

Project 2: Smartphone Based TV Remote

Executive Summary

Objective: The project aimed to improve the user experience of navigating smart TV interfaces through a smartphone-based remote control application.

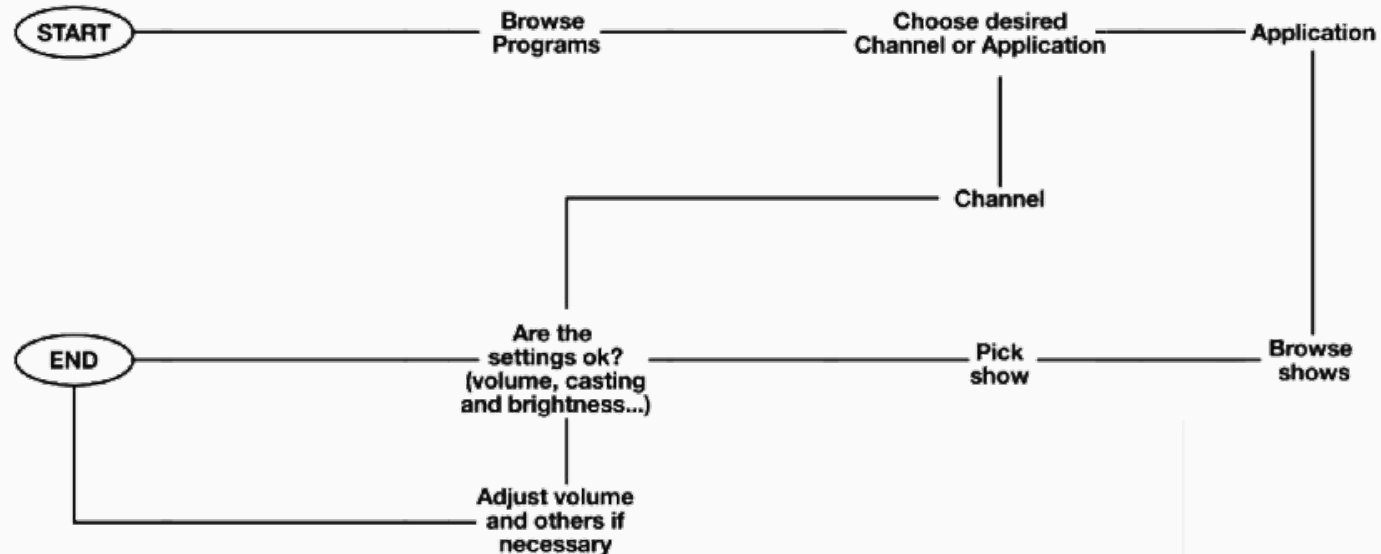
Key Findings: Initial user observations revealed challenges with traditional TV remotes, including excessive clicks and user confusion.

Approach: Benchmark testing and A/B testing were conducted to assess usability and refine prototypes.

Outcome: Iterative refinement led to the development of a final prototype, offering streamlined navigation and enhanced user experience.

Key Takeaway: User-centered design principles and iterative testing were instrumental in creating an impactful solution.

User Journey Map



Benchmark Testing

Overview: The benchmark testing phase aimed to identify usability issues and gather data to inform iterative improvements.

Tasks and Metrics: Users were tasked with common TV-related actions, such as turning on the TV, changing channels, and adjusting volume. Metrics included the number of clicks and deviations from expected paths.

Observations: Users struggled with tasks requiring navigation to specific features, such as turning on the TV and switching channels. Confusion arose from unclear labels and interface layout.

Concerns: Issues included suboptimal button placement, complicated navigation, and user confusion regarding remote functionality.

Solutions: Recommendations included placing power buttons prominently on all pages, providing clearer feedback on device status, and simplifying remote access.

Key Insights: Users demonstrated a preference for intuitive navigation and clear feedback. Improvements focused on enhancing usability and reducing cognitive load

Data Collected from Benchmark Testing

	Expected Path in Clicks	User 1	User 2	User 3	User 4
Task 1	3	3	7	3	5
Task 2	4	4	5	4	5
Task 3	2	2	2	2	2
Task 4	3	3	3	9	3
Total	12	12	17	18	15

Table 1, Deviations During Tasks and Number of Clicks for Each User, per Task

Legend

User Deviated	
User Did Not Deviate	

Experimental Design for A/B Testing

Objective: The A/B testing aims to compare the effectiveness of two prototypes (A and B) in improving smart TV navigation, focusing on reducing unnecessary clicks and errors.

Hypothesis: Prototype B will outperform Prototype A in reducing clicks and errors due to its streamlined interface and intuitive design.

Independent Variables: The design variations between Prototype A and Prototype B, including layout, button placement, and navigation features.

Dependent Variables: The number of clicks required to complete tasks, the number of deviations from expected paths, and user comfort and satisfaction.

Measuring Dependent Variables: Tasks will be predefined, and the number of clicks and deviations will be recorded during user interactions. User feedback surveys will gauge comfort and satisfaction.

Anticipated Confound Variables: Users' familiarity with the interface may impact their performance. Counterbalancing and screening questions will help mitigate this effect.

Statistical Analysis: T-tests will be conducted to compare the means of clicks and errors between Prototype A and Prototype B, with an alpha level set at 0.05. Additionally, qualitative feedback will supplement quantitative data to provide deeper insights.

A/B Testing Results

Objective: Evaluate Prototype A vs. Prototype B for smart TV navigation efficiency.

Findings:

- Prototype A had fewer clicks on home screen tasks.
- Prototype B's program page favored for intuitive scrolling.
- No significant difference in error reduction.

Analysis:

- T-tests showed Prototype A statistically superior for home screen tasks ($p < 0.05$).
- User feedback highlighted preferences for specific features.

Conclusion:

- Prototype A excels in reducing clicks on home screen.
- Prototype B's program page layout preferred for ease of use.
- Suggested hybrid solution combining strengths of both prototypes.

Number of Errors	User 1	User 2	User 3	User 4	User 5	User 6	User 7	User 8	User 9	User 10
Task Aa	0	0	0	0	0	4	2	0	4	4
Task Ba	0	0	0	3	0	0	4	0	4	0
Task Ca	0	0	0	0	0	1	1	1	1	0
Task Ab	0	0	0	0	1	0	5	0	0	0
Task Bb	0	0	0	5	0	0	0	6	0	2
Task Cb	0	3	2	3	0	2	3	0	0	0

Number of errors per user for each task

Question 1	Question 2		Question 3		Question 4		Question 5		Question 6		
Mean	4.4		Mean	4.1		Mean	3.8		Mean	4.2	
Standard Err	0.22110832		Standard Err	0.27688746		Standard Err	0.32659863		Standard Err	0.34801022	
Median	4.5		Median	4		Median	4		Median	4	
Mode	5		Mode	5		Mode	5		Mode	4	
Standard Dev	0.6992059		Standard Dev	0.87559504		Standard Dev	1.03279556		Standard Dev	1.10050493	
Sample Vari	0.48888889		Sample Vari	0.76666667		Sample Vari	1.06666667		Sample Vari	1.21111111	
Kurtosis	-0.1461039		Kurtosis	-1.7337294		Kurtosis	-0.8956473		Kurtosis	-0.5216011	
Skewness	-0.7801058		Skewness	-0.2234505		Skewness	-0.2723191		Skewness	-0.8628233	
Range	2		Range	2		Range	3		Range	3	
Minimum	3		Minimum	3		Minimum	2		Minimum	2	
Maximum	5		Maximum	5		Maximum	5		Maximum	5	
Sum	44		Sum	41		Sum	38		Sum	41	
Count	10		Count	10		Count	10		Count	10	

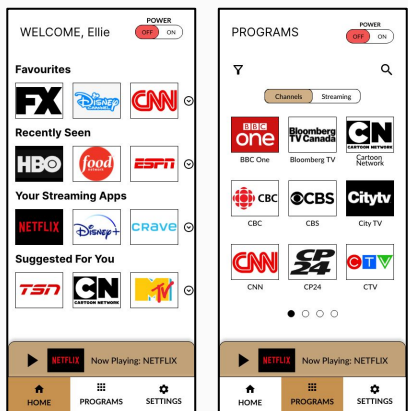
Measures of spread and centrality, for the post-survey results

Prototype Summary & Description

Prototype A:

Home screen: Channels categorized in horizontal rows

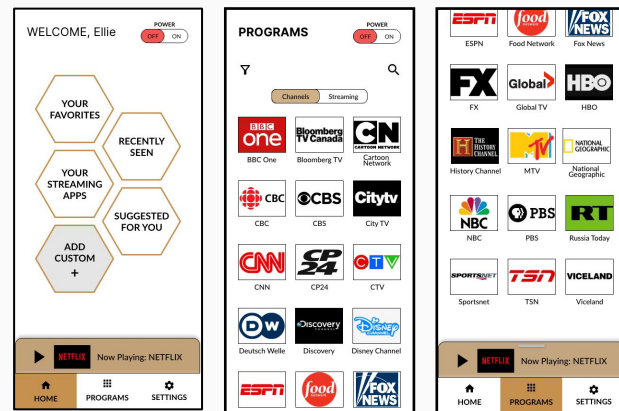
Programs page: Grid layout across multiple pages



Prototype B:

Home screen: Categories displayed in hexagons

Programs page: Scrolling instead of swiping



Conclusion

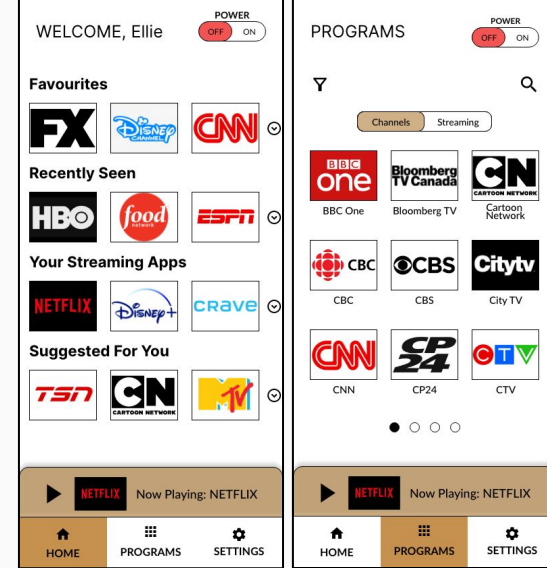
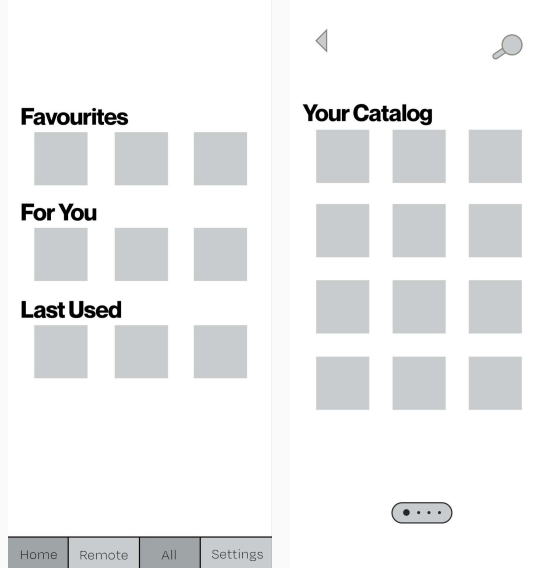
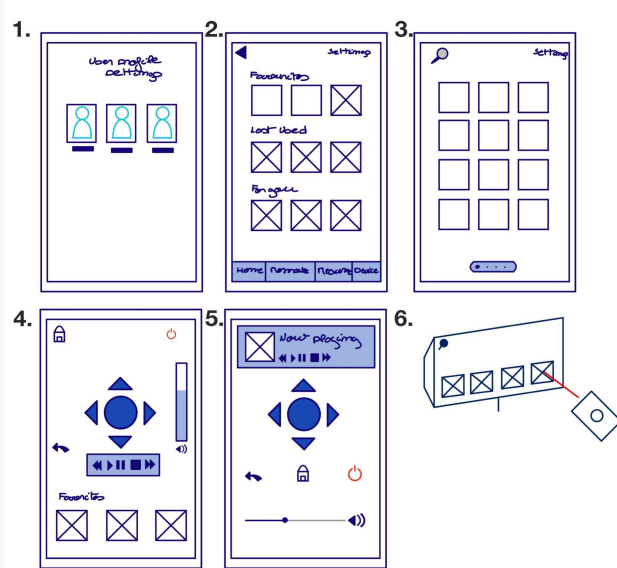
Prototype A demonstrated fewer clicks and errors on the home page due to clearer information presentation.

Prototype B's infinite scrolling on the programs page was favored by users for its intuitive navigation.

No significant difference in error reduction between prototypes.

Focus on features promising click reduction for final prototype development.

The Design Evolution



The Final Design

