CS-639 — Interaction Design Studio

Navigation, IA & Intelligent Collaboration*

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Week 6: How Intelligence Collaborates

— **Last week:** Flow design — and how intelligence intervenes (P6, P7, P8)

— **This week:** Navigation & IA — and how intelligence collaborates (P9, P10)

Two final principles. How should users correct the system? How should control shift between human and AI?

Slide Color Guide

Today's lecture weaves together two threads. The slide colors tell you which one you're in:

— **Orange slides** — Intelligence Principles (P9, P10)

— **Dark slides** — Design Fundamentals (navigation, IA)

— **Light gray slides** — Bridges connecting the two

Same structure every week. Principles first, then fundamentals, then synthesis.

P9 — User Correctability

Give users clear ways to teach and correct the system.

When the system gets it wrong, users should be able to fix it — and the system should learn from the correction.[2]

[2] Amershi et al. (2019), G15 · Google PAIR Guidebook, Feedback patterns

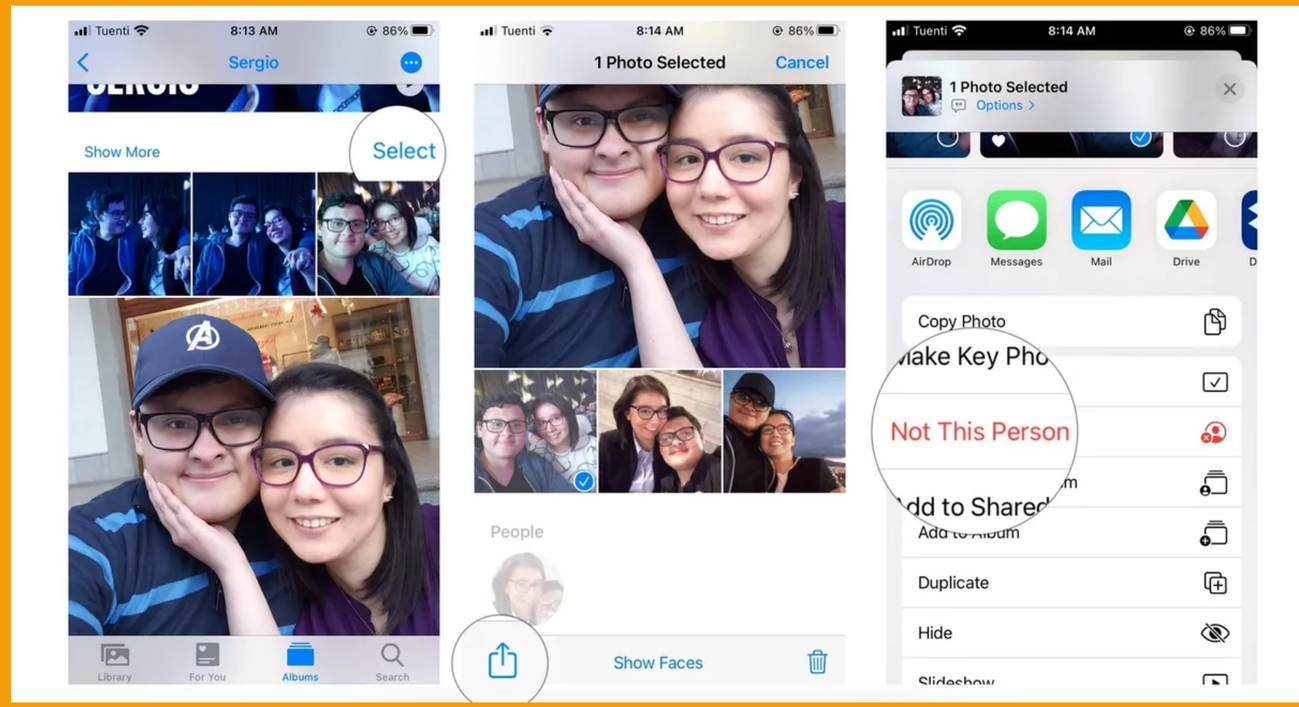
P9 in Practice: Apple Photos — "Not This Person"

— Photos groups faces automatically using on-device ML

— Misidentified? Tap the face → "Not This Person"

— User directly teaches the model who someone is

— Correction is immediate, persistent, and improves future grouping



P9: Correction Patterns

Pattern	What It Does	Example
Thumbs up/down	Binary feedback	Netflix, Spotify, YouTube
Not interested	Removes category/topic	Instagram Explore, Google News
Edit suggestion	Refines the output	Autocorrect "learn this spelling"
Undo automation	Reverses system action	Gmail "Undo send," Smart Compose reject
Explicit teaching	User provides new rule	Mail filters, Smart Home routines

Design question: How many levels of correction does your system offer?

P10 — Smooth Initiative Transitions

Design clear patterns for shifting control between user and system.

When initiative moves from human to AI or back, the transition should be visible, predictable, and reversible.[3]

[3] Horvitz (1999), Mixed-initiative principles · Hearst (1999), Mixed-initiative interaction

P10 in Practice: Apple Watch — Fall Detection

— System monitors motion passively (system initiative)

— Fall detected → screen alert with two options (system proposes)

— "I'm OK" → user dismisses, system stands down (user decides)

— "Emergency SOS" → user confirms, system calls services (user delegates)

P10: The Initiative Spectrum

Level	Who Leads	Example
Manual	User does everything	Text editor, calculator
Suggestion	System suggests, user decides	Smart Compose, autocomplete
Negotiation	Both propose and refine	"Faster route available — accept?"
Supervised automation	System acts, user monitors	Cruise control, spam filter
Full automation	System acts independently	Auto-brightness, spam deletion

Most good designs live in the middle — suggestion and negotiation.

From Principles to Fundamentals

Now we'll learn **navigation & information architecture** — how to organize and connect content.

Notice how navigation connects directly to P9 and P10:

— **Adaptive navigation** → How does the system personalize paths? Can users correct it? (P9)

— **Navigation state** → Who controls where the user goes next? (P10)

— **Wayfinding** → Can users always find their way, even when the system adapts?

Information Architecture

Organizing content so users can find it

What Is Information Architecture?

IA is the structural design of information — how content is organized, labeled, and connected.

— **Organization:** How is content grouped?
— **Labeling:** What are things called?
— **Navigation:** How do users move between groups?
— **Search:** How do users find specific things?

Four Structural Patterns

Every screen in your app falls into one of these categories.

Pattern	Purpose	Example
Single item	Focus on one thing	Article, photo viewer, video player
List / collection	Browse a set of items	Feed, search results, file browser
Creation tool	Make or edit something	Text editor, drawing canvas, form
Task facilitator	Complete a multi-step process	Checkout, onboarding, settings

Combining Structures

Real apps don't use just one pattern — they combine them.

App	Structures Used
Gmail	List (inbox) + Single item (email) + Creation (compose) + Task facilitator (settings)
Spotify	List (playlists) + Single item (now playing) + Task facilitator (search/filter)
Figma	Creation (canvas) + Task facilitator (properties panel) + List (layers, assets)

— Each screen has a **primary** structure — that determines its layout

— Secondary structures appear as panels, modals, or embedded sections

— The IA organizes which structures connect to which

Wayfinding

Wayfinding: Helping users understand where they are, where they can go, and how to get back.

Three key questions:

— Where am I?
— Where can I go?
— How do I get back?

Design tools:

— Breadcrumbs
— Highlighted current location
— Back buttons / navigation history
— Clear visual hierarchy
— Consistent placement

Navigation Cost

Every navigation action has a cognitive and time cost.

Cost Type	What It Means	Example
Context switch	Shifting mental model to a new space	Leaving a document to find settings
Error recovery	Wrong path → backtrack → try again	Tapping the wrong tab, hunting for a feature
Delay	Loading, searching, scrolling	Waiting for a page to load after each tap
Memory load	Remembering where things are	"Was it under Settings or Profile?"

Minimizing Navigation Cost

Good navigation minimizes total cost to reach any destination.

— Fewer steps isn't always cheaper — one clear step beats three ambiguous ones

— Visible labels reduce memory load; consistent placement reduces error recovery

— Intelligence can reduce cost (shortcuts, predictions) — or increase it (moving things, unexpected changes)

The test: Can a first-time user reach any screen in 3 taps or fewer?

Navigation Principles

1. Visibility

— Show available options
— Highlight current location
— Make navigation persistent

2. Predictability

— Consistent placement across screens
— Labels match destinations
— Same patterns throughout the app

3. Efficiency

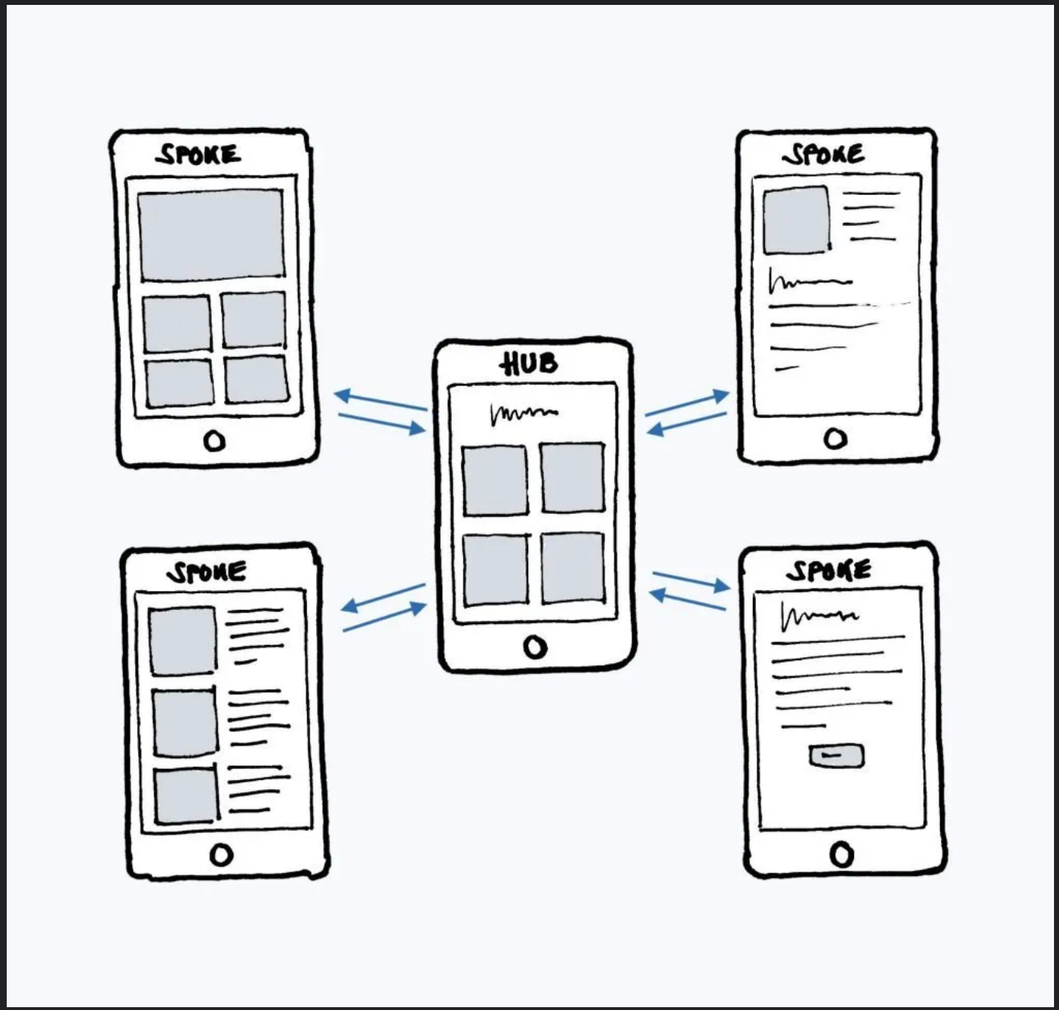
— Minimize steps to any destination
— Provide shortcuts for frequent paths
— Support both browsing and searching

Navigation Models

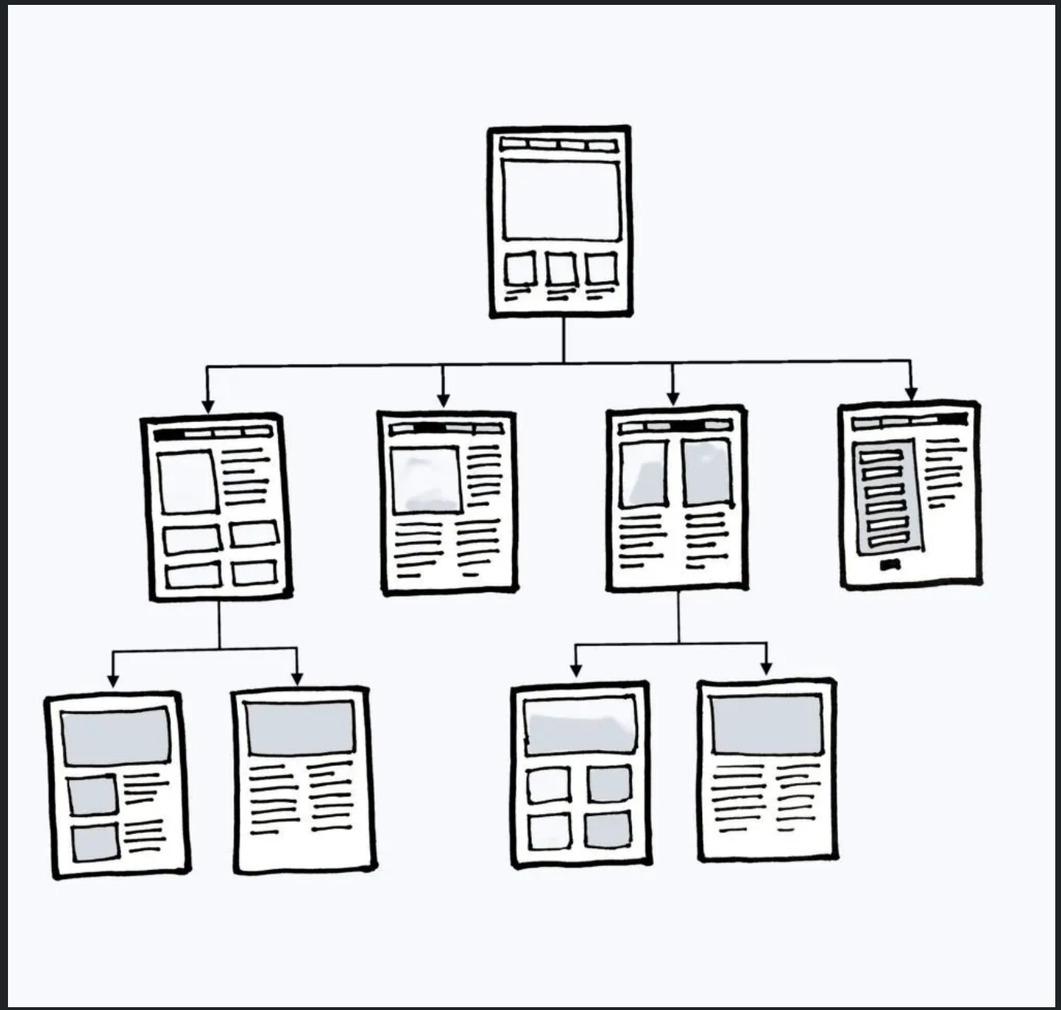
Different structures for different needs.

Model	Structure	Best For
Hub and spoke	Central screen, branch out and return	Mobile apps (iPhone home screen)
Fully connected	Every screen links to every other	Small apps, dashboards
Multi-level	Hierarchical tree structure	Settings, file systems, large content
Stepwise	Linear sequence, forward/back	Onboarding, checkout, wizards
Flat navigation	Tabs or bottom bar, all top-level	Most mobile apps (Instagram, Spotify)

Hub and Spoke



Multi-Level



Navigation Patterns for Intelligent Systems

Three patterns that become especially important when intelligence is involved.

Pattern	What It Does	Why It Matters for AI
Escape hatch	Quick return to a known state (home, undo) without backtracking	When AI takes users somewhere unexpected, they need a reliable way out
Clear entry points	Direct access to frequent or predicted destinations	AI can surface smart entry points — but the base set must stay stable (P5)
Modal panel	Temporary overlay on a flat workspace — focused task, then dismiss	Natural container for AI-initiated interactions — system proposes, user engages or dismisses (P10)

These three patterns are your safety net. Every intelligent navigation system needs escape hatches and clear entry points.

Navigation Aids

Global navigation:

— Top bar / bottom tabs

— Sidebar / hamburger menu

— Always visible, always consistent

— Primary way users move

Utility navigation:

— Settings, help, profile

— Secondary, less frequent

— Often in corners or menus

Associative navigation:

— "Related items," "See also"

— Content-driven connections

— Keeps users exploring

In-Class Activity: Navigation in the Wild (5 min)

Pull out your phone. Pick 2–3 apps you use daily.

For each app, identify:

1. **Navigation model** — hub-and-spoke, flat, multi-level, stepwise, or a combination?
2. **Navigation aids** — what's global? Utility? Associative?
3. **Adaptive elements** — does the app personalize any navigation? ("For You," recent, suggested?)

Compare with a neighbor — did you identify the same models?

Navigation in Intelligent Systems

Intelligence personalizes navigation — but it must not break wayfinding.

The key principle: Personalization should accelerate, not relocate.

— Adaptive elements add shortcuts — "Recently used," "Suggested for you"

— Core navigation stays stable — menus, tabs, structure don't move

— Users can always fall back to known paths

— Personalization is a layer, not a replacement

P9 + P10 in Navigation

Navigation Element	P9 (Correctability)	P10 (Initiative Transitions)
Suggestions	"Not interested" / dismiss	System suggests → user accepts/rejects
Adaptive shortcuts	"Remove from frequent"	System adds → user can remove
Search results	"Show fewer like this"	System ranks → user refines
Onboarding flow	"Skip this step"	System guides → user takes over

Every adaptive navigation element needs both a correction mechanism (P9) and a clear handoff (P10).

The Fundamentals–Intelligence Connection

Navigation Concept	Intelligence Application	Principle
Wayfinding	Can users still find their way when the system adapts?	P5
Navigation cost	Does AI reduce cost (shortcuts) or increase it (moving things)?	P8
Combining structures	Can AI shift emphasis between structures based on context?	P6
Escape hatch	Can users always get out when AI takes them somewhere unexpected?	P9
Clear entry points	Can AI surface smart shortcuts without removing stable ones?	P5, P10
Modal panel	Does AI use temporary overlays for suggestions, not permanent changes?	P1, P10
Navigation aids	Where do adaptive elements live? (Usually associative — not global)	P1

Intelligence Design Principle Cards — Complete!

Today, we've added the final **2 cards** — you now have the full P1–P10 set.

Week	Principles	Design Lens
W03	P1 Subordinate Intelligence, P2 Efficient Dismissal	How intelligence appears
W04	P3 Honest Capabilities, P4 Uncertainty, P5 Predictable Adaptation	How intelligence adapts
W05	P6 Contextual Awareness, P7 Explain When Needed, P8 Timely Intervention	How intelligence intervenes
W06	**P9 User Correctability, P10 Smooth Initiative Transitions**	**How intelligence *collaborates***
W08–09	P11, P12 (generative AI)	How intelligence generates

Your core framework is complete. P1–P10 will guide every design decision from here on.

Analog + Digital: How You'll Work from Here

You're not leaving your sketchbook behind — you're adding a second tool.

— **Always start analog.** Sketch first. Explore ideas with markers and paper — it's faster, cheaper, and keeps you focused on structure, not polish.

— **Move to digital when the design is mature.** Once your layout, flow, and IA decisions are solid, translate to Figma for hi-fi precision, interaction, and testing.

— **Both materials get submitted.** Later assignments will ask for analog sketches (process) and Figma screens (final). Your sketchbook shows how you think; Figma shows what you built.

Analog = explore and decide. Digital = refine and deliver.

Building Assignment 1: Navigation & IA

Add navigation structure to your A1 app

What You're Building Today

Use your Assignment 1 domain. Today you add the navigation and IA layer — the structural backbone of your app.

This is Part 2 of your Foundations Portfolio. No separate submission — this work goes directly into Assignment 1.

By the end of today, your A1 should have:

— An IA diagram showing how screens connect
— A navigation model labeled
— Consistent navigation elements across screens
— An adaptive layer with P9/P10 annotations

Three Steps (Same as Last Week)

1. **IA Diagram** (15 min) — Draw a structural map of your A1 app: boxes for screens, arrows for connections. Label each screen and mark your navigation model (hub-and-spoke, flat, multi-level, etc.). This is a diagram, not screens — show how everything connects.
2. **Screen Design** (20 min) — Refine your A1 screens with consistent navigation. Apply all fundamentals (hierarchy, grid, spacing, color, flow). Show navigation elements (tabs, bars, menus) in the same position on every screen.
3. **Adaptive Layer** (10 min) — Switch markers. Add personalized elements (suggestions, shortcuts, reordering). Annotate with P9/P10 tags.

The test: remove the adaptive layer — does the navigation still work? Can users correct every adaptive element?

Before Wednesday

— **Continue** your A1 design — sketch your IA diagram and navigation structure

— **Set up:** Create a free Figma account (Education plan — free)

— **Reflection due Wednesday:** Navigation & Intelligence Analysis — analyze a real app's navigation system + P9/P10

— **Bring** your principle cards (P1–P10 — full set!) and your A1 sketches

Wednesday is the Figma Workshop — you'll start translating your A1 screens to digital.

What's Next?

— **Wednesday:** Figma Workshop (TA-led) — start translating your A1 screens to digital

— **Reflection due Wednesday:** Navigation & Intelligence Analysis (submit on Canvas)

— **By end of this week:** Aim to have at least 1 A1 screen translated to Figma

— **No separate studio submission** — all work feeds into A1 (due Monday, March 9)

— **Next week:** Intelligence as Design Material — the bridge

References

Design Fundamentals:

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— Rosenfeld, L., Morville, P. & Arango, J. (2015). Information Architecture (4th ed.)

— Krug, S. (2014). Don't Make Me Think — Navigation predictability

— Material Design — Navigation

Intelligence Design:

— Horvitz, E. (1999). Principles of Mixed-Initiative User Interfaces — Initiative transitions

— Hearst, M. (1999). Mixed-Initiative Interaction — Collaboration patterns

— Amershi, S. et al. (2019). Guidelines for Human-AI Interaction — G15

— Google People+AI Guidebook — Feedback patterns

Media Sources

Apple Photos "Not This Person" | Apple Watch Fall Detection | Hub and Spoke / Multi-Level IA diagrams