

Building User Interfaces

Interaction Design

Structure, Layout, & Navigation

Professor Bilge Mutlu

Announcements

- React 1 α and React 1 β deadlines extended: *Thursday* \rightarrow *Sunday*
- Review sandbox code (e.g., CodePen) provided in lectures

What we will learn today?

- Interaction structure
- Visual layout design
- Principles of navigation

Interaction Structure

Information Architecture

Definition: The design of the organizing principle of an interactive system.

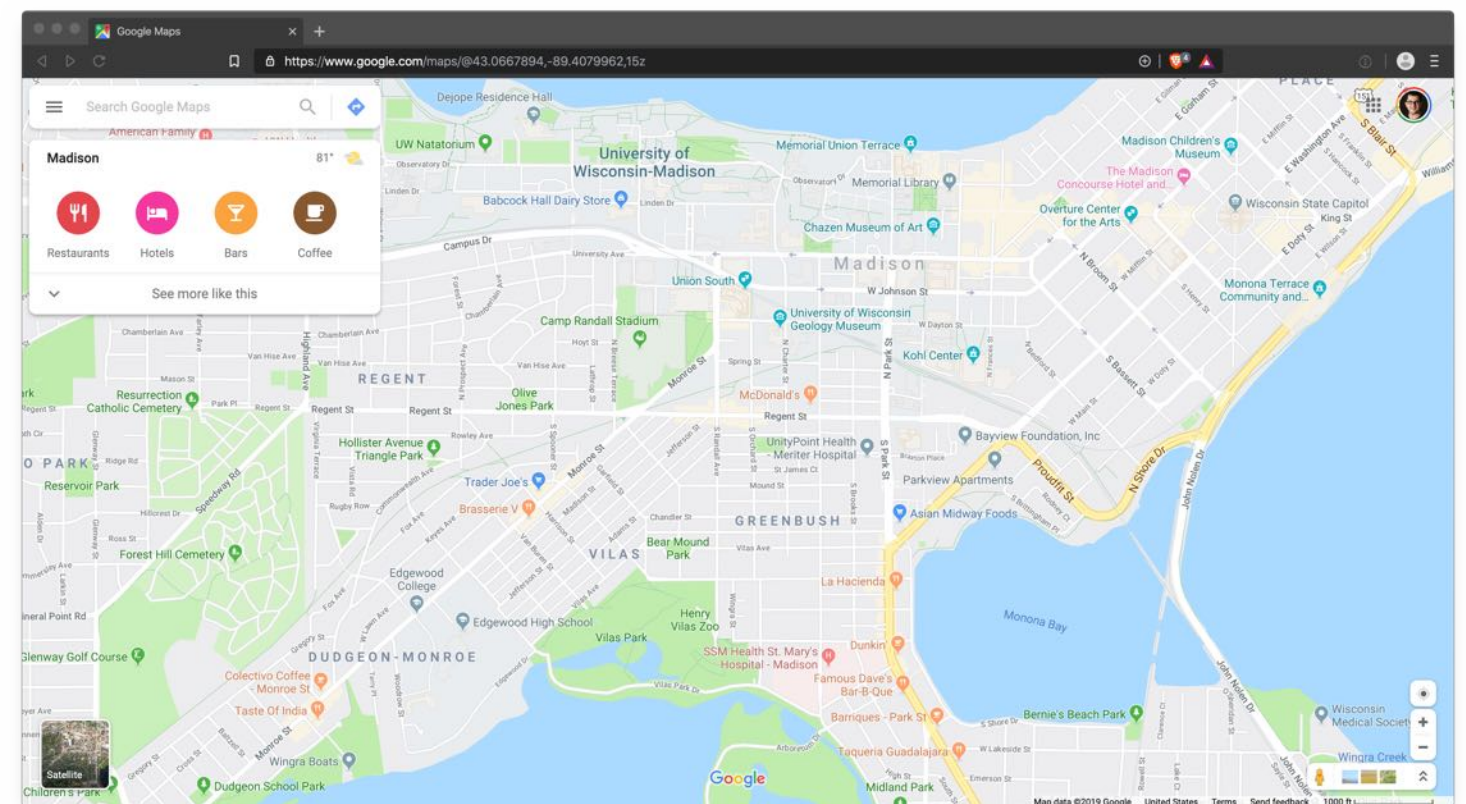
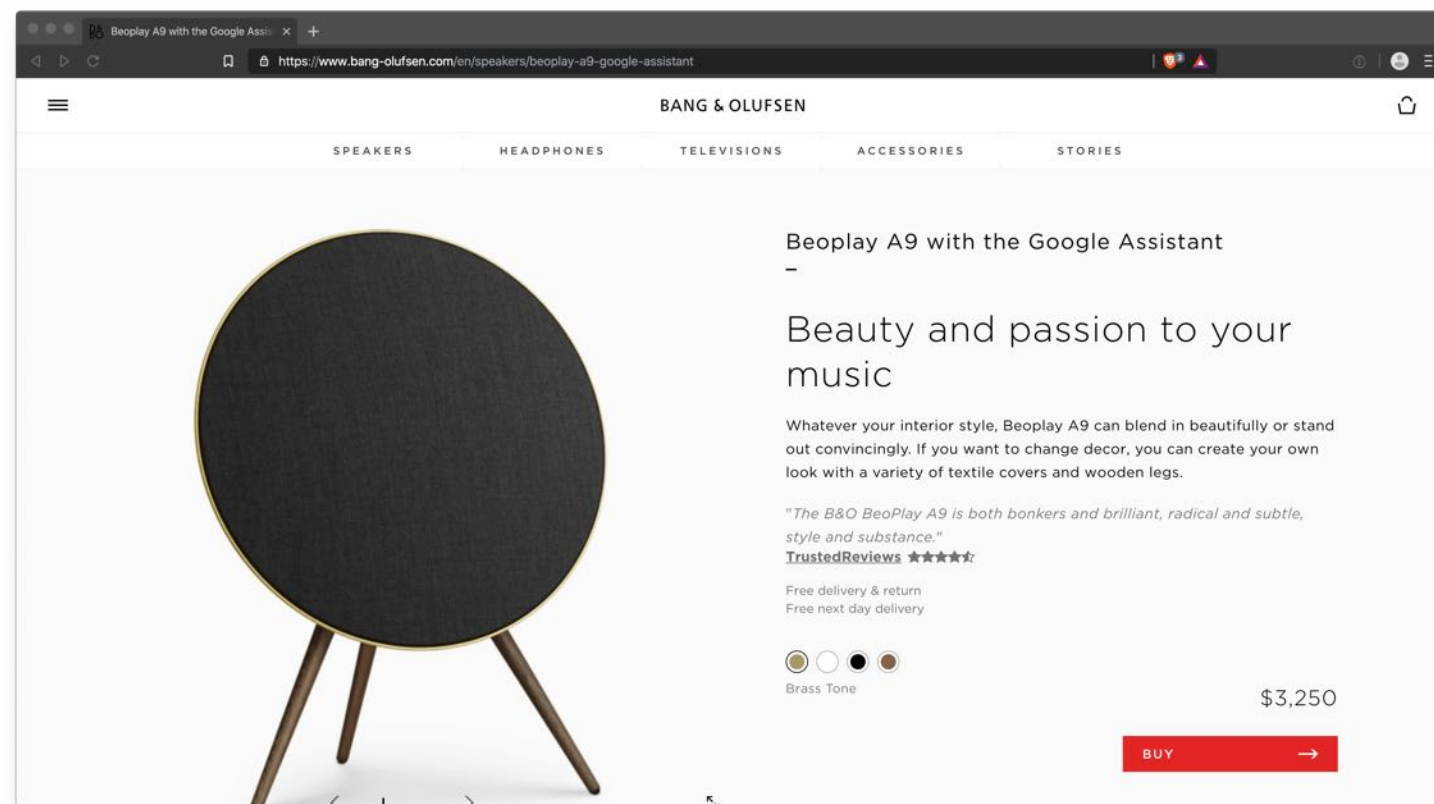
A set of structural categories:¹

1. "Show one single thing"
2. "Show a list or set of things"
3. "Provide tools to create a thing"
4. "Facilitate a task"

¹Tidwell, 2010, *Designing Interfaces*

"Show one single thing"

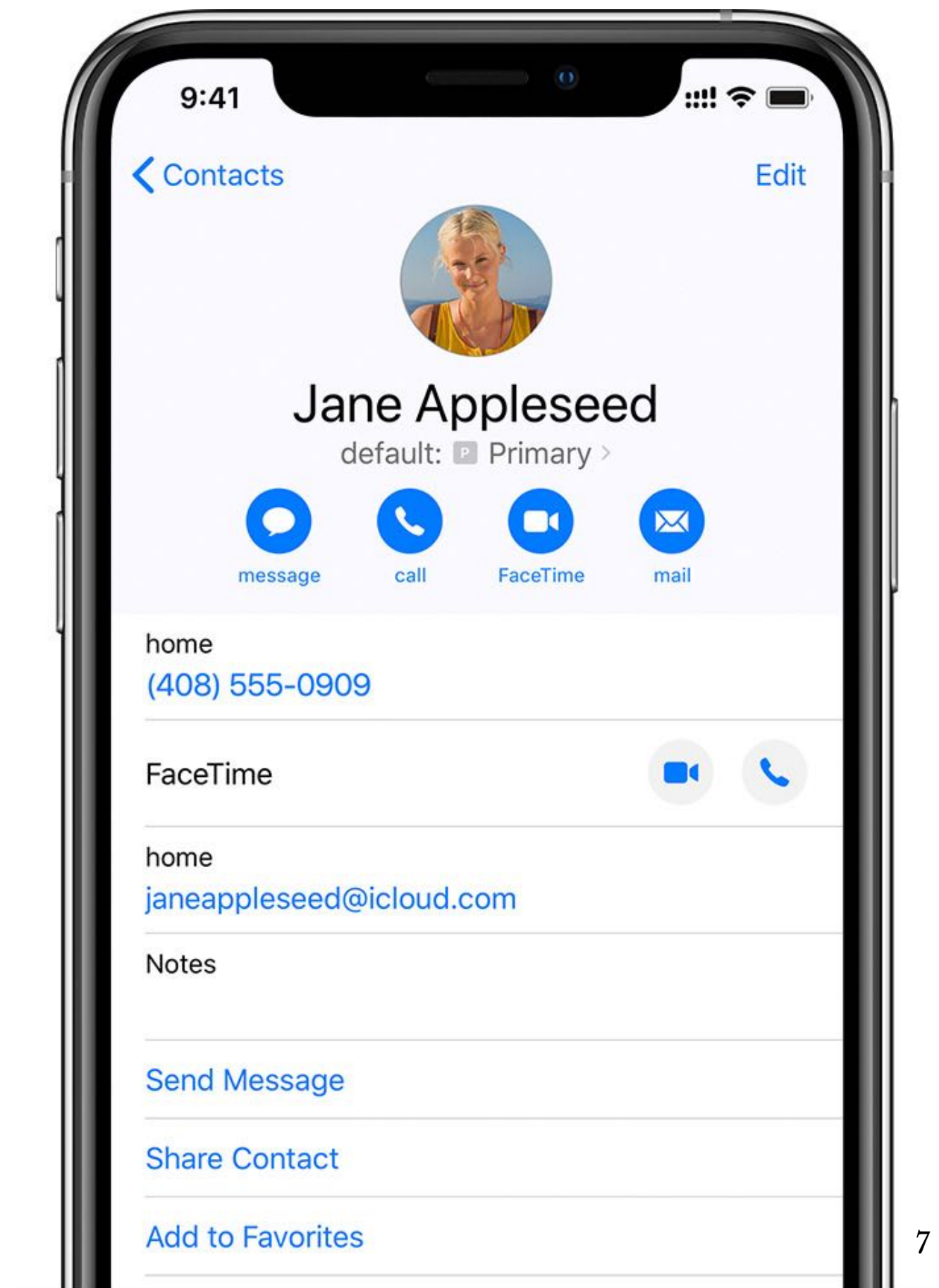
Focuses on conveying information on a specific topic/facilitating a specific activity



Supports a specific activity, eliminating other distractions.

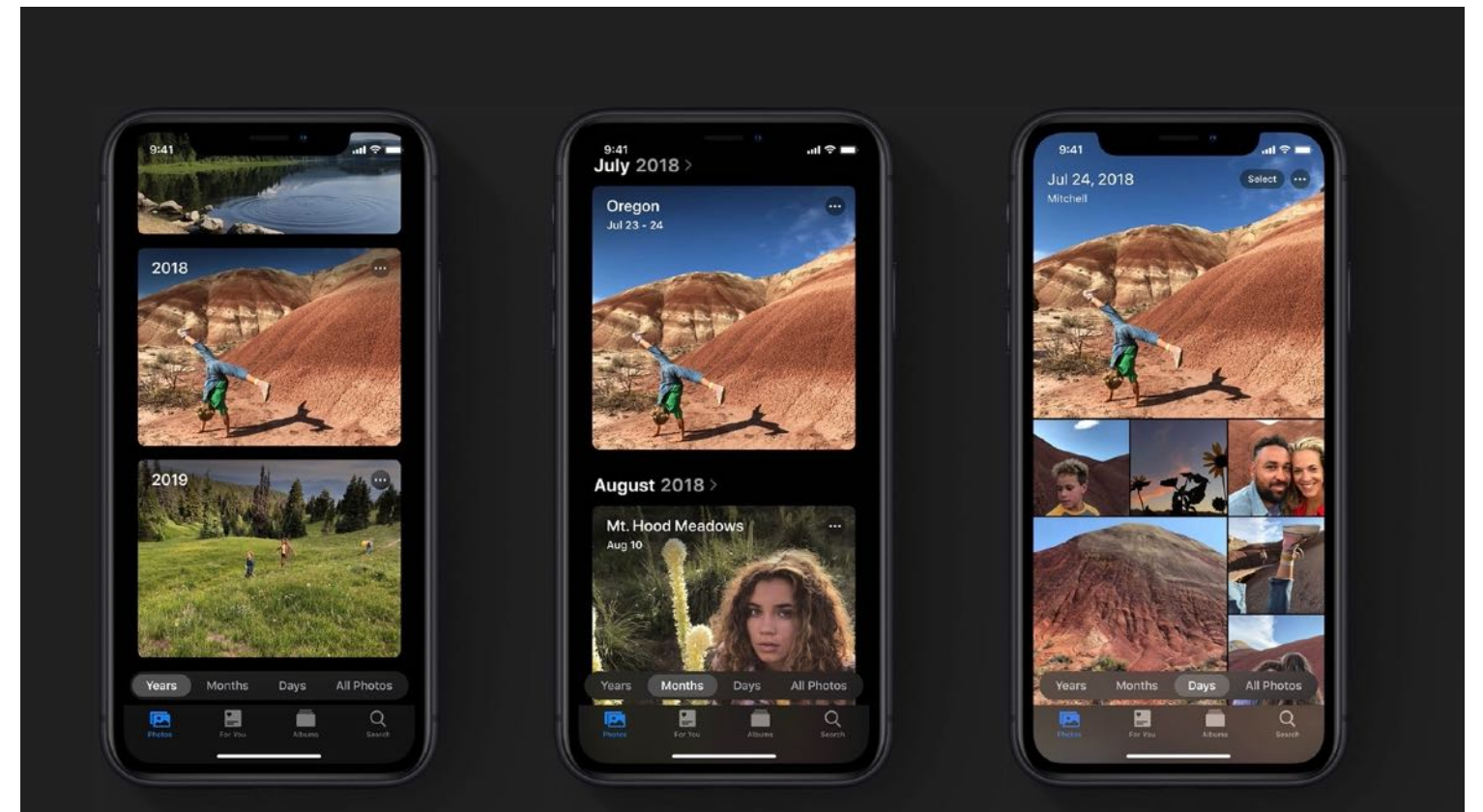
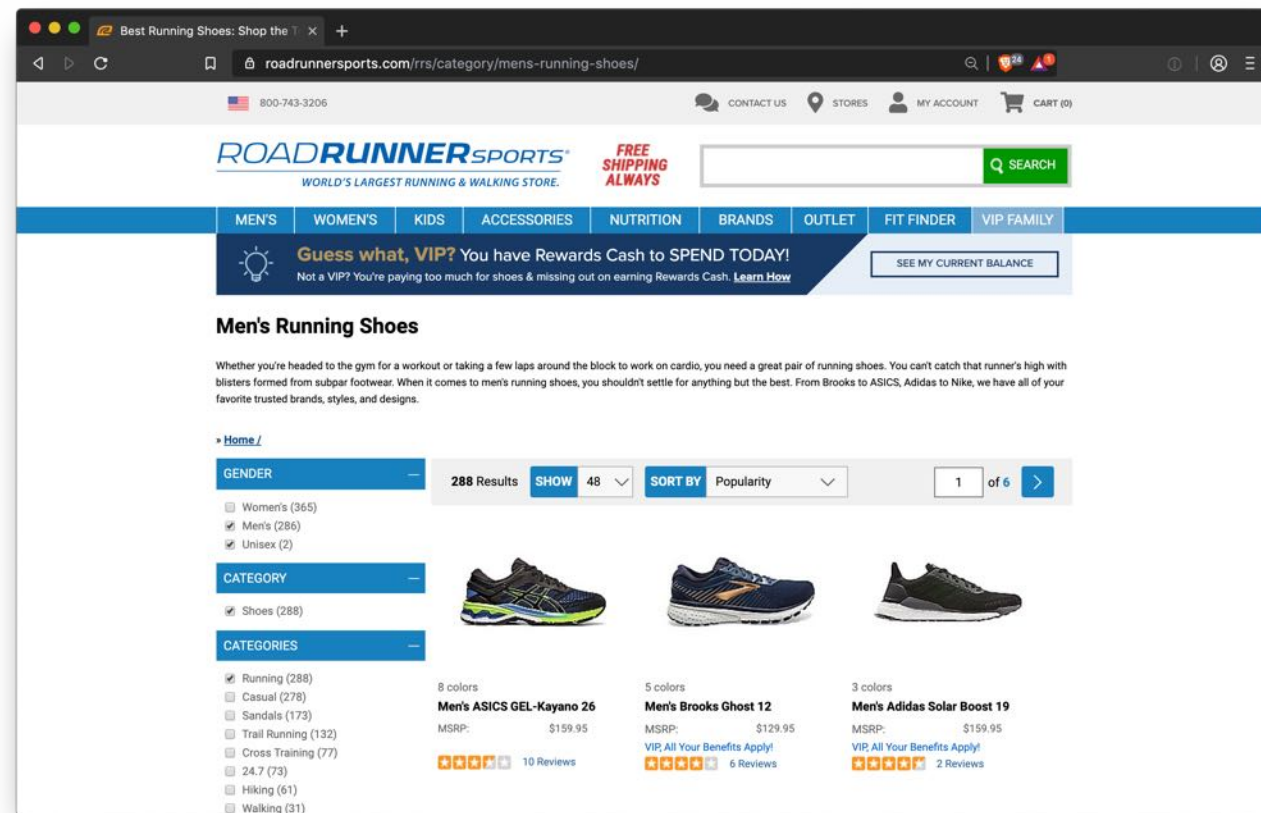
Includes key components:

1. Content of the "single thing"
2. Supporting tools that help the user act on the content



"Show a list or set of things"

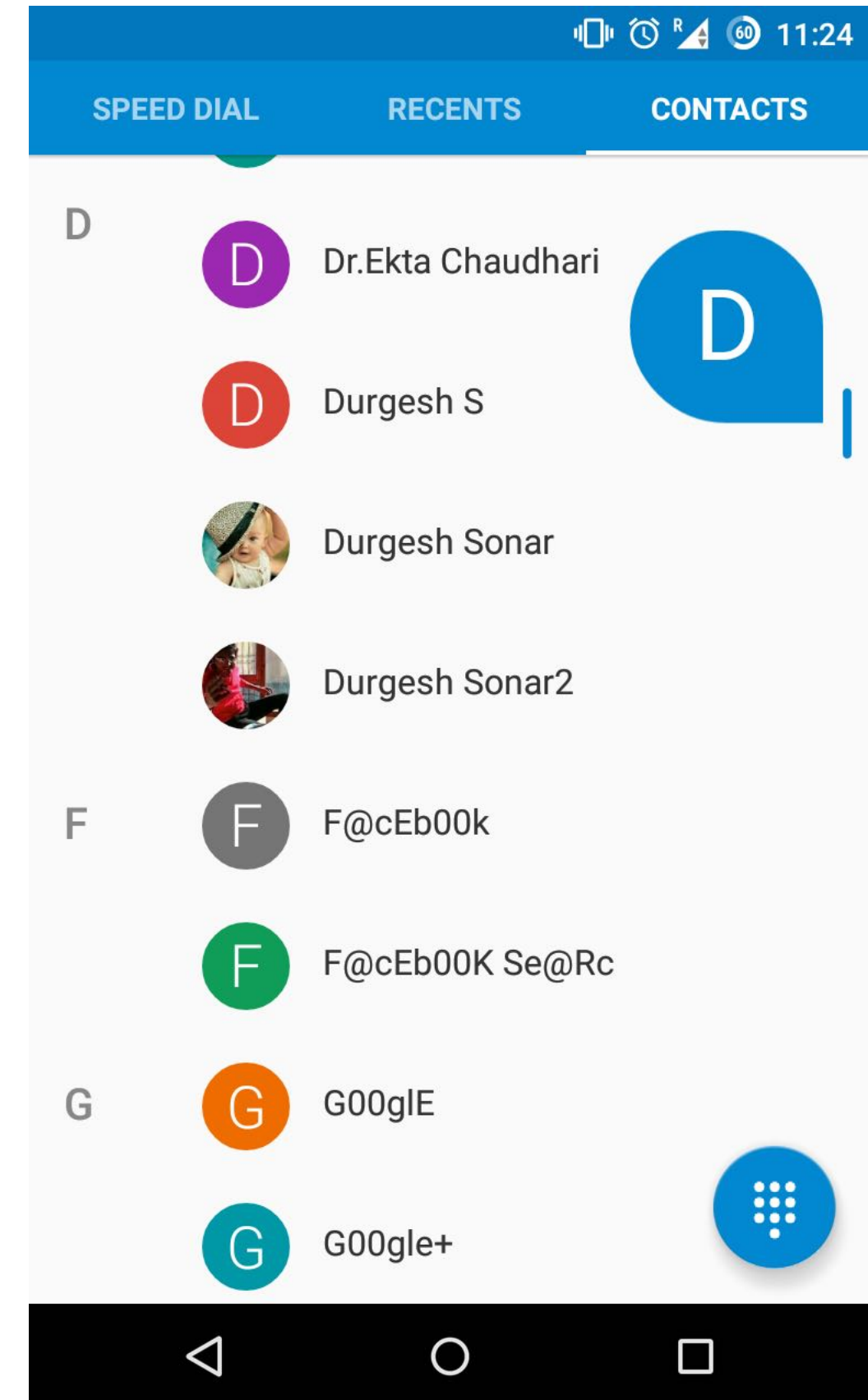
Provides rows or grids of items of the same kind that provide links to components that focus on that item.



Includes design elements that help the user organize and categorize the lists

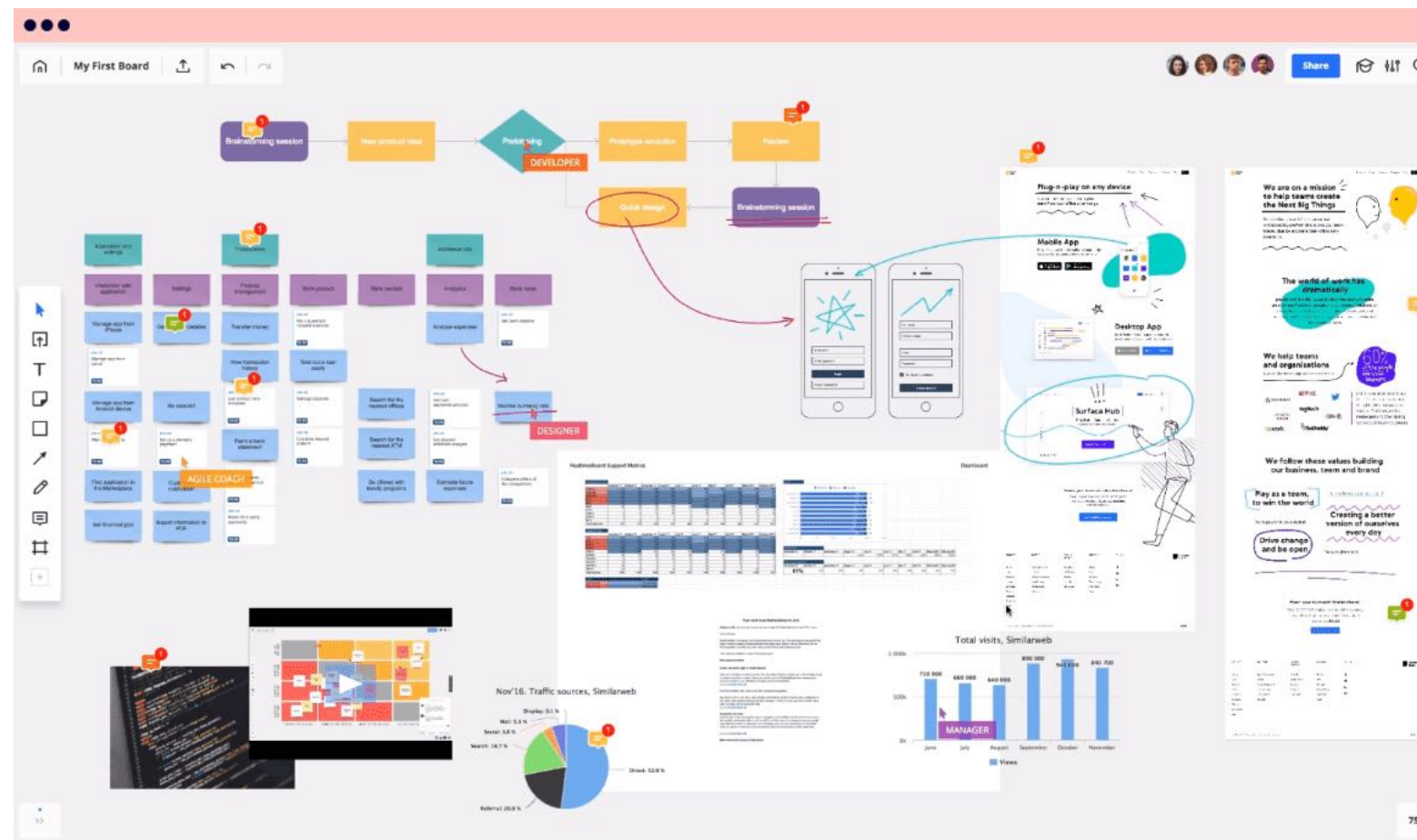
Can be applied hierarchically

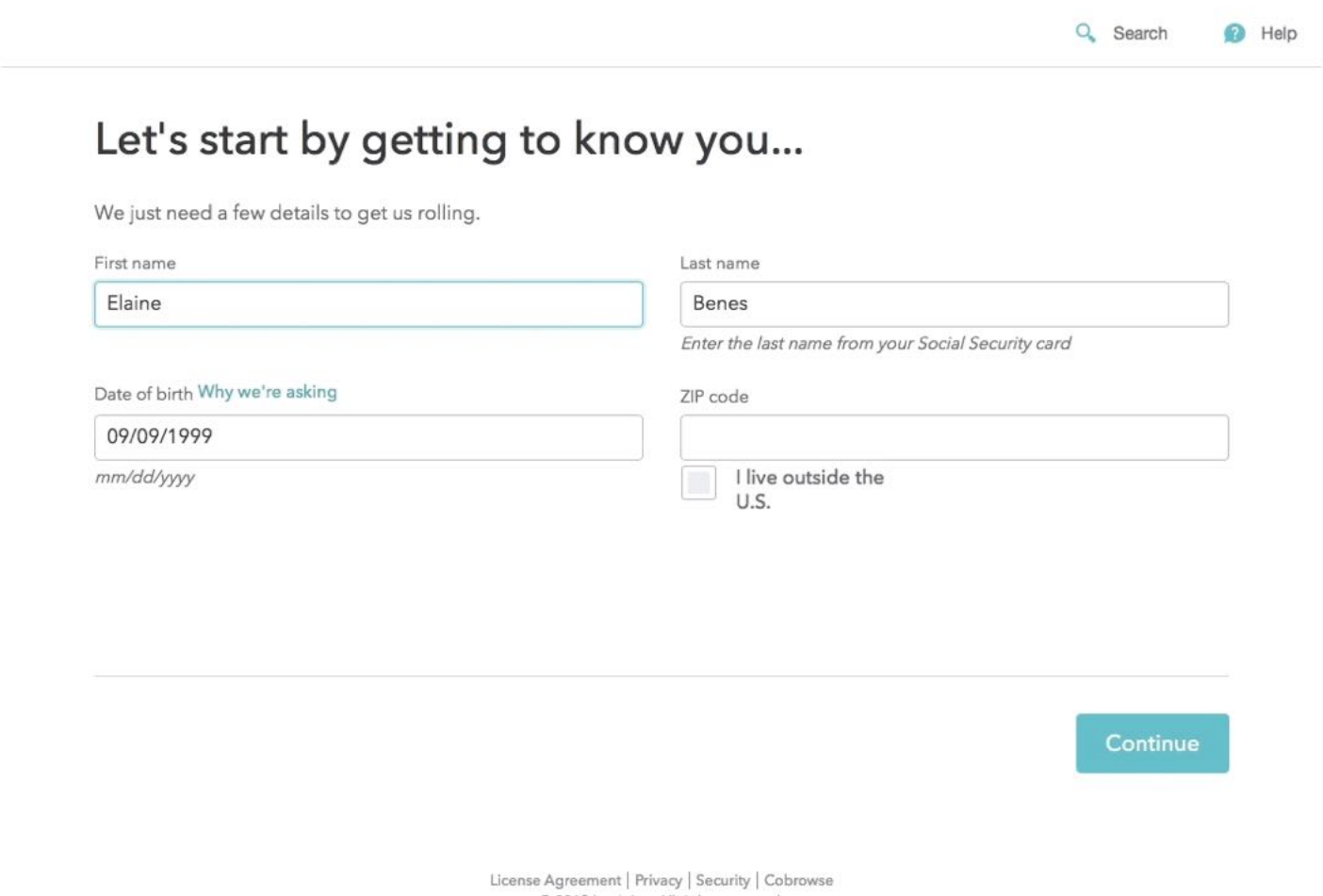
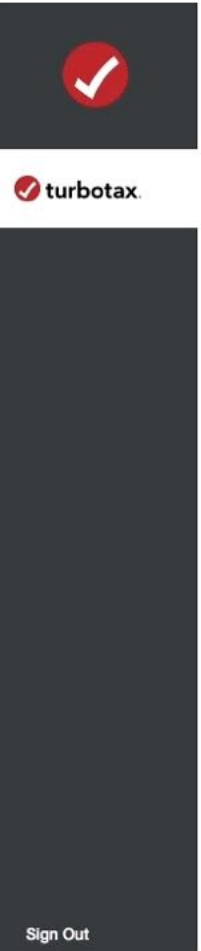
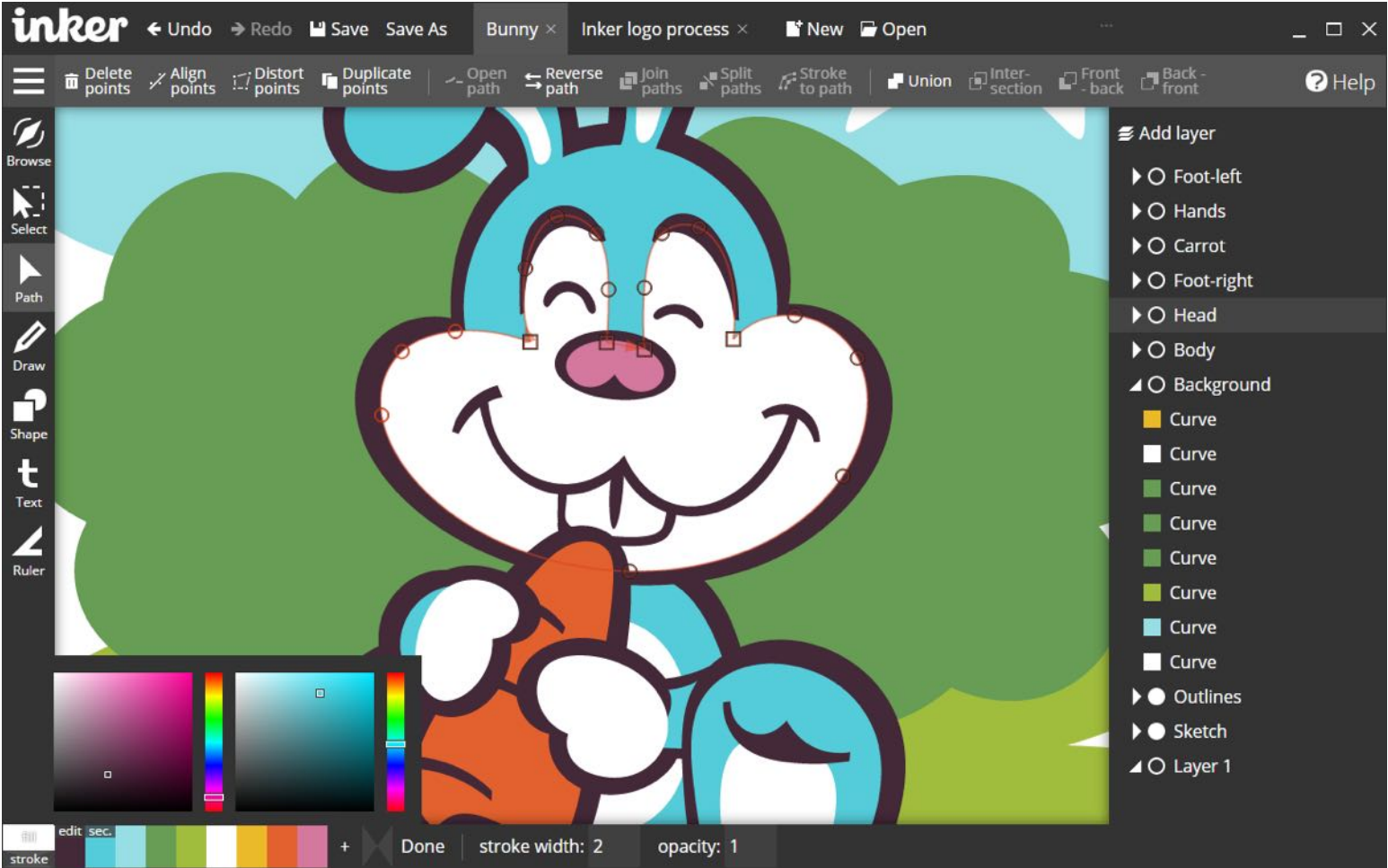
Does this remind you of something we've been discussing?



"Provide tools to create a thing"

Supporting user creation of new content, e.g., a canvas on which to write, draw, paint or structured form for data entry

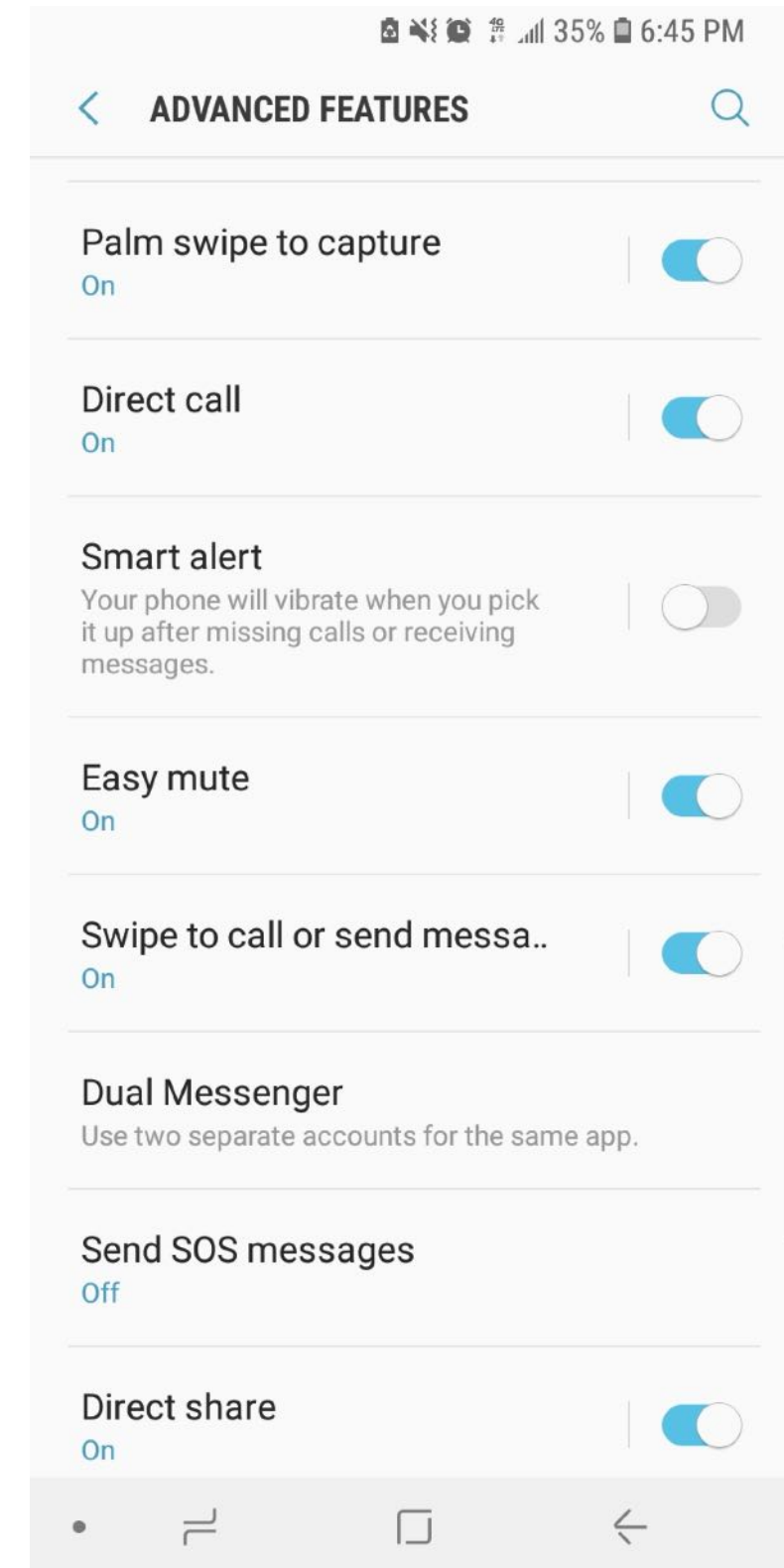




"Facilitate a task"

Provides collections of components or controls that help users perform specific actions, e.g., changing a setting

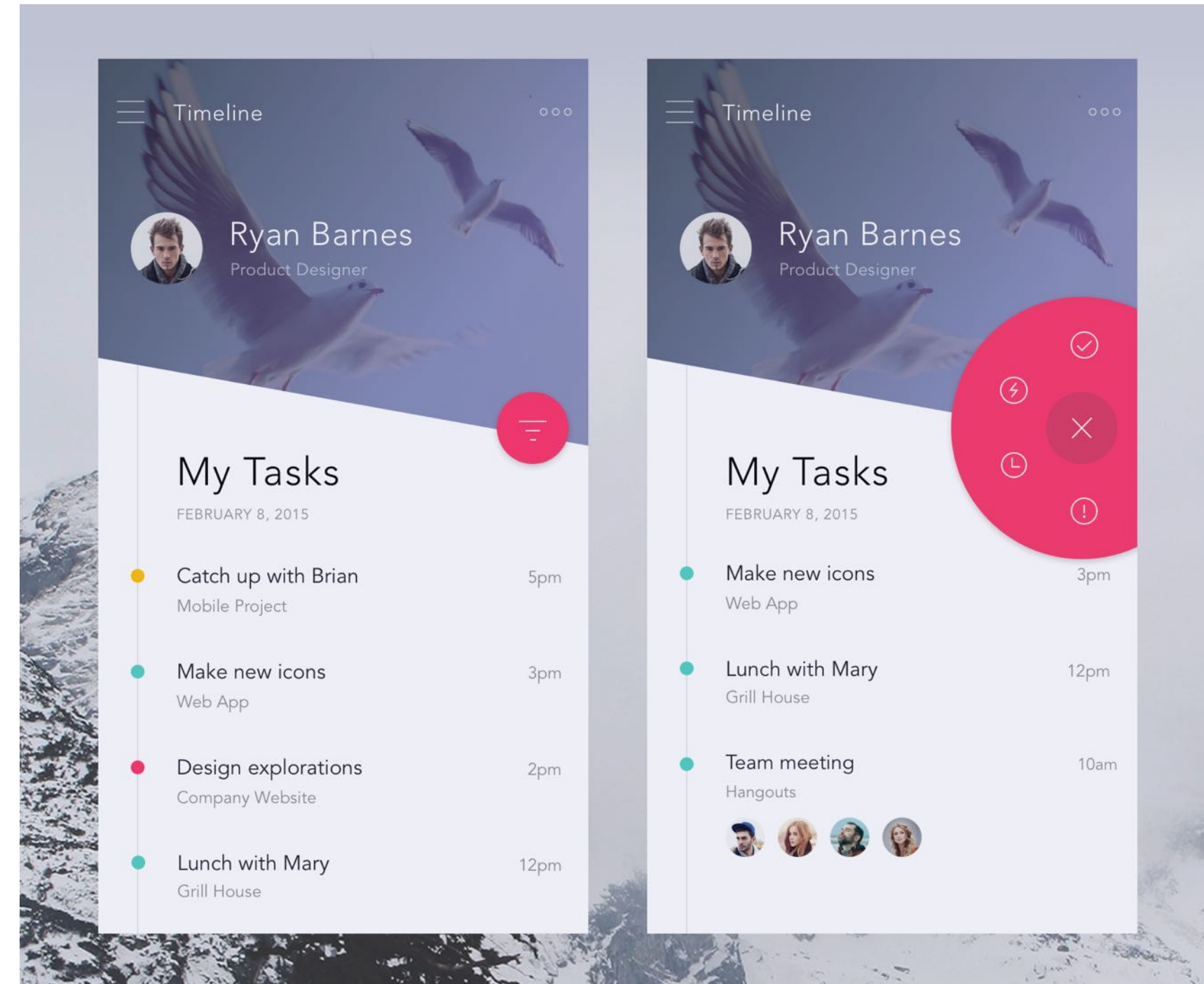
The designer must organize these controls in an effective and logical way



Combining Structures

Any page/component can follow the structure of these components, thus they can be combined to create complex applications

Single-page applications (SPAs) often combine these structures



Quiz 1

Complete the Canvas quiz.



canvas

Layout

Layout

Definition: Arrangement of visual elements on a canvas.²

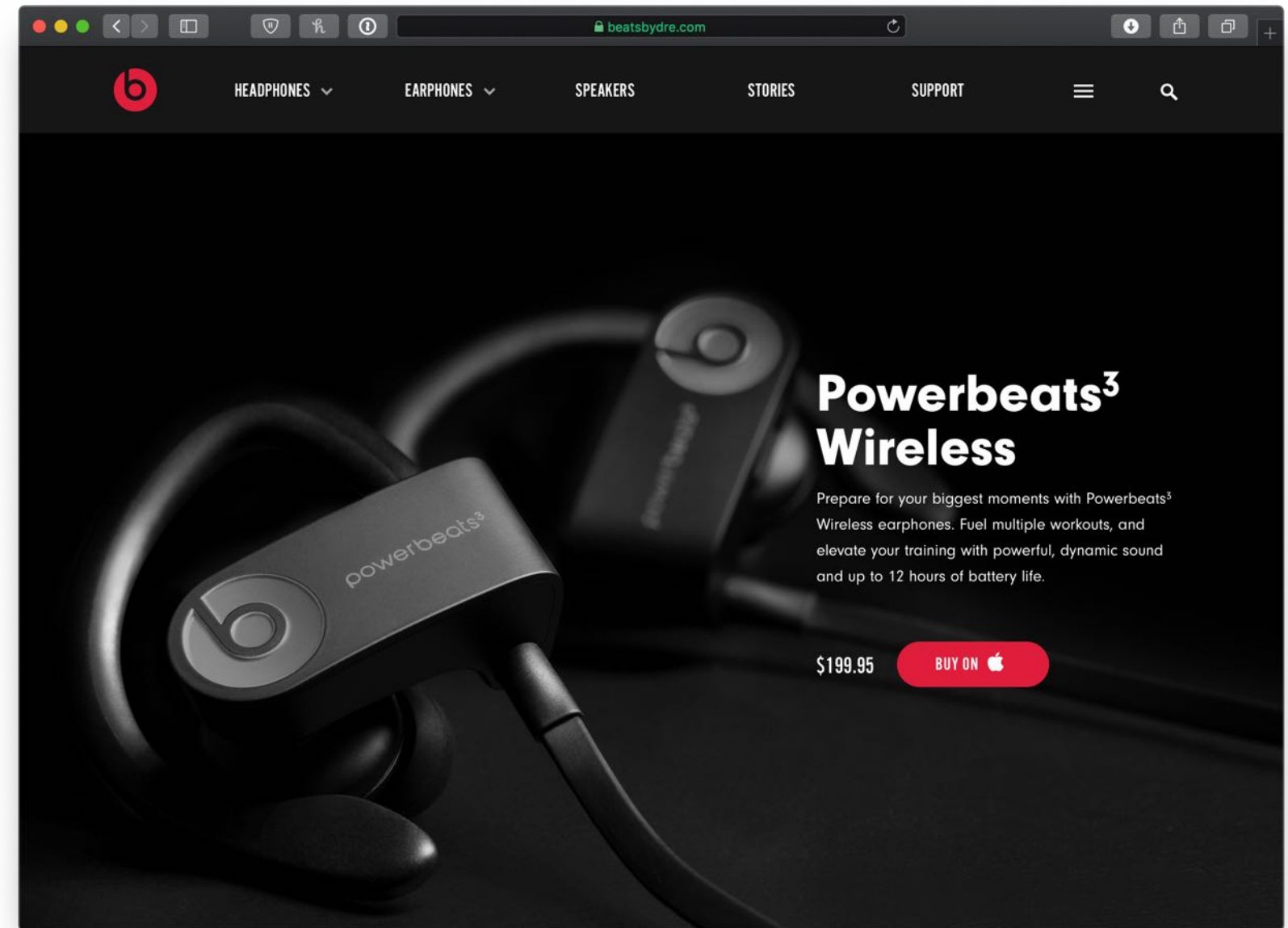
1. Creating a focal point
 2. Following the golden ratio
 3. Using the rule of thirds
 4. Effectively using grids
 5. Integrating type
 6. Placing imagery
1. Using negative space
 2. Grouping using gestalt theory
 3. Creating visual hierarchy
 4. Exploiting visual scan patterns
 5. Creating contrast/emphasis

²These build on the visual design elements/principles that we covered last week.

Creating a focal point

Definition: Aka, center of visual interest, where the design directs the attention of the viewer first.

Pro Tip: Successful use locks attention to the focal point and gently guides it to its next destination.

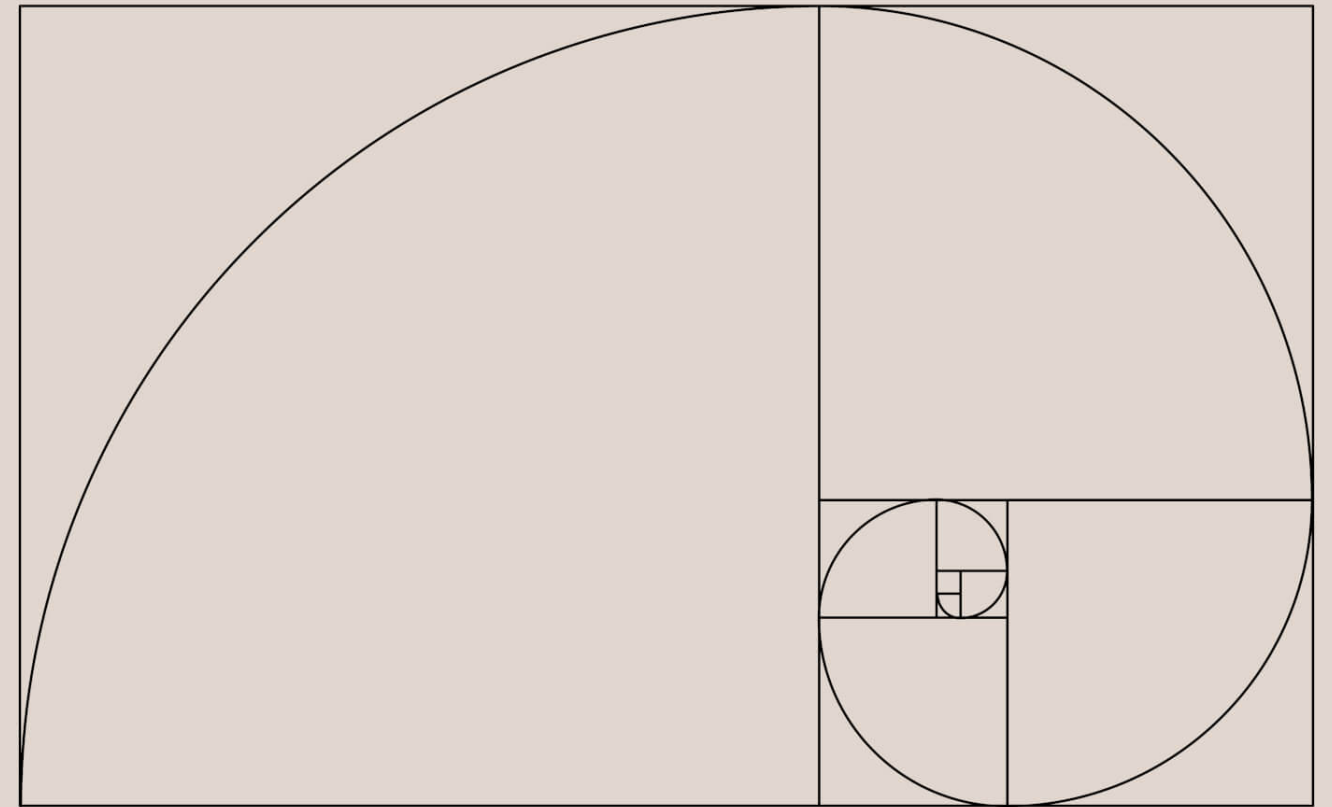


Following the golden proportion³

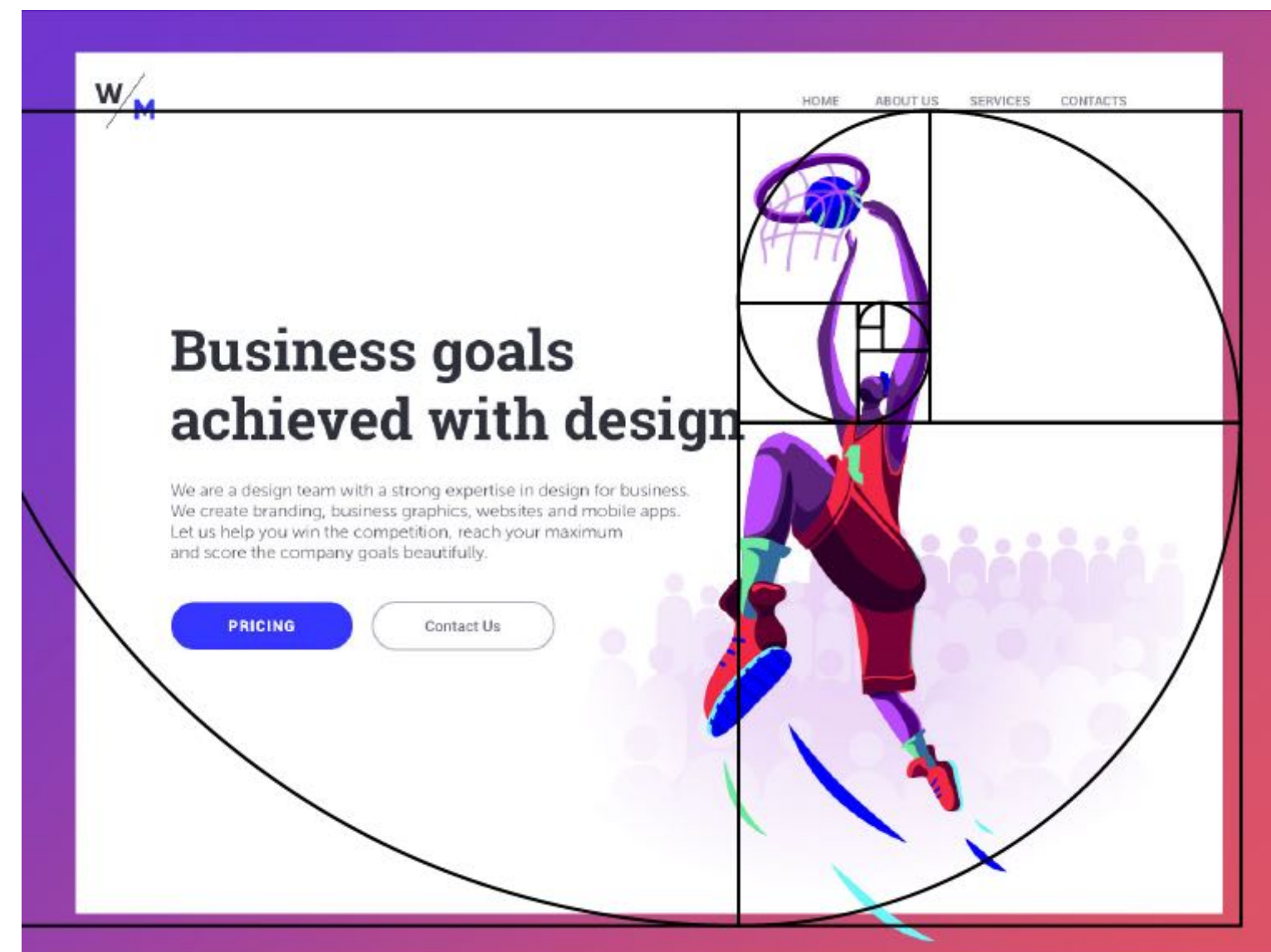
Definition: A ratio, 1:1.618, which creates a compositional grid that suggests an asymmetrical, but balanced placement of items on a layout and produces a universal aesthetic appeal.

³Further reading on the golden ratio

The golden ratio

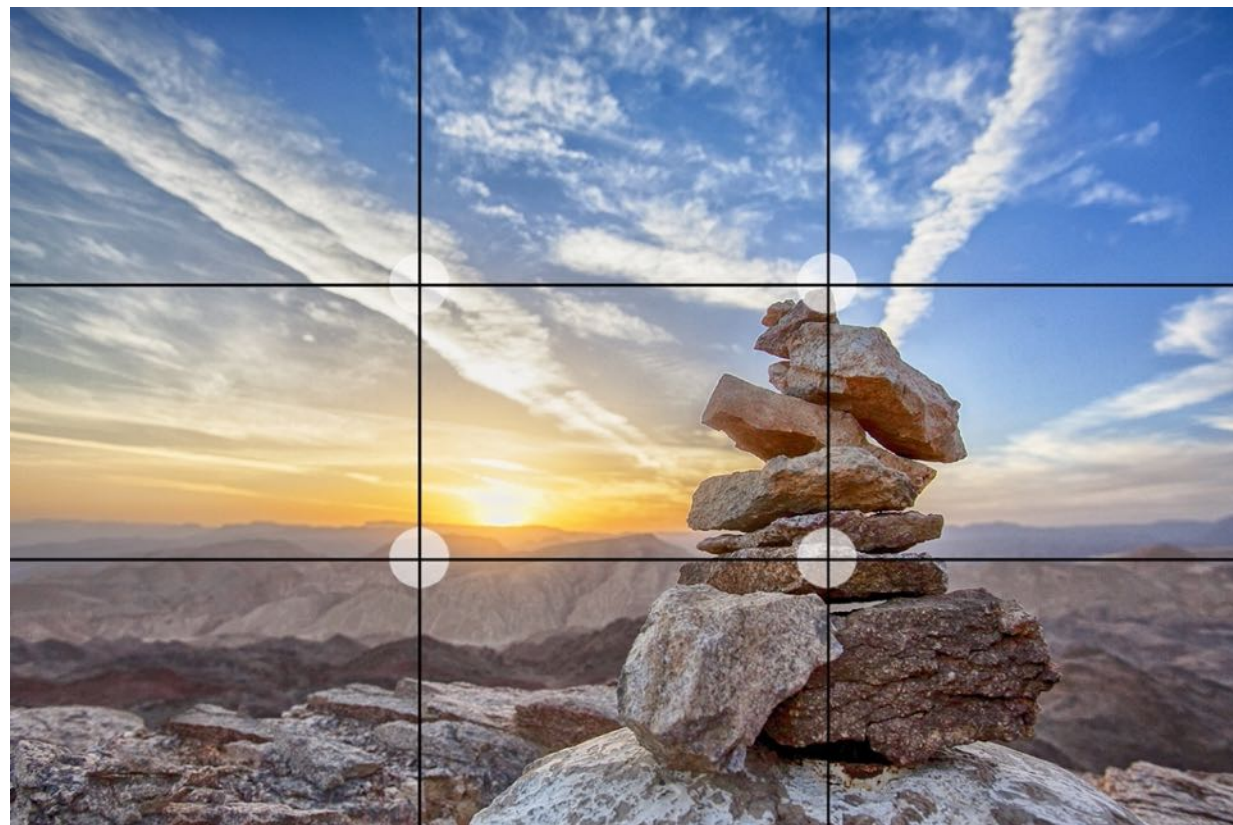


thesplashlab.com



Using the rule of thirds

Definition: An approximation of the golden ratio that is easier and more flexible to use. When the canvas is divided into a 3x3 grid, the intersections serve as focal points.

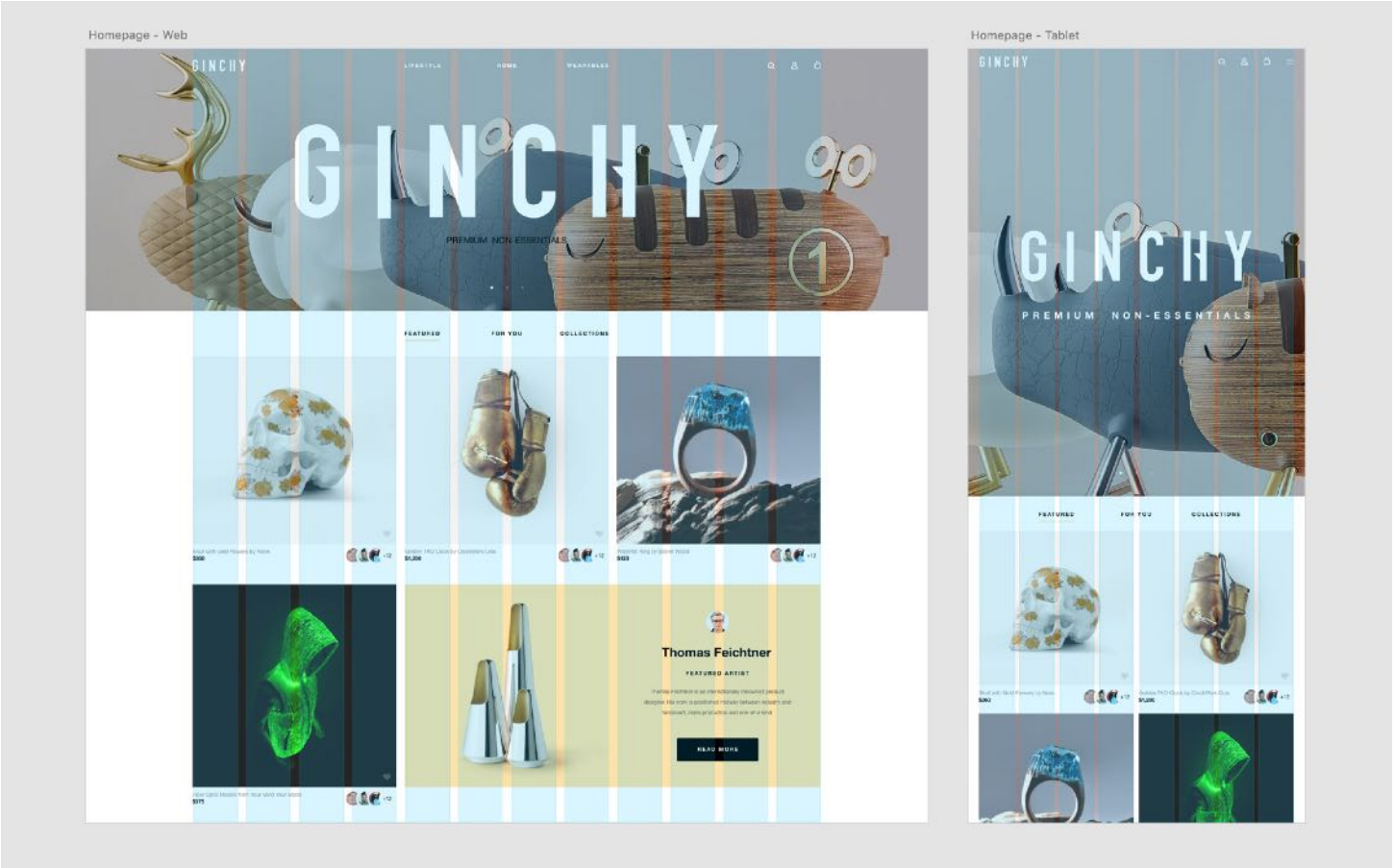
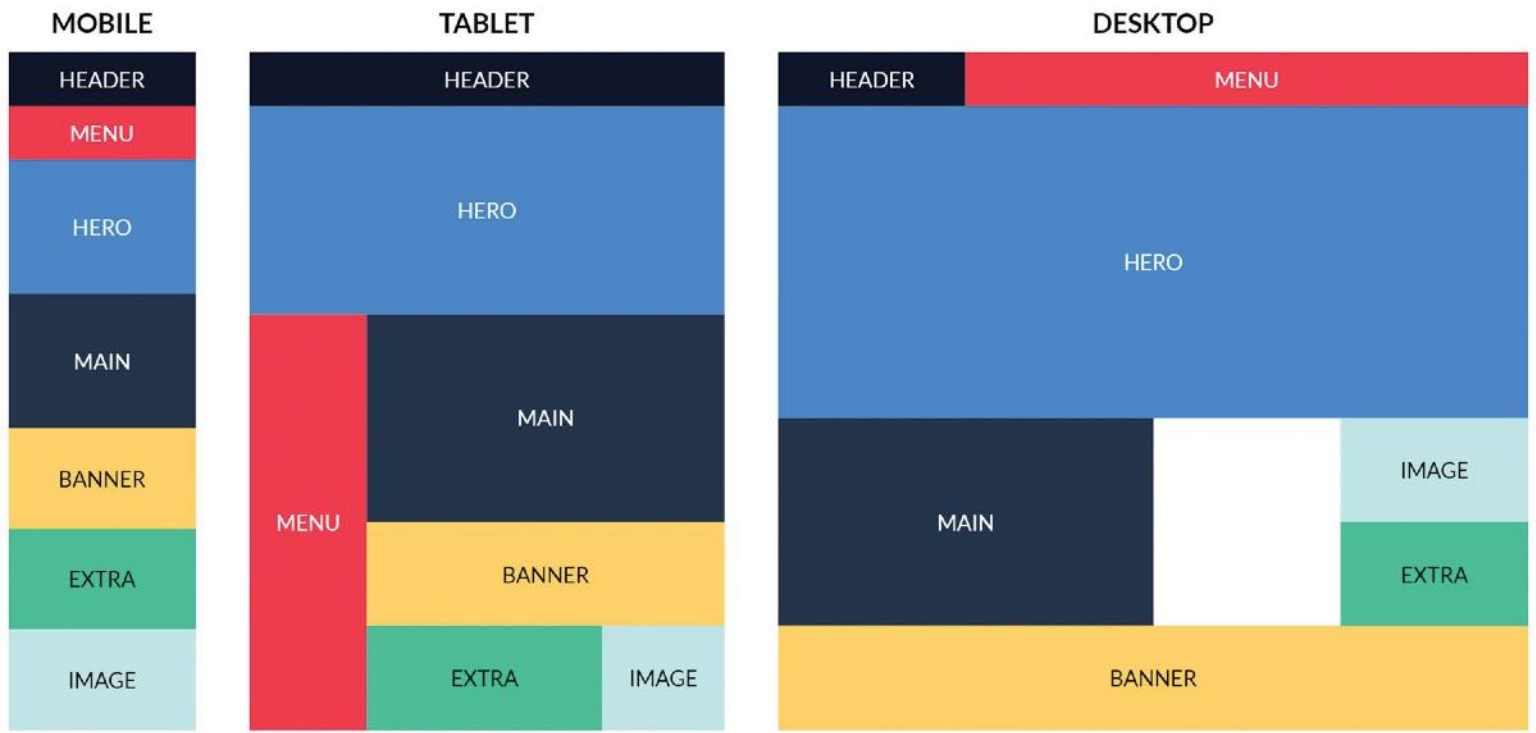


Effectively using grids

Definition: Grids serve as a visual framework for organizing elements in an orderly and balanced fashion.

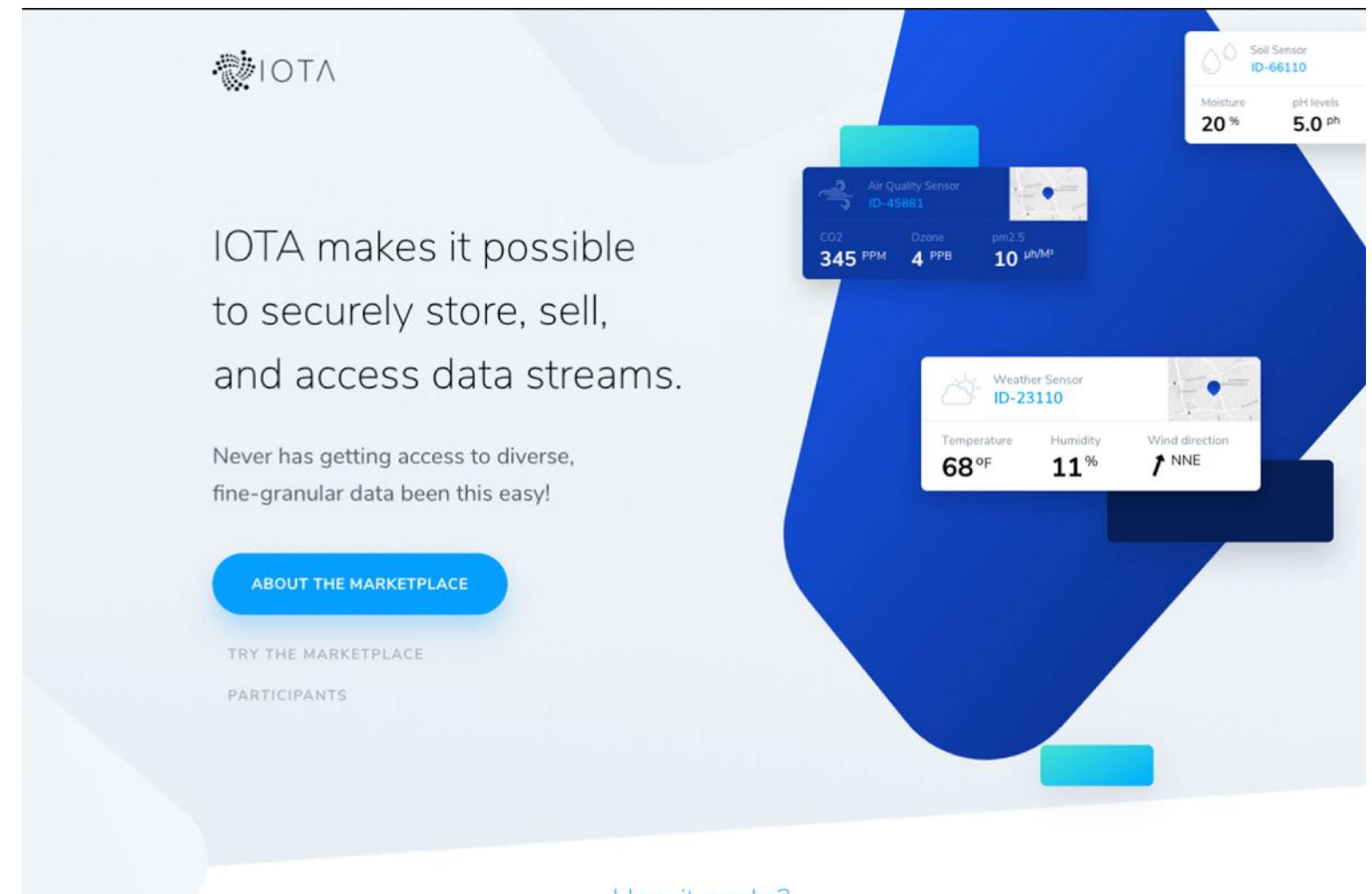
Parameters associated with grids: *format, aspect ratio, margins, trim size, bleed, live area, column, alley, gutter, and grid.*





Integrating type

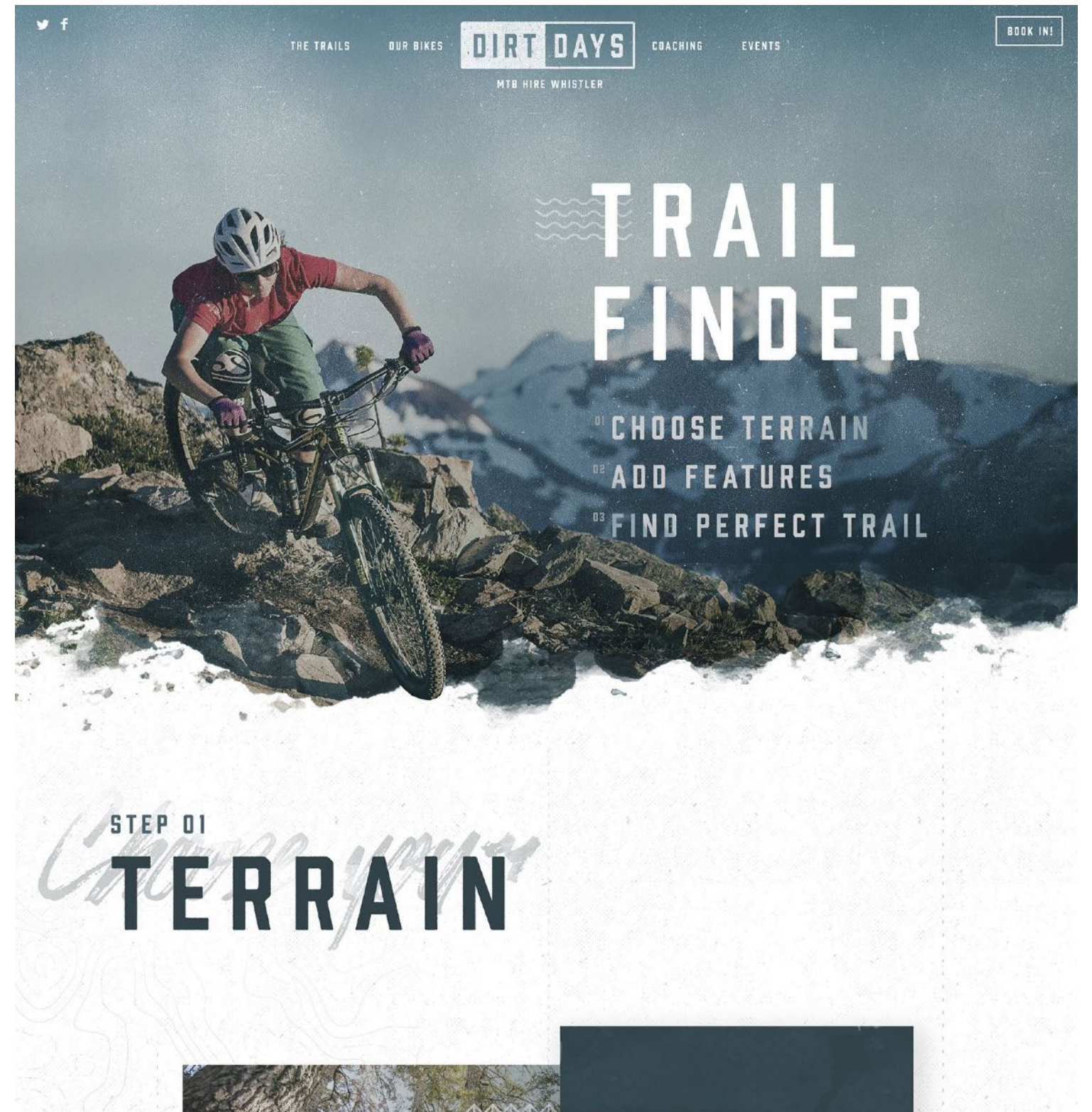
Definition: The use of *headlines* or *blocks of text* to guide the user's attention to messages.



Placing imagery

Definition: The use of imagery to create a focal point or movement on the canvas.

Pro Tips: Place on top, not bottom; direction should be toward next focal point; never flip images; do not interrupt headlines; do not wrap text around images.



Using negative space

Definition: Space left on the canvas from other design elements, used to provide a visual break and create balance.



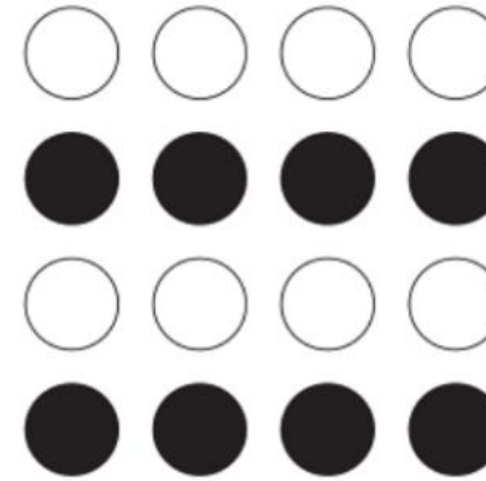
Grouping using Gestalt Theory

Definition: Visual perception principles that predict how users will perceive design elements.

Includes four key principles:

1. Proximity
2. Similarity
3. Continuity
4. Closure

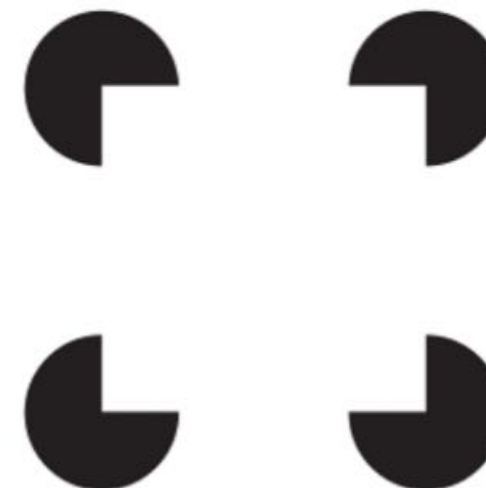
Similarity



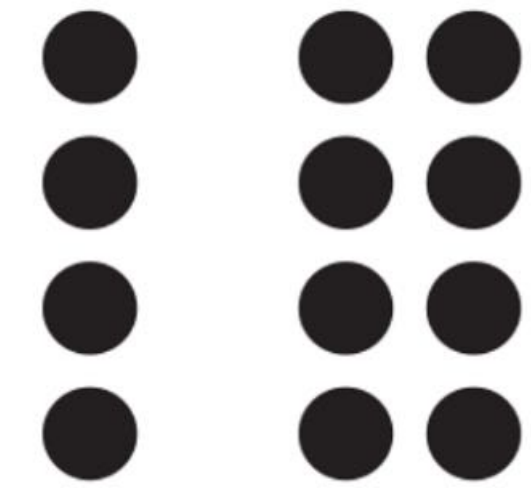
Continuity



Closure



Proximity



Similarity

This principle states that objects that share similar visual characteristics; shape, size, colour and so on, create a connection in the viewer's mind implying that they are related or naturally belong together. In the diagram above horizontal lines of the same sized shape appear to be grouped together because alternately they are either solids or outline.

Closure

In this example the effect is created in the mind of a white square floating above four solid circles, even though there is no square. The principle of closure states that when elements are aligned in such a way that we perceive that the information is connected, we tend to see complete figures even when some of the information is missing.

Continuity

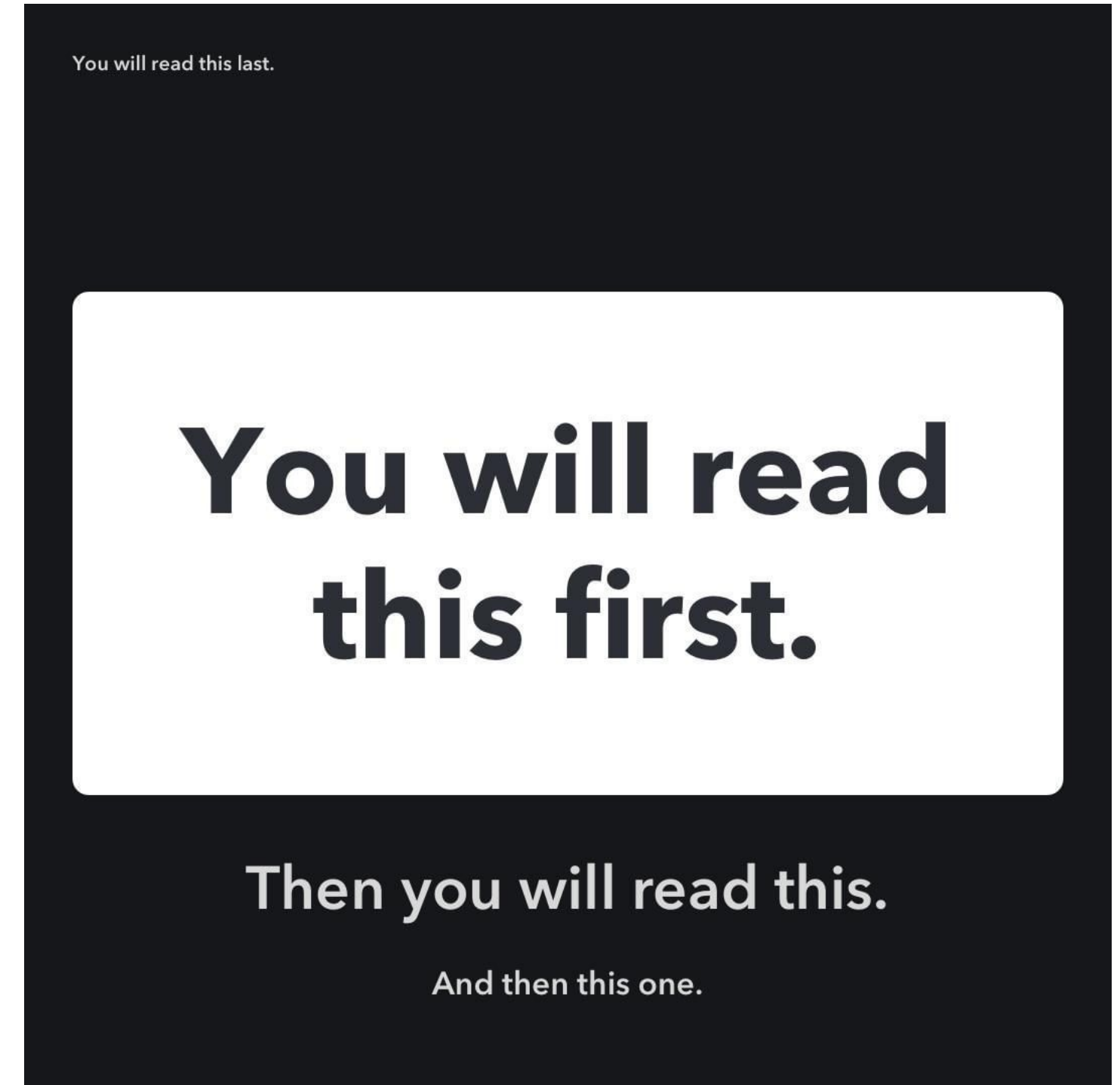
The gestalt principle at work here is that closure occurs when an object is incomplete or a space is not entirely enclosed. Provided enough of the shape is indicated, we perceive the object as whole by filling in the information that is absent, thus completing the circle.

Proximity

Proximity occurs when objects or elements are placed close together. They tend to be perceived as a group or a unified whole. In the example above, the vertical lines of dots that are closer together appear to be more related to each other or are understood as a single unit, separate from the single line of dots on the left.

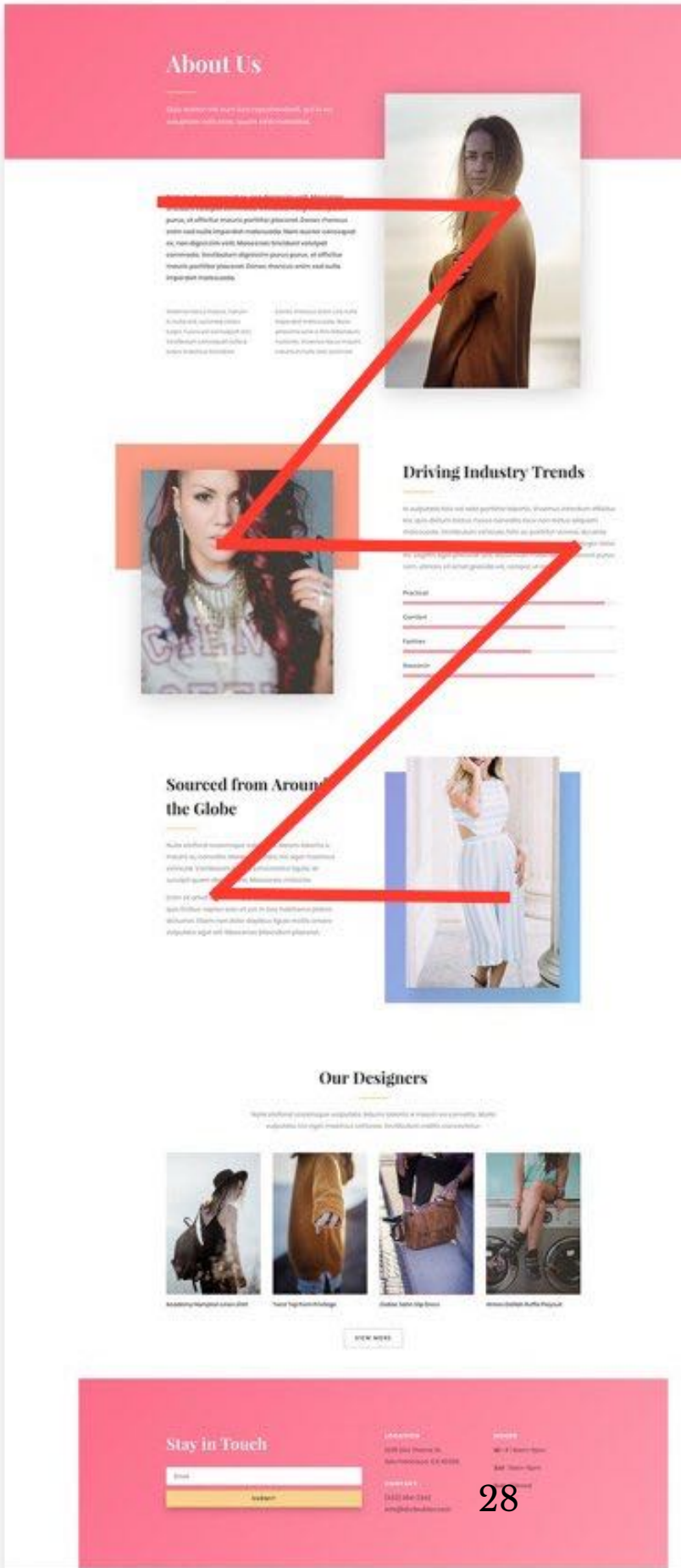
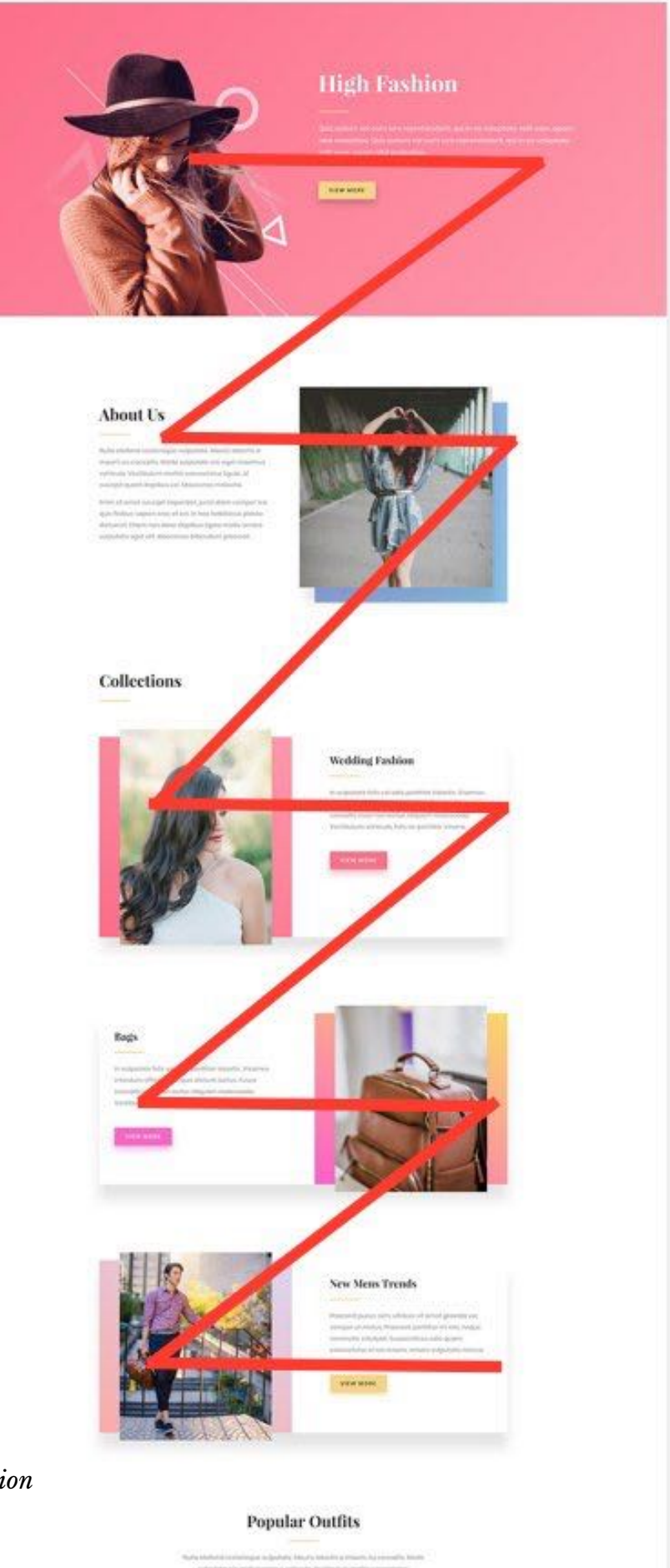
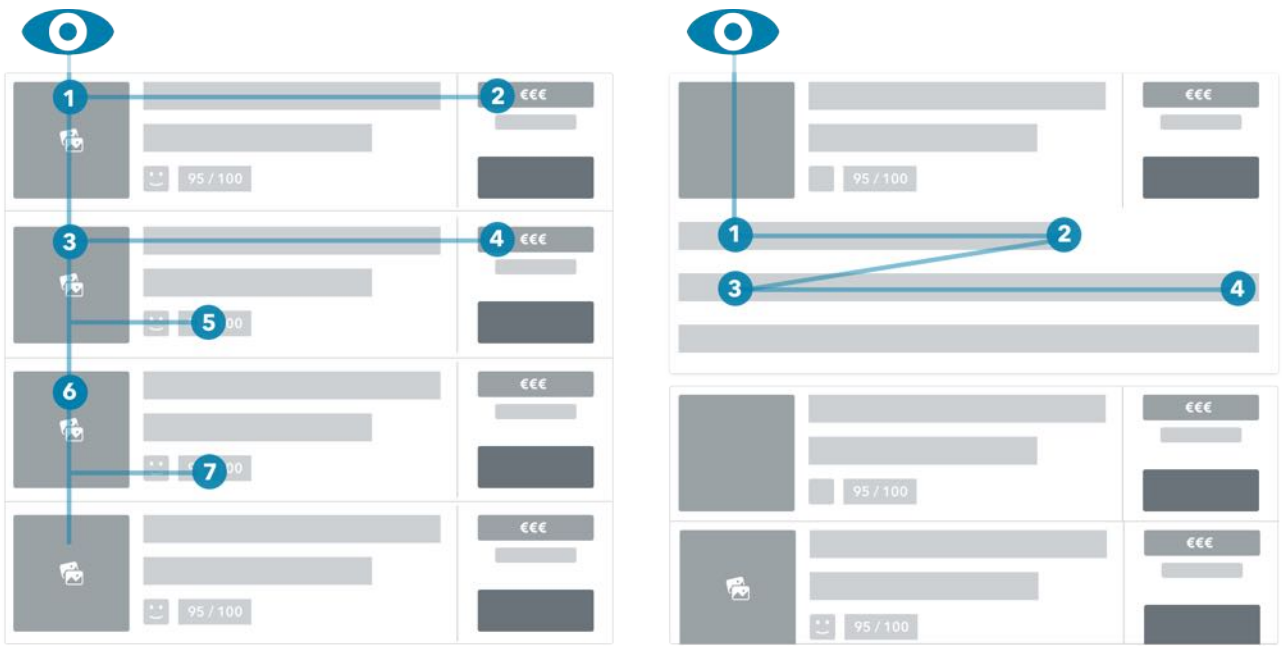
Creating visual hierarchy

Definition: Using relative positioning and sizing to communicate what design elements are more important and should be looked at first.



Exploiting visual scan patterns

Definition: Designing layouts that exploit common eye-scanning patterns, e.g., the F-pattern and the Z-pattern.



Free credit monitoring and reports won't work to fix identity theft. We will.

Identity theft is more than credit card fraud. Free credit services don't look for threats like a criminal draining your 401(k), renting an apartment or committing crimes in your name. Our Advantage and Ultimate Plus memberships will. We detect a wide range of threats and work to fix identity theft issues.

START MEMBERSHIPS

GET 60 DAYS RISK-FREE!

How LifeLock works to help protect you from identity theft.

Our proprietary technology alerts you to wide range of identity threats.¹ If you have an identity theft problem, our U.S.-based team of specialists will work to fix it.



DETECT & ALERT

We can detect a wide range of threats and will alert you by phone,² email and text of the suspicious activity.³



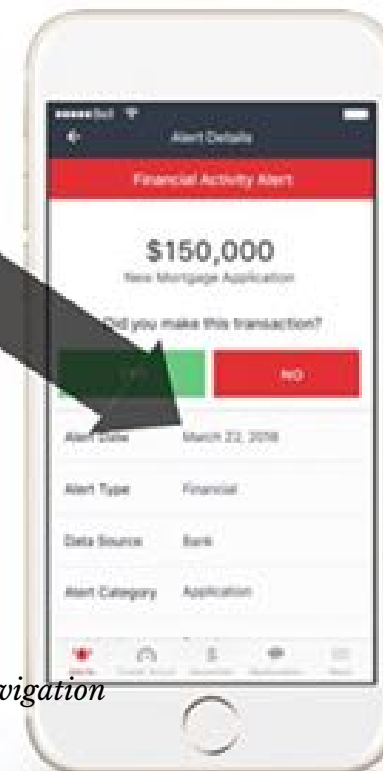
RESTORE

If you become a victim of identity theft while a LifeLock member, a dedicated U.S.-based Identity Restoration Specialist will work with you from start to finish to help fix the issue. With our \$1M Service Guarantee⁴, we'll spend up to \$1M on lawyers and experts if needed.



REIMBURSE

If you have money stolen due to identity theft, we'll replace it, as provided by your plan.⁵



Creating contrast and emphasis⁴

Definition: Using contrast and emphasis to establish visual hierarchy by manipulating features of design elements, including position, size, color, typographic characteristics.

TABLE 10.1. Opposing features that can create contrast.

Contrast Type	Feature 1	Feature 2
Spatial contrast	Filled space High density	Empty space Low density
Layout contrast	Top High Right Isolated Symmetrical	Bottom Low Left Grouped Asymmetrical
Form contrast	Simple Representational Geometric Angled	Complex Abstract Organic Curved
Direction contrast	Vertical Static	Horizontal Moving
Style contrast	Technical and precise Playful	Hand-drawn and irregular Serious
Size	Large Long Wide	Small Short Narrow
Color contrast	Dark Black and white Warm colors Vivid	Light Colorful Cool colors Muted
Texture contrast	Fine Smooth	Coarse Rough
Typographic contrast	Serif Roman style (regular)	Sans serif Bold style

⁴ Golombisky & Hagen, 2010, *White space is not your enemy*

Quiz 2

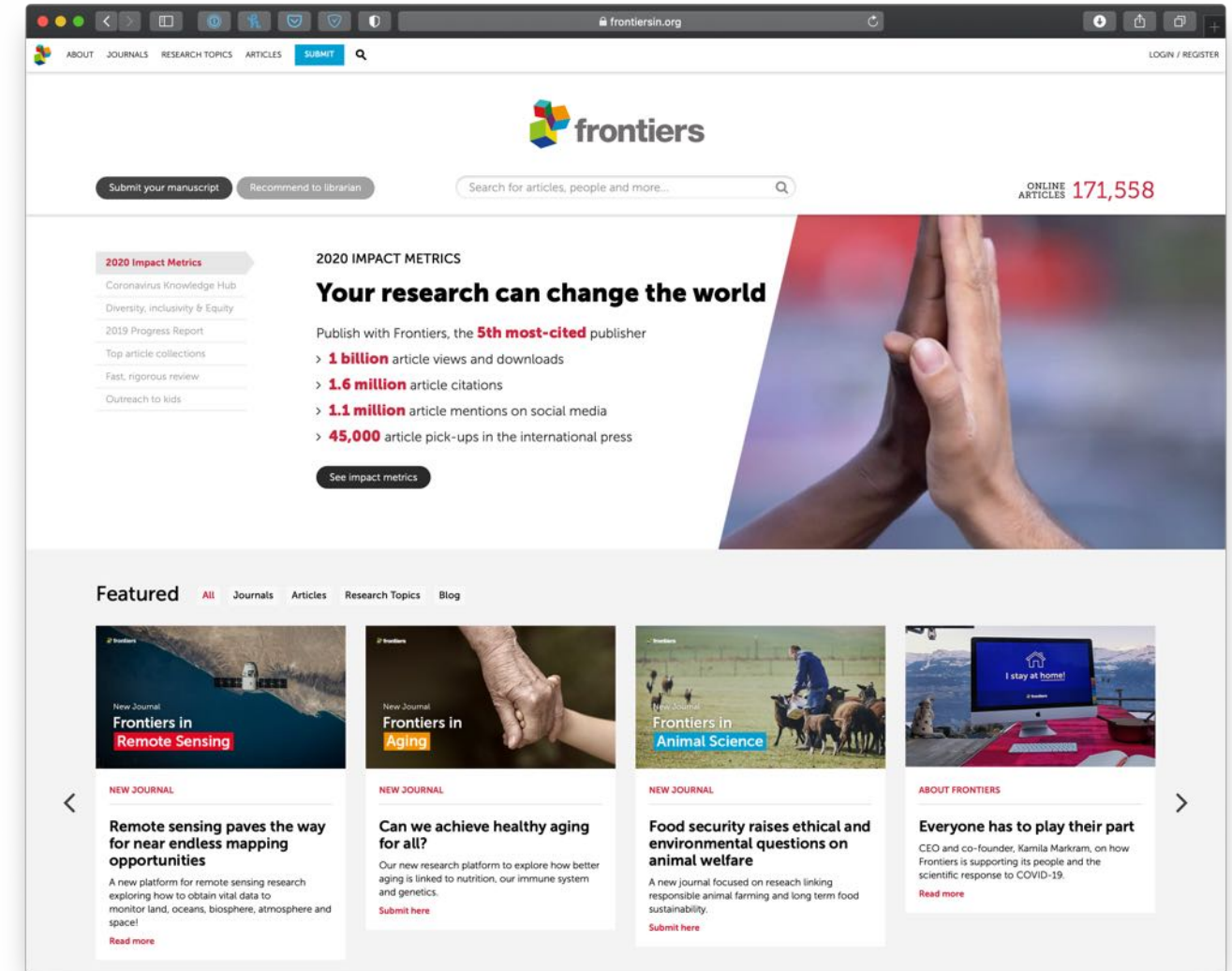
Complete the Canvas quiz.



In-Class Activity 1: Layout Deconstruction

Cheatsheet:

Creating a focal point
Following the golden ratio
Using the rule of thirds
Effectively using grids
Integrating type
Placing imagery
Using negative space
Grouping using gestalt theory
Creating visual hierarchy
Exploiting visual scan patterns
Creating contrast/emphasis

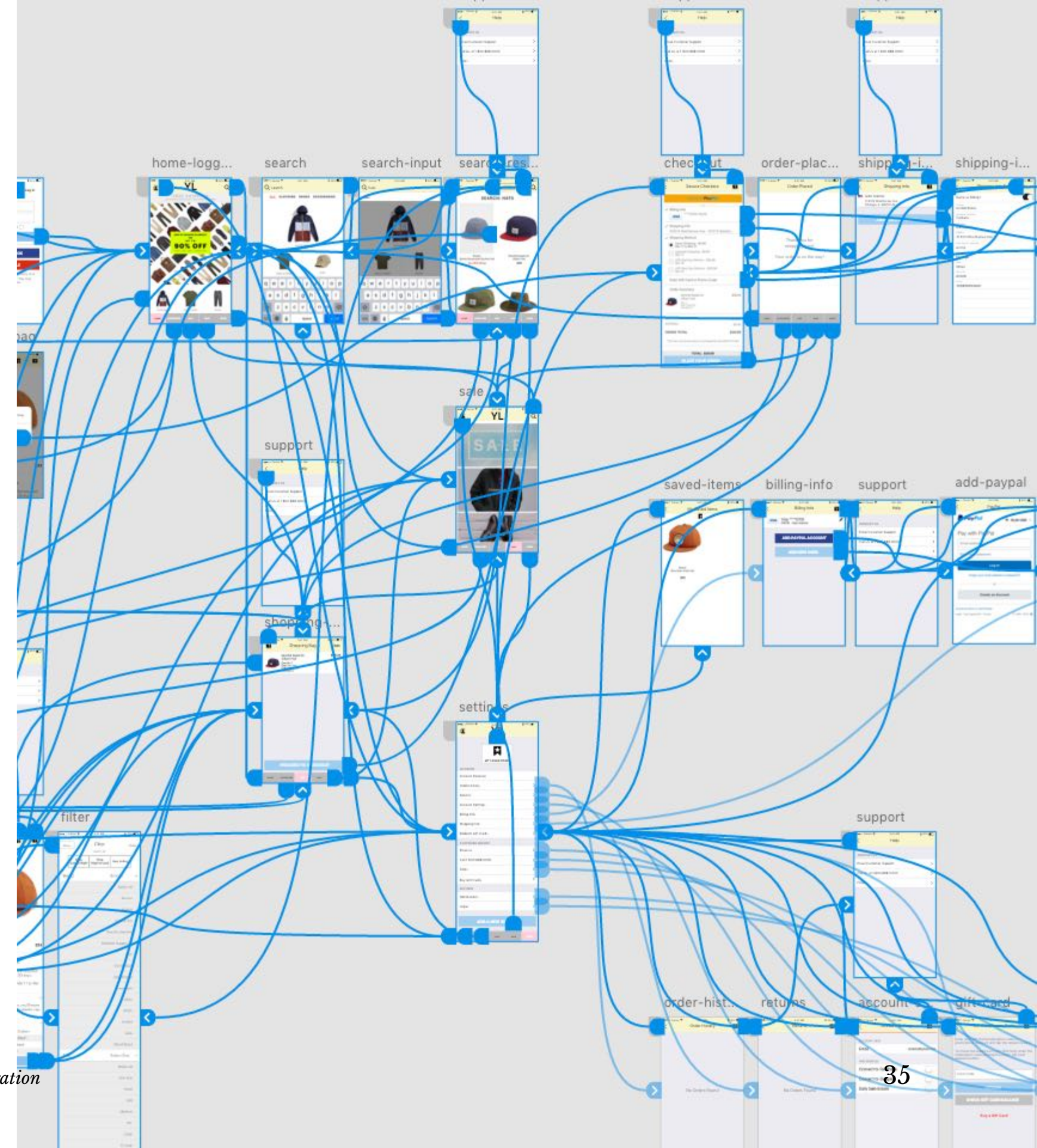


Principles of Navigation

Principles of Navigation⁵

1. Wayfinding
2. Cost
3. Aids
4. Models

⁵ Tidwell, 2010, *Designing Interfaces*

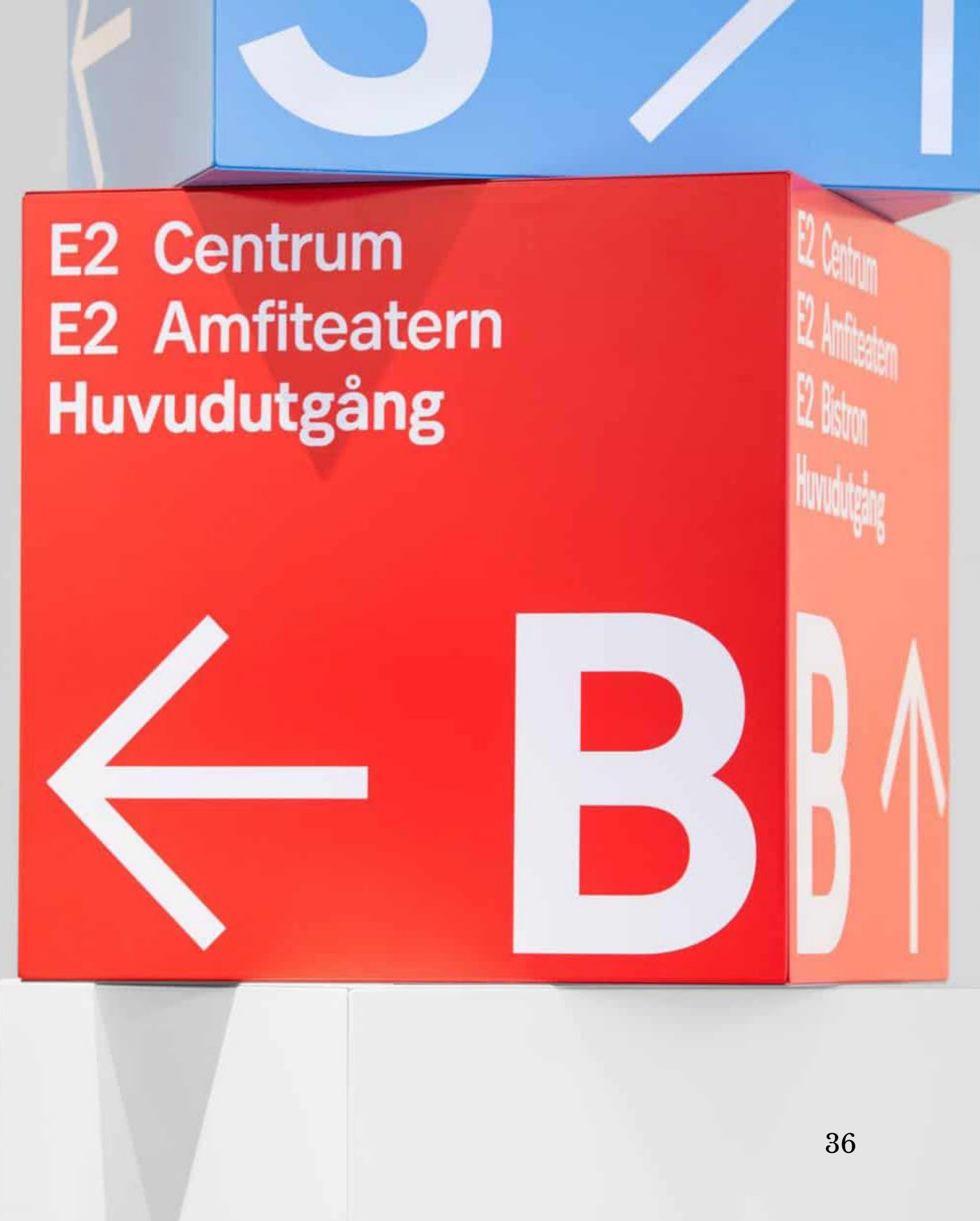


Wayfinding

Definition: User behavior where navigation across components follows a particular workflow or supports user goals.

Three key elements:

1. Labels & signage
2. Navigation clues & aids
3. Maps, *e.g.*, site maps



← BACK TO SHOP

SECURE CHECKOUT 

Complete Your Purchase

NEED HELP?

If you need help, contact us and let us help you. Support is available for 24 hours.

+111 2 345 678 mail@company.com

1

CART

2

INFORMATION

3

SHIPPING

4

PAYMENT

← BACK

SHIPPING METHOD



Choose one of the shipping methods below



Standard Shipping 2-3 Days

\$3.00



Special Shipping 1-2 Days

\$7.50

SHIPPING TO



John Doe
32 Syarifudin Street, West Bogor, West Java,
Indonesia 112233

PHONE 012 34 567 89
ETD 1-2 Days

Is this wrong? [Change here](#)

ESTIMATION



Order	\$137.19
Shipping	\$0.00
Discount	\$0.00
Tax	\$10.00

TOTAL
\$147.19

GO TO PAYMENT METHOD →

Home & Kitchen ▾



EN



Hello, Sign in
Account & Lists ▾

Orders

Today's Deals

Your Amazon.com

Gift Cards

Help

Whole Foods

Registry

Sell

Room

Discover

Shop by Style

Home Décor

Furniture

Kitchen & Dining

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Shop Cookware Sets

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Cuisinart MCP-12N Multiclad Pro Stainless Steel 12- Piece Cookware Set

by Cuisinart

★★★★★ ▾ 2,264

customer reviews

| 729 answered questions

Amazon's Choice

for "cuisin..."



Get the Best Deal

Price: **\$197.21** & **FREE**

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Get \$50 off instantly: Pay
\$197.21 \$147.21 upon approval
for the Amazon Rewards Visa
Card. No annual fee.

Size: **12-PC Set**

7-PC Set

10-PC Set

12-PC Set

- Polished cooking surface does not discolor, react with food or alter flavors.
- Cookware also features cool grip handles secured with stainless steel rivets and self-basting, tight fitting lids, Triple-Ply construction

\$197.21

& **FREE**

& **FREE**

Want it

Order w

choose

checkou

In Sto

Qty: 1

70s

90s



Ships fr

Amazon

packagi

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reveals

choose

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committee

ectors

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Winni

with I

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GROUP

SITEMAP

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H&M HOME

& Other Stories

ARKET

Afound

Animal welfare

Chemicals

Climate positive value cha

Water

Business ethics

Get involved

Care for your clothes

Recycle your clothes

Sustainability Summary 201

Career

Grow with us

Be yourself

Enjoy our culture

More about our values

Be proud

Lead the way

Randall April, H&M

Andreas Sjunnesson, Weekday

Anna Norling, Cheap Monday

Michael Hafner, Monki

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Stylish rewards

H&M Incentive Program

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pictures

Capital Markets Day 2018

The share

Shareholders

Dividend

Five year summary

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Newsroom

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Calendar

Social media

Media contacts

Sustainability

Vision and strategy

Sustainability strategy

Stakeholder engagement

Cost

Definition: The time and effort required by users to navigate between components.

Two key principles:

1. Minimize factors that increase cost of navigation: *context switch, errors, delays*
2. Minimize travel time by minimizing number of steps and context switches

Aids

Definition: Design elements that aid users in navigating through content.

Three types of navigation aids:

1. Global navigation aids, *e.g.*, menus, tabs, sidebars
2. Utility navigation aids, *e.g.*, settings pane
3. Associative/in-line navigation aids, *e.g.*, related links



Quiz 3

Complete the Canvas quiz.



canvas

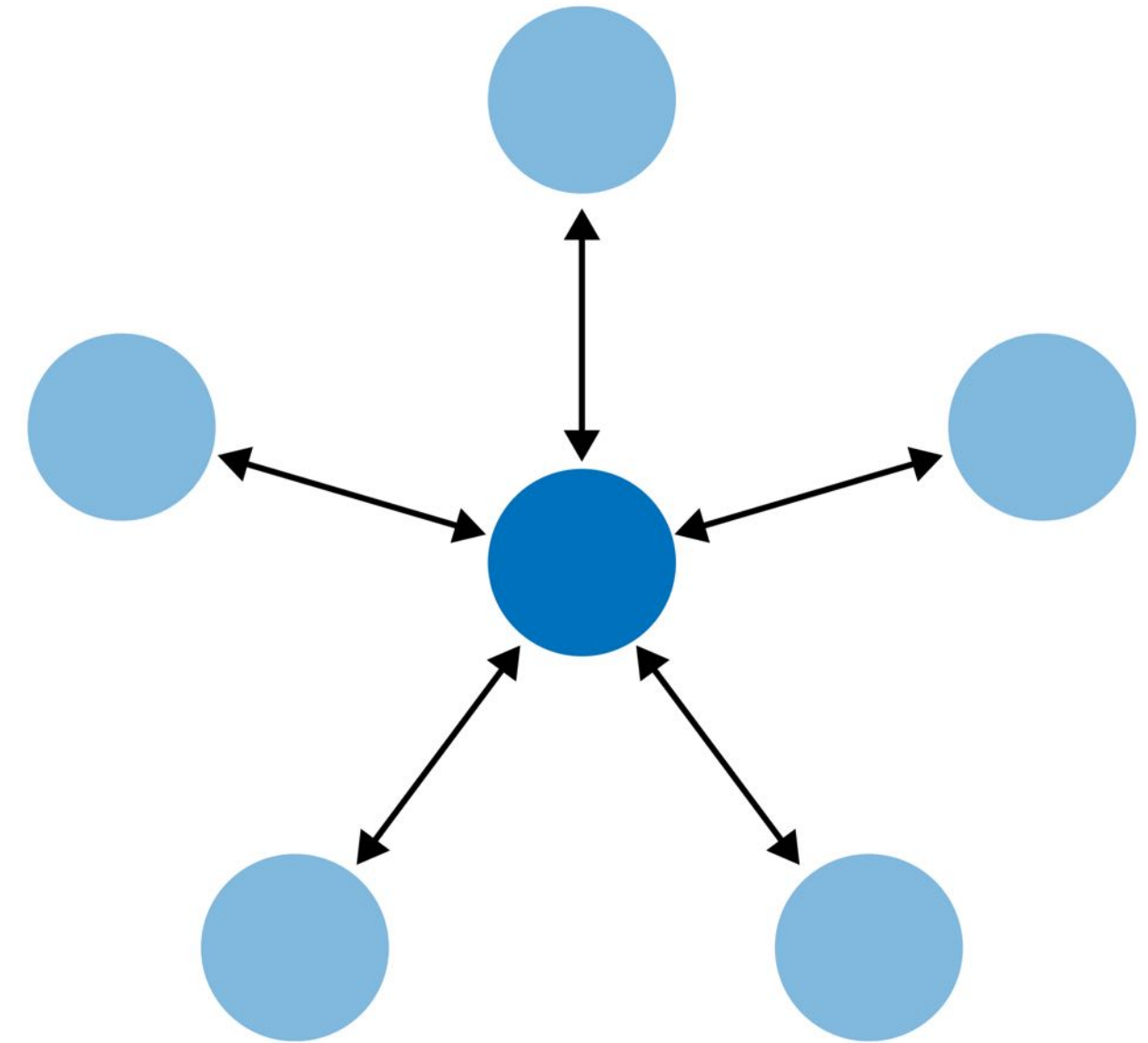
Models

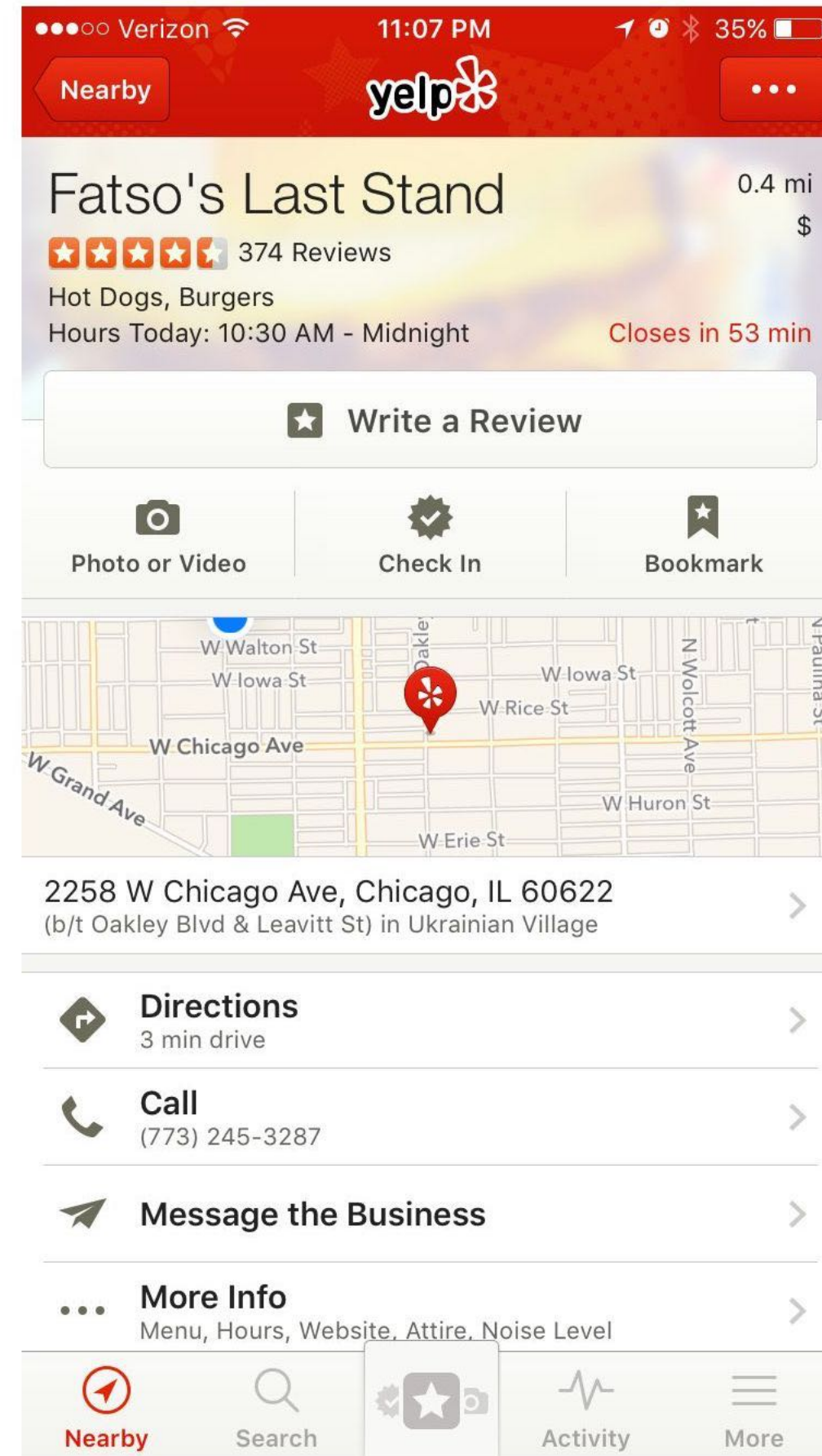
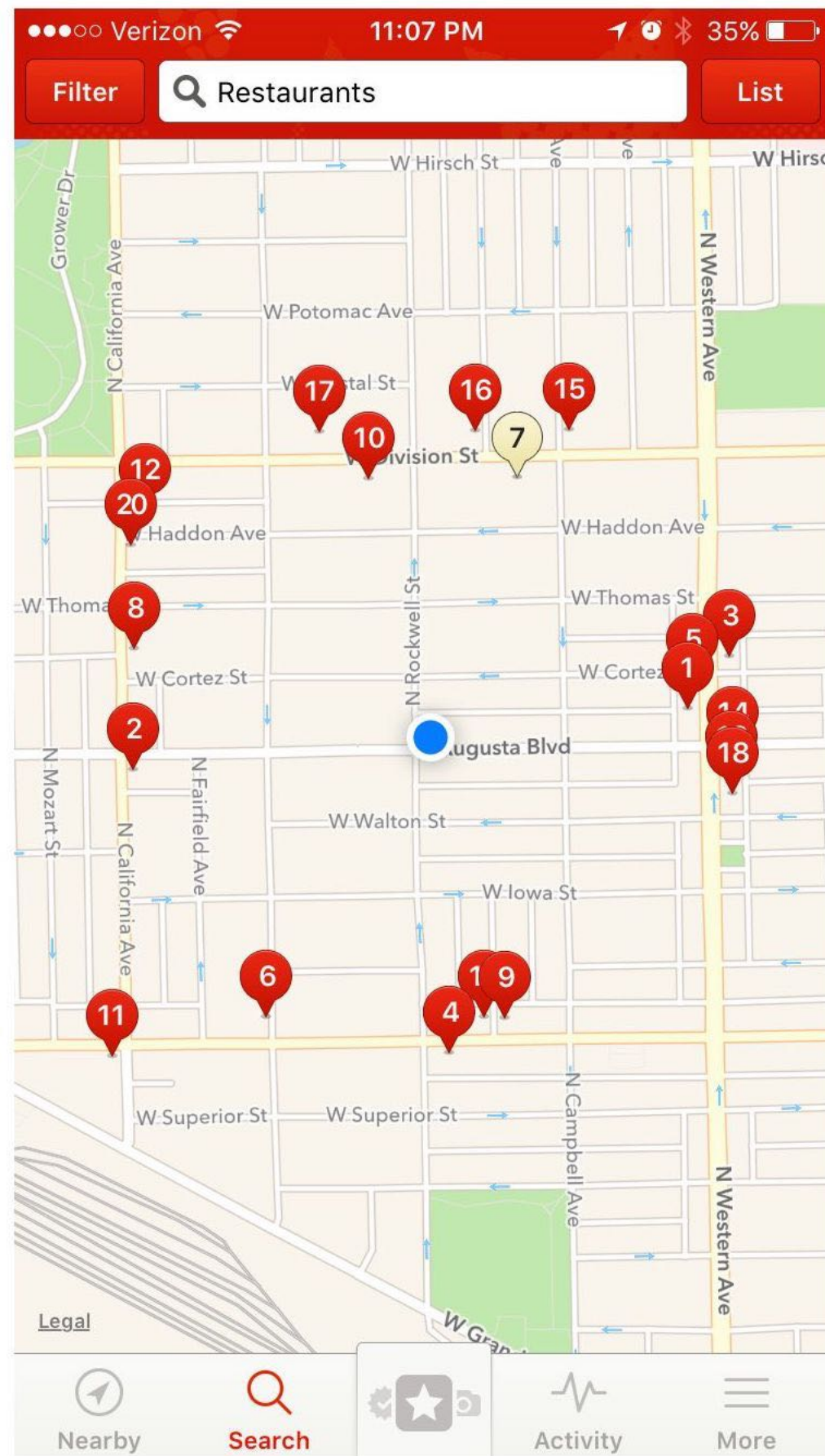
Definition: Commonly used patterns of navigation through interactive applications.

- | | |
|--------------------|-----------------------|
| 1. Hub and spoke | 1. Pan-and-zoom |
| 2. Fully connected | 2. Flat navigation |
| 3. Multi-level | 3. Modal panel |
| 4. Stepwise | 4. Clear entry points |
| 5. Pyramid | 5. Bookmarks |
| | 6. Escape hatch |

Models: Hub & spoke

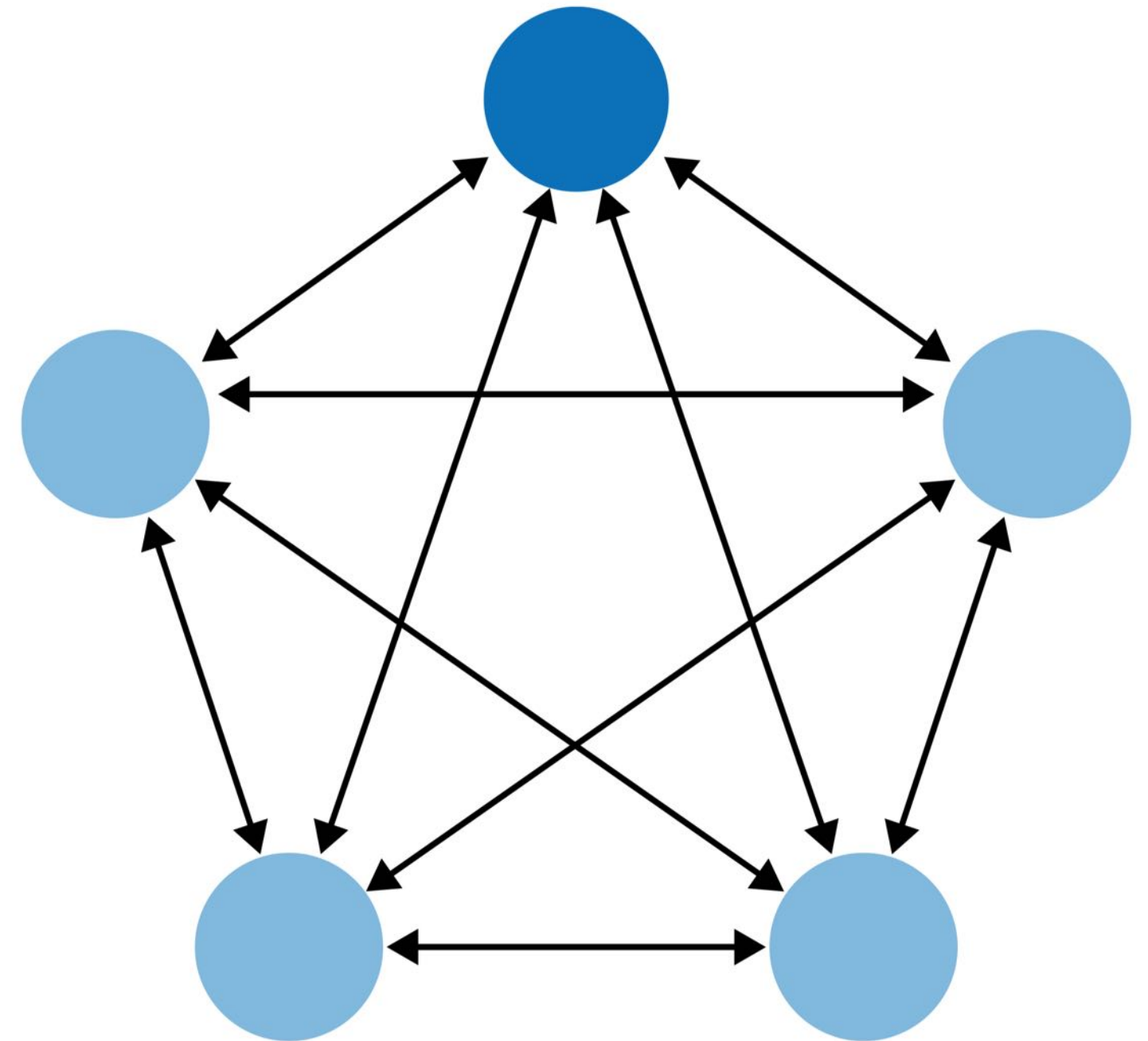
Definition: Involves a central hub, e.g., a home screen, that provides transitions to and from several specialized components.





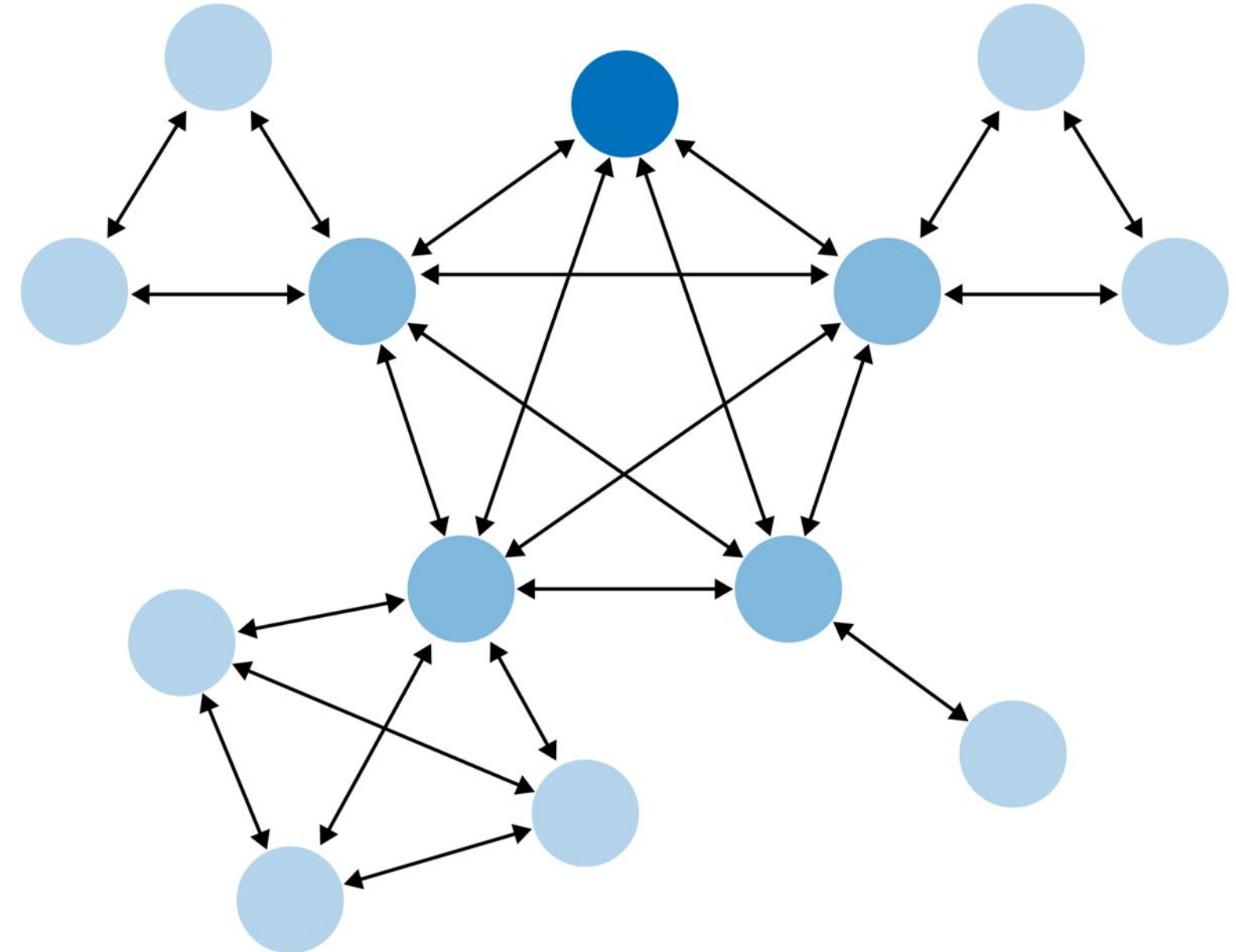
Models: Fully connected

Definition: A central component/page is connected to all other components that are also linked to each other.



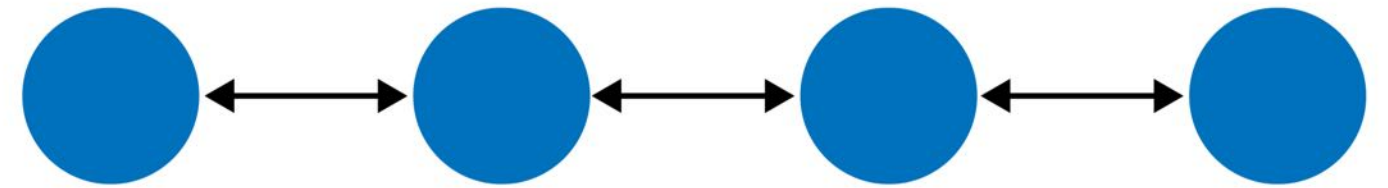
Models: Multi-level

Definition: Involves main components that are fully connected with each other and sub-components that are only connected among themselves.



Models: Stepwise

Definition: Follows a sequential or branching navigation that represents step-by-step process, e.g., checking out on an e-commerce site.





Set up your Amazon selling account

Have the following available:



**Business name &
address**



**Mobile or
telephone number**



**Chargeable credit
card & valid bank
account**



Tax information
[What does this mean?](#)

Legal name

[What is a legal name? ▸](#)

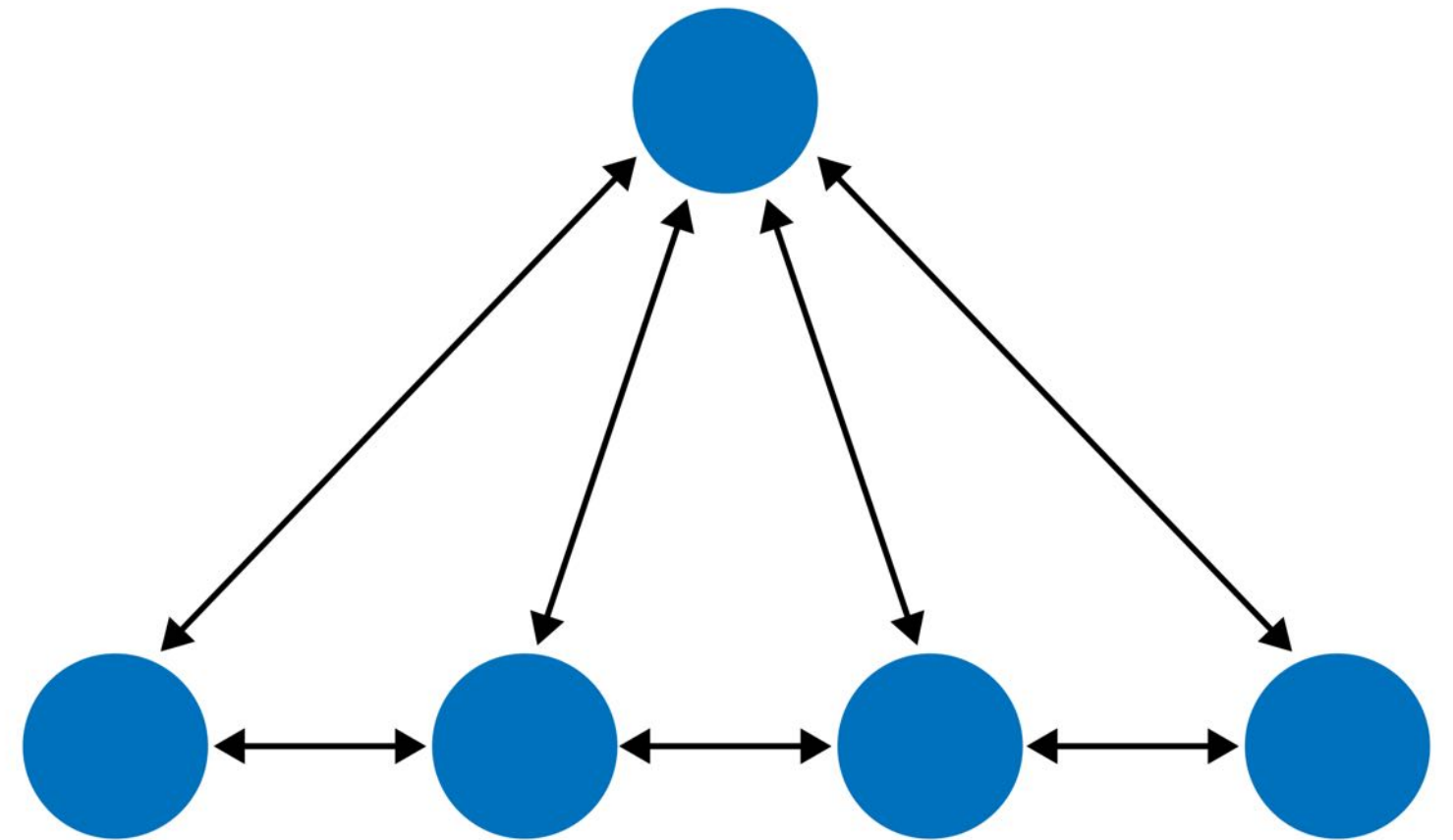
Seller agreement

☐ I have read and accepted the terms and conditions of the
[Amazon Services Business Solutions Agreement](#)

Please Leave Feedback

Models: Pyramid

Definition: Similar to the stepwise model, but at each step, the user can navigate to the hub and back.



TurboTax Online

intuit

turbotax

Federal Free Edition

Upgrade

My Account

Search

Contact

< Tax Timeline

Personal Info

Federal Taxes

State Taxes

Review

File

\$0

Federal Refund

\$0

NY Refund


(in progress)

Hide

Prepare State

Your State Returns

State Review



Let's get your state taxes done right

Here's what's coming up:

- We'll cover your state requirements
- We'll search for state tax breaks
- We'll help ensure your taxes are accurate

< Back

Continue

License Agreement

Privacy

Security

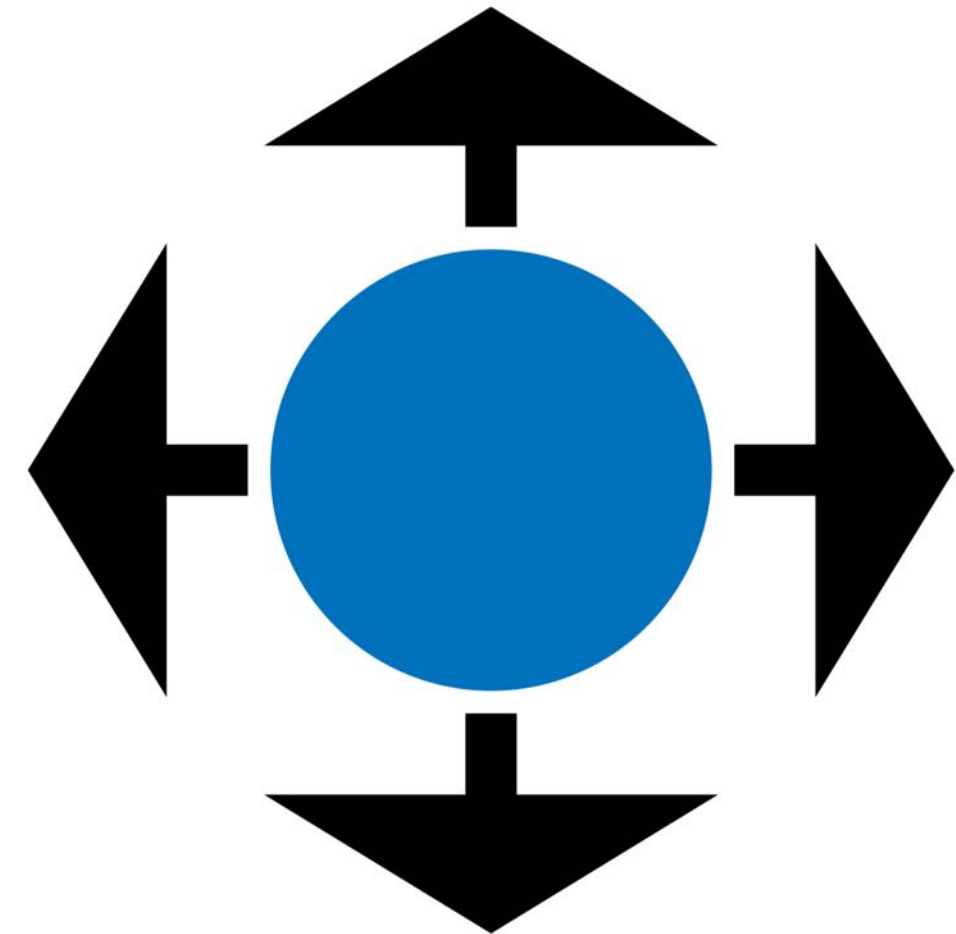
Support

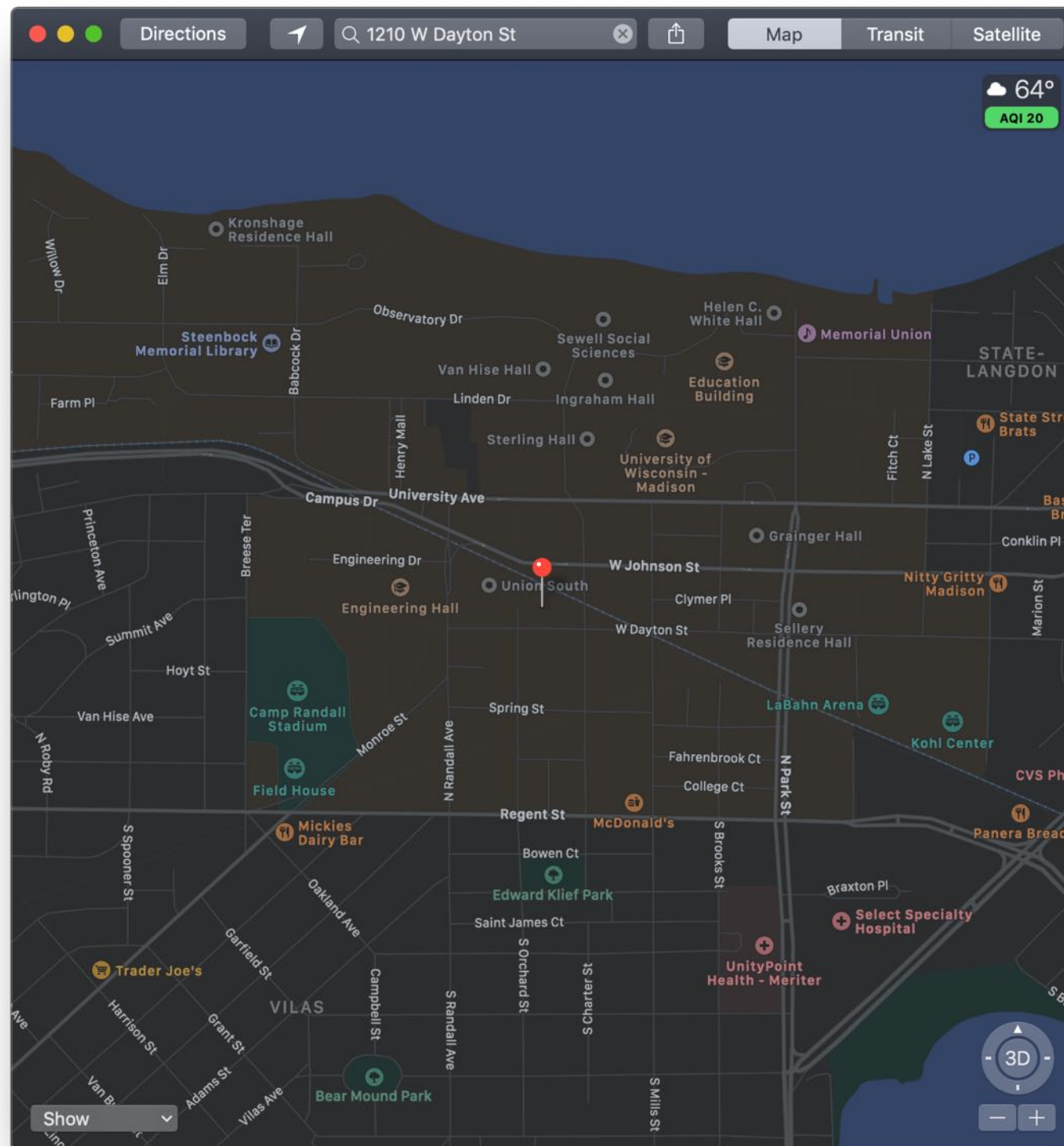
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49

Models: Pan-and-zoom

Definition: Provides users with the ability to continuously navigate across a large space of content, e.g., a map, a list, or a written document.





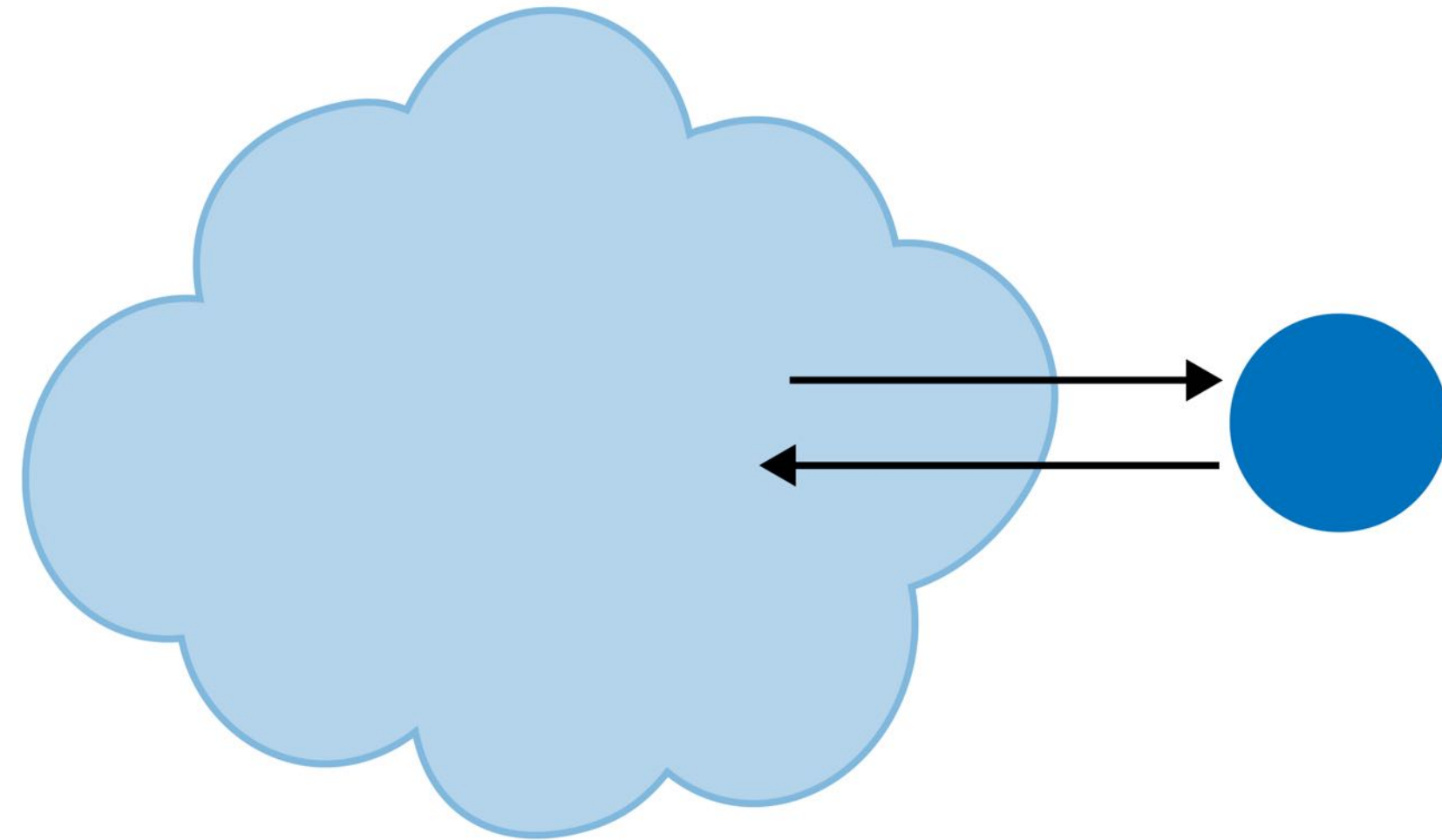
Vestibulum sodales sem sit amet erat faucibus pellentesque. Duis vestibulum in velit ac cursus. Nullam ultrices feugiat nisl sed fermentum. Donec neque eros, molestie vel ullamcorper at, molestie vitae risus. Cras ut vestibulum mi. Pellentesque vitae bibendum sapien, sed mattis sem. Nam eu quam orci. In ut imperdiet nibh. Sed lectus est, commodo non augue at, vehicula tristique tellus. Proin condimentum, orci sed imperdiet commodo, nisl ipsum sodales ipsum, et maximus mauris dui sed felis. Aliquam tincidunt quam sed aliquet elementum. Aliquam nec ex et diam luctus semper vel in augue.

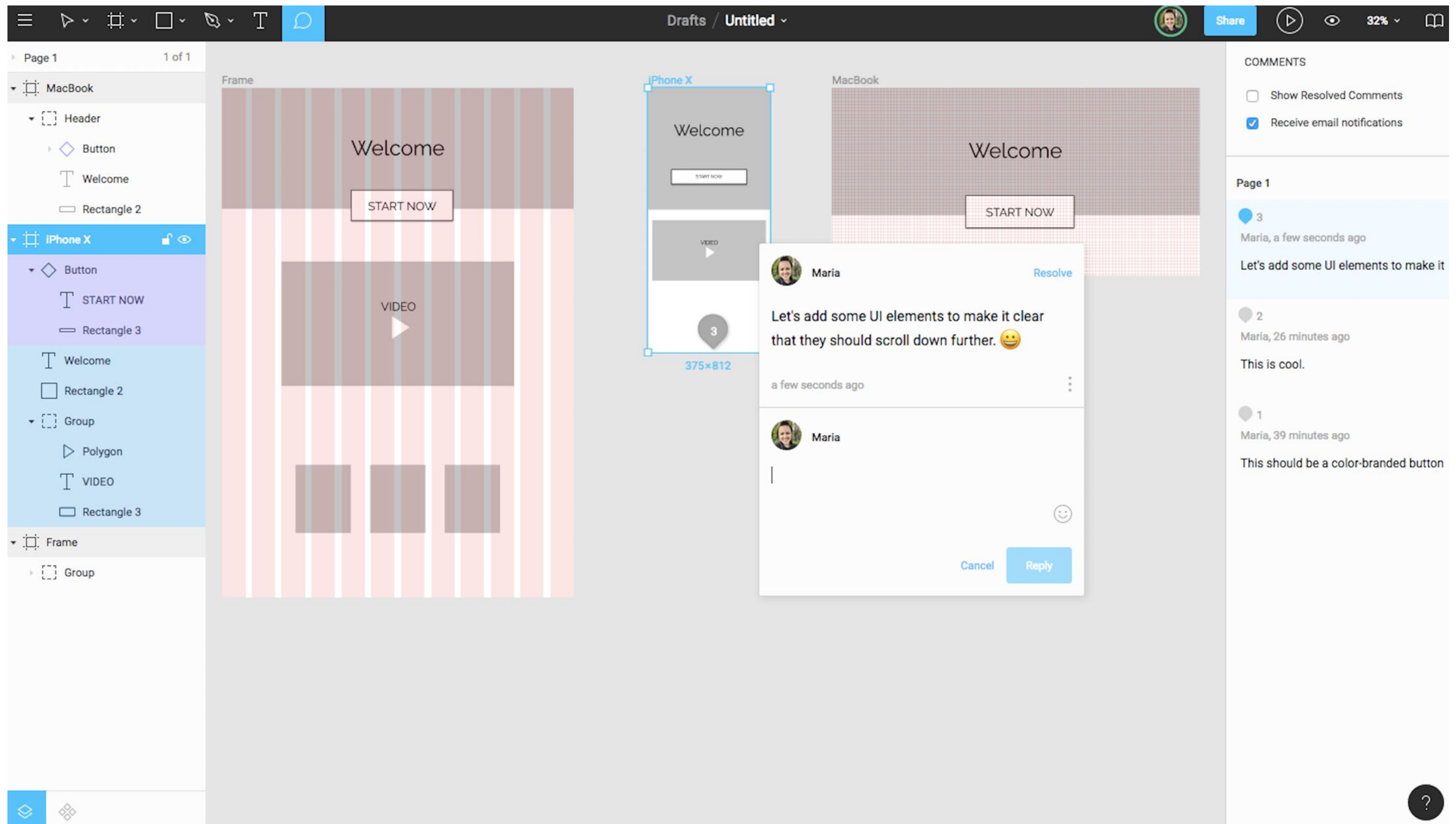
Cras eu scelerisque enim. Sed id diam pharetra, gravida lectus at, maximus nisl. Curabitur eu magna imperdiet, accumsan purus id, faucibus neque. Praesent quam mauris, tincidunt in turpis et, posuere porttitor justo. Donec in dignissim risus. Sed ut ultricies orci, nec pharetra ante. Sed quis ex augue. Aenean id magna quis purus tristique sodales. Quisque bibendum dolor at ante viverra, sed placerat erat suscipit. Proin finibus lacus quis ligula pulvinar imperdiet.

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Models: Flat navigation

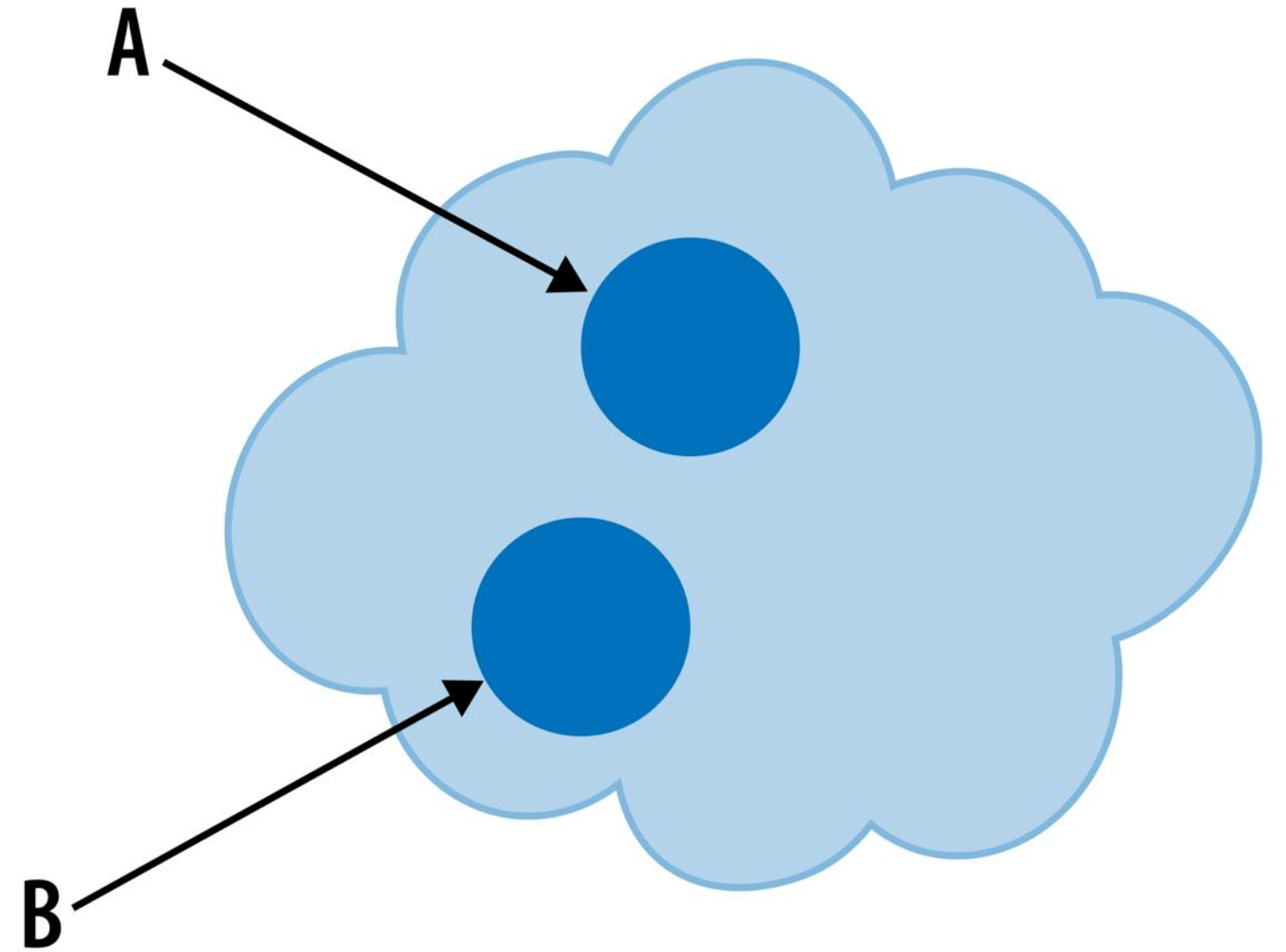
Definition: Involves a central workspace that is always visible and functions that do not require context switches or navigation.

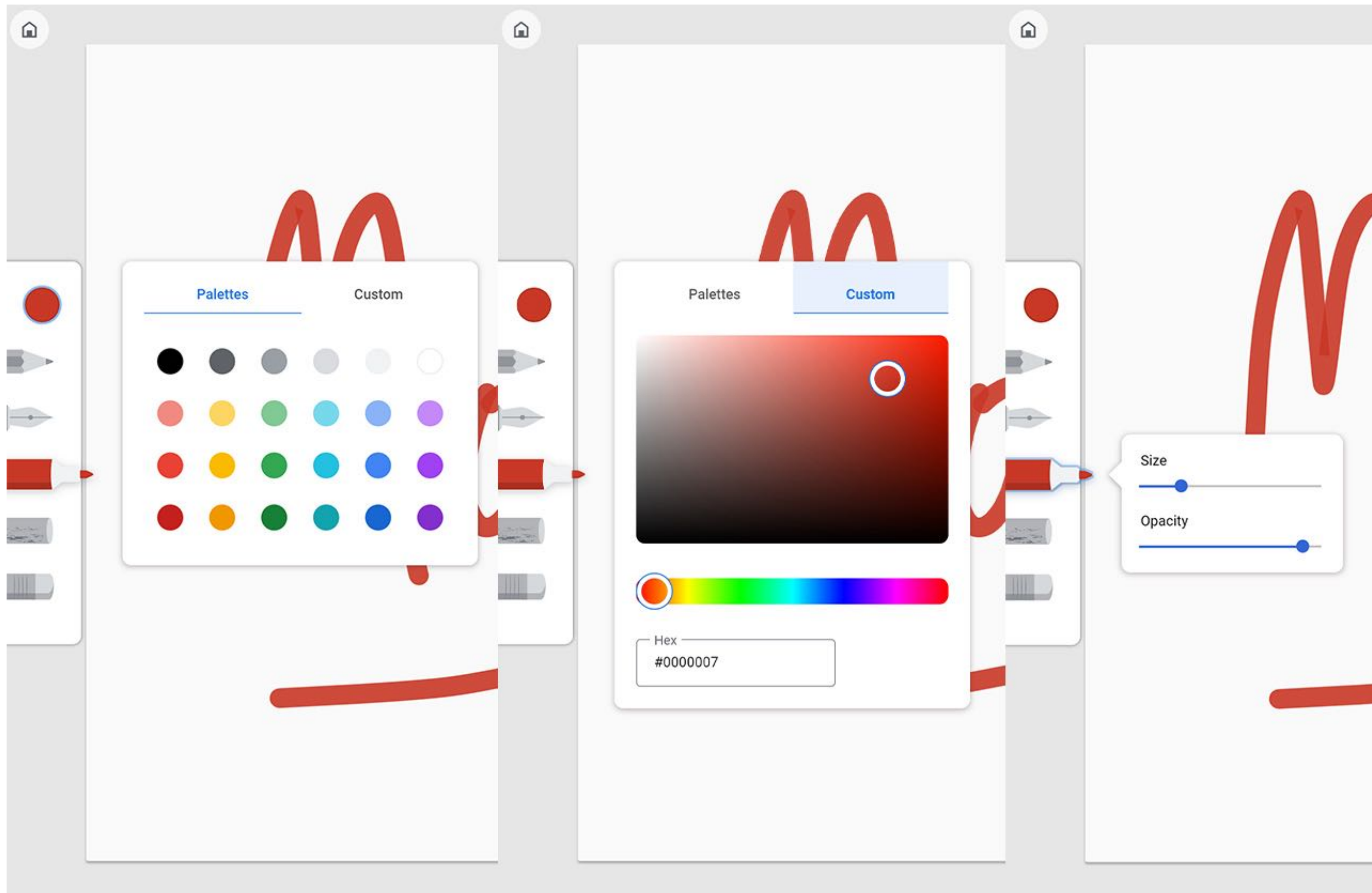




Models: Modal panel

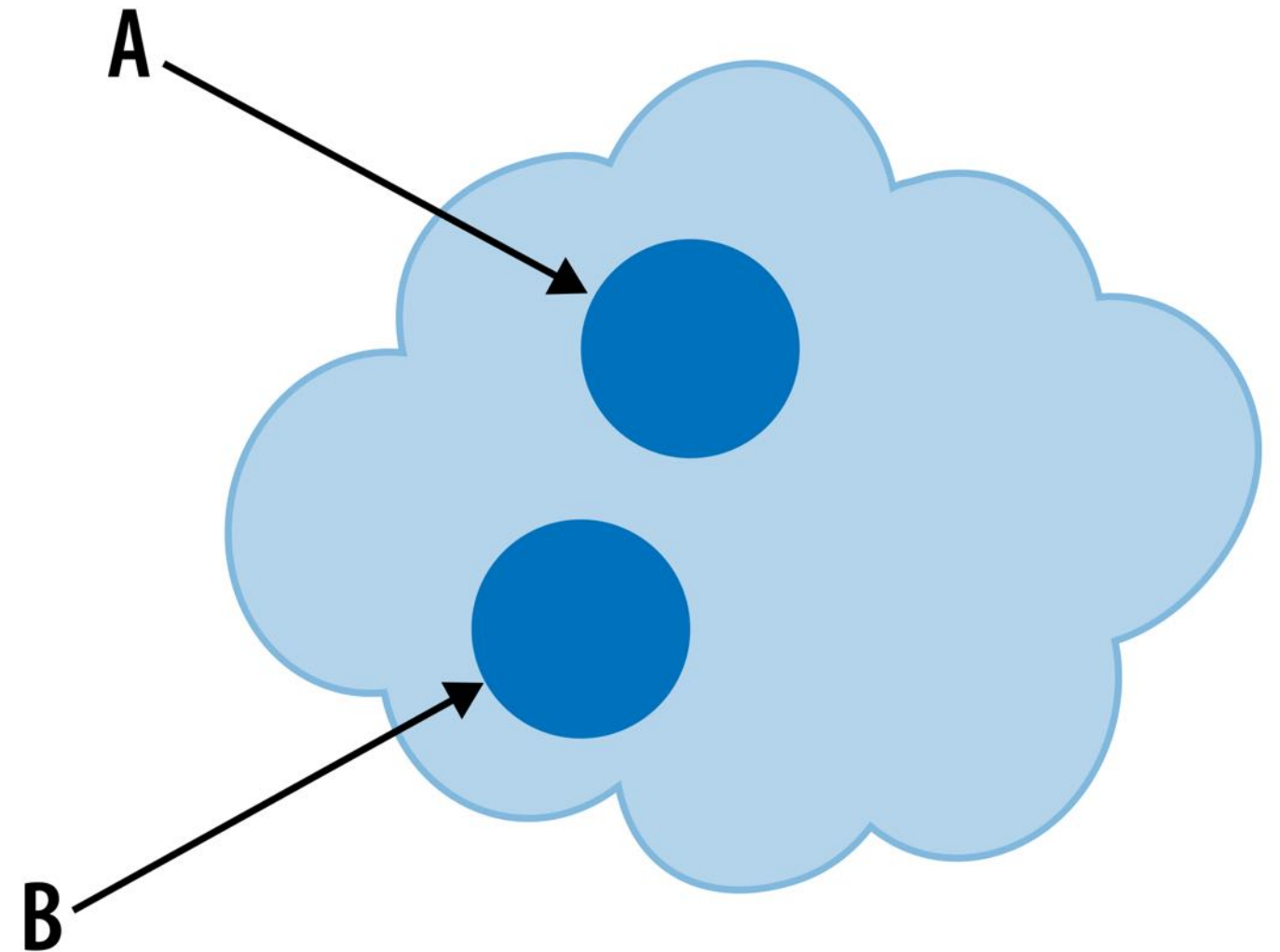
Definition: Follows the flat navigation model except for modal dialogs that are temporarily overlaid on them in canvas to help the user perform specific functions.






Models: Clear entry points

Definition: Complex applications involve navigational models with clear entry points that guide the user to frequently used or temporary functions without having to go through the hierarchical structure or a step-by-step process.





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2020 Marketing





Add/remove people


The client


Message Board

 Retouched team photos
FYI — Hey Victor, here's

 Logo concept
Question — Hey Victor,


 Ad comps
Hey all, take a look at these and

 Campaign ideas
Here's a few thoughts I had



 Raw shots from the shoot
Here's a few shots from the


To-dos


Requests

☐ Company logo Victor

Business cards


☐ finalize overall design Jul 23
 Annie B.


☐ create press-ready files
 Annie B.


☐ send to printer Jul 29


☐ photograph cards for portfolio

Group Chat


Hey Victor, is 1:00 still to...


 Victor 3:47pm
Sure is!

 Victor 3:48pm
Mind if we grab sushi inste...

 Victor 3:48pm
I've got a fever and the only...

...

 Adam 3:51pm
Ha! Sounds great.


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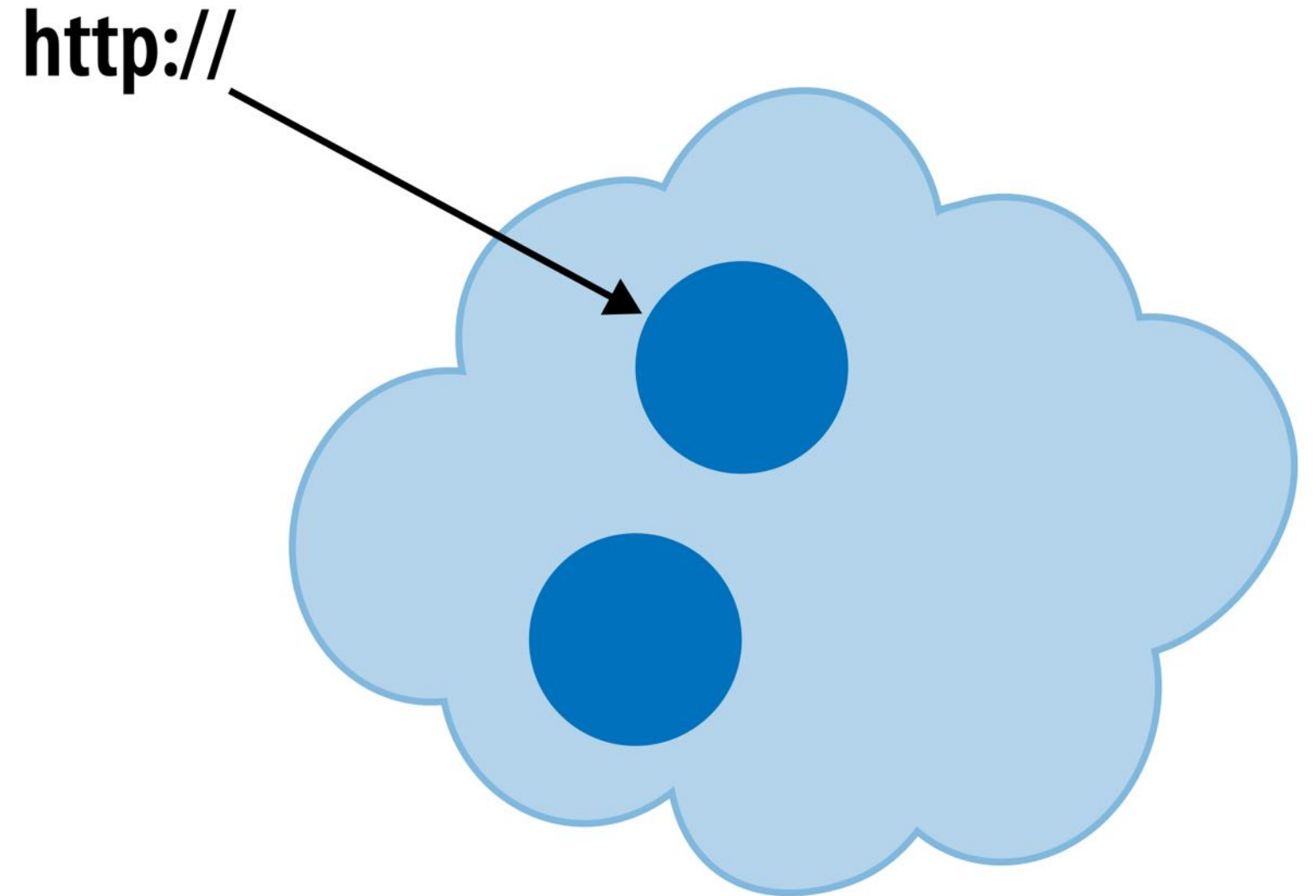
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57

Models: Bookmarks

Definition: Bookmarks allow frequent or infrequent users to directly access particular functions without having to navigate through hierarchical structures.



what will Doran do? *What will his brother do to avenge our murdered prince?* She moved closer to the captain. “And you say, *he does not wish to be a*

“He do Hotah said again.

The captain of guards knew the prince he guarded. Once, long ago, a callow youth had come from Norvos, a big broad-shouldered boy with a mop of dark hair. That hair was white now, and his body bore the scars of many battles... but his strength remained, and he kept his longaxe sharp, as the bearded priests had taught him. *She shall not pass*, he told himself, and said, “The prince is watching the children at their play. He is *never* to be disturbed when he is watching the children at their play.”

“Hotah,” said Obara Sand, “you will remove yourself from my path, else I shall take that longaxe and—”

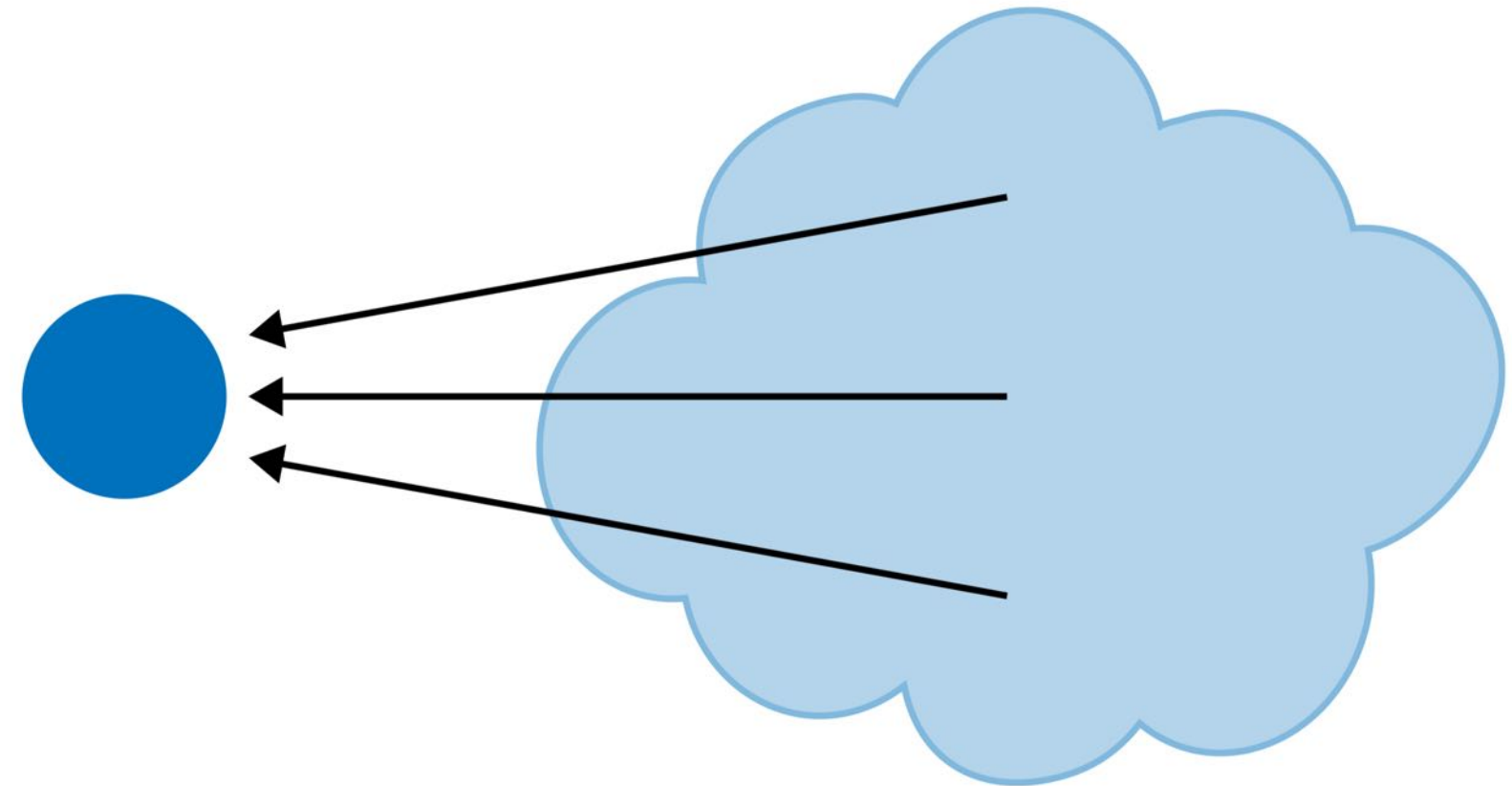
“Captain,” came the command, from behind. “Let her pass. I will speak with her.” The prince’s voice was hoarse.

Areo Hotah jerked his longaxe upright and stepped to one side. Obara gave him a lingering last look and strode past, the maester hurrying at her heels. Caleotte was no more than five feet tall and bald as an egg. His face was so smooth and fat that it was hard to tell his age, but he had been here before the captain, had even served the

The screenshot displays a mobile application interface with a list of text excerpts. Each excerpt is highlighted in yellow and includes a circular progress indicator with a green dot and a number (38, 39, or 570) over a total of 767. The excerpts are: "Obara touched her whip.", "The captain of guards knew the prince he guarded.", "She snorted. 'It has been twenty years, or near enough to make no matter. And I was not here long. I am the whore's whelp, or had you forgotten?' When he did not answer, she rose again and put her hands upon her hips.", and "hanged". The interface includes a sidebar with "Table of contents", "Bookmarks", "Highlights", and "Notes". A bottom navigation bar shows a home icon, a search icon, and a right arrow. A black banner at the bottom reads "Votre Artisan 24H/7J" with a right arrow and a small icon.

Models: Escape hatch

Definition: An "escape hatch" provides users with the ability to go back to the main component/page in a complex structure without having the trail steps back.



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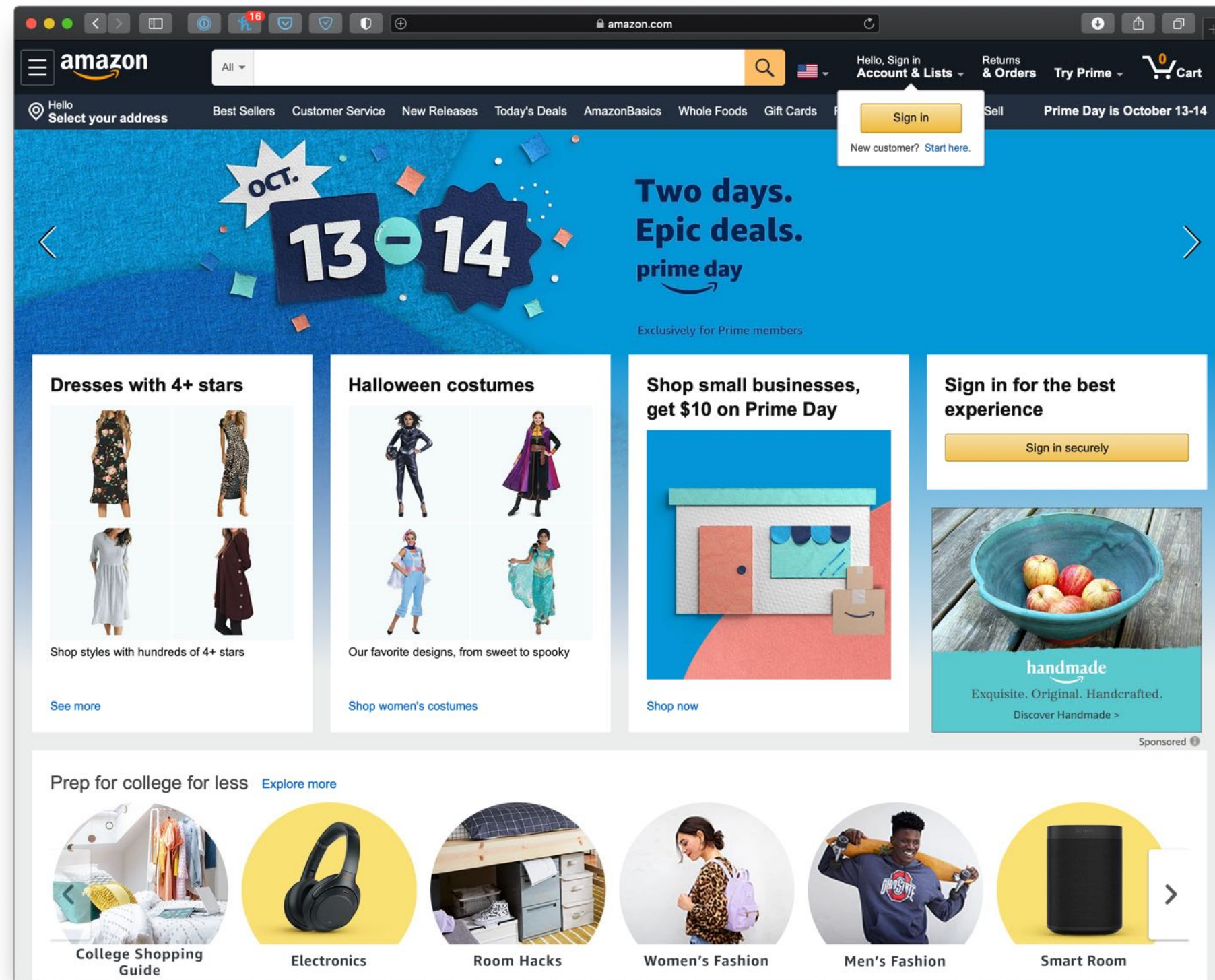
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In-Class Activity 2:

Reverse Engineering Navigation Models



Principles of Navigation

1. Wayfinding
2. Cost
3. Aids
4. Models

Quiz 4

Complete the Canvas quiz.



What did we learn today?

- Interaction structure
- Visual layout design
- Principles of navigation