Using Design Tokens to up your Accessibility Game

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Meet Karen Hawkins

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Level Access

Connect with me

Email

LinkedIn

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Deck on notist

https://noti.st/khawk27

Today's Goals

1. Learn what types of design token decisions affect the accessibility of UI (User Interface) elements.

2. Learn how to use design tokens to improve the accessibility of UI elements.

3. Understand the importance of using design tokens to ensure a consistent experience across a wide set of UI elements.

Little Ditty about Design and Designs Systems

A **design system** is a complete set of standards intended to manage design at scale using reusable components and patterns.

Nielsen Norman Group

A **design system** is a complete set of standards intended to manage design at scale using reusable components and patterns.
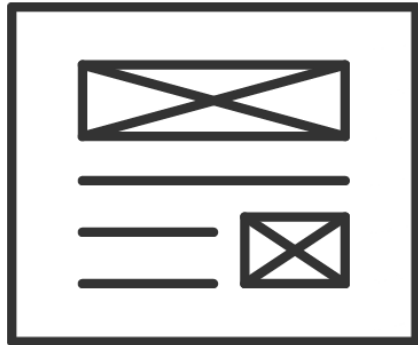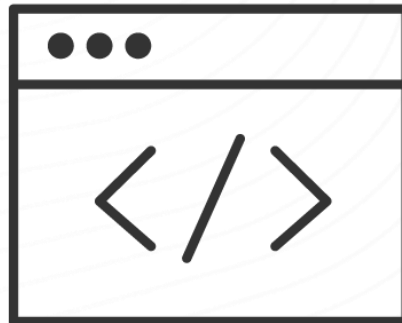
Nielsen Norman Group

Consistency Efficiency Scale

Design System Composition

A design system is comprised of reusable design elements, reusable coded elements, and their documentation.
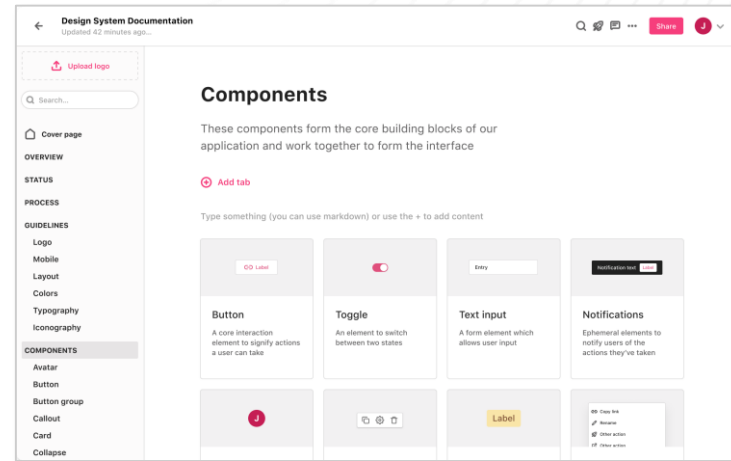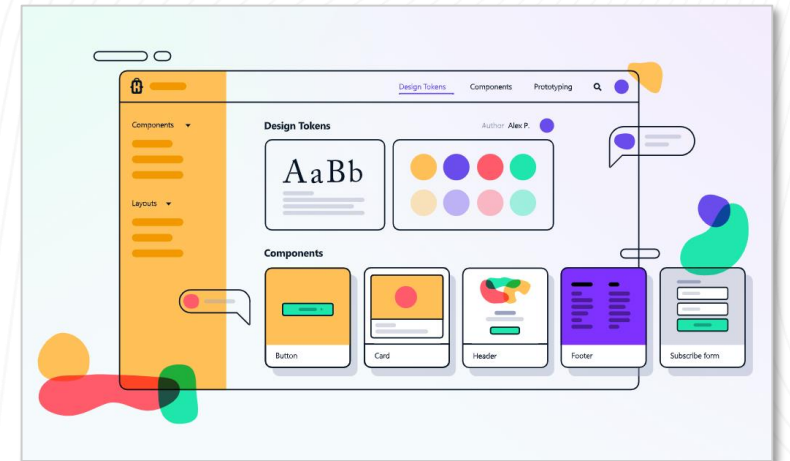
Design + **Code** + **Documentation**

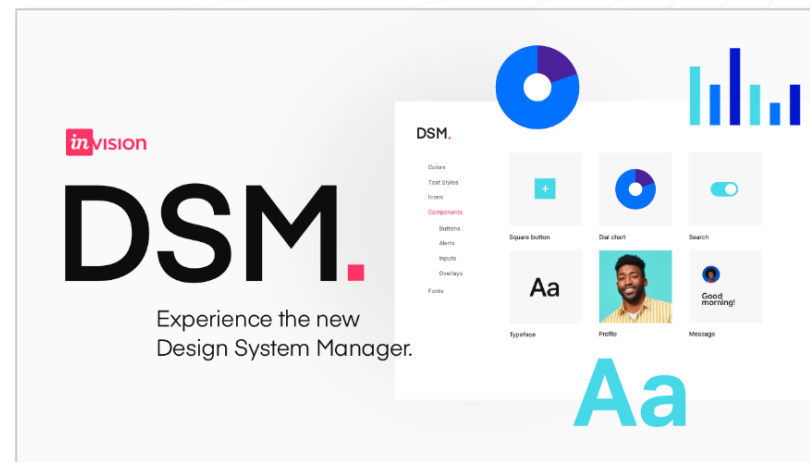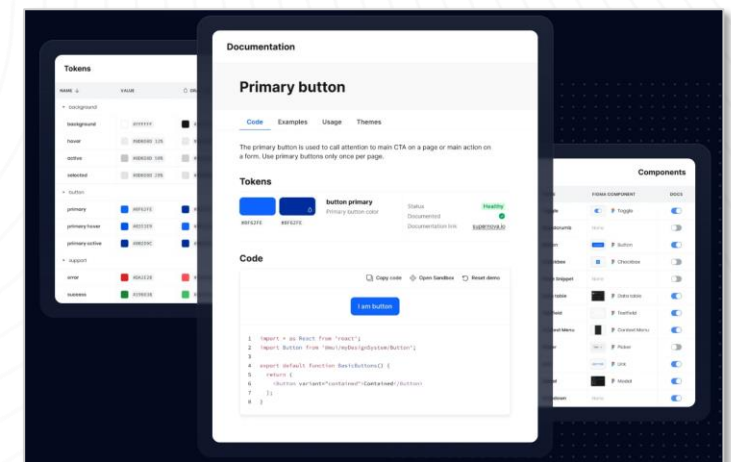# Popular Design System Programs

Zeroheight

Knapsack

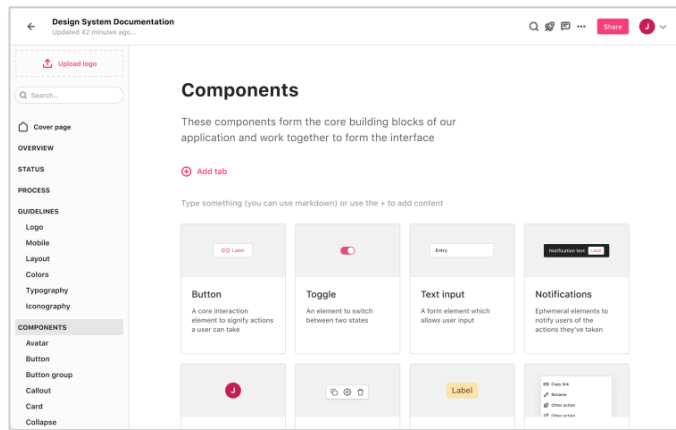## InVision DSM

Supernova

Design Systems are Ecosystems of Design and Development Artifacts

Figma Assets

Design System Program
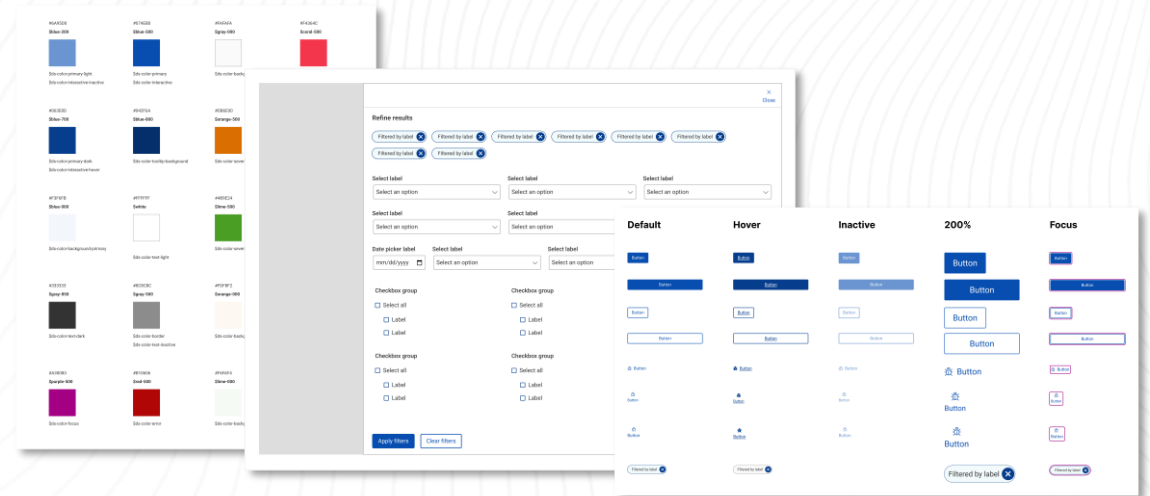
Storybook Assets

Style Guide Examples

Component Library Examples

This link is an [inline link](#) in the middle of some text.

Button

Button

🐞 Button

Checkbox group *

Instructions

- ☐ Select all
- ☐ Label
- ☑ Selected label
- ☐ Label
- ☑ Selected label
- ☐ Label
- ☑ Selected label
- ☐ Label
- ☑ Selected label

Radio button group *

Instructions

- ○ Label
- ◉ Selected label
- ○ Label
- ◉ Selected label
- ◉ Selected label
- ○ Label

Select label *

Instructions

| Select an option | ⌄ |

Label *

Instructions   0/###

| Text |

Pattern Library Examples

Atomic Design

Atomic design is a methodology for creating design systems. It is a framework to break interfaces down into fundamental reusable building blocks and build them back up in potentially infinite variations.

Atoms → **Molecules** → **Organisms** → **Templates** → **Pages**

Concept reference: Brad Frost
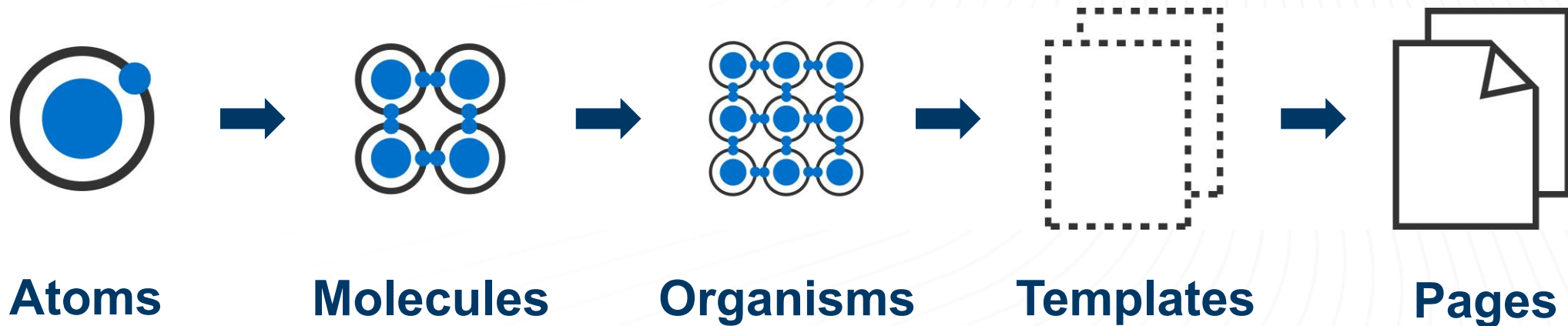
Atomic Design Example

Atoms

Postal Code

○

Select an option

Radio Buttons Group Label

⌄

Molecules

Postal Code

Dropdown Label

Select an option ⌄

○ First choice

Organism

First Name

Last Name

City

Select an option ⌄

Email Address

Phone Number

How would you like to be contacted?

○ Email

○ Phone

Atomic Breakdown of a Button

Atoms

Button

Molecule

Button

Atomic Breakdown of a Button: Further Analysis

Atoms

Properties

Molecule

Button

Font Type

Font Size

Text Color

Padding

Border Color

Border Size

Border Corners

Button Fill

Button
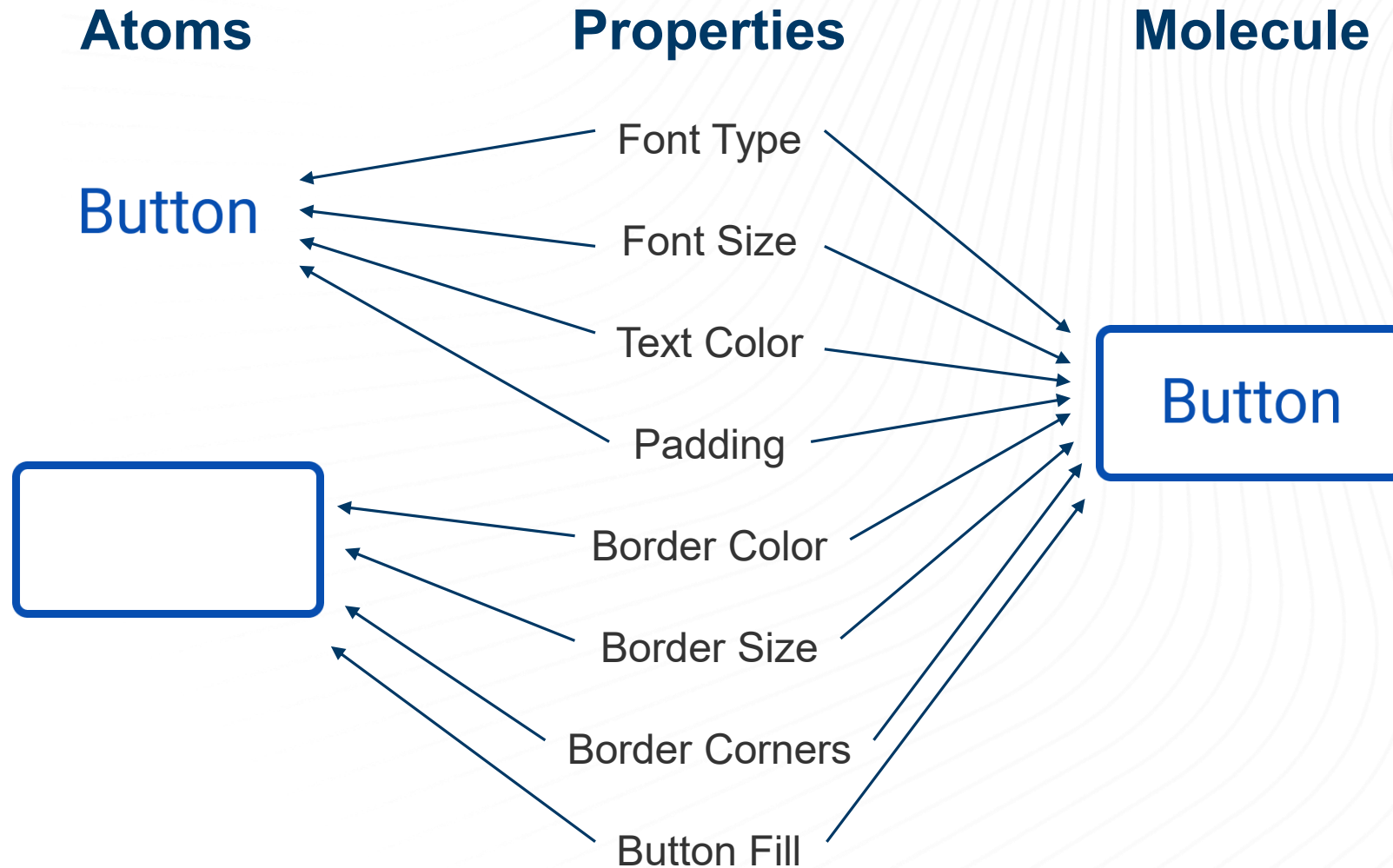
Subatomic Design

Design tokens are small, repeatable design decisions, that store a design system's visual attributes. They ensure the same style values are used across design files and code.
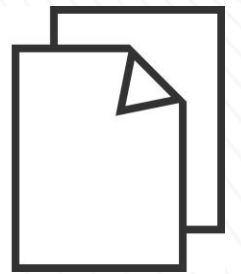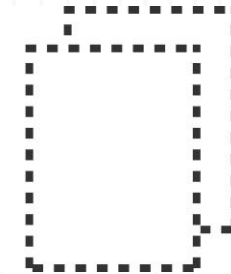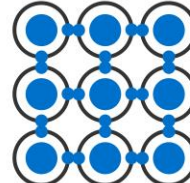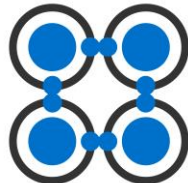
Subatomic Particles → **Atoms** → **Molecules** → **Organisms** → **Templates** → **Pages**

Subatomic Breakdown of a Button

Atoms

Button

Properties / Design Tokens

Font Type: body-copy-semi-bold

Font Size: body-copy-semi-bold

Text Color: interactive

Padding: spacing-10

Border Color: interactive

Border Size: border-2

Border Corners: border-radius-2

Button Fill: color-background-light

Molecule

Button
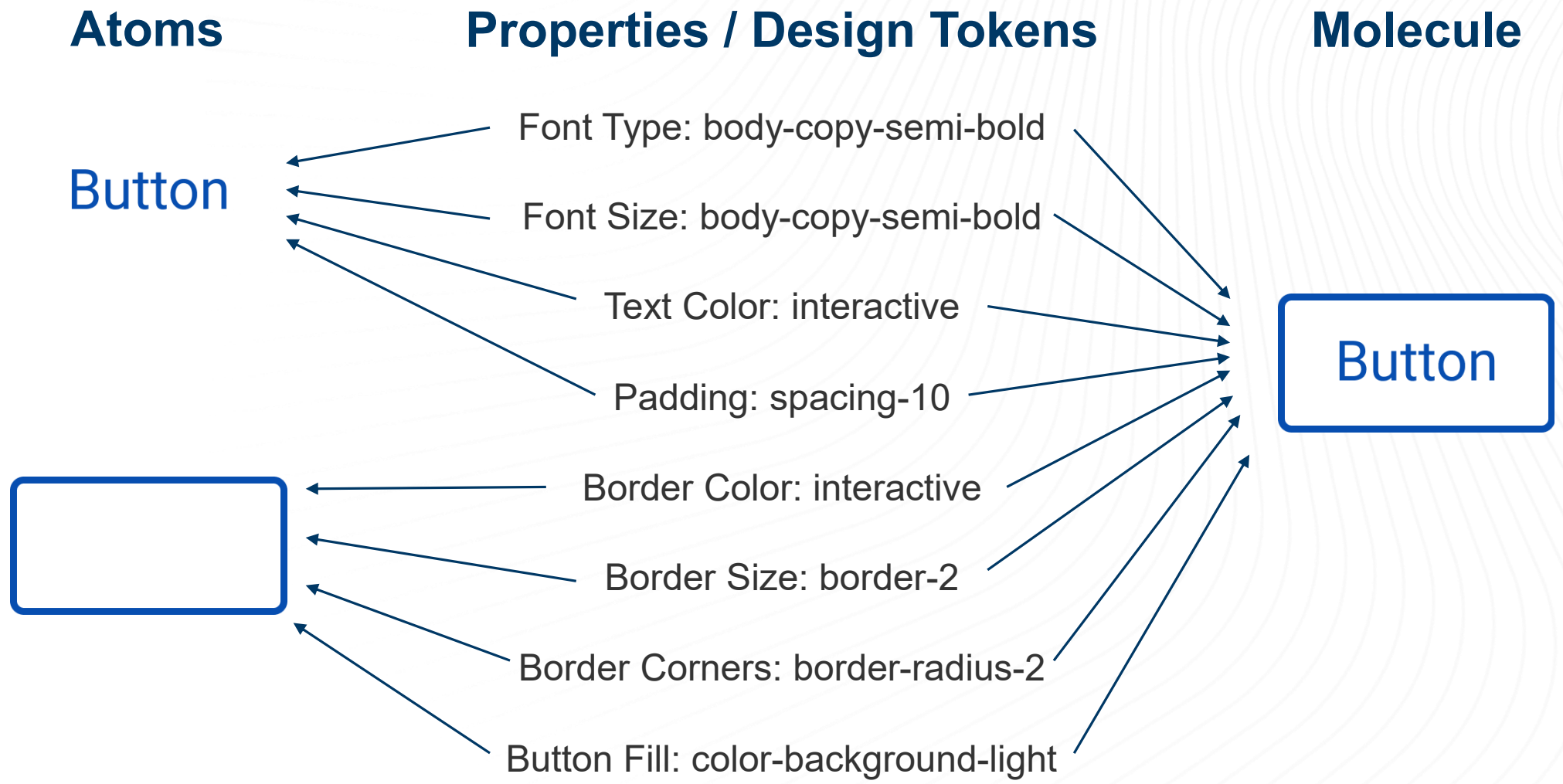
Design Systems Tend to be Incomplete

Molecular Variations and States

Molecule

Postal Code

Default / Unpopulated
Postal Code

Focused / Typing
Postal Code

A1A |

Optional Field
Postal Code (Optional)

A1A 2B2

Focused / Typing / Formatted
Phone Number

(55|_)-___-____

Instructional Text / Unpopulated
Date
DD / MM / YYY

Error
Postal Code

A1A

⊘ Postal code is too short

Design Tokens Fill Some of the Gap

Design Tokens

Molecular States

Molecule

Border Color: color-text-dark

Border Size: border-1

Postal Code

Focused / Typing
Postal Code
A1A|

Border Color: color-focus

Border Size: border-3

Focused / Typing / Formatted
Phone Number
(55|)-___-____

Border Color: color-error

Border Size: border-3

Error
Postal Code
A1A
❗ Postal code is too short
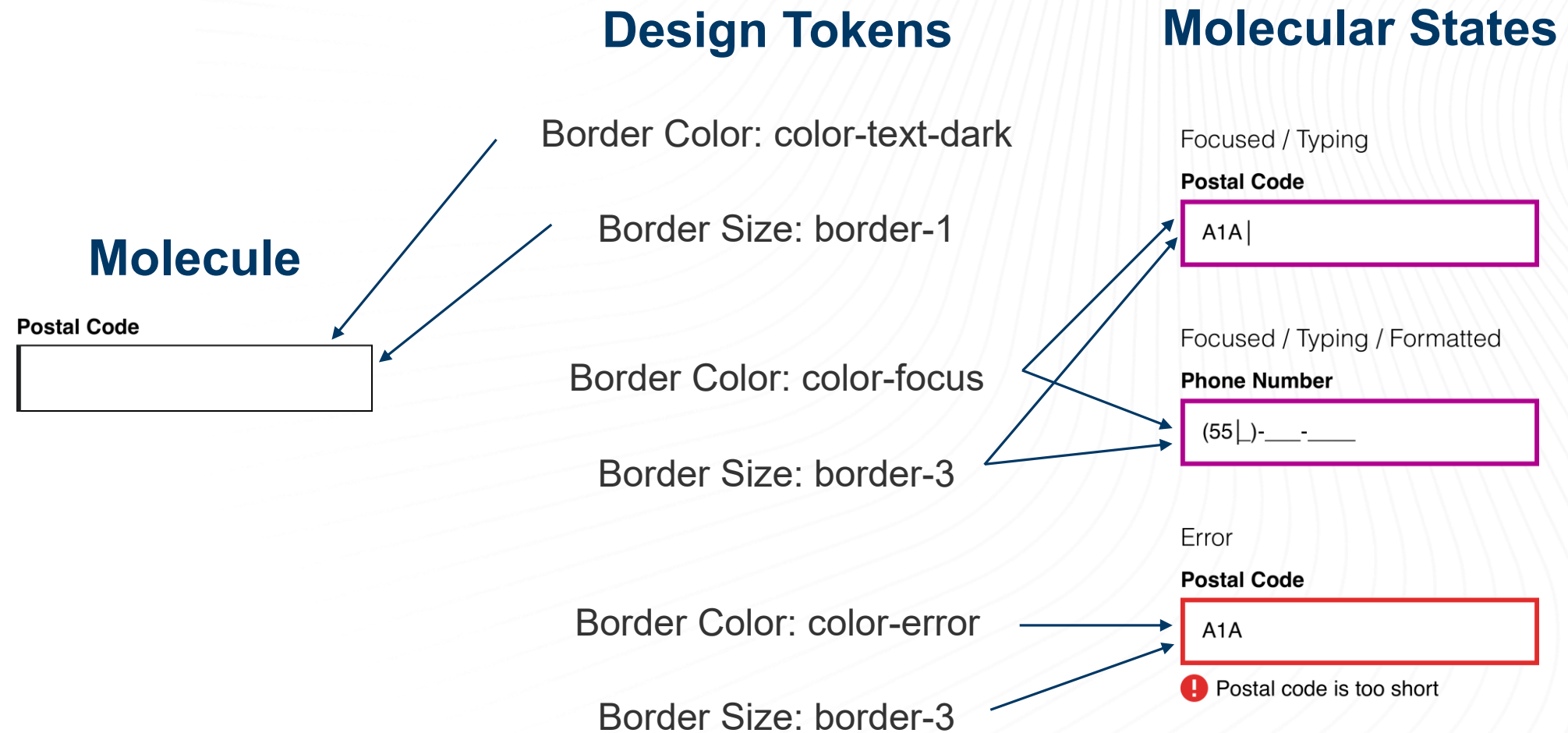
Remaining Gaps are Filled with Other Aspects of Design and Documentation

Molecule

Postal Code

Other Elements

Molecular States

Focused / Typing

Postal Code

A1A|

Focused / Typing / Formatted

Phone Number

(55|)-___-____

Error

Postal Code

A1A

Error message with icon ⟶ ❗ Postal code is too short

Style Guides Map to Atoms and Subatomic Particles

Focus on design tokens

Components Map to Molecules

Focus on foundational aspects:
- States
- Variations
- Keyboard interactions
- Screen reader experiences
- Etc.

This link is an inline link in the middle of some text.

Button

Button

🐞 Button

Checkbox group *

Instructions

- ☐ Select all
- ☐ Label
- ☑ Selected label
- ☐ Label
- ☑ Selected label
- ☐ Label
- ☑ Selected label
- ☐ Label
- ☑ Selected label

Radio button group *

Instructions

- ◯ Label
- ⦿ Selected label
- ◯ Label
- ⦿ Selected label
- ⦿ Selected label
- ◯ Label

Select label *

Instructions

Select an option	⌄

Label *

Instructions   0/###

Text
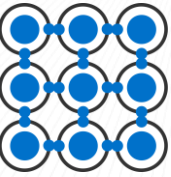
Patterns Map to Organisms

Focus on higher order thinking:
- Reading order
- Landmarks
- Skip links
- Interdependencies between multiple components
- Etc.

Questions?
Comments?

Design Tokens in Style Guides

Colours

Colours

#6A95D0	#074EB0	#FAFAFA	#F4364C
$blue-200	**$blue-500**	**$gray-000**	**$coral-500**
$ds-color-primary-light	$ds-color-primary	$ds-color-background-alt	$ds-color-severity-critical
$ds-color-interactive-inactive	$ds-color-interactive		

#063E8D	#042F6A	#DB6E00	#0098C7
$blue-700	**$blue-800**	**$orange-500**	**$teal-500**
$ds-color-primary-dark	$ds-color-tooltip-background	$ds-color-severity-medium	$ds-color-info
$ds-color-interactive-hover			

#F3F6FB	#FFFFFF	#4B9E24	#FEF5F6
$blue-000	**$white**	**$lime-500**	**$coral-000**
$ds-color-background-primary		$ds-color-severity-low	$ds-color-background-danger
	$ds-color-text-light		

#333333	#8C8C8C	#FDF8F2	#F2FAFC
$gray-850	**$gray-500**	**$orange-000**	**$teal-000**
$ds-color-text-dark	$ds-color-border	$ds-color-background-warning	$ds-color-background-info
	$ds-color-text-inactive		

#A30083	#B10606	#F6FAF4
$purple-500	**$red-500**	**$lime-000**
$ds-color-focus	$ds-color-error	$ds-color-background-success

Grid

Large Grid

Token name	Max width	Min width
$ds-grid-large	1440	992

Medium Grid

Token name	Max width	Min width
$ds-grid-medium	991	576

Small Grid

Token name	Max width	Min width
$ds-grid-small	575	320
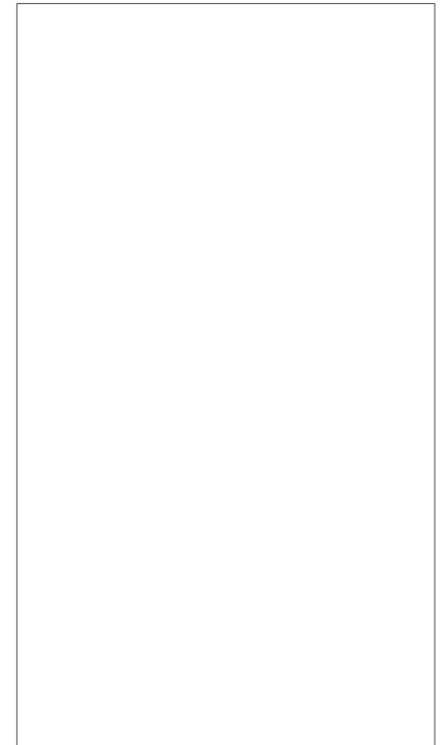
Typography

Headings

Characteristics	Breakpoint	Visual
ds-heading-100 Font: Rubik Weight: semi bold (600) Size: 28 px (1.75 REM) Line height: 42 px (~2.625 REM)	Desktop and tablet	**Lorem ipsum dolor si** consectetur adipisci morbi magna ornare dictum sit.
ds-heading-100 Font: Rubik Weight: semi bold (600) Size: 24 px (1.5 REM) Line height: 36 px (2.25 REM)	Mobile	**Lorem ipsum dolor sit an** adipiscing elit. Quam am ornare nunc netus dictu
ds-heading-200 Font: Roboto Weight: semi bold (600) Size: 24 px (1.5 REM) Line height: 36 px (2.25 REM)	Desktop and tablet	Lorem ipsum dolor sit ame adipiscing elit. Quam ame nunc netus dictum sit.
ds-heading-200 Font: Roboto Weight: semi bold (600) Size: 22 px (1.375 REM) Line height: 33 px (~2.100 REM)	Mobile	Lorem ipsum dolor sit amet, elit. Quam amet morbi magna dictum sit.
ds-heading-300 Font: Roboto Weight: semi bold (600) Size: 20 px (1.25 REM) Line height: 30 px (1.875 REM)	Desktop, tablet, and mobile	Lorem ipsum dolor sit amet, co Quam amet morbi magna ornar
ds-heading-400 Font: Roboto Weight: semi bold (600) Size: 18 px (1.125 REM) Line height: 27 px (~1.690 REM)	Desktop, tablet, and mobile	Lorem ipsum dolor sit amet, conse amet morbi magna ornare nunc ne
ds-heading-500 Font: Roboto Weight: semi bold (600) Size: 16 px (1 REM) Line height: 24 px (1.5 REM)	Desktop, tablet, and mobile	Lorem ipsum dolor sit amet, consectet magna ornare nunc netus dictum sit.
ds-heading-600 Font: Roboto Weight: medium (500) Size: 16 px (1 REM) Line height: 24 px (1.5 REM)	Desktop, tablet, and mobile	Lorem ipsum dolor sit amet, consectetur adipiscing elit. Quam amet morbi magna ornare nunc netus dictum sit.

Body copy

Characteristics	Breakpoint	Visual
ds-body-copy Font: Roboto Weight: regular (400) Size: 16 px (1 REM) Line height: 24 px (1.5 REM)	Desktop, tablet, and mobile	Lorem ipsum dolor sit amet, consectetur adipiscing elit. Quam amet morbi magna ornare nunc netus dictum sit.
ds-body-copy-highlight Font: Roboto Weight: medium (500) Size: 16 px (1 REM) Line height: 24 px (1.5 REM)	Desktop, tablet, and mobile	Lorem ipsum dolor sit amet, consectetur adipiscing elit. Quam amet morbi magna ornare nunc netus dictum sit.
ds-body-copy-semi-bold Font: Roboto Weight: semibold (600) Size: 16 px (1 REM) Line height: 24 px (1.5 REM)	Desktop, tablet, and mobile	Lorem ipsum dolor sit amet, consectetur adipiscing elit. Quam amet morbi magna ornare nunc netus dictum sit.
ds-small-copy Font: Roboto Weight: regular (400) Size: 14 px (0.875 REM) Line height: 21 px (~1.315 REM)	Desktop, tablet, and mobile	Lorem ipsum dolor sit amet, consectetur adipiscing elit. Quam amet morbi magna ornare nunc netus dictum sit.
ds-body-copy-200% Font: Roboto Weight: regular (400) Size: 32 px (2 REM) Line height: 48 px (3 REM)		Lorem ipsum dolor sit amet, consectetur adipiscing elit. Quam amet morbi magna ornare nunc netus dictum sit.
ds-small-copy-200% Font: Roboto Weight: regular (400) Size: 28 px (1.75 REM) Line height: 42 px (2.625 REM)		Lorem ipsum dolor sit amet, consectetur adipiscing elit. Quam amet morbi magna ornare nunc netus dictum sit.

30

Spacing

Spacing

Token name	Pixel value	REM value	Image
$ds-spacing-00	0 px	0 REM	
$ds-spacing-02	1 px	0.0625 REM	.
$ds-spacing-05	2 px	0.125 REM	.
$ds-spacing-10	4 px	0.25 REM	.
$ds-spacing-20	8 px	0.5 REM	▪
$ds-spacing-30	16 px	1 REM	■
$ds-spacing-40	24 px	1.5 REM	■
$ds-spacing-50	32 px	2 REM	■
$ds-spacing-60	40 px	2.5 REM	■
$ds-spacing-70	48 px	3 REM	■
$ds-spacing-90	64px	4 REM	■

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Border Thickness

Border Thickness

Token name	Pixel value	REM value	Image
$ds-border-1	1 px	0.0625 REM	
$ds-border-2	2 px	0.1250 REM	
$ds-border-3	3 px	0.1875 REM	
$ds-border-4	4 px	0.25 REM	
$ds-border-8	8 px	0.5 REM	

Border Radius

Border Radius

Token name	Pixel value	REM value	Image
$ds-border-radius-0	0 px	0 REM	
$ds-border-radius-1	2 px	0.125 REM	
$ds-border-radius-2	4 px	0.25 REM	

Shadow

Shadow

Token name	Color	X	Y	Blur	Spread	Image
$ds-shadow-01	$ds-color-border 50%	0	2	4	0	
$ds-shadow-02	$ds-color-border 50%	1	1	4	0	
$ds-shadow-03	$ds-color-border 50%	-2	0	4	0	
$ds-shadow-04	$ds-color-border 50%	0	-2	4	0	

34

Grid Accessibility

1.4.10: Reflow

- 400% zoom: 1280 / 4 = 320

- Mobile designs are on a 320px viewport for vertically scrolling content

  - Or 1024 / 4 = 256 for horizontally scrolling content

- Benefits:

  - Ensures a design for 1 column of content

  - Enforces designing responsively / for mobile (**1.3.4 Orientation**)
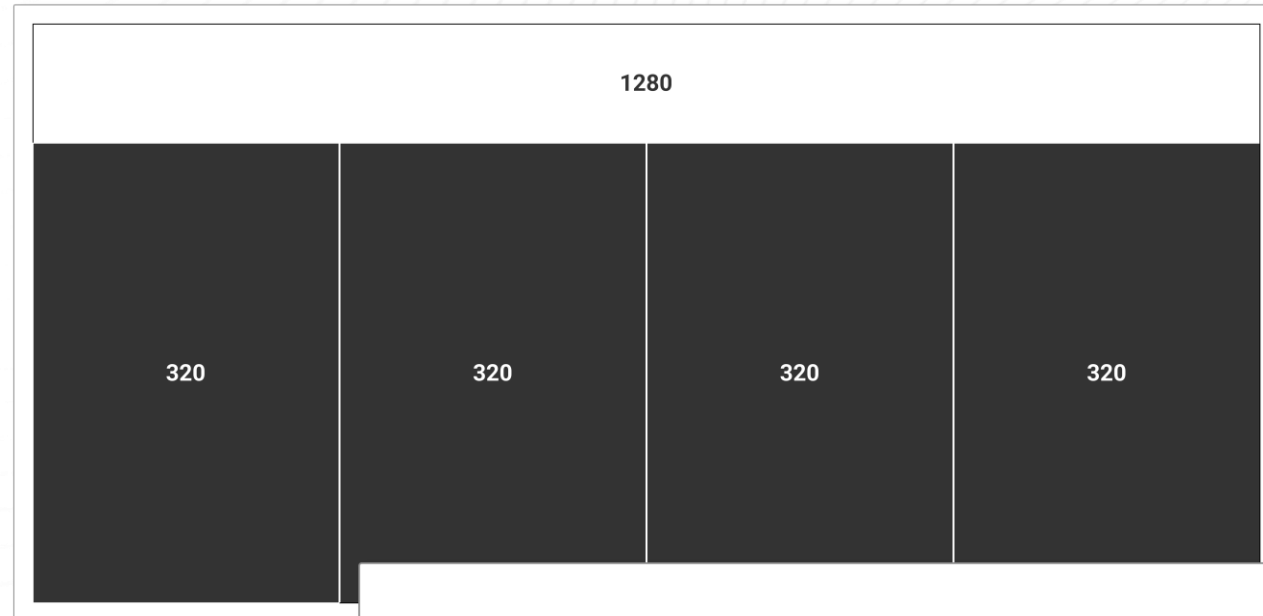
Grid size	Token name	Min width	Max width
Small	$ds-grid-small	320	575
Medium	$ds-grid-medium	576	991
Large	$ds-grid-large	992	1440

Typography Accessibility

Best Practices

- Font type: Selected for perceived readability

- Min font size: 12pt / 16px / 1 REM

- Body copy font weight: Regular / 400

- Body copy line height: 1.5X font size

- Heading font weight: Semi-bold / 600

1.4.4 Resize Text

- 200% font size: 24pt / 32px / 2 REM

- 200% line height: 3X font size

Characteristics	Breakpoint	Visual
ds-body-copy Font: Roboto Weight: regular (400) Size: 16 px (1 REM) Line height: 24 px (1.5 REM)	Desktop, tablet, and mobile	Lorem ipsum dolor sit amet, consectetur adipiscing elit. Quam amet morbi magna ornare nunc netus dictum sit.
ds-body-copy-200% Font: Roboto Weight: regular (400) Size: 32 px (2 REM) Line height: 48 px (3 REM)	Desktop, tablet, and mobile	Lorem ipsum dolor sit amet, consectetur adipiscing elit. Quam amet morbi magna ornare nunc netus dictum sit.
ds-heading-500 Font: Roboto Weight: semi bold (600) Size: 16 px (1 REM) Line height: 24 px (1.5 REM)	Desktop, tablet, and mobile	Lorem ipsum dolor sit amet, consectetur adipiscing elit. Quam amet morbi magna ornare nunc netus dictum sit.

Spacing Accessibility

2.5.8 Target Size (Minimum)

- Minimum target size for icons:
  24px X 24px
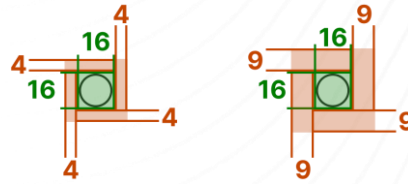
Best Practices

- Aiming for 44px X 44px (**2.5.5 Target Size**)

- Considerations for contextual spacing requirements for improved operability and readability
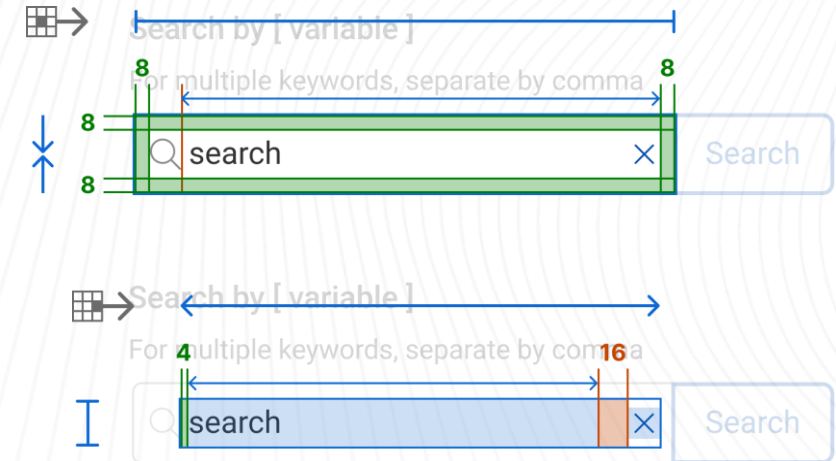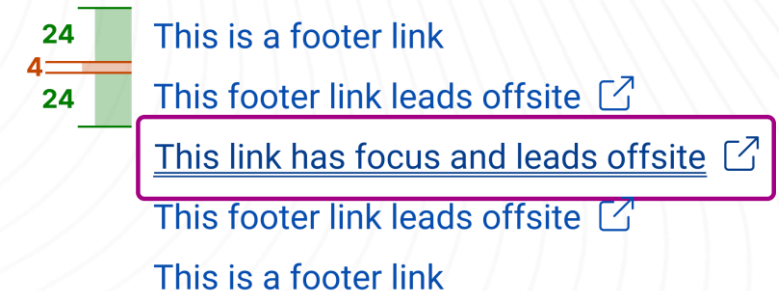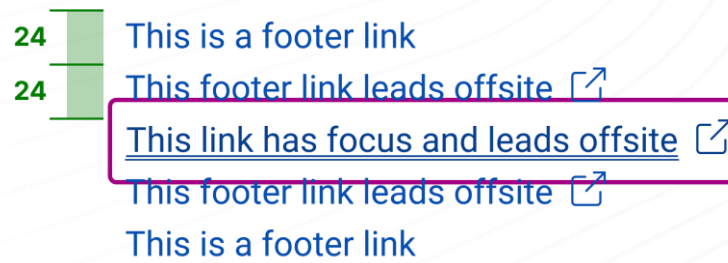
Best Practices

- Documented colour pairs that meet minimum standards with guidelines for usage

- No placeholder text (**1.4.3 Minimum Contrast, 3.3.2. Labels or Instructions**)

- No images of text (**1.4.3 Minimum Contrast**)

#074EB0   #0098C7

Normal Text

This is what 14pt normal text looks like.

WCAG AA: ⊗   WCAG AAA: ⊗

Large Text

This is what 18pt large text looks like.

WCAG AA: ⊗   WCAG AAA: ⊗

Graphical Objects and User Interface Components

WCAG AA: ⊗

#074EB0   #83A5D8

Normal Text

This is what 14pt normal text looks like.

WCAG AA: ⊗   WCAG AAA: ⊗

Large Text

This is what 18pt large text looks like.

WCAG AA: ✓   WCAG AAA: ⊗

Graphical Objects and User Interface Components

WCAG AA: ✓

#074EB0   #FFFFFF

Normal Text

This is what 14pt normal text looks like.

WCAG AA: ✓   WCAG AAA: ✓

Large Text

This is what 18pt large text looks like.

WCAG AA: ✓   WCAG AAA: ✓

Graphical Objects and User Interface Components

WCAG AA: ✓

1.4.1 Use of Colour

- Not using colour alone to indicate meaning, information, etc.
  - Particular attention to state design and chart design
- Inline links underlined by default
- Using at least 1 dimension to convey meaning, with or without the addition of colour

1.3.3 Sensory Characteristics

- Not using colour alone to indicate meaning, information, etc. in instructions

Contrast

- Aiming for greater than 7:1 contrast for text (**1.4.6 Contrast Enhanced**)
- Aiming for greater than 4.5:1 contrast for graphical objects and user interface components (**1.4.11 Non-Text Contrast**)
- Aiming for greater than 3:1 contrast for inactive elements (**1.4.3 Minimum Contrast**)

Sidebar: Dual Modality Design

Colour

Read means stop.

Yellow means slow down.

Green means go.
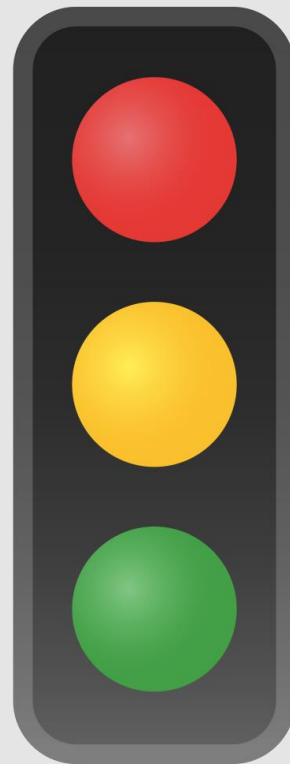
Position

Top means stop.

Middle means slow down.

Bottom means go.

Focus Indicator Accessibility

Best Practices

- Focus indicator is always situated outside an element

- Focus indicator is made of 3 rings which meets contrast requirements between the rings (white, medium pink, white)
    - Each ring is 2px thick (**2.4.13 Focus Appearance**)

- Contrast is guaranteed with any adjacent colour in our design system
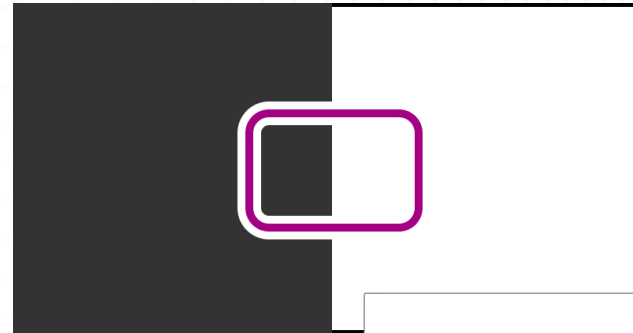
Anatomy		Usage	
Outline name	**Token names**	**Token name**	**Usage**
Inner outline	$white outline-M border-radius-M	spacing-S	Around text
		spacing-00	Around boxes
Middle outline	$focus outline-M border-radius-M	spacing-M	Around icons
Outer outline	$white outline-M border-radius-M		

Questions?
Comments?

SECTION 3

Design Tokens in Component Libraries
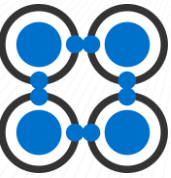
Components Map to Molecules

Design tokens help with:
- State design
- Variation design

This link is an inline link in the middle of some text.

Button

Button

🐞 Button

Checkbox group *

Instructions

☐ Select all

☐ Label

☑ Selected label

☐ Label

☑ Selected label

☐ Label

☑ Selected label

☐ Label

☑ Selected label

Radio button group *

Instructions

◯ Label

◉ Selected label

◯ Label

◉ Selected label

◉ Selected label

◯ Label

Select label *

Instructions

| Select an option | ⌄ |

Label *

Instructions   0/###

Text

Primary Button Design Token Example

Font Type: body-copy-semi-bold

Font Size: body-copy-semi-bold

Text Color: color-text-light

Padding: spacing-10

Border Color: interactive

Border Size: border-2

Border Corners: border-radius-2

Button Fill: color-background-interactive

Button

Primary Button Design Token Example

Font Type: body-copy-semi-bold

Font Size: body-copy-semi-bold

Text Color: color-text-light

Padding: spacing-10

Border Color: interactive

Border Size: border-2

Border Corners: border-radius-2

Button Fill: color-background-interactive
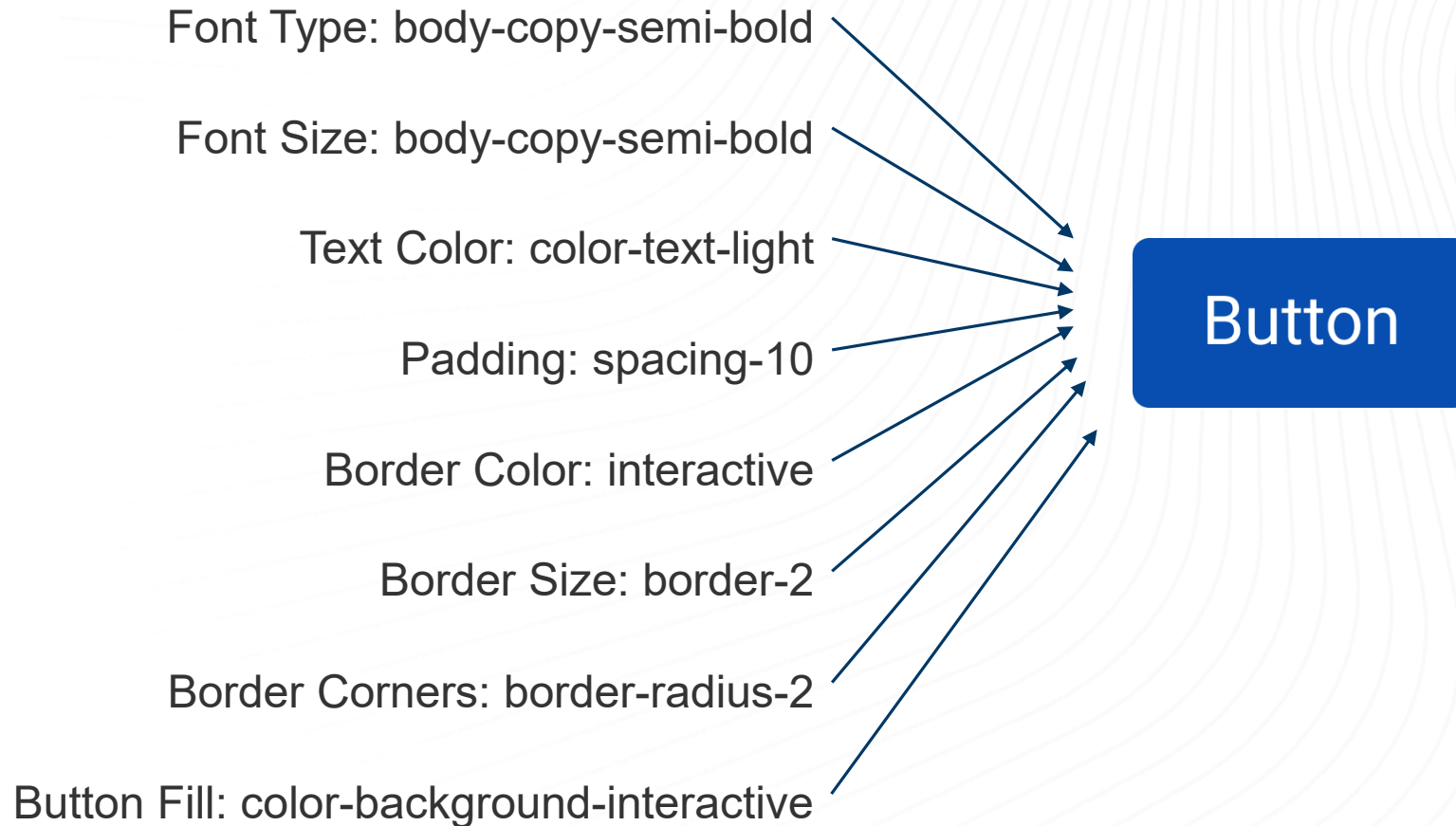
Button
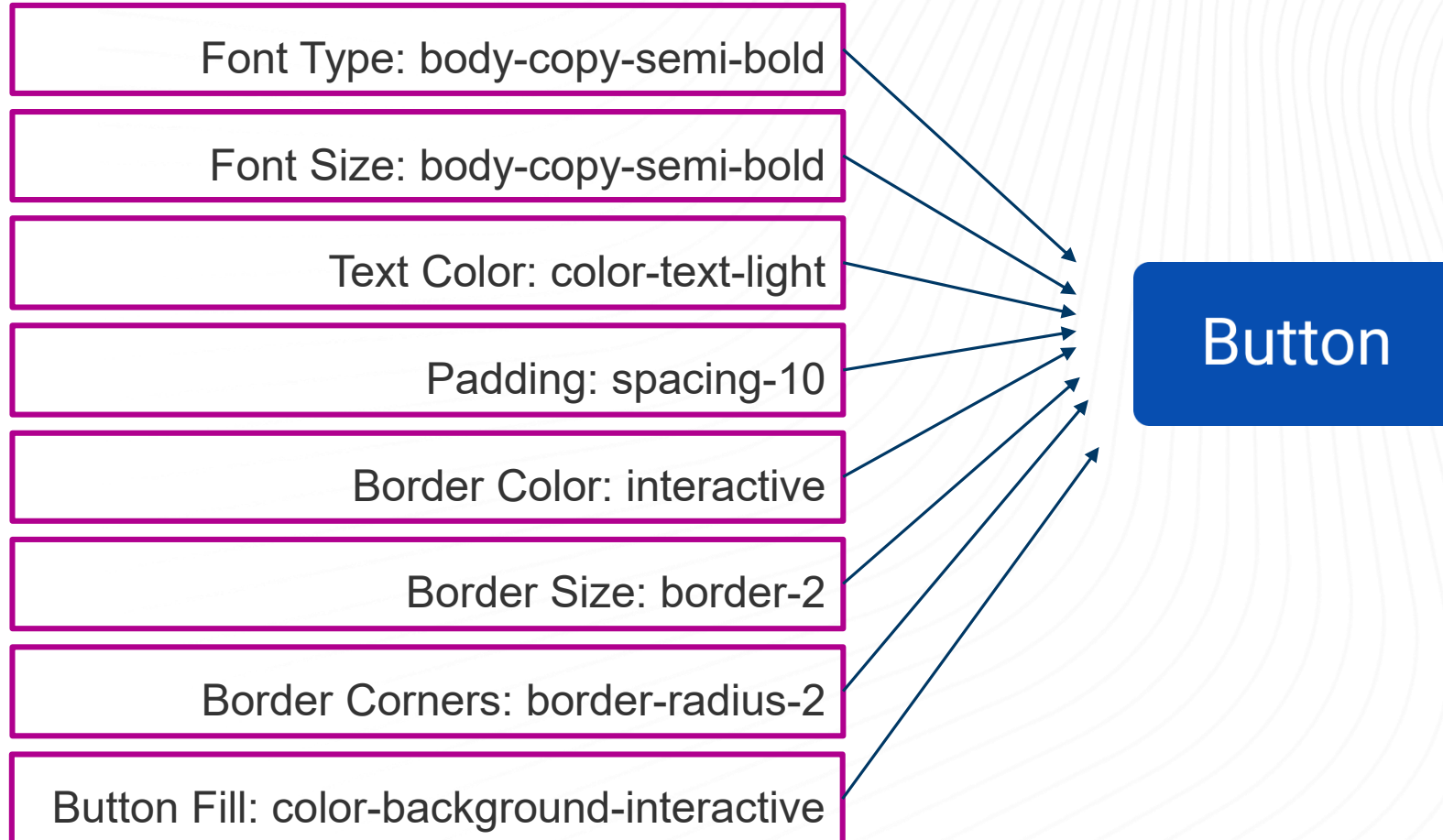
State Change Design Examples

Default

Button

Hover

Button

- **Background colour change (token)**
- Underlined

Focus

Button

- **Background colour change (token)**
- Underlined
- Focus indicator

Inactive

Button

- **Background colour change (token)**

Hover State Options: Colour-Only

Default

Button

Options

Button Button Button Button Button

Hover State Options: Underline, Bold Text, Larger Text, Smaller Text

Default

Button

Options

Button

Button

Button

Button

Button

Button

Button

Button

Button

Button

Hover State Options: Button Size

Default

Button

Options

Button   Button   Button

Hover State Options: Invert Colours

Default

Button

Options

Button Button

Hover State Options: Thick Lines

Default

Button

Options

Button Button

Hover State Options: Border Thickness

Default

Button

Options

Button Button Button Button Button Button

53

Hover State Options: Border Radius

Default

Button

Options

Button Button Button

Hover State Options: Shadows

Default

Button

Options

Button   Button   Button   Button   Button

Hover State Options: Animation

Default

Button

Options

Consider the Variations

Apply Design Decisions to Links

Default	Hover	Focus
Button	Button	Button
Button	Button	Button
🐞 Button	🐞 Button	🐞 Button
Standalone Link	Standalone Link	Standalone Link
This link is an inline link in the middle of some text.	This link is an **inline link** in the middle of some text.	This link is an **inline link** in the middle of some text.

Apply Design Decisions to Other Elements

Default	Hover	Focus	Inactive	Error
○ Label	● Label	● Label	○ Label	○ Label
				⊘ Error message
⦿ Label	◉ Label	◉ Label	⦿ Label	⦿ label
				⊘ Error message
☐ Label	☐ Label	☐ Label	☐ Label	☐ Label
				⊘ Error message
☑ Label	☑ Label	☑ Label	☑ Label	☑ Label
				⊘ Error message
⊟ Label	⊟ Label	⊟ Label	⊟ Label	⊟ Label
				⊘ Error message

Why is consistency so important?

Consistency is Key to Usability

Usability Quality Attributes

- Learnability

- Memorability

- Efficiency

- Error Tolerance
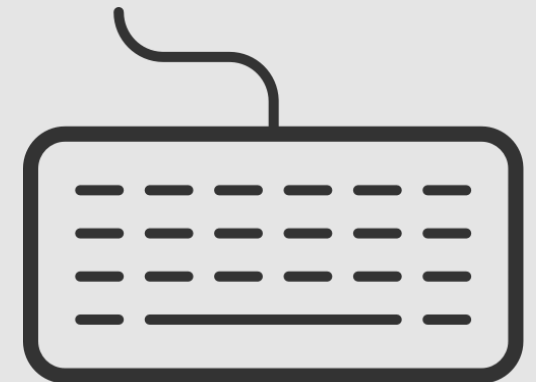
- Satisfaction

Consistency Experiences Are

- Easy to learn

- Easy to remember

- Efficient

- Error tolerant

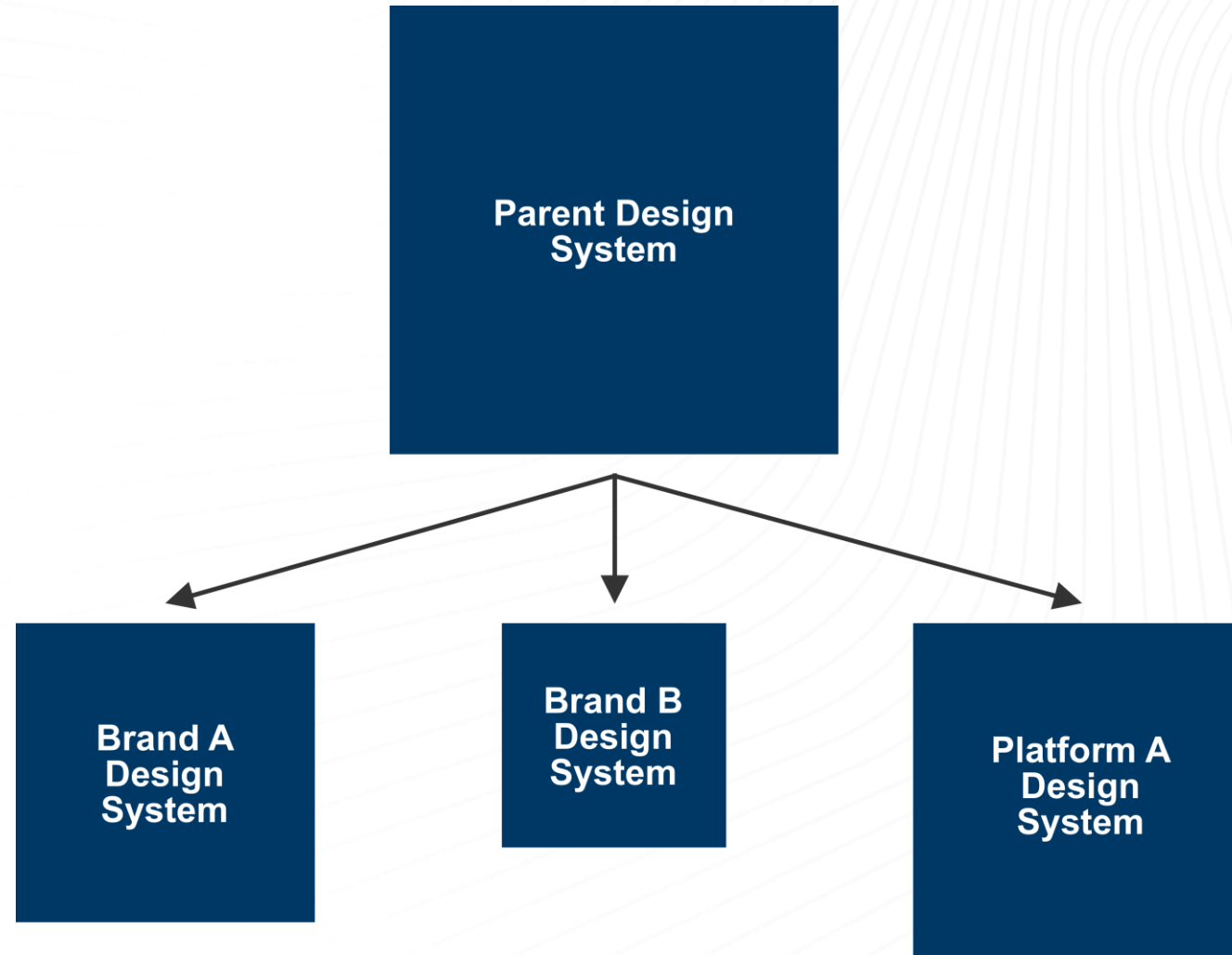- Pleasant to use

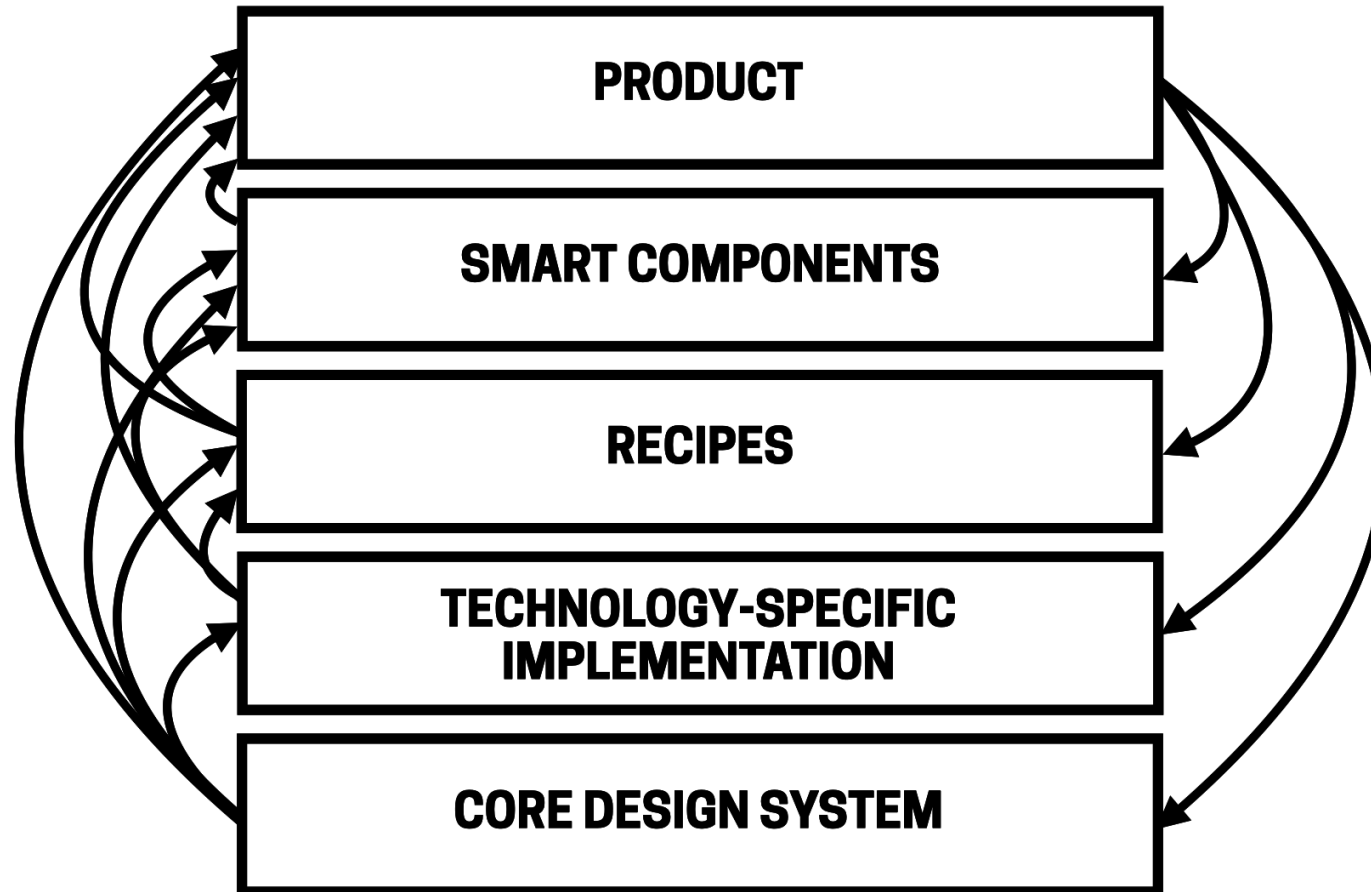# Sidebar: Design Consistency Across Device Usage

Pointer / Hover

Keyboard / Focus

Design System Inheritance

Parent Design System

Brand A Design System

Brand B Design System

Platform A Design System

Design System Layer Cake Inheritance

Concept reference: The Design System Ecosystem

Inheritance Examples

Parent

Default

Postal Code

Border Thickness: 1px
Border Color: #333333
Corner Radius: 0

Focused / Typing

Postal Code

A1A|

Border Thickness: 3px
Border Color: #333333
Corner Radius: 0

Child 1

Default

Postal Code

Border Thickness: 1px
Border Color: #333333
Corner Radius: 0

Focused / Typing

Postal Code

A1A|

Border Thickness: 3px
Border Color: #B0008E
Corner Radius: 0

Child 2

Default

Postal Code

Border Thickness: 1px
Border Color: #002D04
Corner Radius: 0

Focused / Typing

Postal Code

A1A|

Border Thickness: 5px
Border Color: #002D04
Corner Radius: 0
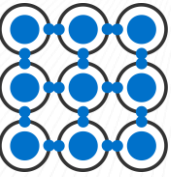
Child 3

Default

Postal Code

Border Thickness: 3px
Border Color: #413B94
Corner Radius: 0

Focused / Typing

Postal Code

A1A|

Border Thickness: 1px
Border Color: #413B94
Corner Radius: 0

Patterns Map to Organisms

Design tokens help with:
- ?

Questions? Comments?

Slides, Contact Details, and a Guide

Connect with me

Email and LinkedIn

Karen Hawkins, CPACC

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https://noti.st/khawk27

Get agile design guide

Downloadable document

Accessibility in the design process

Thank you

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