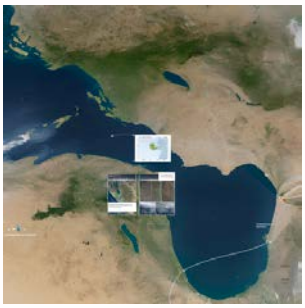
MM7: SDG13 SPACE4SDGS CLIMATE ACTION IN SPACE



SDG 13: Climate Change Monitoring Through Visual Dashboards and App Interfaces

- Design / develop a visual tool, that presents critical climate data in a user-friendly way

Challenge
Your task is to develop a visual tool, such as a dashboard or app interface, that presents critical climate data in a user-friendly way. Instead of focusing on satellite engineering, you will interpret data from existing satellites to make climate information—like deforestation rates, polar ice melting, and greenhouse gas levels—accessible to the public. This challenge encourages you to transform complex data into understandable and engaging formats that empower individuals and communities to take informed action.

Considerations
- User Accessibility: Think about the range of people who may use this tool, from scientists to community members, and how you can make it simple to understand and interact with.
- Data Visualization: Consider how to present climate change indicators visually to highlight trends, changes, and impacts clearly and effectively.
- Relevance to Community Needs: Design a tool that focuses on issues relevant to specific areas (e.g., local air quality, rising sea levels, drought patterns) and informs users of actionable insights.
- Usability and Engagement: Focus on making the interface not only functional but also intuitive and engaging, encouraging regular use and interaction with climate data.

Background
As global climate challenges grow, satellite data offers us unprecedented insight into Earth's changes, from deforestation to glacier retreat and rising greenhouse gas emissions. While these data are crucial, the information is often difficult for the public to access or understand. Scientists and everyday people alike need tools that translate data into accessible, actionable formats that inspire climate awareness and solutions.

Many communities and individuals worldwide face urgent climate risks, and it is essential to bridge the gap between data and action. By designing a visual interface or app that communicates climate data clearly, you can help make satellite insights relevant to community goals, policy-making, and public awareness campaigns.

Your Mission
Your mission is to design a visual dashboard, app interface, or tool that uses satellite data to help people understand and act on climate change. You will identify a climate impact area, interpret related satellite data, and create a user-friendly design that makes the information meaningful and accessible to specific audiences, from scientists to community members.

Project Objectives

- Data Interpretation and Visualization: Develop skills in data analysis by transforming satellite data into clear, meaningful visuals.
- Community Engagement and Awareness: Understand how to communicate climate information that is both impactful and accessible to different user groups.
- User-Friendly Design: Design a product that serves a practical purpose while also being easy to navigate and enjoyable to use.

Deliverables

- User Profile(s): Develop a profile for your intended user(s), including their needs and expectations.
- Data Visual Mock-up: Create a visual dashboard or app mock-up displaying key climate data indicators relevant to your audience.
- Campaign or Action Plan: Develop a proposal for how this tool will support awareness or action on climate change.
- Feedback Integration: Include a testing and feedback phase, where you refine your design based on user insights.

Questions to Consider

- Who is the primary audience for this dashboard or app? How can it best serve their needs?
- Which climate change indicators (e.g., greenhouse gases, deforestation, sea level) are most relevant to your audience?
- How can you present complex scientific data in a way that's simple to understand?
- What visuals or interactive features would help people use and engage with this information regularly?
- How will this tool encourage users to take actionable steps towards climate awareness or advocacy?

Design Process Overview

Step 1: Introduction: What is available?

- Explore the role of satellites in monitoring climate change and environmental degradation.

Step 2: Empathy - Who are your users?

- Create user profiles for environmental scientists, governments, and communities affected by climate change.

Step 3: Defining the Problem

- Define the problem of e.g. monitoring deforestation, rising sea levels, and pollution.

Step 4: Ideate

- Brainstorm using the various satellite-based solutions for tracking environmental data (e.g., forest cover, ocean temperature

Step 5: Ideate 2 – Good Idea / Bad Idea

- explore and discuss the solutions available you have discovered that are tracking environmental data and consider how to improve your app.

Step 6: Prototype

- Create a prototype of your dashboard / app using your user profiles your research a and testing phase

Step 7: Test

- Test the system in a simulation and refine the design based on performance.
- Share your prototype with others to get feedback. Use their suggestions to make

improvements and ensure it's easy to understand for your users

Each step will take one or more lessons, your teacher will guide you with lessons and resources from 'Space Design Challenge Problem to Pitch' Module and the Future of Space

The United Nations Office for Outer Space Affairs (UNOOSA) works to promote international cooperation in the peaceful use and exploration of space, and in the utilisation of space science and technology for sustainable economic and social development.

VISIT https://www.unoosa.org/oosa/en/ourwork/space4sdgs/sdg1.html

Step 1: Introduction:

Visit https://www.unoosa.org/oosa/en/ourwork/space4sdgs/sdg12.html to find out about projects using space technology to support climate action at the global level

Support: Use the resources in MM2,4 and 5 and the Problem to Pitch Space Design Challenge, Lesson 1,

Step 2: Empathy: Understand the needs and experiences of the potential users of your tool
Consider how different groups—such as local policymakers, students, or community activists—interact with climate information and what barriers they might face in understanding or using data.

Identify Potential Users

- Who would benefit most from access to climate data in a clear, easy-to-understand format?
- Are you designing this for a specific group, such as environmental groups, students, or local policymakers?

Daily Challenges and Pain Points

- What climate-related concerns does this group face regularly?
- What information or tools do they currently lack to address these challenges?

Impact on Goals and Daily Life

- How could this tool make a difference in their understanding of climate issues?
- What positive impact could this tool have on their lives or work?

Skills and Technology Needs

- What level of familiarity with technology does your user have?
- Are there any accessibility needs (e.g., large text, audio support, visual cues) to consider?

Global Benefits and Impacts

- How will your tool help connect users with a broader understanding of global climate issues?
- In what ways might your tool inspire action or community initiatives related to climate change?

Creating User Profiles for a a Climate Change Monitoring Dashboards or App
After reviewing the challenge, you will create a user profile for an individual who would benefit from a climate change monitoring dashboard or app interface that presents critical climate data in a user-friendly way. This could be a researcher studying climate change effects, a local government official making data-driven decisions for their community, or a climate-conscious citizen seeking reliable information for advocacy. This will help you think about what information you might need to include on your dashboard or app.

Profile Components

Name, Age, and Location of the User

- Prompt: Give the person a background by including details like age, role, and location to ground the profile in relatable experiences. Examples might include "Amina, a 30-year-old environmental policy advisor in Berlin" or "Daniel, 16-year-old student from a coastal town in Ireland."

Once you decide on who you are designing for, e.g., a researcher studying climate change effects, a local government official making data-driven decisions for their community, or a climate-conscious citizen seeking reliable information for advocacy or another user you can begin to ask the following questions to help you

Background and Connection to Climate Data

- Prompt: Describe the user's background and how climate change impacts their role or interests. What is their connection to climate data, and why is it important to them? For instance, a city planner might need data to assess rising sea levels, while a teacher might use the data to educate students on climate impacts.

Daily Challenges and Pain Points

- Prompt: Outline specific difficulties they face due to a lack of accessible climate information. Examples might include struggling to find reliable, real-time data, interpreting complex datasets, or feeling uncertain about local climate projections. How do these challenges affect their ability to act on climate issues?

Technology Access and Comfort Level with Data Tools

- Prompt: Describe the types of technology they use and their comfort level with data tools, such as mobile apps, online dashboards, or data visualisation software. For instance, does the user rely on social media for information, or do they regularly use online mapping tools but need more user-friendly features?

Specific Needs or Goals Related to a Climate Dashboard/App

- Prompt: Identify how the user would benefit from a more effective climate dashboard or app. For example, a local official might need data on air quality trends to make health recommendations, while a student might want simplified visualisations to understand climate patterns better. What data formats, insights, or tools would be most helpful to them?

Example of How They Would Use the Dashboard/App to Achieve Their Goals

- Prompt: Describe a realistic scenario where this user would rely on the dashboard or app to reach their objectives. For instance, a policy advisor might use the dashboard to track CO2 emissions and prepare reports, while a community activist could access visuals on local climate risks to educate others and promote climate action.

Step 3: Define the core issue your project addresses.

- What are the primary climate data needs of your chosen audience, and what challenges do they face in accessing or interpreting this information? Establish a clear problem statement that identifies the gap between available climate data and the user's understanding or engagement.

Step 4: Ideate Generate ideas for the layout and features of your tool that will make climate data accessible and engaging.

- Consider using visualisations (graphs, maps, icons) that make the information more intuitive. Brainstorm additional features, like alert notifications or interactive elements, that help users stay updated on local climate issues.

Step 5. Refine your ideas by selecting the best solutions for your visual tool

- Focus on ensuring that your visual dashboard or app interface is durable, accurate, and effective in presenting climate data in a clear and accessible way.
- Consider user feedback and prioritise features that make the system user-friendly, sustainable, and resilient against data misinterpretation or technical issues.

Support: Use the resources in MM7: Problem to Pitch Space Design Challenge, Lesson 4 and 5, Ideate

Step 6. Create a mock-up or model of your visual dashboard or app interface

- Display sample climate data relevant to your audience.
- Focus on layout and usability, arranging elements to create a logical, engaging user flow. Include clear navigation and customizable features for accessibility.

Support: Use the resources in MM7: Problem to Pitch Space Design Challenge, Lesson 4 and 5, Ideate

Support: Use the resources in MM7: Problem to Pitch Space Design Challenge, Lesson 6 Prototype

Prototypes can be 3D or 2D if using wireframes for software / apps. You can read this article to help you https://www.figma.com/resource-library/what-is-wireframing/

Mock-ups can help you imagine how a user might interact with your satellite data -based app or system. The following links in Canva to create prototypes for any platform

- https://www.canva.com/prototypes/templates/
- https://www.canva.com/prototypes/
- https://www.canva.com/prototypes/templates/desktop/

Explore Canva's Mock-up app to show a range of prototypes for different aspects of your programme

Creating a Mobile Interface Mock-up for a Climate Monitoring App. Use these steps in Canva to create a user-friendly climate data dashboard:

Open a New Project

- Begin by creating a custom-size project, setting the dimensions to 1080x1920 pixels to represent a mobile screen.
- This ensures the design is optimised for mobile accessibility, readability, and ease of use.

Set Up a Mobile Background

- Search in Canva's Elements for a "mobile screen" frame and place it centrally on the canvas.
- Choose a background colour that is soft on the eyes, such as light blue or grey, to ensure good contrast for text and icons, enhancing readability.

Design the App's Home Screen

- Within the mobile frame, add a rectangle at the bottom of the screen to serve as the main navigation bar.
- Include essential menu items like "Climate Tracker," "Data Insights," and "Actions," giving users easy access to climate data, visual reports, and suggestions for climate-friendly actions.
- Near the top, place a circle or square for the app icon or logo, creating a friendly first impression. Title this screen with text like "My Climate Monitor" to promote engagement with the app.

Add Buttons or Icons for Key Functions

- Design large, clear buttons or icons for each core function. For example, “Learn” for climate resources, “Connect” for community forums or expert profiles, and “Track” for live data visualisations.
- Label each button with clear text and add alt-text descriptions or audio labels to support users with visual impairments. Arrange the icons and buttons logically, leaving sufficient space to make tapping easy and avoid accidental selections.

Add a Sample Data Preview

- Place a rectangle in the centre of the screen to serve as a “data preview” area where users can see dynamic content such as “Current Air Quality Levels,” “Weekly Temperature Trends,” or “Top Climate News.”
- Display the data with small but legible text, and consider adding options for text enlargement or voice narration to increase accessibility for all users.

Enhance with Colours and Borders

- Add borders around each button and icon to give the interface a polished, organised look. Choose colours that fit a climate-conscious theme, like friendly blues, greens, and whites, with high contrast to ensure easy readability for all text and icons.
- Include themes that consider users with colour blindness or low vision to enhance overall accessibility.

Review, Download, and Save

- Review the mock-up to ensure all elements are neatly aligned, readable, and user-friendly.
- Check that icons and labels are accessible and the layout is intuitive, encouraging users to explore the app’s features.
- Once the mock-up is finalised, download and save it, ready for feedback and future improvements.

Step 7: Test

- Share your prototype with classmates, teachers, or potential users to gather feedback.
- Ask if the system is user-friendly and intuitive to use, observe how they interact with the tool and what they find challenging or helpful.
- Use their insights to refine the design, making adjustments to improve ease of use, readability, and relevance.

Support: Use the resources in MM7: Problem to Pitch Space Design Challenge, Lesson 7 Test

- ITU (2022) AI and digital twins: Tools to tackle climate change [1:47 mins] https://www.youtube.com/watch?v=BQr593iCE
- PwCUS (2023) Reimagine your climate reporting capabilities [2:20 mins] https://www.youtube.com/watch?v=GTmLPvDe7UM
- Relevant Software (2023) Mobile App UI Design: An Expert’s Complete Guide for 2024
- https://relevant.software/blog/mobile-app-ui-design-guide/
- Tas, U. (2017) 6 Necessary Elements For Designing A Perfect Mobile App User Interface https://medium.com/@yunustas2607/6-necessary-elements-for-designing-a-perfect-mobile-app-user-interface-688cc31736f6
- United Nations (2024) SDG13 Targets and Indicator https://sdgs.un.org/goals/goal13#targets_and_indicators
- UNOOSA (2024) Decent Work and Economic Growth https://www.unoosa.org/oosa/en/ourwork/space4sdgs/sdg13.html