Lab 2: Heuristic Evaluation of a GUI Prototype + Live Redesign

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Aim

To evaluate the usability of a GUI prototype using Nielsen's 10 heuristics and redesign the interface to address identified issues.

Objectives

1. Select an existing GUI prototype (website or application screen).

2. Apply Nielsen's 10 usability heuristics to identify design flaws.

3. Document at least 5 heuristic violations with annotated screenshots.

4. Redesign the flawed interface using Figma, Balsamiq, or PowerPoint.

5. Compare before-and-after designs with usability justification.

6. Share redesigned screens for peer review.

Selected GUI Prototype

For this evaluation, the **IRCTC Train Ticket Booking Website (old version homepage)** was selected due to its wide usage and known usability issues.

Nielsen's 10 Heuristics

1. Visibility of system status

2. Match between system and the real world

3. User control and freedom

4. Consistency and standards

5. Error prevention

6. Recognition rather than recall

7. Flexibility and efficiency of use

8. Aesthetic and minimalist design

9. Help users recognize, diagnose, and recover from errors

10. Help and documentation

Identified Violations

Violation 1 – Cluttered Homepage (Heuristic 8: Aesthetic & Minimalist Design)
Issue: Too many links, banners, and pop-ups distract users.
Problem: Increases cognitive load, difficult for new users.
Fix: Simplify homepage, group related items into menus, reduce ads.

Violation 2 – Technical Language in Error Messages (Heuristic 2 & 9)
Issue: Messages like "Session expired due to error code 500".
Problem: Non-technical users cannot understand.
Fix: Use plain language: "Your session timed out. Please log in again."

Violation 3 – Poor Navigation (Heuristic 6: Recognition over Recall)
Issue: Users must remember navigation paths.
Problem: Increases memory load.
Fix: Add clear menu bar with frequently used actions visible.

Violation 4 – Lack of Undo/Back Options (Heuristic 3: User Control and Freedom)
Issue: Once you select wrong train/date, no simple undo option.
Problem: Frustrates users, forces restart.
Fix: Provide "Back" or "Edit Selection" buttons.

Violation 5 – Inconsistent Button Labels (Heuristic 4: Consistency & Standards)
Issue: "Submit", "Proceed", and "Go" used interchangeably.
Problem: Confuses users.
Fix: Use consistent action labels like "Continue" throughout.

Redesign (Screenshots / Mockups)

The redesigned interface addresses the above issues:

- Clean homepage with reduced clutter and clear categories.

- User-friendly error messages in plain English.

- Fixed top navigation bar for recognition.

- Undo/Back option included on all booking steps.

- Standardized button labels ("Continue", "Back").

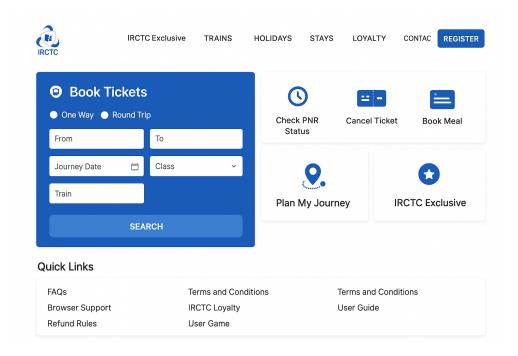fascm

Figure 1: Original IRCTC Homepage (Before Redesign)

Figure 2: Redesigned Homepage (After Redesign)

Before vs After Comparison

Heuristic Violation	Before (Problem)	After (Redesign)	Usability Justification
Minimalist Design	Cluttered homepage with too many elements	Simplified layout with clear categories	Reduces cognitive load
Error Messages	Technical jargon like "Error 500"	User-friendly: "Session expired, please log in again."	Increases clarity
Navigation	Users must recall hidden paths	Top navigation menu always visible	Supports recognition
User Control	No undo option in booking	Added "Back" and "Edit" buttons	Increases freedom and reduces frustration
Consistency	Different button labels ("Submit", "Proceed")	Standardized to "Continue"	Improves predictability
Minimalist Design	Cluttered homepage with too many elements	Clean layout with single booking panel and quick links	Reduces cognitive load and improves focus

Conclusion

The heuristic evaluation identified multiple usability flaws in the old IRCTC interface. By applying Nielsen's heuristics, the redesigned prototype improved clarity, reduced user cognitive load, increased consistency, and enhanced overall user experience.