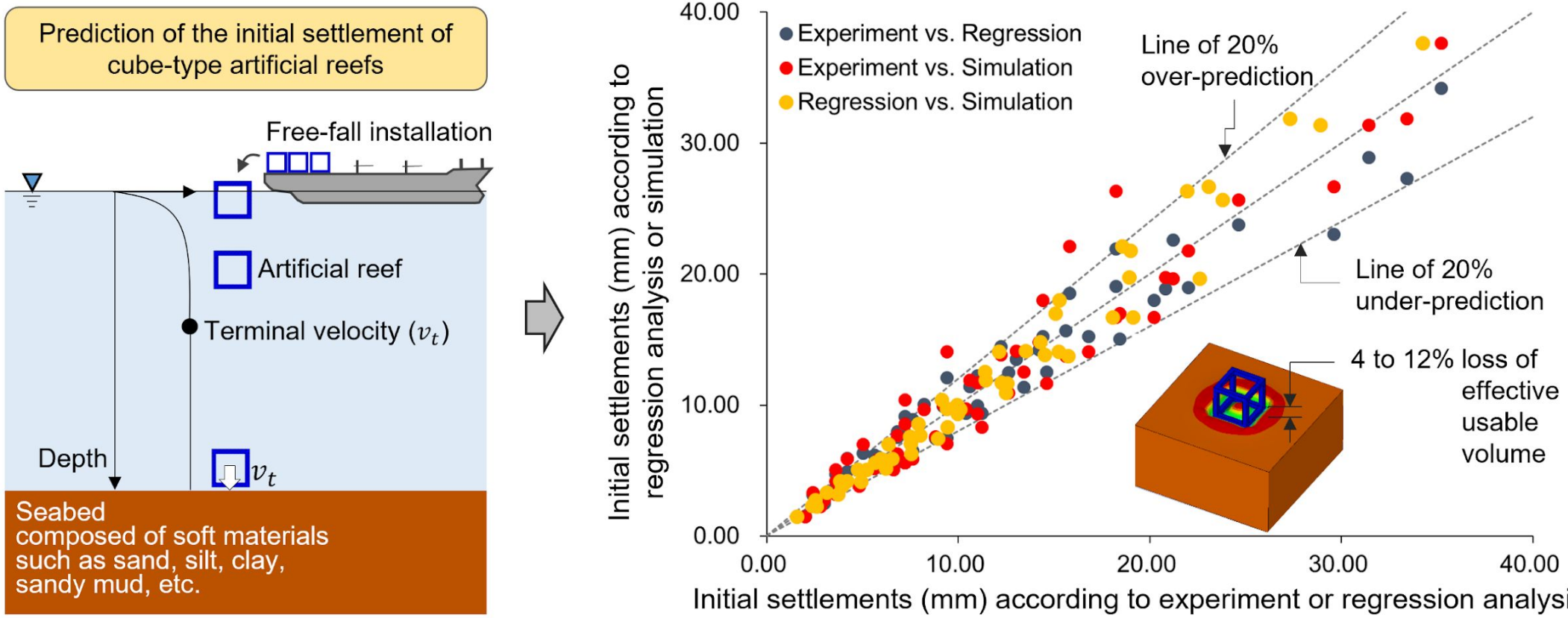
Aestheticism



Whale: Hot Line

Ocean engineering students can create illustrations.

- Artist: Somi Jung (OE, PKNU)
- Software: Microsoft PPT



AI can create illustrations.

- AI software: Gemini

WWII Naval Combat in Pacific Islands



Potentially Polluting Wrecks (PPW)



Marine environment issues from PPW



AI can create illustrations.

- AI software: Gemini

Urgent Action addressing marine environment issues from PPW	Isometric Illustration	3D rendering illustration
		

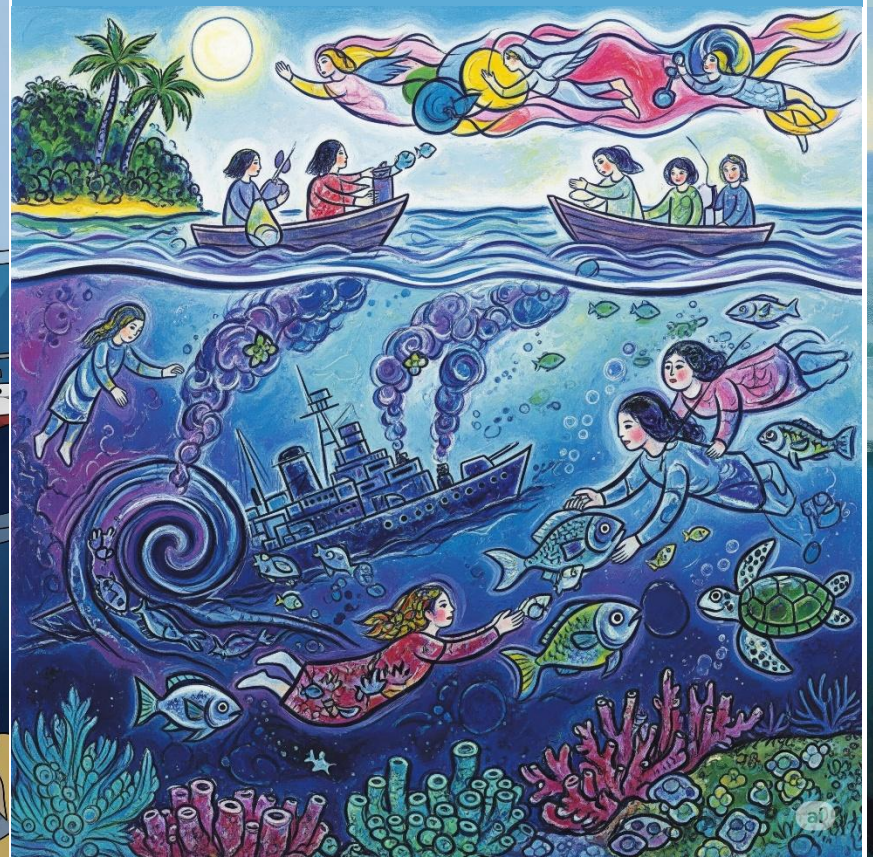
AI can create illustrations.

- AI software: Gemini

"Pablo Picasso" style



"Marc Chagall" style



"Claude Monet" style



AI can create illustrations.

- AI software: Gemini

"Paul Gauguin" style



"Jesper Johns" style



"Andy Warhol" style



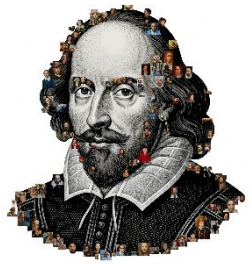
AI can create illustrations.

- AI software: Gemini

“Roy Lichtenstein” style	“Alphonse Maria Mucha” style	“Vincent van Gogh” style
		

AI can create maxims as well.

- AI software: Gemini



“William Shakespeare” style

"To cleanse these briny depths of poisoned blight, or suffer nature's wrath, is now our mortal plight."



“Jane Austin” style

"It is a truth universally acknowledged, that a vast ocean, once pristine, must be preserved with utmost diligence from the dire consequences of human neglect."

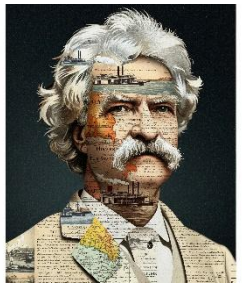


“George Orwell” style

"The official truth states the ocean is clean, yet the black oil speaks otherwise, demanding inconvenient action."

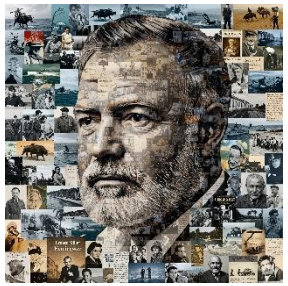
AI can create maxims as well.

- AI software: Gemini



“Mark Twain” style

"Trouble with them old sunken war-wagons ain't just the rust; it's the oil, spillin' out slower than a government promise, killin' what the war didn't."



“Ernest Miller Hemingway” style

“The sea is dying; act, or lose all.”



“Han Kang” style

"From the corroding vessels, a black blood seeps, staining the ocean's skin, a silent scream from depths that remember the dying."

Sea-level rise for Pacific Islands

- Problem statement:

  In the next 30 years, the Pacific Island nations (e.g., Tuvalu, Kiribati, and Fiji) will experience at least 15 cm of sea-level rise. This rise will occur regardless of any change in greenhouse gas emissions in the coming years.

- Let’s use AI Gemini to create illustrations related to the above problem statement.

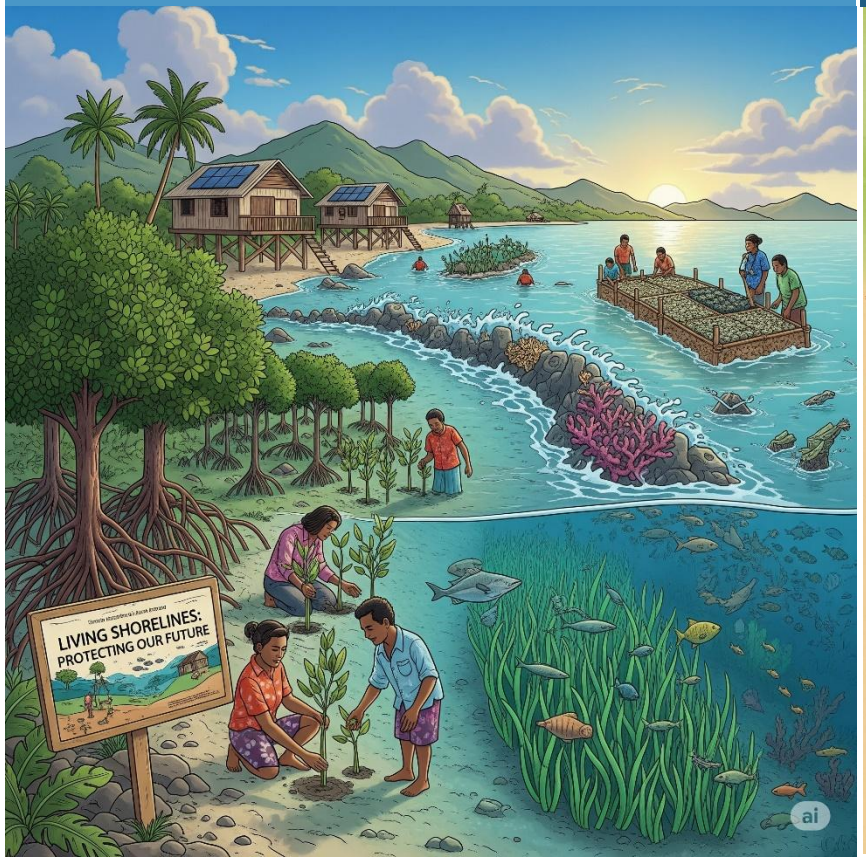
Illustrations of sea-level rise for the Pacific Islands

- AI software: Gemini

Sea-level rise in the Pacific Islands



Adaptation strategies using living shorelines



2D plan view illustration



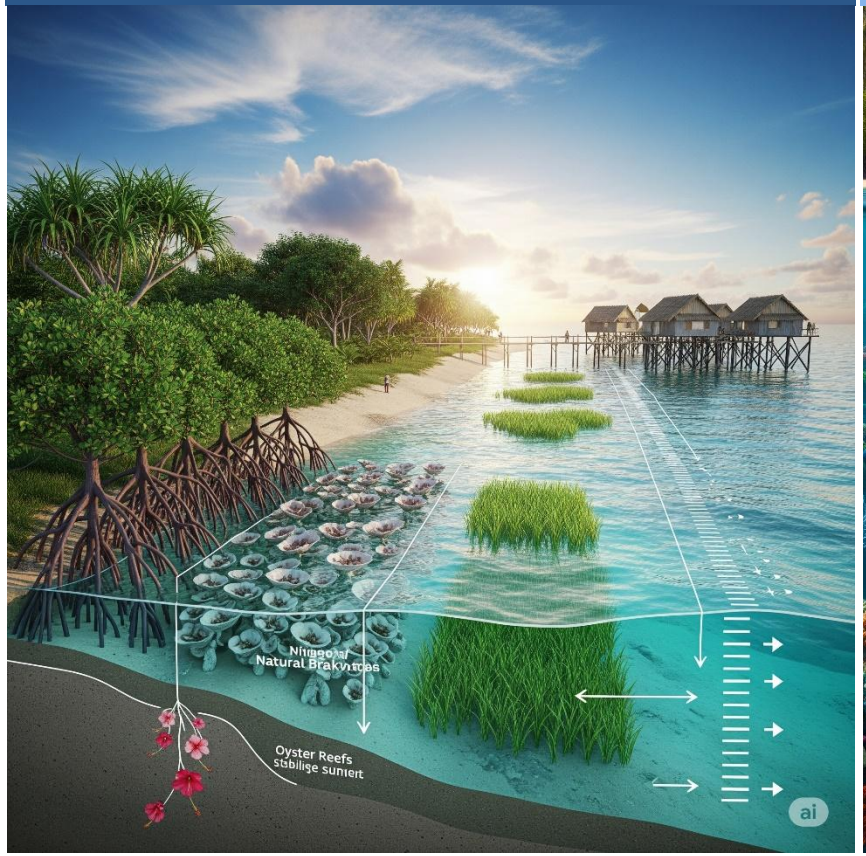
Illustrations of sea-level rise for the Pacific Islands

- AI software: Gemini

2D plan-view illustration



3D rendering illustration



3D rendering illustration



Illustrations of sea-level rise for the Pacific Islands

- AI software: Gemini

Poster



Poster



Poster – emphasizing UN



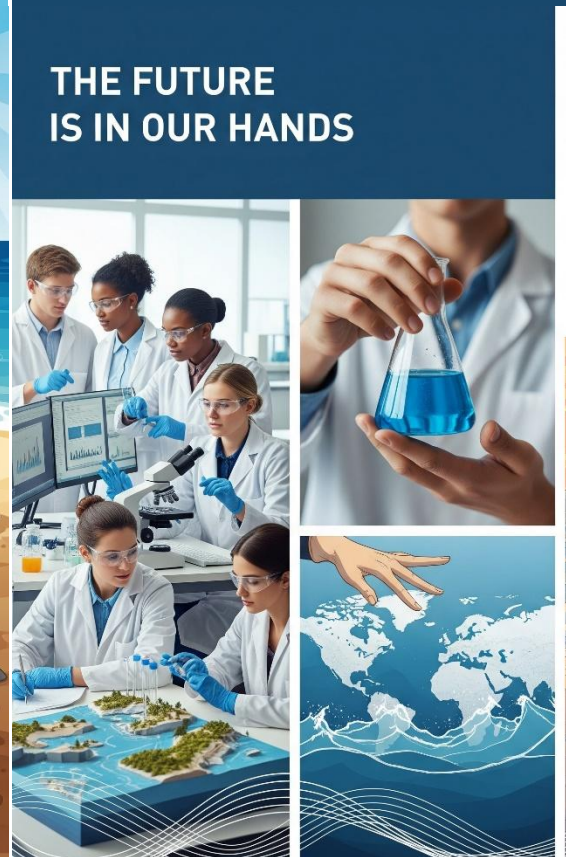
Illustrations of sea-level rise for Pacific Islands

- AI software: Gemini

Poster for elementary students

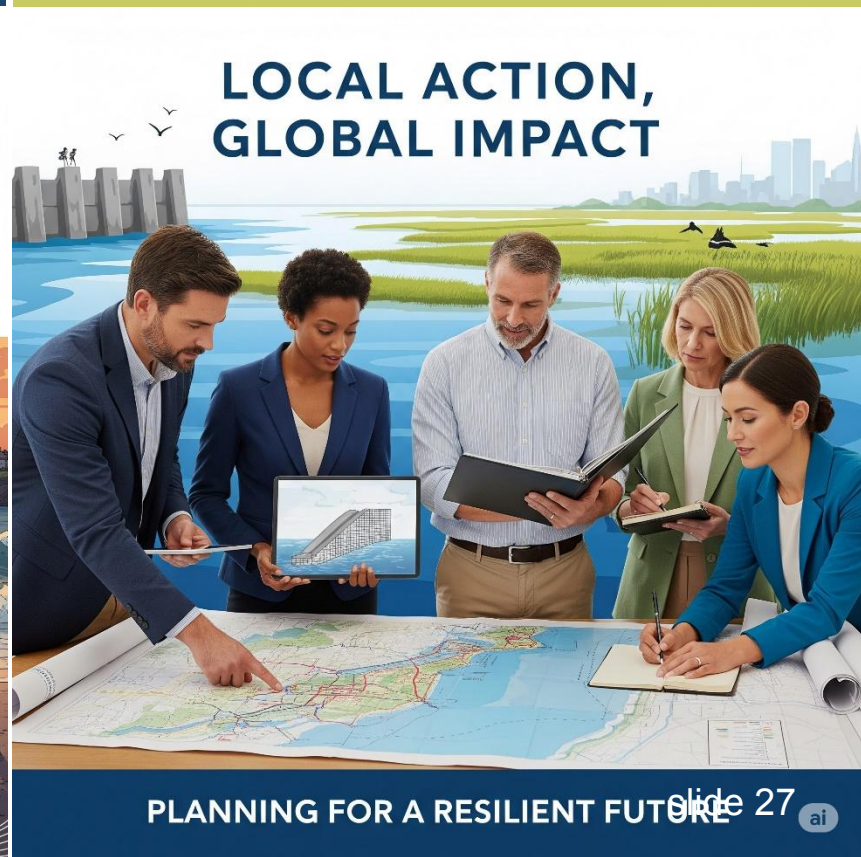


Poster for college students





Poster for government officials



Video clip – sea-level rise for Pacific Islands

- AI software: Gemini

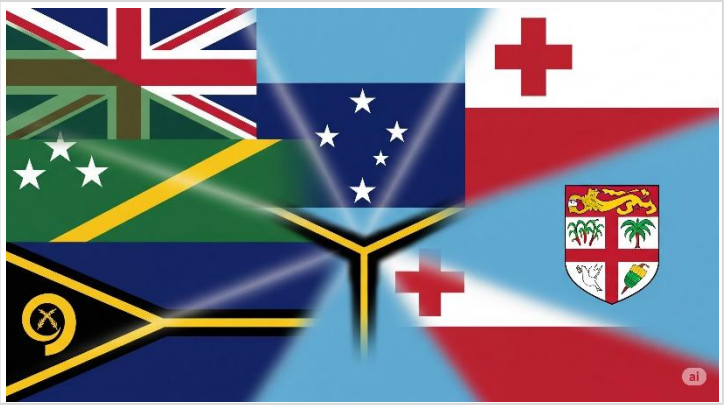


Video clip (14-second)



2 Team exercise

Team exercise – overview



- First, divide the trainees into five teams, each representing a different Pacific Island country. Within each team, assign a team leader, a timekeeper, and a coordinator.



- Next, each team researches and designs adaptation strategies for coastal built environments in its assigned country. Then, they present proposals that balance cultural heritage, environmental resilience, and community needs.

Team exercise – overview



- Finally, each team creates a series of hand-drawn sketches to explore and communicate a sustainable built environment in the Pacific Islands.



- These sketches will serve as the foundation for a subsequent digital illustration that blends traditional drawing techniques with modern digital workflows.

Step 1

- Conduct research and establish context.



Identify coastal hazards

- Identify the coastal hazards specific to your country (e.g., sea-level rise, storm surge, and erosion).



Review current adaptation measures

- Review current adaptation measures: hard engineering, nature-based solutions, and planning.



Gather cultural insights

- Gather cultural insights: traditional materials, communal practice, and governance structures

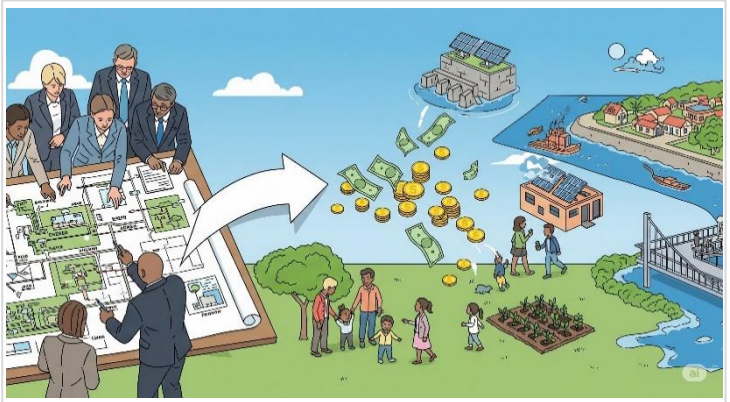
Step 2

- Proposal development



Design strategies

- Design at least three complementary strategies: elevated stilt architecture, mangrove buffers, and community zoning plans.



Create a concept

- Create concept sketches, maps, or simple diagrams.

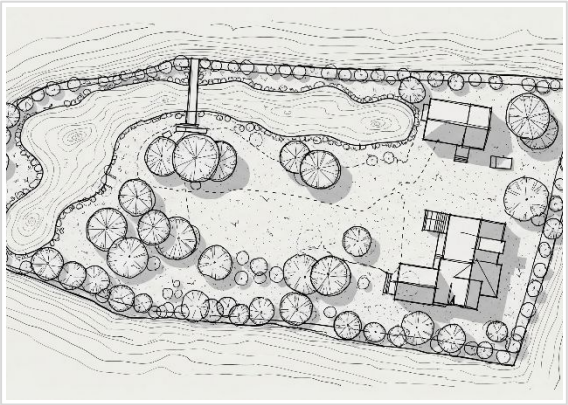


Outline some details

- Outline the materials, costs, and community engagement steps.

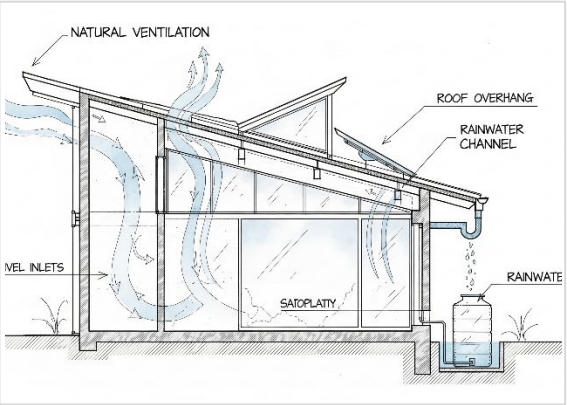
Step 3

- Produce hand-sketch deliverables:



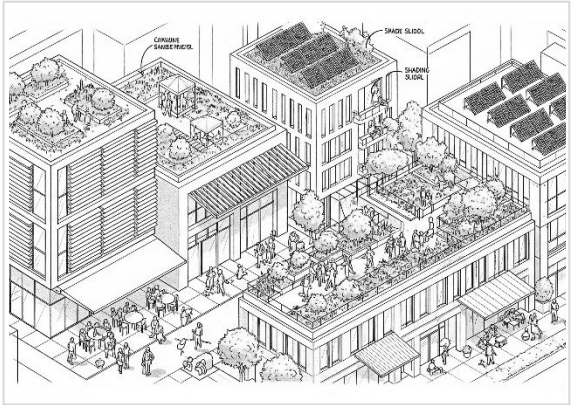
A site plan sketch

- A rough outline of the terrain, vegetation, water bodies, and existing structures.



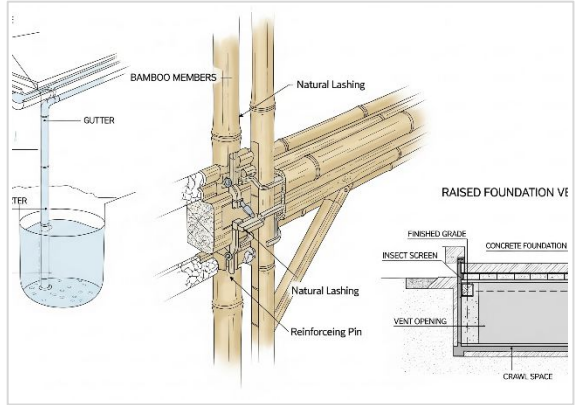
A concept sectional sketch

- A cut through a building showing natural ventilation, roof overhangs, and rainwater channels.



A perspective or isometric sketch

- Depicts people's interactions with spaces (e.g., elevated walkways), highlighting shading devices, green roofs, and solar panels.

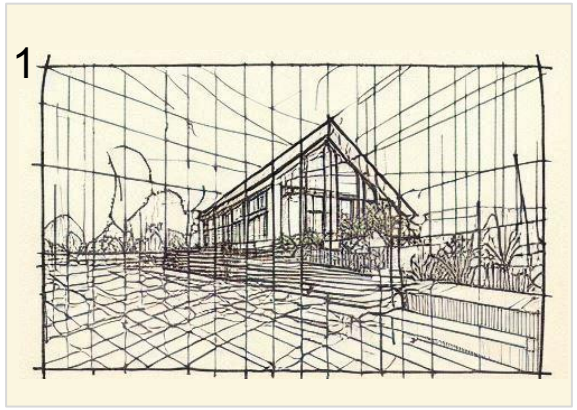


Detail diagrams

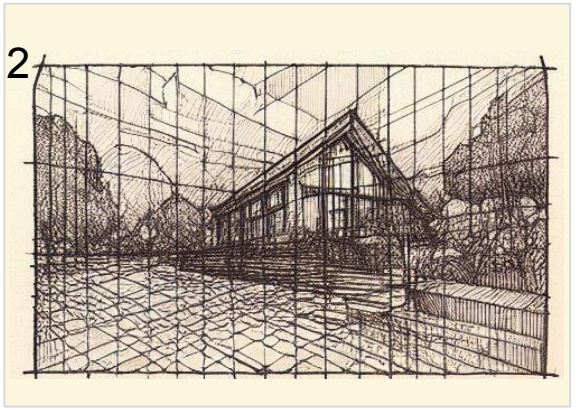
- Focus on sustainable details, e.g., bamboo framing joints, gutter-collection system, and raised foundation vents.

Step 4

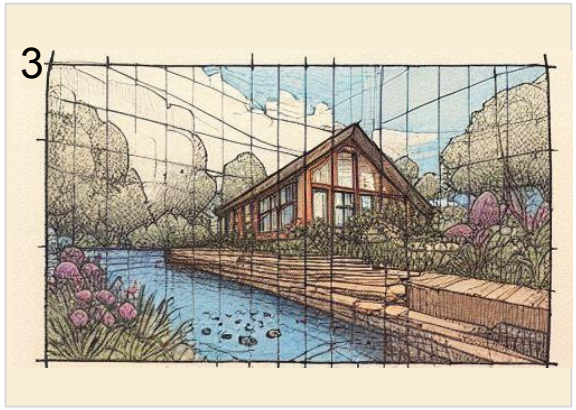
- Consider sketching techniques and tips:



Use any pen for loose initial lines, then refine with fine-liner pens for clarity.



Employ light construction lines to create perspective grids (one-, two-, or three-point perspective).



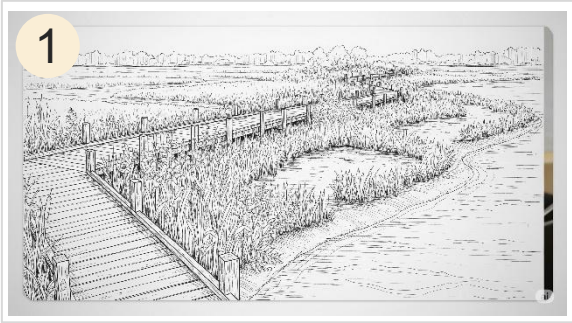
Annotate directly on sketches—use arrows to indicate airflow, color accents to highlight water and greenery.



Keep each sketch on A4 or A3 tracer paper to simplify later scanning.

Step 5

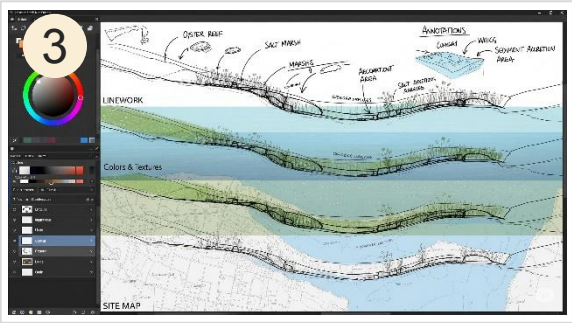
- Transition to digital illustration (take-home assignment)



Scan or photograph sketches at a minimum 300 dpi.



Import into software (e.g., Procreate, Photoshop, Clip Studio Paint).



Create separate layers: background, linework (cleaned hand-sketch), color and textures (watercolor brushes, leaf textures), annotation and diagrams.



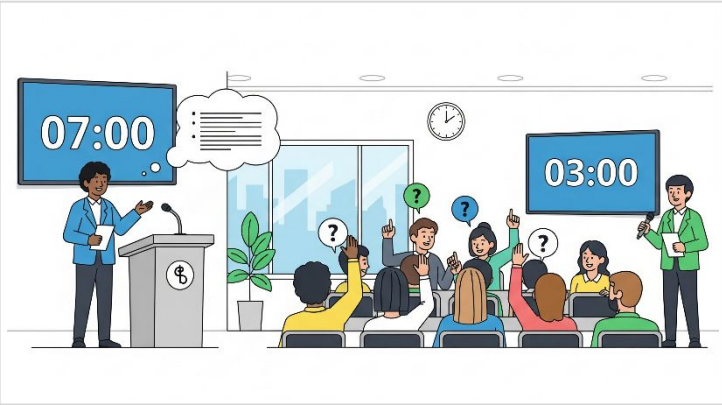
Use layer masks and adjustment layers to preserve hand-drawn authenticity while adding digital polish.

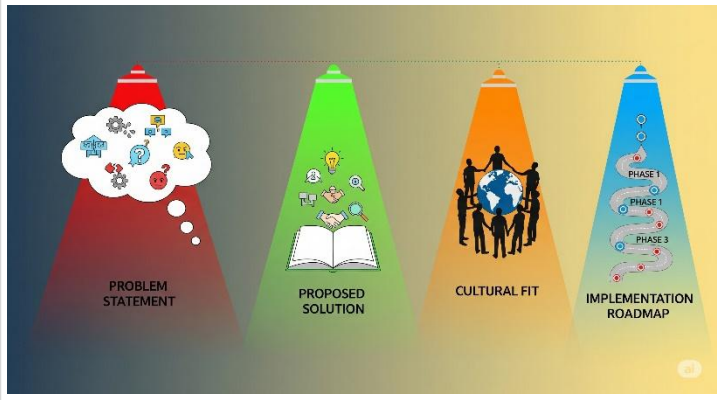


3 Presentation

Presentation outline

- Prepare an oral presentation that incorporates a conceptual illustration.







Prepare a presentation

- Prepare a 7-minute oral presentation followed by a 3-minute Q&A.

Highlight key factors

- Highlight the problem statement, proposed solution, cultural fit, and implementation roadmap.

Consider 3P

- Consider people (audience), purpose, and place (venue).

Presentation outline

- Focus on visualization, the rule of three, and time for planning.



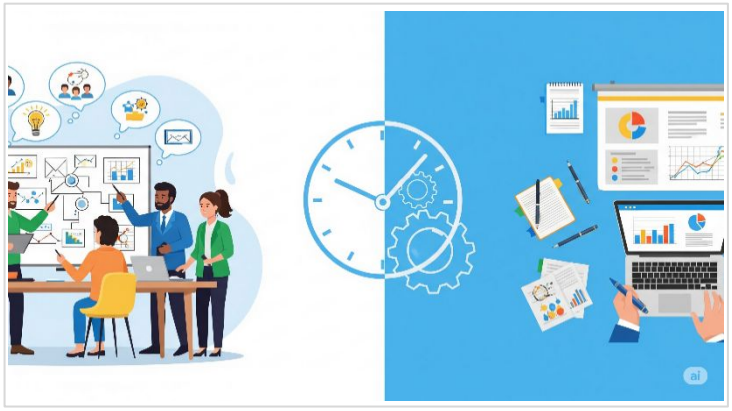
Use your illustration

- People remember 83% of what they see but only 11% of what they hear.



Rule of three

- A presentation that conveys three key messages is recognized as effective.



Proper time management

- Invest your time not only in the team exercise but also in preparing the presentation.

Thank you for your attention.

