Visual Card Sorting in UX Research

A Product Case Study for Home Page Layout in the SCOPE Simulator

# Executive Summary

This case study explores the introduction of layout questions into the **SCOPE Simulator**, an open-source UX research platform. Instead of acting as a direct digital replacement for card sorting, this feature adapts the methodology into a visual abstraction. Traditional card sorting groups concepts into categories to reveal user mental models of information architecture. In contrast, the questions produced in this case study ask participants to locate where on an abstract homepage they would expect to find a function or piece of information. By capturing these choices spatially, SCOPE opens new opportunities for studying user expectations in layout and navigation, while remaining true to its mission of enabling extensible, bias-conscious UX research.

## Background & Problem Statement

Card sorting has been a cornerstone method for decades in information architecture research, offering insights into how people classify and retrieve information. Yet it is inherently categorical, relying on the sorting of concepts into groups. This makes it powerful for taxonomy design, but less suited for studying spatial or layout-driven expectations. Furthermore, existing card sorting tools are often costly or cumbersome, limiting accessibility for smaller teams or open-source communities.

The SCOPE Simulator is able to address such barriers through its open and extendable format. It provides an open platform for testing user intuition across a range of interface challenges. With its plugin-based architecture and abstract design philosophy, SCOPE aims to foster research that is lightweight, adaptable, and focused on perception rather than aesthetics. Within this vision, the opportunity arose to extend the card sorting concept into a new modality: one that asks not only what goes together, but also where users believe it spatially belongs.

## Methodology & Implementation

The questions employ an abstract homepage diagram composed of geometric blocks representing typical site sections such as headers, hero areas, and feature panels. Instead of specific interface elements, the diagram provides neutral placeholders, ensuring that responses are not driven by visual styling choices. Participants are presented with contextual prompts (e.g., where they would sign up, log in, or look for pricing, etc.) and asked to indicate the region of the layout that feels appropriate.

Technically, this is implemented as a React component (HomepageDiagram.tsx) that captures precise click coordinates. Each response is stored with spatial data that can be analyzed for clustering, consistency, and divergence. The questions are fully configurable through SCOPE’s JSON-based system, meaning researchers can adapt them to new contexts or extend them with additional scenarios. This initial implementation is integrated into the SCOPE repository, making it readily available for community use, expansion, and experimentation.

## Prototype Outcomes

As a proof of concept, the questions illustrate how an abstracted, visual version of card sorting can generate novel insights. Where card sorting tells us which concepts belong together, this approach captures not only what belongs together, but also where users expect to find them within a spatial frame. The outcome is a dataset that lends itself to heatmaps and spatial analysis, revealing whether expectations align with common design conventions or diverge in meaningful ways.

At present, no user testing has been conducted, so outcomes are limited to demonstrating technical feasibility. Still, the potential is clear: by moving from categories to coordinates, SCOPE expands the researcher’s toolkit for exploring mental models of interface design.



Figure : Abstract Homepage Layout

## Discussion & Implications

This adaptation of card sorting into a spatial, abstracted form represents an important step toward studying how users interpret layout rather than taxonomy. For design teams, it provides a way to validate assumptions about navigation placement and information hierarchy before committing to high-fidelity prototypes. For researchers, it illustrates how abstract representations can strip away bias and focus attention on intuition and convention.

The implementation also ties directly into SCOPE’s broader goals. By leveraging its modular plugin system, researchers can extend this approach into mobile layouts, e-commerce workflows, or culturally specific design conventions. Future enhancements, such as analytics dashboards and AI-generated summaries, will make it possible to automatically visualize and interpret the results quickly and easily.

## Limitations & Future Work

As a prototype, this work has several constraints. The abstraction has not yet been validated through user testing, and further studies are needed to confirm whether bias is reduced compacts to high fidelity designs in a similar framework. The current scope is limited to single-page homepage layouts, leaving multi-step journeys and domain-specific interfaces for future development. Accessibility considerations also remain to be addressed, ensuring that abstract diagrams can be interpreted by screen readers and other assistive technologies.

## Conclusion

The question framework in SCOPE Simulator demonstrates how traditional UX methods can be reimagined for new research needs. By abstracting card sorting into a spatial exercise, SCOPE offers a novel way to capture user expectations about where information and functionality should reside. Although still at the prototype stage, its availability in the open-source repository provides a foundation for others to explore, validate, and extend. In doing so, it advances the broader mission of SCOPE: to create accessible, extensible tools for understanding perception, intuition, and interaction in digital design.

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