

MM7: SDG3 SPACE4SDGS HEALTH AND WELL-BEING



SDG 3: Good Health and Well-being – Remote Medical Support

- Remote Medical Support Create a telemedicine platform using satellite networks to deliver remote medical services and health monitoring for isolated or underserved populations.

Challenge

Design a telemedicine platform that uses satellite networks to provide remote medical services and health monitoring for isolated or underserved populations. Imagine you live in a place where doctors and nurses are hours away. What if you could see and talk to a doctor through your phone or a computer screen, even if you're far from a hospital? In this project, you'll be creating a platform that makes this possible, connecting people with healthcare professionals from anywhere using satellites in space. As you work on your project, consider the larger impact your design could have: how it could help save lives, reduce health disparities, and provide a new level of care to those who need it most.

Considerations

- User-Friendly Design: Make it easy for everyone, regardless of tech experience, to connect with medical professionals.
- Language and Literacy: Consider options for translating information or using icons for people who may not be able to read.
- Low Bandwidth Optimization: Design the platform to work well even with slow or limited internet connections.
- Offline Capabilities: Think about what features could work offline (like a way to store health information locally) until a connection is available.
- Safety and Privacy: Include secure ways to store and share sensitive health data, keeping it private and accessible only to authorised people.

Background

In many parts of the world, access to basic healthcare is challenging due to factors like geographical isolation, lack of medical facilities, and limited transportation options. For people living in remote areas, particularly in rural or underserved communities, seeing a doctor or nurse often requires traveling long distances, which can delay essential treatments and increase health risks. This gap in healthcare access can lead to worsening conditions, particularly for chronic illnesses, elderly populations, and those with limited mobility. One solution that is becoming increasingly important is telemedicine, which uses technology to connect patients and healthcare providers remotely. Through video consultations, remote diagnostics, and health monitoring, telemedicine platforms can help bridge these gaps by allowing people to receive medical advice, monitoring, and even treatment from a distance.



Telemedicine relies on internet connectivity, which is not always available in remote areas. That's where satellite networks come into play. Satellites in space provide internet connections that are not limited by physical infrastructure (like cell towers or fibre-optic cables). This makes it possible to deliver medical support to areas that are difficult to reach through traditional internet methods.

Using satellites, telemedicine platforms can allow people in underserved areas to connect with healthcare providers, even during emergencies or natural disasters when regular communication lines might be down. Through a combination of satellite technology and user-friendly software, telemedicine has the potential to make healthcare more accessible, timely, and effective for everyone, no matter where they live.

Your Mission

By designing a telemedicine platform for people who might not be familiar with technology, you'll need to consider what features are most important for patient safety, ease of use, and reliable operation. Imagine a simple app or platform where someone can speak to a doctor over video, enter health information (like symptoms, temperature, or heart rate), and receive advice right from their home. This isn't just about technology, it's also about understanding the needs of people in underserved communities, designing with empathy, and thinking about how to keep people's health information private and secure.

Questions to Consider

1. Understand the Users: Think about who will use this platform.
 - What kind of health problems are most common in isolated areas?
 - What kind of devices might they have access to (like basic smartphones or simple tablets)?
2. Design the Platform Features:
 - Video Consultations: Create a feature where patients can talk to a doctor or nurse through video.
 - Health Monitoring: Design a system for people to report their vital signs (like heart rate, temperature, etc.), possibly through wearable devices.
 - Medical Records: Include a way to keep a simple record of patients' health information that both patients and doctors can see.
 - Emergency Alerts: Have a way to send alerts if someone needs immediate help.
3. Use Satellite Networks:
 - Think about how satellite technology can help make these services reliable even in areas without good internet connections.
 - Consider how this could work during emergencies, like natural disasters.
4. Prioritise Privacy and Accessibility:
 - Think about how you will keep people's health information safe and private.
 - Make sure the design is easy to use, especially for people who may not be familiar with technology.

Design Process Overview

Step 1: Introduction: What is the available and Who are your users?

- Explore examples of satellite and app solutions for health care or telemedicine



- Think about how space technology can gather different data

Step 2: Empathy

- Create user profiles for the people you want to help.
What are their challenges, and what would help improve their lives?

Step 3: Defining the Problem

- Define the main problem that your project will solve. For example, is it access to education, markets, weather information for farming, or something else?

Step 4: Ideate

- Brainstorm different ideas for how your system could work. How would people use it? What kind of information would it provide?

Step 5: Ideate 2 – Good Idea / Bad Idea

- Refine your ideas. Focus on the most promising ones and think about how they could be even better or more accessible.

Step 6: Prototype

- Create a model or sketch of your satellite system or app. This could include the type of information it provides, how people interact with it, and what it looks like.

Step 7: Test

- Share your prototype with others to get feedback. Use their suggestions to make improvements and ensure it's easy to understand for your users

Deliverables

- User Profile: A description of a typical user or medical professional and their needs.
- System Overview: A one-page summary explaining how your system uses satellite data to support telemedicine.
- Prototype: A simple model or mock-up, such as a sketch or digital layout.
- Presentation: Share your system's impact on improving health and well-being

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



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.

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

Step 1: Introduction: What is the available and Who are your users?

- Use the Internet to explore examples of satellite and app solutions that support telemedicine
- Think about how space technology can reach people in ways that other services can't.

Step 2: Empathy: Create user profiles for the people you want to help. What are their challenges, and what would help improve their lives?



Support: Use the resources in MM7: Problem to Pitch Space Design Challenge, Lesson 2, Empathy

These prompts encourage learners to think about the experiences, needs, and emotions of people living in remote or underserved areas, helping them design a telemedicine platform that's truly user-centered and impactful.

User Persona Prompts for users of a telemedicine platform designed for remote medical support

- Identify the Needs of Different Users
 - Who are the people who might need this telemedicine service the most? Think about those living in isolated places, rural areas, or places with few doctors and hospitals.
 - What are some reasons these people may not be able to easily see a doctor? List some challenges like transportation, costs, or long distances.
- Daily Life in Isolated Areas
 - Imagine a typical day in the life of someone living in a remote village or rural area. What might their daily routine look like?
How might they usually handle health issues or emergencies?
 - What might be hard about staying healthy in an isolated place? Think about things like access to medicines, clean water, or basic health education.
- Different Users, Different Challenges
 - Think about how different groups might use telemedicine. How might elderly people, pregnant women, or young children need this service differently?
 - How might people with limited technology experience (like smartphones) feel when trying to use a health app? What features could help make it easy for them?
- Health Needs in Isolated Communities
 - What are some common health issues that might affect people in rural or underserved communities (like malnutrition, infections, or chronic conditions like diabetes)?
 - What kind of health monitoring would be helpful? Consider things like checking heart rate, blood pressure, or symptoms for common illnesses.
- Emergency Situations
 - Imagine an emergency situation, like an injury or an illness that needs immediate attention. How would someone in a remote area contact a healthcare provider using this platform?
 - How could a satellite network help in a disaster situation, like after a flood or earthquake, when people may be cut off from hospitals?
- Understanding Privacy and Comfort
 - How might people feel about sharing their health information over a platform? What privacy and security concerns might they have?
 - What would make users feel more comfortable and confident using a remote medical service for the first time?
- Limited Internet and Device Capabilities
 - Think about the challenges of using the internet in a remote place. What happens if the internet connection is weak or if users only have older phones?



- How might the platform look and feel if it needs to work on low-bandwidth connections or simpler devices? What basic features should it have?
- User Accessibility
 - How could language, literacy, or cultural differences affect the way people use this platform?
 - What visual aids or voice-guided features could help people understand and use it better?
 - Imagine a user who isn't comfortable reading. How would you design a feature that helps them check their vital signs or send a message to a doctor?
- Building Trust in Technology
 - How could this platform earn users' trust, especially if they are unfamiliar with technology or healthcare services?
 - What information or messages could help reassure users that they are safe and that their health information is secure?
- Feedback for Improvement
 - What questions might you ask users to understand if the platform meets their needs? How would you find out what works well and what could be improved?
 - What might users wish they had in a platform like this, even if they don't know exactly how to ask for it? Think about special features that could improve their healthcare experience.

Creating User Profiles

After working through the prompts, ask learners to create a user profile for a typical farmer who might use the system. This can include:

- Name, age, and location of the farmer
- A description of their daily challenges and pain points
- Technology they have access to and comfort level with digital tools
- Their specific needs for improving crop management
- An example of how they would use the system to make better farming decisions

Step 3: Defining the Problem: Define the main problem that your project will solve. For example, is it connecting people with healthcare professionals, submitting health data

Support: Use the resources in MM7: Problem to Pitch Space Design Challenge, Lesson 3, Define e.g. on the problem tree what are the root causes (isolation, lack of facilities, transportation issues) and the “branches” (worsening conditions, early childhood deaths) to show interconnected issues.

Step 4: Ideate: Brainstorm different ideas for how your system could work. How would people use it? What kind of information would it provide?

Step 5: Refine your ideas. Focus on the most promising ones and think about how they could be even better or more accessible.

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

Step 6: Prototype: Create a model or sketch of your satellite system or app. This could include

the type of information it provides, how people interact with it, and what it looks like.

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. Follow the steps in Canva to create a user Interface (UI) Mock-up for Satellite Solution

Steps in Canva:

1. Open a New Project:
 - Create a Custom Dimensions project, and set it to 1080x1920 pixels (this mimics a mobile screen format).
2. Set Up a Mobile Background:
 - In Elements, search for “mobile screen” to find a blank phone outline. Place it in the centre of the canvas.
3. Design the App’s Home Screen:
 - Inside the mobile frame, add a rectangle for a menu bar at the bottom and a circle or square near the top for the main icon or app name.
 - Use text to title this screen as “Video Consultations” or “Readings.”
4. Add Buttons or Icons for Key Functions:
 - Create buttons or icons for each function, such as Heart Rate, Temperature. Place each button within the phone screen as a tapable icon.
 - Label each icon clearly with small text beneath or beside it.
5. Add a Sample Data Preview:
 - Use a rectangle as a sample “data preview” section in the middle, where satellite data like “Weather Update: Sunny, 75°F” or “Fertiliser: 5 km away” would appear.
 - Use smaller text for this data to simulate a realistic UI (user interface) feel.
6. Enhance with Colours and Borders:
 - Add borders to each button/icon for a polished look, and apply a consistent colour theme (e.g., blue and white for a “tech” feel).
7. Review, Download, and Save:
 - Make sure everything is aligned neatly and easy to read.
 - Download the mock-up once it’s polished!

You can also use cardboard - Cardboard Prototyping | Techniques, [Cal Maritime Makerspace](https://www.youtube.com/watch?v=qxXj2RhKjZY) see <https://www.youtube.com/watch?v=qxXj2RhKjZY>

Or Paper Mobile Application Design : Paper Prototype Video, [Cor-mac](https://www.youtube.com/watch?v=y20E3qBmHpg) <https://www.youtube.com/watch?v=y20E3qBmHpg>

Step 7: Test: Share your prototype with others to get feedback. Use their suggestions to make improvements and ensure it’s easy to understand and helpful for your users.

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