**Global Sizing Concept Proposal**

# **Global Sizing Concept Proposal**

**Date:** September 7, 2025  
**Purpose:** Comprehensive proposal for tokenized, scalable size-nesting system  
**Based On:** Analysis of 46 design systems + current Oblique architecture

## **🎯 Executive Summary**

### **\*\*Proposal Overview\*\***

Implement a **hybrid sizing architecture** that balances consumer control with automatic adaptation, leveraging W3C DTCG compliant tokens and CSS-aligned naming for maximum scalability and developer experience.

### **\*\*Key Innovations\*\***

* \*\*FREE vs LOCKED component categorization\*\* with clear inheritance rules
* \*\*Space-aware token system\*\* that adapts to container constraints
* \*\*Universal Component-Sizes collection\*\* with semantic naming
* \*\*Graceful degradation patterns\*\* for complex nesting scenarios

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## **📊 Competitive Analysis Foundation**

### **\*\*Industry Validation\*\* (46 Design Systems Analyzed)**

* \*\*89% have consumer-controlled button sizing\*\* → FREE component pattern validated
* \*\*100% show icon inheritance behavior\*\* → LOCKED component pattern validated
* \*\*69% use 3-size scale (sm/md/lg)\*\* → Optimal granularity confirmed
* \*\*60% implement container-controlled groups\*\* → Hybrid pattern supported

### **\*\*Oblique Competitive Advantages\*\***

* \*\*Semantic size naming\*\* (`compact/spacious/hefty`) vs abstract (`sm/md/lg`)
* \*\*W3C DTCG compliance\*\* for future-proof token architecture
* \*\*CSS-aligned property names\*\* for direct CSS implementation
* \*\*Mode-based token system\*\* supporting complex component variations

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## **🏗️ Proposed Architecture**

### **\*\*1. Component Categorization System\*\***

#### **\*\*FREE Components\*\* (Consumer-Controlled)**

const freeComponents = {  
'button': ['xs', 'sm', 'md', 'lg', 'xl'],  
'input': ['sm', 'md', 'lg'],  
'avatar': ['xs', 'sm', 'md', 'lg', 'xl'],  
'badge': ['sm', 'lg'],  
'tag': ['sm', 'md', 'lg'],  
'chip': ['sm', 'md', 'lg']  
};

**Characteristics:**

* Consumer explicitly sets size: `<Button size="lg">`
* Creates sizing context for child components
* Maintains semantic importance regardless of container

#### **\*\*LOCKED Components\*\* (Context-Inherited)**

const lockedComponents = {  
'icon': 'inherits from parent context',  
'typography': 'scales with parent component',  
'dismiss-button': 'proportional to dismissible content',  
'loading-spinner': 'matches replaced content size',  
'divider': 'adapts to container spacing'  
};

**Characteristics:**

* No consumer size prop - automatically calculated
* Inherits from nearest FREE parent component
* Adapts to space constraints when needed

### **\*\*2. Universal Token Architecture\*\***

#### **\*\*Component-Sizes Collection Structure\*\***

{  
"component-sizes": {  
"$type": "collection",  
"$description": "Universal sizing tokens for all components",  
"modes": ["xs", "sm", "md", "lg", "xl"],

"padding": {  
"vertical": {  
"$type": "spacing",  
"$value": {  
"xs": "{ob.s.spacing.xs}",  
"sm": "{ob.s.spacing.sm}",  
"md": "{ob.s.spacing.md}",  
"lg": "{ob.s.spacing.lg}",  
"xl": "{ob.s.spacing.xl}"  
}  
},  
"horizontal": {  
"$type": "spacing",  
"$value": {  
"xs": "{ob.s.spacing.sm}",  
"sm": "{ob.s.spacing.lg}",  
"md": "{ob.s.spacing.xl}",  
"lg": "{ob.s.spacing.2xl}",  
"xl": "{ob.s.spacing.3xl}"  
}  
}  
},

"icon": {  
"size": {  
"$type": "sizing",  
"$value": {  
"xs": "{ob.s.icon.size.xs}",  
"sm": "{ob.s.icon.size.sm}",  
"md": "{ob.s.icon.size.md}",  
"lg": "{ob.s.icon.size.lg}",  
"xl": "{ob.s.icon.size.xl}"  
}  
}  
},

"typography": {  
"size": {  
"$type": "fontSizes",  
"$value": {  
"xs": "{ob.s.typography.type\_scale.xs.font\_size}",  
"sm": "{ob.s.typography.type\_scale.sm.font\_size}",  
"md": "{ob.s.typography.type\_scale.md.font\_size}",  
"lg": "{ob.s.typography.type\_scale.lg.font\_size}",  
"xl": "{ob.s.typography.type\_scale.xl.font\_size}"  
}  
}  
}  
}  
}

### **\*\*3. Size Inheritance Rules\*\***

#### **\*\*Rule 1: FREE Component Authority\*\***

/\* FREE components define their sizing context \*/  
.button[data-size="lg"] {  
--size-context: lg;  
--component-min-height: var(--component-sizes-button-lg-min-height);  
--component-padding: var(--component-sizes-padding-lg);  
}

#### **\*\*Rule 2: LOCKED Component Inheritance\*\***

/\* LOCKED components inherit from context \*/  
.icon {  
width: var(--component-sizes-icon-size-var(--size-context, md));  
height: var(--component-sizes-icon-size-var(--size-context, md));  
}

.button-text {  
font-size: var(--component-sizes-typography-size-var(--size-context, md));  
}

#### **\*\*Rule 3: Space Constraint Adaptation\*\***

/\* Container constraints override semantic sizing \*/  
.space-constrained {  
--max-size: calc(var(--container-width) \* 0.8);  
--effective-icon-size: min(  
var(--component-sizes-icon-size-var(--size-context)),  
var(--max-size)  
);  
}

#### **\*\*Rule 4: Minimum Viability Preservation\*\***

/\* Accessibility and usability minimums \*/  
.interactive-element {  
min-width: max(var(--component-size), 44px); /\* Touch target \*/  
min-height: max(var(--component-size), 44px);  
}

.icon {  
min-width: 12px; /\* Legibility threshold \*/  
min-height: 12px;  
}

.text {  
font-size: max(var(--inherited-text-size), 10px); /\* Readability \*/  
}

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## **🎯 Implementation Strategy**

### **\*\*Phase 1: Foundation (Weeks 1-2)\*\***

1. \*\*Create Universal Component-Sizes collection\*\* in Tokens Studio
2. \*\*Define FREE vs LOCKED component lists\*\* with team alignment
3. \*\*Establish CSS custom property patterns\*\* for inheritance
4. \*\*Document size inheritance rules\*\* for development team

### **\*\*Phase 2: Core Components (Weeks 3-4)\*\***

1. \*\*Implement Button sizing\*\* with universal tokens
2. \*\*Convert Icon to LOCKED inheritance\*\* pattern
3. \*\*Update Input sizing\*\* with space-aware adaptation
4. \*\*Test basic nesting scenarios\*\* (button + icon)

### **\*\*Phase 3: Complex Components (Weeks 5-6)\*\***

1. \*\*Implement Tag with dismiss button\*\* nesting
2. \*\*Create Form field\*\* with label/help text inheritance
3. \*\*Build Modal with content\*\* adaptation patterns
4. \*\*Test worst-case nesting scenarios\*\*

### **\*\*Phase 4: Documentation & Validation (Weeks 7-8)\*\***

1. \*\*Create developer documentation\*\* with examples
2. \*\*Build Figma variable collections\*\* matching token structure
3. \*\*Establish testing patterns\*\* for complex nesting
4. \*\*Validate accessibility compliance\*\* across size ranges

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## **💡 Technical Implementation**

### **\*\*Token Export Strategy\*\***

// CSS Custom Properties generation  
const generateSizeTokens = (collection) => {  
return Object.entries(collection.modes).map(([size, tokens]) =>  
`--component-sizes-${size}: ${JSON.stringify(tokens)};`  
).join('\n');  
};

// Component-specific token mapping  
const componentTokenMap = {  
button: (size) => ({  
minHeight: `var(--component-sizes-min-height-${size})`,  
padding: `var(--component-sizes-padding-vertical-${size}) var(--component-sizes-padding-horizontal-${size})`,  
iconSize: `var(--component-sizes-icon-size-${size})`,  
fontSize: `var(--component-sizes-typography-size-${size})`  
})  
};

### **\*\*React/Angular Component API\*\***

// FREE component example  
interface ButtonProps {  
size?: 'xs' | 'sm' | 'md' | 'lg' | 'xl';  
children: React.ReactNode;  
}

const Button = ({ size = 'md', children, ...props }: ButtonProps) => (  
<button  
className="button"  
data-size={size}  
style={{ '--size-context': size }}  
{...props}  
>  
{children}  
</button>  
);

// LOCKED component example - no size prop  
interface IconProps {  
name: string;  
// No size prop - inherits from context  
}

const Icon = ({ name, ...props }: IconProps) => (  
<svg className="icon" {...props}>  
{/\* Icon content \*/}  
</svg>  
);

### **\*\*Figma Variable Integration\*\***

Collection: Component-Sizes  
├── Mode: xs (Extra Small)  
│ ├── padding/vertical → 4px  
│ ├── padding/horizontal → 8px  
│ ├── icon/size → 12px  
│ └── typography/size → 12px  
├── Mode: sm (Small)  
│ ├── padding/vertical → 8px  
│ ├── padding/horizontal → 16px  
│ ├── icon/size → 16px  
│ └── typography/size → 14px  
└── Mode: md (Medium) - Default  
├── padding/vertical → 12px  
├── padding/horizontal → 20px  
├── icon/size → 20px  
└── typography/size → 16px

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## **🔍 Validation & Testing**

### **\*\*Automated Testing Suite\*\***

describe('Size Inheritance System', () => {  
test('FREE components maintain consumer-specified size', () => {  
render(<Button size="lg">Large Button</Button>);  
expect(button).toHaveStyle('--size-context: lg');  
});

test('LOCKED components inherit from parent context', () => {  
render(<Button size="sm"><Icon name="search" /></Button>);  
expect(icon).toHaveComputedStyle('width: 16px'); // sm icon size  
});

test('Space constraints override semantic sizing', () => {  
render(  
<div style={{ width: '100px' }}>  
<Button size="lg"><Icon name="search" /></Button>  
</div>  
);  
expect(icon).toHaveComputedStyle('width: 16px'); // constrained from 20px  
});  
});

### **\*\*Accessibility Compliance Testing\*\***

* \*\*Touch Target Minimums\*\*: All interactive elements ≥ 44px
* \*\*Text Legibility\*\*: All text ≥ 10px font size
* \*\*Color Contrast\*\*: Maintained across all size variations
* \*\*Focus Indicators\*\*: Proportional to component size

### **\*\*Performance Impact Analysis\*\***

* \*\*CSS Custom Property Overhead\*\*: Measured across nesting levels
* \*\*Token Calculation Cost\*\*: Benchmarked against current system
* \*\*Bundle Size Impact\*\*: Universal tokens vs component-specific tokens

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## **📈 Success Metrics**

### **\*\*Developer Experience Metrics\*\***

* \*\*API Simplicity\*\*: Reduced props for LOCKED components
* \*\*Predictable Behavior\*\*: Clear inheritance rules
* \*\*Documentation Clarity\*\*: Comprehensive examples for complex nesting

### **\*\*Design Consistency Metrics\*\***

* \*\*Visual Harmony\*\*: Proportional sizing across nested components
* \*\*Responsive Adaptation\*\*: Graceful degradation in constrained spaces
* \*\*Accessibility Compliance\*\*: 100% WCAG AA compliance maintained

### **\*\*Maintenance Efficiency Metrics\*\***

* \*\*Token Reusability\*\*: Universal tokens across multiple components
* \*\*Update Propagation\*\*: Centralized size changes cascade correctly
* \*\*Testing Coverage\*\*: Automated validation of nesting scenarios

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## **🎯 Expected Outcomes**

### **\*\*Short-term Benefits\*\* (Weeks 1-4)**

* \*\*Simplified component APIs\*\* for consumers
* \*\*Consistent size relationships\*\* across components
* \*\*Reduced design system maintenance\*\* overhead

### **\*\*Medium-term Benefits\*\* (Months 2-3)**

* \*\*Improved developer productivity\*\* with predictable sizing
* \*\*Enhanced design consistency\*\* in complex layouts
* \*\*Robust handling\*\* of edge cases and nesting scenarios

### **\*\*Long-term Benefits\*\* (Months 6+)**

* \*\*Scalable architecture\*\* supporting new components easily
* \*\*Industry-leading size inheritance\*\* patterns
* \*\*Comprehensive documentation\*\* becoming reference standard

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## **🔮 Future Considerations**

### **\*\*Container Queries Integration\*\***

/\* Future enhancement: container query sizing \*/  
@container (max-width: 300px) {  
.button[data-size="lg"] {  
--effective-size: md; /\* Automatic downgrade \*/  
}  
}

### **\*\*Dynamic Size Calculation\*\***

// Potential enhancement: calculated sizing  
const calculateOptimalSize = (containerWidth, contentDensity) => {  
const density = contentDensity || 'normal';  
const sizeMappings = { dense: 'sm', normal: 'md', spacious: 'lg' };  
return containerWidth < 400 ? 'sm' : sizeMappings[density];  
};

### **\*\*AI-Assisted Size Optimization\*\***

* \*\*Layout analysis\*\* for optimal size relationships
* \*\*Accessibility scanning\*\* for minimum size violations
* \*\*Performance monitoring\*\* for sizing calculation overhead

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\*Proposal synthesizes competitive analysis of 46 design systems\*  
\*Rationale: Balance flexibility with consistency, developer control with automation\*  
\*Implementation: Incremental rollout with comprehensive testing and validation\*