

Design Thinking

Designing Solutions for Real Users

How can we design something people actually need and want to use?



From Data Science to Design Thinking

Data helps us understand problems. Design Thinking helps us create solutions.

Last lesson: Data Science Process



Ask questions



Collect data



Find patterns



Make decisions

Problem → Solution



Today: Design Thinking



Understand users



Create ideas



Test prototypes



Improve solutions



Can a solution be correct but still not useful for users?

Why Listening to Users Matters

A solution is only useful if people can use it.



too confusing



too detailed



unclear action



users may not use it



Good design starts with user needs.



Data Is Not Enough

Users need clear and useful information.



Problem:

The app shows many charts.



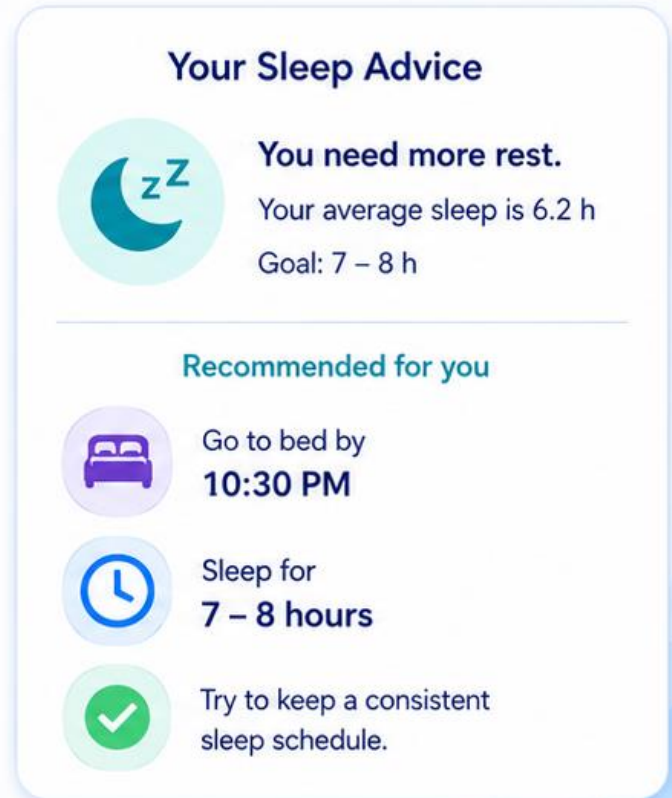
User reaction:

"I do not know what this means."



Better design:

Give clear advice users can act on.



Good design turns information into action.

Case Study: Fitness Sleep App

What did the athletes really need?

The app collected:



The problem:

Athletes did not understand the complex charts.



What users wanted:

- ✓ What time should I sleep?
- ✓ How long should I sleep?
- ✓ Am I getting enough rest?

Your Sleep Recommendation

Sleep
7h 45m

Go to bed by
10:30 PM

✓ Great! You're on track for better recovery.



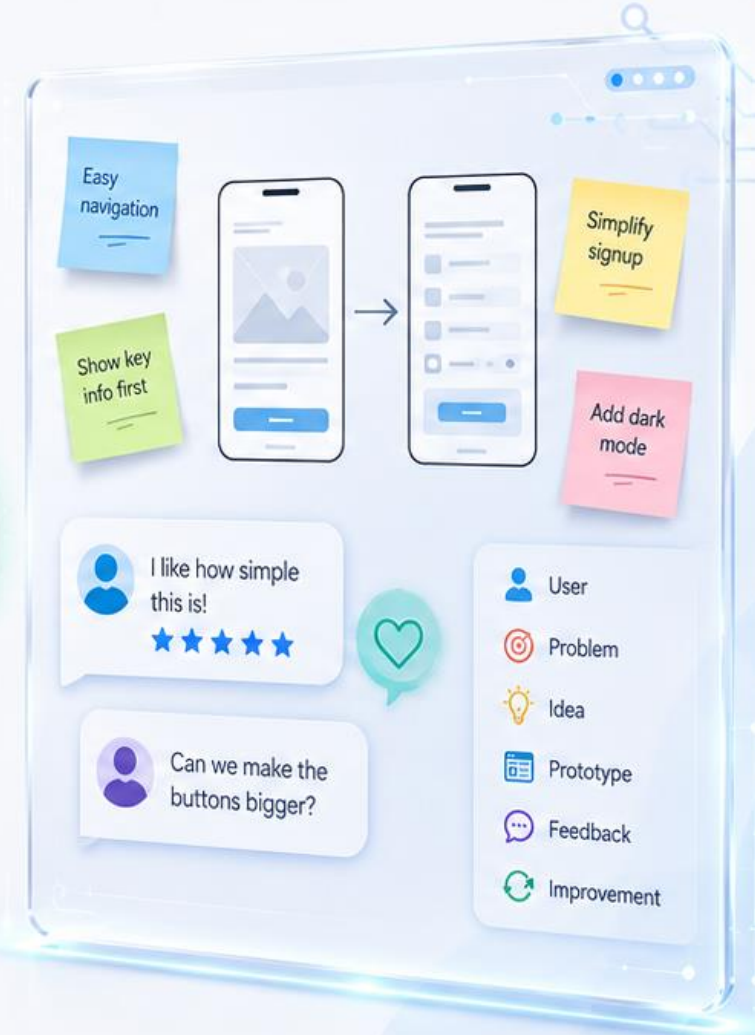
Good design turns complex data into clear, actionable advice.

What Is Design Thinking?

A process for solving problems with users in mind.

Design Thinking helps us:

- understand users
- define real problems
- create ideas
- test solutions
- improve designs



The Design Thinking Process

From user need to better solution



Start with users. Improve with feedback.

1. Empathize

Understand the user.

Ask:



Who is the user?



What problem do they have?



What do they need?



What is difficult for them?



Students want to save money, but they do not know where their money goes.



2. Define the Problem

Turn user needs into a clear problem.



Problem statement formula



User

Who is the user?



Need

What do they need?



Reason

Why is this important?

3. Brainstorm

Create many possible ideas.



Possible app features

- 1 Daily spending limit



- 2 Income and expense tracker



- 3 Category summary



- 4 Warning when spending too much



- 5 Saving goal



- 6 Weekly report



Rule:

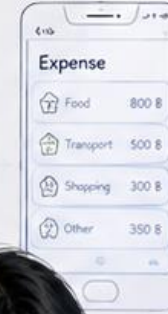
Do not choose the first idea too quickly.

MONEY SAVER APP

Easy to use

Clear summary

Motivate saving



Simple charts

Remind me



4. Prototype

Make a simple version before building the real app.



paper screen
sketch



app
mockup



simple
dashboard



clickable
design



A prototype is for testing ideas,
not for being perfect.



5. Test with Users

Feedback shows what works and what does not.

Ask users:



Is it easy to understand?



What is confusing?



What is useful?



What should be changed?



Feedback is information for improvement.

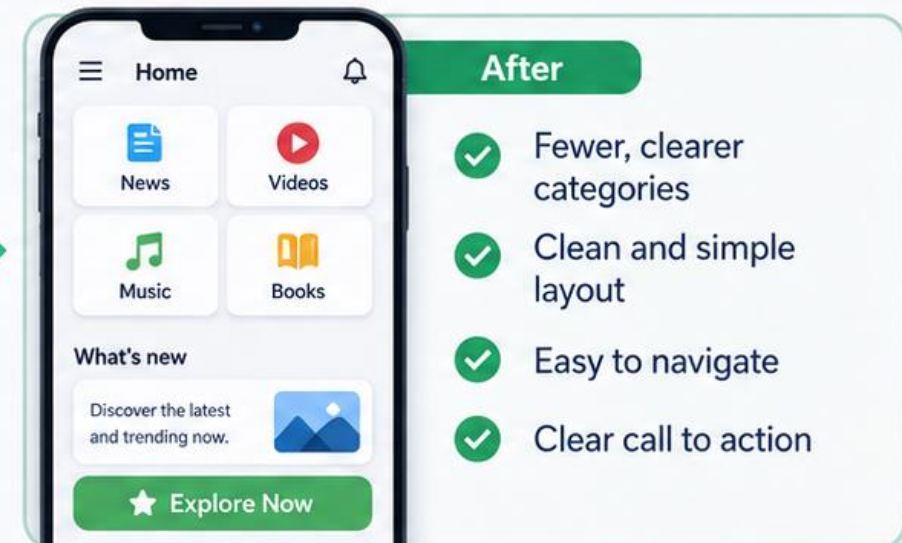
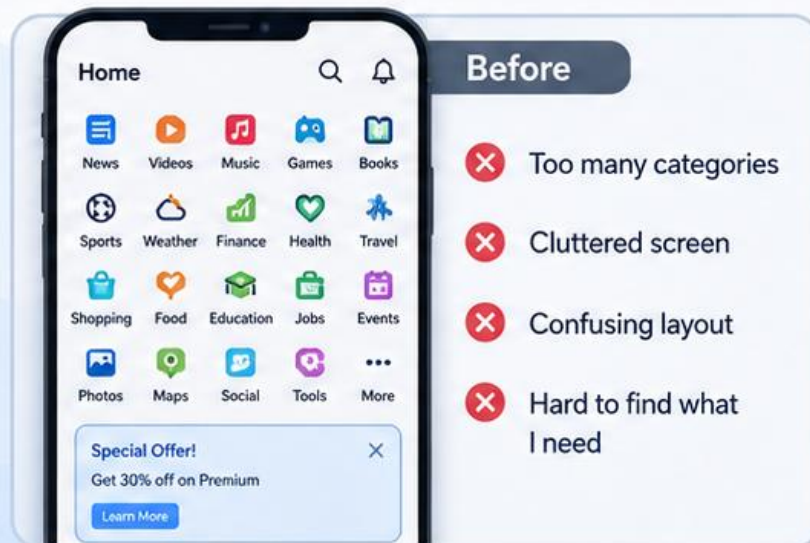


6. Improve the Design

Good products are updated many times.

Use feedback to:

- ✓ remove confusing parts
- ✓ simplify steps
- ✓ add useful features
- ✓ improve layout
- ✓ test again



Mary's Money-Saving App

Applying Design Thinking



Mary wants to help students save money.



Her first idea:

-  track income
-  track expenses
-  show spending categories
-  show how much money is left



?

What should Mary do before building the real app?

Mary Tests Her Prototype

Feedback helps improve the design.



Mary asks five friends to test the app.



Feedback:

- the design is easy to use
- expense categories are too detailed
- users want faster input



Improvement:

Mary simplifies the expense categories.

Feedback:



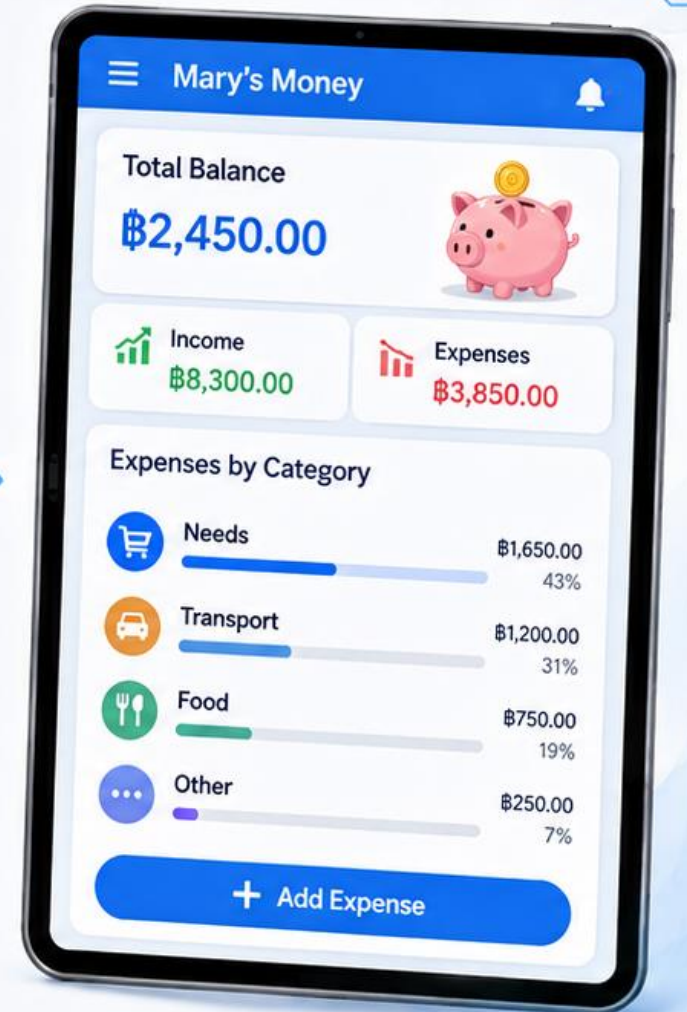
Easy to use



Too many categories



Make it faster



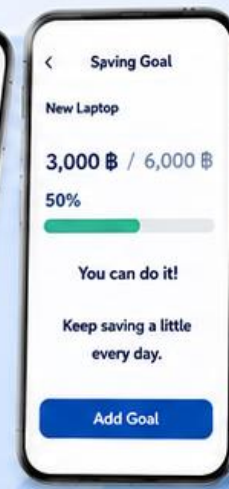
Mary simplifies the expense categories.

Design Challenge

Homework Project



Design a money-saving app prototype and create a short video explaining how your app helps students save money.



What to Submit



App Prototype

- 5 screens for your money-saving app.
- Paper sketches or digital tools.
- Clear features and buttons.



Short Explanation Video

- 1-2 minutes

- Explain:
 - ✓ The problem and user
 - ✓ Main screens and features
 - ✓ How your app helps
 - ✓ How Design Thinking helped your group improve



Peer Grading

Watch videos from other groups and grade using the rubric.



Grading Rubric (10 Points Total)

Teacher Grade (5 Points)	Points
Clear user problem	1
App idea matches the user need	1
Prototype screens are complete	1
App is easy to understand	1
Video explanation is clear	1
Total	5

Peer Grade (5 Points)	Points
The app is easy to understand	2
The app seems useful for students	2
The video explains the app clearly	1
Total	5

Design Thinking Process



Empathize
Understand users



Define
Find the real problem



Ideate
Think of ideas



Prototype
Make your design



Test
Get feedback from others



Improve
Make it better



Remember:

Good design starts with users and gets better with feedback!

Design Challenge

Create a simple money-saving app prototype.

1

Home /
Summary

2

Add
Income

3

Add
Expense

4

Spending
Categories

5

Saving Goal /
Advice



For each screen:



write the screen name



draw the layout



explain what the screen does



Work in groups.



20 minutes



What Did We Learn Today?

The Data Science Process helps us solve problems.

PM2.5 ($\mu\text{g}/\text{m}^3$)



1



Ask better questions

2



Collect useful data

3



Check data quality

4



Find patterns

5



Explain meaning

6



Present results clearly

7



Make better decisions

Average

28 $\mu\text{g}/\text{m}^3$

Data Points

1,248



Ask



Collect



Prepare



Explore



Explain



Present



Decide

Exit Ticket

Before you leave

1 What does empathize mean?

2 Why should designers test a prototype?

3 What is one way feedback can improve an app?

4 What is one screen your money-saving app should include?



Use today's lesson words.

