

**ITI0209: User Interfaces**

# **07. Design Systems**

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**Design System is the single source of truth which groups all the elements that will allow the teams to design, realize and develop a product.**

**Design System** is a set of standards to manage design at scale by reducing redundancy while creating a shared language and visual consistency across different pages and channels.

in die ire furoris sui. **Mem** De recesso  
misit ignem in ossibus meis: et exarduit  
me. **Ep** adit recte pedibus meis: con-  
uertit me retrorsum. Posuit me deso-  
latam: tota die merore confecta. **Rum**  
Vigilauit iugum iniquitatum mearum in  
manu eius: conuoluit sunt et imposi-  
te collo meo. Infirmata est uirginitas mea:  
dedit me dominus in manu de qua non po-  
tero surgere. **Samech** Abstrulit omnes  
magnificos meos dominus de medio mei:  
uocauit aduersum me tempus: ut con-  
tereret electos meos. Torcular calcauit  
dominus uirgini filie iuda. **Ain** Idcirco e-  
go plorans et oculus meus deducens  
aquas: quia longe factus est a me con-  
solator: conuertens animam meam. Facti  
sunt filii mei perditioni: quoniam inualuit  
inimicus meus. **He** Ep adit syon manus  
suas: non est qui consoletur eam. Man-  
dauit dominus aduersum iacob: in circui-  
tu eius hostes eius. Facta est iherusalem pol-  
luta mensuris inter eas. **Sade** Iustus  
est dominus: quia os eius ad iracundiam  
prouocauit. Audite obsecro uniuersi  
populi: et uidete dolorem meum. Virgines  
mee et iuuenes mei abierunt in captiui-  
tatem. **Coph** Uocauit amicos meos: et  
ipsi depererunt me. Sacerdotes mei et  
senes mei in uerbo consumpti sunt: quia  
quesierunt cibum sibi ut resocillarent ani-  
mas suas. **Res** Uide domine quoniam  
tribulor: tribulatus est uenter meus. Sub-  
uersum est cor meum in meueripa: quoniam  
amaritudine plena sum. Foris inter-  
fecit gladius: et domi mors similis est.  
**Sen** Audierunt quia ingenuus ego: et  
non est qui consoletur me. Omnes ini-  
mici mei audierunt malum meum: locati  
sunt quoniam tu fecisti. Adduxisti diem conso-  
lationis: et factus sis spes mei. **Tau** Ingre-  
ditur omne malum meum cor meum: et uindictam

meam sicut uindictam meam propter omnes  
iniquitates meas. Multi enim genui-  
tus mei: et cor meum merces. **Aleph**  
**Q**uomodo obrexit caligine in furo-  
re suo dominus filiam syon. Projecit  
de celo in terram iudicium israel: et non  
est recordatus scabelli pedum suorum in die  
furoris sui. **Seth** Precipitauit dominus nec  
pepercit omnia speciosa iacob: destruxit  
in furore suo munitiones uirginis  
iuda: et dericuit in terram: polluit regnum  
et principes eius. **Gymel** Conflagrauit in  
ira furoris sui omne cornu israel: a-  
uertit retrorsum depererunt suam a facie inimi-  
ci: et succendit in iacob ignem flammae  
deuorantis in giro. **Deleth** Cecidit ar-  
cum suum quasi inimicus: firmavit de-  
pererunt suam quasi hostis: et occidit o-  
mnem quod pulchrum erat uisum. In taber-  
naculo filie syon effudit ignem indi-  
gnationis suae. **Ne** Factus est dominus uelut ini-  
micus: precipitauit israel. Precipita-  
uit omnia mensa eius: dissipauit mu-  
nitiones eius: et repleuit in filia iuda  
humiliatum et humiliatum. **Uau** Et  
dissipauit quasi ortum terrorum suum:  
demolitus est tabernaculum suum. Obli-  
uioni tradidit dominus in syon festiuitatem  
et sabbatum: et in obprobrium et in indi-  
gnationem furoris sui regem et sacerdotes.  
**Zay** Repulit dominus altare suum: maledi-  
xit sanctificationi suae: tradidit in ma-  
nus inimici muros ierusalem eius. Vocem  
dederunt in domo domini: sicut in die so-  
lenni. **Yeth** Cogitauit dominus dissipare  
murus filie syon: cecidit funiculum suum  
et non auerit manum suam a perditione.  
Luxitque ante muralem: et murus pariter dis-  
sipatus est. **Teth** Defixae sunt in terra por-  
te eius: perdidit et contruit uertes eius: re-  
gum eius et principes eius in genibus.  
Non est lex: et propheta eius non inueniuntur

uisione a domino. **Jeth** Deperit in terra:  
conticuerunt fetes filie syon: conspexerunt  
cineere capita sua. Accendi sunt cilicija-  
abiecerunt in terra capita sua uirgines  
iherusalem. **Caph** Depererunt per lacrimas  
oculi mei: conturbata sunt viscera mea.  
Effusum est in terra iecor meum super con-  
tritionem filie populi mei: cum deficeret paru-  
lus et lactes in plateis oppidi. **Lamech**  
Strabus suis dixerunt ubi est triticum et  
uinum: cum deficerent quasi uulnera in  
plateis ciuitatis: cum egalarent animas  
suas in sinu maris suarum. **Mem** Cui  
comparabo te: uel cui assimilabo te fi-  
lia iherusalem? Cui aequabo te: et con-  
solabor te uirgo filia syon? Magna  
enim uelut mare contritio tua. Quis  
medebitur tui? **Rum** Prophete tui ui-  
derunt tibi falsa et stulta: nec aperiebant  
iniquitatem tuam: ut te ad penitentiam  
prouocaret. Viderunt autem tibi assump-  
tiones falsas et risiones. **Samech**  
Plauserunt super te manibus omnes trans-  
euntes per uiam: sibilauerunt et mouerunt ca-  
pita sua super filiam iherusalem: haec enim est uerbo  
dixit pedes decoris: gaudium uniuerse ter-  
re. **Ain** Aperuerunt super te os suum omnes  
inimici tui: sibilauerunt et fremuerunt den-  
tibus suis: et dixerunt deuorabimur. **Ain**  
Ista est dies que respiciet abimur: inue-  
nimus uidimus. **He** Fecit deus que  
cogitauit: compleuit sententiam suam que  
preperat a diebus antiquis. Destruxit et  
non pepercit: laetificauit super te inimicum:  
et exaltauit cornu hostium tuorum. **Sade**  
Clamauit cor eorum ad dominum: super mu-  
ros filie syon. Deduc quasi torrentem  
lacrimas per diem et noctem: non des-  
requie tibi: neque taceat pupilla oculi  
tui. **Coph** Consurge: lauda in nocte  
in principio uigiliarum: effunde sicut  
aquam cor tuum ante conspectum domini.

Teua ad eum manus tuas per animam  
parulorum tuorum: qui fame perierunt in ca-  
pite omnium compitorum. **Res** Uide domine  
et considera: quem uindictam uentis ita.  
Ergo ne comedet mulieres fructum suum:  
parulos ad mensuram palme? Si oc-  
cubatur in laudario domini: sacerdos et  
propheta? **Sen** Haec uentis in terra foris  
puer et senex: uirgines mee et iuuenes  
mei ceciderunt in gladio: interfecisti in die  
furoris tui: percussisti: nec misertus es.  
**Tau** Uocasti quasi diem solemnem  
qui terecerent me de circui: et non fuit  
in die furoris domini qui effugeret et reli-  
queretur. Quos educaui et evertiui: in-  
imicus meus consumpsit eos. **Aleph**  
**E**go uir uidens paupertatem meam: in  
uirga indignationis eius. **Aleph**  
Non minauit et adduxit in tenebris: et  
non in luce. **Aleph** Tancum in me uentis: et  
conuertit manum suam tota die. **Seth**  
Uerulam fecit pelle mea et carne mea:  
contuit ossa mea. **Seth** Edificauit  
in giro meo: et circumdedit me selle et la-  
txe. **Seth** In tenebris collocauit  
me: sicut mortuos sempiternos. **Gymel**  
Circumdificauit aduersum me ut non  
egrediar: aggrauauit compedem meam.  
**Gymel** Sed et clamauero: et cum rogauero:  
excluse orationem meam. **Gymel** Co-  
dulsit uias meas lapidibus quadris:  
semitas meas subuertit. **Deleth** Uelut  
insidiarum factus est michi: leo in abscondito.  
**Deleth** Seruitas meas subuertit: con-  
fecit me: posuit me desolatam. **Deleth**  
Cecidit arcum suum: et posuit me quasi  
signum ad sagittam. **He** Misit in retibus  
meis filias pharaonis sue. **He** Fa-  
ctus sum in decus omnium populo meo: can-  
ticum eorum tota die. **He** Repleuit me a-  
maritudinibus: inebriauit me absin-  
thio. **Uau** Et fecit ad numerum denos

# A Pattern Language

Towns · Buildings · Construction



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

Josef Müller-Brockmann

# Grid systems

in graphic design

A visual communication manual  
for graphic designers,  
typographers and  
three dimensional designers

# Raster systeme

für die  
visuelle Gestaltung

Ein Handbuch für  
Grafiker, Typografen und  
Ausstellungsgestalter

Verlag Gerd Hatje  
Stuttgart

Verlag Arthur Niggli  
CH-9410 Heiden

# NASA Graphics Standards Manual

Richard Danne and Bruce Blackburn

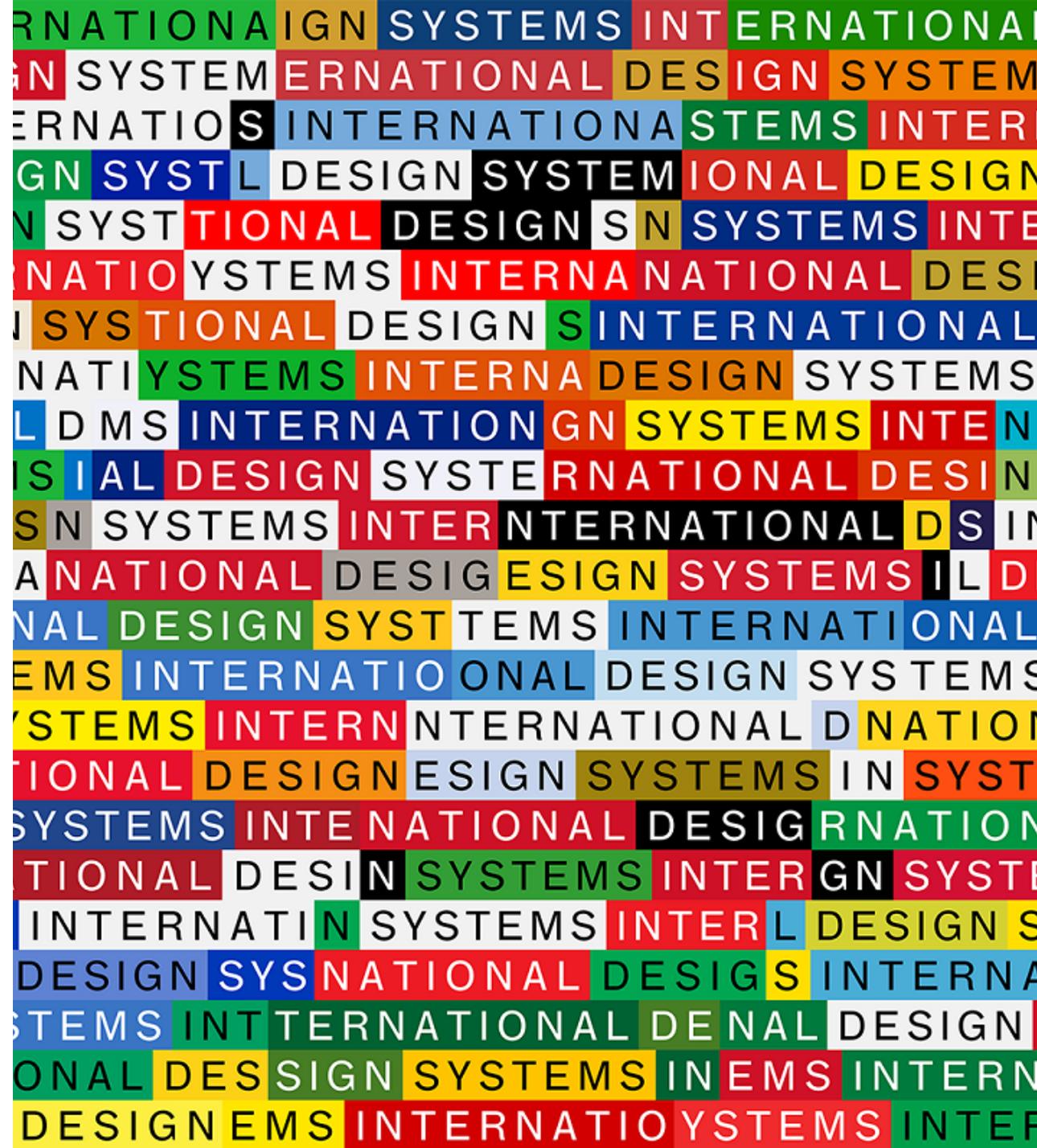
*1976*

[https://www.nasa.gov/wp-content/  
uploads/2015/01/  
nasa\\_graphics\\_manual\\_nhb\\_1430-2  
\\_jan\\_1976.pdf](https://www.nasa.gov/wp-content/uploads/2015/01/nasa_graphics_manual_nhb_1430-2_jan_1976.pdf)



## More

- 1968: NATO Software Engineering Conference - using patterns was first mentioned
- 1980s: Software design patterns
- 1990s: Jennifer Tidwell. "Designing Interfaces"
- 2000s: Yahoo! Design Pattern Library (2006)
- 2010s: Google Material Design (2014)



# The Structure of a Design System

## Building Blocks

Color Palettes

Typographic

Grid Definitions

Icons &

## Pattern Library

Templates

Modules

Components

Elements

## Rules

Design

Implementation Guidelines

Editorial Guidelines

Styleguide

# Why Use a Design System?

- Design (and development) work can be created and replicated quickly and at scale.
- It alleviates strain on design resources to focus on larger, more complex problems.
- It creates a unified language within and between cross-functional teams.
- It creates visual consistency across products, channels, and departments.
- It can serve as an educational tool and reference for junior-level designers and content contributors.

**If you don't have a **Design System** in place, creating consistent user interfaces is very hard, and focusing in-depth on details, will lose time, effort, and of course the consistency of your user interfaces.**

<https://github.com/alamenai/ydkui>

# Definitions

**Design System** – A complete set of design standards, documentation, and principles along with the toolkit (UI patterns and code components) to achieve those standards.

**Pattern Library** – A subclass in the design system, this is the set of design patterns for use across a company.

**Style guide** – Another subclass in the design system, this static documentation describes the design system itself: how products should look and feel, use cases for UI patterns, correct typographic scales, etc.

# Your Design System

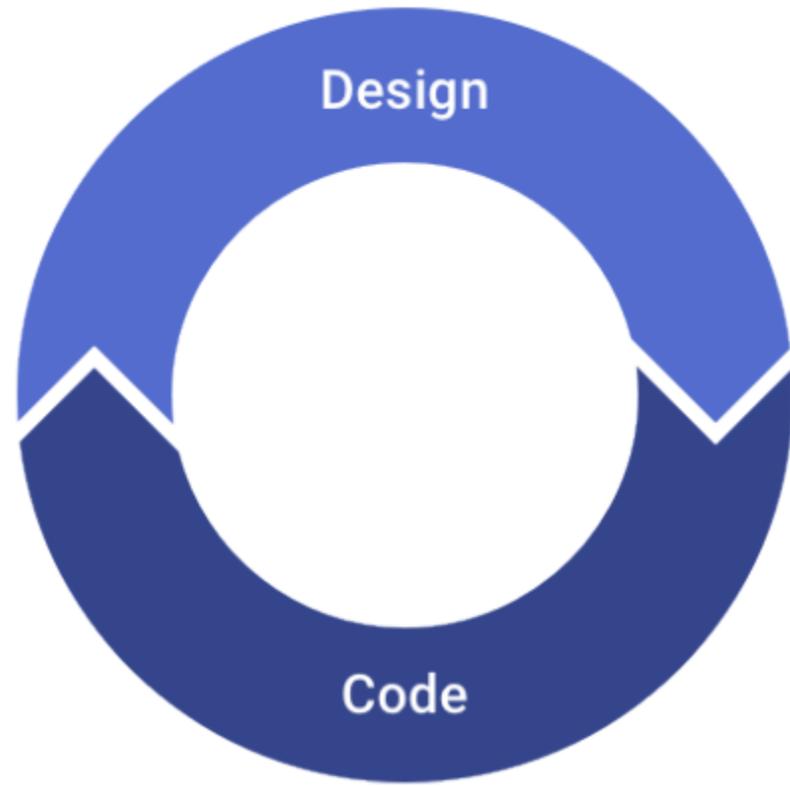
You will want to describe for things like:

- Typography
- Colors
- Margins and paddings
- Box and image styles
- Border styles
- Lists and tables
- Page layouts

etc

<https://medium.com/eightshapes-llc/picking-parts-products-people-a06721e81742>







# Start with a feature, not a layout

When you start the design for a new app idea, what do you design first? If it's the navigation bar at the top of the page, you're making a mistake.

The easiest way to get stuck when working on a new design is to start by trying to “design the app.” When most people think about “designing the app”, they're thinking about the *shell*.

Instead of starting with the *shell*, start with a piece of actual functionality.

# Details Come Later

In the earliest stages of designing a new feature, it's important that you don't get hung up making low-level decisions about things like typefaces, shadows, icons, etc.

That stuff will all matter eventually, but it doesn't matter right now.

Resist the temptation to introduce color right away. By designing in grayscale, you're forced to use spacing, contrast, and size to do all the heavy lifting.

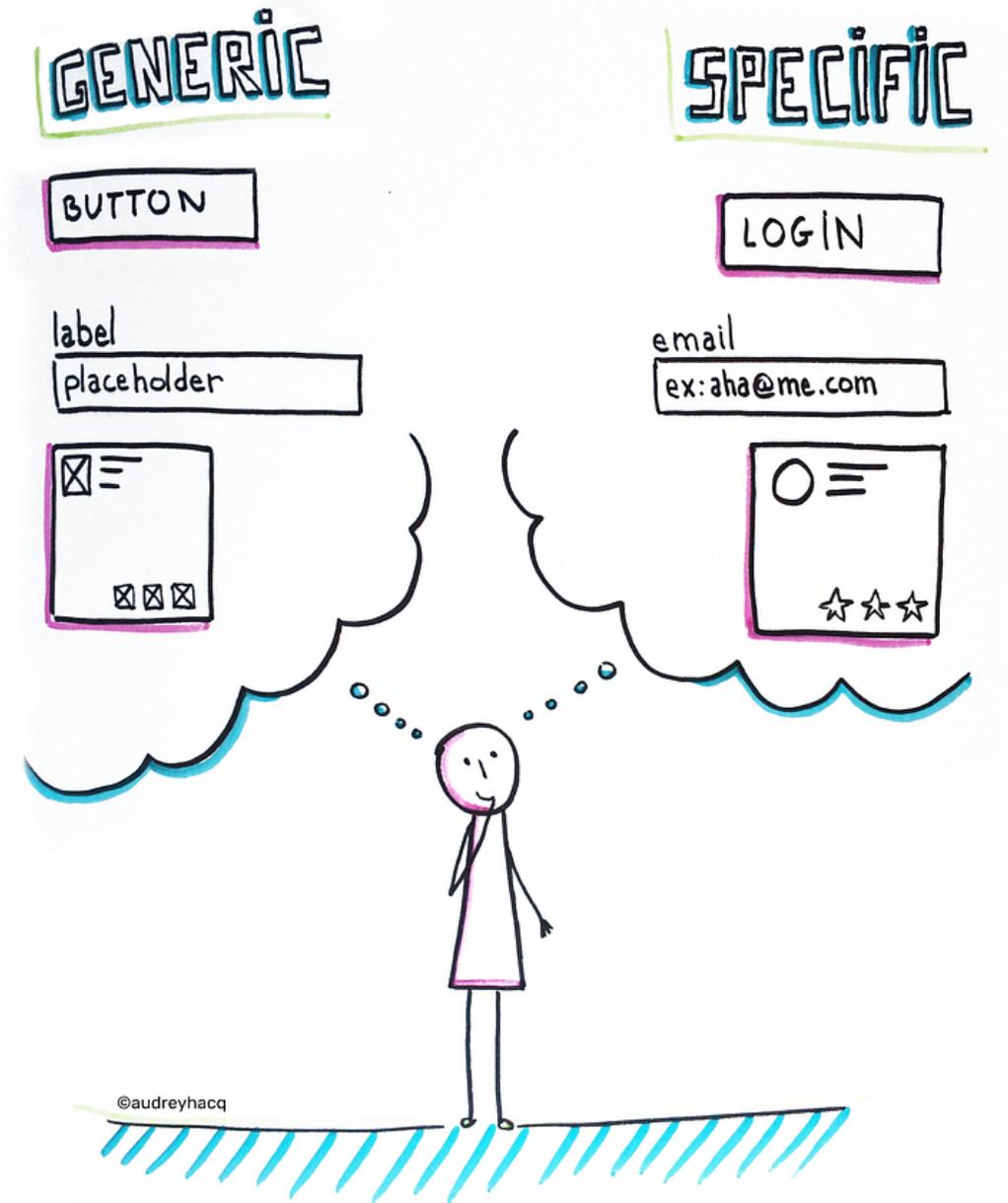




# Think Generic

When we design with atomic, we always have to keep in mind that the same component is going to be declined and reused in very different contexts.

We are thus going to make a real distinction between the structure of an element and its contents.



# Be a pessimist

Do not imply functionality in your designs that you are not ready to build.

When you're designing a new feature, **expect it to be hard to build**. Designing the smallest useful version you can ship reduces that risk considerably.

If part of a feature is a “nice-to-have”, **design it later**. Build the simple version first, and you'll always have something to fall back on.

# Define Choices in Advance

Instead of hand-picking values from a limitless pool any time you need to make a decision - start with a smaller set of options.



# Hierarchy Matters

**Visual hierarchy** refers to how important the elements in an interface appear in relation to one another - it is the most effective tool you have for making something feel *"designed"*.

## Separate visual hierarchy from document hierarchy

Web browsers assign progressively smaller font sizes to heading elements, so an `h1` is large, and an `h6` small. It can encourage bad decisions in application UIs.

Don't let the element you're using influence how you style it — pick elements for semantic purposes and style them however you need for best visual hierarchy.



# Visual Hierarchy



# Semantics is Secondary

When there are multiple actions a user can take on a page, it's easy to fall into the trap of designing those actions based purely on semantics.

- **Primary actions** should be obvious. Solid, high contrast background colors work great.
- **Secondary actions** should be clear but not prominent. Outline styles or lower contrast background colors are great options.
- **Tertiary actions** should be discoverable but unobtrusive. Styling these actions like links is usually the best approach.

PRIMARY

SECONDARY

TERTIARY

Save Draft

Save Draft

[Save Draft](#)

Sign up

Sign up

Sign up

Learn More

Learn More

Learn More

PRIMARY

SECONDARY

TERTIARY

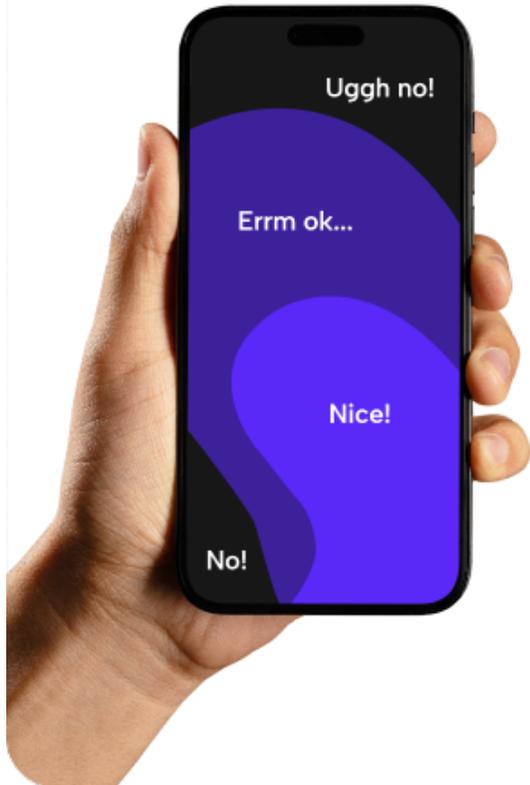
Unpublish

Unpublish

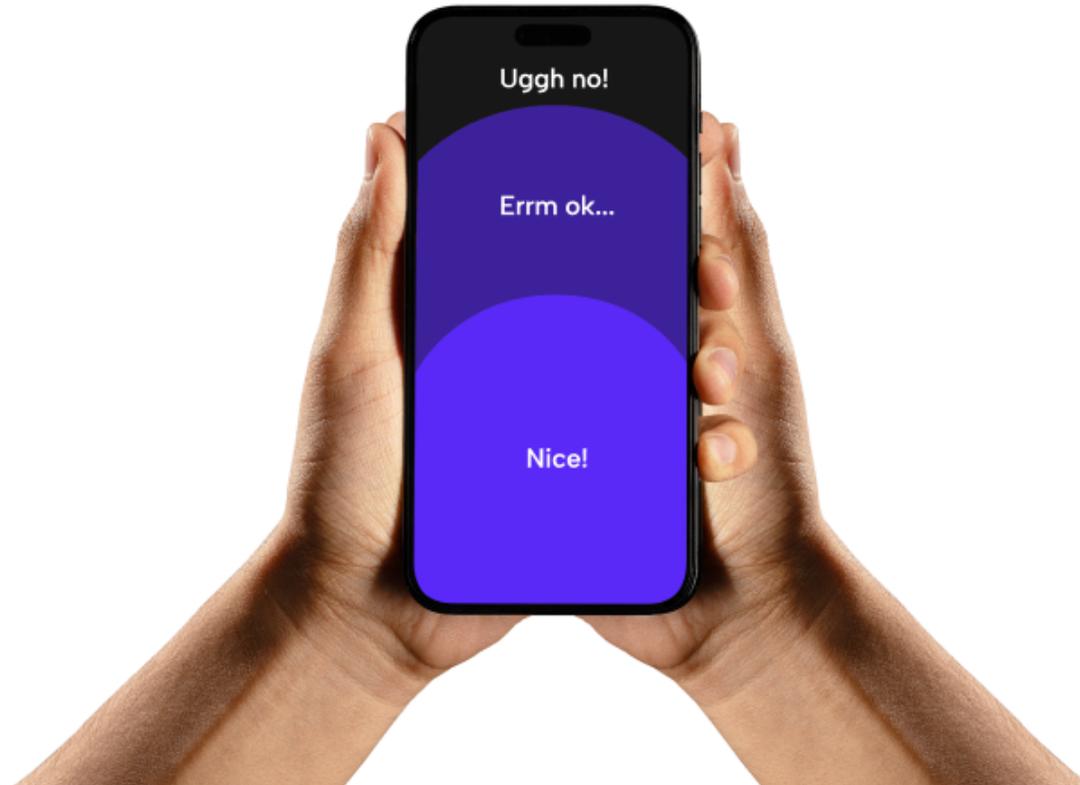
Unpublish

# But also reachability matters ...

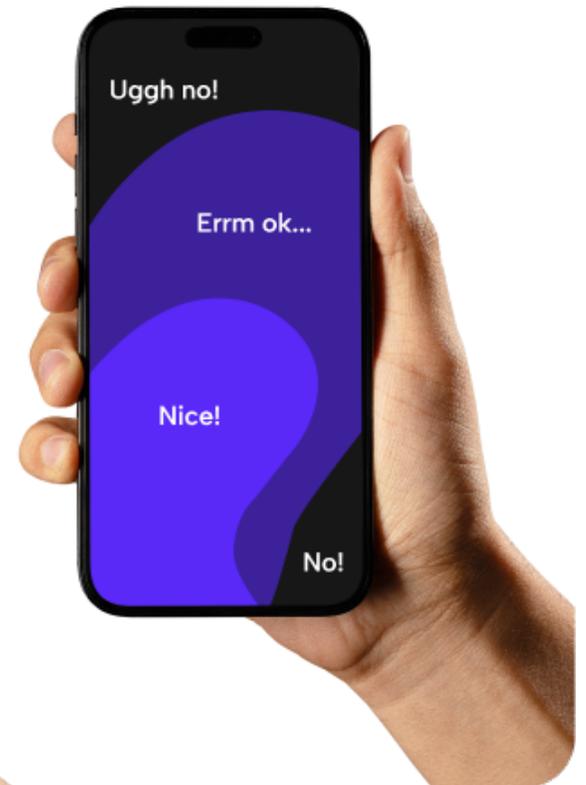
Left thumb



Both thumbs



Right thumb

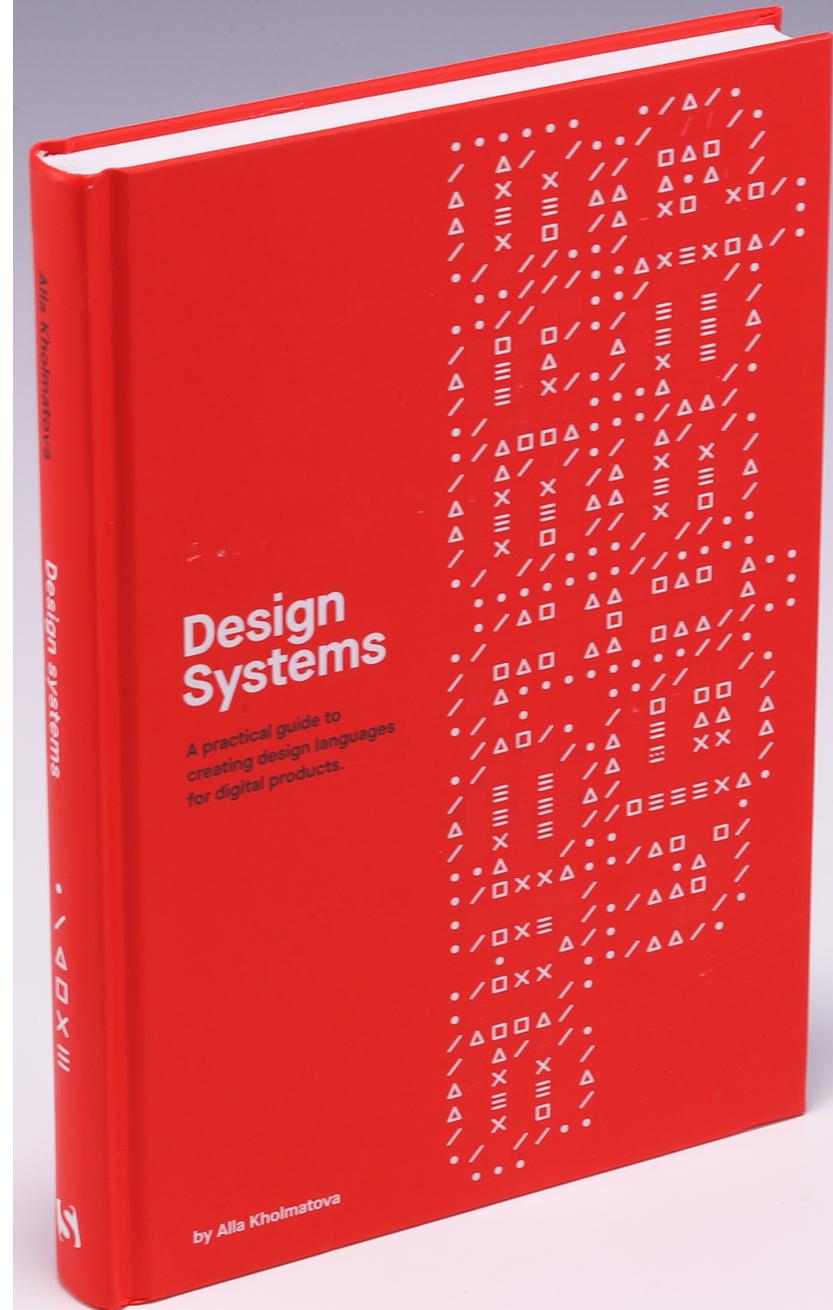


# Examples of Design Systems

- Google Material Design System. <https://material.io/>
- Apple Human Interface Guidelines. <https://developer.apple.com/design/>
- Uber Base Web. <https://baseweb.design/>
- Taltech. <https://taltech.ee/brand>
- Tartu Ülikool. <https://ut-stiiliraamat.voog.com/>
- UK Government Design System. <https://design-system.service.gov.uk/>
- Design Systems in Finland. <https://github.com/viljamis/design-systems-in-finland>

# Useful Ebooks

- Designing Interfaces. *Jennifer Tidwell*. 2010. [https://github.com/ivanarandac/Books/blob/master/Designing Interfaces 2nd ed.pdf](https://github.com/ivanarandac/Books/blob/master/Designing%20Interfaces%202nd%20ed.pdf)Livro-Designing-Interfaces-2nd-Edition-2010.pdf
- Design Systems. *Alla Kholmatova*. 2017. <https://www.smashingmagazine.com/provide/eBooks/design-systems.pdf>
- Programming Design Systems. Rune Madsen. 2020. <https://programmingdesignsystems.com/>



# Links

- Why you should think in a feature, not a layout when you create UI? <https://dev.to/menaiala/think-a-feature-not-a-layout-32ke>
- Everything you need to know about Design Systems. <https://uxdesign.cc/everything-you-need-to-know-about-design-systems-54b109851969#>
- A Brief Guide to Creating a UI Style Guide. <https://xd.adobe.com/ideas/process/ui-design/ui-style-guide-template/>
- 10 great design systems and how to learn (and steal) from them
- Video: The trick to AI prototyping with your design system. <https://www.youtube.com/watch?v=CqMZTg7L-wE>

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**Thank you!**