

# DESIGN TOKENS

**IN INDUSTRIAL HMIs**

JOHANNES ZIEBANDT / HMI PROJECT / 23.10.2024



1

### **What are design tokens?**

An introduction with a detour via design systems

2

### **Working with tokens**

How do you organize tokens systematically?

3

### **Tokens in practice**

Who benefits from them and where can they be used and how?

1

# WHAT ARE DESIGN TOKENS?

# WHAT ARE DESIGN TOKENS?



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# WHAT ARE DESIGN TOKENS?



## Differences

- Colors and Sizes
- Style Guide

## Similarities

- Content
- Usability Principles

# WHAT ARE DESIGN TOKENS?



## Differences

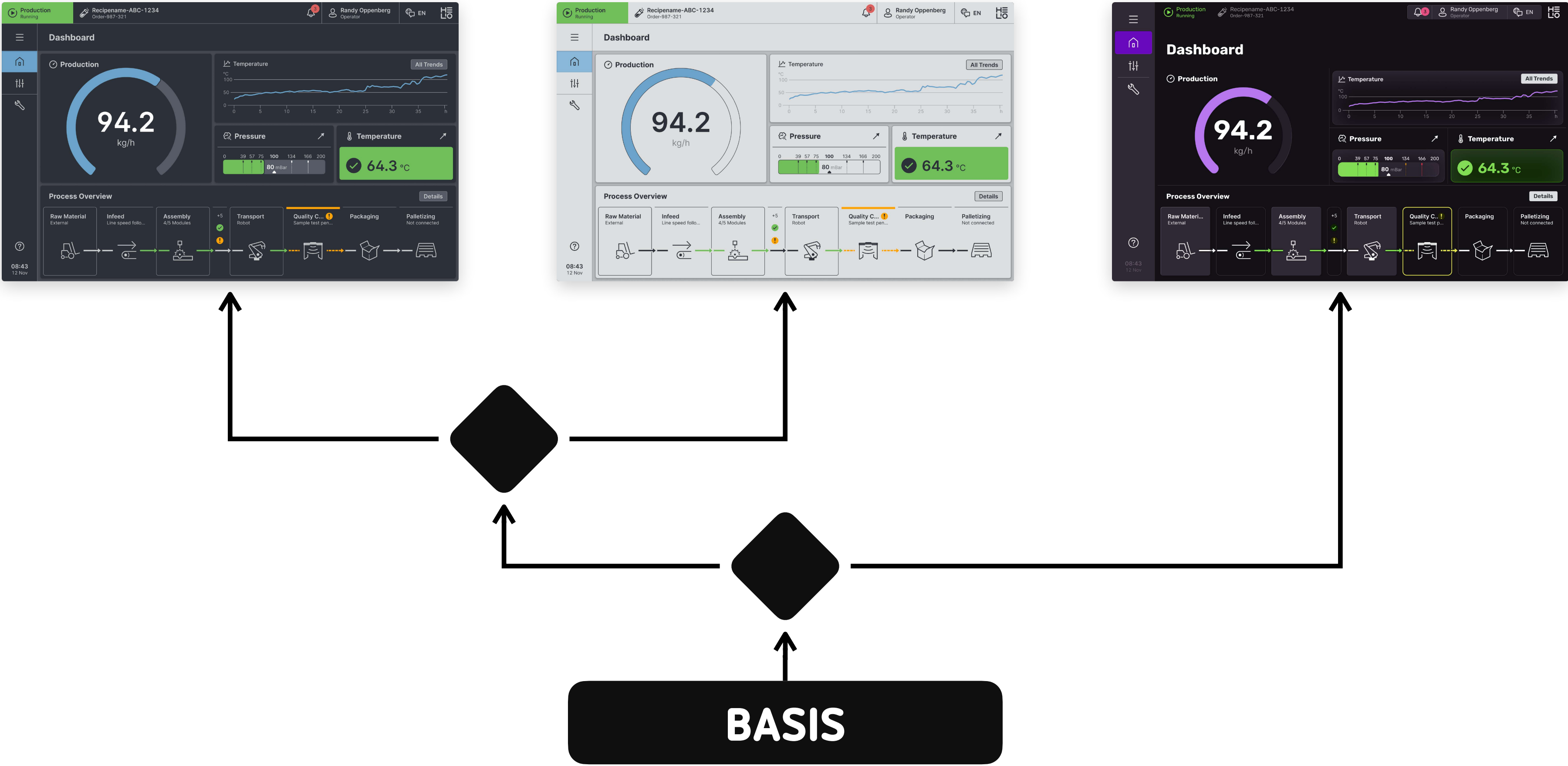
- Design decisions

## Similarities

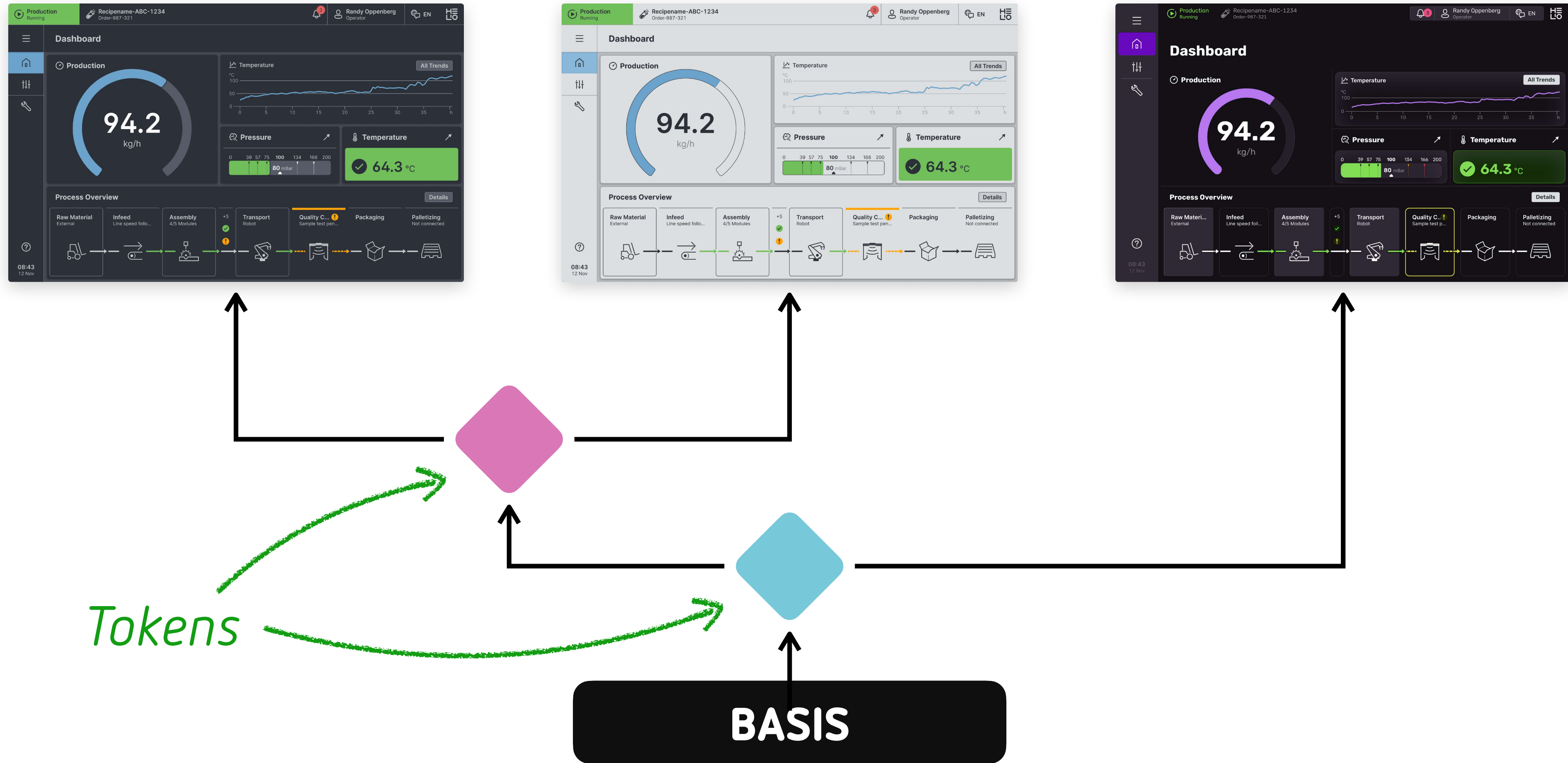
- Content basis



# WHAT ARE DESIGN TOKENS?

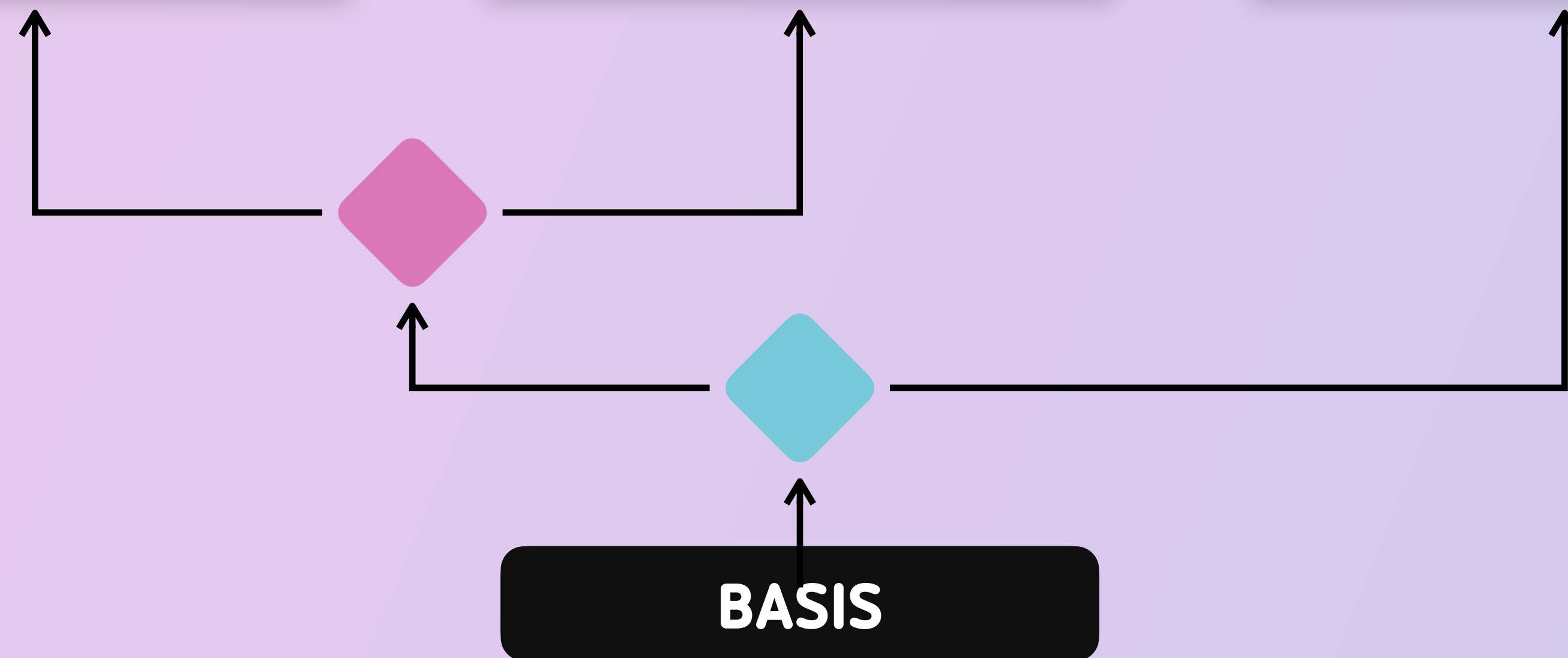


# WHAT ARE DESIGN TOKENS?



# WHAT ARE DESIGN TOKENS?

# Design-System



1.1

# DESIGN SYSTEMS

# Design System vs Style Guide

## Design System

- Exchange basis between design and development
- Toolkit
- Infrastructure for product development
- Contains technical implementation details
- Content basis

## Style Guide

- By designers for designers
- Design guidelines
- Media-independent or comprehensive (print to interfaces)
- Focus on brand and design consistency
- Part of a design system

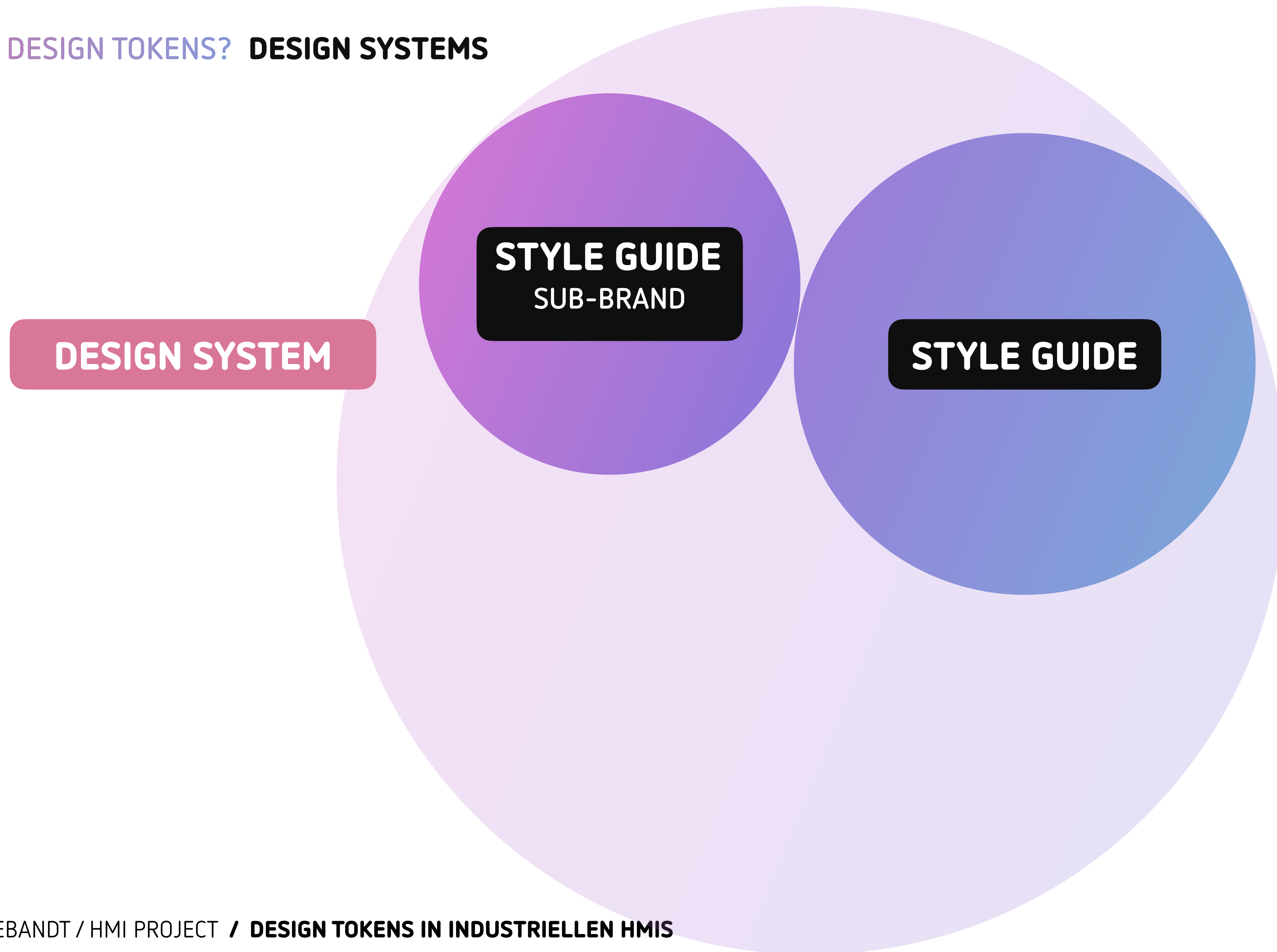
WHAT ARE DESIGN TOKENS? **DESIGN SYSTEMS**

**DESIGN SYSTEM**



**STYLE GUIDE**

## WHAT ARE DESIGN TOKENS? DESIGN SYSTEMS



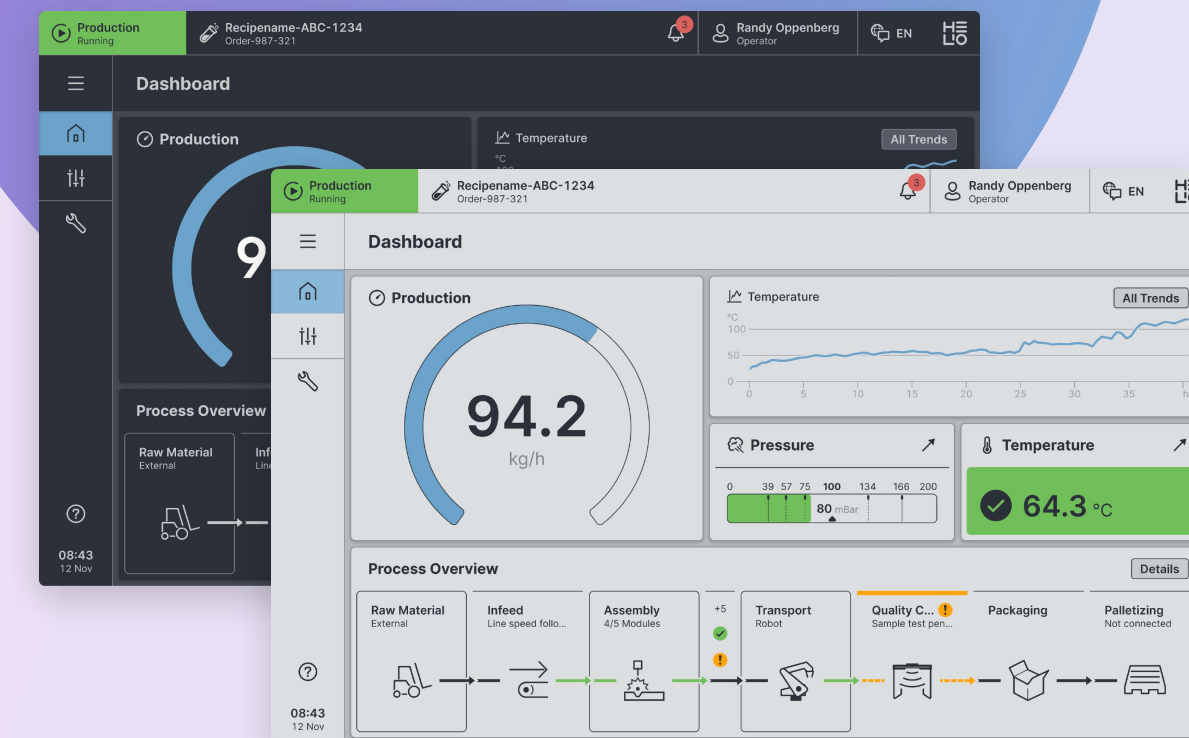


# WHAT ARE DESIGN TOKENS? DESIGN SYSTEMS

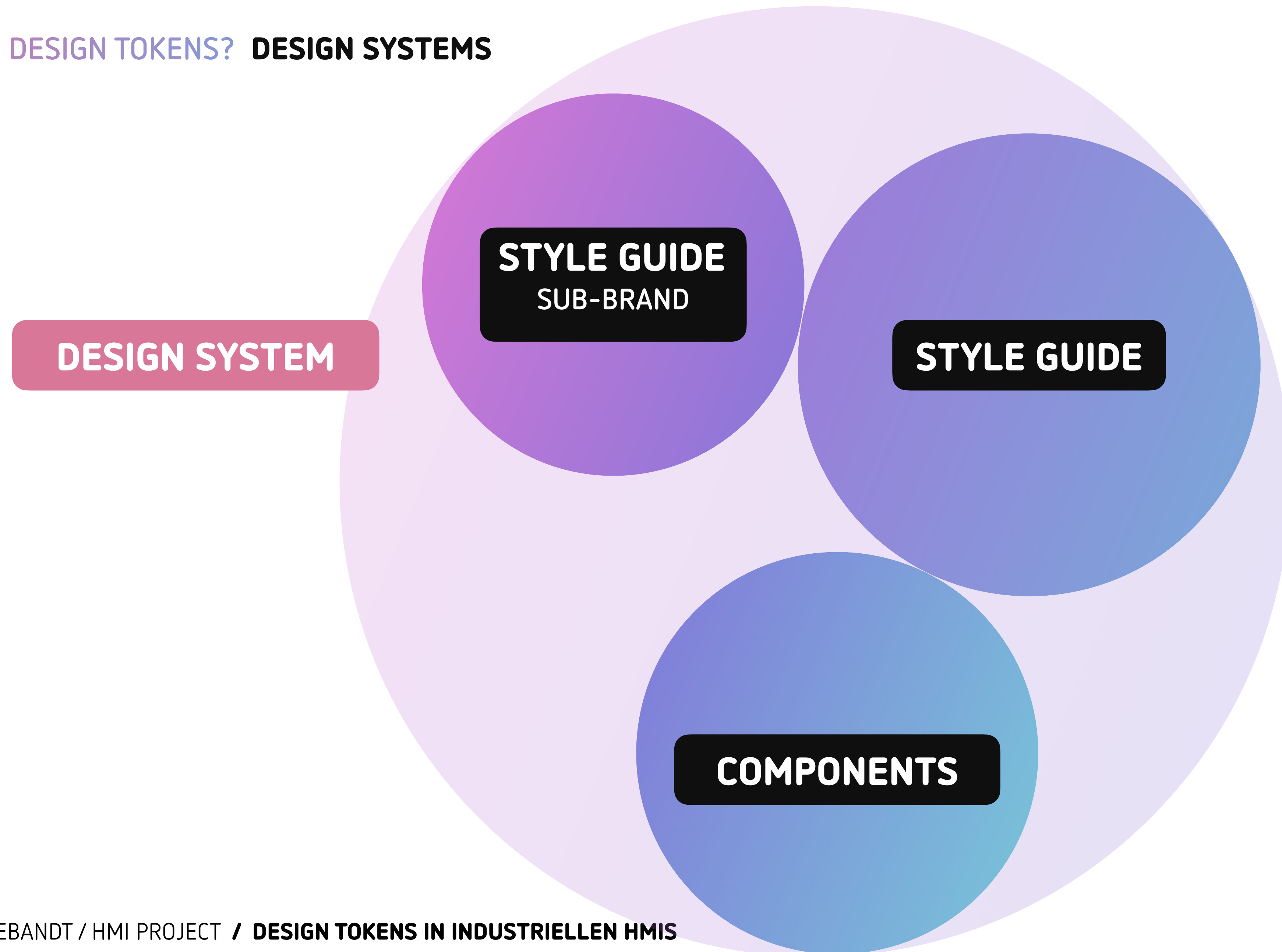
DESIGN SYSTEM

STYLE GUIDE  
SUB-BRAND

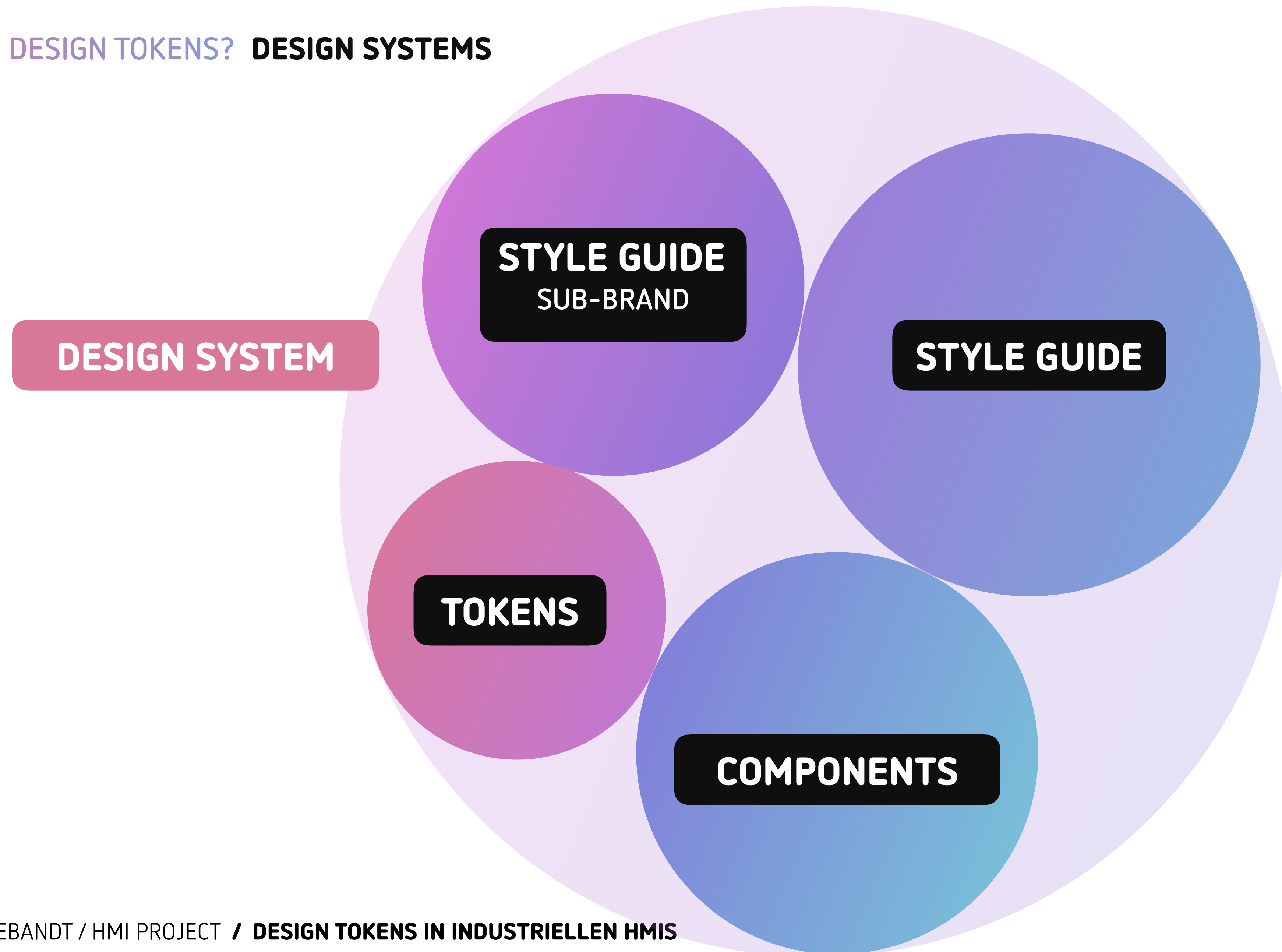
STYLE GUIDE



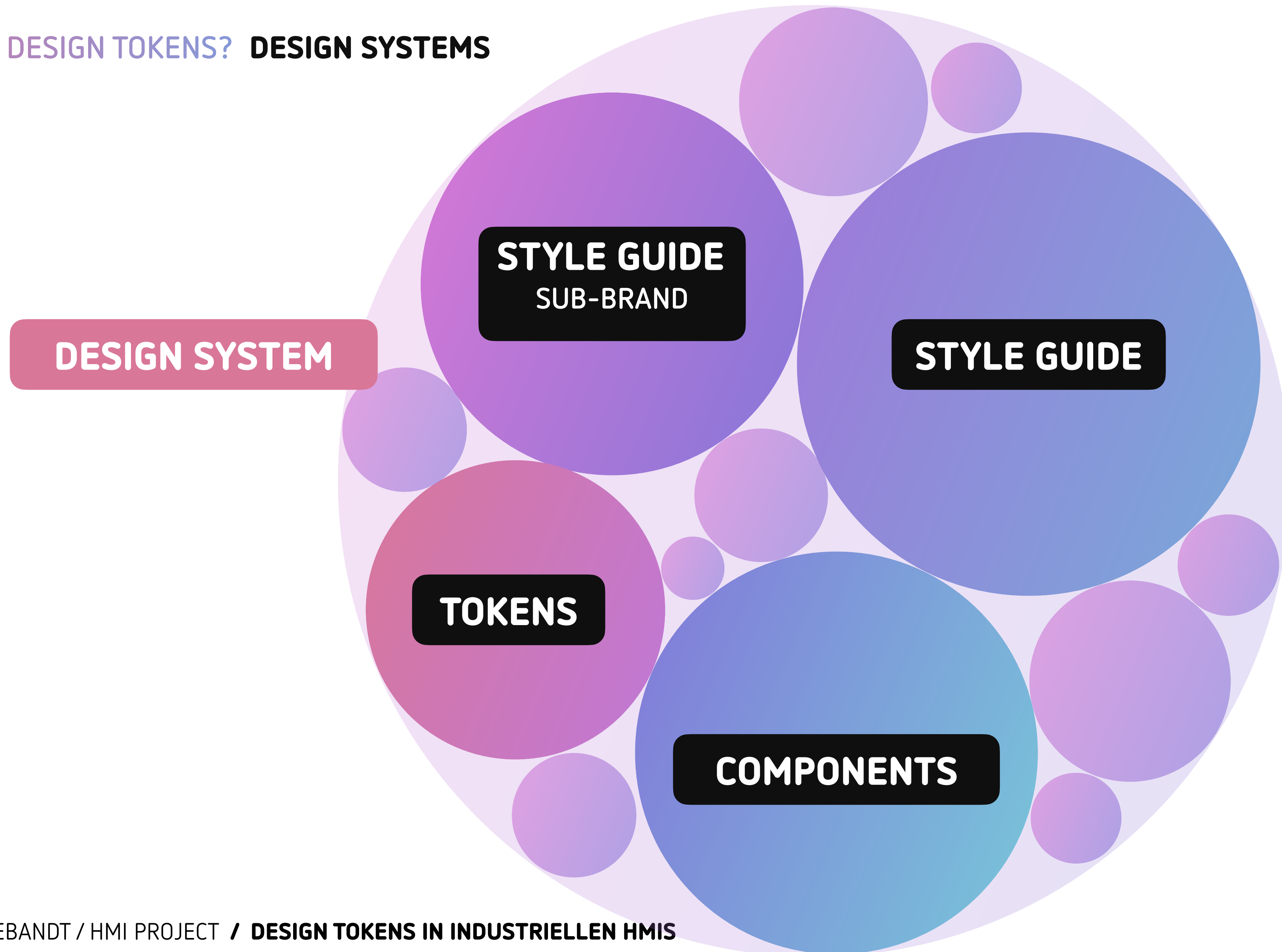
## WHAT ARE DESIGN TOKENS? DESIGN SYSTEMS



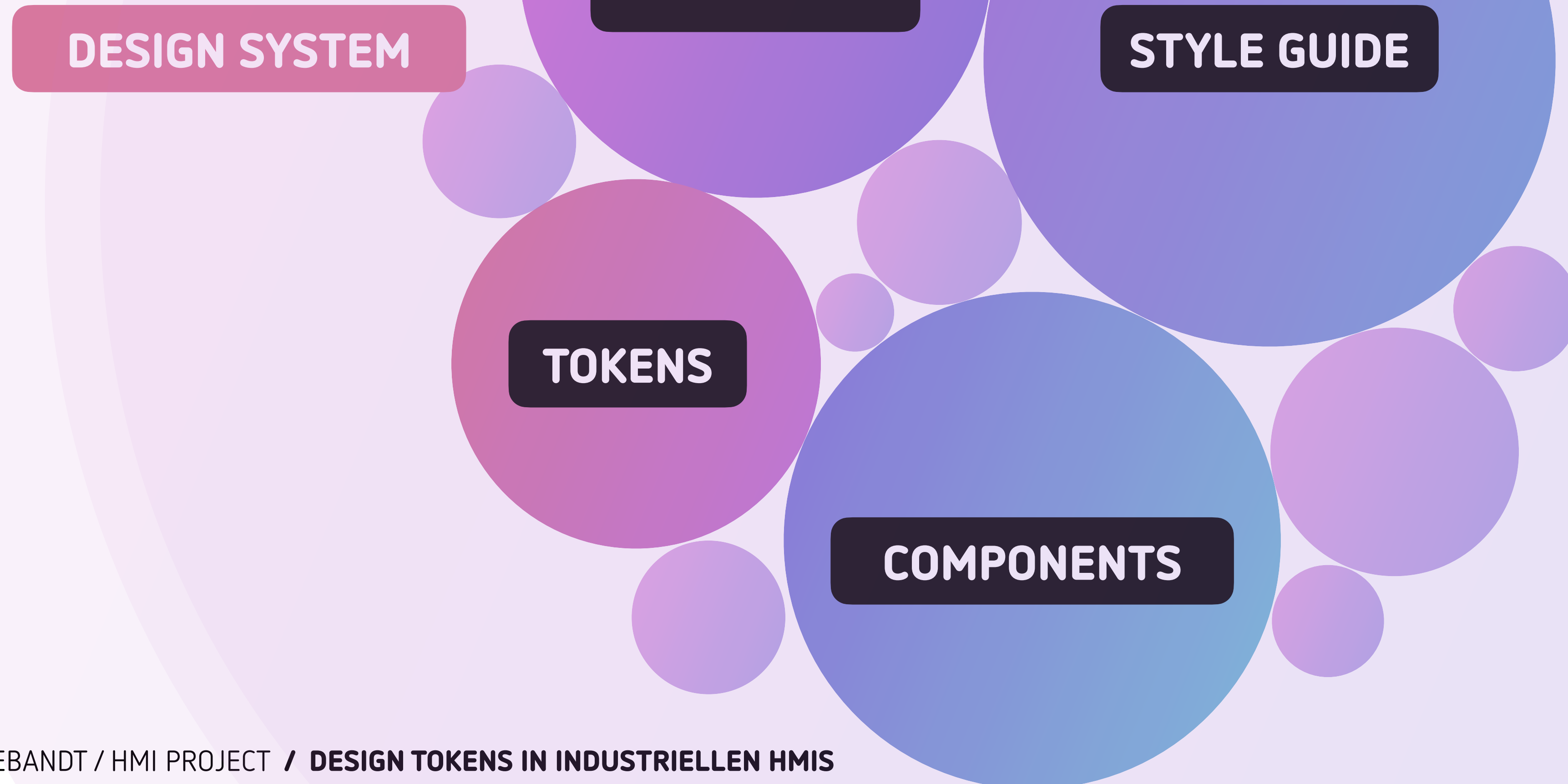
## WHAT ARE DESIGN TOKENS? DESIGN SYSTEMS



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## WHAT ARE DESIGN TOKENS? DESIGN SYSTEMS



Aren't tokens  
just styles?

Aren't tokens  
just CSS?

- Standardized format
- Platform-agnostic
- The exchange of tokens is a central component of their idea
- Enables: best practice for building UI projects across all disciplines

# 1.2

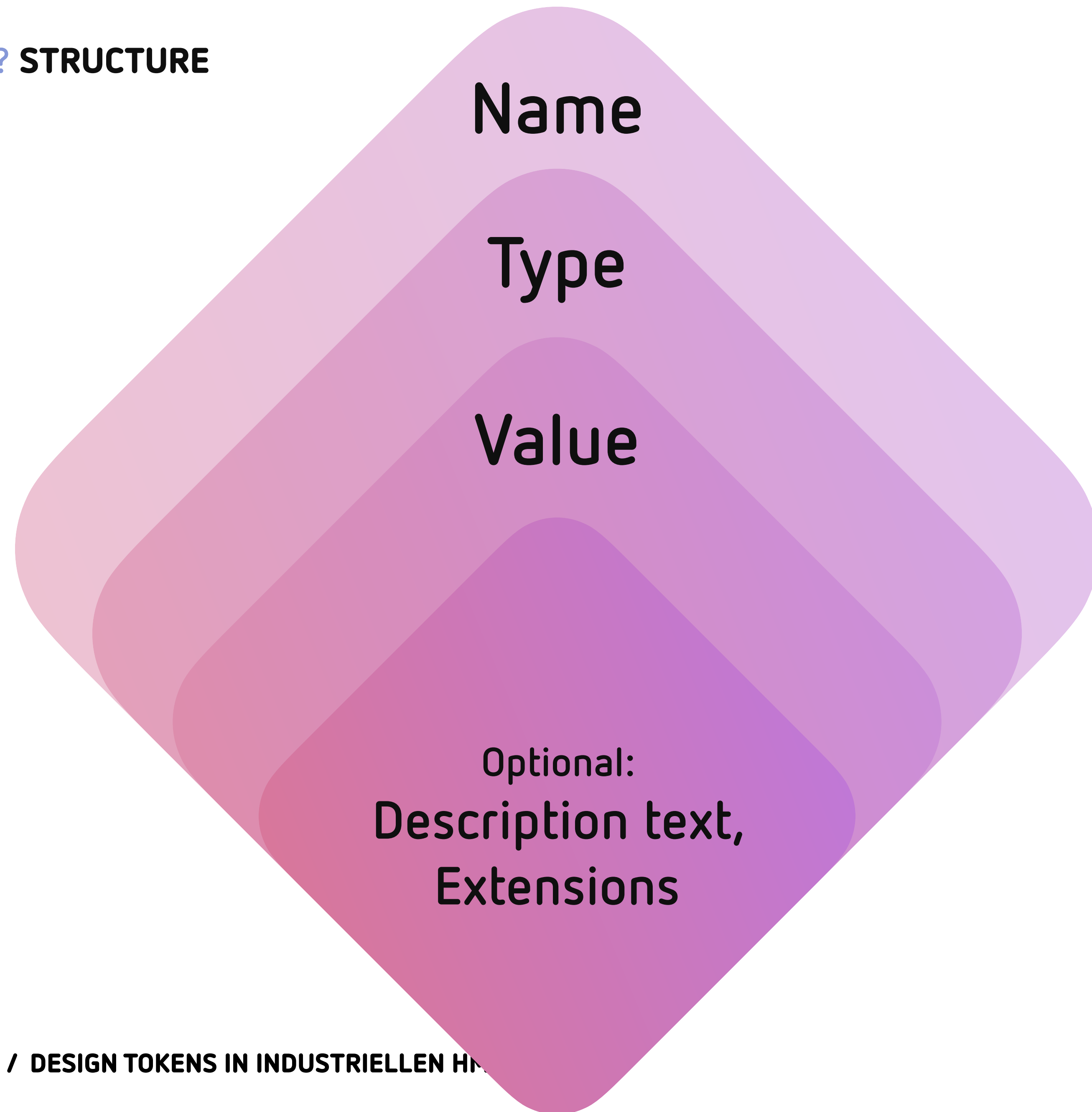
## THE STRUCTURE OF DESIGN TOKENS



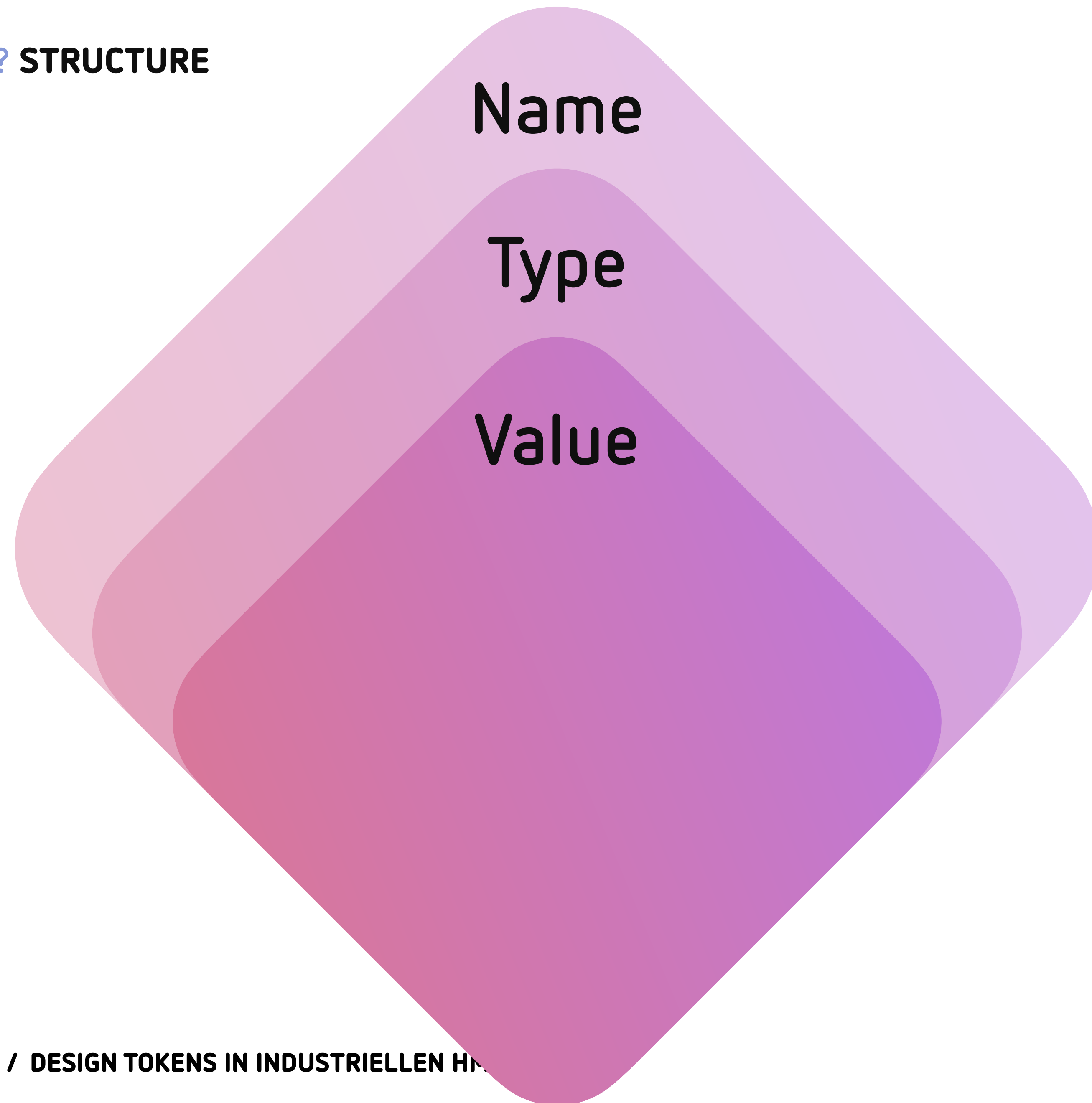
**Design Decision**



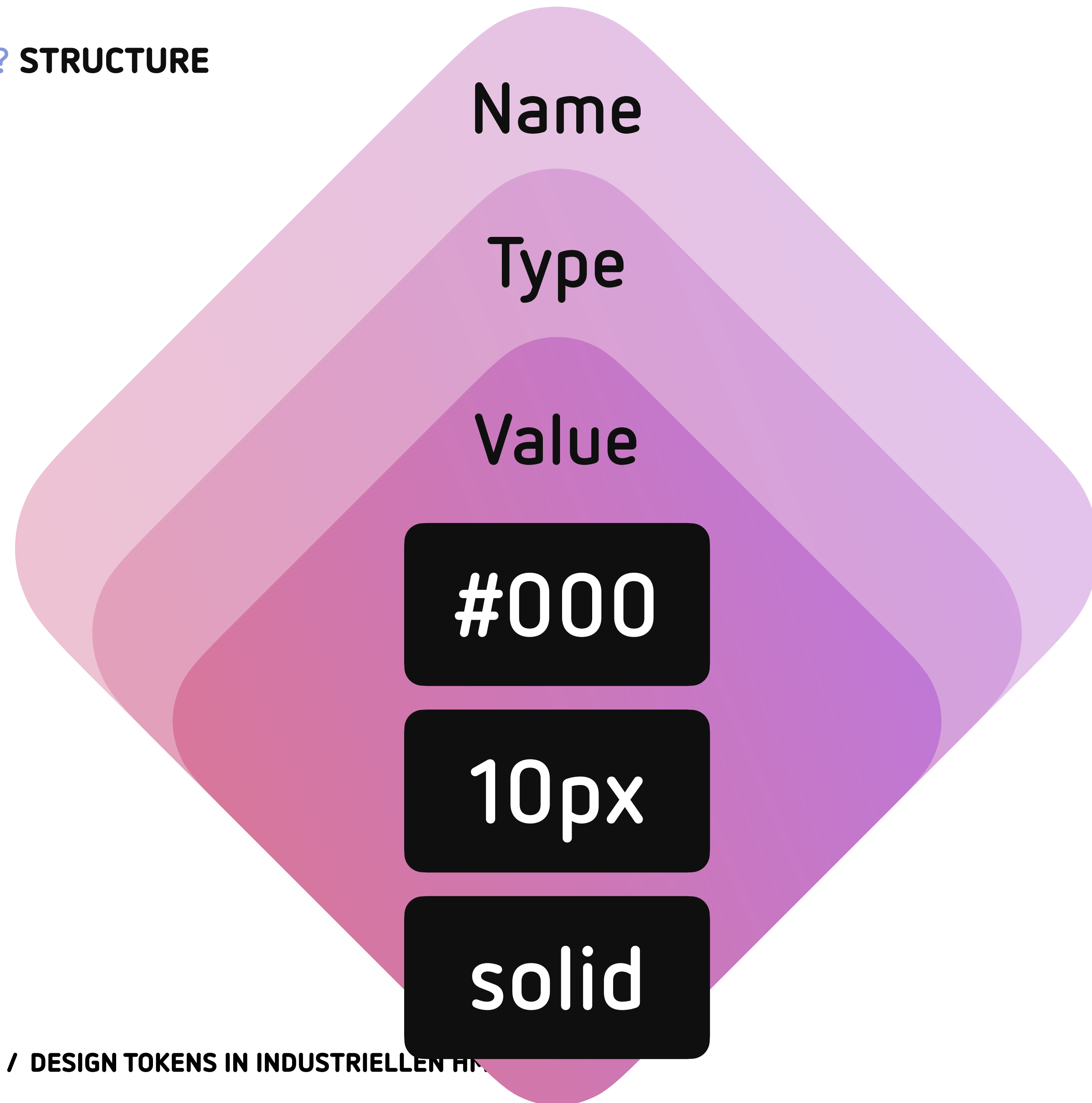
## WHAT ARE DESIGN TOKENS? STRUCTURE



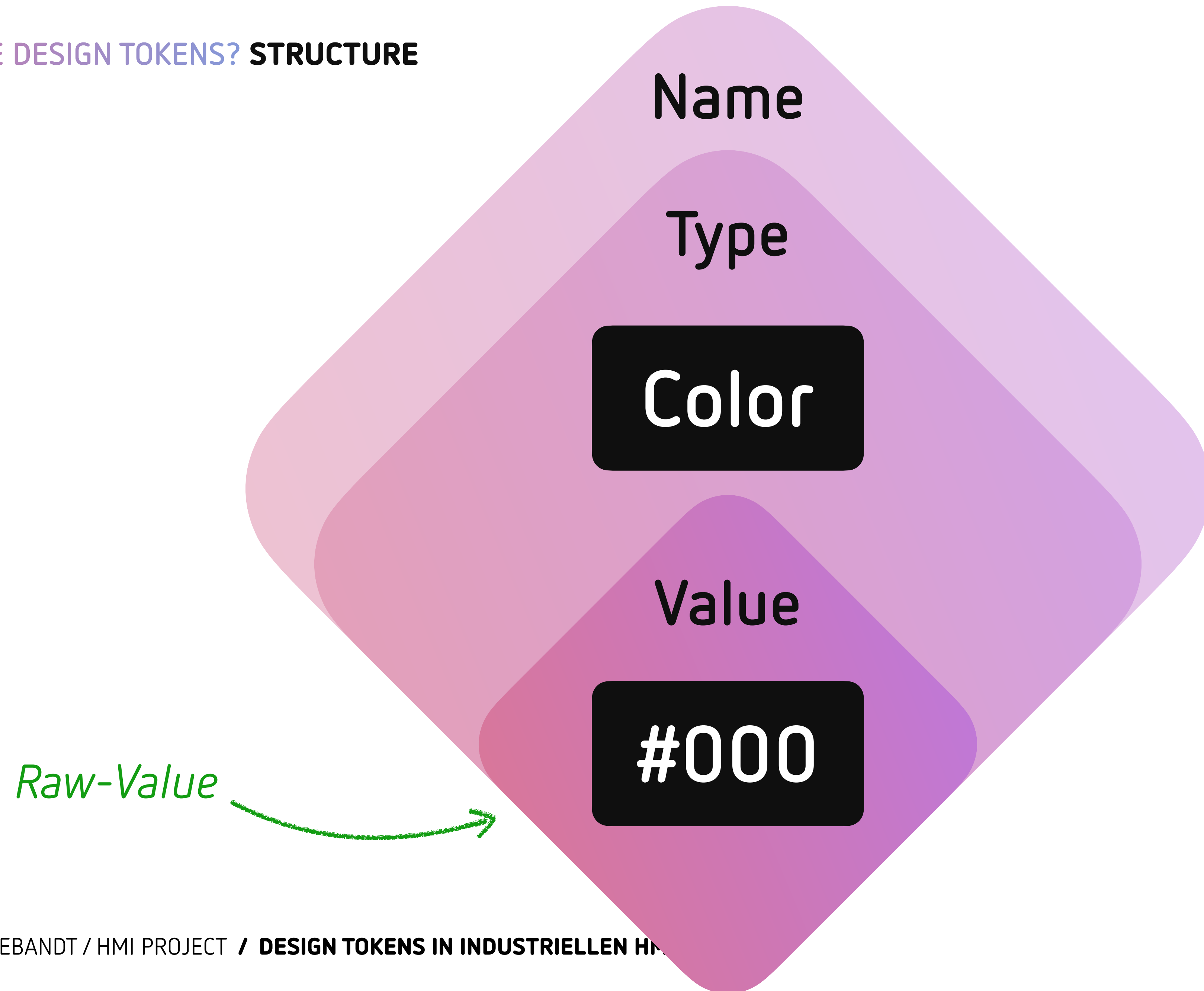
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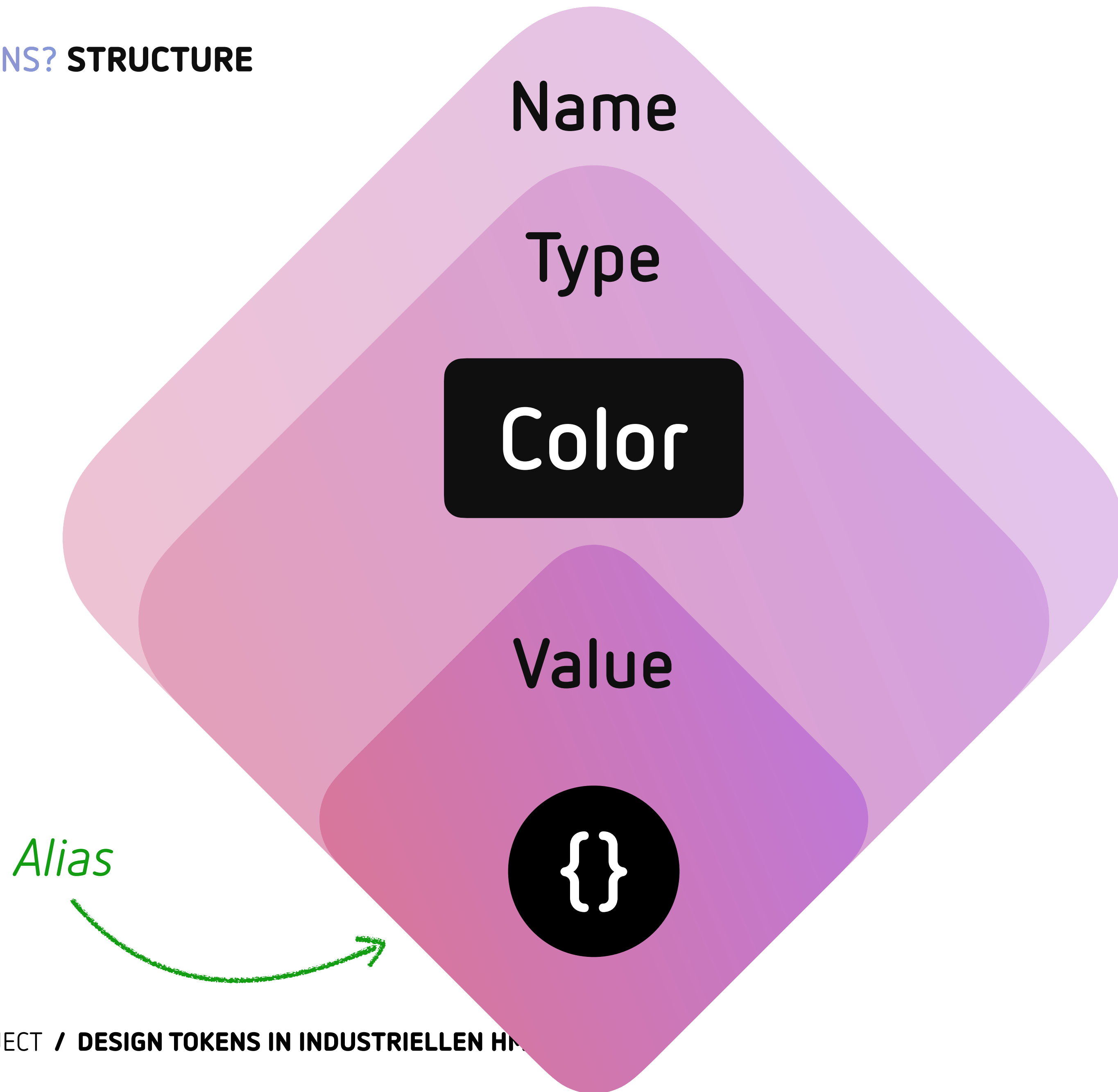
## WHAT ARE DESIGN TOKENS? STRUCTURE



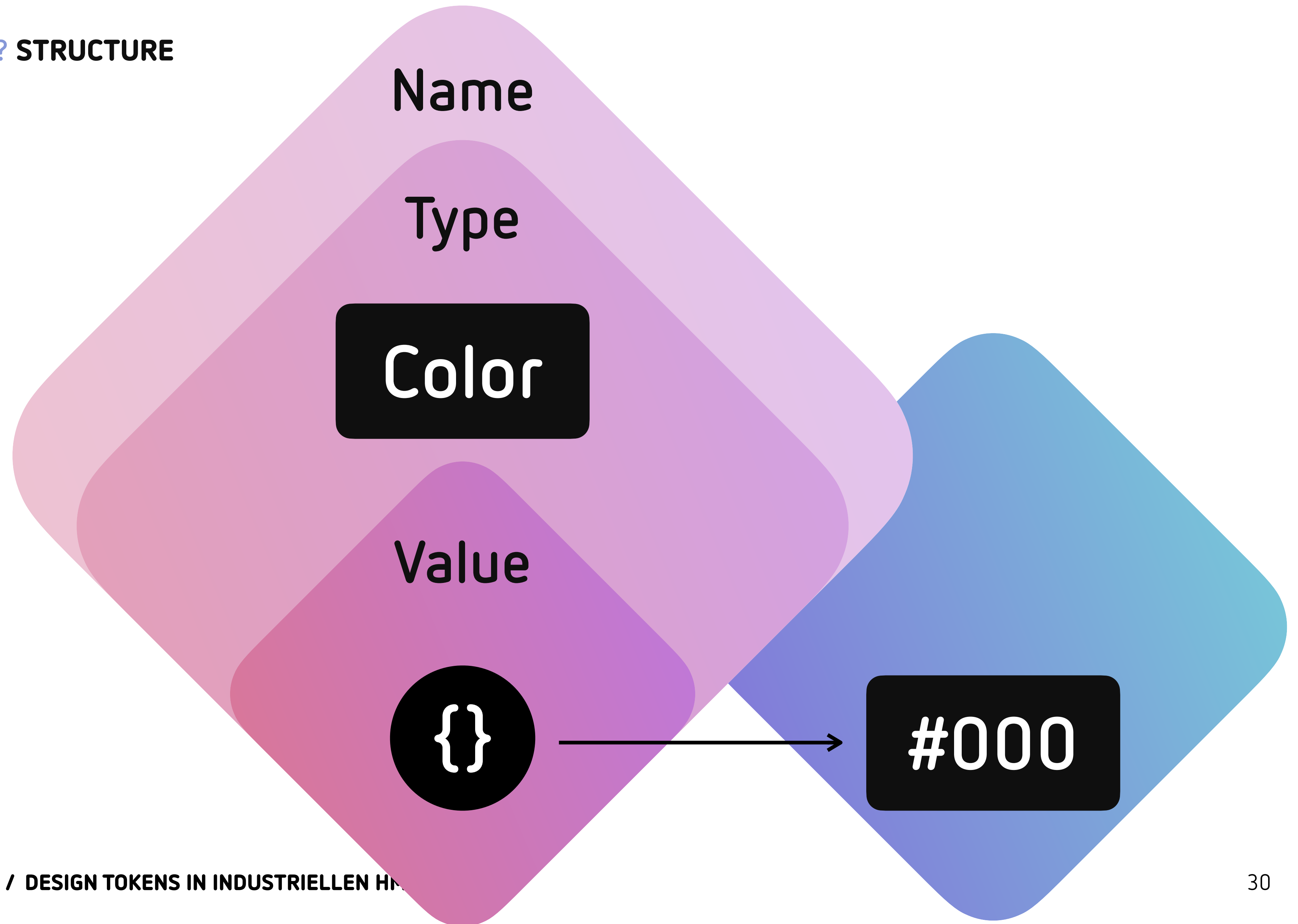
## WHAT ARE DESIGN TOKENS? STRUCTURE



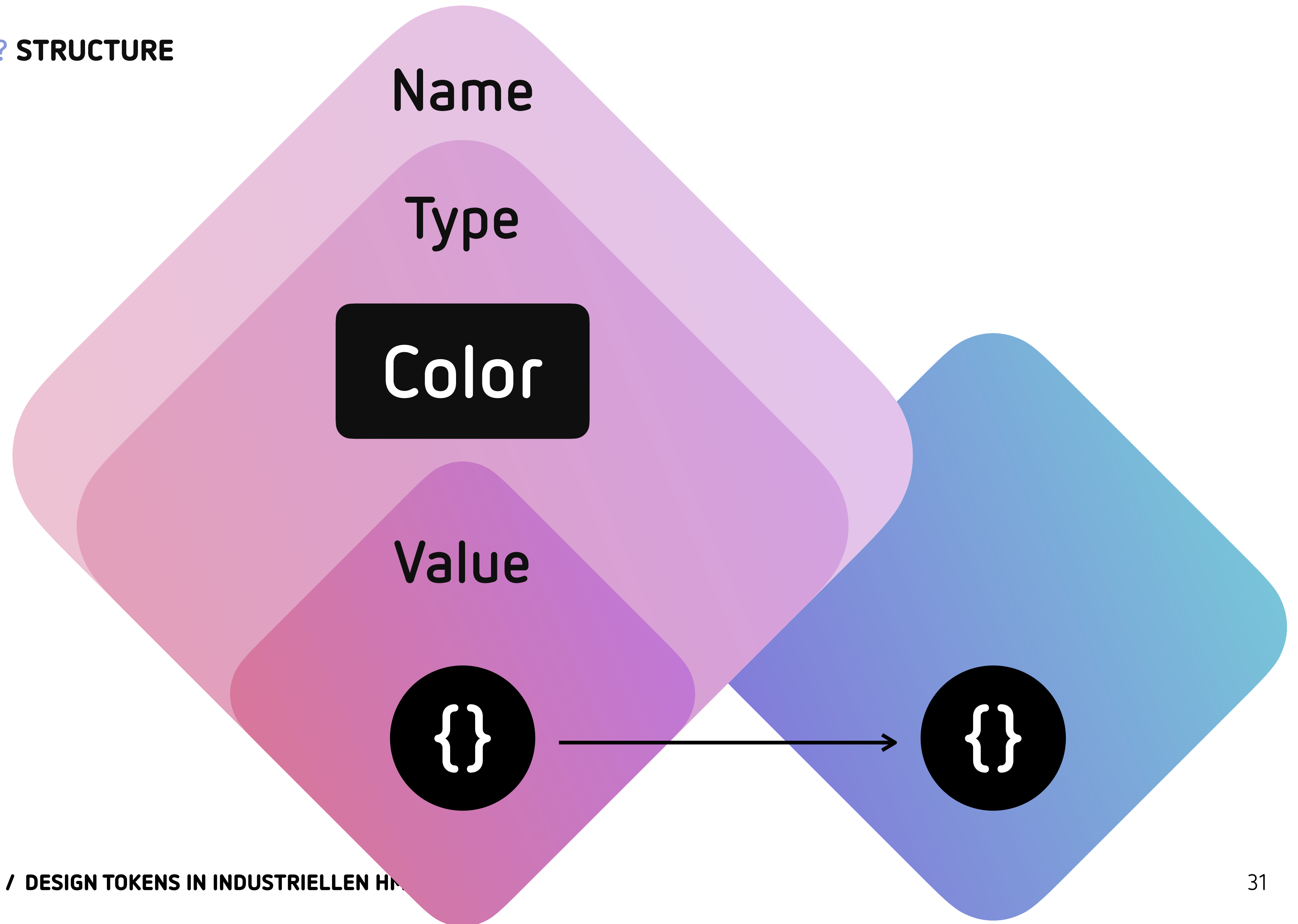
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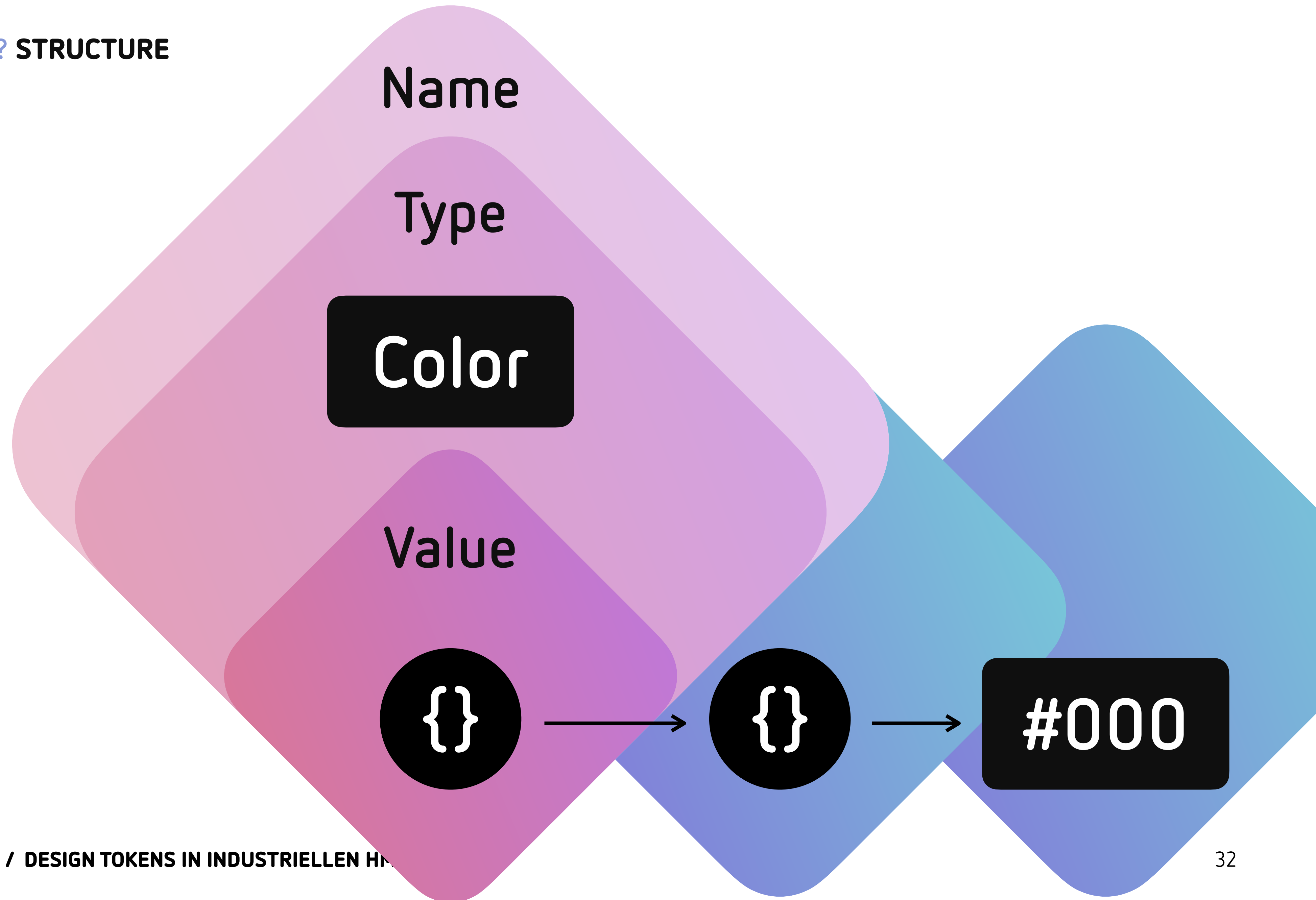
## WHAT ARE DESIGN TOKENS? STRUCTURE



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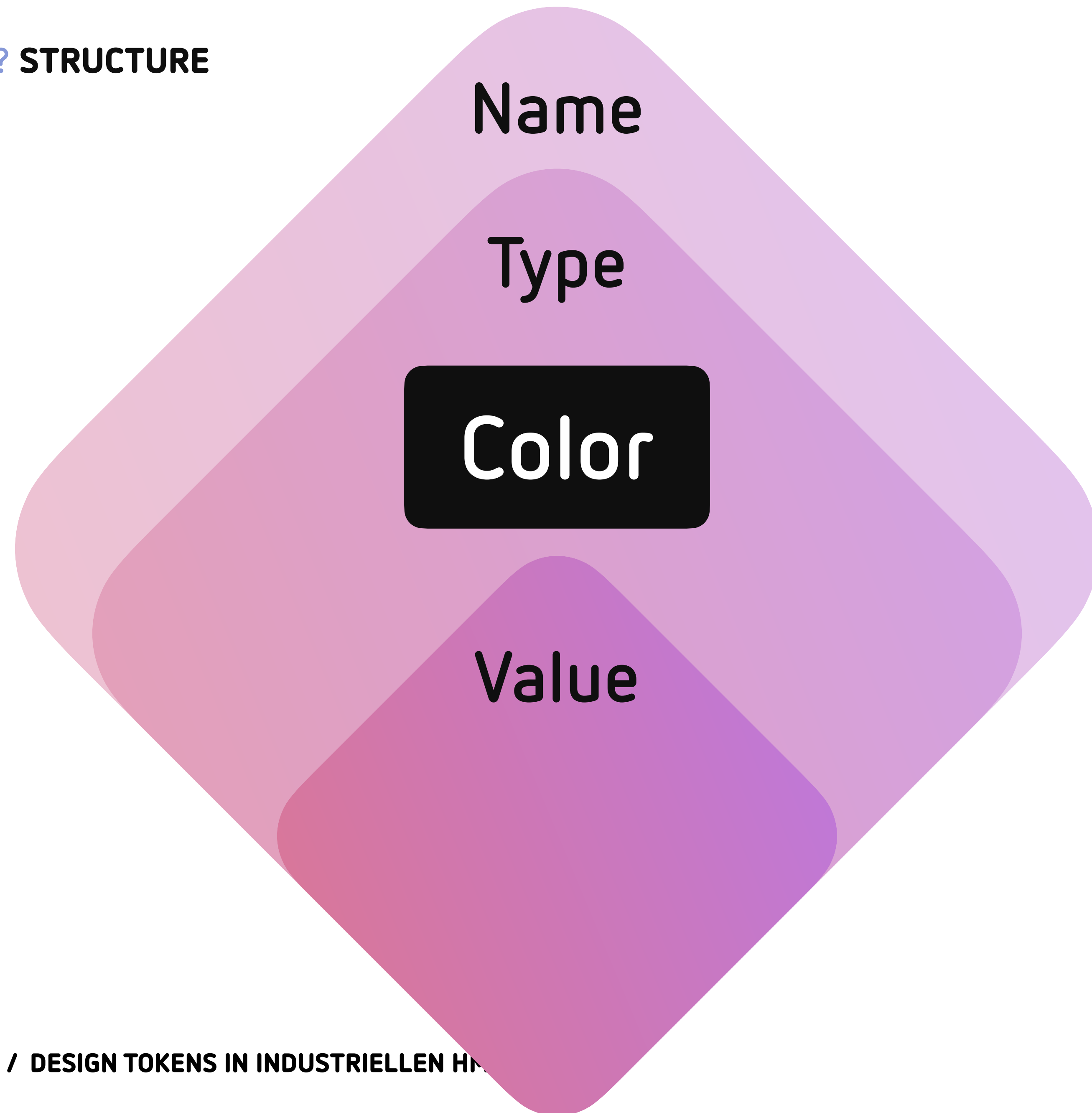


## WHAT ARE DESIGN TOKENS? STRUCTURE

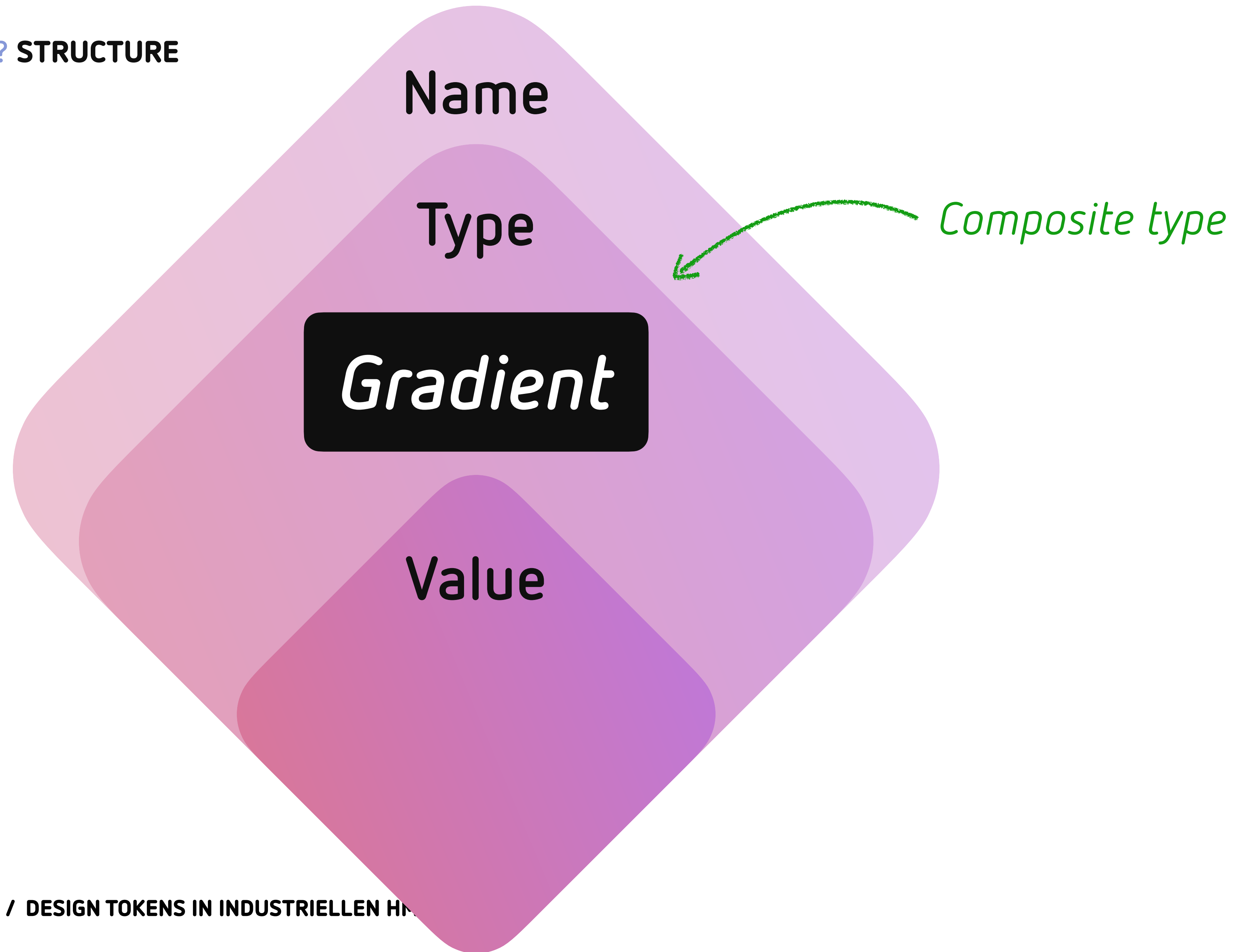




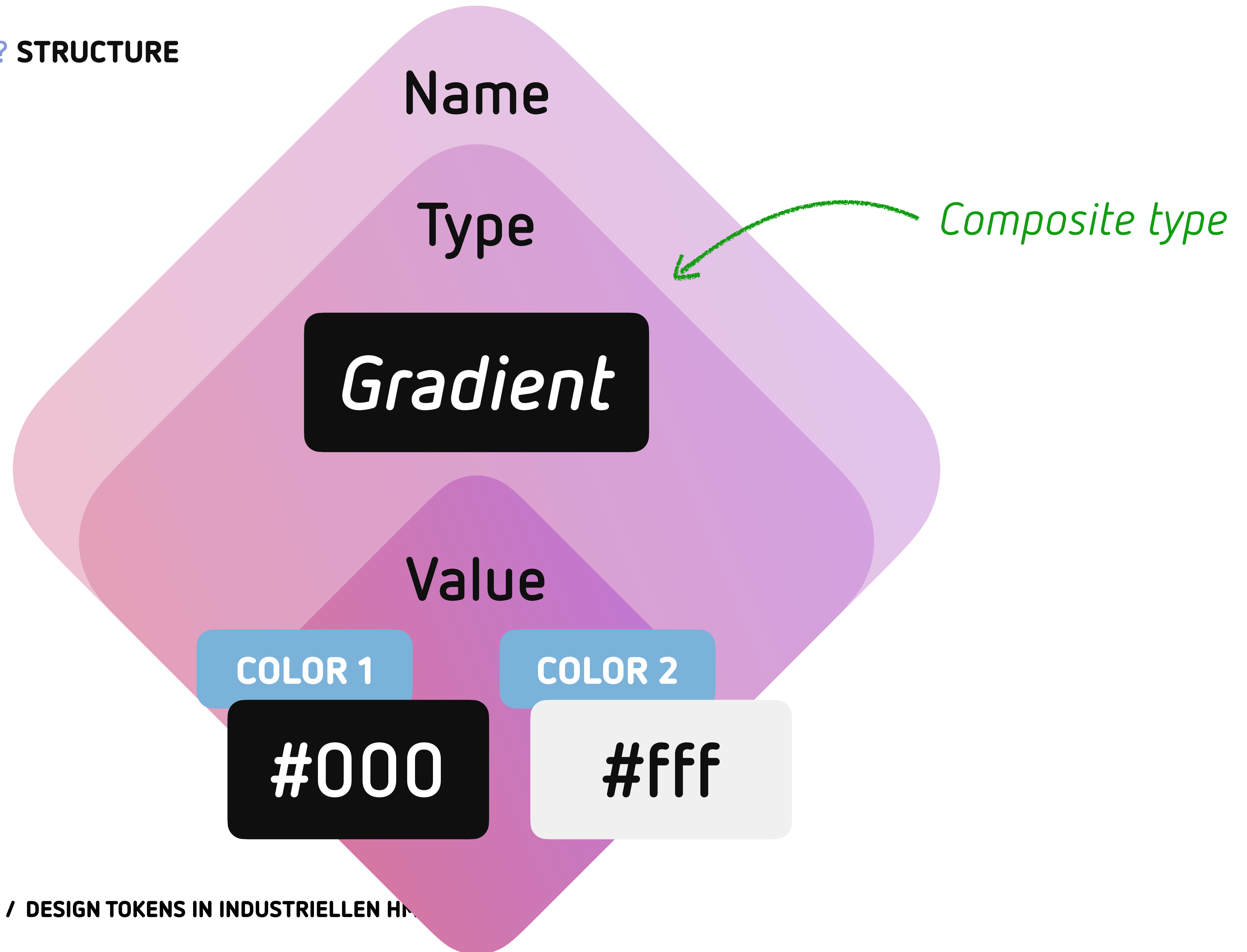
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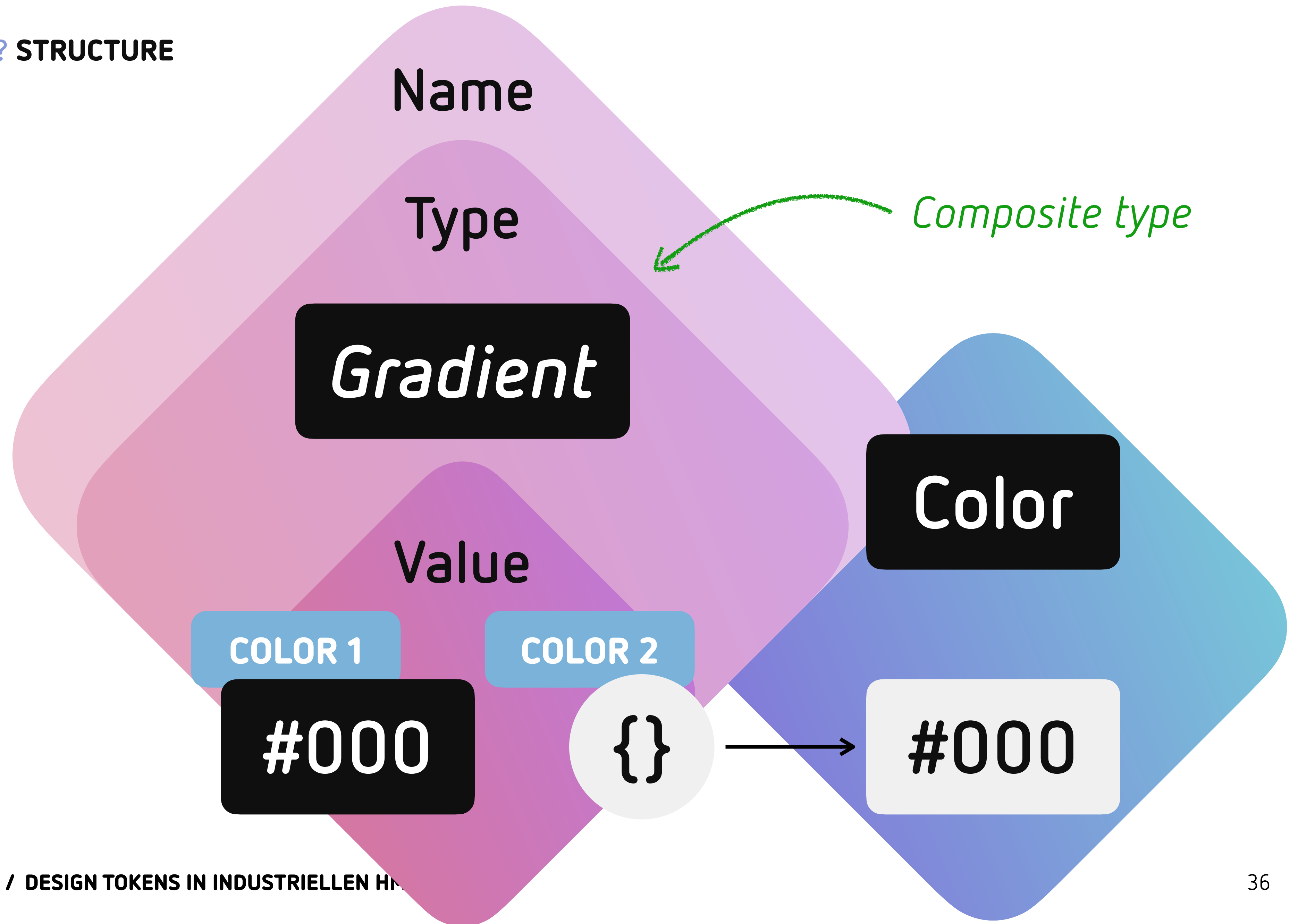
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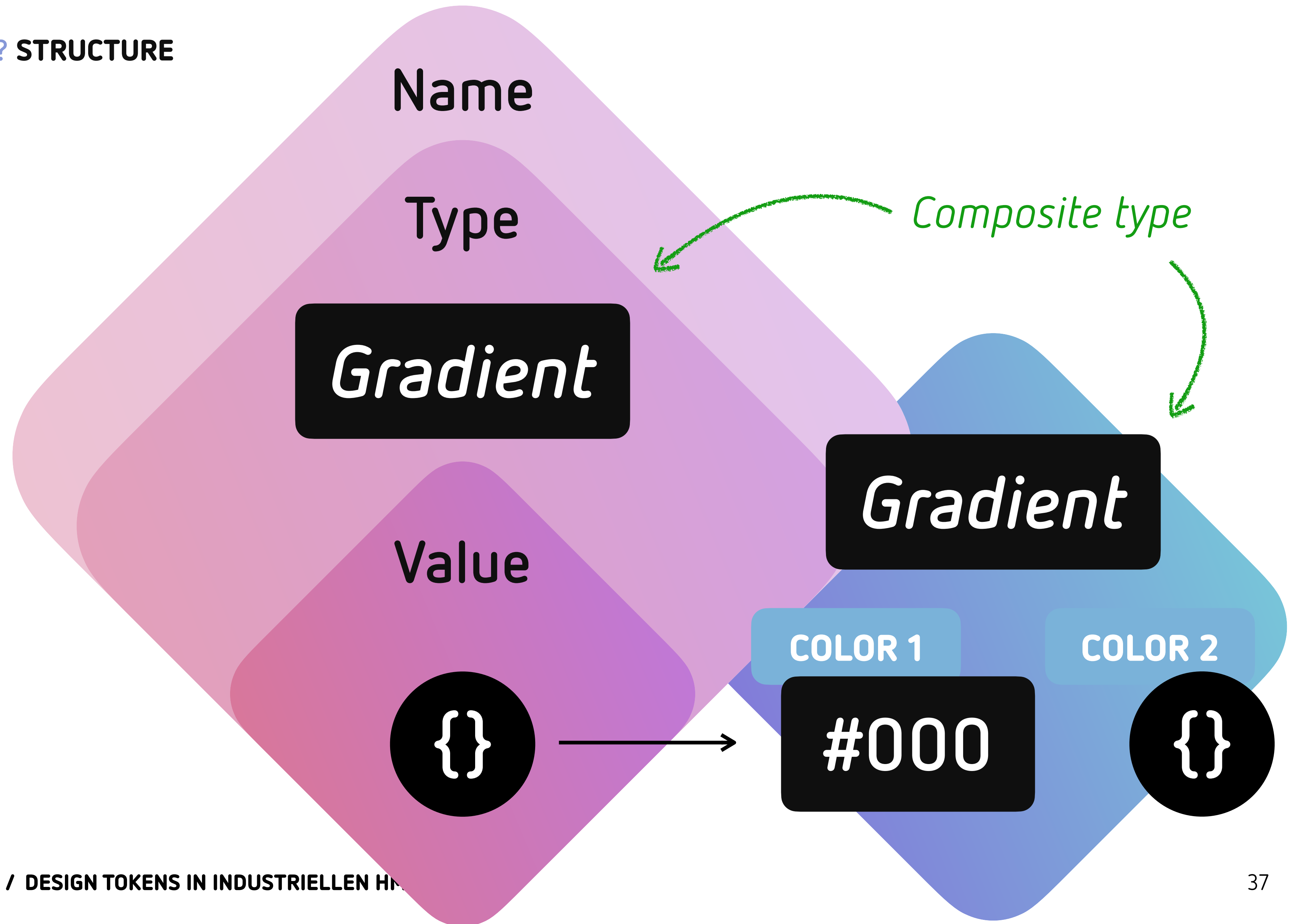
## WHAT ARE DESIGN TOKENS? STRUCTURE



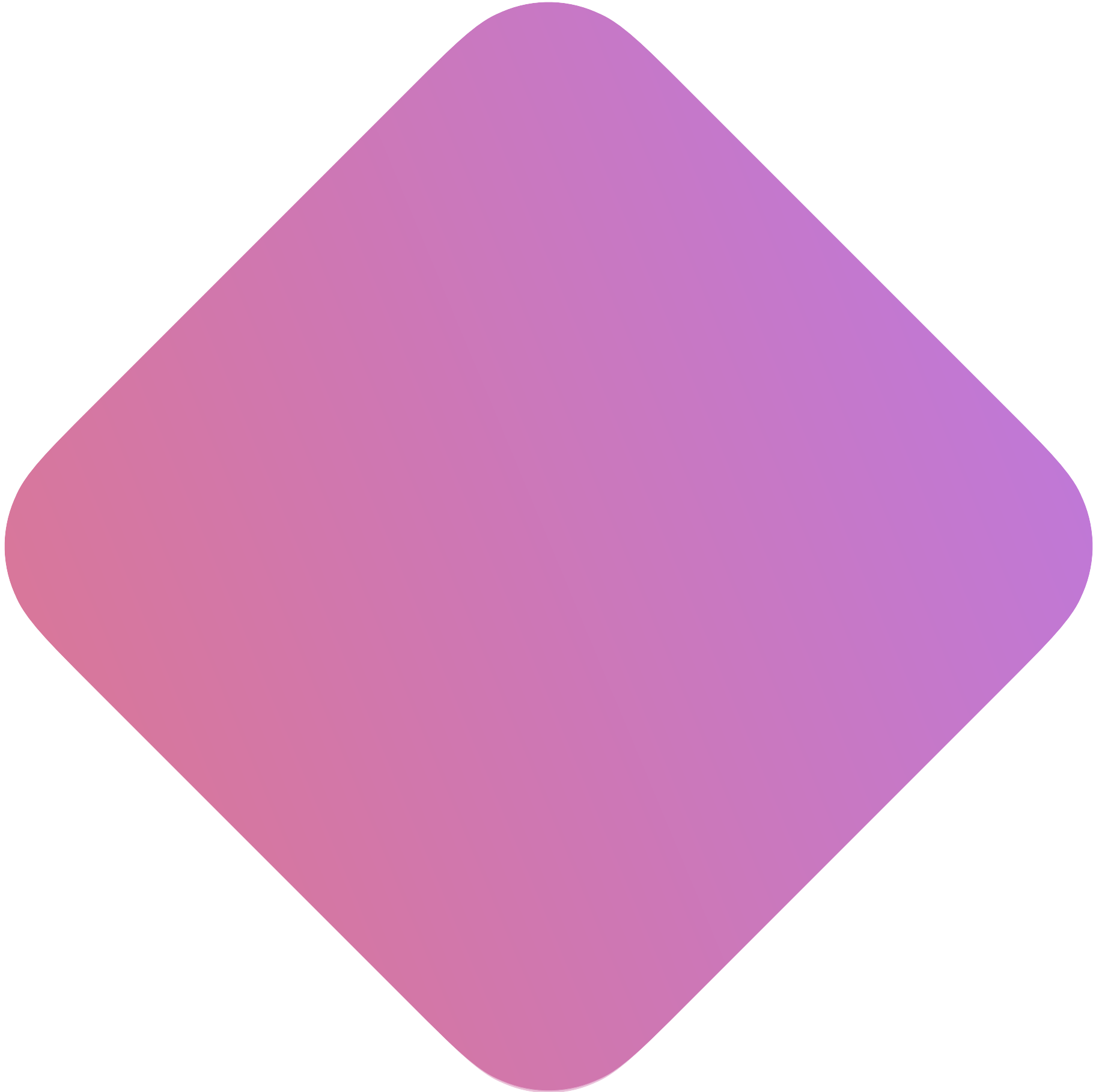
# WHAT ARE DESIGN TOKENS? STRUCTURE



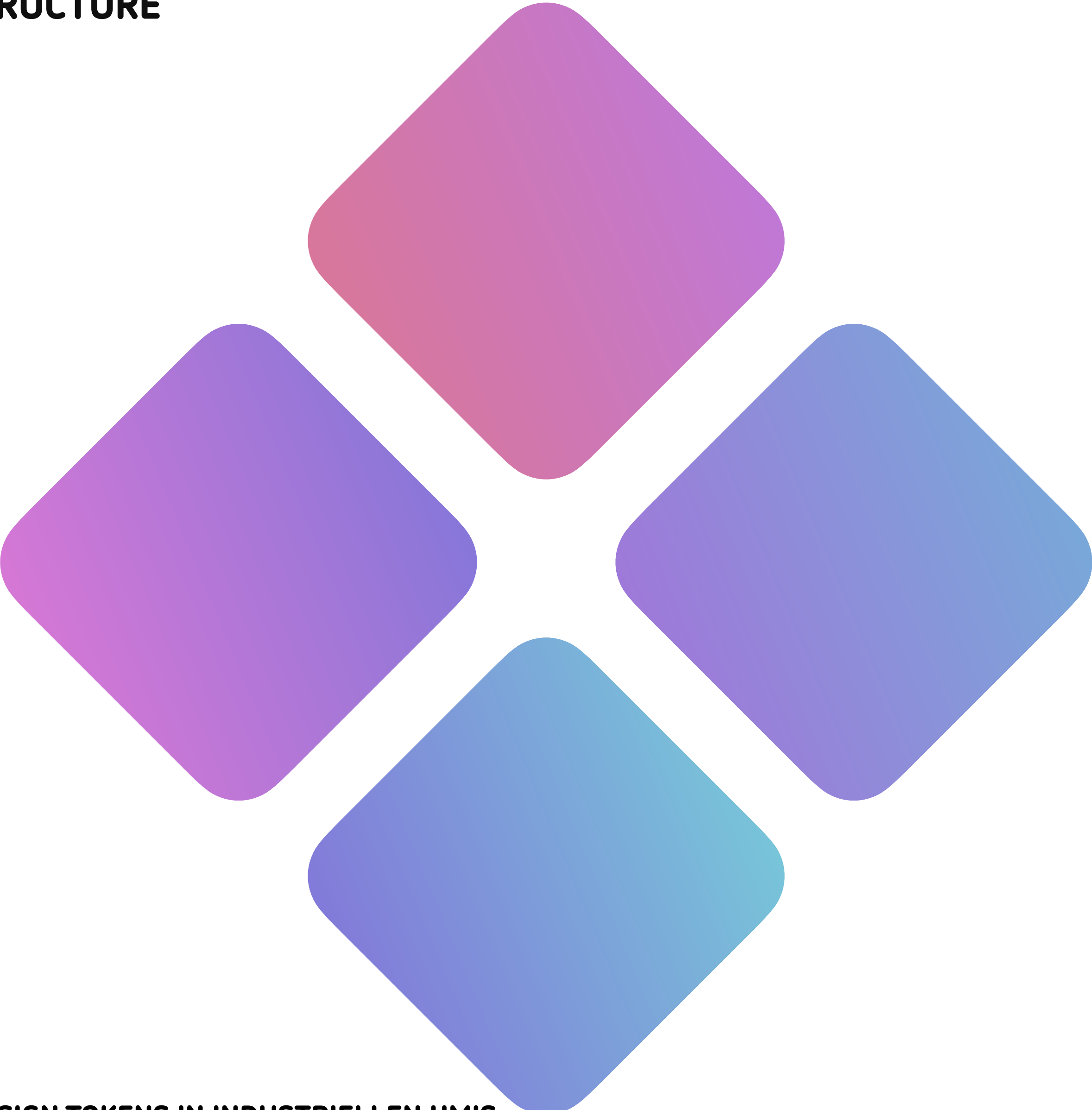
## WHAT ARE DESIGN TOKENS? STRUCTURE



WHAT ARE DESIGN TOKENS? **STRUCTURE**

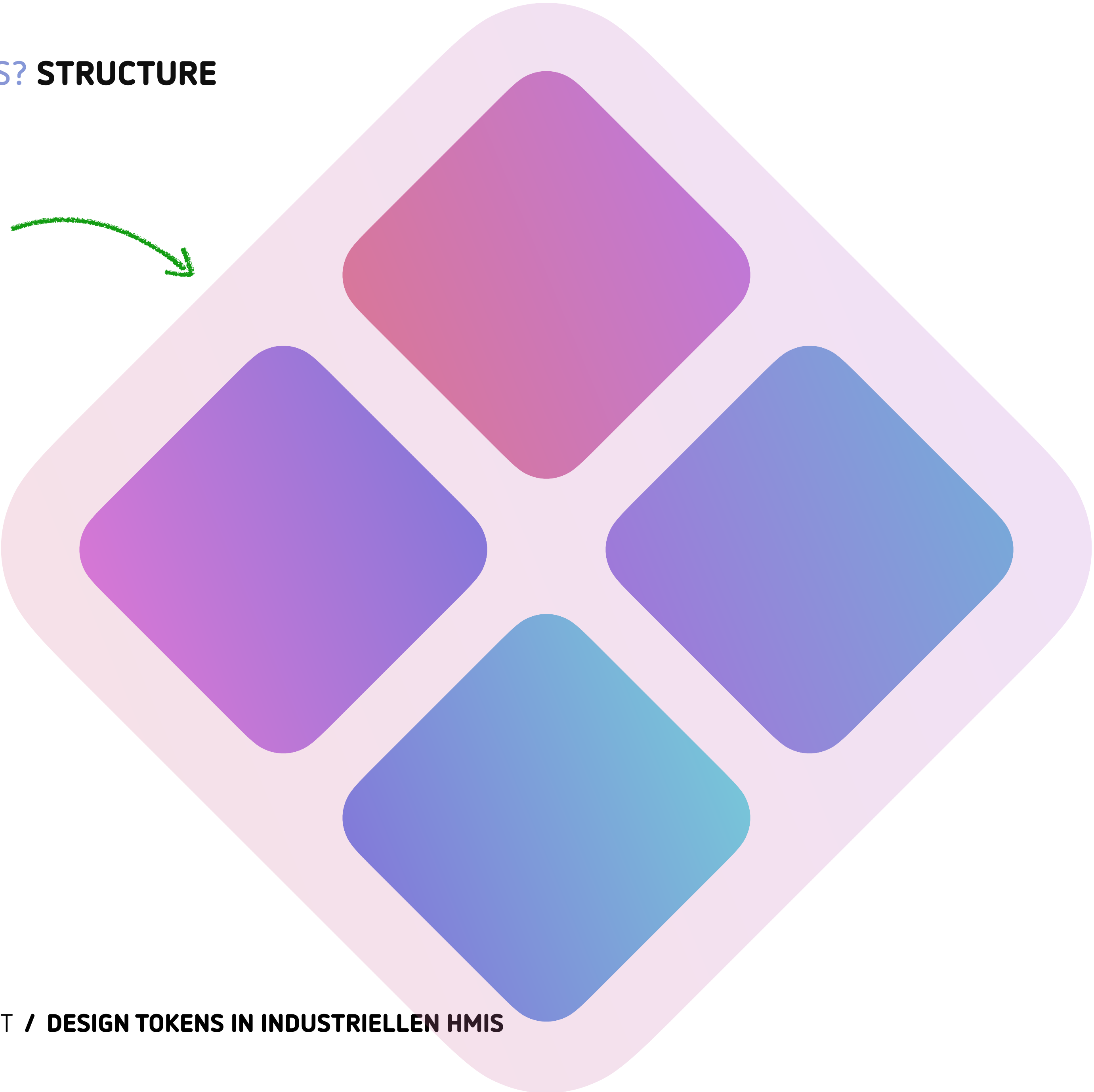


WHAT ARE DESIGN TOKENS? **STRUCTURE**



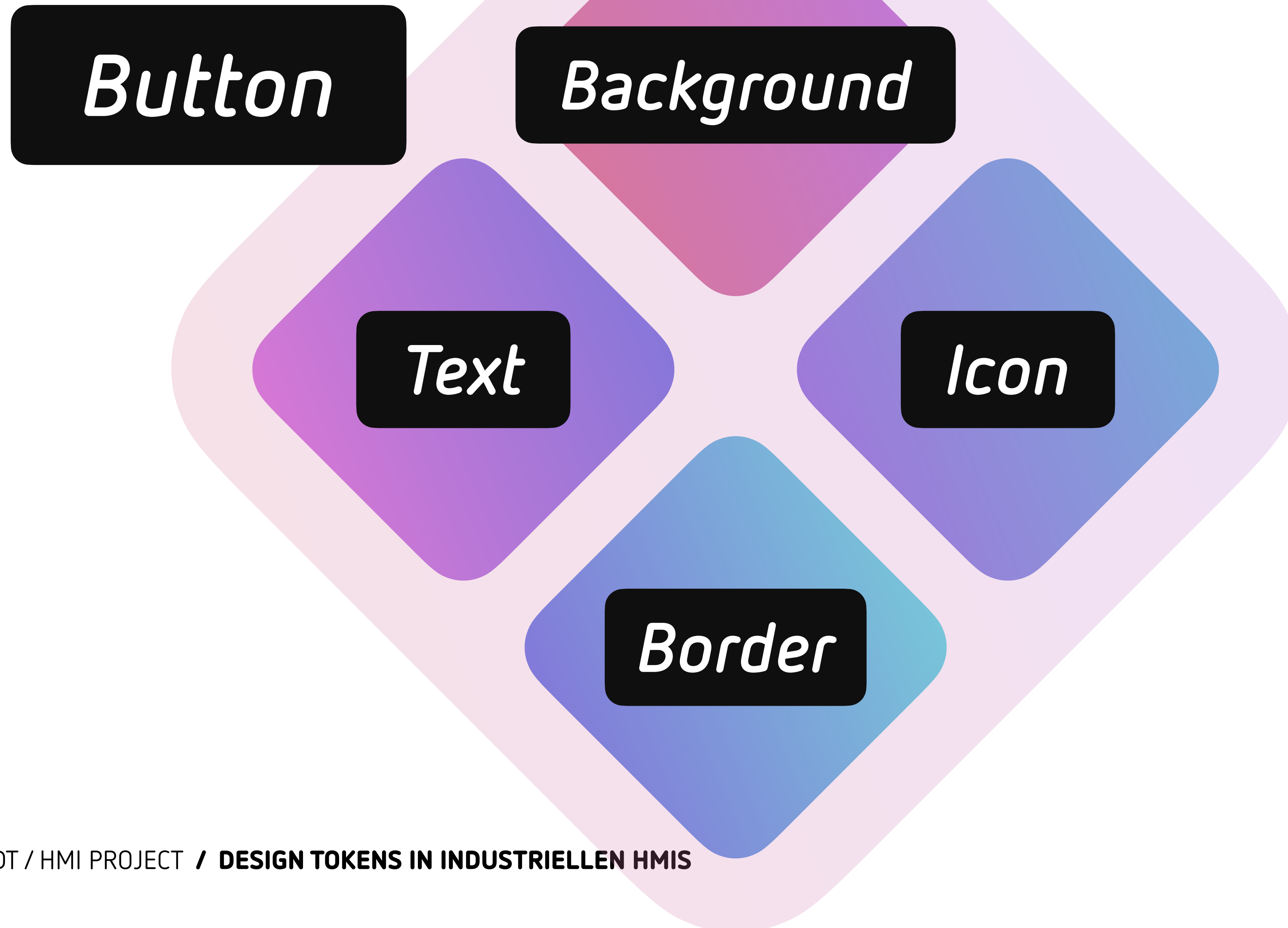
WHAT ARE DESIGN TOKENS? **STRUCTURE**

*Group* →

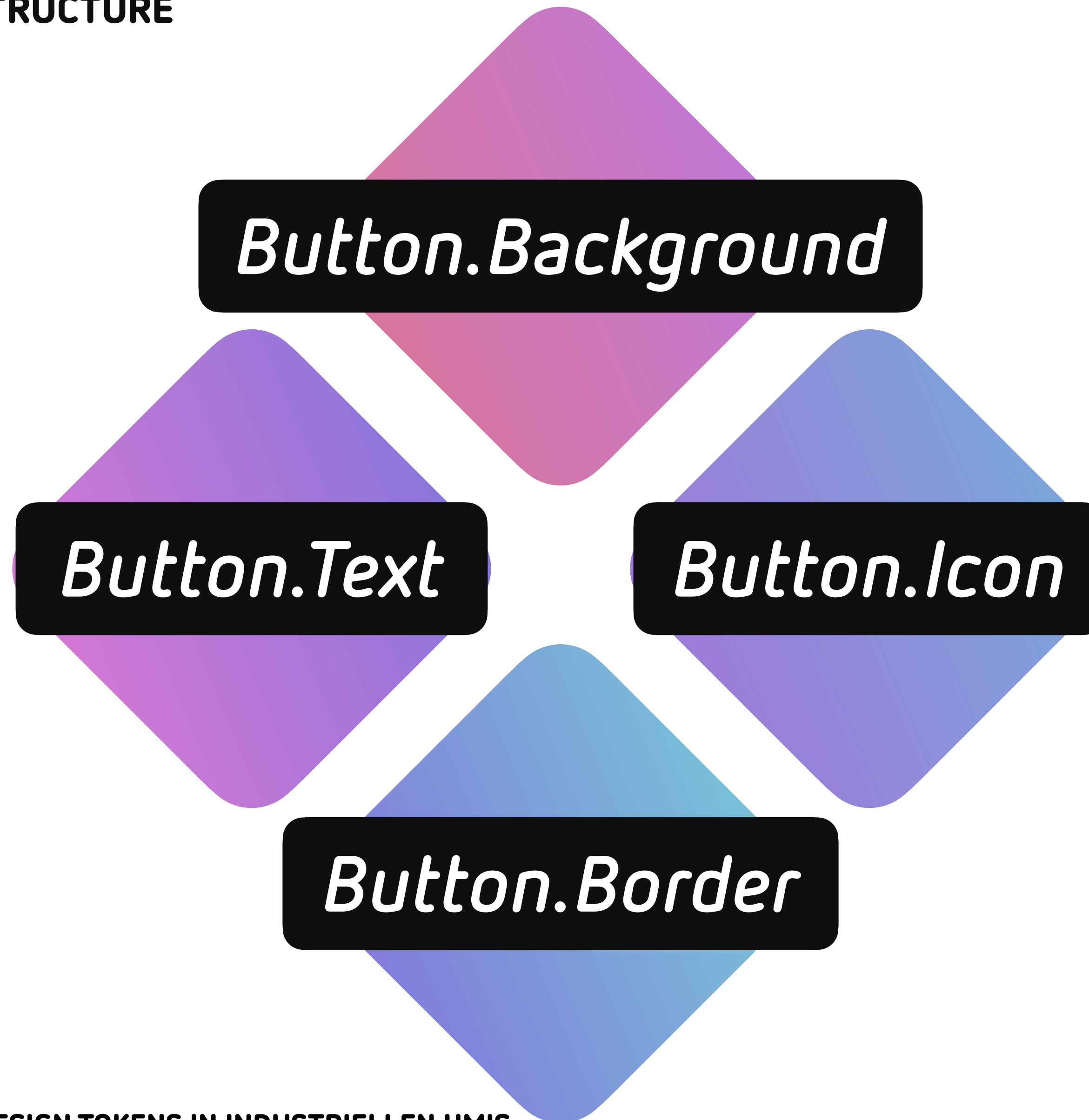




## WHAT ARE DESIGN TOKENS? STRUCTURE



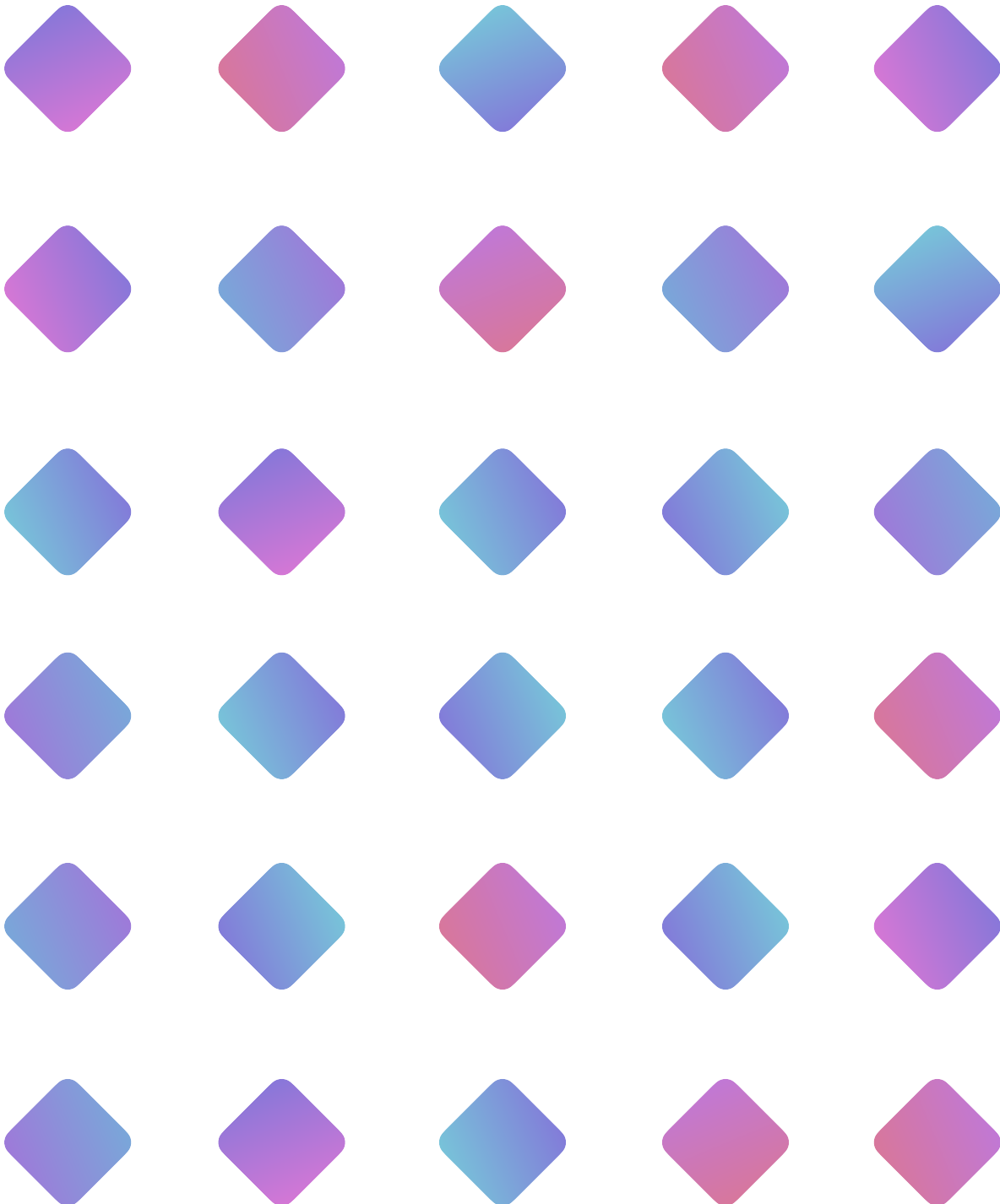
## WHAT ARE DESIGN TOKENS? STRUCTURE



# 1.3

## ORGANIZATION OF TOKENS

WHAT ARE DESIGN TOKENS? ORGANISATION

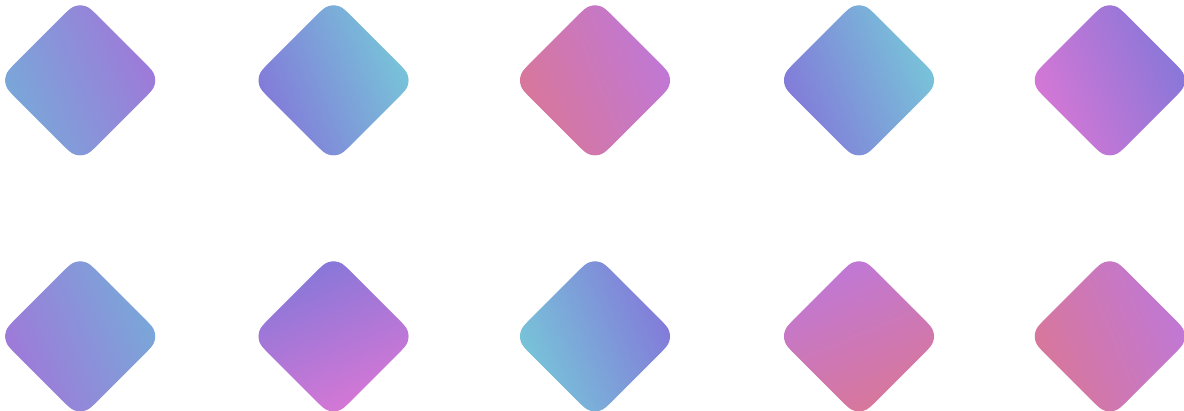


WHAT ARE DESIGN TOKENS? ORGANISATION

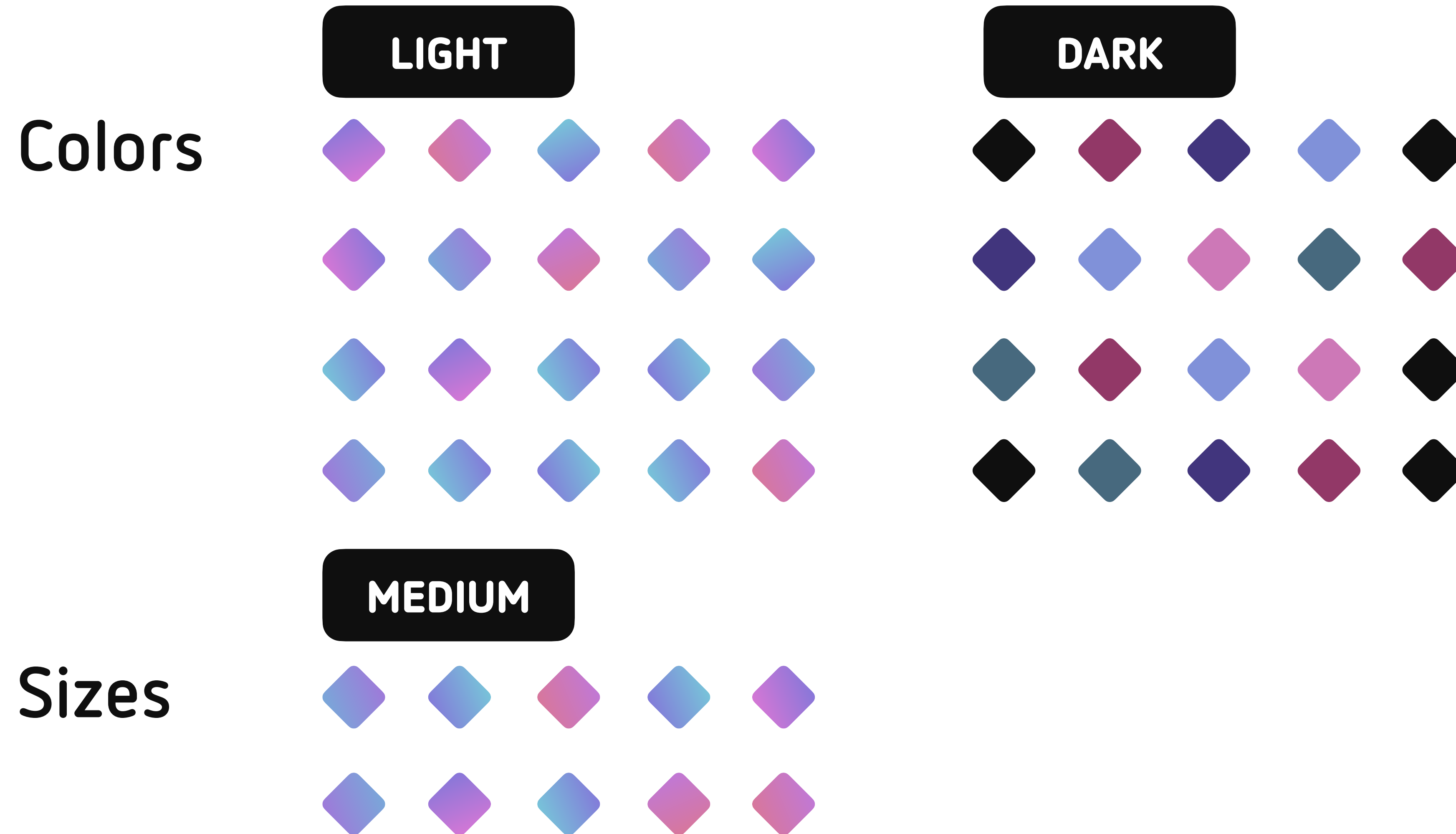
Colors



Sizes



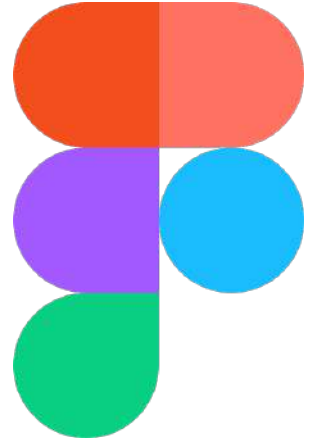
## WHAT ARE DESIGN TOKENS? ORGANISATION



## WHAT ARE DESIGN TOKENS? ORGANISATION

- This division is a question of organization within the design software
- It is not necessarily exported, so it is not always part of the exchange

## WHAT ARE DESIGN TOKENS? ORGANISATION

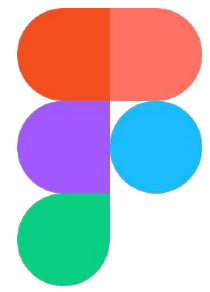


**Figma**

- Collections
- Modes



# WHAT ARE DESIGN TOKENS? ORGANISATION



## Colors

**LIGHT**

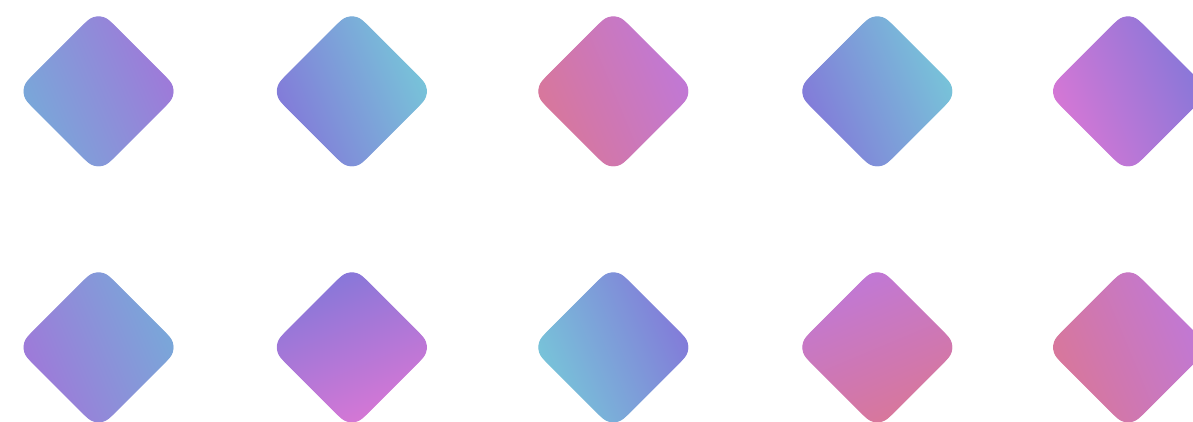


**DARK**

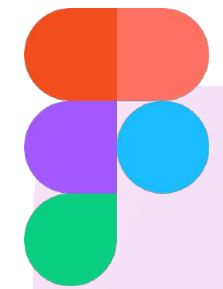


## Sizes

**MEDIUM**

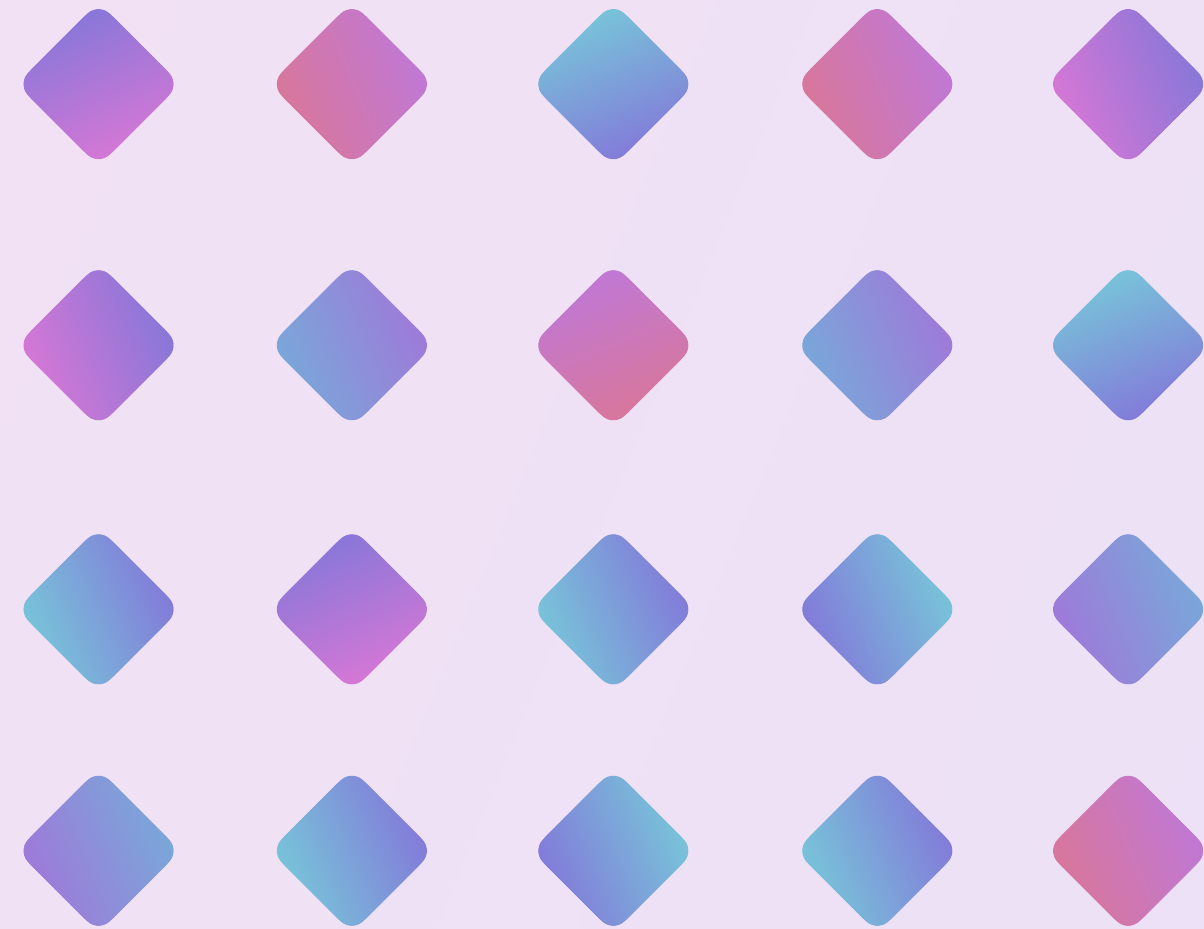


# WHAT ARE DESIGN TOKENS? ORGANISATION

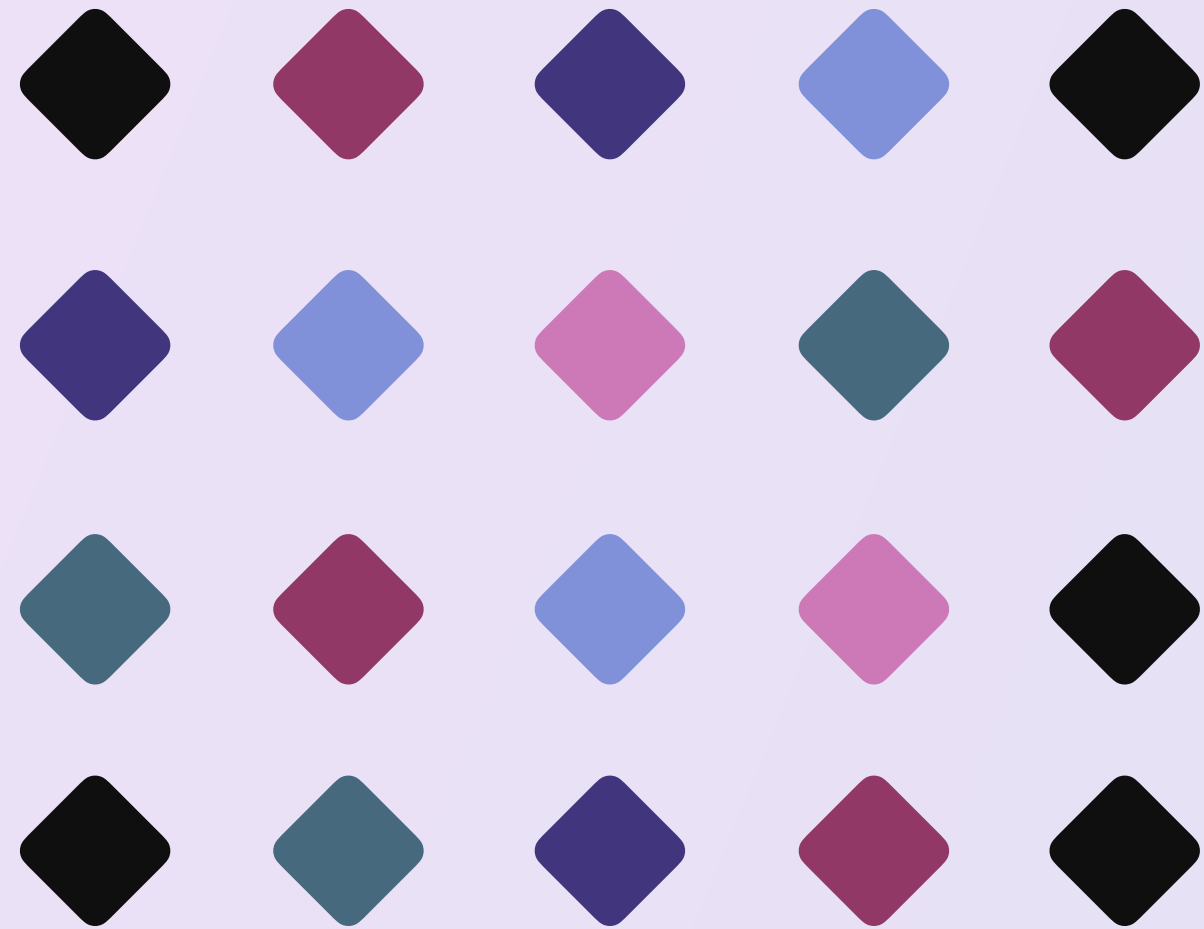


Colors

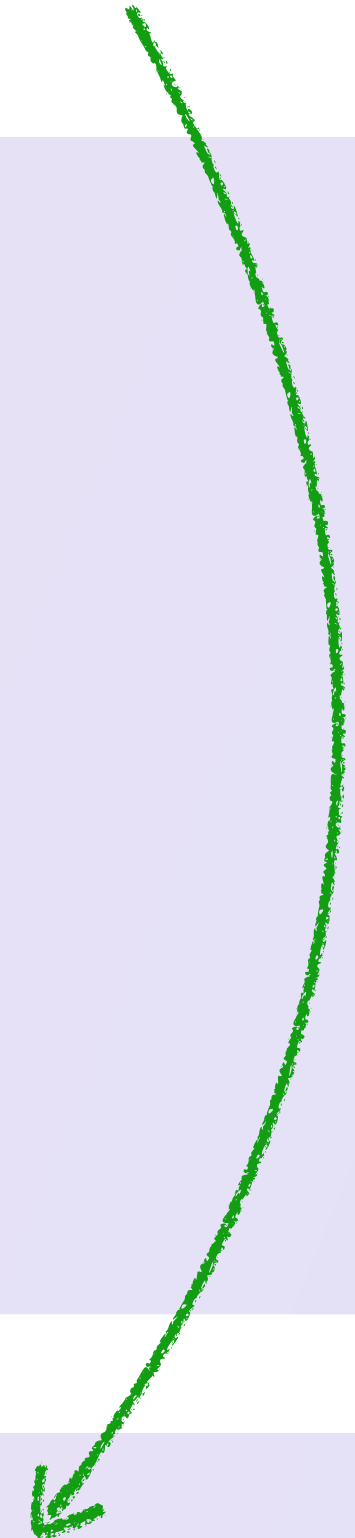
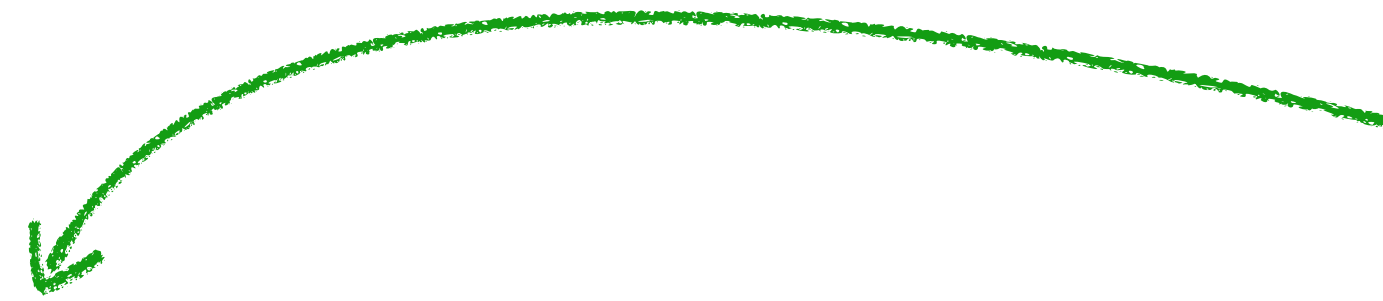
**LIGHT**



**DARK**



*Collections*

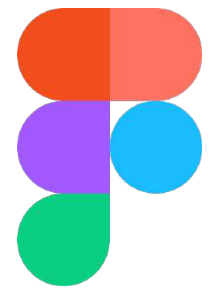


**MEDIUM**

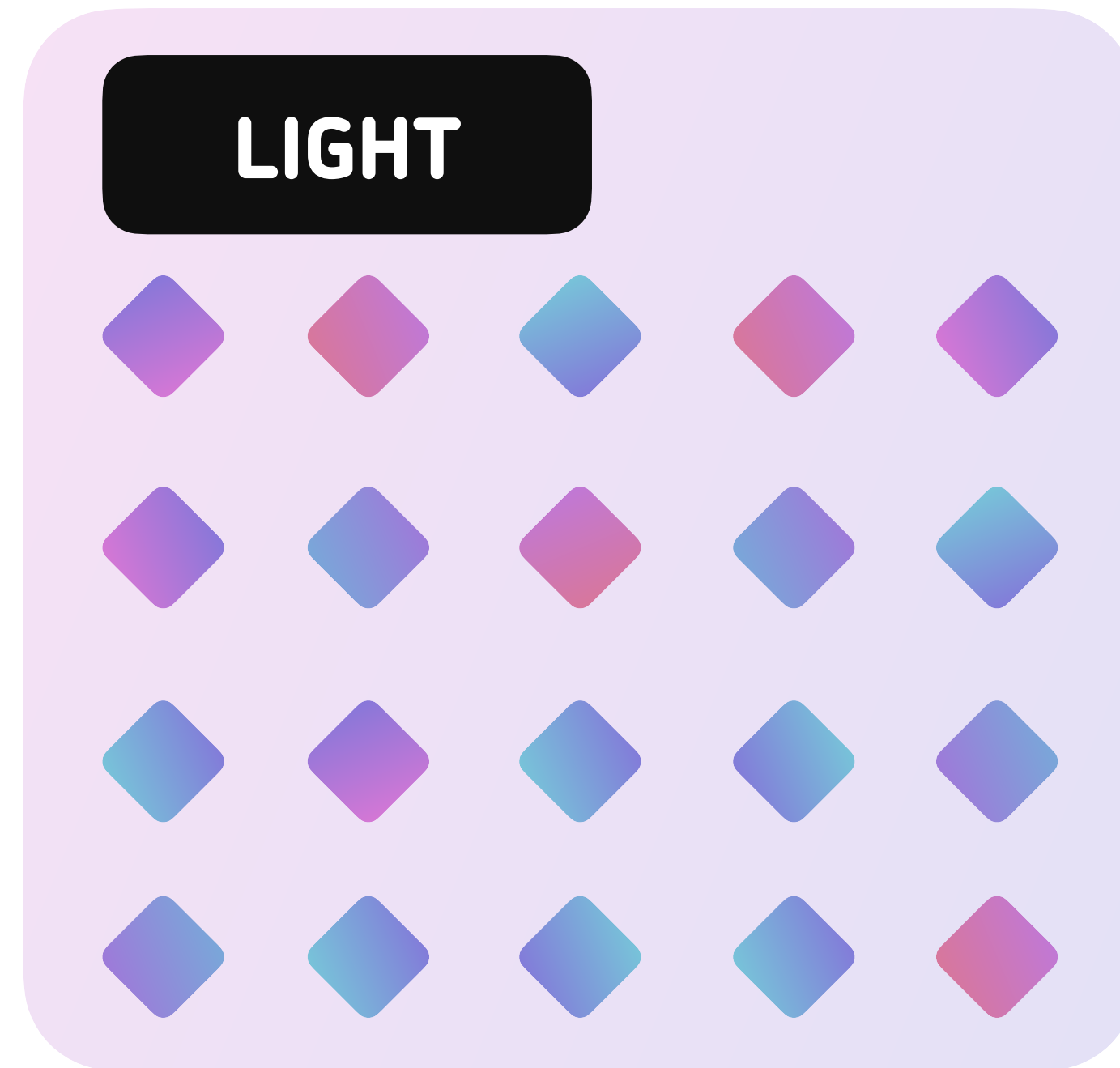
Sizes



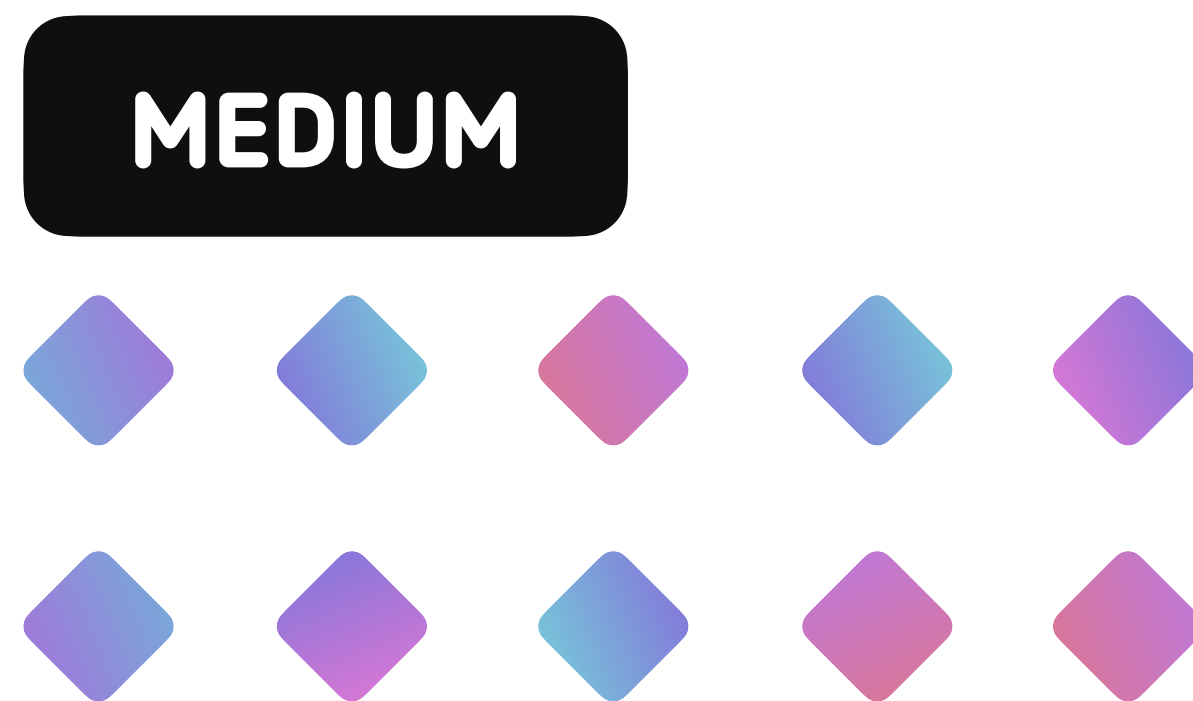
# WHAT ARE DESIGN TOKENS? ORGANISATION



Colors

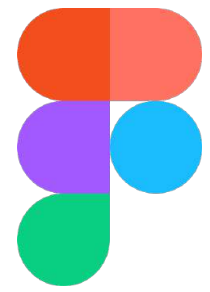


Sizes



*Modes*

# WHAT ARE DESIGN TOKENS? ORGANISATION



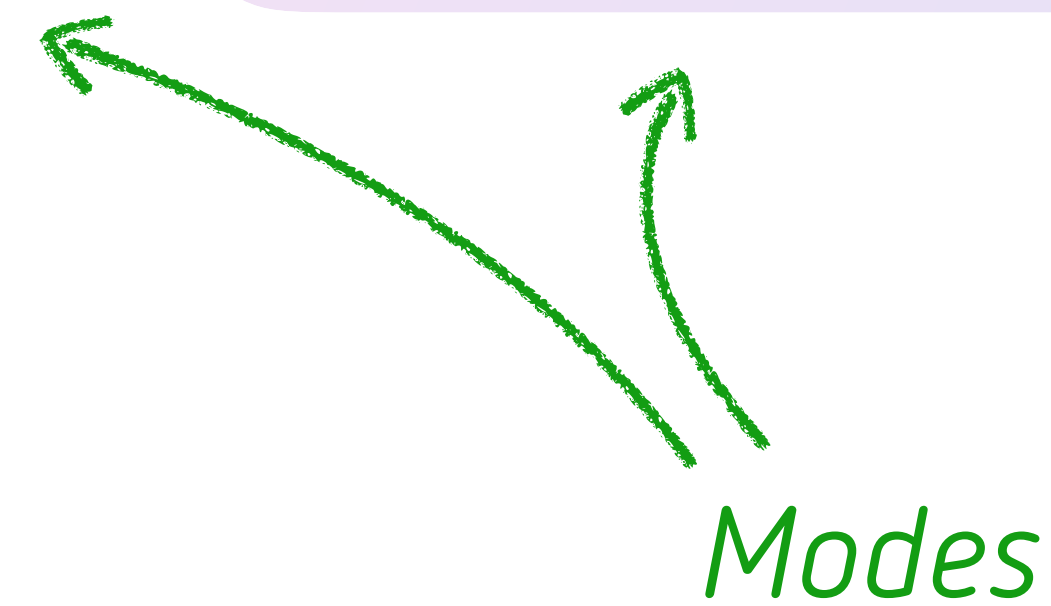
Colors

**LIGHT**

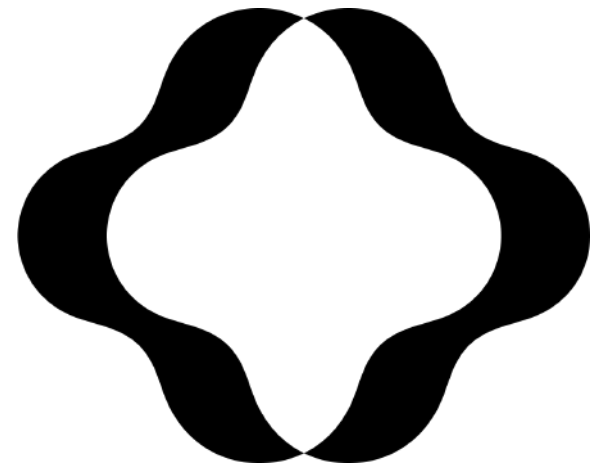
**DARK**

Sizes

**MEDIUM**



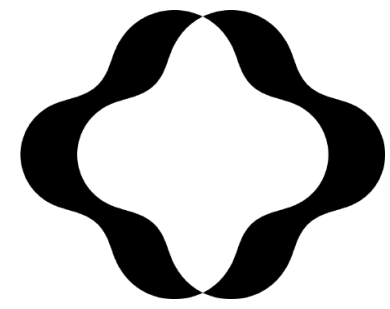
## WHAT ARE DESIGN TOKENS? ORGANISATION



### Tokens Studio

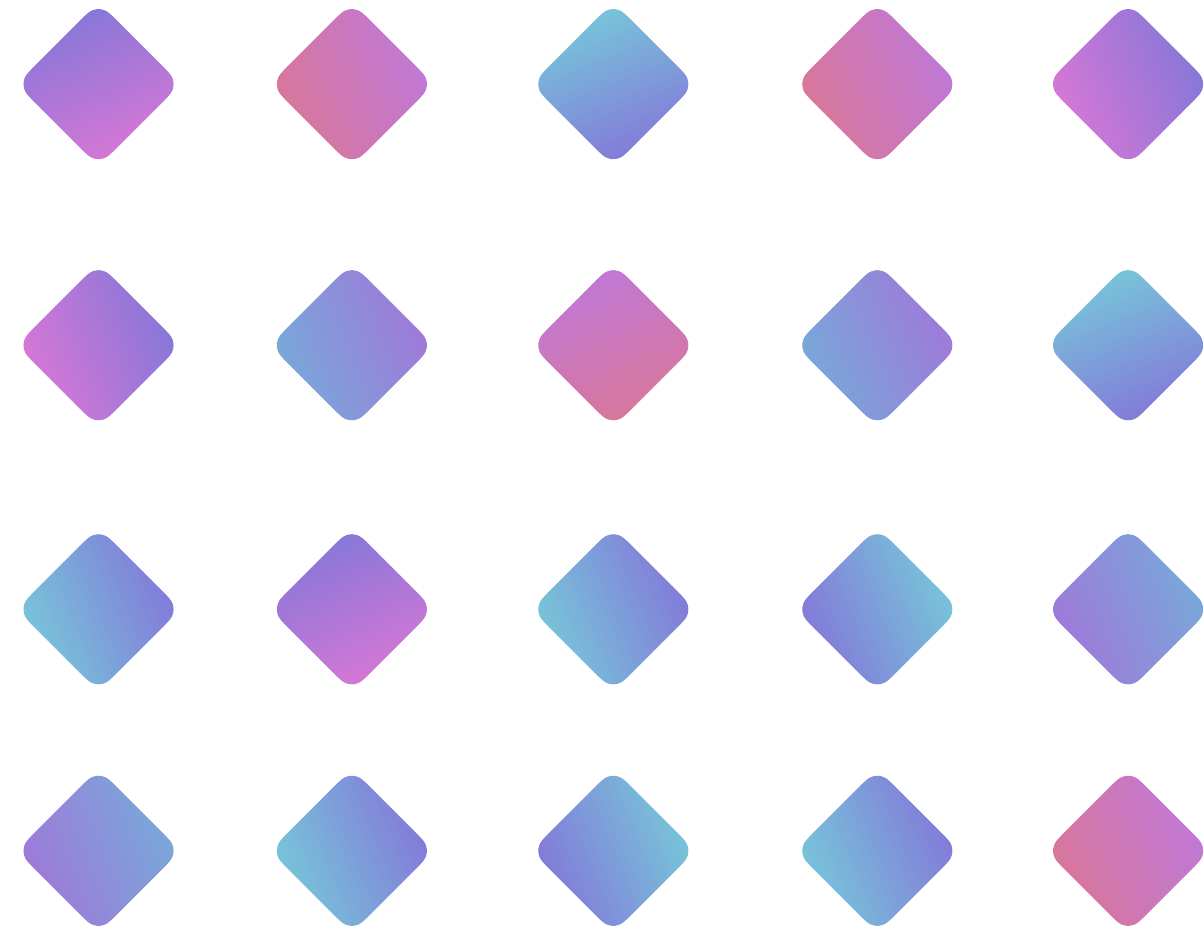
- Sets
- Themes

# WHAT ARE DESIGN TOKENS? ORGANISATION



Colors

**LIGHT**

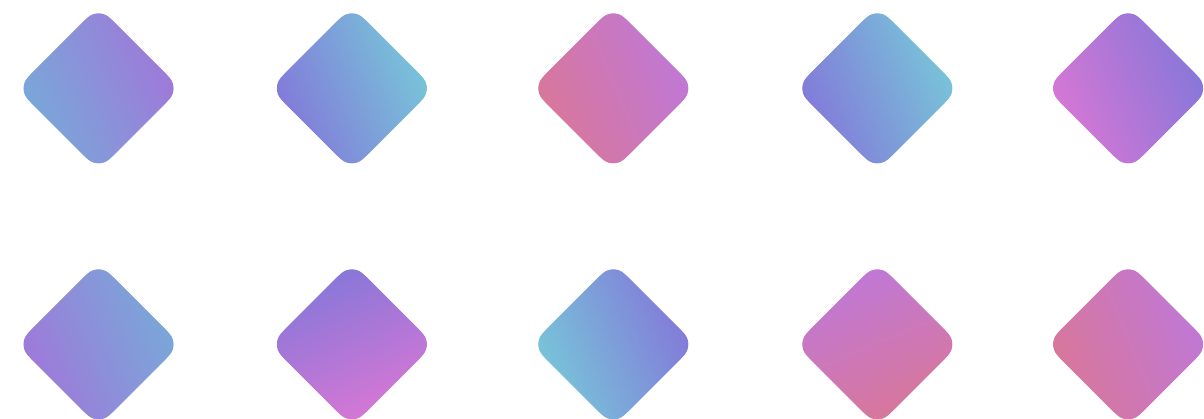


**DARK**

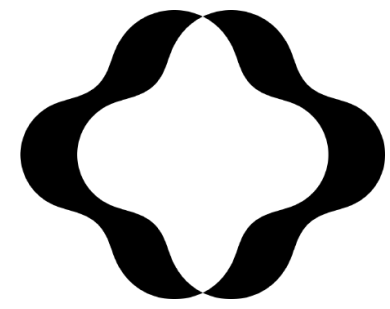


**MEDIUM**

Sizes



WHAT ARE DESIGN TOKENS? ORGANISATION



Colors

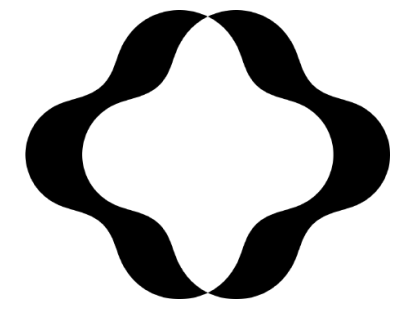
**LIGHT**

**MEDIUM**

*Sets*

**DARK**

# WHAT ARE DESIGN TOKENS? ORGANISATION

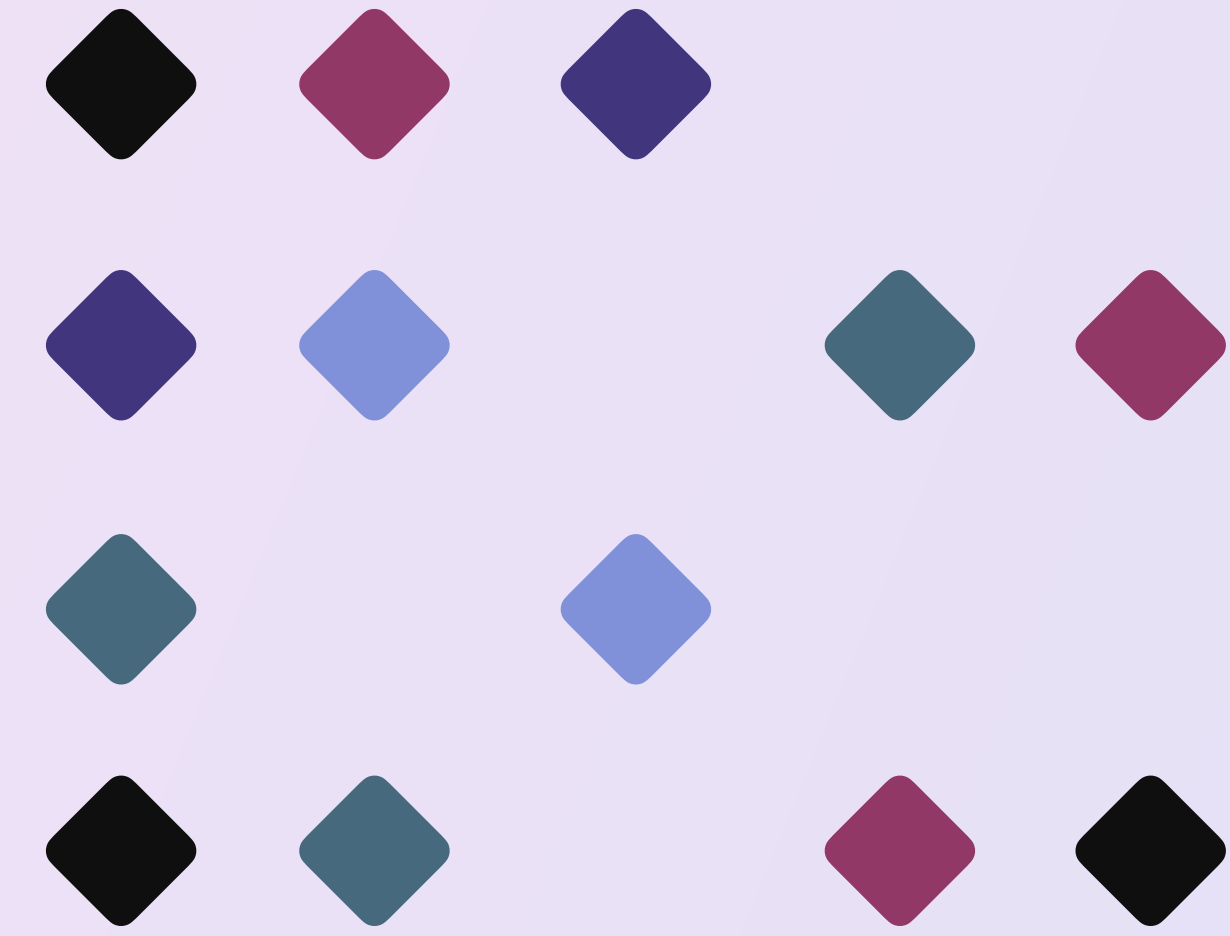


Colors

**LIGHT**

**DARK**

*Theme*



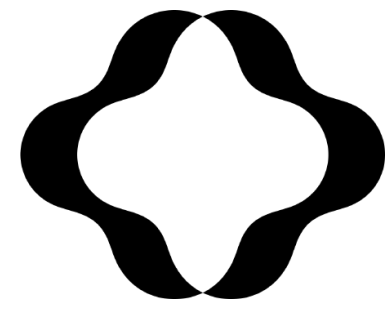
**MEDIUM**

Sizes





WHAT ARE DESIGN TOKENS? ORGANISATION



Colors

LIGHT



DARK



Theme

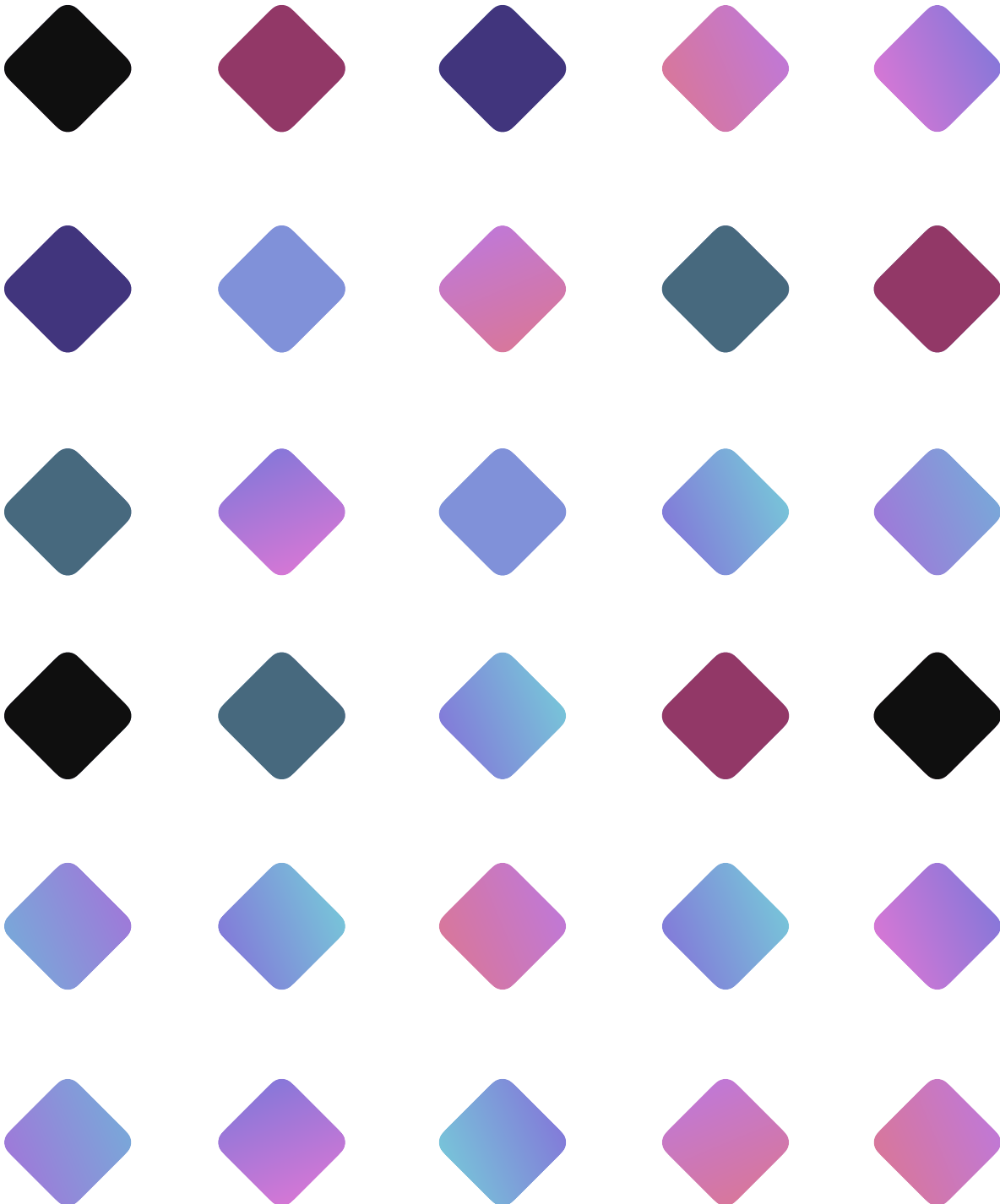
MEDIUM



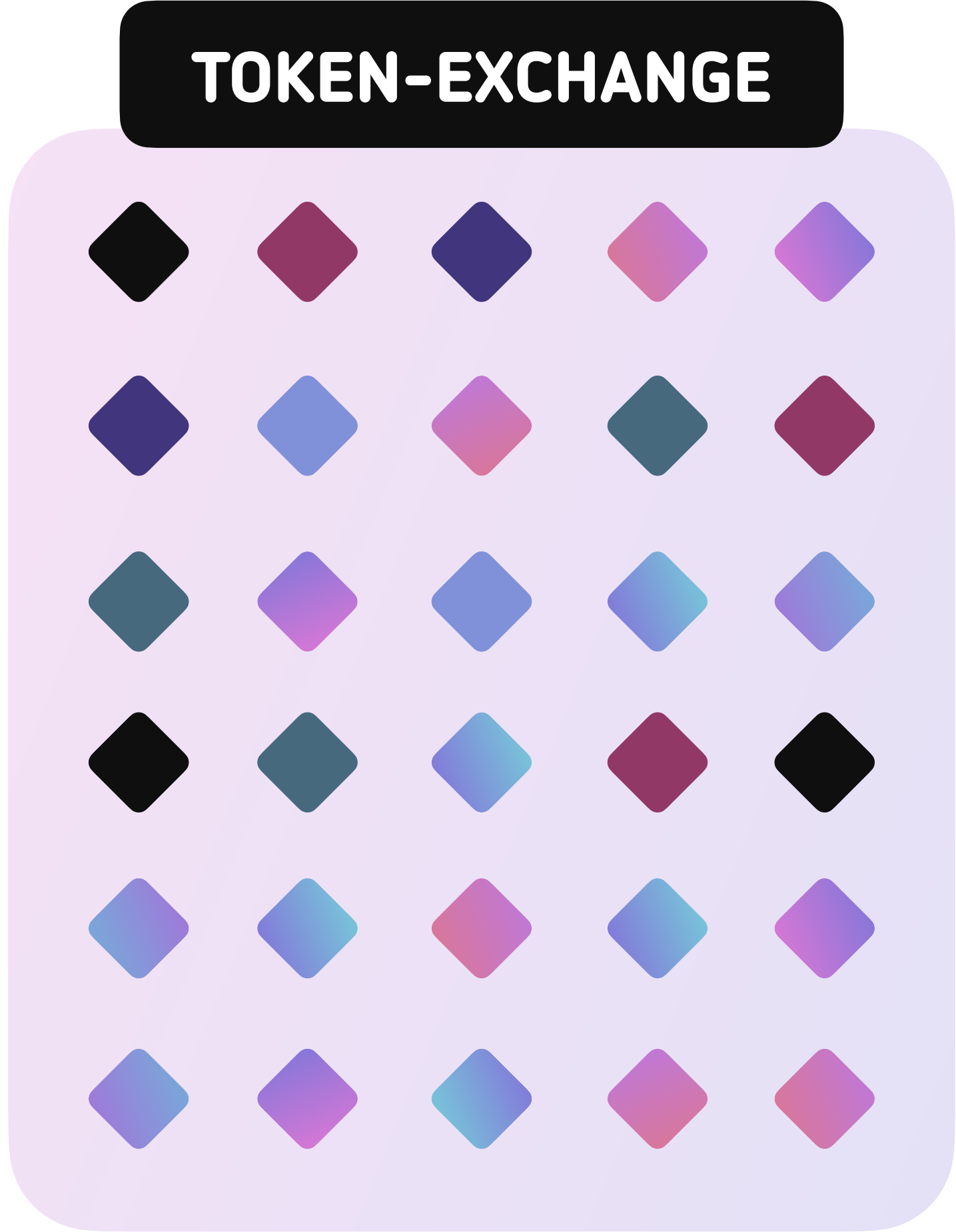
Sizes



WHAT ARE DESIGN TOKENS? ORGANISATION



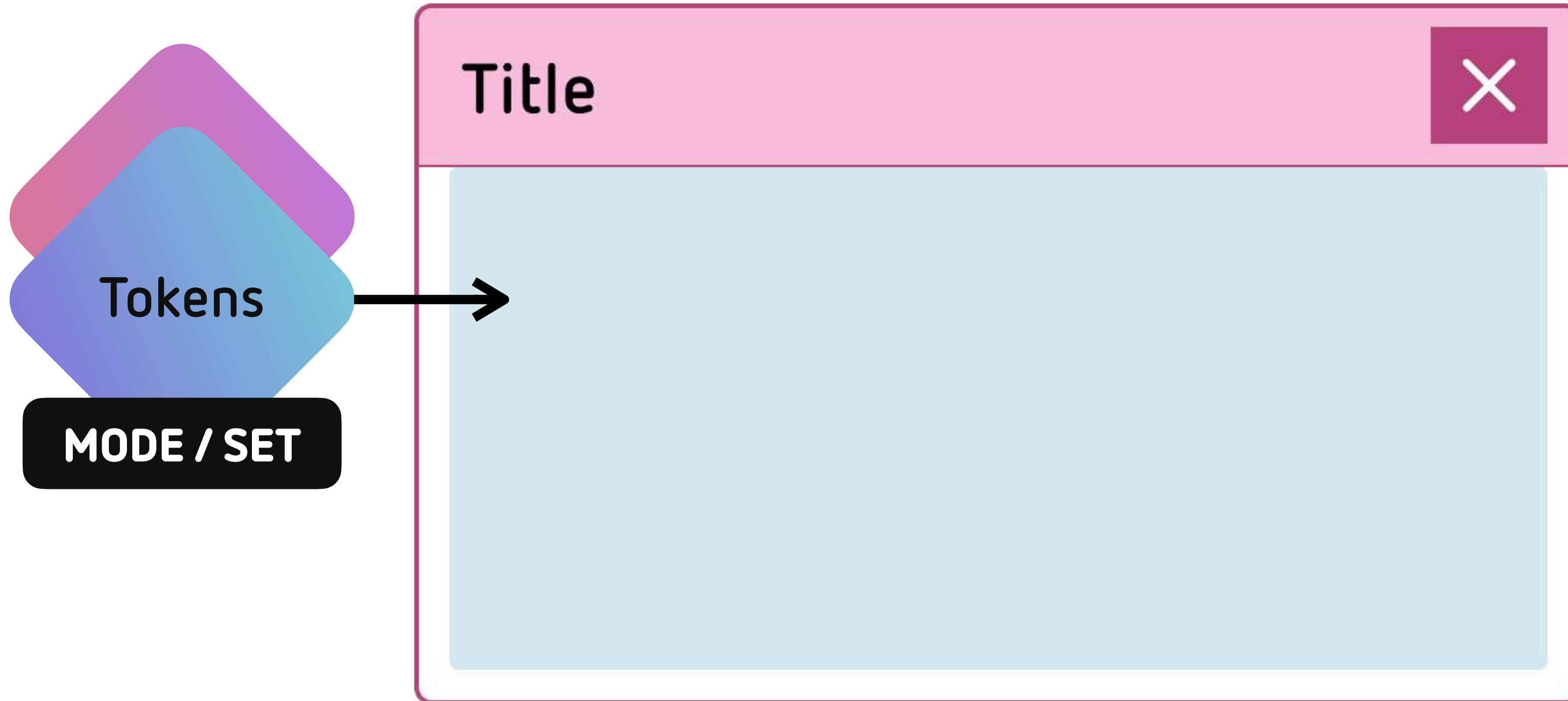
WHAT ARE DESIGN TOKENS? ORGANISATION



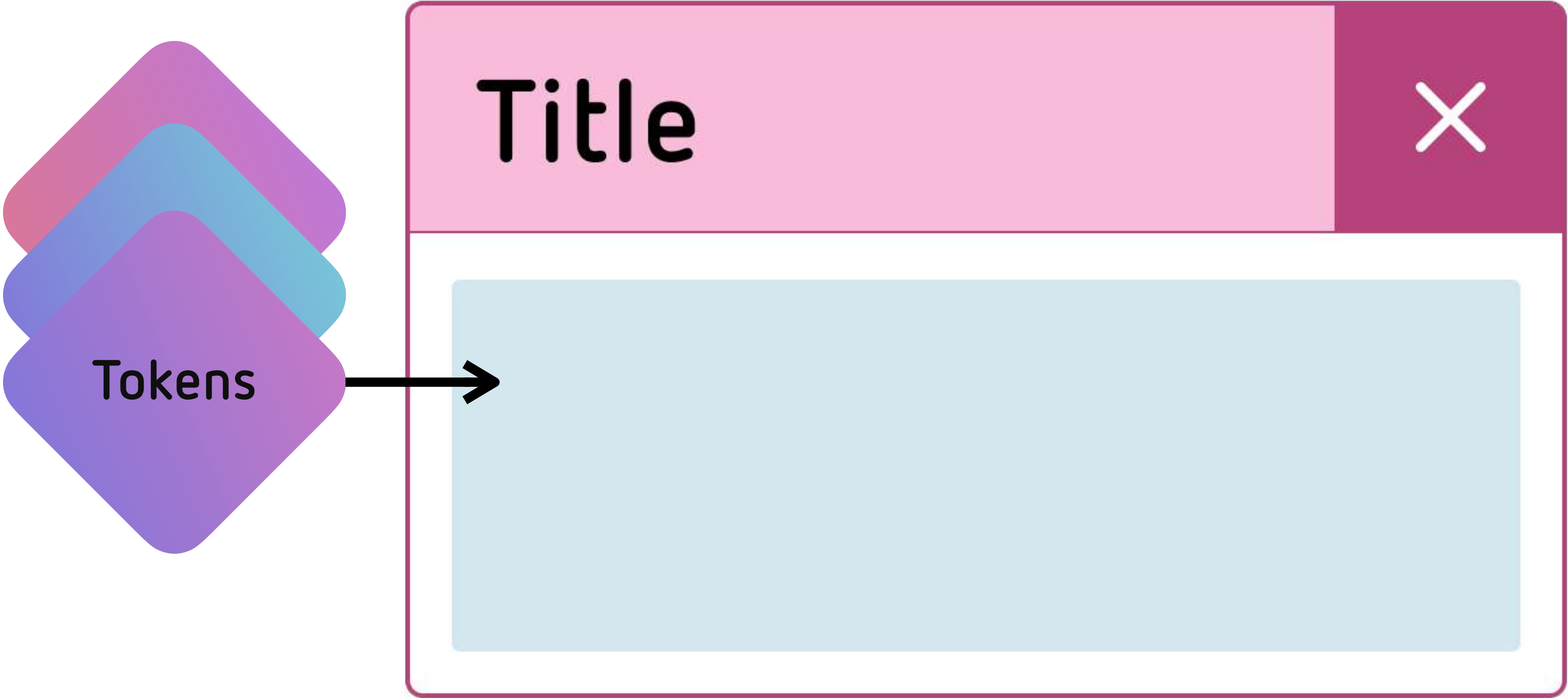
WHAT ARE DESIGN TOKENS? ORGANISATION



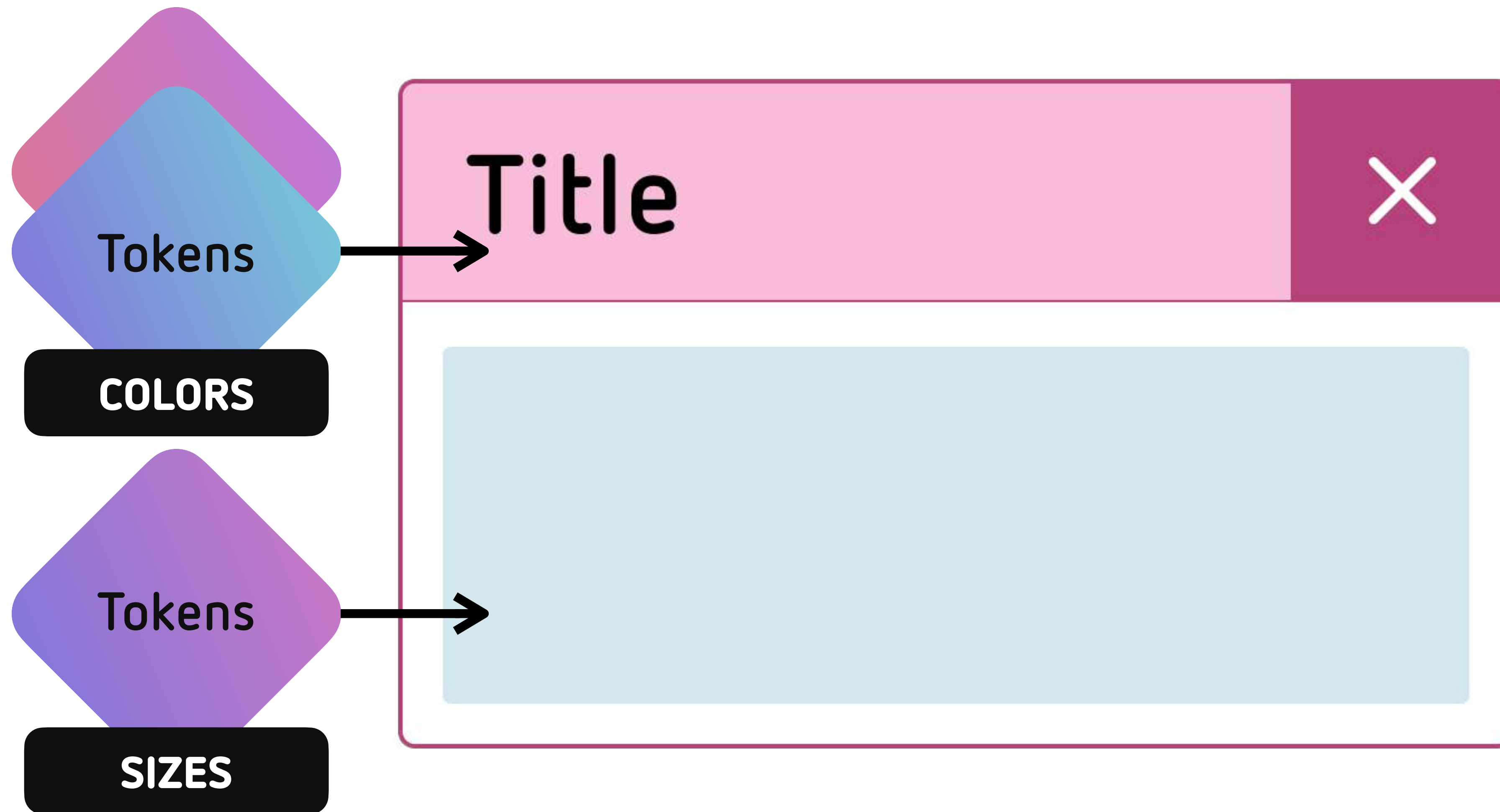
## WHAT ARE DESIGN TOKENS? ORGANISATION



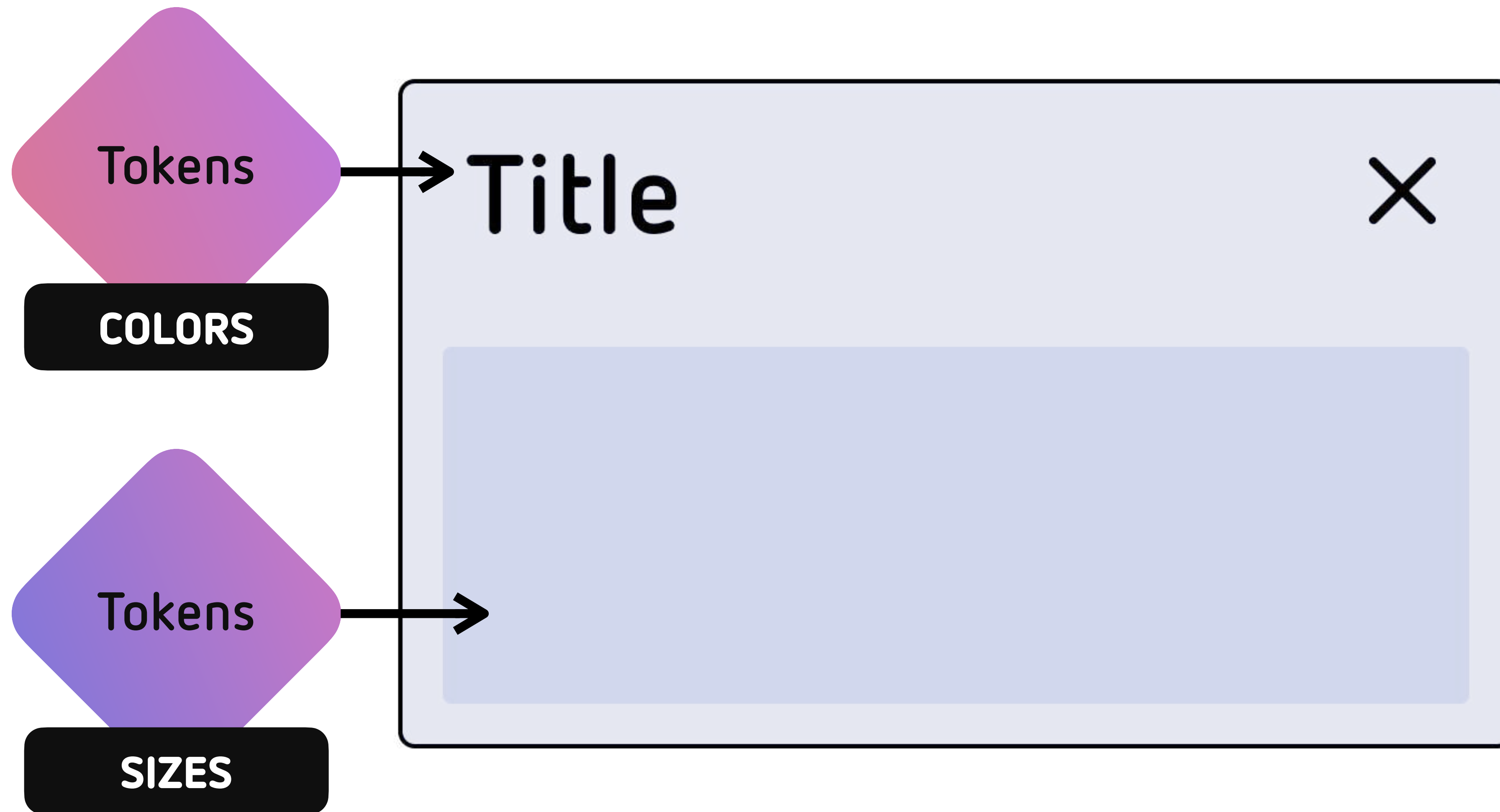
WHAT ARE DESIGN TOKENS? ORGANISATION



## WHAT ARE DESIGN TOKENS? ORGANISATION



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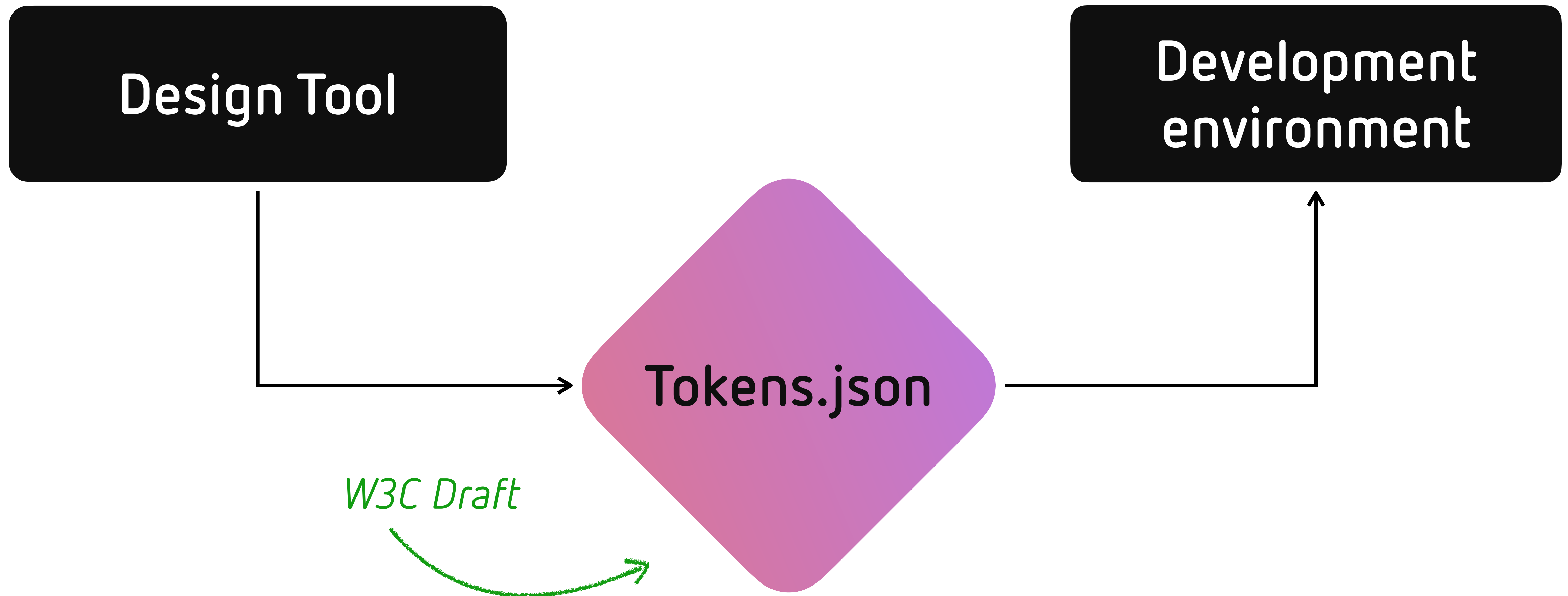




# 1.4

## HOW DO THEY WORK TECHNICALLY?

## WHAT ARE DESIGN TOKENS? TECHNOLOGY



# WHAT ARE DESIGN TOKENS? TECHNOLOGY

The image shows a design tool interface for a design system. The browser tab is titled "HELIO Design System BASE COM".

**Left Sidebar:**

- HELIO Design System BASE COMPONENTS
- HELIO Design System
- File Assets
- Pages
  - 2 - Data Entry / Radiobutton
  - 2 - Data Entry / Checkbox
  - 2 - Data Entry / Switch
  - 2 - Data Entry / Dropdown
  - 2 - Data Entry / Combobox
  - 2 - Data Entry / Chip Group
  - 2 - Data Entry / Selection Menu
  - 2 - Data Entry / Axis Button
- 3 - Data Output / Basics
- 3 - Data Output / Numeric Output**
- 3 - Data Output / Text Output
- 3 - Data Output / Multiline Text Output
- 3 - Data Output / Status Indicator

**Main Canvas:**

- Level 2
- Components
- Main Component
- Level 2 / Numeric Output Feature

The main component is a grid of four "Text Output" components, each with a value of "0.00 unit" and the text "Additional Description".

- Top-left: Green background, green checkmark icon.
- Top-right: Green background, black checkmark icon.
- Bottom-left: White background, orange exclamation mark icon.
- Bottom-right: Orange background, black exclamation mark icon.

**Right Panel (Properties):**

- Design Prototype 75%
- Auto layout: W Fill, H 40, padding (8), margin (16), gap (16), clip content.
- Appearance: 100% opacity, 0 degrees.
- Fill: Contextual/Universal Con...
- Stroke: Contextual/Universal Con..., Inside, 0.

# WHAT ARE DESIGN TOKENS? TECHNOLOGY

The image shows a design tool interface with a central workspace displaying a dashboard design titled "LunarLight - Dashboard - Panel Screen". The dashboard includes a production gauge showing "94.2" and a temperature line graph. On the left is a sidebar with navigation options like "File", "Assets", "Pages", and "Themes". On the right is a control panel with "Design" and "Prototype" modes, a "Share" button, and a "Local variables" section.

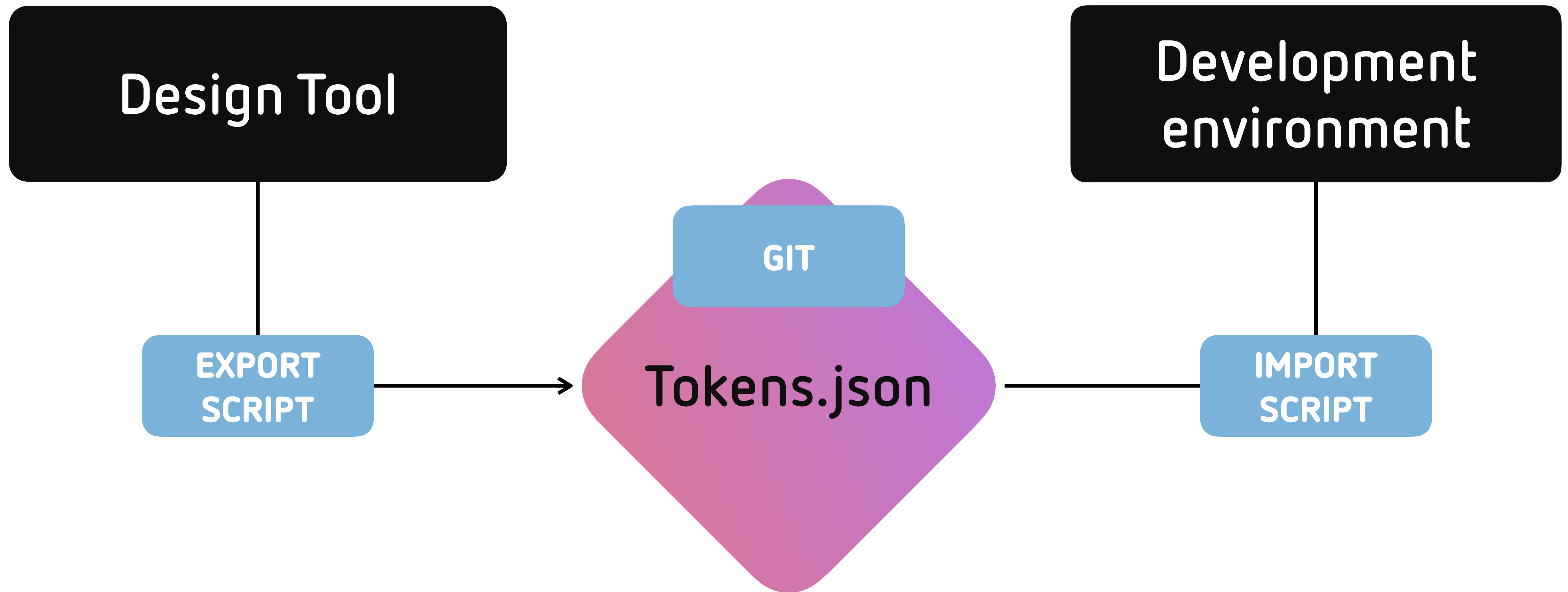
In the foreground, a "Themes" panel is open, displaying a table of design tokens for four themes: LunarLight, LunarDark, OrbitLight, and OrbitDark. The table lists various tokens such as Background, Text, FontWeight, and BorderColor, each with a visual representation and a corresponding value.

Name	LunarLight	LunarDark	OrbitLight	OrbitDark
Background	Immutables/White	Immutables/Black	Immutables/White	Grey/30
BackgroundHover	Neutral Light/200	Neutral Dark/900	Grey/90	Grey/40
BackgroundActive	Subtle Primary/100	Subtle Primary/800	Grey/90-hover	Grey/50
Text	Neutral Light/900	Neutral Dark/100	DarkBlue/DarkBlue	Immutables/White
TextSubtle	Neutral Light/600	Neutral Dark/300	Grey/50	Grey/80
FontWeight	FontWeight/Medium	FontWeight/Medium	FontWeight/Medium	FontWeight/Medium
FontWeightSubtle	FontWeight/Regular	FontWeight/Regular	FontWeight/Regular	FontWeight/Regular
BorderColor	Neutral Light/500	Immutables/Undefined	DarkBlue/DarkBlue	Grey/50
BorderWidth	Border/Border Width S	Border/Border Width NONE	Border/Border Width S	Border/Border Width S
BorderStyle	Border/Border Style SOLID	Border/Border Style SOLID	Border/Border Style SOLID	Border/Border Style SOLID
BorderRadiusOutwards	...dary/BorderRadiusOutwz	...dary/BorderRadiusOutwz	...dary/BorderRadiusOutwz	...dary/BorderRadiusOutwz

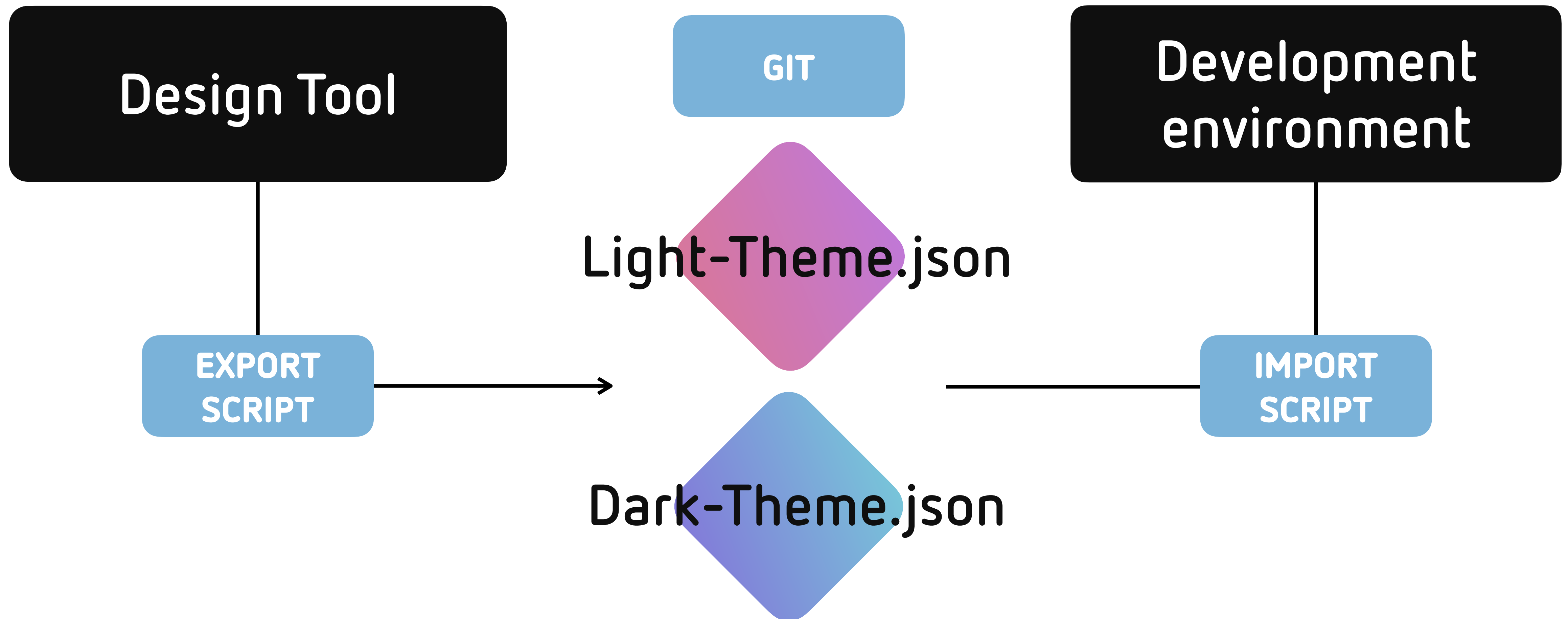
# WHAT ARE DESIGN TOKENS? TECHNOLOGY

```
1 {
2   "themes": {
3     "accentuationBaseFocus": {
4       "$type": "color",
5       "$value": "rgb(1 120 152 )"
6     },
7     "accentuationBaseSelection": {
8       "$type": "color",
9       "$value": "rgb(28 192 237 / 50%)"
10    },
11    "accentuationCriticalActiveEndBoxShadow": {
12      "$type": "shadow",
13      "$value": {
14        "offsetX": "0px",
15        "offsetY": "0px",
16        "blur": "0px",
17        "spread": "8px",
18        "color": "rgb(248 85 101 / 50%)",
19        "inset": false
20      }
21    },
22    "accentuationCriticalActiveStartBoxShadow": {
23      "$type": "shadow",
24      "$value": {
25        "offsetX": "0px",
26        "offsetY": "0px",
27        "blur": "0px",
```

## WHAT ARE DESIGN TOKENS? TECHNOLOGY



## WHAT ARE DESIGN TOKENS? TECHNOLOGY



# 2

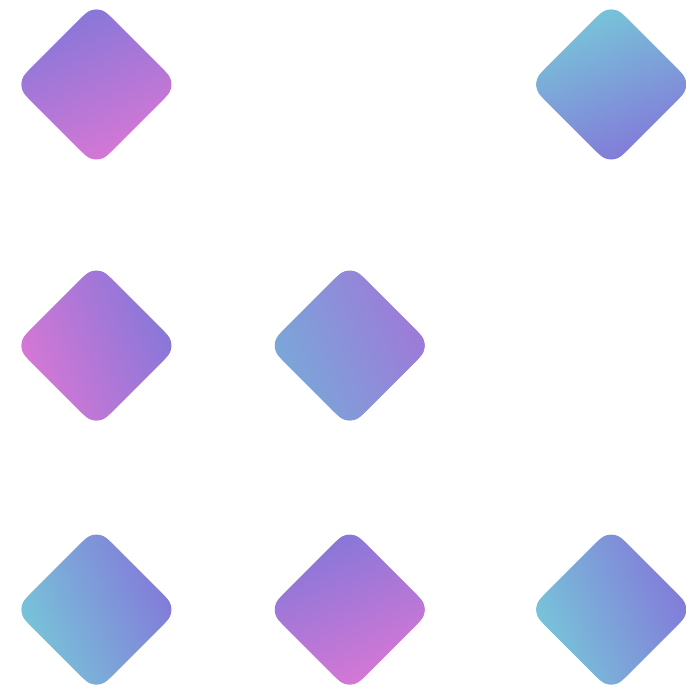
## WORKING WITH TOKENS



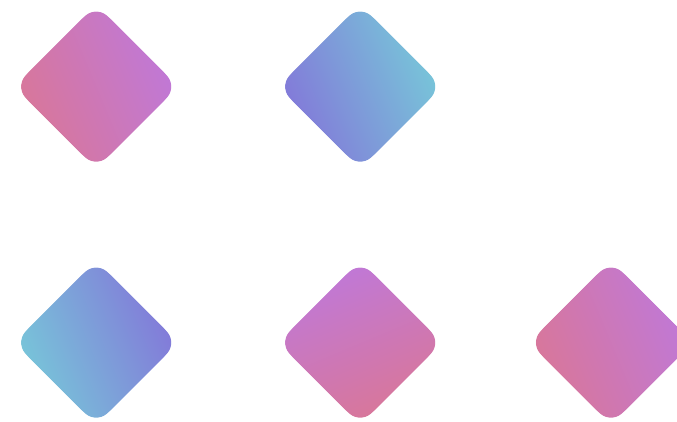
# 2.1

## STRUCTURE OF A TOKEN SYSTEM

WORKING WITH TOKENS **STRUCTURE**



**FARBEN**



**GRÖßEN**



...

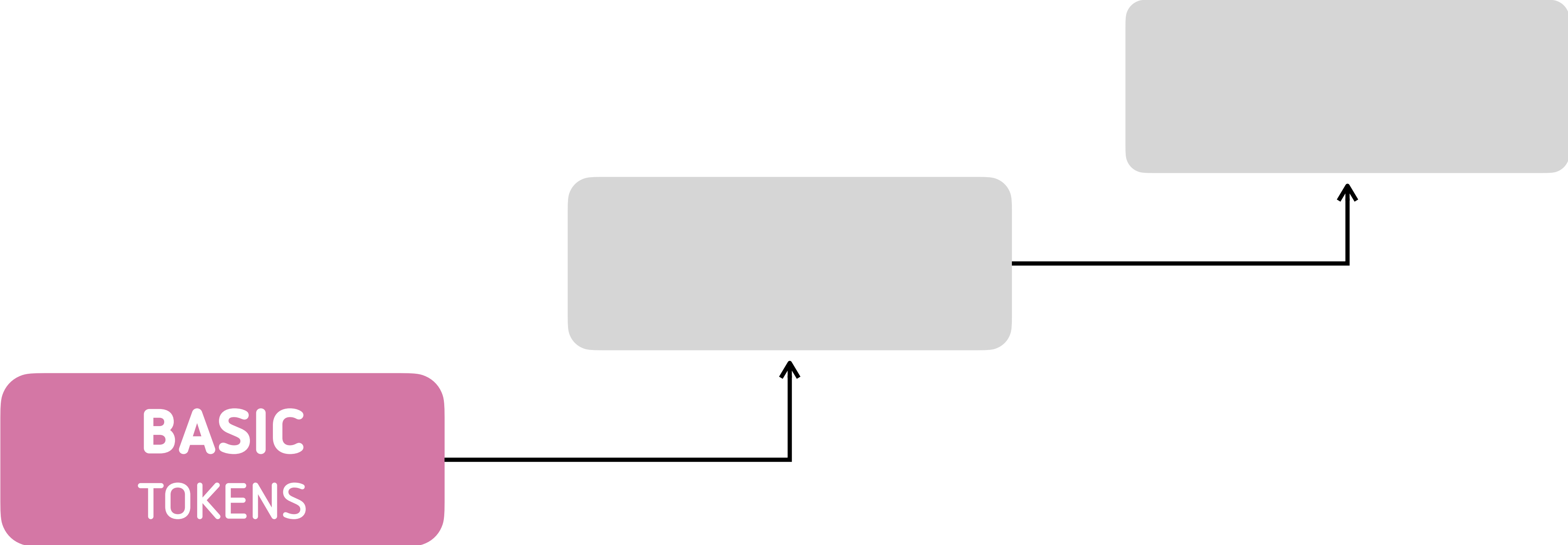


*Thematisch*

WORKING WITH TOKENS **STRUCTURE**

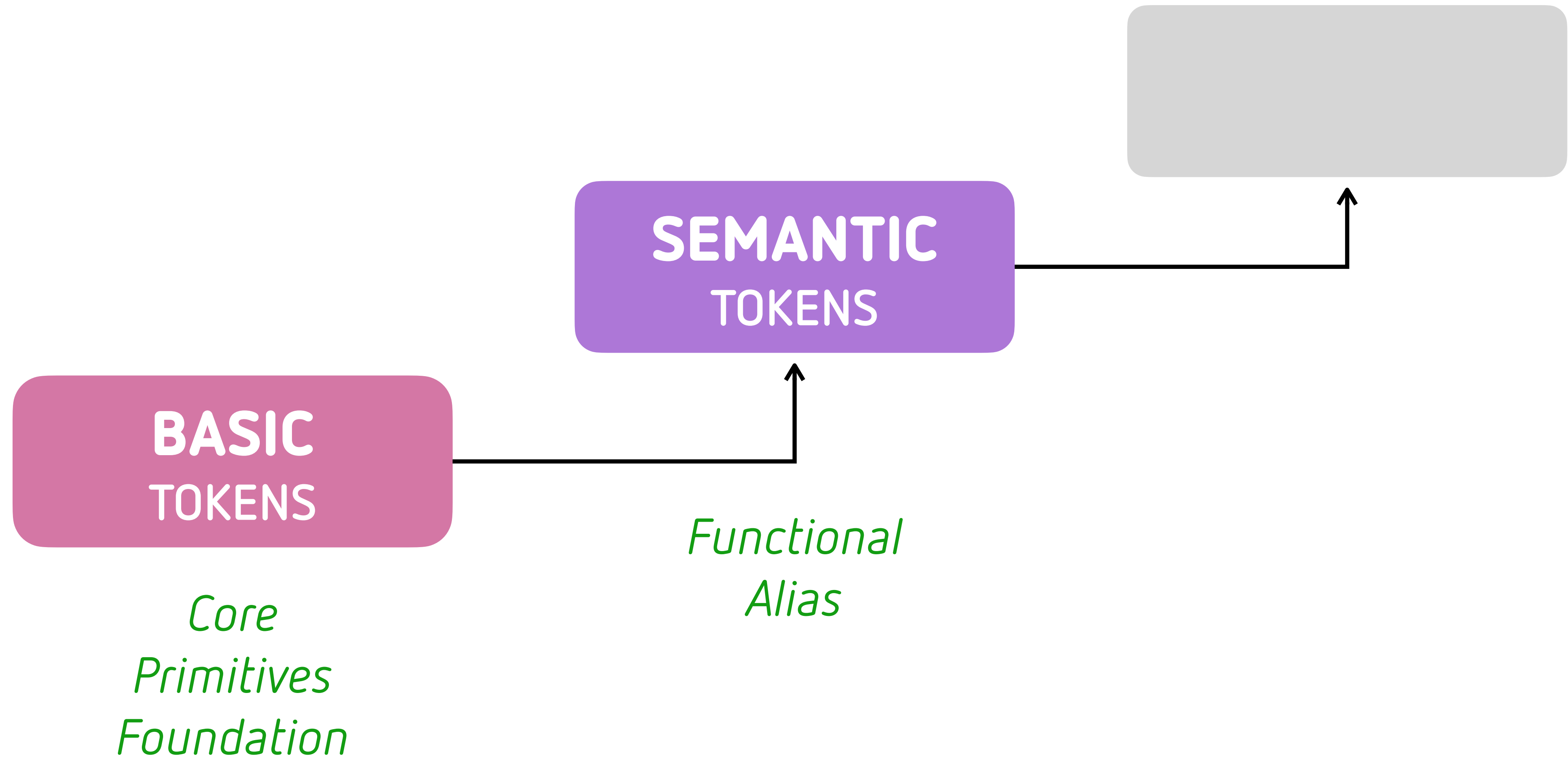


WORKING WITH TOKENS **STRUCTURE**

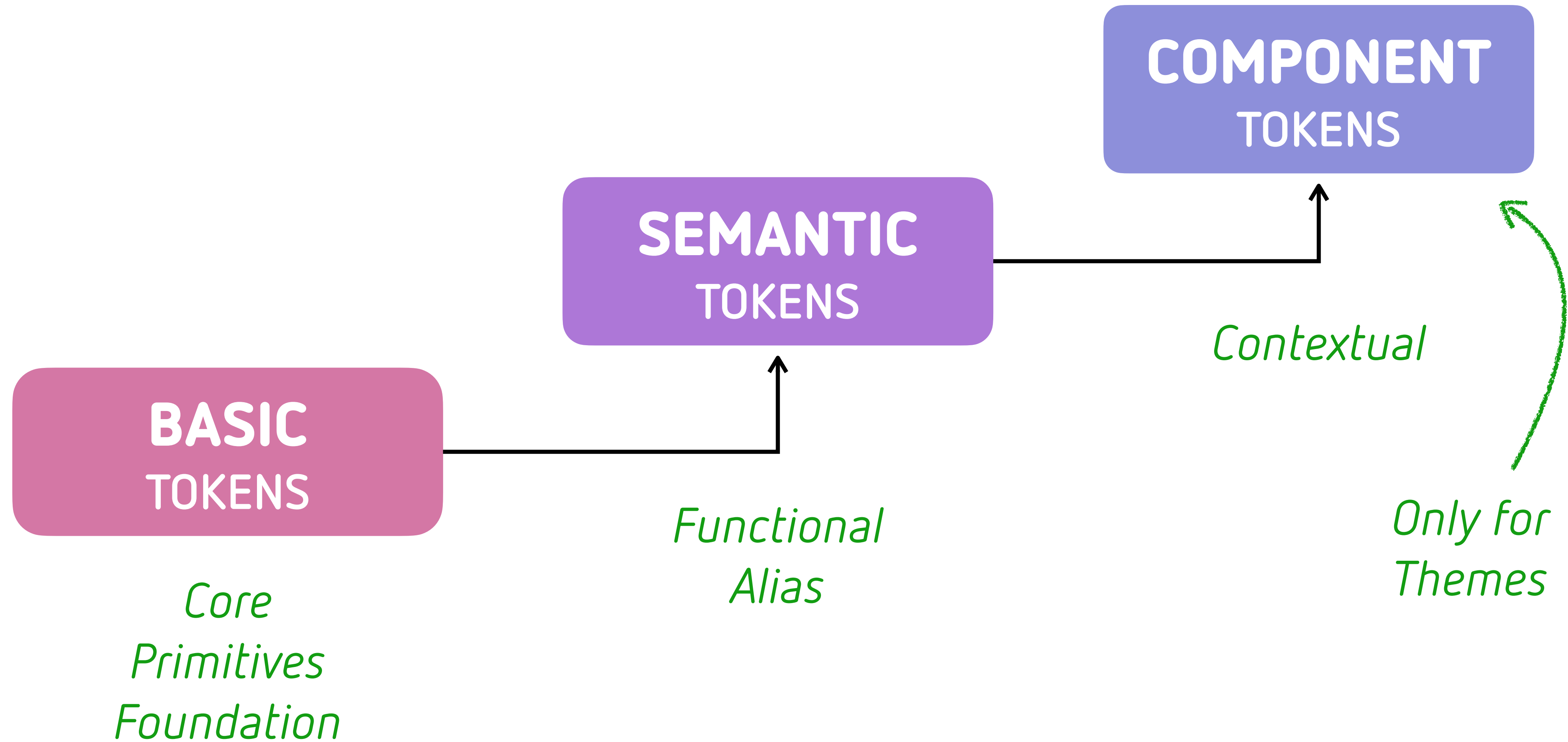


*Core  
Primitives  
Foundation*

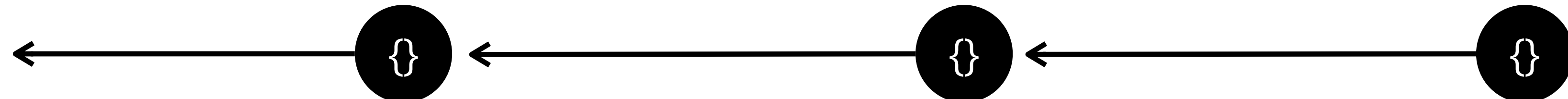
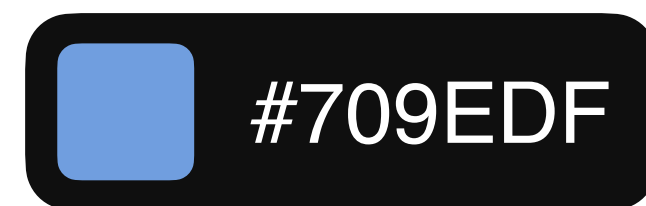
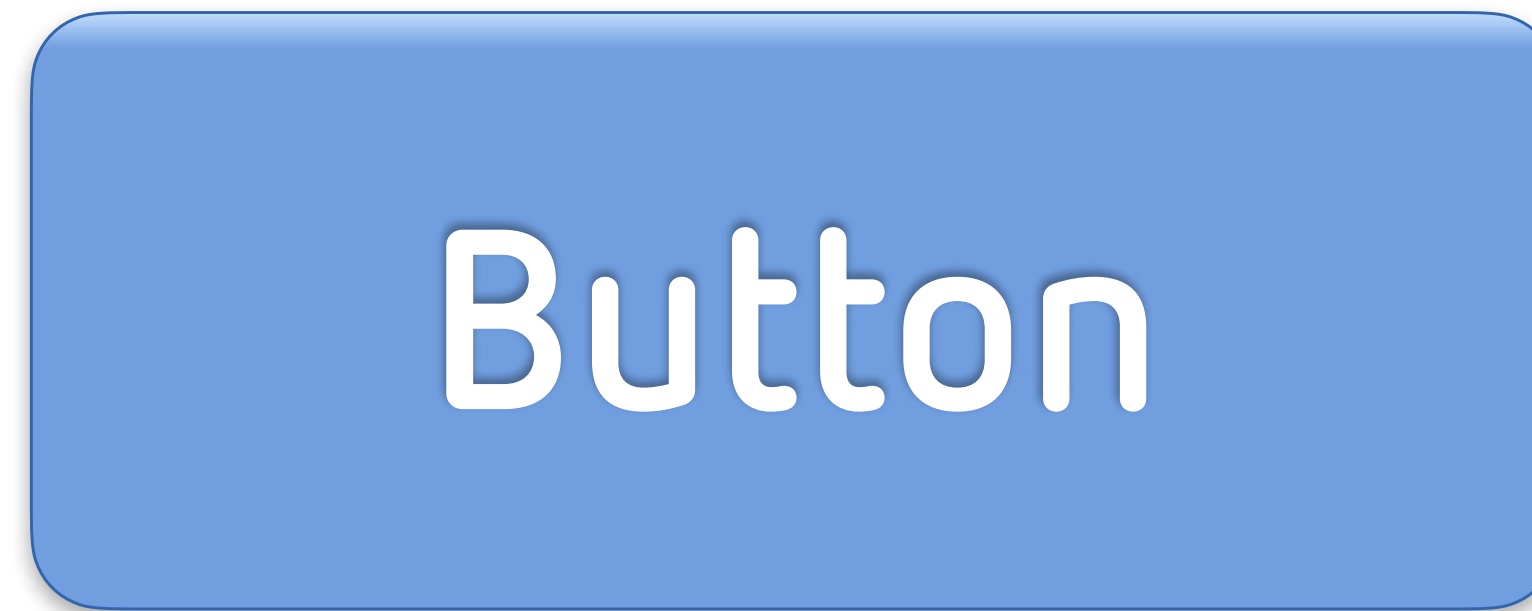
## WORKING WITH TOKENS STRUCTURE



## WORKING WITH TOKENS STRUCTURE



## WORKING WITH TOKENS STRUCTURE



Brand-color-500

Primary-Background

Button-Background

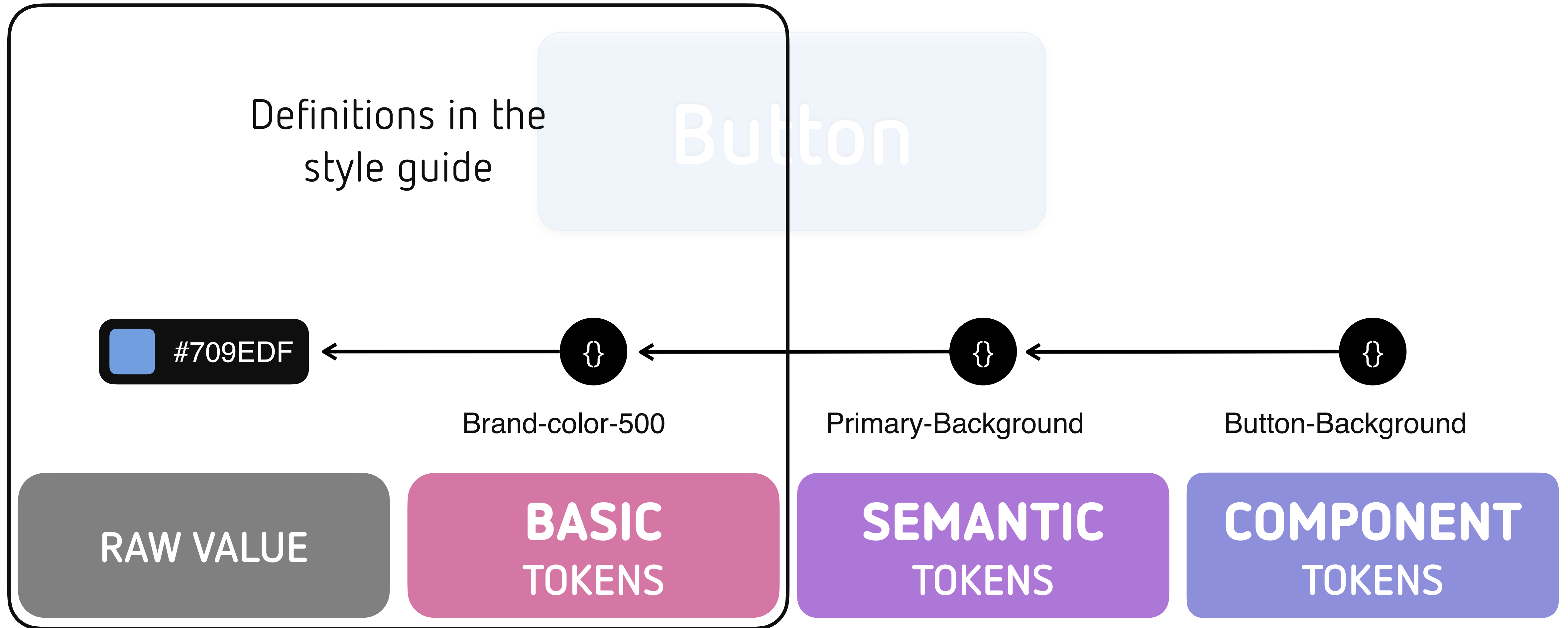
RAW VALUE

BASIC  
TOKENS

SEMANTIC  
TOKENS

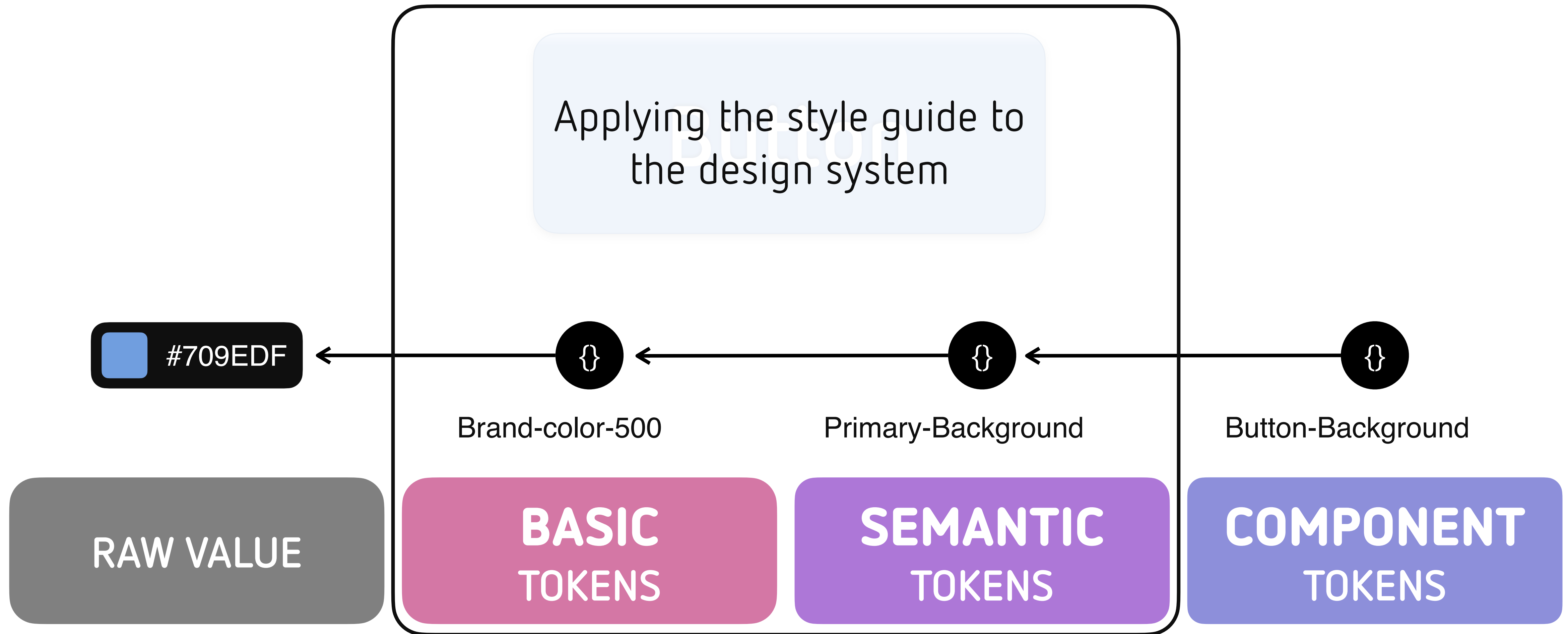
COMPONENT  
TOKENS

## WORKING WITH TOKENS STRUCTURE

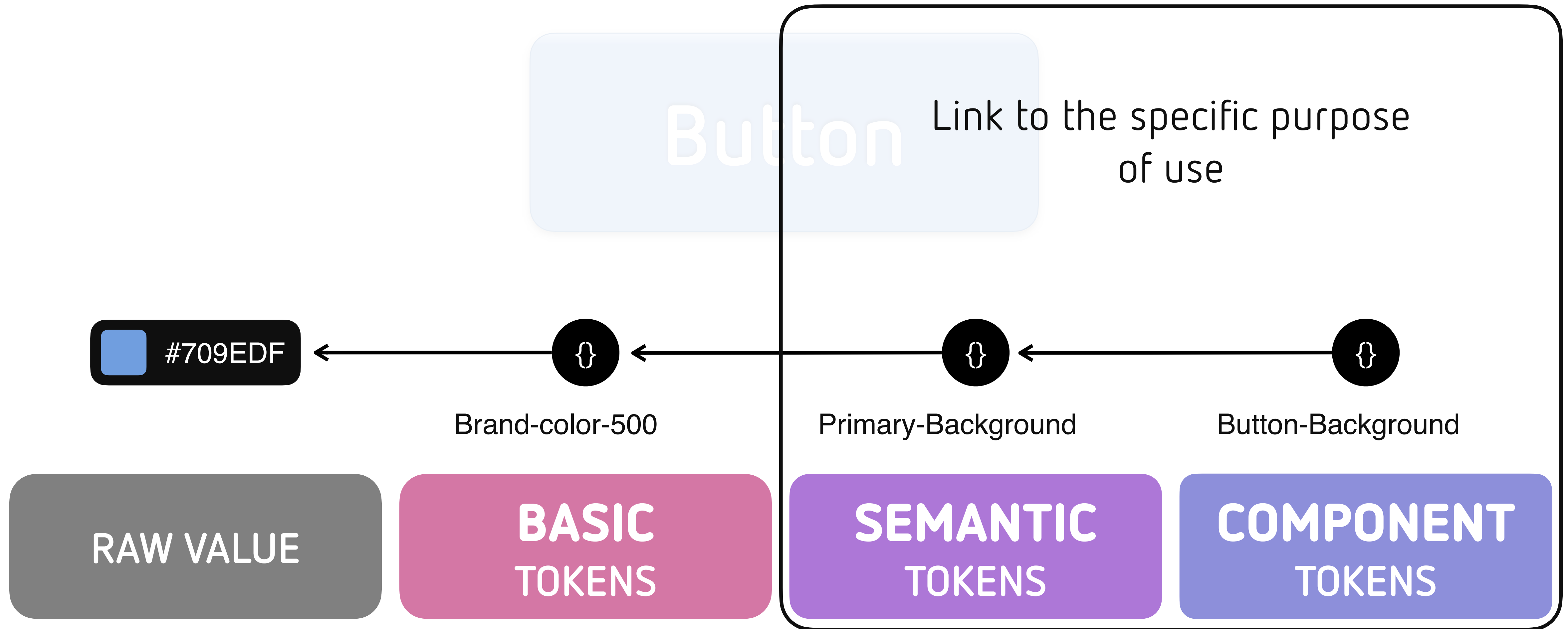




## WORKING WITH TOKENS STRUCTURE



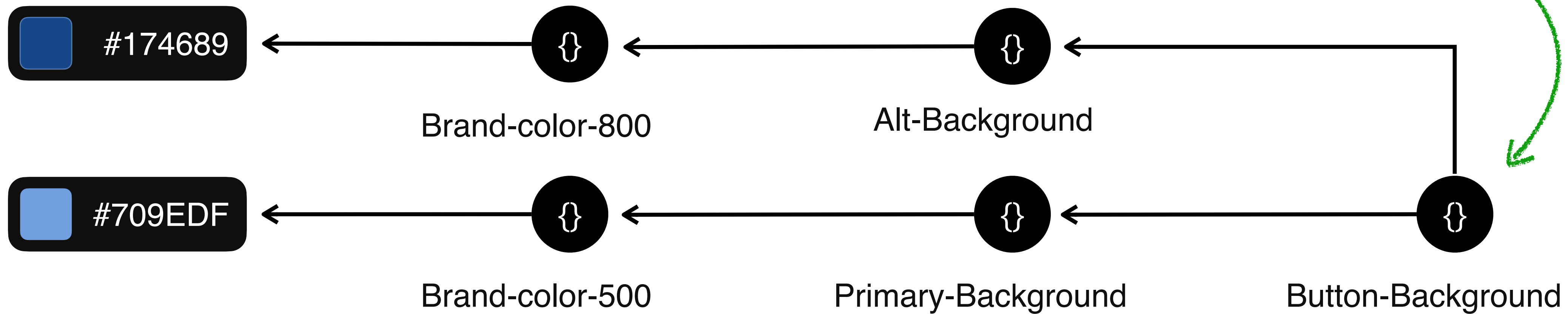
## WORKING WITH TOKENS STRUCTURE



WORKING WITH TOKENS STRUCTURE



Modes



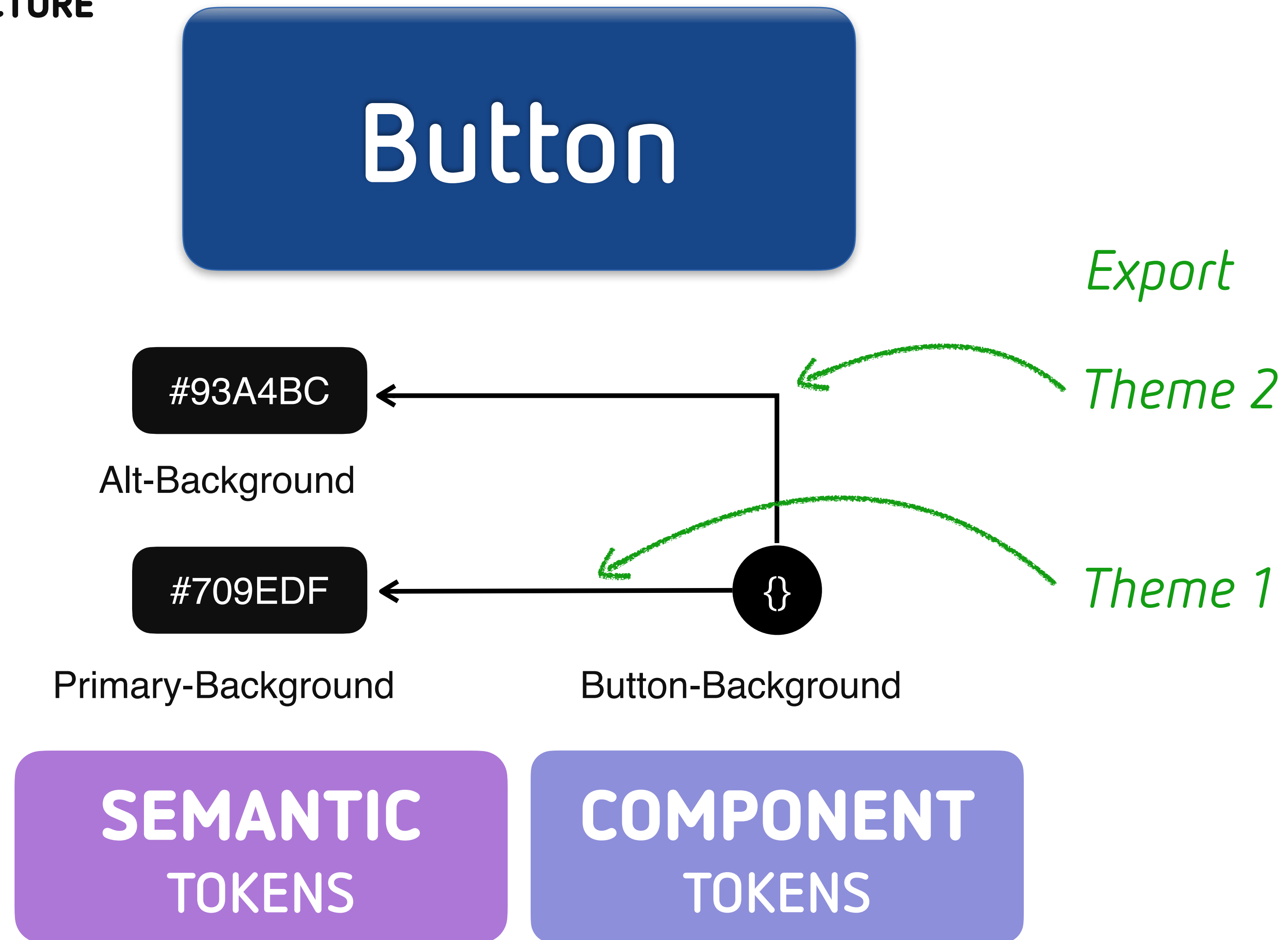
RAW VALUE

BASIC  
TOKENS

SEMANTIC  
TOKENS

COMPONENT  
TOKENS

## WORKING WITH TOKENS STRUCTURE



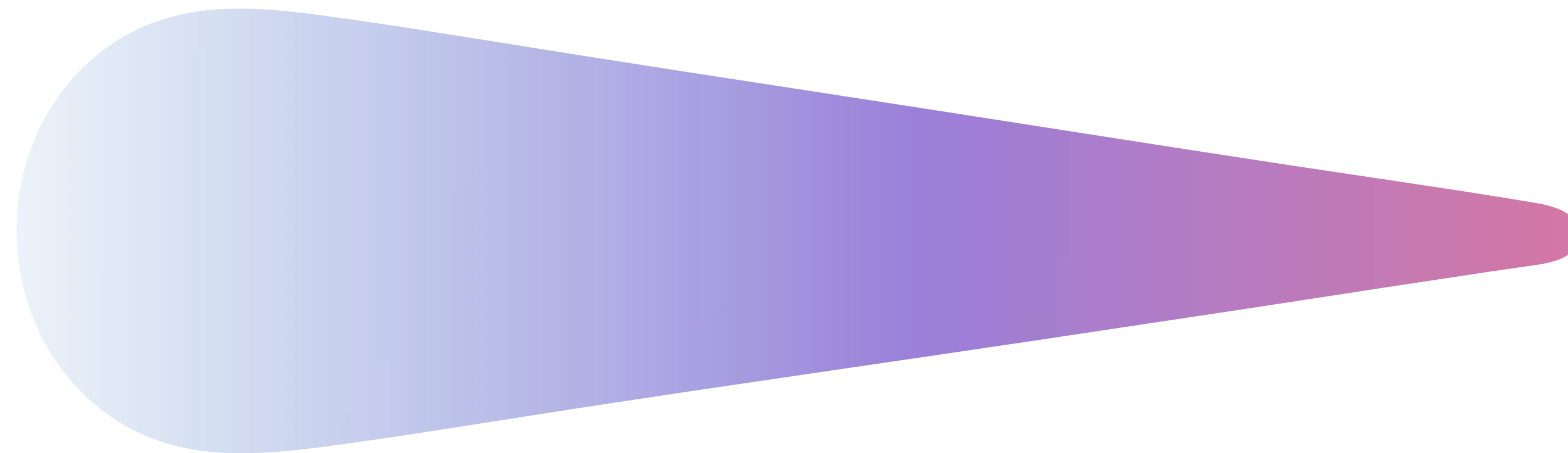
# 2.2

## NAMING OF TOKENS

„BEM“  
(Block-Element-modifier)

**BACKGROUND-BUTTON-PRIMARY**

*Generic*

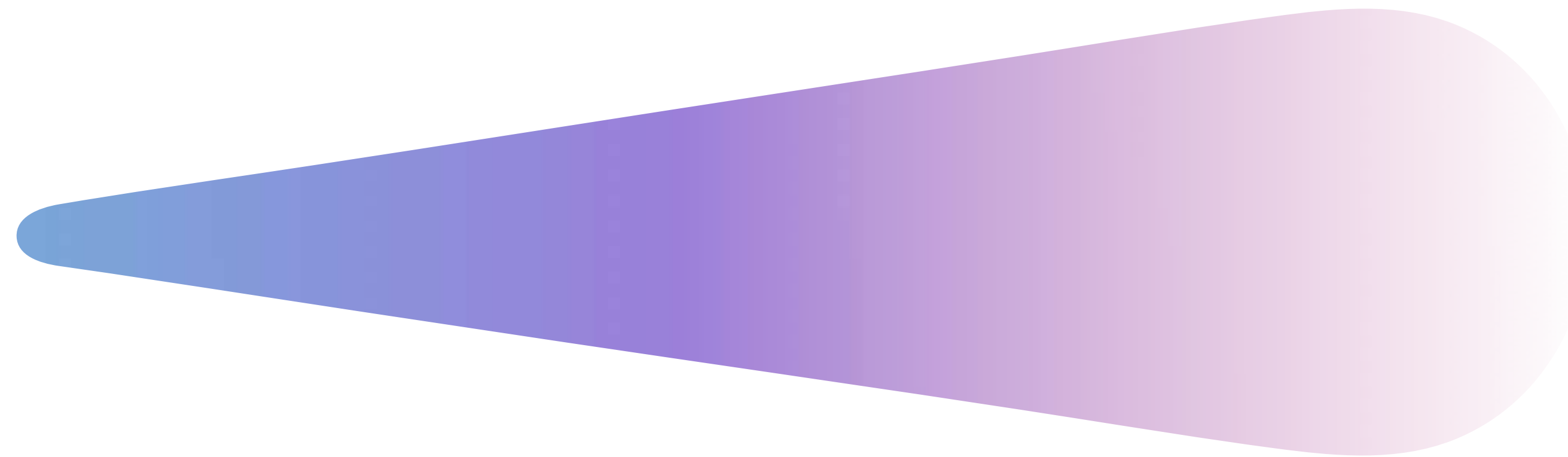


*Specific*

„Functional“

**PRIMARY-BUTTON-BACKGROUND**

*Generic*



*Specific*

## BEM

### Background

Button-Primary

Button-Secondary

### Border

Button-Primary

Button-Secondary

### Text

Button-Primary

Button-Secondary

## Functional

### Primary-Button

Background

Border

Text

### Secondary-Button

Background

Border

Text



## BEM

- Supports designing with the design system
- Simplifies the combination of properties for new components
- Potential for deviations from fire or A11y guidelines

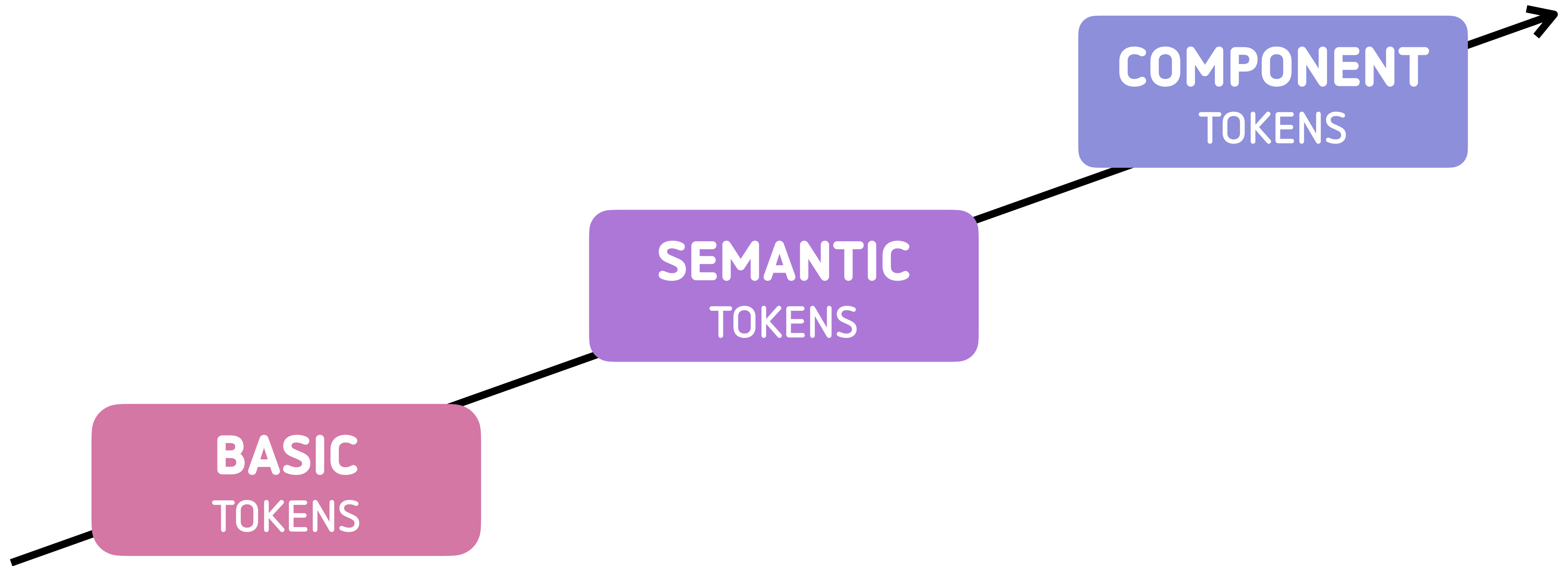
## Functional

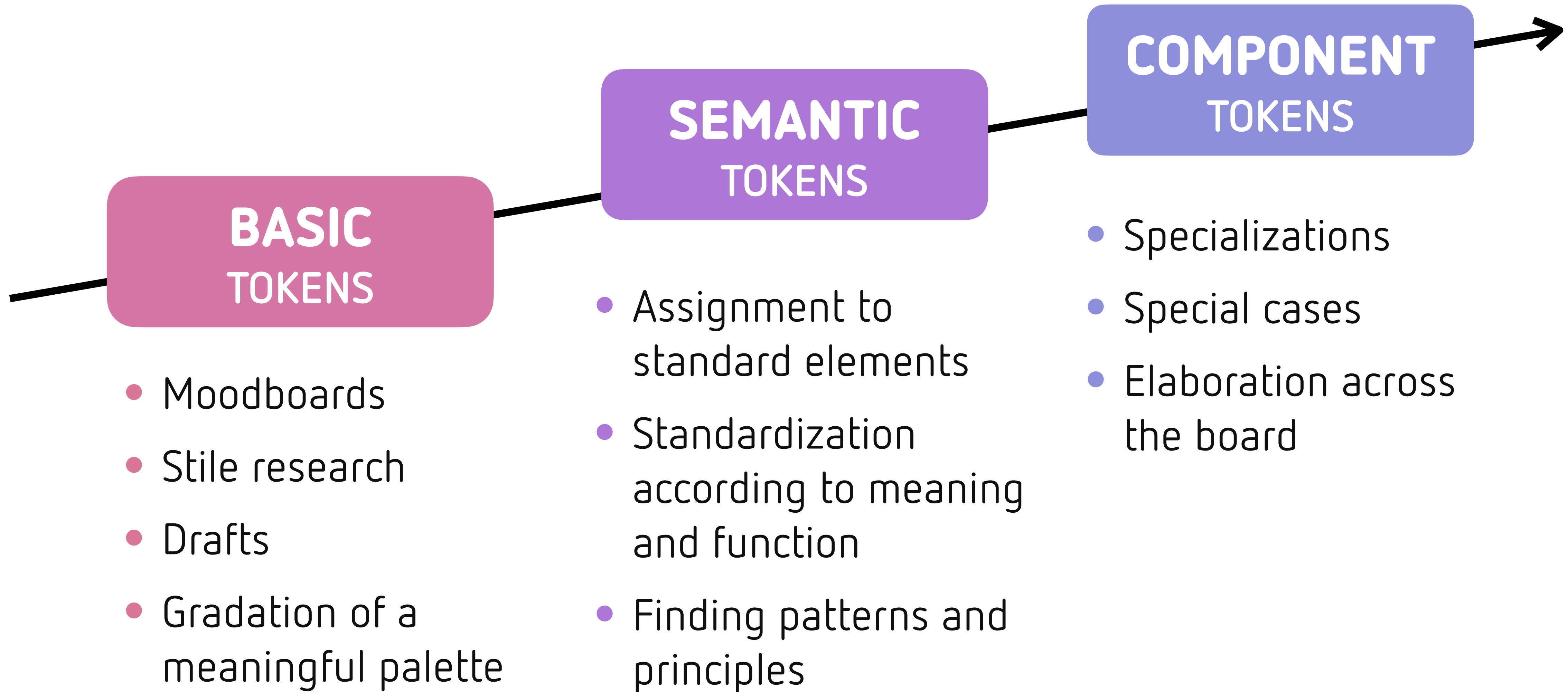
- Less ambiguity: Groupings are predefined
- Breaking out of the system requires time-consuming redefinitions
- The structure simplifies the creation of new themes

# 2.3

## GROWING WITH THE SYSTEM

- What do I call the first token?
- Can I do everything wrong if I choose the wrong structure at the beginning?
- Do all tokens have to be ready before I hand over to the developers?
- Do I start with semantic tokens or do I need component tokens right away?





- Tokens can accompany the entire process from design to the finished product
- Adjustments and revisions are inevitable, but also create a common understanding of the (design) decisions
- Coordination between all parties involved (designers and developers) is essential

# 3

## TOKENS IN PRACTICE

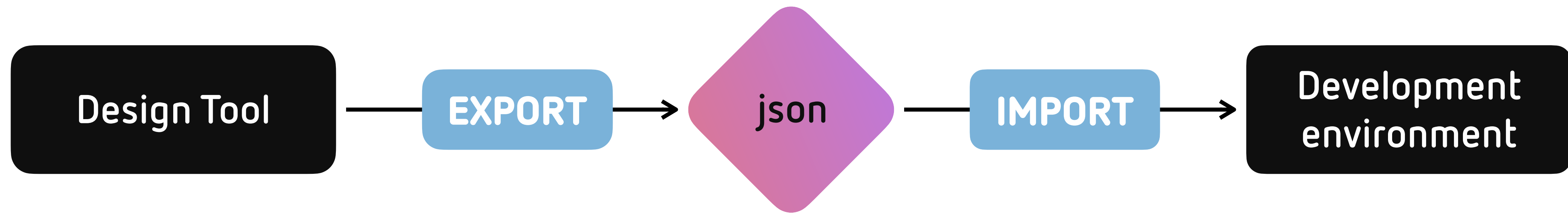
# Key Benefits

- „Bridging The Gap“ – Förderung eines besseren Austausch zwischen allen Beteiligten
  - Automatisierung von Übergabe-Prozessen
  - Themes!
- wichtig*
- mächtig*
- beeindruckend*
-



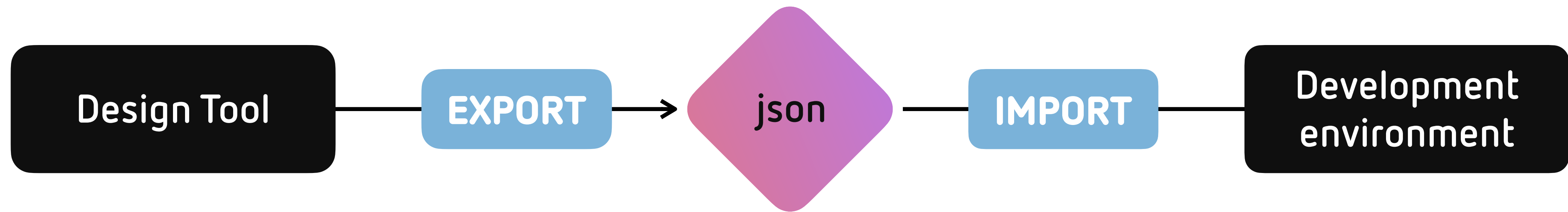
# 3.1

## WIE NUTZEN TOOLS DIESE VORTEILE



- Figma

- Web
- iOS
- Android
- Powerpoint?



- Figma

- Engineering environment

## TOKENS IN PRACTICE TOOLS



- Colors
- Borders, Sizes, Paddings
- Fonts, Font Sizes
- Effects
- JSON



**zenon**  
by COPA-DATA

- Colors
  - Several pallets that can be switched during runtime
- Fonts, Font Sizes
- Shadows
- XML

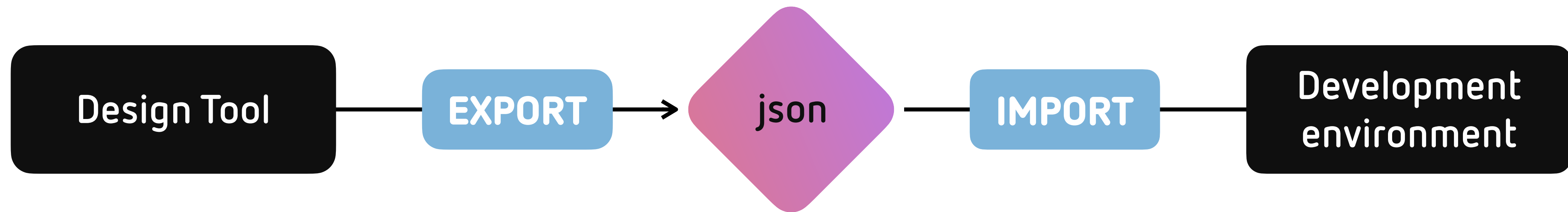


**SIMATIC WinCC  
Unified System**

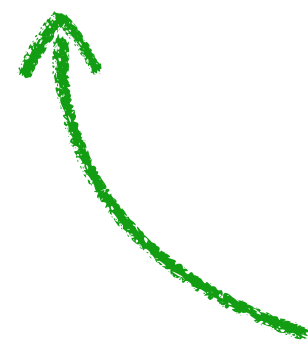
- V19 Update 2
  - 500 Colors per Palette
- WinCC Unified Corporate Designer
  - Style library
  - Proprietary exchange format



*Own  
ecosystem*



- Figma



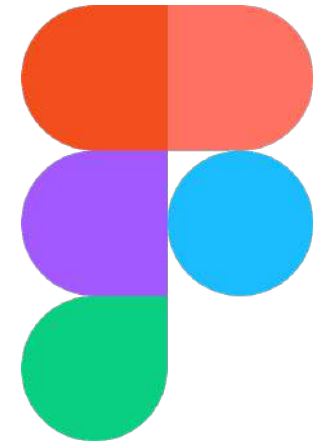
*But everything works here?*

- Engineering environment



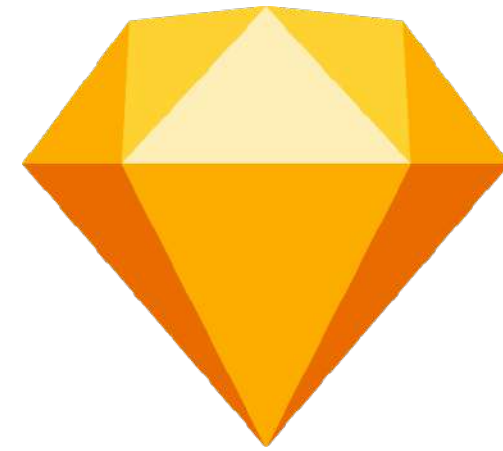
*limited*

## TOKENS IN PRACTICE TOOLS



Figma

- "Variables"
- Mixes tokens with content and prototyping
- No native export
- Large projects need expensive subscriptions



Sketch

- Limited to colors, styles and fonts
- More about plugins

*limited*



Adobe XD

- Styles
- Export as CSS

*"Maintenance mode"*



Penpot

- Open Source
- Little distribution
- Standard-compliant integration planned





- Figma

*Progress...*

- Engineering environment

*limited*

*Is it worth using in industrial UIs?*

# 3.2

## INSIGHTS AND OPPORTUNITIES



## Design

- Create your own guidelines to keep the design consistent.
- Naming creates clarity, saves documentation (but is also difficult)
- Simplifies teamwork (designer to designer)
- “Fundamental” changes can be implemented quickly
- Independence from tools: standardization instead of proprietary styles

## Entwicklung

- Common understanding of the structure of components
- Better separation of content and design
- Changes (even if they have to be applied manually) can be easily tracked with Git

TOKENS IN PRACTICE OPPORTUNITIES

A11Y

# A11Y

WCAG-Conformity

EAA / BFSG

# Flexibility & Speed

For large projects



Hardly any disadvantages\*  
Even for small projects

# THANK YOU VERY MUCH!

## **W3C Draft**

<https://second-editors-draft.tr.designtokens.org/>

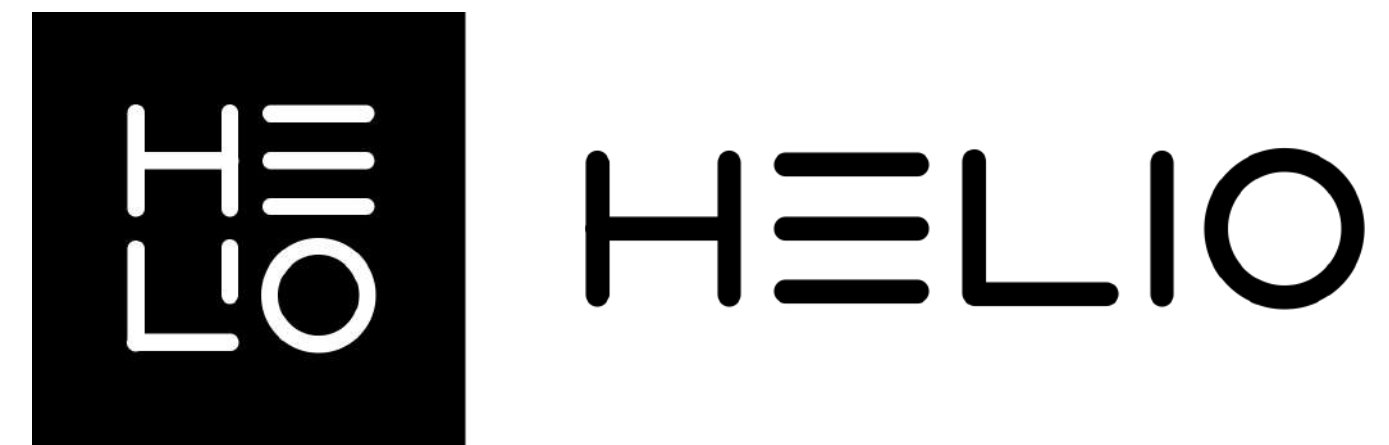
## **Naming Tokens**

Unterhaltsam: <https://thedesigntoken.guide/design-tokens-naming-playbook>

Ausführlich: <https://medium.com/eightshapes-llc/naming-tokens-in-design-systems-9e86c7444676>

## **BEM - Block Element Modifier**

<https://getbem.com/introduction/>



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