

Design Patterns

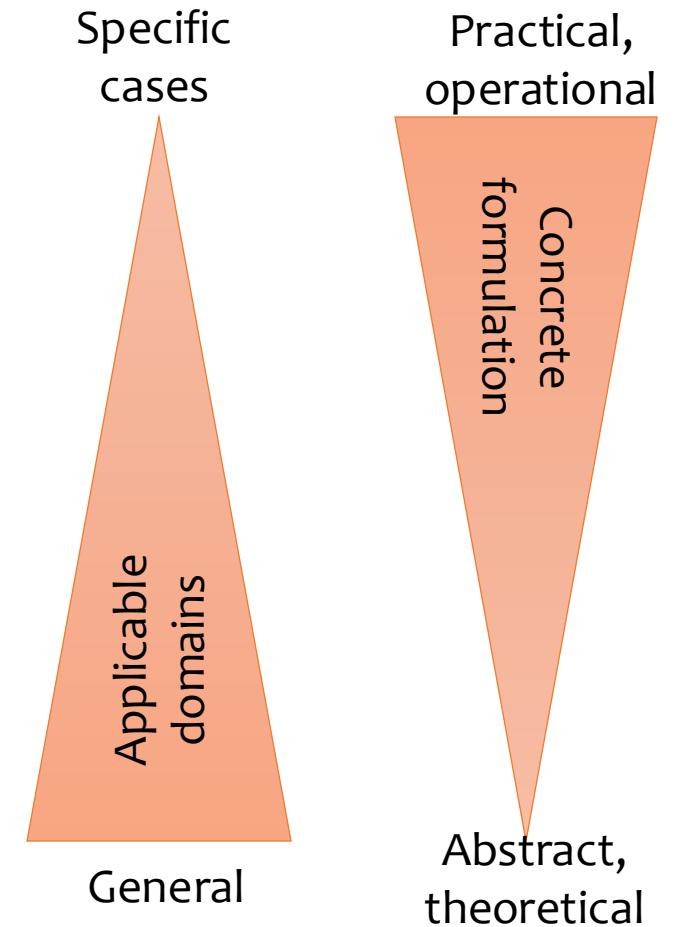
User Experience Design

Alberto Monge Roffarello

Academic Year 2023/2024

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.



Design Guidelines

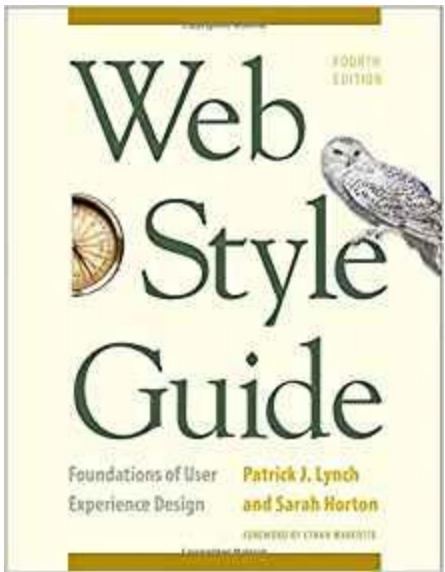
Shared language to promote **consistency** among multiple designers in terminology usage, appearance, and action sequences

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 Style Guide by Patrick J. Lynch and Sarah Horton

Contents

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About the authors

Patrick J. Lynch and Sarah Horton have been working together on award-winning interface and graphic design projects since 1991. They began collaborating on *Web Style Guide* in 1997, moving from a web-only version to print and web in 1999. The book is in its 4th edition and has been translated into more than eight languages.

- [Learn more about Pat and Sarah](#)
- [Web Style Guide, 4th Edition: Foundations of User Experience Design on Amazon](#)

Praise for the 4th Edition of Web Style

...
Contents Search Front Matter

Web Content Accessibility Guidelines (WCAG)



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

The screenshot shows the WCAG 2 Overview page. At the top, there's a navigation bar with links for 'Skip to Content', 'Change Text Size or Colors', 'This page in: English • Español • Français • All Translations', and 'Hide Options'. The main header 'WCAG 2 Overview' is in large teal text. Below it, a sidebar titled 'Standards/Guidelines' lists various sections: 'Web Content - WCAG 2' (with 'How to Meet WCAG 2 (Quick Reference)' as the first item), 'At a Glance', 'The Documents', 'Applying to Non-Web ICT', 'New in 2.2 Draft', 'New in 2.1', 'Translations', 'Commenting', 'Conformance Logos', 'FAQ', 'WCAG 3 Draft', and 'Authoring Tools - ATAG'. The main content area starts with a 'Summary' section, which states: 'This page introduces the Web Content Accessibility Guidelines (WCAG) international standard, including WCAG 2.0, WCAG 2.1, and WCAG 2.2. WCAG documents explain how to make web content more accessible to people with disabilities.' It also mentions 'WCAG 3' and provides links to 'Accessibility Fundamentals Overview' and 'Quick links to resources' (including 'How to Meet WCAG 2 (Quick Reference)', 'WCAG 2.2 Draft', 'What's New in WCAG 2.2 Draft', 'WCAG 2.1 Standard', and 'WCAG 2.0 Standard'). A 'Page Contents' section at the bottom lists: 'Introduction', 'WCAG 2.0, 2.1, 2.2', 'Who WCAG is for', and 'What is in WCAG 2'.

U.S. Government Mobile User Experience Guidelines



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

An official website of the United States government [Here's how you know](#) ▾

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Mobile User Experience Guidelines

Six user experience guidelines for creating a mobile product.

If your app doesn't have a good user experience, it goes to the [app graveyard](#).

The need for digital products to work better is not new in the federal government. Resources like the [Digital Playbook](#) and [Public Participation Playbook](#) have had impact helping agencies become user-friendly and both of these resources note the importance of developing usable products for mobile users.

As more agencies develop mobile apps and websites, they need quick guidance on mobile user experience Do's and Don'ts. To answer their call, we asked [MobileGov Community of Practice](#) members to choose their top Mobile UX Guidelines from the original group of 42 created in 2013 at community events in late 2014 and early 2015. From that feedback, we have distilled the following six mobile user experience guidelines:

Guideline 1: Make sure your content is structured and chunked appropriately for multiple devices

Guideline 2: Follow industry user interface guidelines and government regulations (like 508) in the development of your mobile product

In this page

Join a Community

Mobile

Web Analytics and Optimization

Web Managers

User Experience

U.S. Web Design System

Previously
(2016 - 2021)

Relative Importance
Strength of Evidence:
1 2 3 4 5

Strength of Evidence:
1 2 3 4 5

Research-Based Web Design & Usability Guidelines

Forewords by:
Michael O. Leavitt
Secretary of Health and Human Services

Ben Shneiderman
Professor of Computer Science, University of Maryland





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

U.K. Government Design System

GOV.UK Design System

Get started Styles Components Patterns Community

Search Design System

Design your service using GOV.UK styles, components and patterns

Use this design system to make your service consistent with GOV.UK. Learn from the research and experience of other service teams and avoid repeating work that's already been done.

[Get started >](#)

What's new

17 October 2022: We've changed our 'Backlog' page into the new '[Upcoming components and patterns](#)' page and chosen 3 priorities that we plan to work on next.

[Sign up to get update emails about the Design System.](#)

Styles Components Patterns

Italian Government Guidelines and Design System



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

The screenshot shows the homepage of the 'Designers Italia' website. At the top, there's a navigation bar with links to 'Piano Triennale', 'Developers', 'Designers' (which is highlighted in blue), 'Forum', 'Docs', and 'GitHub'. Below the navigation, the 'Designers Italia' logo is displayed, along with social media links for Twitter and LinkedIn. A main menu includes 'Linee guida e manuale' (underlined), 'Kit', 'Modelli', 'Piano attività', and 'Notizie'. To the right, there are two sections: 'Partecipa' and 'Team'. The central content area features a large title 'Linee guida e manuale operativo di design' followed by a descriptive paragraph about the technical rules and operational guidelines for digital service design. At the bottom, there are links to 'Le linee guida' and 'Il manuale operativo di design'. To the right of the text, there are six icons arranged in a 2x3 grid: a pencil writing on a screen, a document with horizontal lines, three people with a lightbulb above them, a person's eye, a video camera, and a heart.



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

Apple HIG

The screenshot shows the Apple Developer website's Design section. The top navigation bar includes links for News, Discover, Design, Develop, Distribute, Support, Account, and a search icon. Below this, a secondary navigation bar for the Design section offers links to Overview, What's new, Guidelines, Design Awards, Videos, and Resources. On the left, a sidebar lists categories: Platforms, Foundations, Patterns, Components, Inputs, and Technologies. The main content area features a large title "Human Interface Guidelines" and a subtext explaining its purpose: "The HIG contains guidance and best practices that can help you design a great experience for any Apple platform." Below this, a section titled "New and updated" highlights three recent additions: "Charting data" (Patterns), "Live Activities" (Components), and "Designing for iPadOS" (Platforms). A final section titled "Featured" shows three more items: "Secondary Primary" (Patterns), a hand icon (Components), and a circular arrow icon (Components).

Apple Developer

News Discover Design Develop Distribute Support Account

Design

Overview What's new Guidelines Design Awards Videos Resources

Platforms Foundations Patterns Components Inputs Technologies

Human Interface Guidelines

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New and updated

Patterns Charting data

Components Live Activities

Platforms Designing for iPadOS

Featured

Patterns Secondary Primary

Components

Components



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

Microsoft «Fluent» Design

The screenshot shows the official website for the Microsoft Fluent Design System. At the top, there's a navigation bar with icons for a grid, the Fluent Design System logo, and links for Web, Windows, iOS, and Android. The main content area has a black background. On the left, the text "Fluent Design System" is displayed in large, light blue letters. Below it is a paragraph of smaller text: "Fluent brings the fundamentals of principled design, innovation in technology, and customer needs together as one. It's a collective approach to creating simplicity and coherence through a shared, open design system across platforms." Further down, another line of text reads "Open ecosystem, open design system." To the right of the text is a 3D wireframe cube composed of green, white, and purple lines. At the bottom of the page is a horizontal bar divided into five colored segments: blue, cyan, magenta, and two shades of green. Each segment contains a white icon representing a different platform: a globe for the first, a Windows logo for the second, an iOS logo for the third, and an Android logo for the fourth and fifth.



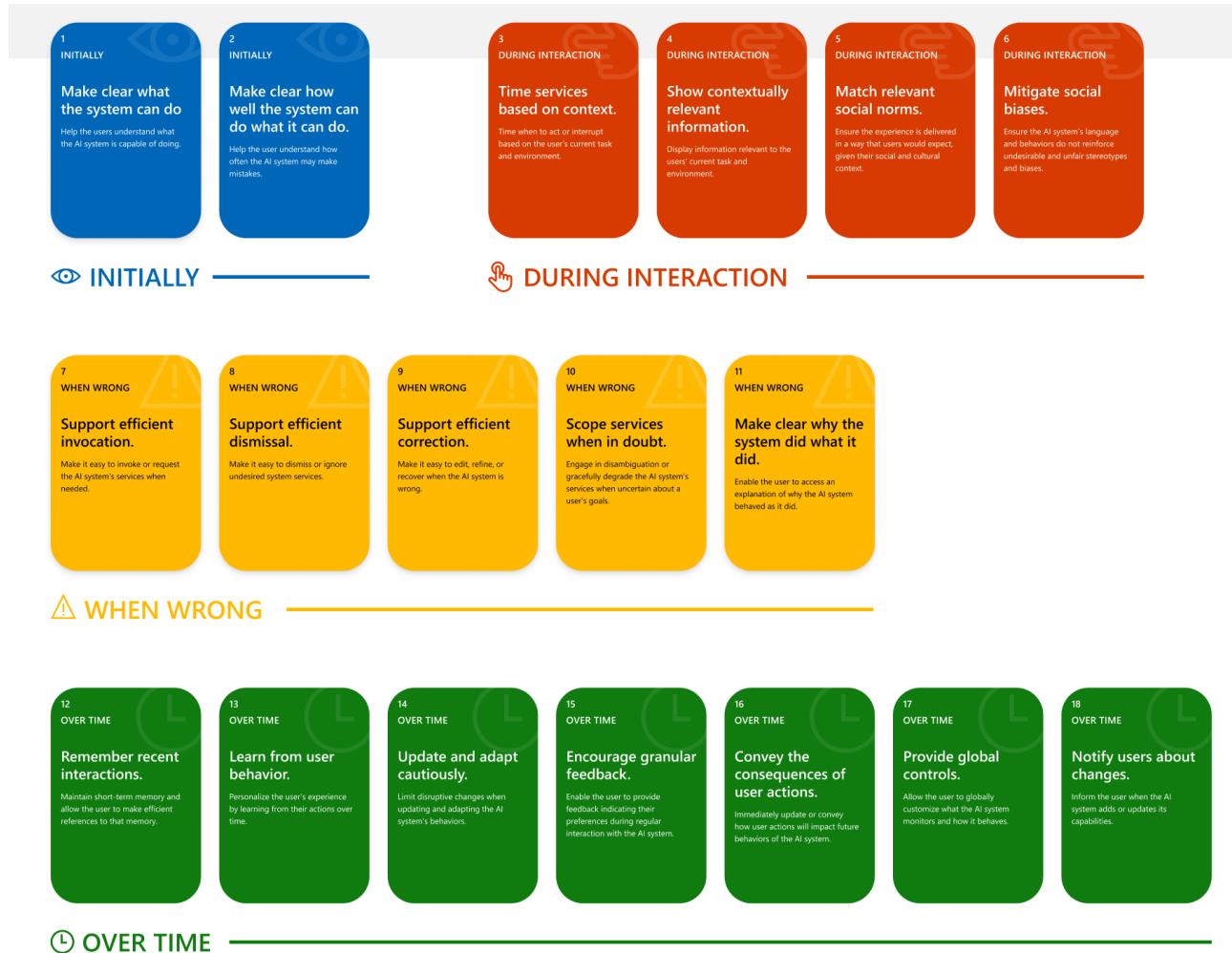
<https://material.io/>

Google Material Design

A screenshot of the Google Material Design website. The header features a navigation bar with icons for Home, Get started, Develop, Foundations, Styles, Components, and Blog. The main section has a colorful, wavy background image. The title 'Material Design' is prominently displayed in large, bold, black font. Below the title is a subtitle: 'Material 3 is the latest version of Google's open-source design system. Design and build beautiful, usable products with Material 3.' A blue 'Get started' button is located below the subtitle. In the bottom left corner of the main section, there is a small circular icon with a refresh symbol. The bottom of the page features a 'News & launches' section with three cards: one showing abstract purple and green shapes, another showing a dark background with a white 'Relay' logo and the word 'ALPHA' in small letters, and a third showing a yellow gradient background with the Material Design logo and a stylized 'B' icon.

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/hax toolkit/ai-guidelines/>



Guidelines for Human-AI Interaction: Examples

2

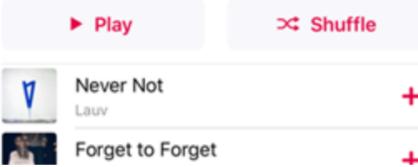
INITIALLY

Make clear how well the system can do what it can do.

Help the user understand how often the AI system may make mistakes.

EXAMPLE IN PRACTICE

Discover new music from artists we think you'll like.
Refreshed every Friday.



The recommender in **Apple Music** uses language such as "we think you'll like" to communicate uncertainty.

Make clear how well the system can do what it can do.

2

9

WHEN WRONG

Support efficient correction.

Make it easy to edit, refine, or recover when the AI system is wrong.

EXAMPLE IN PRACTICE

All Images Videos Maps

757,000 Results Any time ▾

Including results for **keanu reeves**. Do you want results only for **keanu reaves**?

When **Bing** automatically corrects spelling errors in search queries, it provides the option to revert to the query as originally typed with one click.

Support efficient correction.

9

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

- Guidelines, practices
- Principles, comparisons
- Theories, drawings or models

support communication and teaching.

Specific cases

Practical, operational

Concrete formulation

App

General

Abstract, theoretical

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.

Design = Solutions

- Design is about solution
- Unfortunately, designers often reinvent 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.*"

A Pattern Language

Towns • Buildings • Construction



Christopher Alexander
Sara Ishikawa • Murray Silverstein
WITH
Max Jacobson • Ingrid Fiksdahl-King
Shlomo Angel

Design Patterns

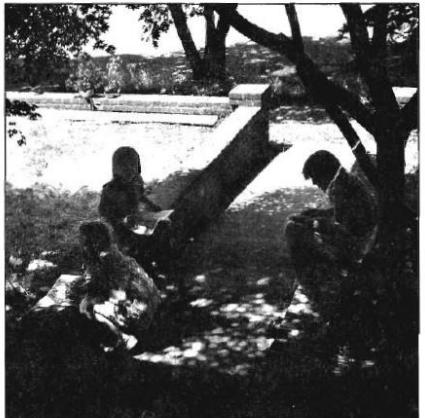
- They are a way to communicate common **design problems** and **related solutions**
 - Design patterns are recurring solutions that solve common design problems
- They are not too general and not too specific
 - use a solution “a million times over, without ever doing it the same way twice”
- They are 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**



... 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

1124

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—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:

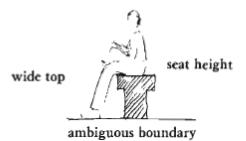
Last summer I was lodging for a little while in a cottage in the country, and in front of my low window there were, first, some beds of daisies, then a row of gooseberry and currant bushes, and then a low wall about three feet above the ground, covered with stone-cress. Outside, a corn-field, with its 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 my 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). . . .

1127

Design Patterns Description

Name

243 SITTING WALL**

Images



... 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.

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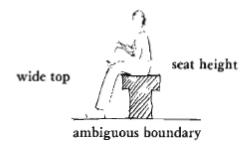
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1126

243 SITTING WALL



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User Experience Design

24

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Images

Context

... if all is well, the outdoor space is 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.

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.

1124

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—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:

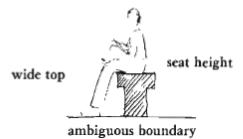
Last summer I was lodging for a little while in a cottage in the country, and in front of my low window there were, first, some beds of daisies, then a row of gooseberry and currant bushes, and then a low wall about three feet above the ground, covered with stone-cress. Outside, a corn-field, with its 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 my 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). . . .

1127

Design Patterns Description

Name

243 SITTING WALL**

Images



Context

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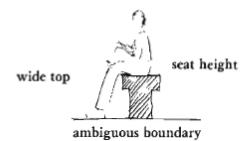
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243 SITTING WALL



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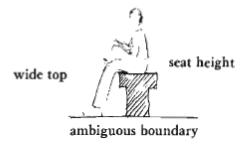
Two Paths, N.

The

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1126 1127

243 SITTING WALL



Design Patterns Description

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243 SITTING WALL**

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Two Paths, No Fence

The

Solution statement

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1126

243 SITTING WALL



References to other patterns

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1127

Design Patterns Balance Forces

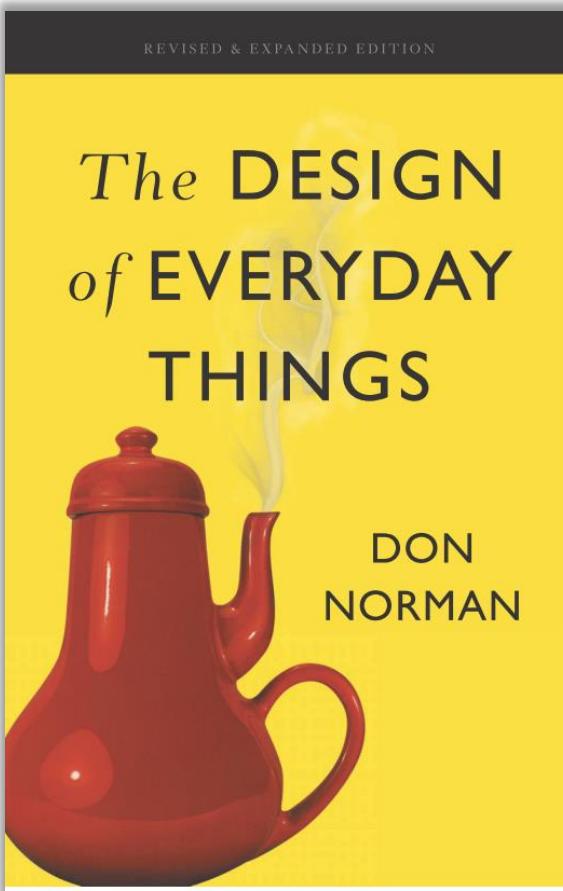
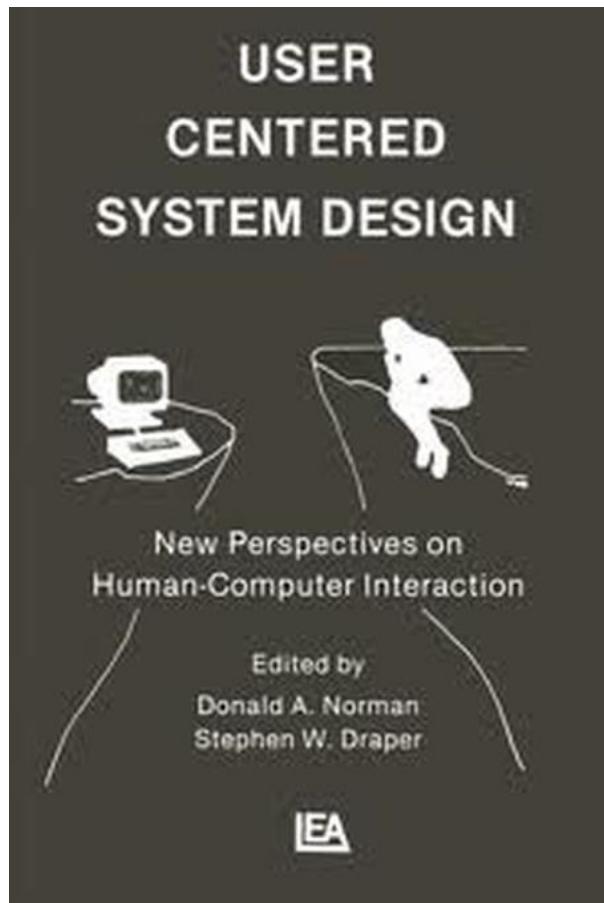
- Design patterns solve a problem **of conflicting forces**
- Example:
 - People are naturally drawn towards light
 - But like to sit

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!
- With UI design patterns, we can accelerate our users understanding of the interface

UI Design Patterns

Design patterns

User Interface Design patterns are recurring solutions that solve common design problems. Design patterns are standard reference points for the experienced user interface designer.

Dive into the patterns below to learn a common language of web design.

User Interface Design Patterns

Getting input	Navigation	Dealing with data	Social
Forms Password Strength Meter Structured Format Captcha Rule Builder Keyboard Shortcuts Drag and drop Inplace Editor Preview Expandable Input Autosave Input Prompt Good Defaults Fill in the Blanks WYSIWYG Input Feedback Color Picker	Tabs Navigation Tabs Module Tabs Jumping in hierarchy Breadcrumbs Fat Footer Notifications Modal Home Link Shortcut Dropdown Menus Vertical Dropdown Menu Accordion Menu Horizontal Dropdown Menu Content	Tables Alternating Row Colors Sort By Column Table Filter Formatting data Frequently Asked Questions (FAQ) Dashboard Copy Box Images Gallery Slideshow Image Zoom Search Autocomplete Search Filters	Reputation Collectible Achievements Testimonials Leaderboard Social interactions Activity Stream Auto-sharing (Mini) Friend list (Mini) Reaction Chat Follow Invite friends Friend Miscellaneous

<https://ui-patterns.com/patterns>

UI Design Patterns

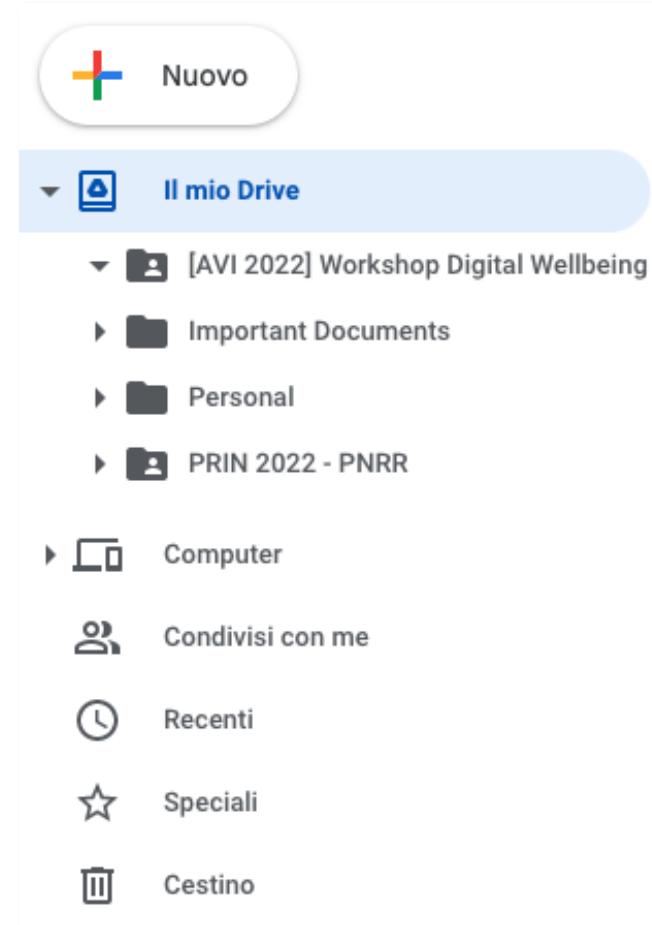
ACCORDION MENU

DROPDOWN MENU

CARDS

BREADCRUMBS

THE HAMBURGER



UI Design Patterns

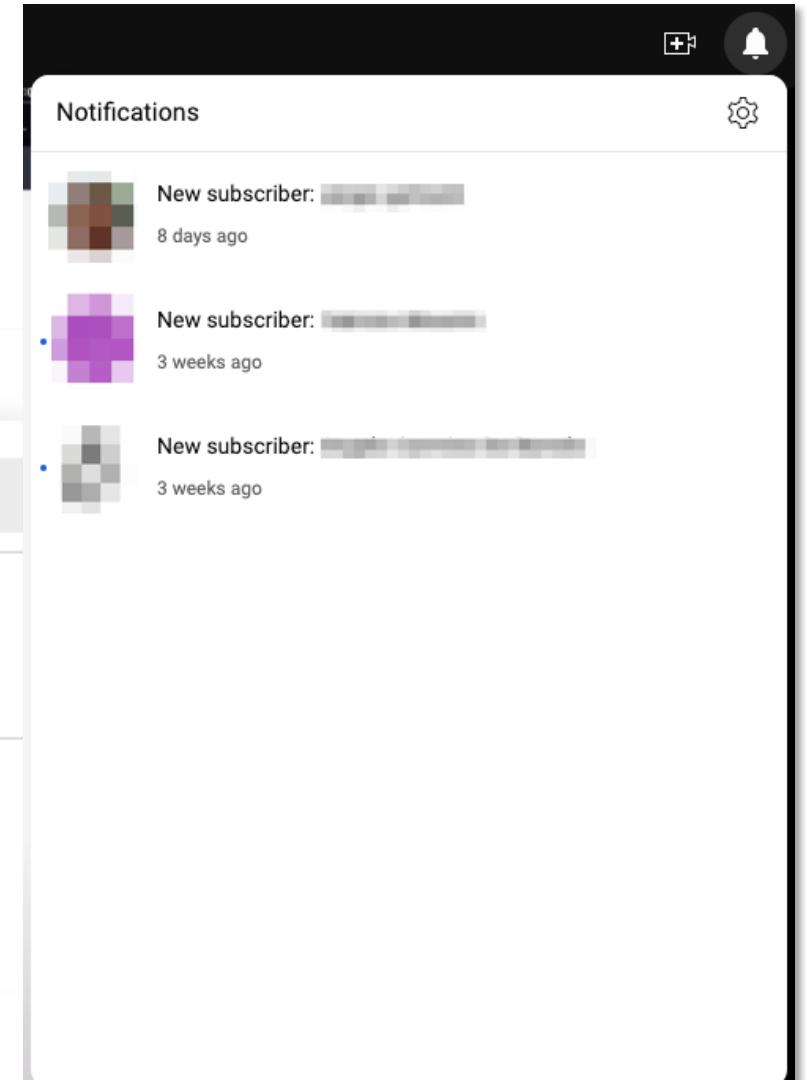
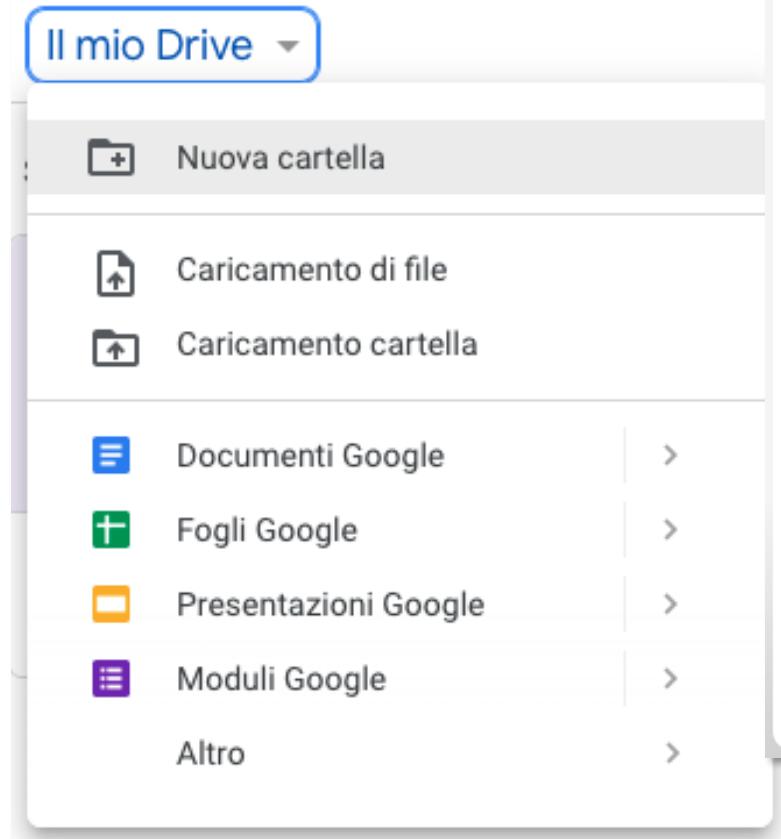
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UI Design Patterns

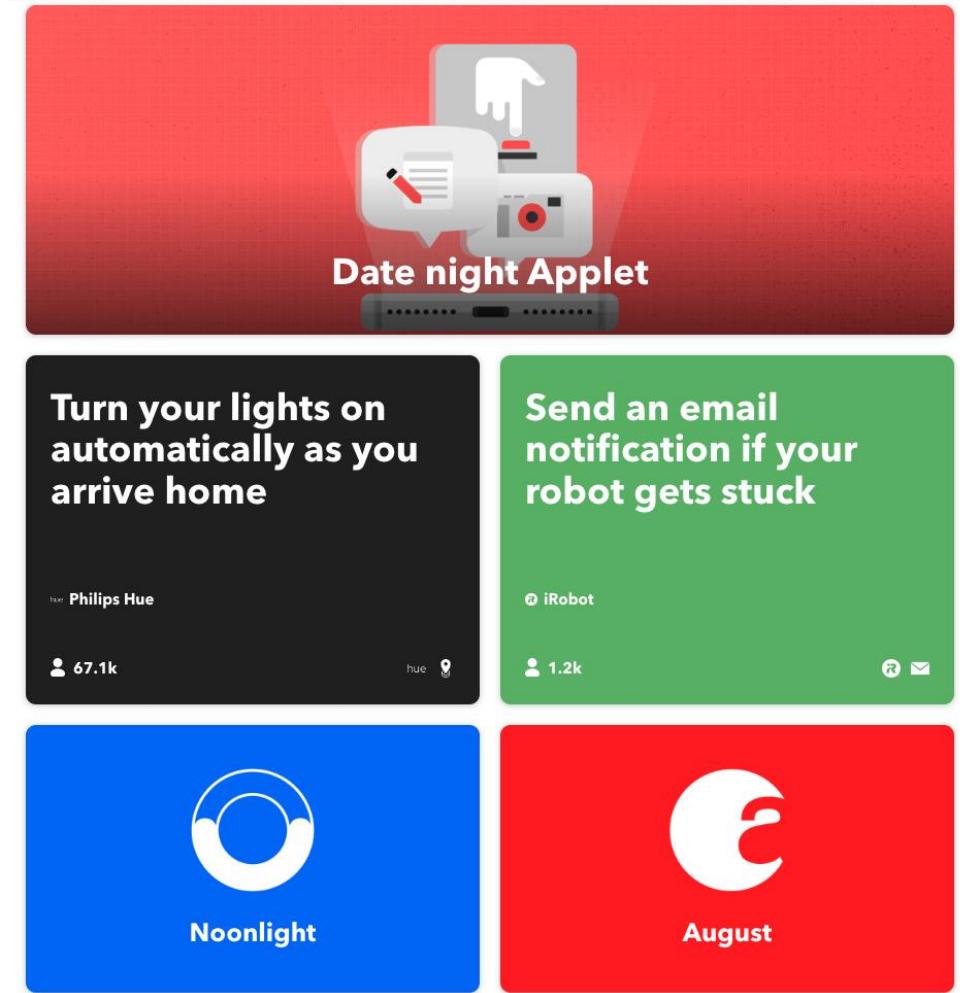
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UI Design Patterns

ACCORDION MENU

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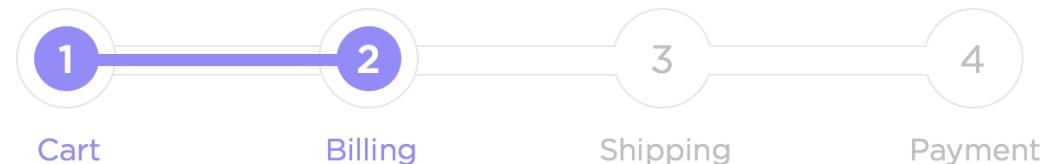
BREADCRUMBS

THE HAMBURGER

Cart > Billing > Shipping > Payment



Cart / Billing / Shipping / Payment



UI Design Patterns

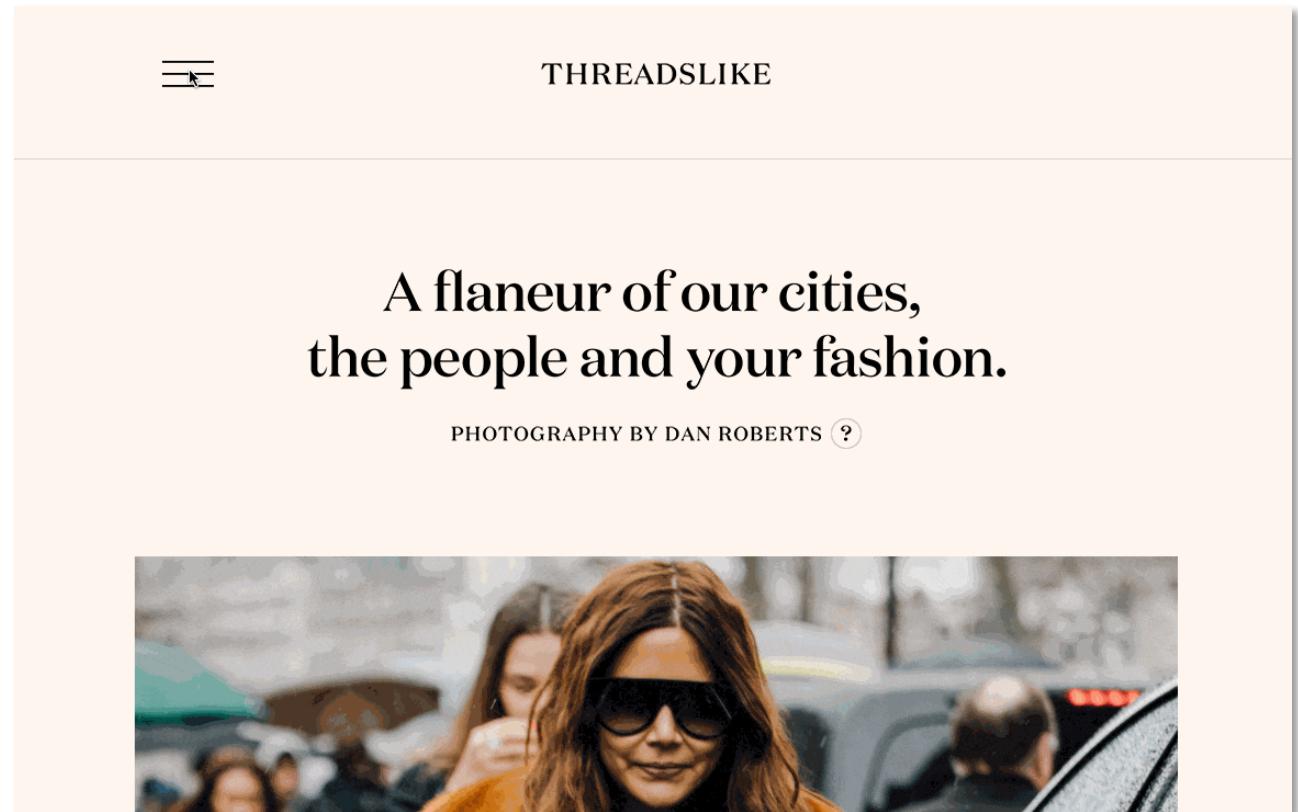
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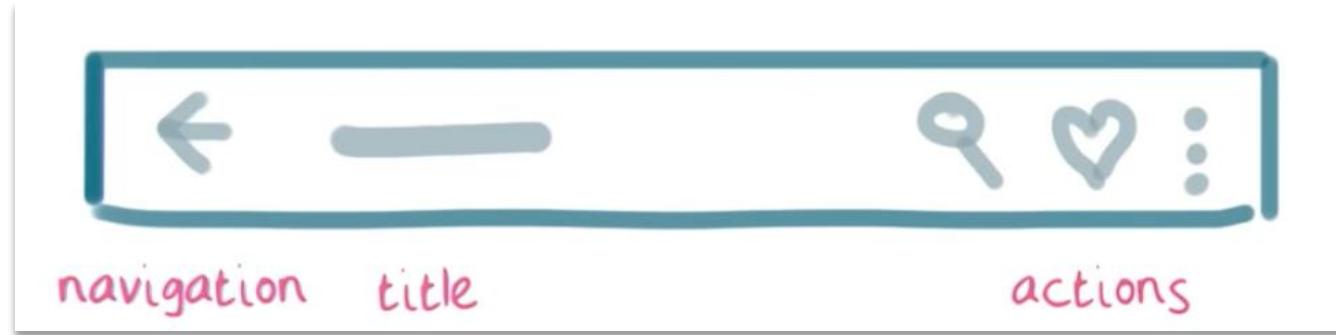
BREADCRUMBS

THE HAMBURGER



Design Patterns in (Android) Mobile Apps

TOOLBAR

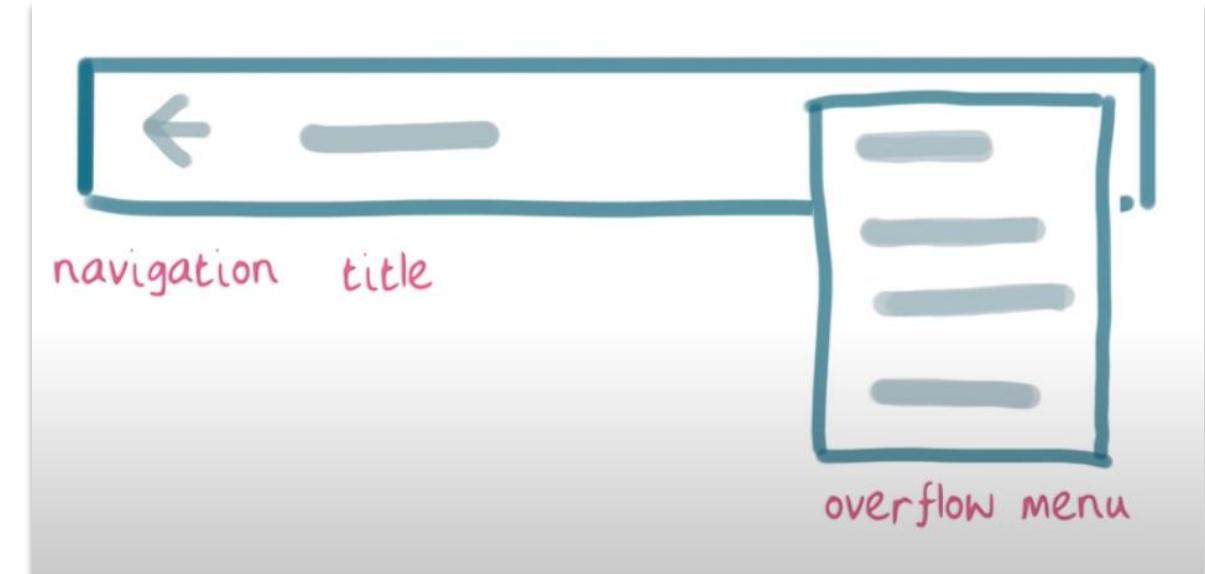


APP BAR

TABS

NAVIGATION DRAWER

SCROLLING AND PAGING



Design Patterns in (Android) Mobile Apps

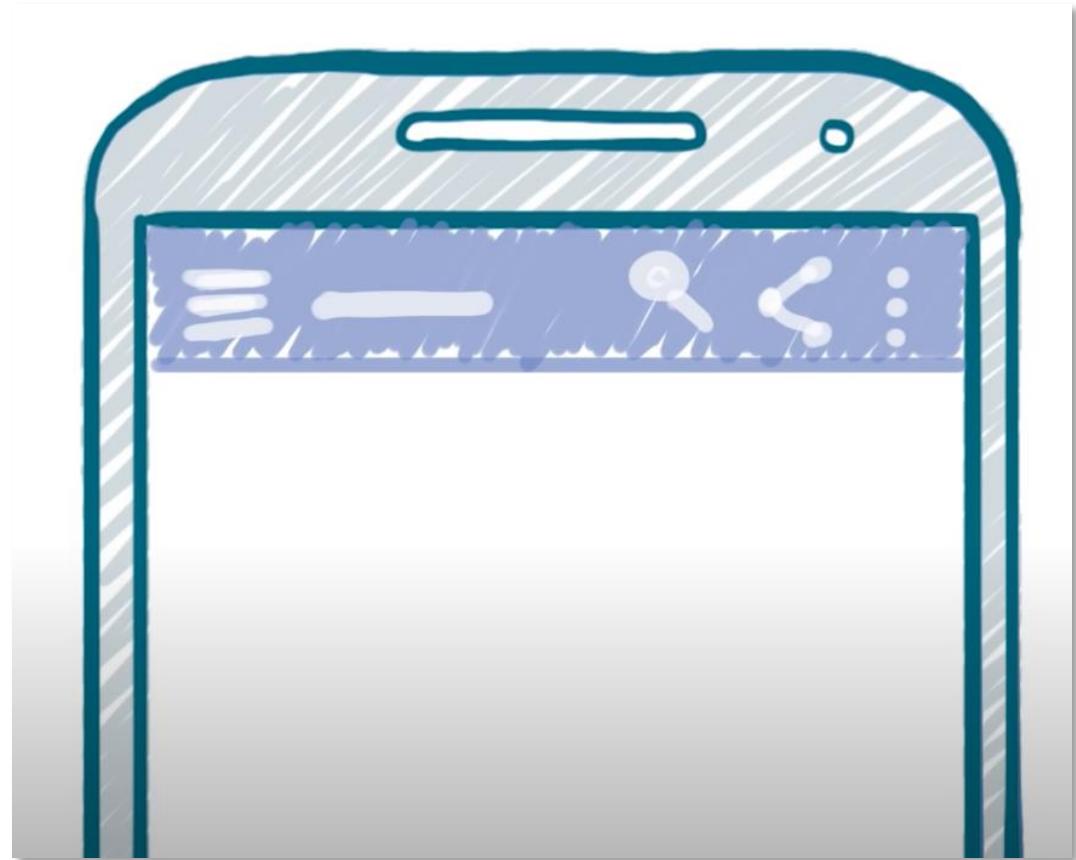
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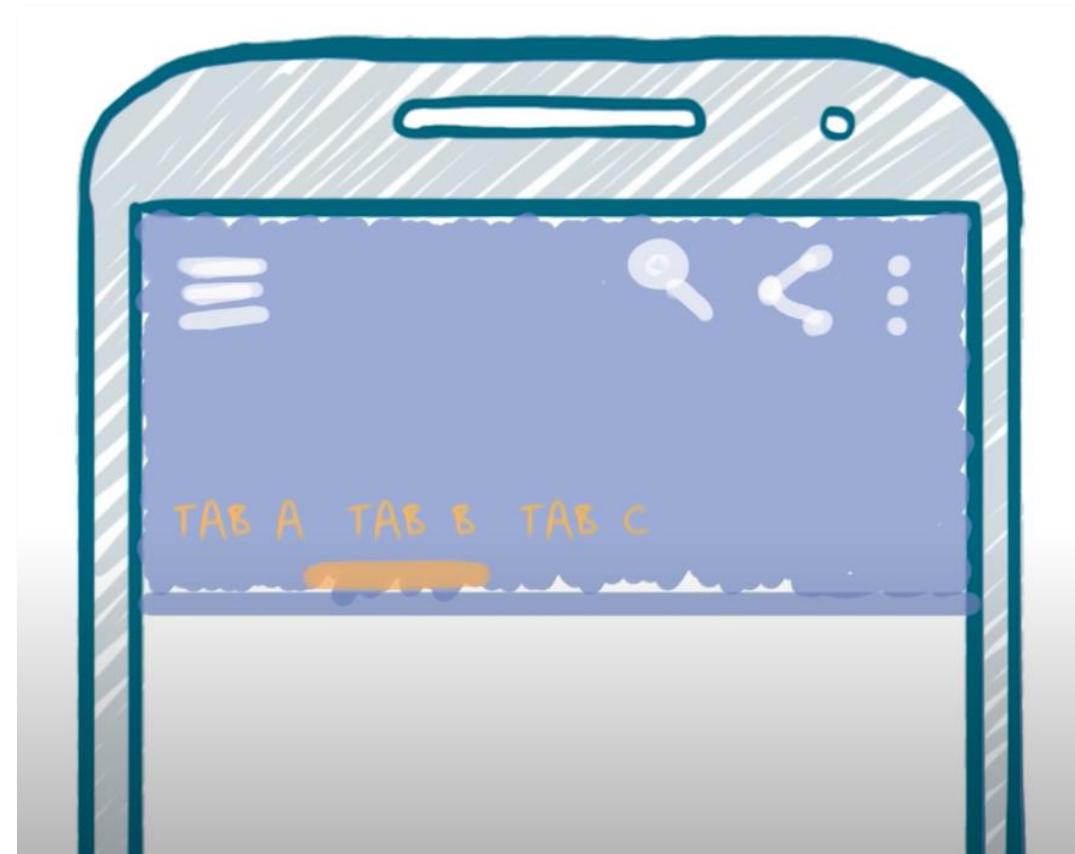
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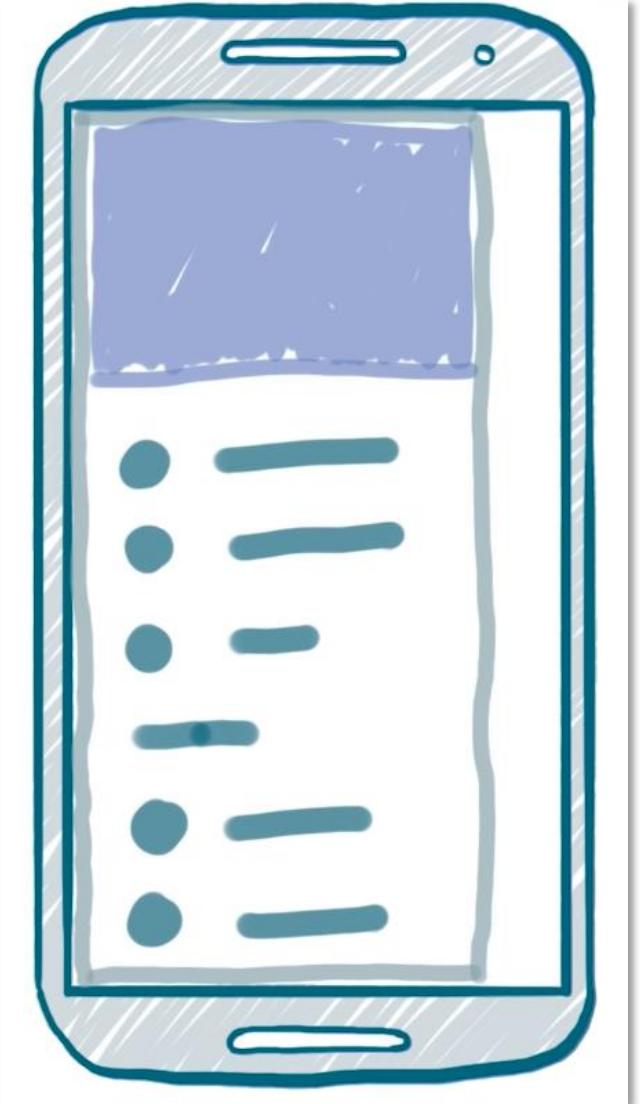
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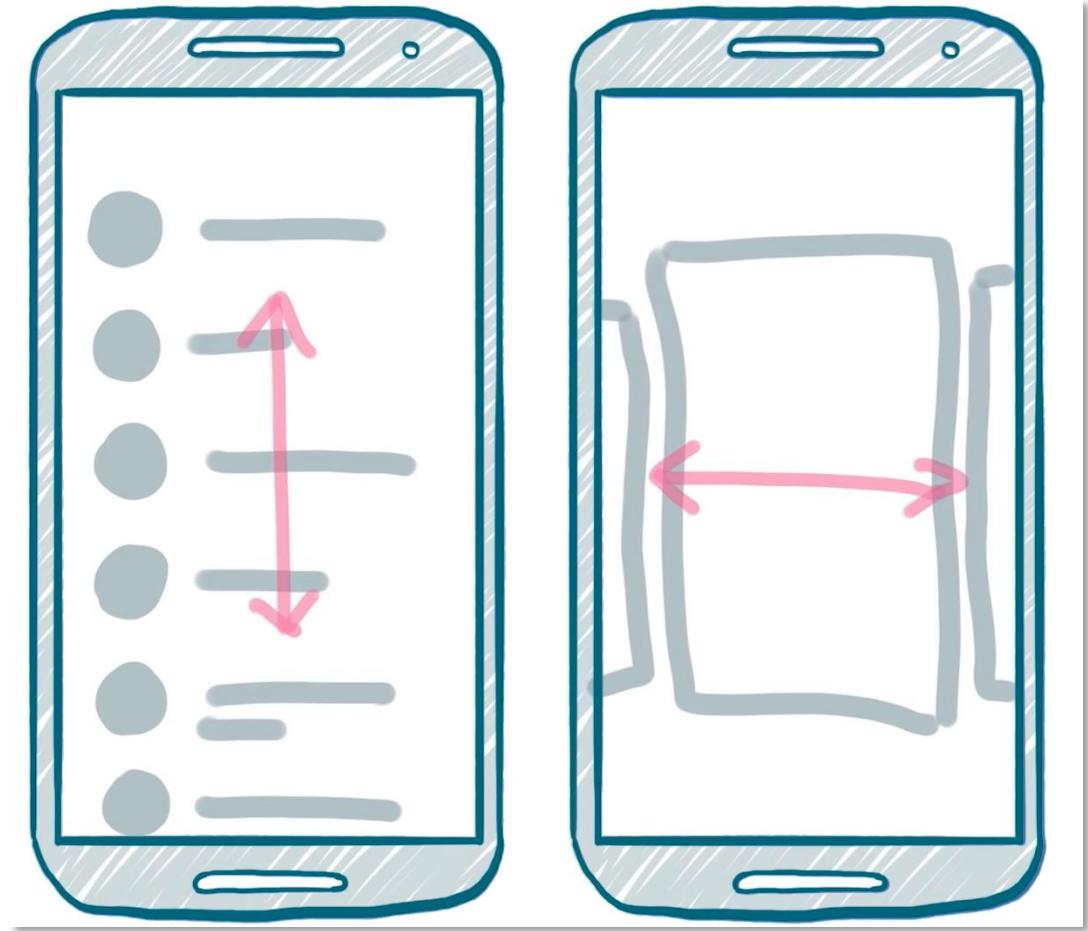
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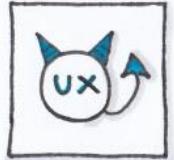


Dark Patterns

Deceptive designs that go against users' best interests

Dark Patterns

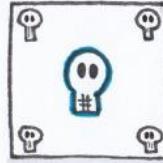
- The term “dark pattern” was coined in 2010 by **Harry Brignull**, a design practitioner
- The aim was to include all those designs that are **deliberately** adopted to promote choices that are not in the user’s best interest



DARK PATTERNS

©KRISZTINA SZEROVAY
WWW.SKETCHINGFORUX.COM

UX Knowledge Base Sketch #29

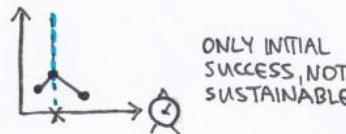


DARK PATTERNS ARE
TRICKS
THAT MAKE THE USERS DO
THINGS THEY DID NOT MEANTO.

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

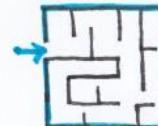


THE MOST COMMON TYPES



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



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



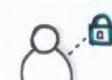
DISGUISED ADS
AN AD LOOKING LIKE
ANOTHER TYPE OF CONTENT
/NAVIGATION



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

Dark Patterns

- **Harry Brignull** published a gallery of dark patterns on the www.darkpatterns.org
- He launched an hall of shame campaign on Twitter using the hashtag **#darkpatterns**

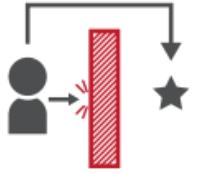
Dark Patterns ... or Deceptive Designs

- 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 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>
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<https://doi.org/10.1145/3411764.3445610>

Dark Patterns Taxonomies

				
NAGGING <p>Redirection of expected functionality that persists beyond one or more interactions.</p> <p>INCLUDES: Brignull "Roach Motel," "Price Comparison Prevention," and "Intermediate Currency"</p>	OBSTRUCTION <p>Making a process more difficult than it needs to be, with the intent of dissuading certain action(s).</p> <p>INCLUDES: Brignull "Forced Continuity," "Hidden Costs," "Sneak into Basket," and "Bait and Switch"</p>	SNEAKING <p>Attempting to hide, disguise, or delay the divulging of information that is relevant to the user.</p> <p>INCLUDES: Brignull "Forced Continuity," "Hidden Costs," "Sneak into Basket," and "Bait and Switch"</p>	INTERFACE INTERFERENCE <p>Manipulation of the user interface that privileges certain actions over others.</p> <p>INCLUDES: Hidden Information, Preselection, Aesthetic Manipulation, Toying with Emotion, False Hierarchy, Brignull "Disguised Ad," and "Trick Questions"</p>	FORCED ACTION <p>Requiring the user to perform a certain action to access (or continue to access) certain functionality.</p> <p>INCLUDES: Social Pyramid, Brignull "Privacy Zuckering," and Gamification</p>

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

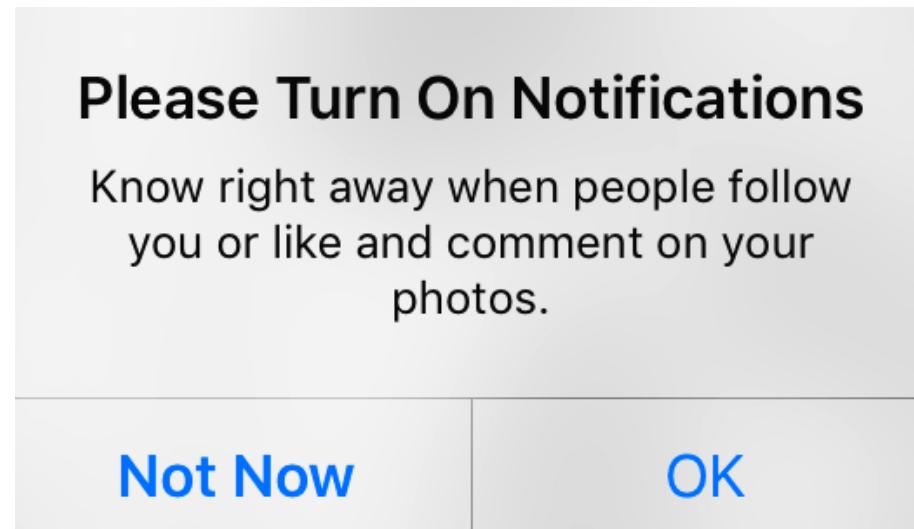


Figure 2: Example of nagging behavior on Instagram, where a modal dialogue provides no opportunity to permanently dismiss the message.

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

The image shows a user interface with the following elements:

- NAGGING**: A section title.
- OBSTRUCTION**: A section title.
- SNEAKING**: A section title.
- INTERFACE INTERFERENCE**: A section title.
- FORCED ACTION**: A section title.
- You have been unsubscribed from all future mailings**: A message in orange text.
- I agree to the Privacy Statement.**: A checkbox with a checked status.
- In particular, I consent to the transfer of my personal information to other countries, including the United States, for the purpose of hosting and processing the information as set forth in the Privacy Statement. [-]**: A descriptive text of the consent.
- I understand that these countries may not have the same data protection laws as the country from which I provide my personal information. I have the right to withdraw my consent at any time. For more information, click [here](#).**: A note about data protection laws and the right to withdraw consent.
- *You can unsubscribe from Marketing emails at any time. Please note that opting-out of Marketing communications does not affect your receipt of business communications that are important to your interaction with Salesforce, such as support/service communications, security updates, event registration updates or account management communications.**: A note about marketing unsubscribe and business communications.
- Save All Changes**: A blue button with white text.

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

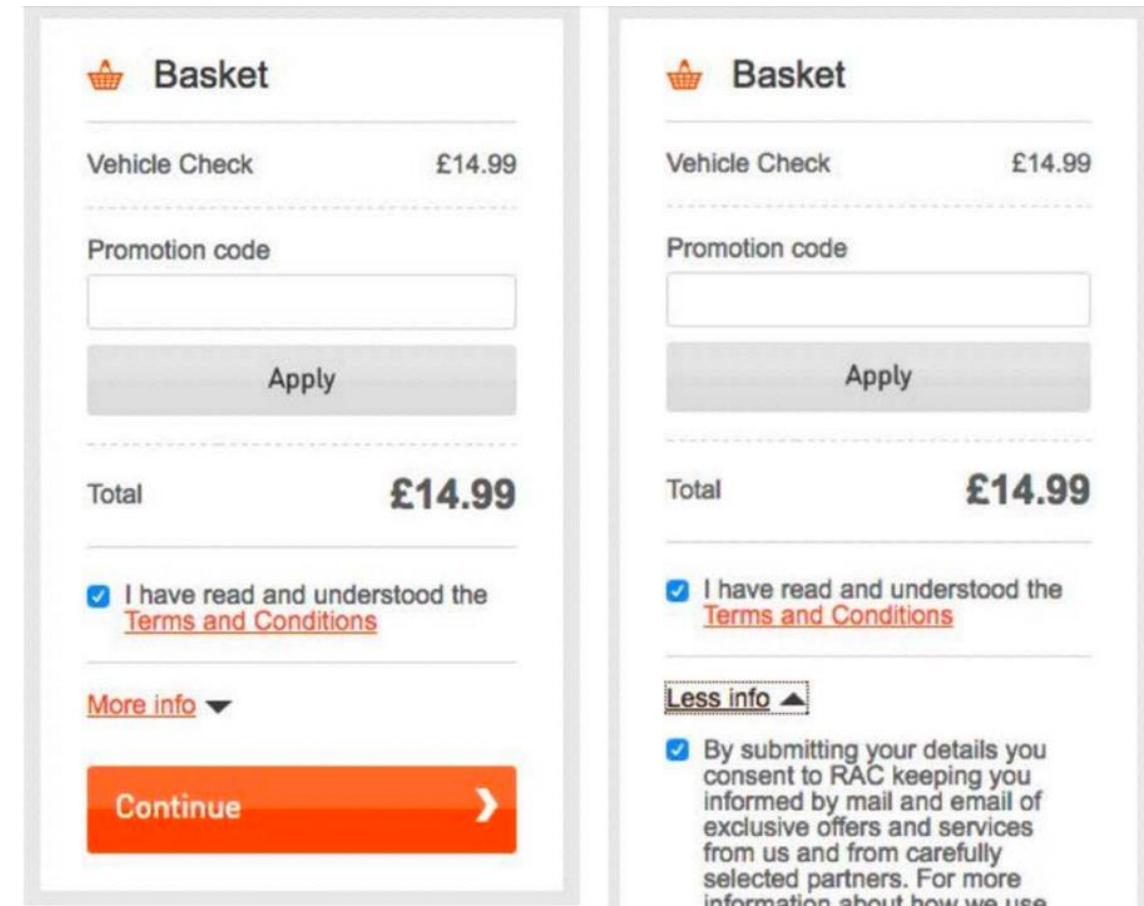


Figure 5: Example of preselection as a type of interface interference, hiding and preselecting a choice that may not be in the user's best interest.

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

FORCED ACTION

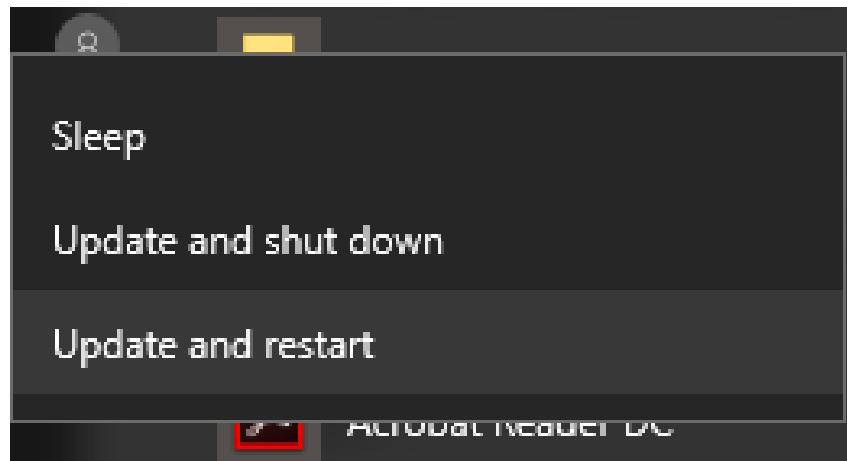


Figure 7: Example of forced action on Windows 10.

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

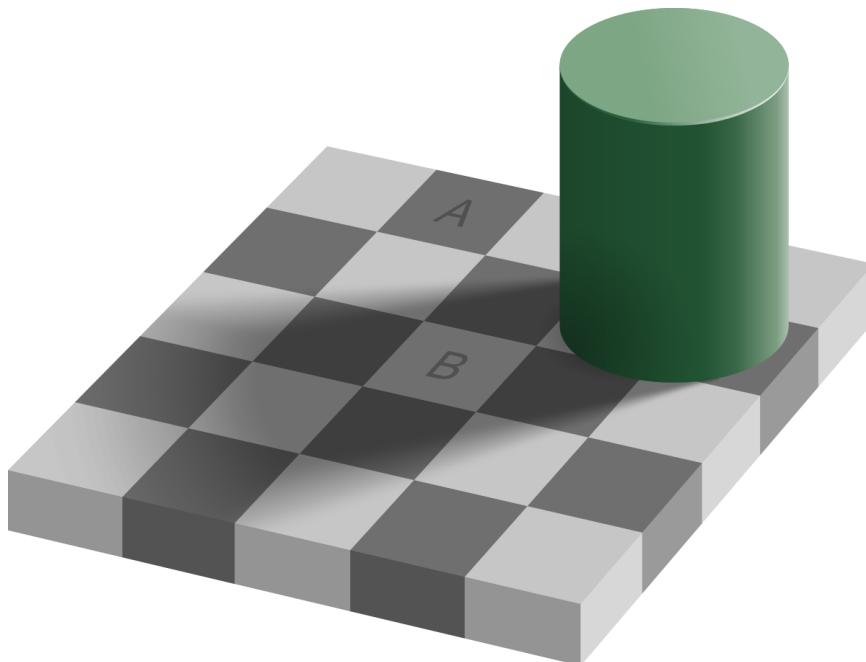
- Typically, they ACDPs the need for autonomous decision making by "automating" processes and functions
- Paradoxically, they can **improve the usability** of a platform
- ACDPs exploit **psychological vulnerabilities** and “**cognitive biases**”
 - Variable reward
 - Immediate gratification
 - [...]

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.

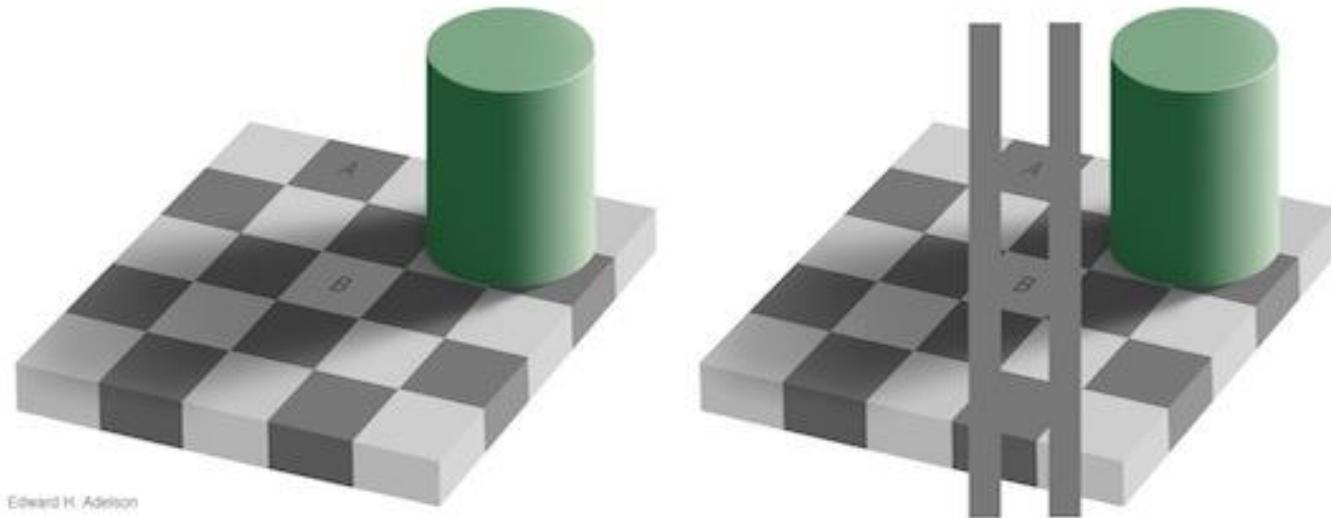
Exploiting Psychological Vulnerabilities and Biases

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



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 Damaging Patterns: Impacts

- ACDPs may negatively affect people's digital well-being
 - They promote "**digital addiction**"
 - They undermine users' **attention** and **productivity**
 - They undermine users' **sense of agency** and self-control
 - They result in a later **sense of regret**

Attention-Capture Dark Patterns: Typology

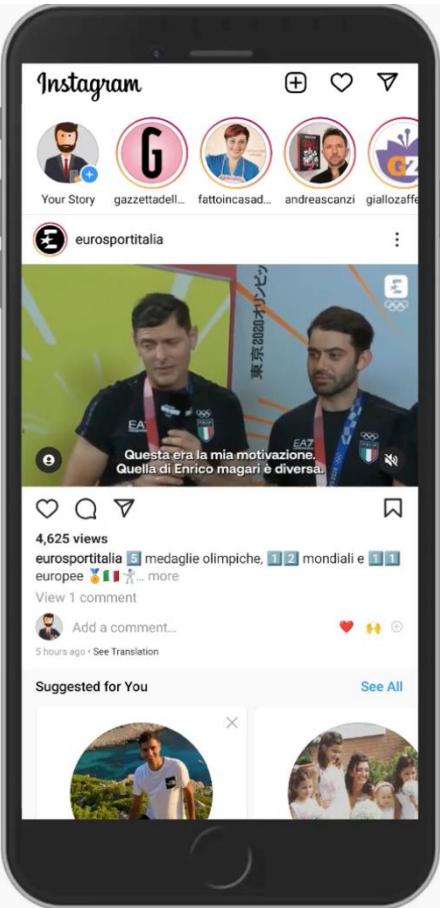
Pattern Name	Description
<i>P1 - Infinite Scroll</i>	As the user scrolls down a page, more content automatically and continuously loads at the bottom.
<i>P2 - Casino Pull-to-refresh</i>	When the user swipes down on their smartphone, there is an animated reload of the page that may or may not reveal new appealing content.
<i>P3 - Neverending Autoplay</i>	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.
<i>P4 - Guilty Pleasure Recommendations</i>	Personalized suggestions that prey on individual consumer frailty to target user's guilty pleasures and increase use time.
<i>P5 - Disguised Ads and Recommendations</i>	Advertisements and recommendations, e.g., posts and sponsored pages, that are disguised as normal content into social networks' newsfeeds.
<i>P6 - Recapture Notifications</i>	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.
<i>P7 - Playing by Appointment</i>	Users are forced to use a digital service at specific times as defined by the service, otherwise the user may lose points and achievements.
<i>P8 - Grinding</i>	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.
<i>P9 - Attentional Roach Motel</i>	Registering to and accessing attention-capture digital services is easy, while operations like logout or canceling an account are painfully difficult.
<i>P10 - Time Fog</i>	A pattern through which designers reduce users' awareness of time spent, e.g., by hiding the smartphone's clock.
<i>P11 - Fake Social Notifications</i>	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



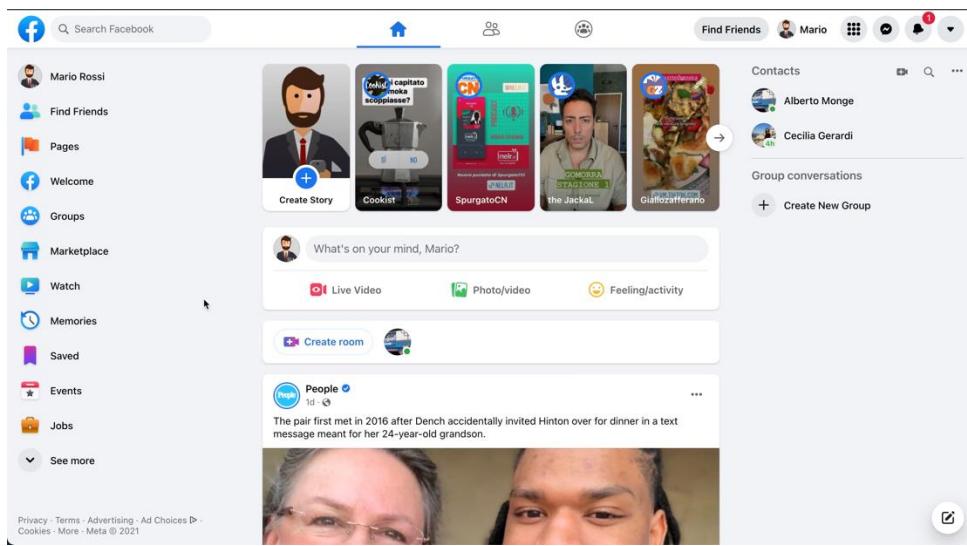
- When the user **swipes down** on their smartphone, there is an **animated reload** of the page that **may or may not** reveal new appealing content.
- Users may be tempted to refresh compulsively, hoping to receive new content.
- It exploits **variable reward techniques**:
 - similar to **slot machines**.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

Neverending Autoplay



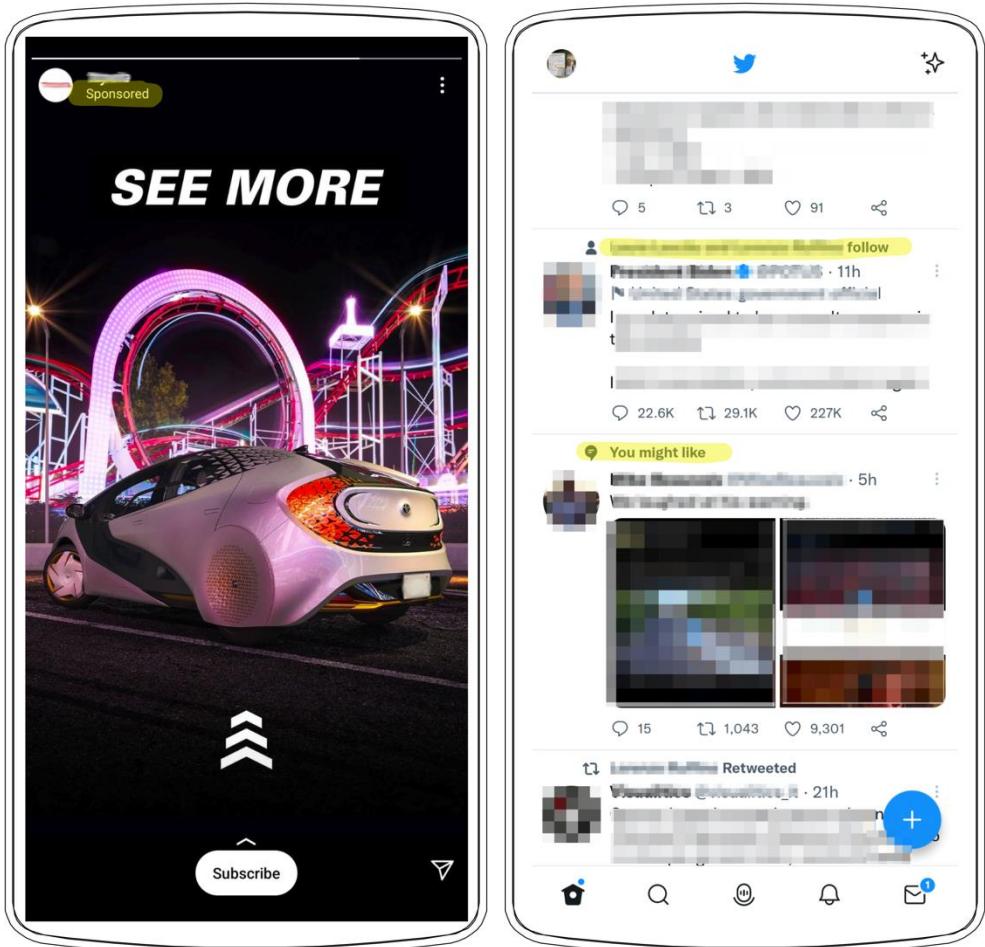
- A new video is **automatically played** when the current one finishes. There is never a point for the user to **stop** and **reflect**, and the option to turn off autoplay is hidden or non-existent.
- Autoplay may be **useful** in some circumstances, e.g., listening to music on YouTube while working.
- 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



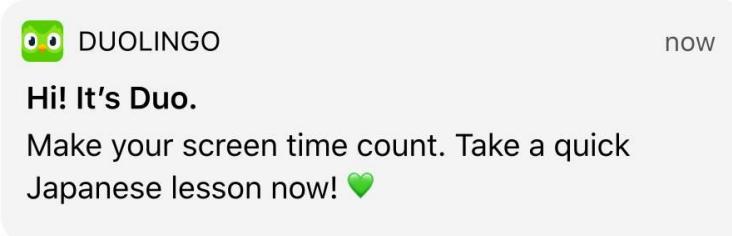
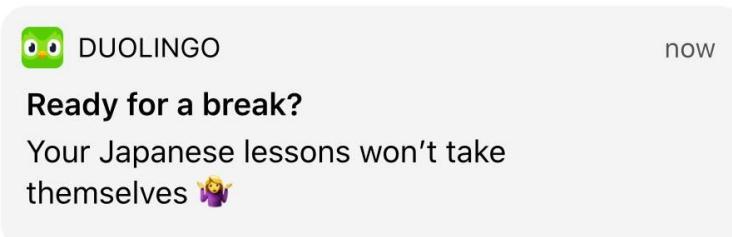
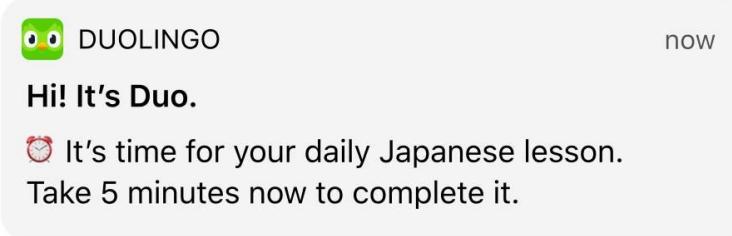
- They are based on:
 - previous user's interactions (**Content-Based**);
 - preferences of similar users (**Collaborative Filtering**).
- Recommendations are useful if the goal of the platform matches the user's goals (**value-alignment problem**).
- They can become a «**trap**» for keeping the user's 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 than a representation of the user's preferences:
 - most users are not able to process such a **misalignment!**
- Common on social media.

Recapture Notifications

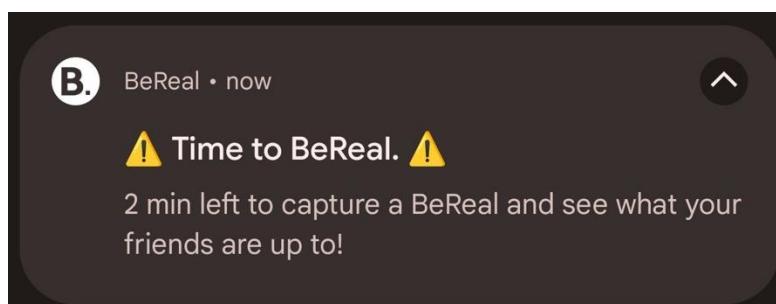
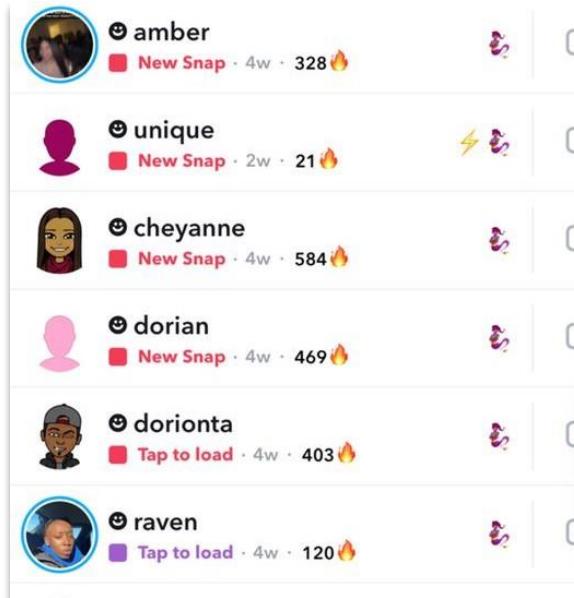


- “if I didn’t have things popping up every 30 minutes like ‘this has happened’ I don’t think I would think about Facebook.”

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



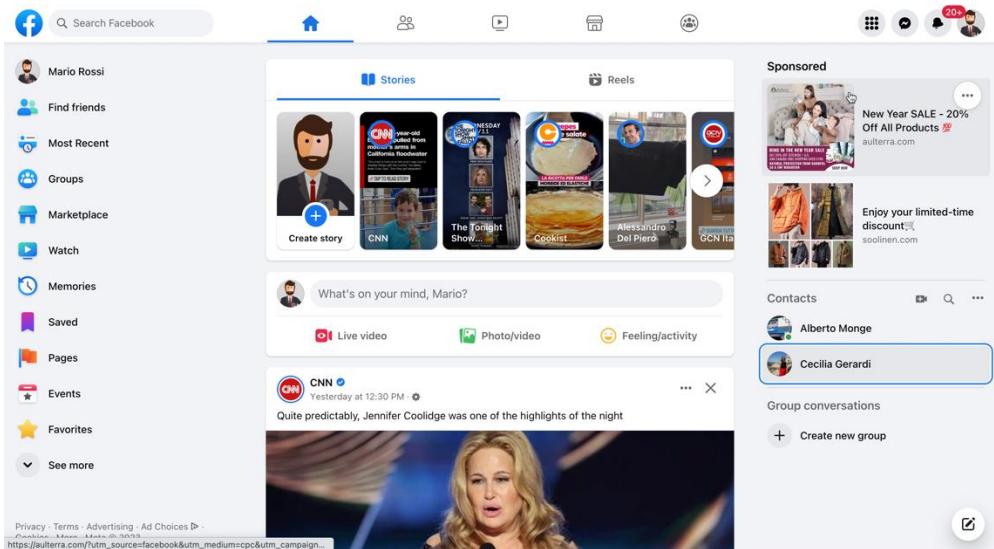
- Force users to use a digital service at **specific times** as defined by the service, rather than the user.
- Engineered to encourage users to **re-visit** a digital service to avoid losing the possibility of earning something, e.g., points or even the ability to progress in a game.
- Common on video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

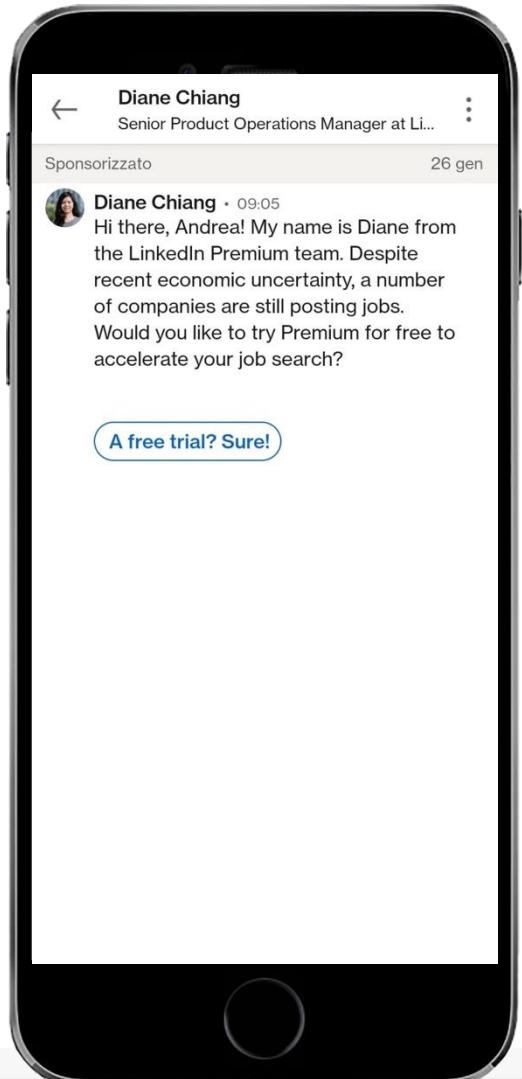
Time Fog



Incomplete Timestamp

- 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.

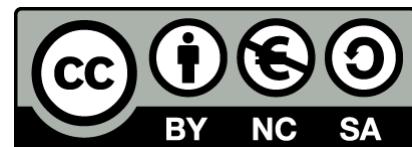
Fake Social Notifications



- 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

- 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_tx154



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