HCI FUNDAMENTALS 2026

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Design Guidelines and Patterns

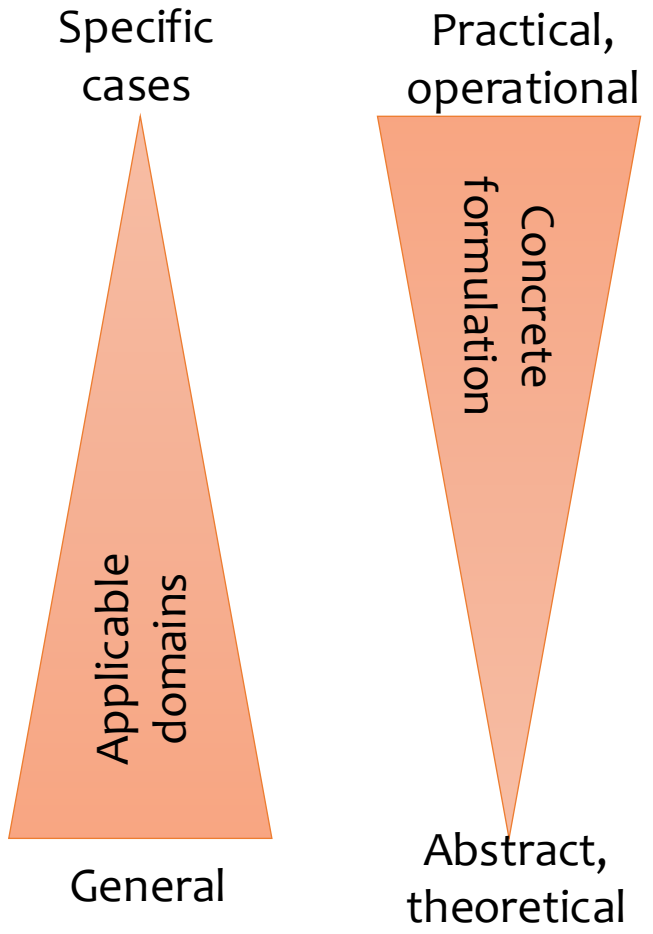
HCI Fundamentals

Luigi De Russis, Alberto Monge Roffarello

Academic Year 2026/2027

Generating Design Solutions (recap)

- **Guidelines**: Low-level focused advice about good practices and cautions against dangers.
- **Principles**: Mid-level strategies or rules to analyze and compare design alternatives.
- **Theories**: High-level widely applicable frameworks to draw on during design and evaluation, as well as to support communication and teaching.



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Design Guidelines

Shared language to promote **consistency** among multiple designers in terminology usage, appearance, and action sequences

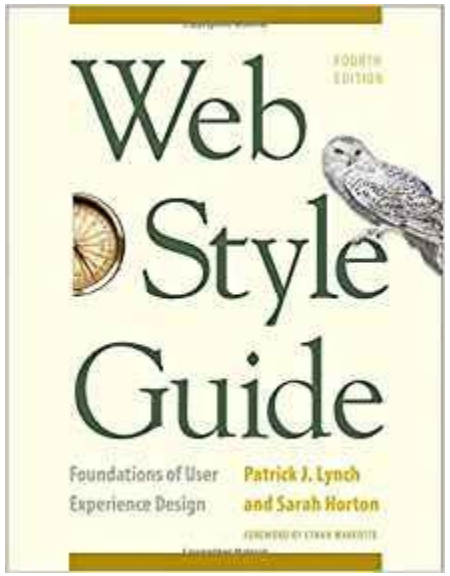
The “How”

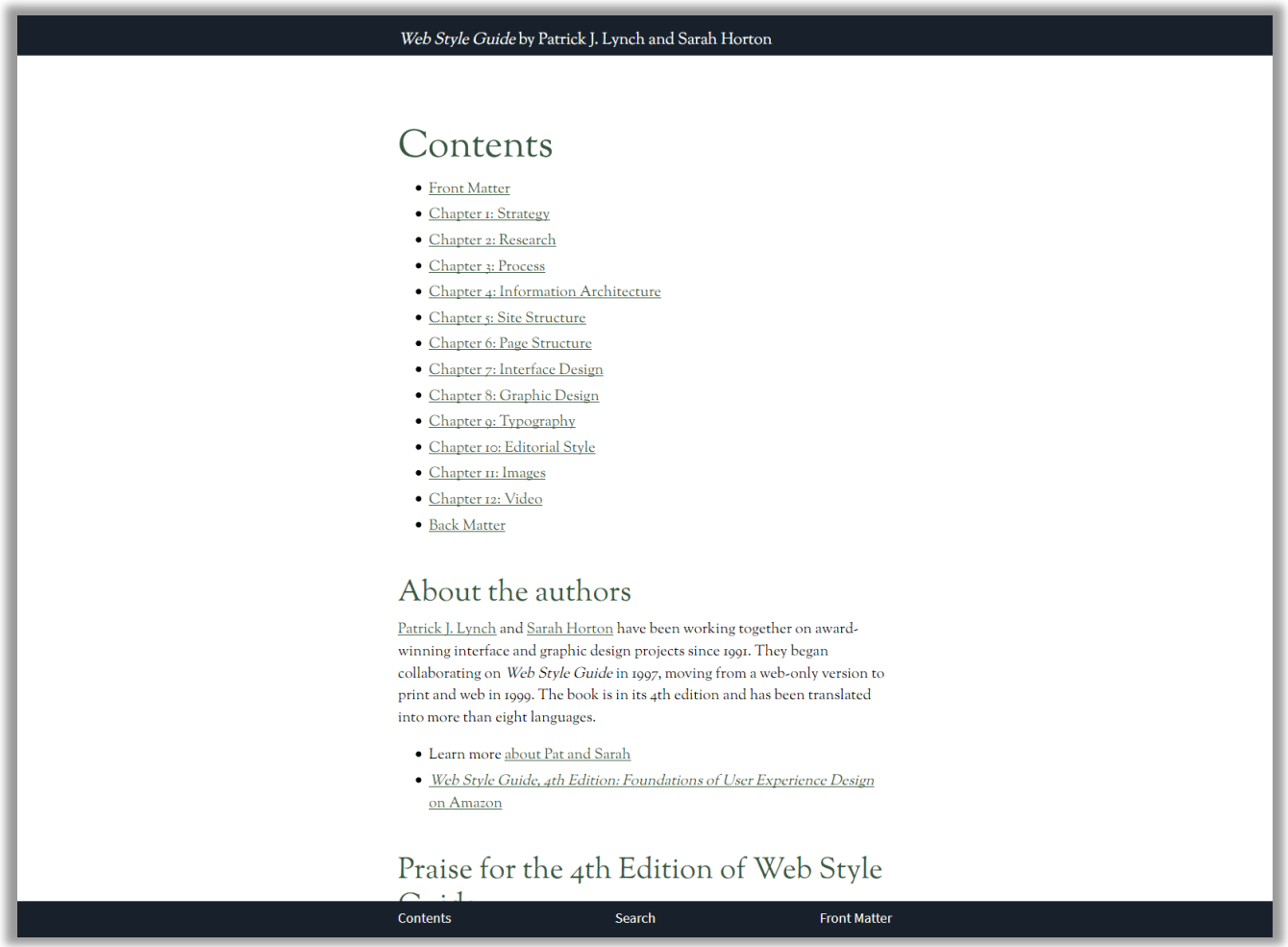
Design Guidelines

- Concrete suggestions about “How” the Principles may be satisfied
- Often rule-based
- Based on best practices
- Encapsulate experience of expert designers
- Sometimes blessed as «standards»
- But:
  - May be too specific and hard to apply to your situation
  - Difficult to develop a general-purpose guideline

Web Style Guide

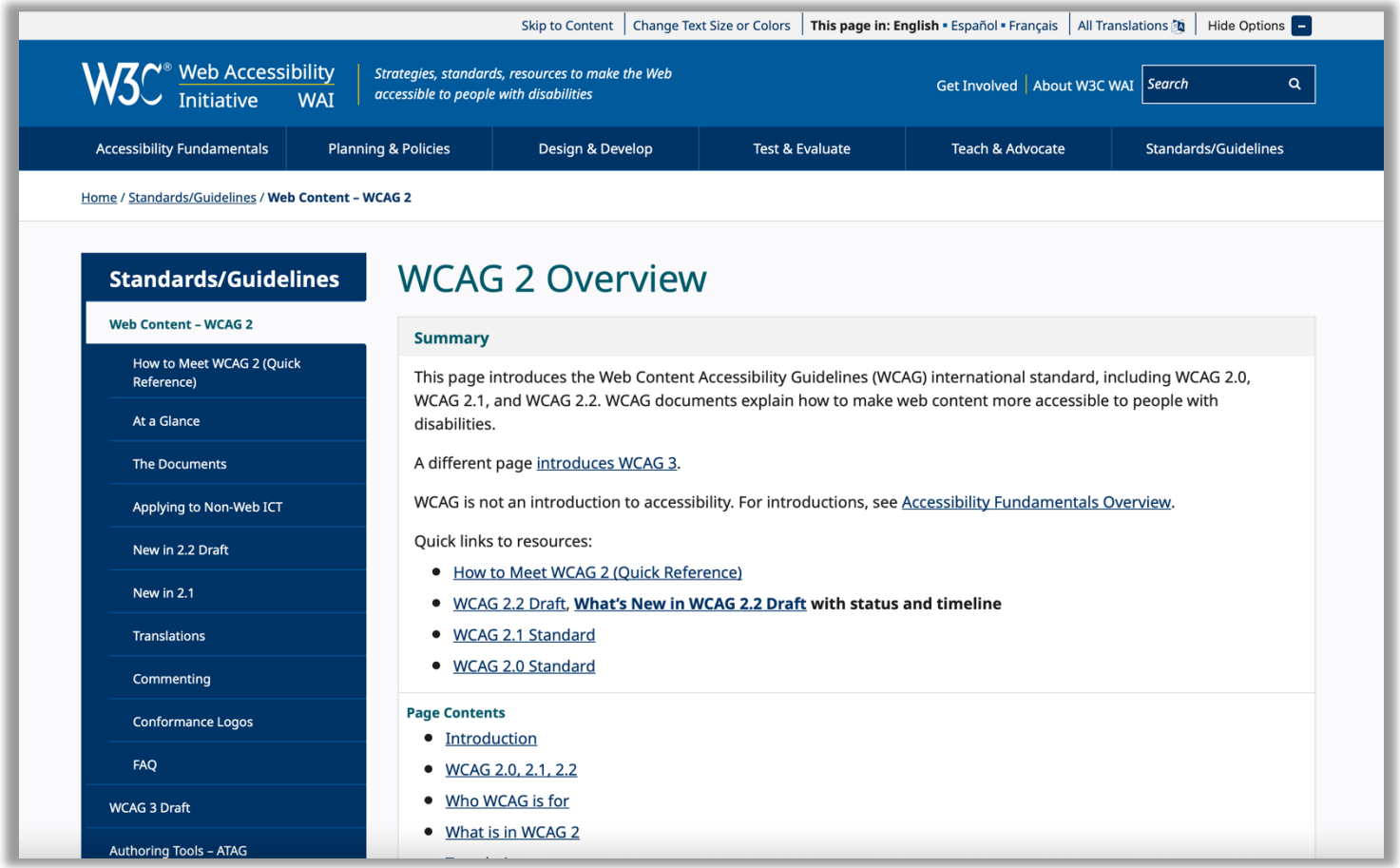
Web Style Guide, 4th Edition: Foundations of User Experience Design (2016)
https://webstyleguide.com/





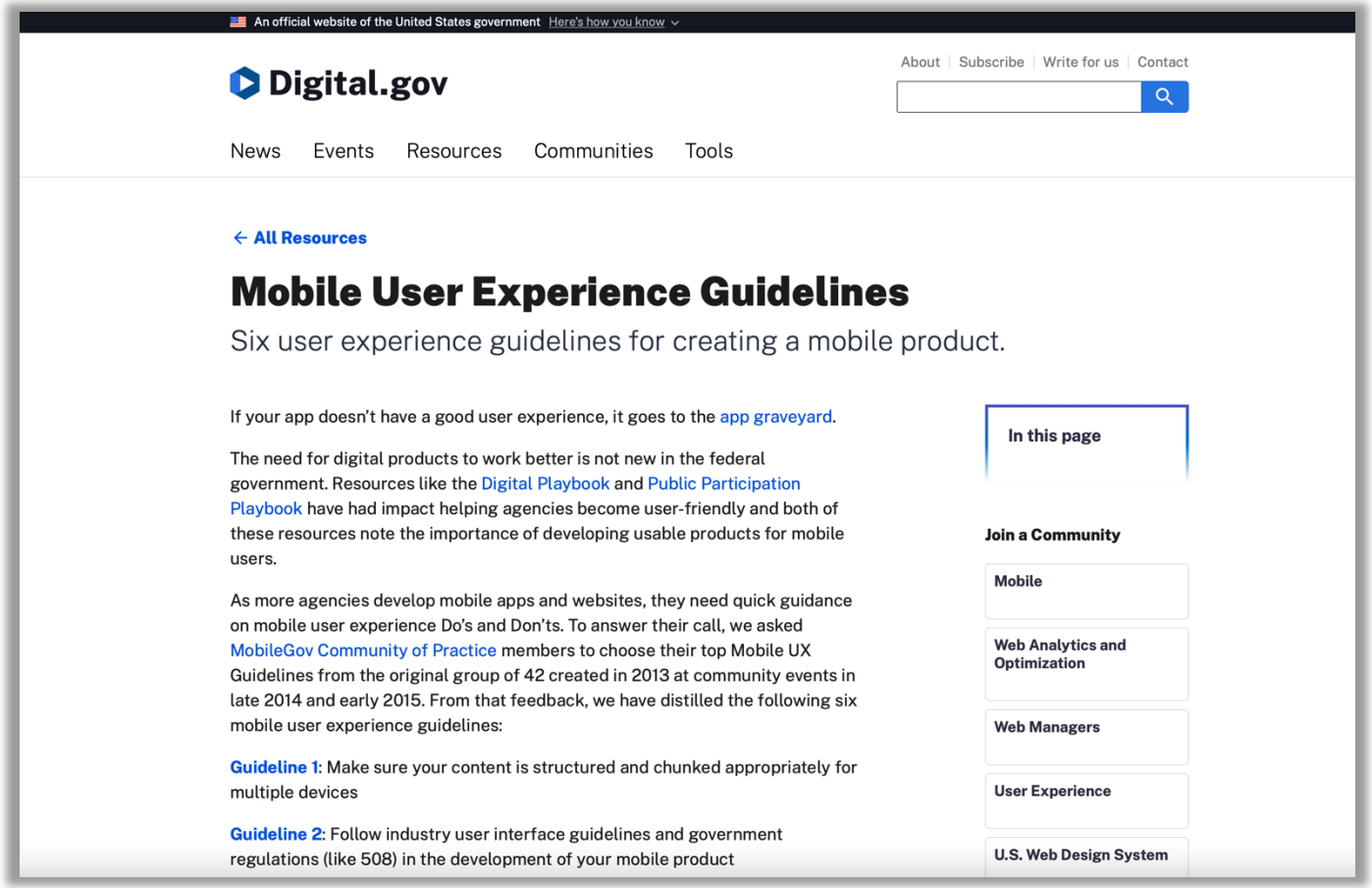
Web Content Accessibility Guidelines (WCAG)

https://www.w3.org/WAI/standards-guidelines/wcag/

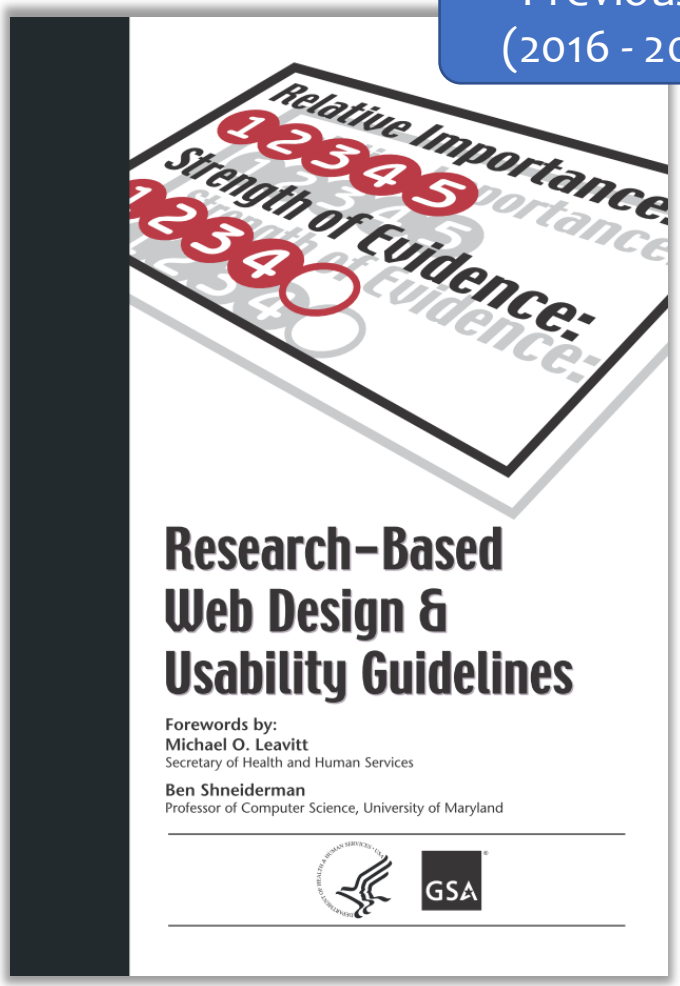


U.S. Government Mobile User Experience Guidelines

U.S. General Service Administration
https://digital.gov/resources/mobile-user-experience-guidelines/

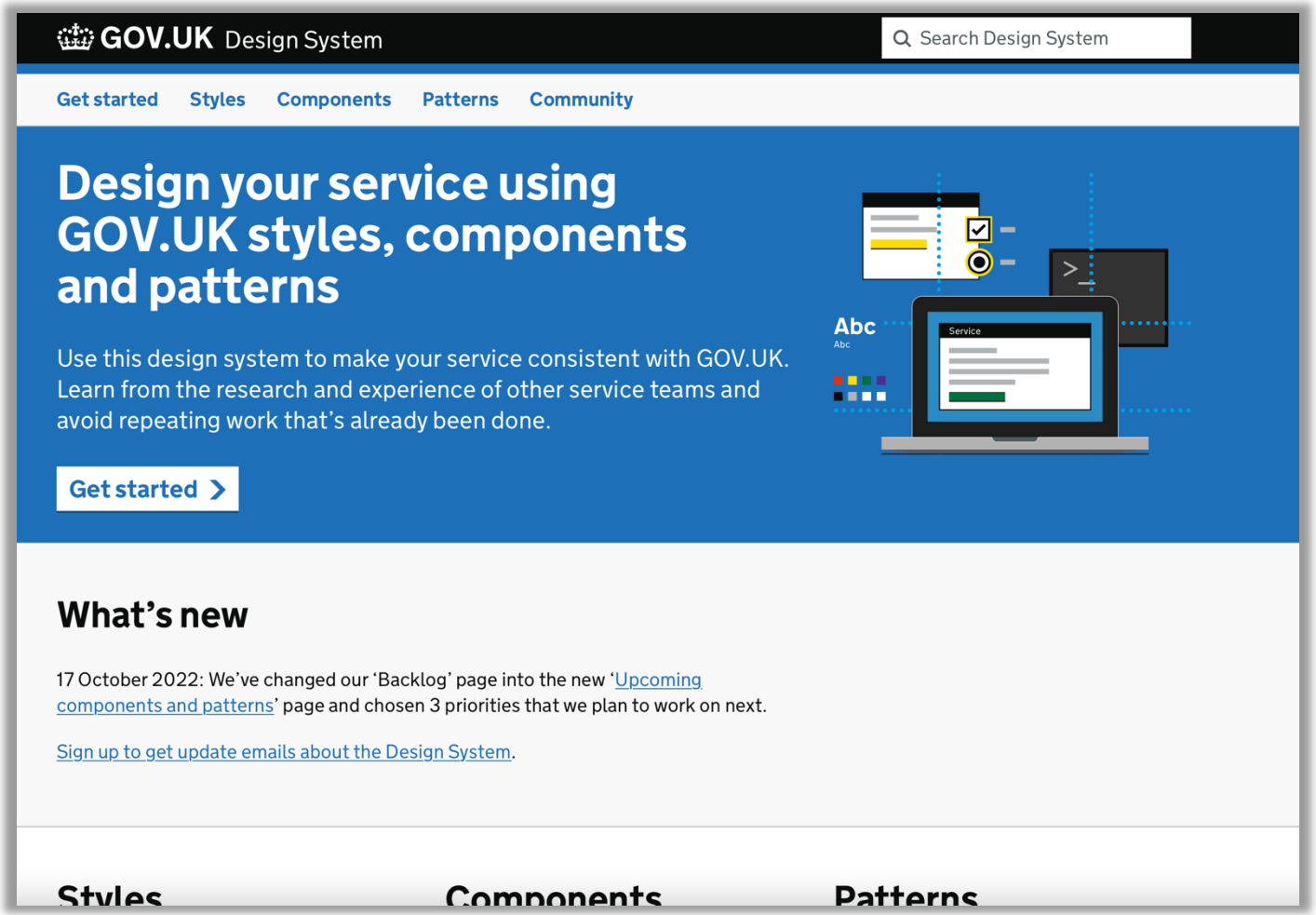


Previously (2016 - 2021)



https://design-system.service.gov.uk

U.K. Government Design System



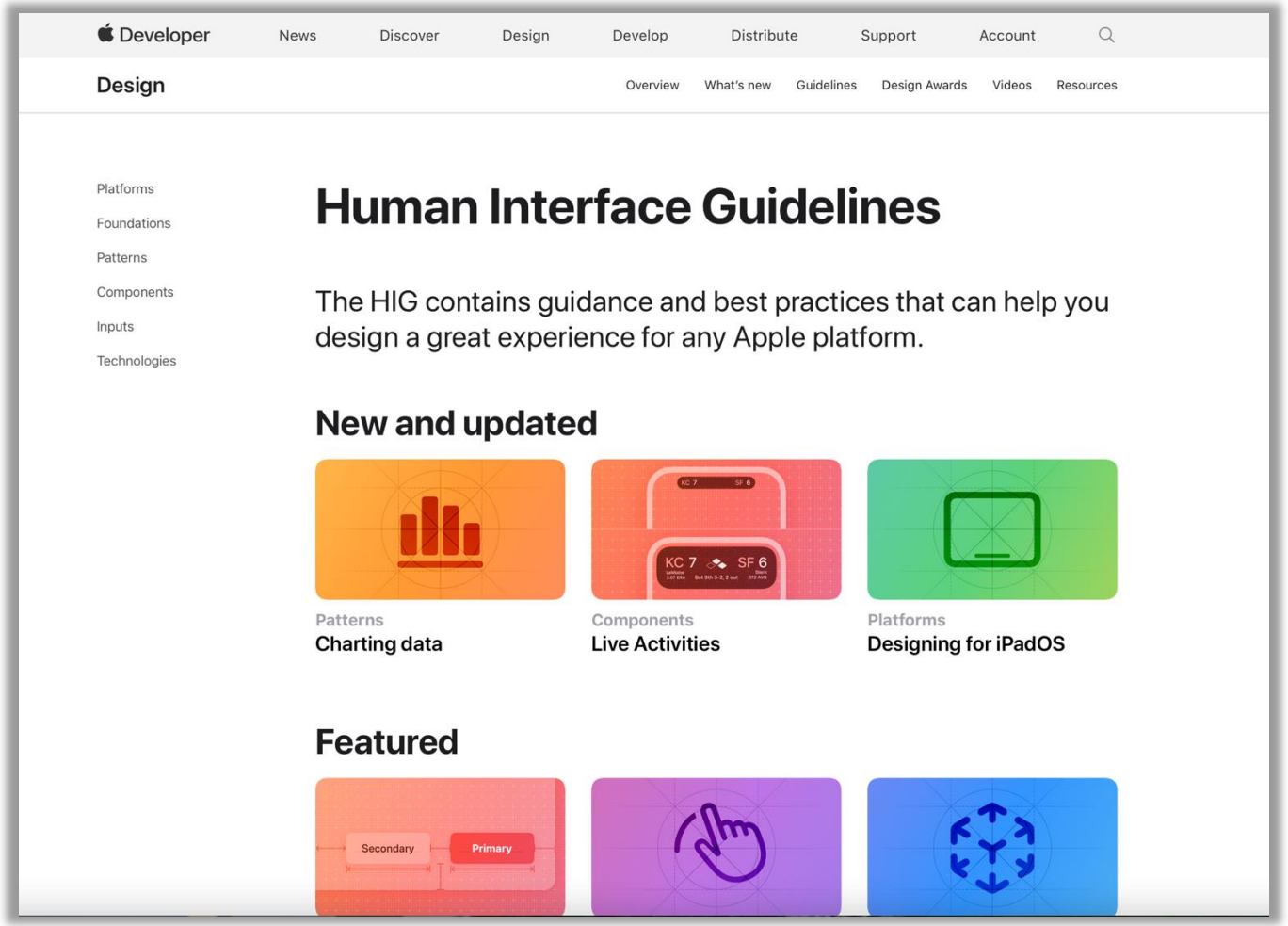
Italian Government Guidelines and Design System

https://designers.italia.it/linee-guida/



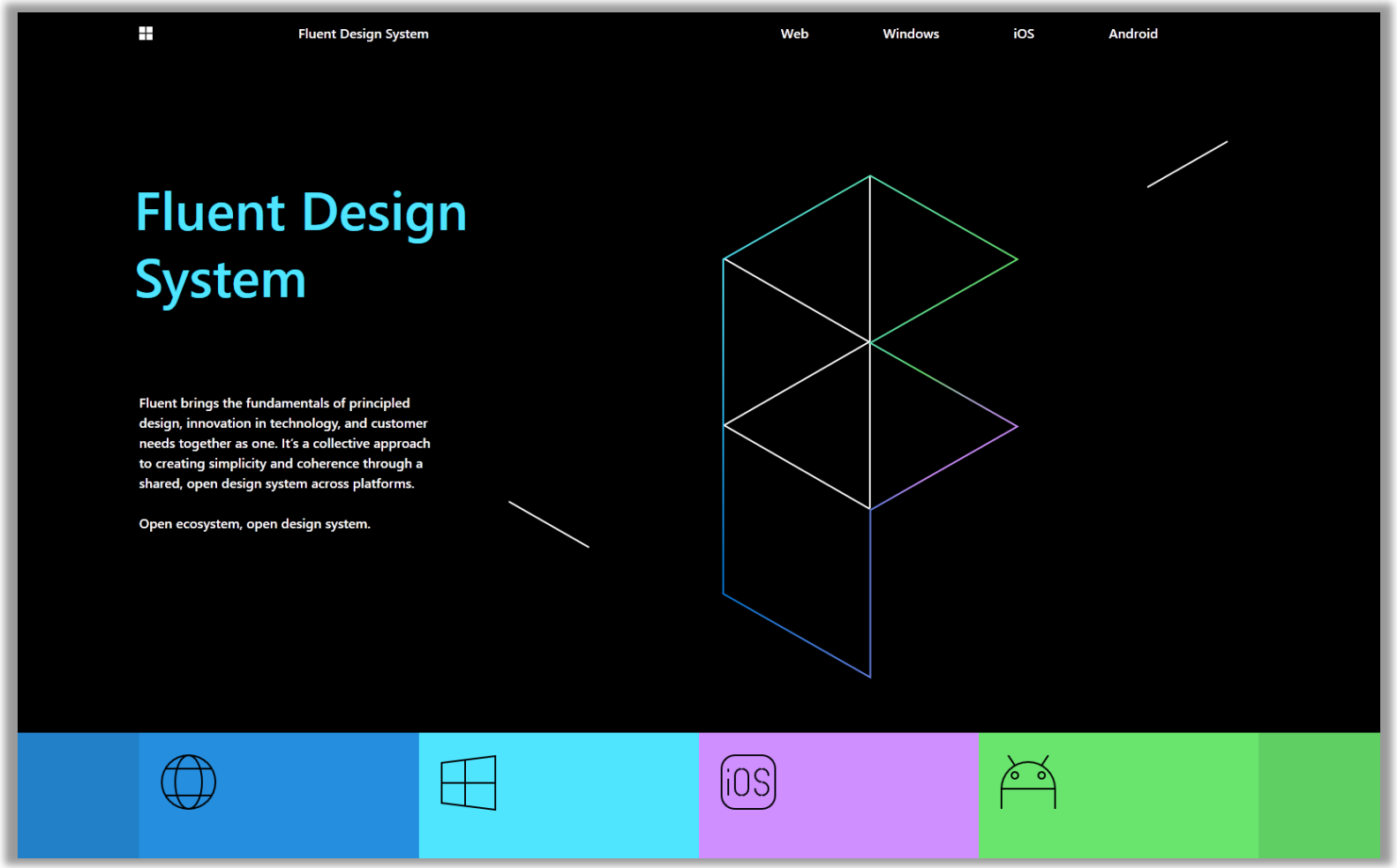
Apple HIG

https://developer.apple.com/design/human-interface-guidelines/



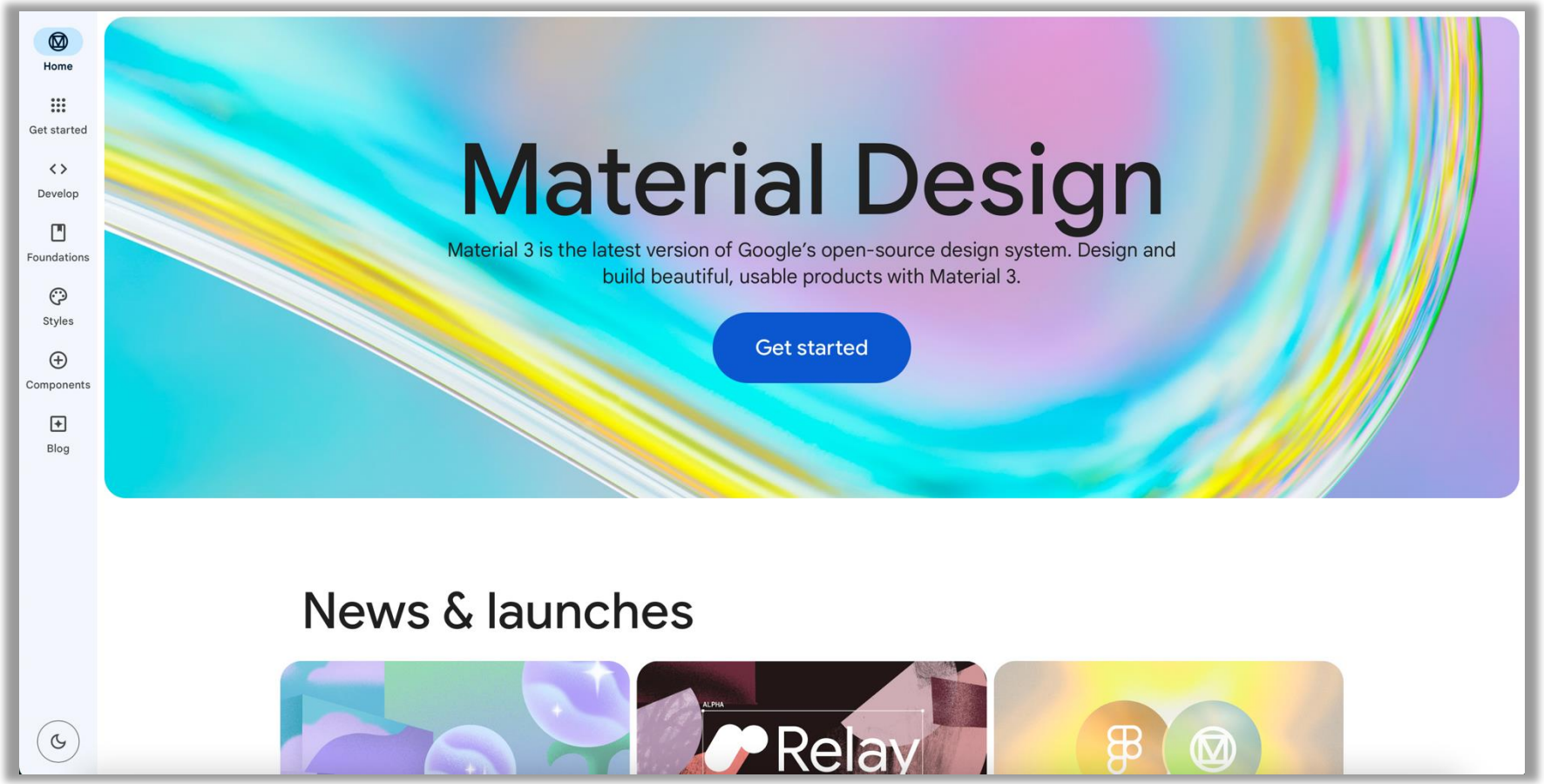
Microsoft «Fluent» Design

https://www.microsoft.com/design/fluent/



https://material.io/

Google Material Design



Guidelines for Human-AI Interaction

- By Microsoft Research:
  - https://www.microsoft.com/en-us/research/project/guidelines-for-human-ai-interaction/
  - https://www.microsoft.com/en-us/haxtoolkit/ai-guidelines/



Guidelines for Augmented Reality

- By Apple Design: https://developer.apple.com/design/human-interface-guidelines/technologies/augmented-reality/

Creating an engaging, comfortable experience

Let people use the entire display. Devote as much of the screen as possible to displaying the physical world and your app's virtual objects. Avoid cluttering the screen with controls and information that diminish the immersive experience.

Strive for convincing illusions when placing realistic objects. Design detailed 3D assets with lifelike textures to create objects that appear to inhabit the physical environment in which you place them. Using information from ARKit, you can scale objects properly and position them on detected real-world surfaces, reflect environmental lighting conditions and simulate camera grain, cast top-down diffuse object shadows on real-world surfaces, and update visuals as the camera's position changes. To help avoid breaking the illusion you create, make sure your app updates scenes 60 times per second so objects don't appear to jump or flicker.

Consider how virtual objects with reflective surfaces show the environment. Reflections in ARKit are approximations based on the environment captured by the camera. To help maintain the illusion that an AR experience is real, prefer small or coarse reflective surfaces that downplay the effect of these approximations.

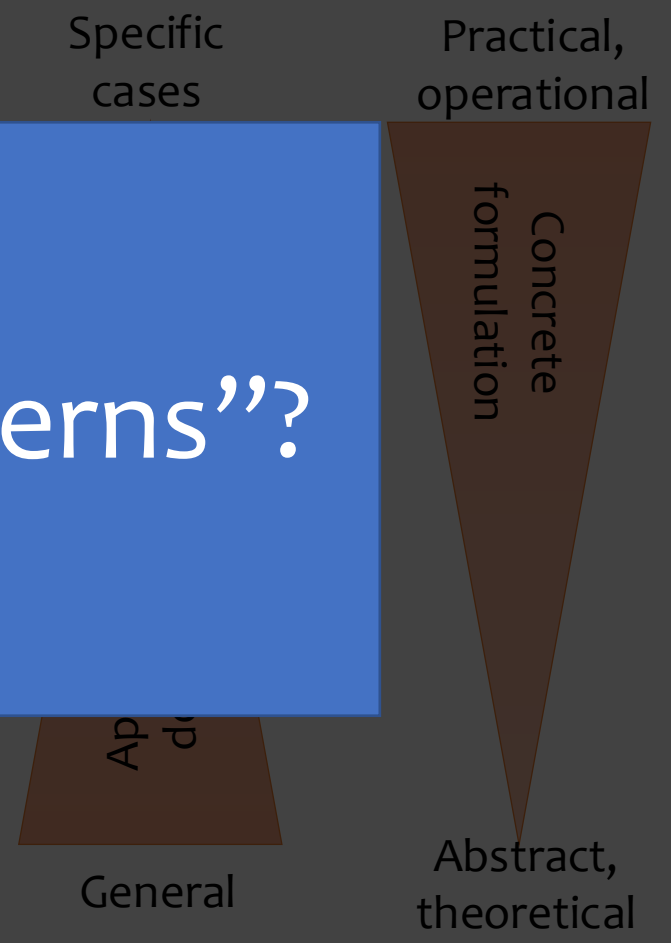
Use audio and haptics to enhance the immersive experience. A sound effect or bump sensation is a great way to confirm that a virtual object has made contact with a physical surface or other virtual object. Background music can also help envelop people in the virtual world. For guidance, see Playing audio and Playing haptics.

Minimize text in the environment. Display only the information that people need for your app experience.

Generating Design Solutions

- **Guidelin**
  practice
- **Principl**
  compar
- **Theorie**
  draw or
  support communication and teaching.

What about "Design Patterns"?



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Generating Design Solutions

- **Design Patterns:** well-proven solutions that solve commonly recurring problems
  - they suggest a specific solution for the specific problem;
  - the solution has been tested by others;
  - the solution can be reused.

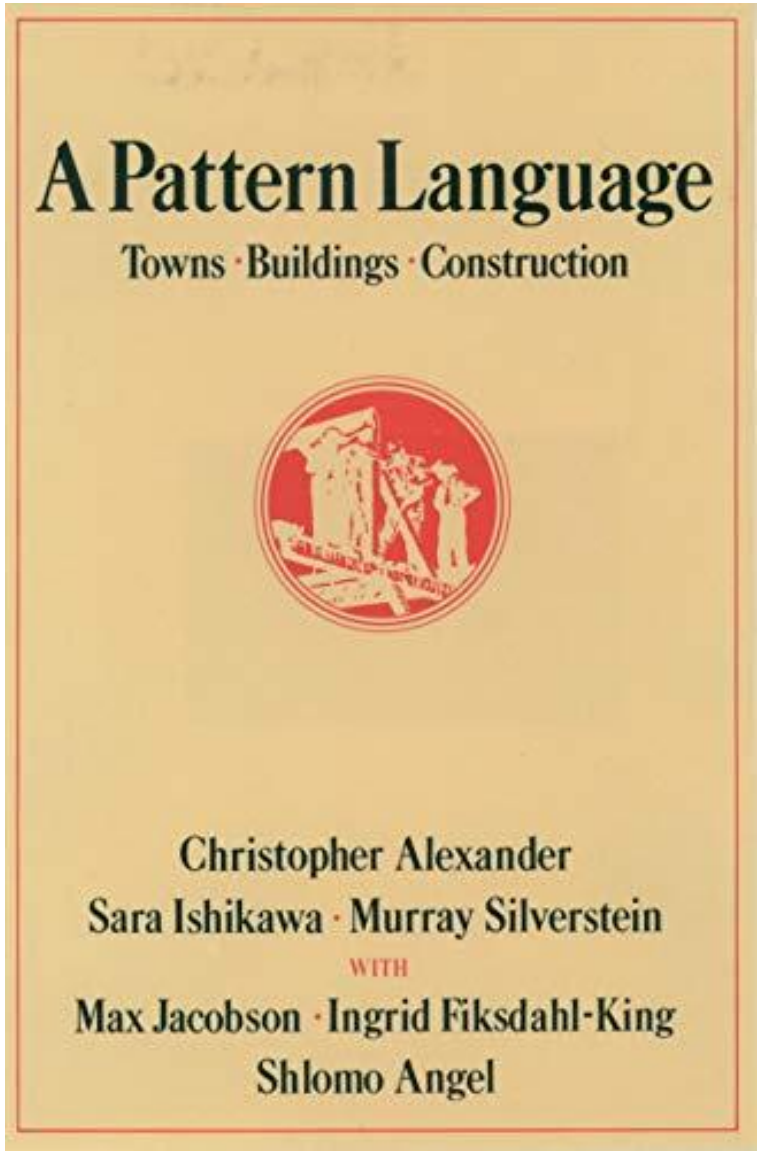
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Design = Solutions

- Design is about solution
- Unfortunately, designers often reivent things, so that it is hard to know:
  - ***how*** things were done before
  - ***why*** things were done in a certain way
  - ***how*** to reuse solutions

Design Patterns

- Design patterns were first used in architecture
- The idea was introduced by the architect Christopher Alexander, who defined a design pattern in this way:
  - *"Each pattern describes a problem that occurs over and over again in our environment, and then describes the core of the solution to that problem, in such a way that you can use this solution a million times over, without ever doing it the same way twice."*



Design Patterns

- They are a way to communicate common **design problems** and **related solutions**
  - Design patterns are recurring solutions that solve common design problems
- They are not too general and not too specific
  - use a solution "a million times over, without ever doing it the same way twice"
- They are a ***shared language***
  - Design patterns are standard reference points for designers
  - They allow for debate over alternatives, where merely mentioning the name of a design pattern implicitly carries much more meaning than merely the name
  - They are readable by non-experts

Design Patterns As a New Literary Form

- A *literary form* is an agreement between the writer and the reader
  - A letter always starts with "Dear …" and ends with some letter closings (e.g., "Best regards")
- We can think about design patterns as a new literary form
  - They define certain **things** to be in a certain **place** with a certain **meaning**

Design Patterns Description

243 SITTING WALL**



1124

. . . if all is well, the outdoor areas are largely made up of positive spaces—POSITIVE OUTDOOR SPACES (106); in some fashion you have marked boundaries between gardens and streets, between terraces and gardens, between outdoor rooms and terraces, between play areas and gardens—GREEN STREETS (51), PEDESTRIAN STREET (100), HALF-HIDDEN GARDEN (111), HIERARCHY OF OPEN SPACE (114), PATH SHAPE (121), ACTIVITY POCKETS (124), PRIVATE TERRACE ON THE STREET (140), OUTDOOR ROOM (163), OPENING TO THE STREET (165), GALLERY SURROUND (166), GARDEN GROWING WILD (172). With this pattern, you can help these natural boundaries take on their proper character, by building walls, just low enough to sit on, and high enough to mark the boundaries.

If you have also marked the places where it makes sense to build seats—SEAT SPOTS (241), FRONT DOOR BENCH (242)—you can kill two birds with one stone by using the walls as seats which help enclose the outdoor space wherever its positive character is weakest.

✣ ✣ ✣

In many places walls and fences between outdoor spaces are too high; but no boundary at all does injustice to the subtlety of the divisions between the spaces.

Consider, for example, a garden on a quiet street. At least somewhere along the edge between the two there is a need for a seam, a place which unites the two, but does so without breaking down the fact that they are separate places. If there is a high wall or a hedge, then the people in the garden have no way of being connected to the street; the people in the street have no way of being connected to the garden. But if there is no barrier at all—then the division between the two is hard to maintain. Stray dogs can wander in and out at will; it is even uncomfortable to sit in the garden, because it is essentially like sitting in the street.

1125

The problem can only be solved by a kind of barrier which functions as a barrier which separates, and as a seam which joins, at the same time.

A low wall or balustrade, just at the right height for sitting, is perfect. It creates a barrier which separates. But because it invites people to sit on it—invites them to sit first with their legs on one side, then with their legs on top, then to swivel round still further to the other side, or to sit astride it—it also functions as a seam, which makes a positive connection between the two places.

Examples: A low wall with the children's sandbox on one side, circulation path on the other; low wall at the front of the garden, connecting the house to the public path; a sitting wall that is a retaining wall, with plants on one side, where people can sit close to the flowers and eat their lunch.

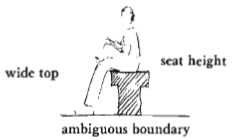
Ruskin describes a sitting wall he experienced:

Last summer I was lodging for a little while in a cottage in the country, and in front of my low window there were, first, some beds of daisies, then a row of gooseberry and currant bushes, and then a low wall about three feet above the ground, covered with stonecress. Outside, a corn-field, with its green ears glistening in the sun, and a field path through it, just past the garden gate. From my window I could see every peasant of the village who passed that way, with basket on arm for market, or spade on shoulder for field. When I was inclined for society, I could lean over my wall, and talk to anybody; when I was inclined for science, I could botanize all along the top of my wall—there were four species of stone-cress alone growing on it; and when I was inclined for exercise, I could jump over my wall, backwards and forwards. That's the sort of fence to have in a Christian country; not a thing which you can't walk inside of without making yourself look like a wild beast, nor look at out of your window in the morning without expecting to see somebody impaled upon it in the night. (John Ruskin, *The Two Paths*, New York: Everyman's Library, 1907, p. 203.)

Therefore:

Surround any natural outdoor area, and make minor boundaries between outdoor areas with low walls, about 16 inches high, and wide enough to sit on, at least 12 inches wide.

1126



✣ ✣ ✣

Place the walls to coincide with natural seat spots, so that extra benches are not necessary—SEAT SPOTS (241); make them of brick or tile, if possible—SOFT TILE AND BRICK (248); if they separate two areas of slightly different height, pierce them with holes to make them balustrades—ORNAMENT (249). Where they are in the sun, and can be large enough, plant flowers in them or against them—RAISED FLOWERS (245). . . .

1127

Design Patterns Description

Name

243 SITTING WALL**

Images



1124

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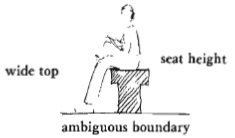
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1126

243 SITTING WALL



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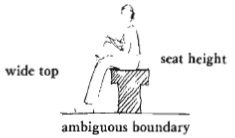
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Problem statement

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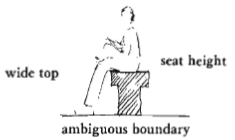
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✣ ✣ ✣

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1127

Design Patterns Description

Name

243 SITTING WALL**

Images



1124

Context

. . . if all is well, the outdoor [illegible] up of positive spaces—POSITIVE OUTDOOR SPACE (106); in some fashion you have marked boundaries between gardens and streets, between terraces and gardens, between outdoor rooms and terraces, between play areas and gardens—GREEN STREETS (51), PEDESTRIAN STREET (100), HALF-HIDDEN GARDEN (111), HIERARCHY OF OPEN SPACE (114), PATH SHAPE (121), ACTIVITY POCKETS (124), PRIVATE TERRACE ON THE STREET (140), OUTDOOR ROOM (163), OPENING TO THE STREET (165), GALLERY SURROUND (166), GARDEN GROWING WILD (172). With this pattern, you can help these natural boundaries take on their proper character, by building walls, just low enough to sit on, and high enough to mark the boundaries.

If you have also marked the places where it makes sense to build seats—SEAT SPOTS (241), FRONT DOOR BENCH (242)—you can kill two birds with one stone by using the walls as seats which help enclose the outdoor space wherever its positive character is weakest.

✣ ✣ ✣

Problem statement

In many places walls and fences between outdoor spaces are too high; but no boundary at all does injustice to the subtlety of the divisions between the spaces.

Consider, for example, a garden on a quiet street. At least somewhere along the edge between the two there is a need for a seam, a place which unites the two, but does so without breaking down the fact that they are separate places. If there is a high wall or a hedge, then the people in the garden have no way of being connected to the street; the people in the street have no way of being connected to the garden. But if there is no barrier at all—then the division between the two is hard to maintain. Stray dogs can wander in and out at will; it is even uncomfortable to sit in the garden, because it is essentially like sitting in the street.

1125

CONSTRUCTION

The problem can only be solved by a kind of barrier which functions as a barrier which separates, and as a seam which joins, at the same time.

A low wall or balustrade, just at the right height for sitting, is perfect. It creates a barrier which separates. But because it invites people to sit on it—invites them to sit first with their legs on one side, then with [illegible] still further to the other [illegible] as a seam, which make [illegible] places.

Examples: A low wall with the children's sandbox on one side, circulation path on the other; low wall at the front of the garden, connecting the house to the public path; a sitting wall that is a retaining wall, with plants on one side, where people can sit close to the flowers and eat their lunch.

Examples of solutions

Ruskin describes a sitting wall he experienced:

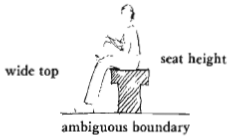
Last summer I was lodging for a little while in a cottage in the country, and in front of my low window there were, first, some beds of daisies, then a row of gooseberry and currant bushes, and then a low wall about three feet above the ground, covered with stonecress. Outside, a corn-field, with its green ears glistening in the sun, and a field path through it, just past the garden gate. From my window I could see every peasant of the village who passed that way, with basket on arm for market, or spade on shoulder for field. When I was inclined for society, I could lean over my wall, and talk to anybody; when I was inclined for science, I could botanize all along the top of my wall—there were four species of stone-cress alone growing on it; and when I was inclined for exercise, I could jump over my wall, backwards and forwards. That's the sort of fence to have in a Christian country; not a thing which you can't walk inside of without making yourself look like a wild beast, nor look at out of your window in the morning without expecting to see somebody impaled upon it in the night. (John Ruskin, *The Two Paths*, New York: Everyman's Library, 1907, p. 203.)

Therefore:

Surround any natural outdoor area, and make minor boundaries between outdoor areas with low walls, about 16 inches high, and wide enough to sit on, at least 12 inches wide.

1126

243 SITTING WALL



✣ ✣ ✣

Place the walls to coincide with natural seat spots, so that extra benches are not necessary—SEAT SPOTS (241); make them of brick or tile, if possible—SOFT TILE AND BRICK (248); if they separate two areas of slightly different height, pierce them with holes to make them balustrades—ORNAMENT (249). Where they are in the sun, and can be large enough, plant flowers in them or against them—RAISED FLOWERS (245). . . .

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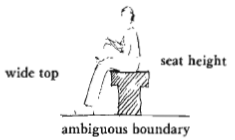
Ther[illegible]

Solution statement

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1126

243 SITTING WALL



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References to other patterns

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1127

Design Patterns Balance Forces

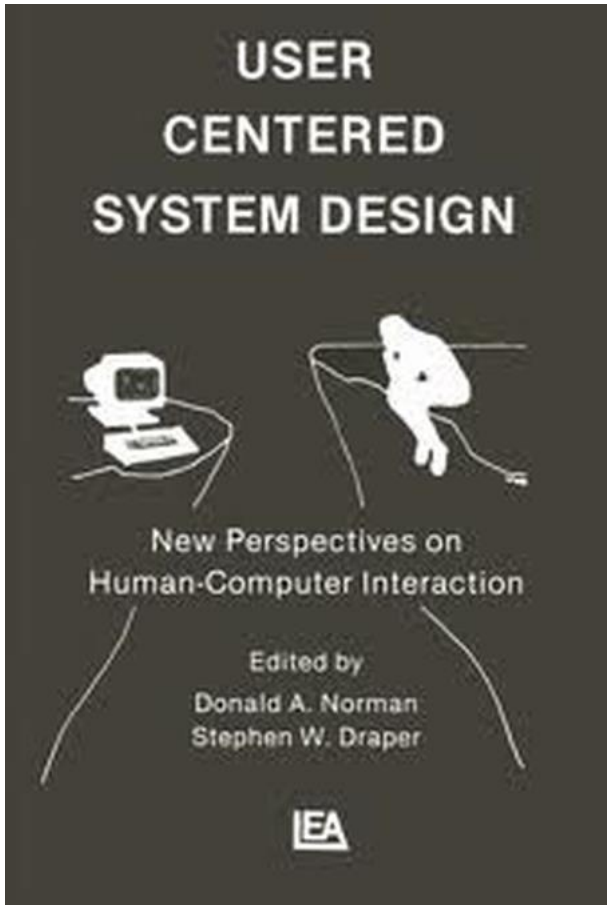
- Design patterns solve a problem **of conflicting forces**
- Example:
  - People are naturally drawn towards light
  - But like to sit

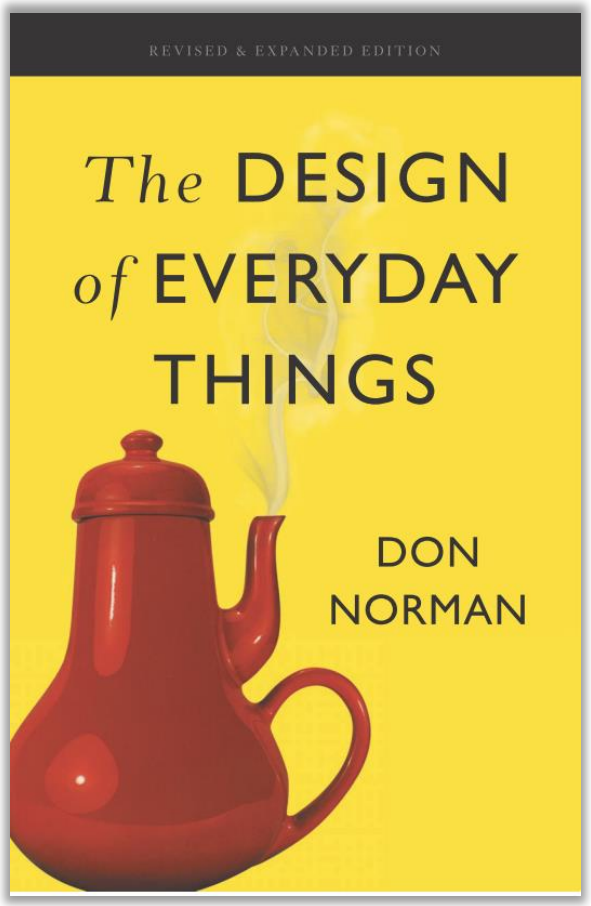
Design Patterns Balance Forces

- Design patterns solve a problem **of conflicting forces**
- Example:
  - People are naturally drawn towards light
  - But like to sit
- Solution:
  - Alexander's **Window Seat** pattern



Patterns in HCI

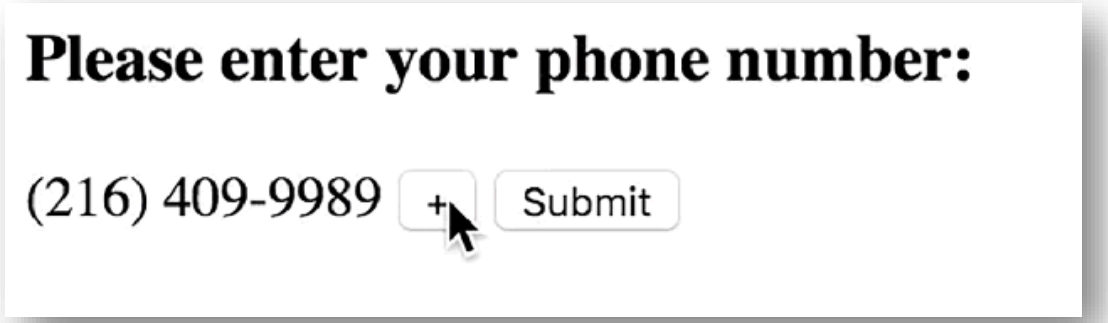


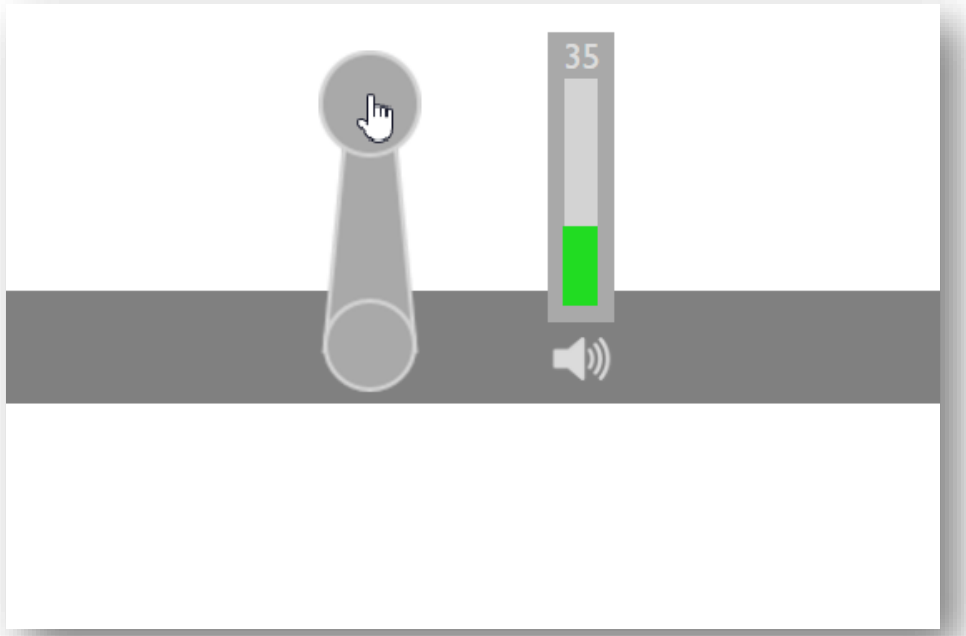




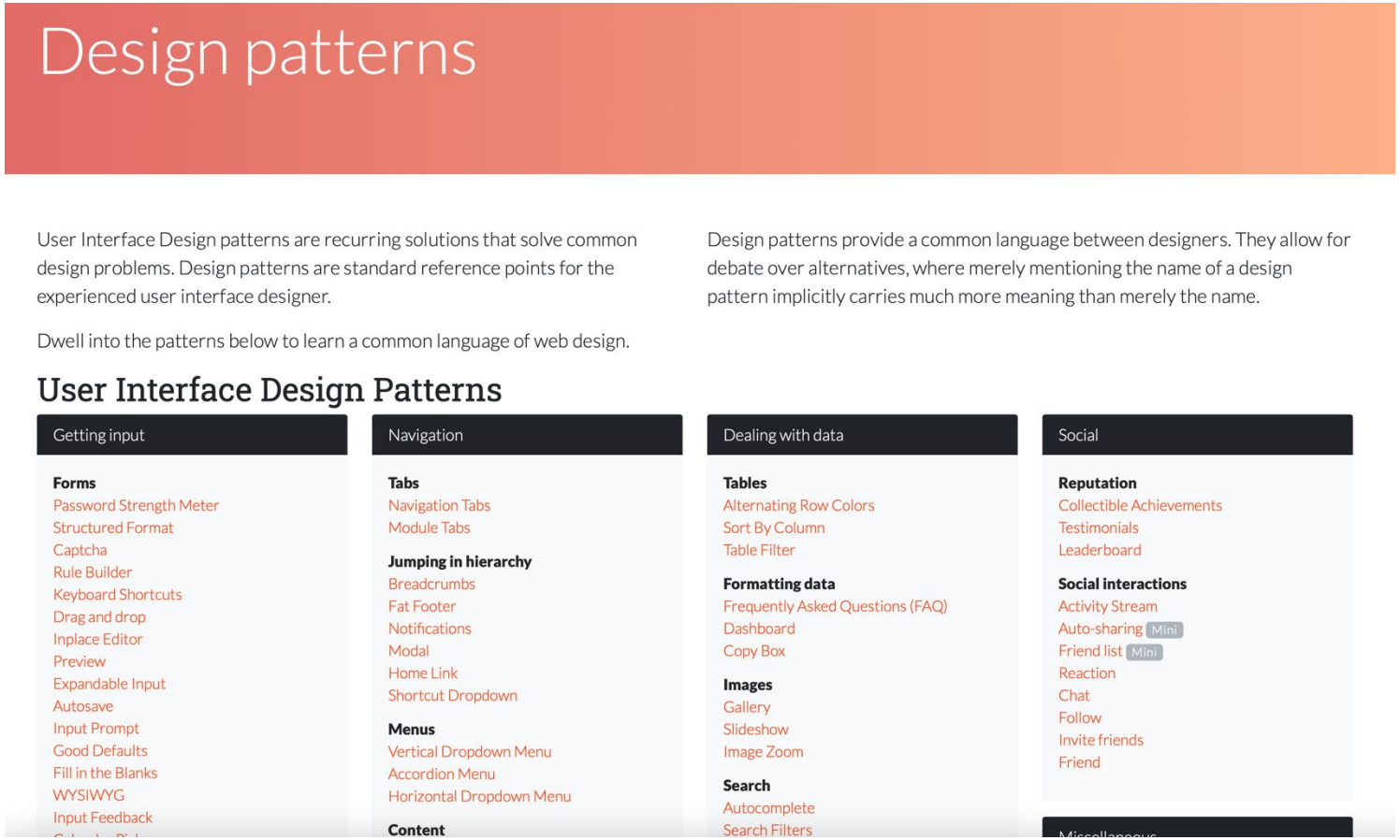
UI Design Patterns

- Each user interface is unique and has its own set of goals and data, but…
  - This does not mean that we should force users to learn new conventions to operate them!





UI Design Patterns



https://ui-patterns.com/patterns

UI Design Patterns

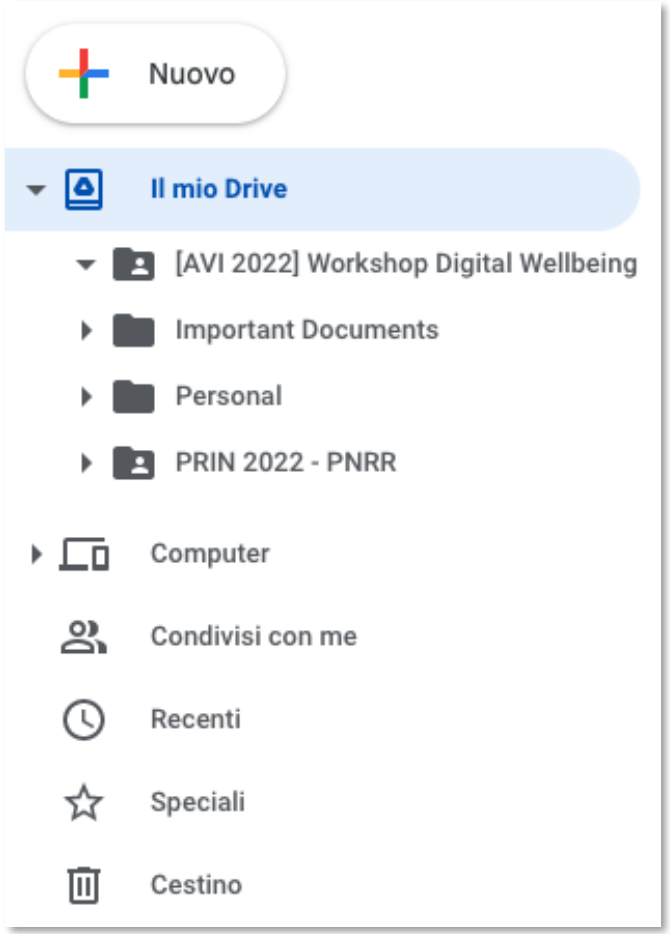
Accordion Menu

Dropdown Menu

Cards

Breadcrumbs

The Hamburger



UI Design Patterns

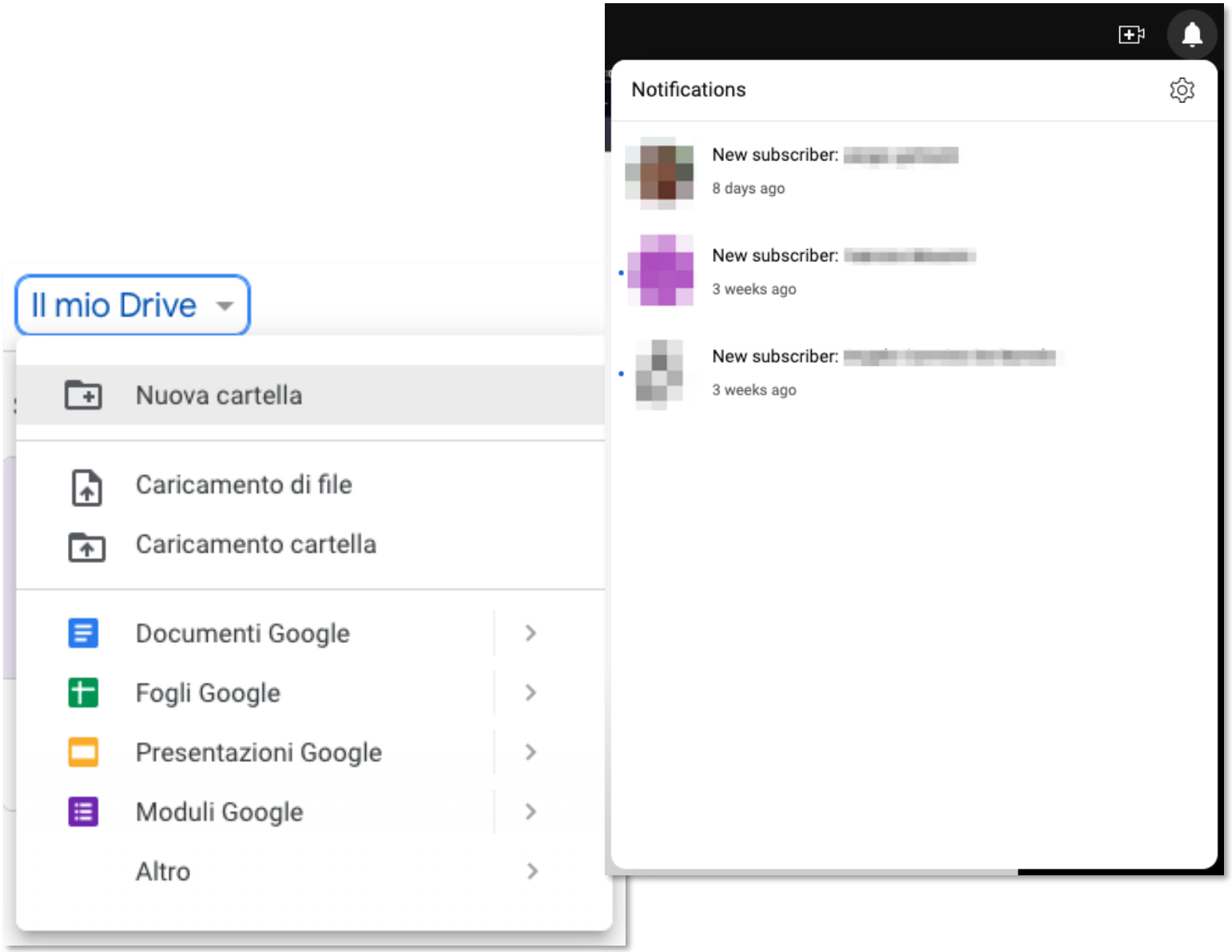
Accordion Menu

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UI Design Patterns

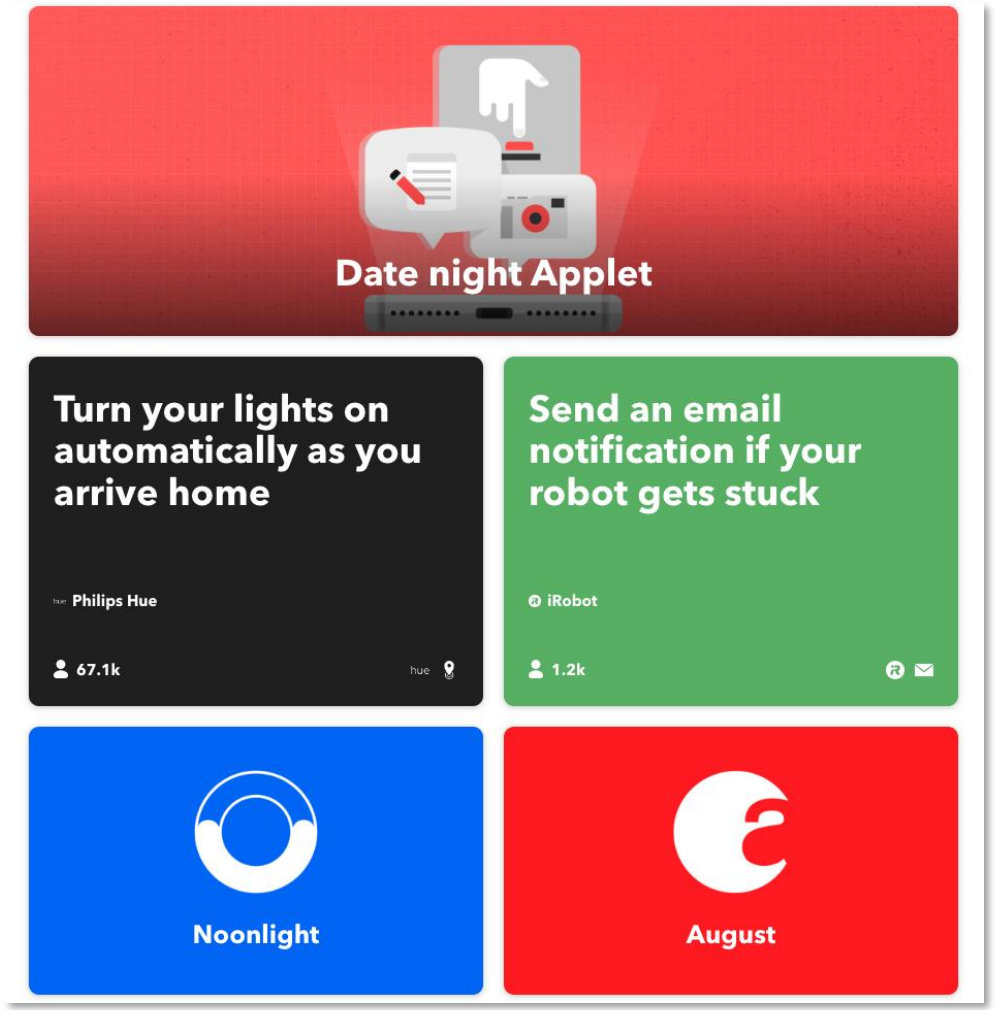
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UI Design Patterns

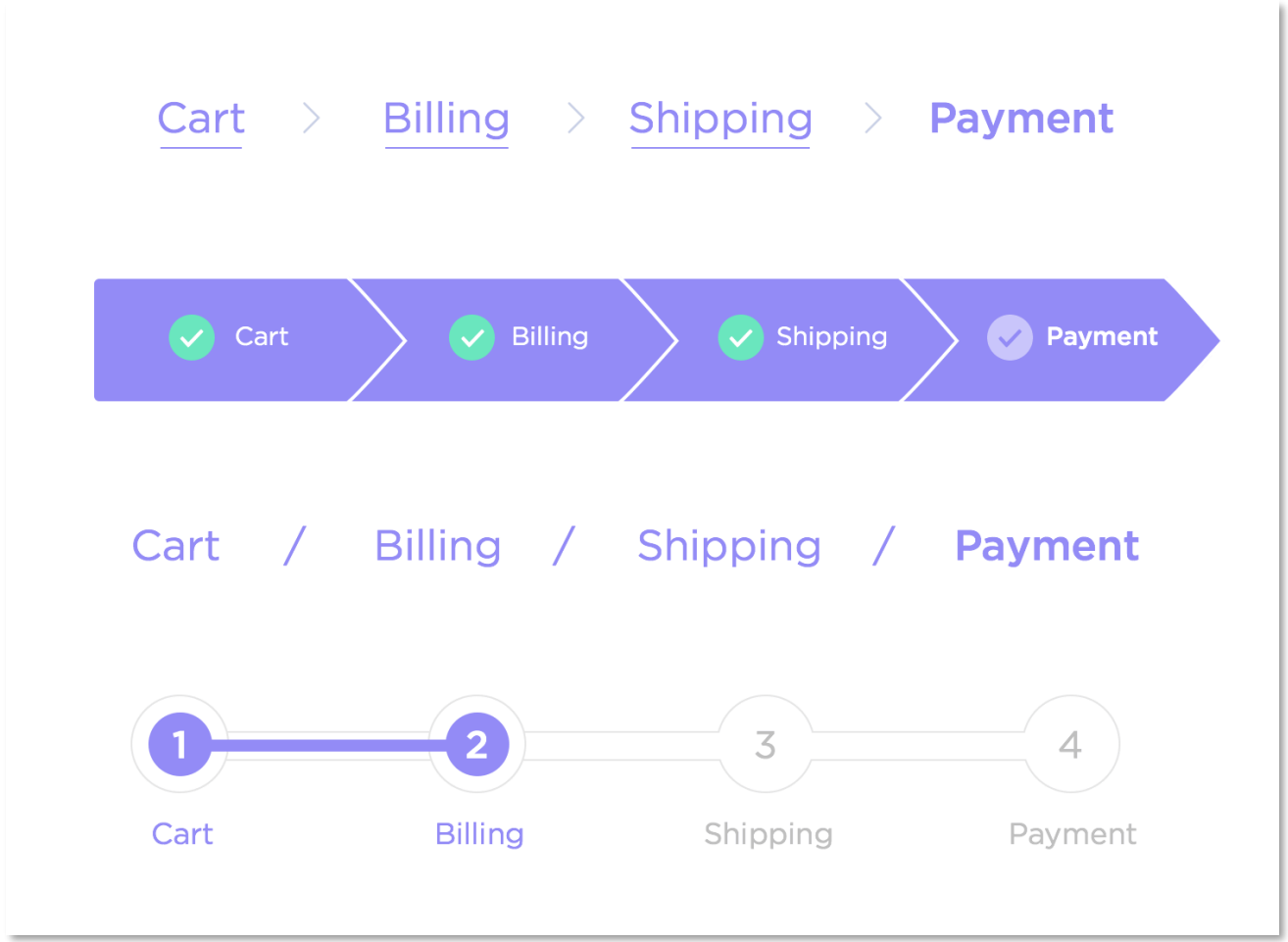
Accordion Menu

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The Hamburger



UI Design Patterns

Accordion Menu

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Design Patterns in (Android) Mobile Apps

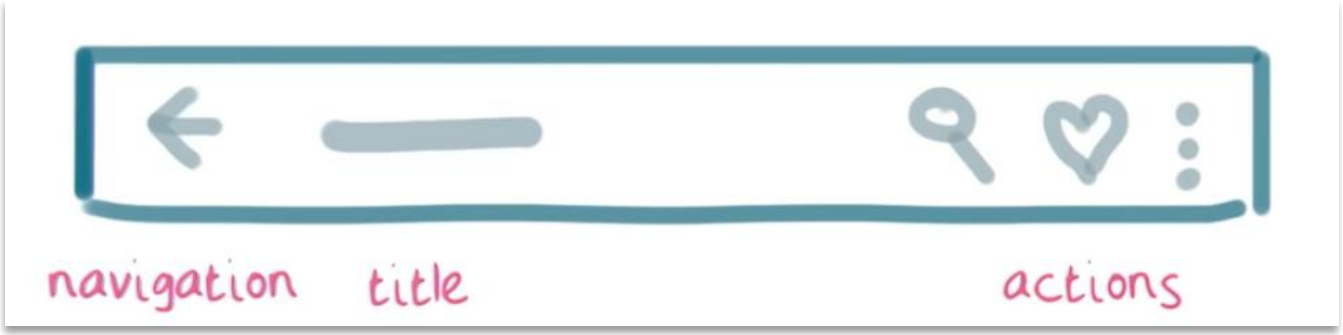
TOOLBAR

APP BAR

TABS

NAVIGATION DRAWER

SCROLLING AND PAGING





Design Patterns in (Android) Mobile Apps

Toolbar

App Bar

Tabs

Navigation Drawer

Scrolling and Paging



Design Patterns in (Android) Mobile Apps

Toolbar

App Bar

Tabs

Navigation Drawer

Scrolling and Paging



Design Patterns in (Android) Mobile Apps

Toolbar

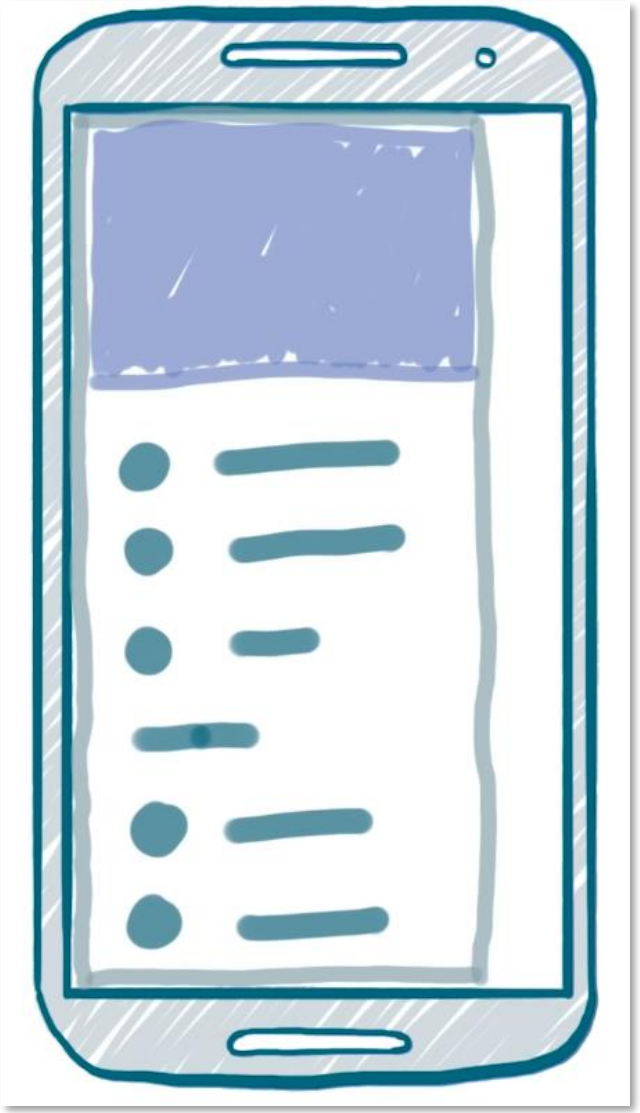
App Bar

Tabs

Navigation Drawer

Scrolling and Paging





Design Patterns in (Android) Mobile Apps

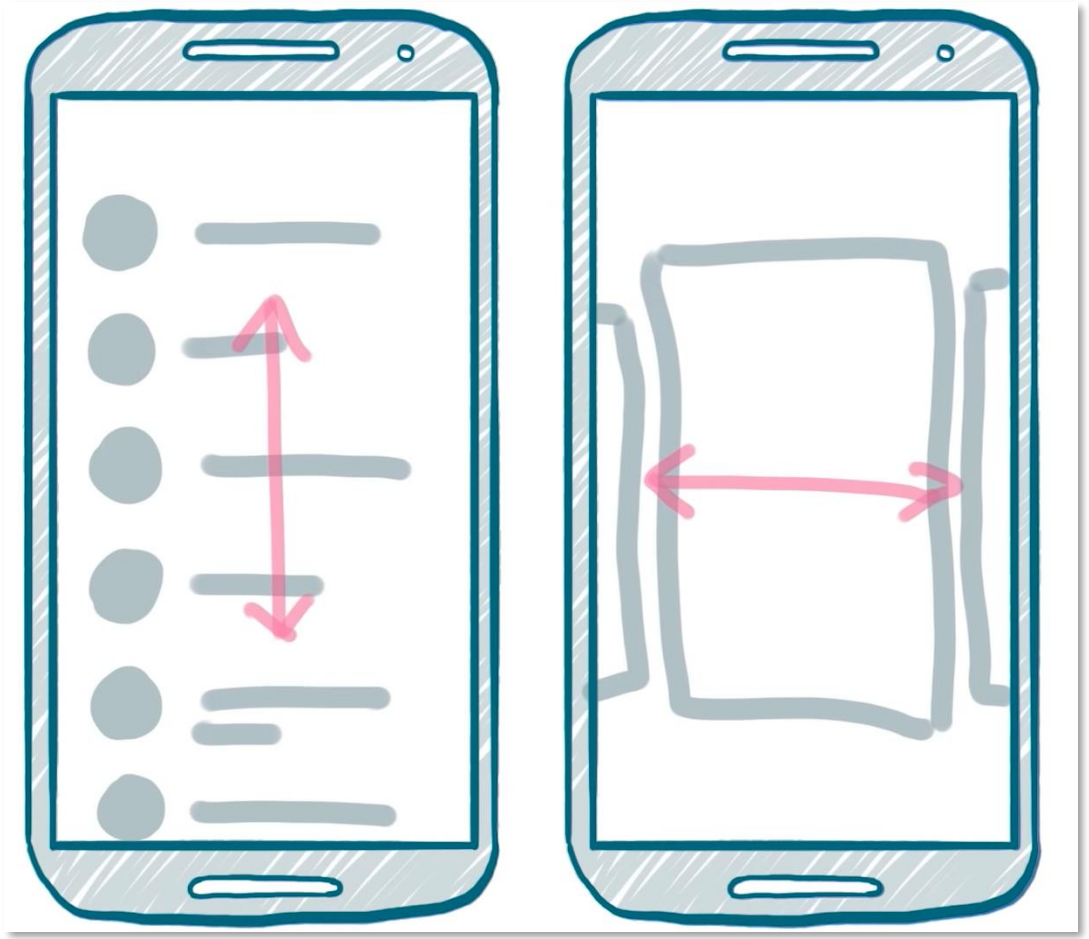
Toolbar

App Bar

Tabs

Navigation Drawer

Scrolling and Paging



Dark Patterns

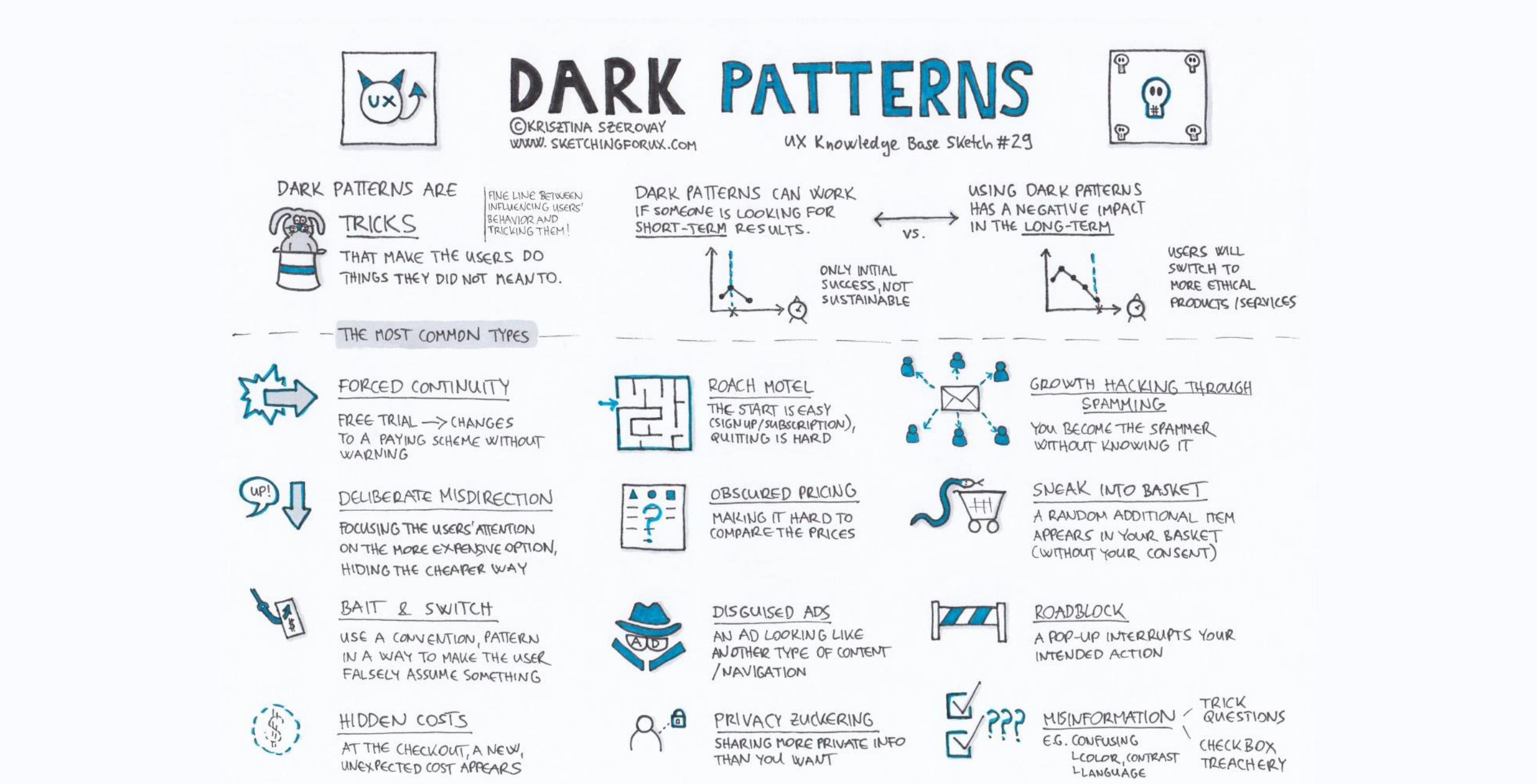
Deceptive designs that go against users' best interests

Dark Patterns

- The term “dark pattern” was coined in 2010 by **Harry Brignull**, a design practitioner
- The aim was to include all those designs that are **deliberately** adopted to promote choices that are not in the user’s best interest

Dark Patterns … or Deceptive Designs

- Many organizations are moving away from the oppressive terminology typical in computer science
  - For example from “master/slave” to “parent/child” and from “blacklist” to “block list”
- In the case of “dark patterns,” the association of “dark” with harm is problematic
  - it may reinforce the racist heuristic of viewing people with darker skin tones as evil (i.e., the “bad is black” effect)
- There are nowadays alternative names for dark patterns as well, such as **deceptive designs**


DARK PATTERNS
©KRISZTINA SZEROVAY
WWW.SKETCHINGFORUX.COM
UX Knowledge Base Sketch #29
DARK PATTERNS ARE
TRICKS
THAT MAKE THE USERS DO THINGS THEY DID NOT MEAN TO.
FINE LINE BETWEEN INFLUENCING USERS' BEHAVIOR AND TRICKING THEM!
DARK PATTERNS CAN WORK IF SOMEONE IS LOOKING FOR SHORT-TERM RESULTS.
VS.
USING DARK PATTERNS HAS A NEGATIVE IMPACT IN THE LONG-TERM
ONLY INITIAL SUCCESS, NOT SUSTAINABLE
USERS WILL SWITCH TO MORE ETHICAL PRODUCTS / SERVICES
THE MOST COMMON TYPES
FORCED CONTINUITY
FREE TRIAL → CHANGES TO A PAYING SCHEME WITHOUT WARNING
ROACH MOTEL
THE START IS EASY (SIGN UP/SUBSCRIPTION), QUITTING IS HARD
GROWTH HACKING THROUGH SPAMMING
YOU BECOME THE SPAMMER WITHOUT KNOWING IT
UP!
DELIBERATE MISDIRECTION
FOCUSING THE USERS' ATTENTION ON THE MORE EXPENSIVE OPTION, HIDING THE CHEAPER WAY
OBSCURED PRICING
MAKING IT HARD TO COMPARE THE PRICES
SNEAK INTO BASKET
A RANDOM ADDITIONAL ITEM APPEARS IN YOUR BASKET (WITHOUT YOUR CONSENT)
BAIT & SWITCH
USE A CONVENTION, PATTERN IN A WAY TO MAKE THE USER FALSELY ASSUME SOMETHING
AD
DISGUISED ADS
AN AD LOOKING LIKE ANOTHER TYPE OF CONTENT / NAVIGATION
ROADBLOCK
A POP-UP INTERRUPTS YOUR INTENDED ACTION
HIDDEN COSTS
AT THE CHECKOUT, A NEW, UNEXPECTED COST APPEARS
PRIVACY ZUCKERING
SHARING MORE PRIVATE INFO THAN YOU WANT
???
MISINFORMATION
E.G. CONFUSING
COLOR, CONTRAST
LANGUAGE
TRICK QUESTIONS
CHECKBOX TREACHERY

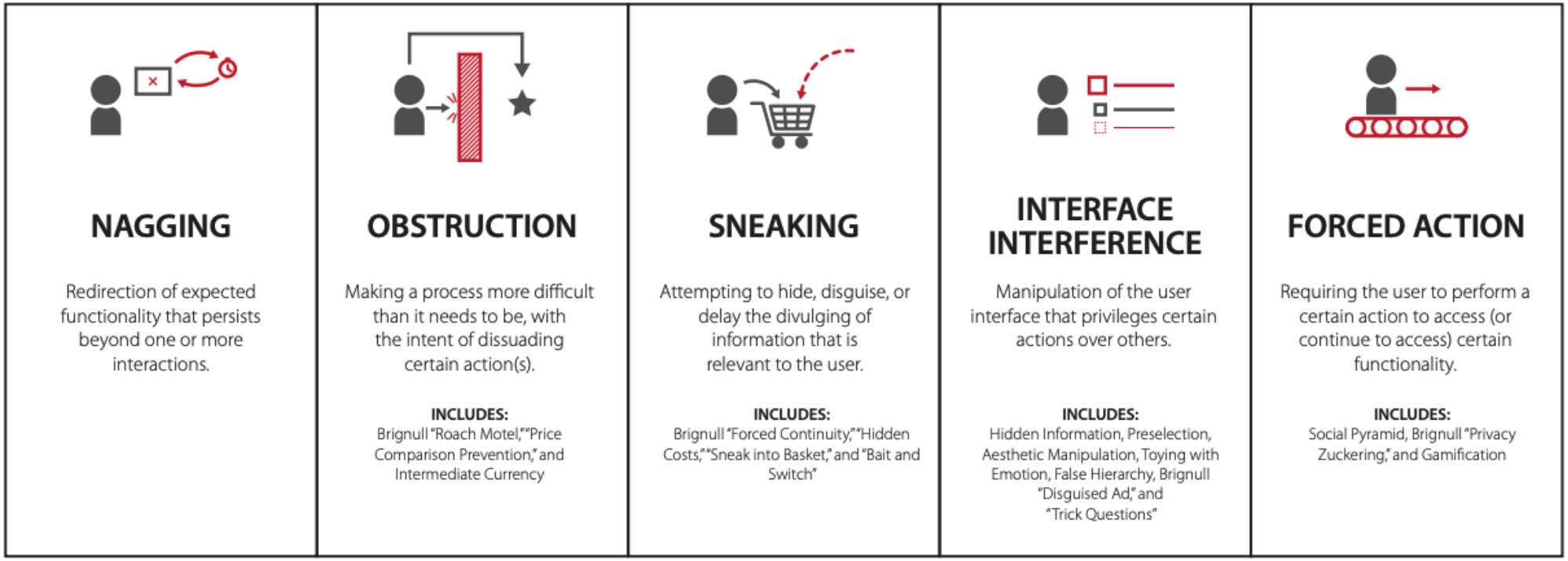
Deceptive Patterns

- **Harry Brignull** published a gallery of deceptive patterns on the https://www.deceptive.design
- He launched a hall of shame campaign on Twitter using the hashtag **#darkpatterns**

Dark Patterns in HCI

- Gray et al., *The Dark (Patterns) Side of UX Design*, CHI 2018, https://doi.org/10.1145/3173574.3174108
- Mathur et al., *Dark Patterns at Scale: Findings from a Crawl of 11K Shopping Websites*, CSCW 2019, https://doi.org/10.1145/3359183
- Gunawan et al., *A Comparative Study of Dark Patterns Across Web and Mobile Modalities*, CSCW 2021, https://doi.org/10.1145/3479521
- Mathur et al., *What Makes a Dark Pattern... Dark?: Design Attributes, Normative Considerations, and Measurement Methods*, CHI 2021, https://doi.org/10.1145/3411764.3445610

Dark Patterns Taxonomies



NAGGING

Redirection of expected functionality that persists beyond one or more interactions.

OBSTRUCTION

Making a process more difficult than it needs to be, with the intent of dissuading certain action(s).

INCLUDES:
Brignull "Roach Motel," "Price Comparison Prevention," and Intermediate Currency

SNEAKING

Attempting to hide, disguise, or delay the divulging of information that is relevant to the user.

INCLUDES:
Brignull "Forced Continuity," "Hidden Costs," "Sneak into Basket," and "Bait and Switch"

INTERFACE INTERFERENCE

Manipulation of the user interface that privileges certain actions over others.

INCLUDES:
Hidden Information, Preselection, Aesthetic Manipulation, Toying with Emotion, False Hierarchy, Brignull "Disguised Ad," and "Trick Questions"

FORCED ACTION

Requiring the user to perform a certain action to access (or continue to access) certain functionality.

INCLUDES:
Social Pyramid, Brignull "Privacy Zuckering," and Gamification

Gray et al., *The Dark (Patterns) Side of UX Design*, CHI 2018, https://doi.org/10.1145/3173574.3174108

Dark Patterns Taxonomies

Nagging

Obstruction

Sneaking

Interface Interference

Forced Action

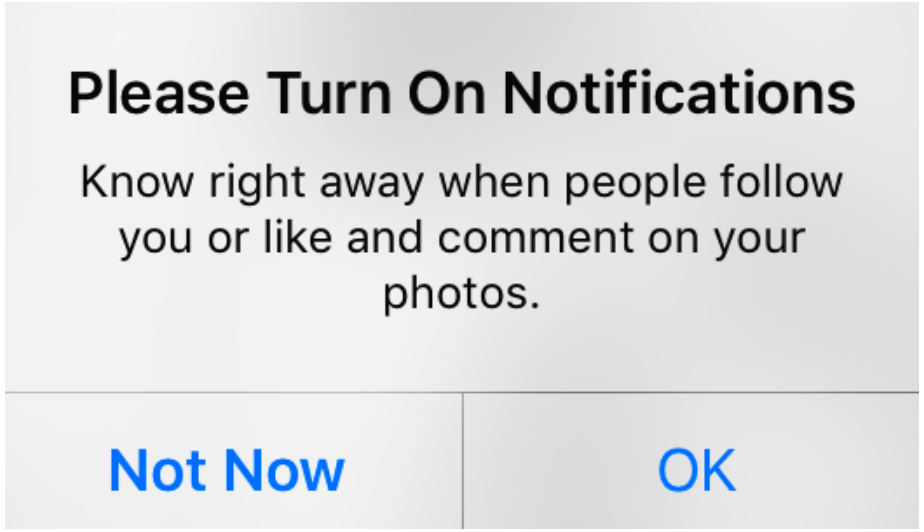


Figure 2: Example of nagging behavior on Instagram, where a modal dialogue provides no opportunity to permanently dismiss the message.

Gray et al., *The Dark (Patterns) Side of UX Design*, CHI 2018, https://doi.org/10.1145/3173574.3174108

Dark Patterns Taxonomies

NAGGING

OBSTRUCTION

SNEAKING

INTERFACE INTERFERENCE

FORCED ACTION



Figure 3: Example of obstructive behavior limiting access to ad tracking settings on Apple iOS 6.

Gray et al., *The Dark (Patterns) Side of UX Design*, CHI 2018, https://doi.org/10.1145/3173574.3174108

Dark Patterns Taxonomies

NAGGING

OBSTRUCTION

SNEAKING

INTERFACE INTERFERENCE

FORCED ACTION

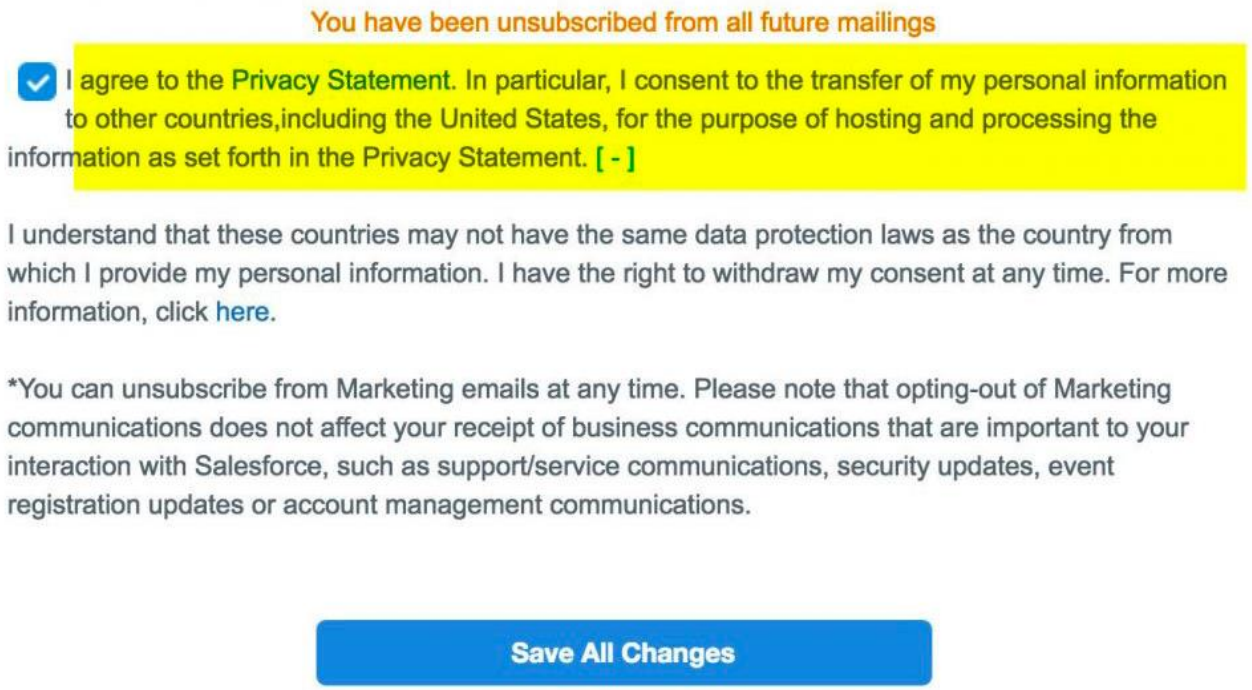


Figure 4: Example of sneaking behavior, asking users to authorize transfer of their information in order to unsubscribe from a newsletter.

Gray et al., *The Dark (Patterns) Side of UX Design*, CHI 2018, https://doi.org/10.1145/3173574.3174108

Dark Patterns Taxonomies

NAGGING

OBSTRUCTION

SNEAKING

INTERFACE INTERFERENCE

FORCED ACTION

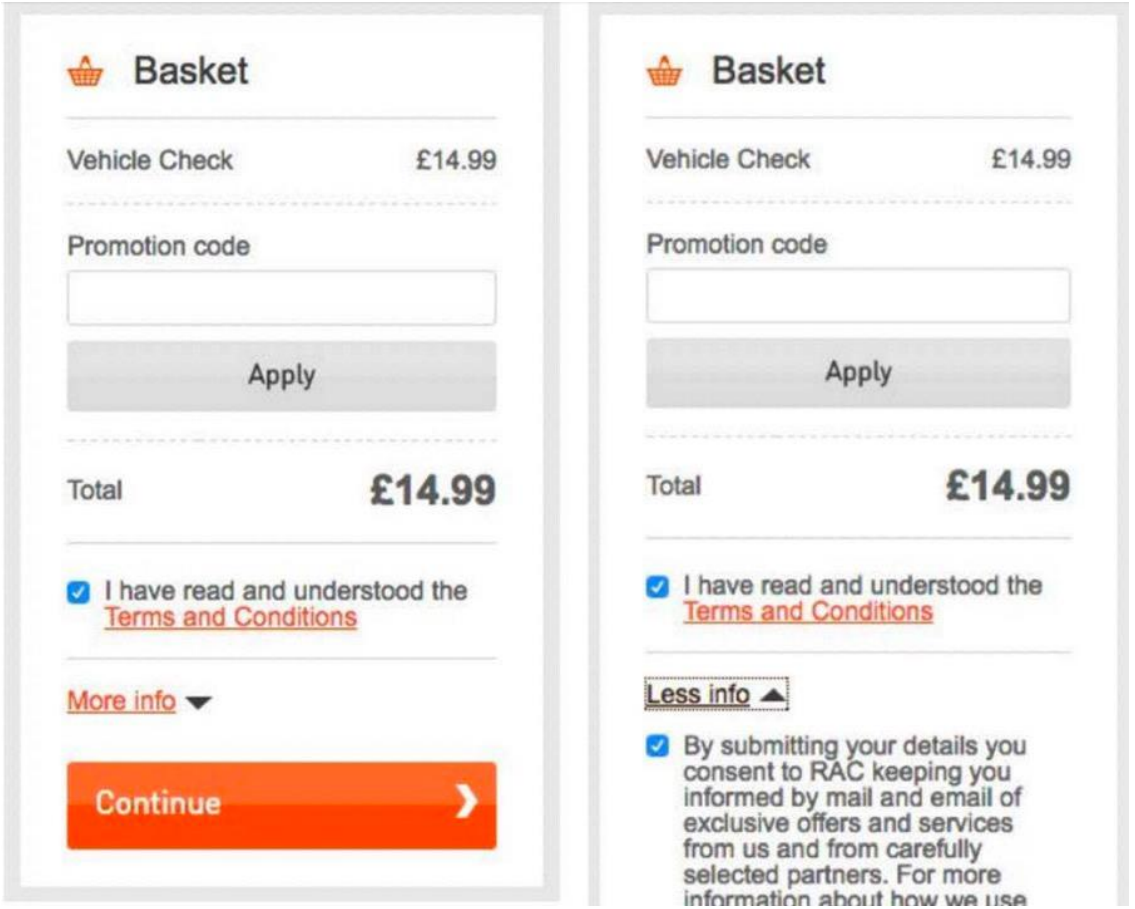


Figure 5: Example of preselection as a type of interface interference, hiding and preselecting a choice that may not be in the user's best interest.

Gray et al., *The Dark (Patterns) Side of UX Design*, CHI 2018, https://doi.org/10.1145/3173574.3174108

Dark Patterns Taxonomies

NAGGING

OBSTRUCTION

SNEAKING

INTERFACE INTERFERENCE

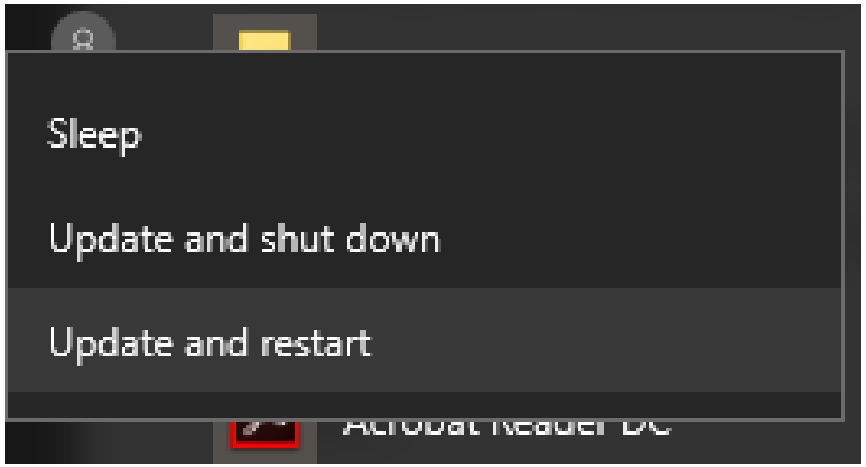


Figure 7: Example of forced action on Windows 10.

FORCED ACTION

Gray et al., *The Dark (Patterns) Side of UX Design*, CHI 2018, https://doi.org/10.1145/3173574.3174108

Attention-Capture Damaging Patterns

A particular kind of dark patterns

Attention Economy

- Why is our digital well-being undermined by contemporary technology?
- Most of the contemporary tech-companies adopt a business model that is called the "Attention Economy"
  - Our **attention** is transformed into a **currency**
  - We **«pay»** for a service with the time we spend on it
  - Tech companies **may sell** our attention (and our data, sometimes) to advertising companies
- This business model is convenient
  - **Alphabet** (the company that owns Google) is worth $1 trillion
  - **Meta** (which owns Facebook, Instagram and WhatsApp) is worth about $700 billion

Attention-Capture Damaging Patterns: Definition

- A recurring pattern in digital interfaces that a designer **uses to** exploit psychological vulnerabilities and **capture attention**, often leading the user to lose **track of their goals**, lose their **sense of time and control**, and later **feel regret**
- The goal of ACDPs is to maximize continuous usage, daily visits, and interactions (e.g., clicks, shares, likes, etc.).
- They make users more likely to visit a digital service again and click on similar types of rewarding content, thus creating a **«trap»** for the user that enables the **stakeholder's goal**

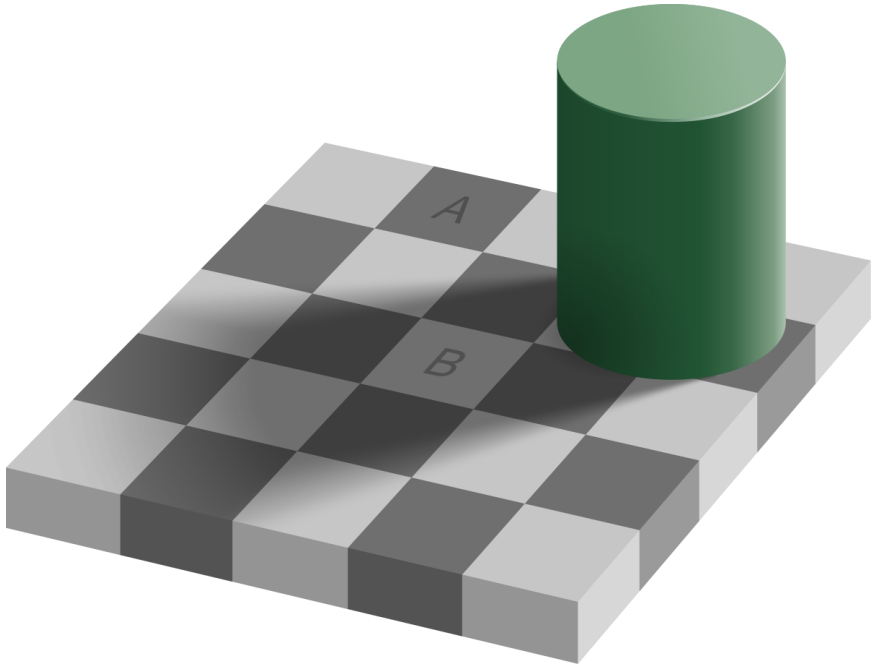
Attention-Capture Damaging Patterns: Strategies

- Typically, they ACDPs the need for autonomous decision making by "automating" processes and functions
- Paradoxically, they can **improve the usability** of a platform
- ACDPs exploit **psychological vulnerabilities** and **“cognitive biases”**
  - Variable reward
  - Immediate gratification
  - […]

Attention-Capture Damaging Patterns: Strategies

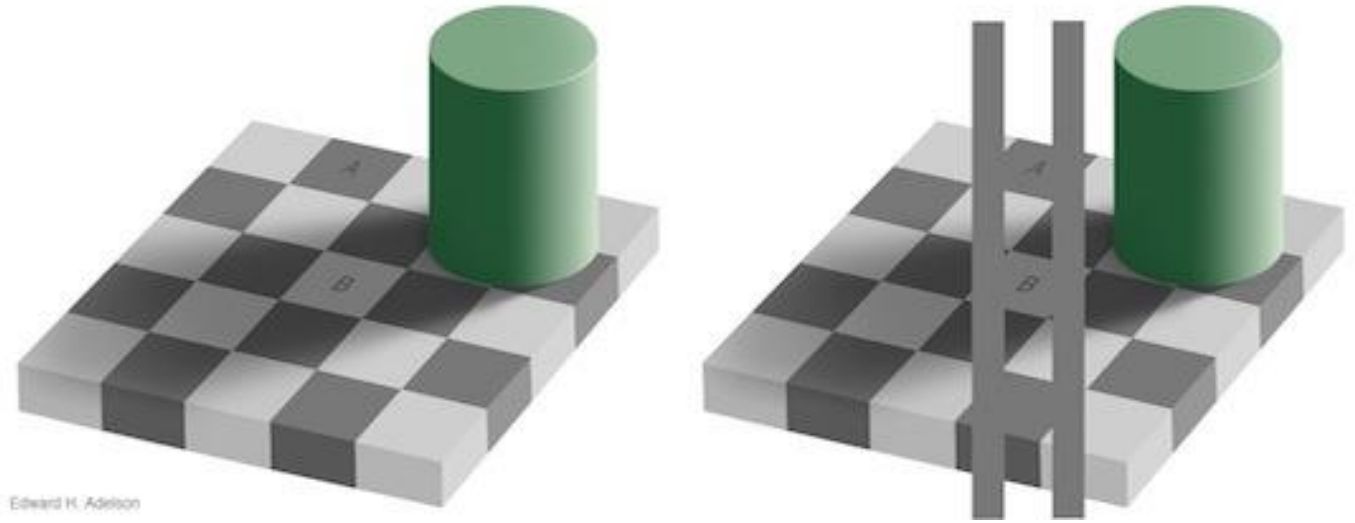
- A cognitive bias is a **systematic error** in thinking that occurs when people are processing and interpreting information in the world around them and affects the decisions and judgments that they make.

Exploiting Psychological Vulnerabilities and Biases



Exploiting Psychological Vulnerabilities and Biases

- **EXAMPLE:** What we perceive as true depends on the context in which we see it!



Checkershadow Illusion

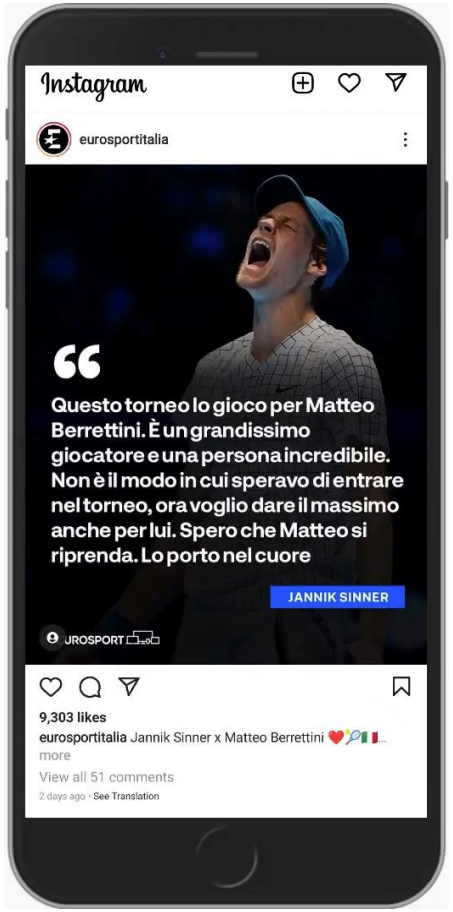
Attention-Capture Damaging Patterns: Strategies

- The exploited psychological vulnerabilities can be of various type:
  - Notifications (with their vibrations, flashing LEDs …) mimic danger signals that we may experience in "offline" life
  - The possibility of receiving new comments or likes keeps us in a persistent state of alert (**variable reward**)
  - Every time we receive a comment or a "like," our brain gets a dose of dopamine, prompting us to compare ourselves with others (**social influence**)
  - In general, today's technology is designed to keep us "engaged," offering us a mix of old and new content each time
    - a mechanism that is used by **slot machines**, too

Attention-Capture Dark Patterns: Typology

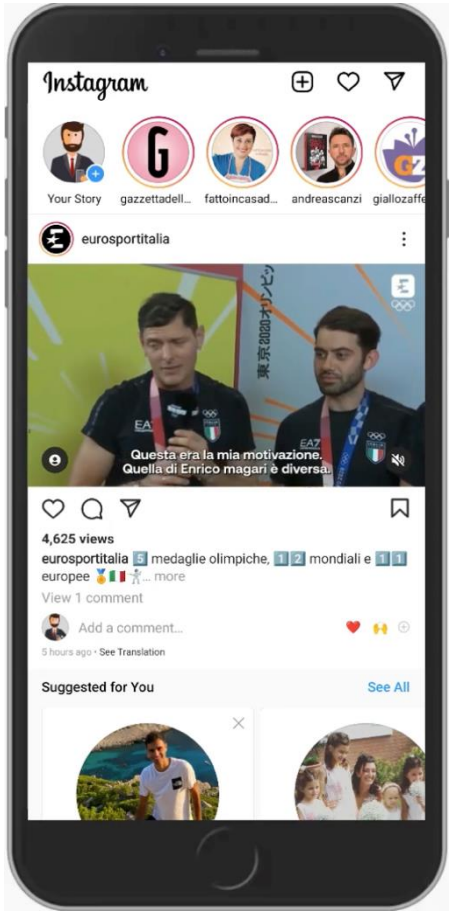
Pattern Name	Description
P1 - Infinite Scroll	As the user scrolls down a page, more content automatically and continuously loads at the bottom.
P2 - Casino Pull-to-refresh	When the user swipes down on their smartphone, there is an animated reload of the page that may or may not reveal new appealing content.
P3 - Neverending Autoplay	A new video is automatically played when the current one finishes. There is never a point for the user to stop and reflect, and the option to turn off autoplay is hidden or non-existent.
P4 - Guilty Pleasure Recommendations	Personalized suggestions that prey on individual consumer frailty to target user's guilty pleasures and increase use time.
P5 - Disguised Ads and Recommendations	Advertisements and recommendations, e.g., posts and sponsored pages, that are disguised as normal content into social networks' newsfeeds.
P6 - Recapture Notifications	Notifications that are deliberately sent to recapture users' attention and have them start a new usage session, e.g., notifications with recommended content or notifications about content the user has never interacted with.
P7 - Playing by Appointment	Users are forced to to use a digital service at specific times as defined by the service, otherwise the user may loose points and achievements.
P8 - Grinding	Users are forced to repeat the same process several times to unlock an achievement, e.g., a new level in a video game or a badge on a social network.
P9 - Attentional Roach Motel	Registering to and accessing attention-capture digital services is easy, while operations like logout or canceling an account are painfully difficult.
P10 - Time Fog	A pattern through which designers reduce users' awareness of time spent, e.g., by hiding the smartphone's clock.
P11 - Fake Social Notifications	The platform sends messages pretending to be another user or social notifications about some content the user has never interacted with.

Infinite Scrolling



- As the user scrolls down a page, more content **automatically** and **continuously loads** at the bottom.
- It **decreases** the **effort** required to browse content and promotes **"endless"** usage sessions.
- It exploits **variable reward techniques.**
- Common in social media.

Casino Pull-to-refresh



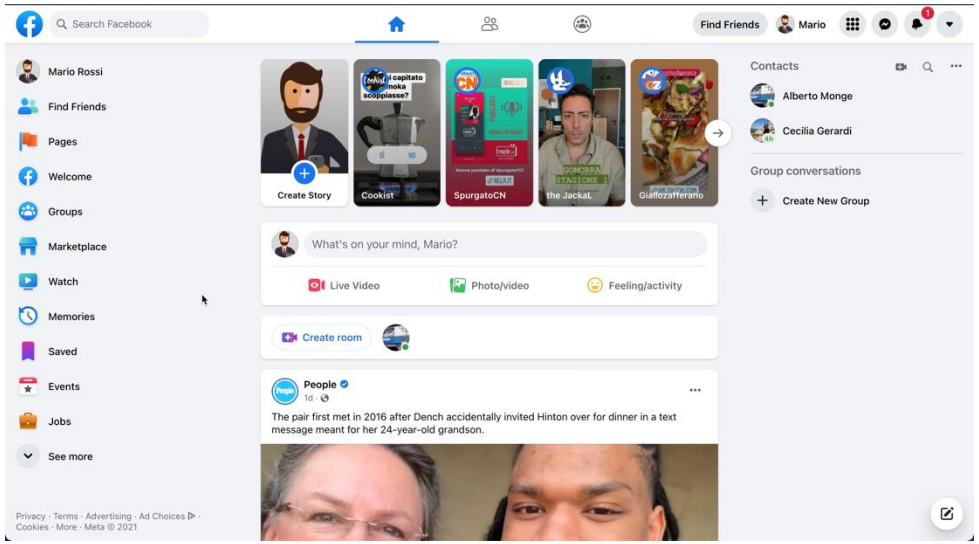
- When the user **swipes down** on their smartphone, there is an **animated reload** of the page that **may or may not** reveal new appealing content.
- Users may be tempted to refresh compulsively, hoping to receive new content.
- It exploits **variable reward techniques:**
  - similar to **slot machines.**
- Common in social media (accessed through a mobile interface).

Neverending Autoplay



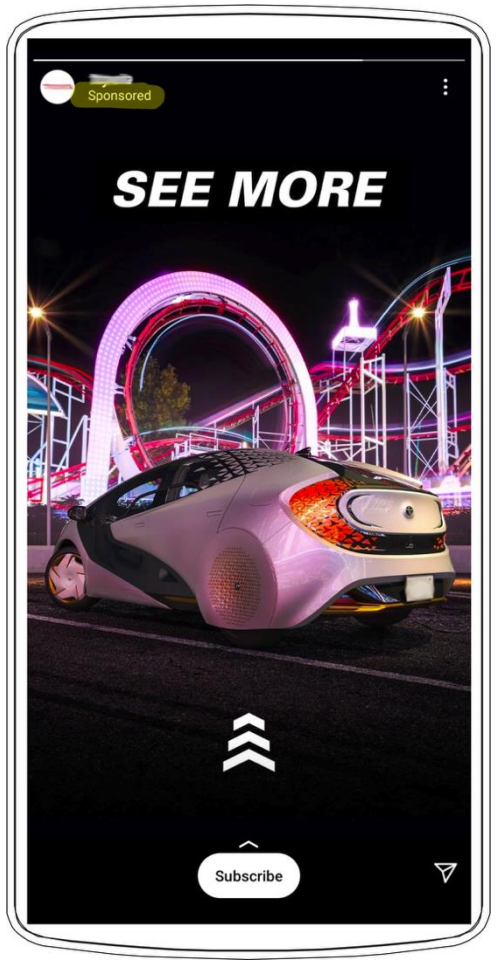
- A new video is **automatically played** when the current one finishes. There is never a point for the user to **stop** and **reflect**, and the option to turn off autoplay is hidden or non-existent.
- Autoplay may be **useful** in some circumstances, e.g., listening to music on YouTube while working.
- It can **prolong** usage sessions (*«let me see this new video and then I will close the app!»*).
- It exploits **variable reward techniques** and reduces the **user's autonomy.**
- Common on social media and video-streaming platforms.

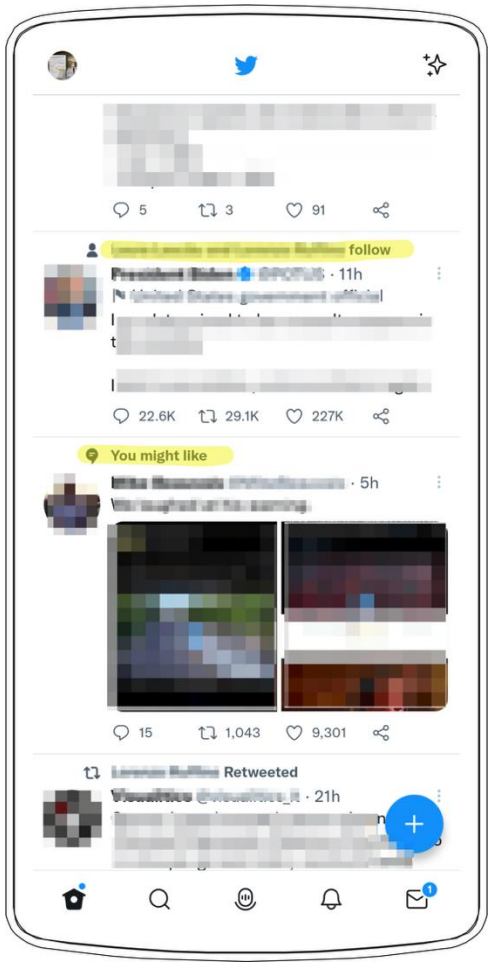
Guilty-Pleasure Recommendations



- They are based on:
  - previous user's interactions (**Content-Based**);
  - preferences of similar users (**Collaborative Filtering**).
- Recommendations are useful if the goal of the platform matches the user's goals (**value-aligment problem**).
- They can become a «**trap**» for keeping the user's attention on the platform against the user's will.
- They exploit **variable reward techniques.**
- Common on social media and video-streaming platforms.

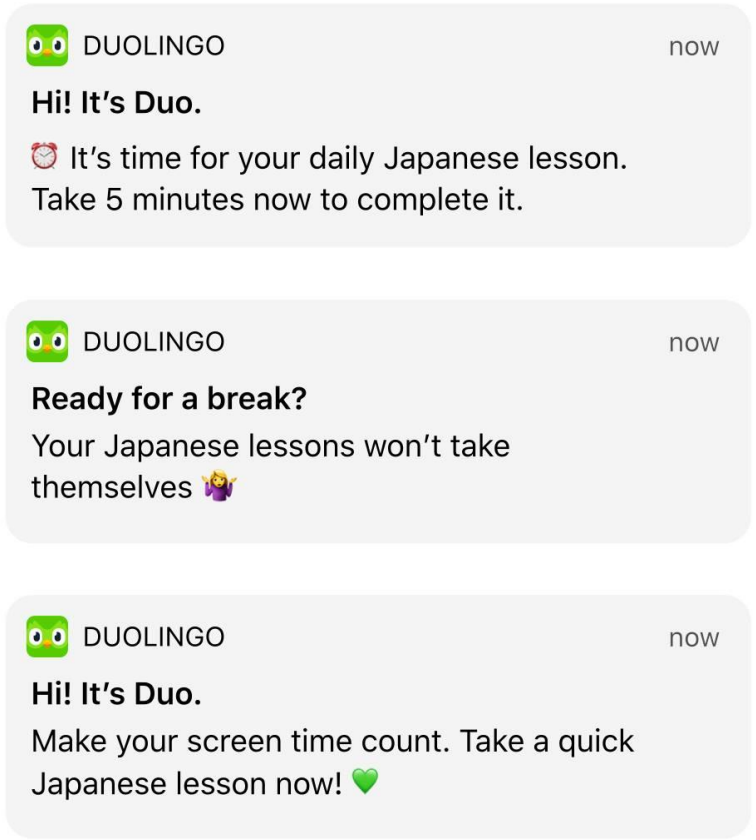
Disguised Ads and Recommendations





- Extension of the **Brignul's Disguised Ads.**
- Ads and recommendations are **camouflaged** as normal content:
  - sponsored stories;
  - tweets from people that the user is not following ('you might like').
- It likely increases the chances of **prolonging usage sessions.**
- Newsfeeds become a representation of what the social network expects will elicit the most clicks based on prior behavior, rather that a representation of the user's preferences:
  - most users are not able to process such a **misalignment**!
- Common on social media.

Recapture Notifications

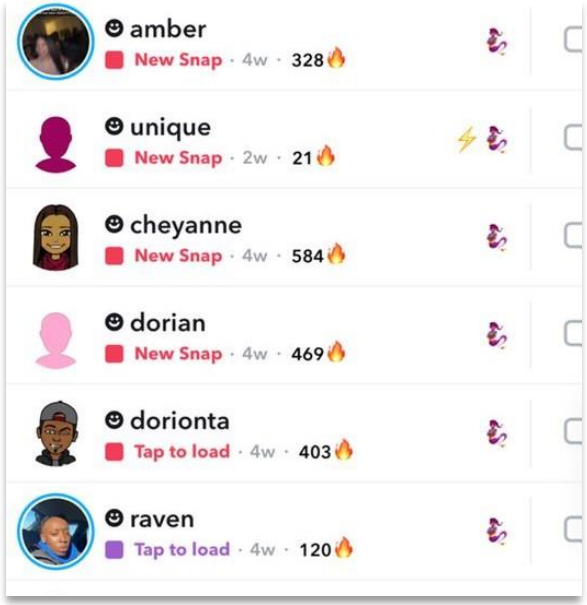


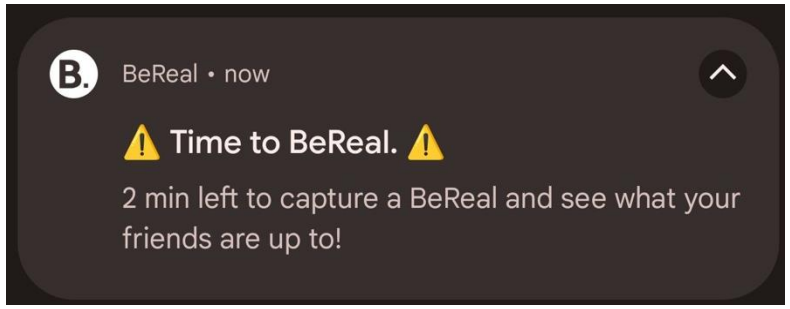
- *"if I didn't have things popping up every 30 minutes like 'this has happened' I don't think I would think about Facebook."*

  Lyngs et al., CHI 2020

- Notifications that are **deliberately** sent to **recapture the attention** of a user who escaped or left a digital service for some period of time:
  - used as a **pretext** to make user unlock a device and going into apps or websites to engage further;
  - typically activated **by default**.
- Common on social media, video streaming platforms, and messaging applications.

Playing by Appointment





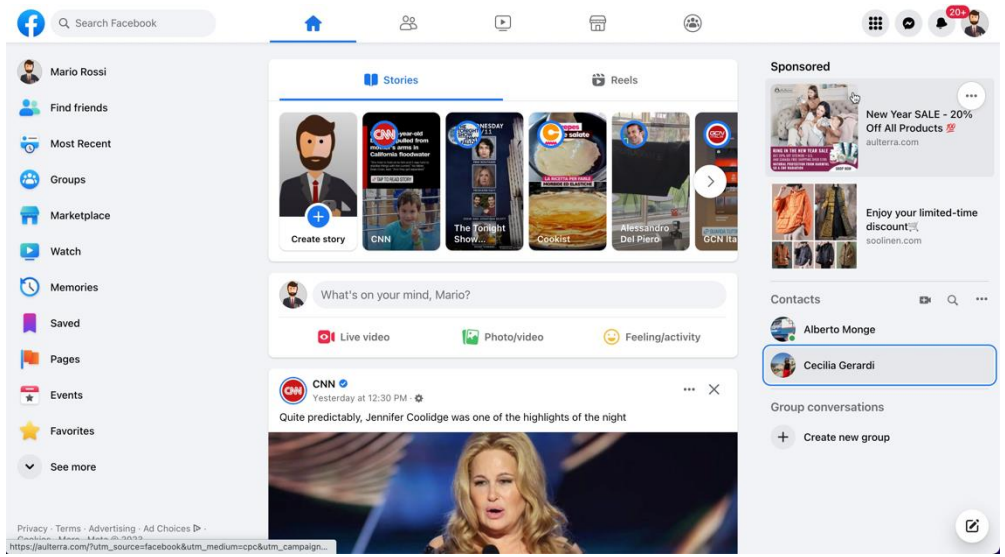
- Force users to use a digital service at **specific times** as defined by the service, rather than the user.
- Engineered to encourage users to **re-visit** a digital service to avoid losing the possibility of earning something, e.g., points or even the ability to progress in a game.
- Common on video games (mostly on social networks) and social media in general.

Grinding



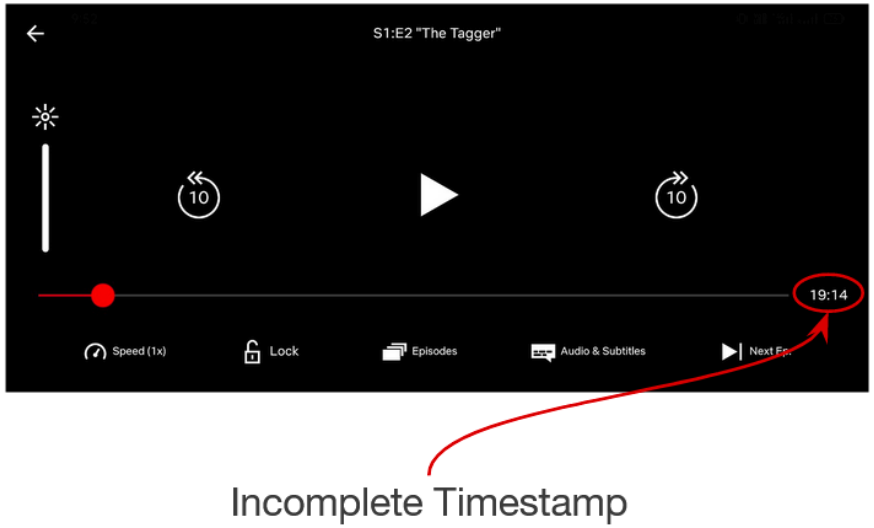
- Force users to **repeat** the same process several times **to unlock** an achievement.
- Digital services "consume" the user's time and attention by increasing engagement and promising **a later achievement**, e.g., a new level in a video game or a badge on a social network.
- Common on video games and social media.

Attentional Roach Motel



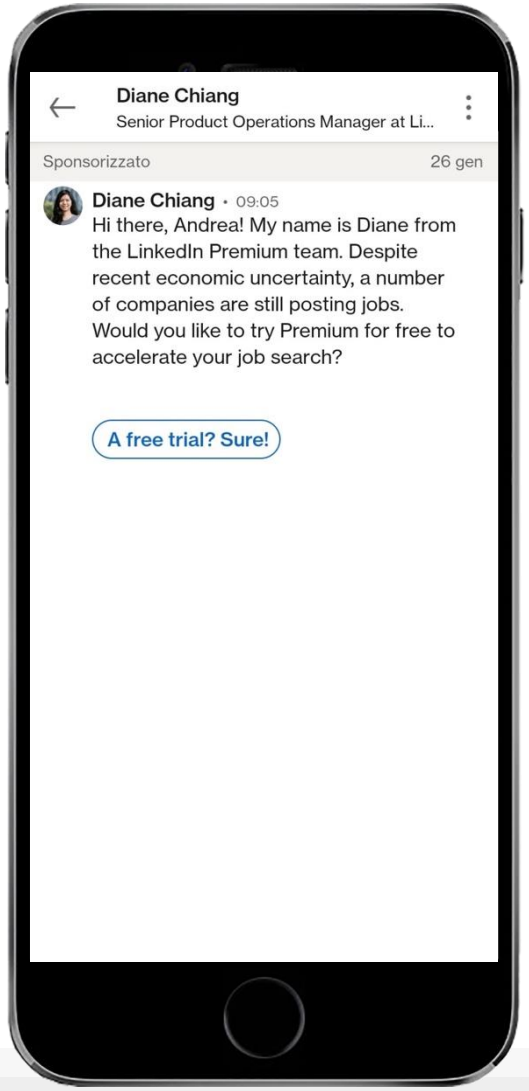
- Extension of the **Brignul's Roach Motel.**
- Easy to get in, hard to get out:
  - it may be exploited to make account settings difficult to access, e.g., to hinder the possibility of **logging out** from a digital service.
- Affect how alternatives are perceived by promoting a predefined action:
  - may exploit deceptive visualizations that leverage the **salience bias.**
- Common on social media.

Time Fog



- Designers deliberately induce **unawareness** by reducing autonomy of monitoring user **time spent.**
- Designed to reduce the possibilities to get feedback on the time spent, e.g., by hiding the video elapsed time, thus increasing the chances of longer usage sessions:
  - may exploit deceptive visualizations that leverage the **salience bias**.
- Common on video streaming platforms.

Fake Social Notifications



- Deceive users with **false social activities** and **information**:
  - digital services that pretend to be real users;
  - notifications about activities of unknown people.
- Violate the expectation that the received messages should actually be from a real person.
- May leverage may leverage on our **herd instinct bias** of replicating others' actions, as well as on the **spotlight effect**, i.e., an egocentric bias that lead us to perform behaviors that elicitsocial approval.
- Common on video games (mostly on social networks), social media, and messaging apps.

References

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  - Chapter 3: Guidelines, Principles, and Theories
- Some material from
  - https://hci.stanford.edu/courses/cs147/2022/wi/lectures/16-design-patterns.pdf
  - https://hci.rwth-aachen.de/cthci-ss2020
  - https://www.youtube.com/watch?v=aB6us_txi54

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