Plan for Building a Simplified Figma Clone for Multi-Device Web Design

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Phase 1: Project Setup & Architecture

1.1 Technology Stack Decision

- **Frontend Framework:** Next JS

- **Canvas Rendering:** HTML5 Canvas API or Fabric.js for easier object manipulation

- **State Management:** Zustand or Redux for managing canvas state

- **Styling:** Tailwind CSS for UI components

- **Build Tool:** Vite for fast development

1.2 Project Structure

```
/src
  /components
    /Canvas
    /Toolbar
    /Sidebar
    /Templates
  /store
  /utils
  /types
  /constants
```

1.3 Core Data Models

Define TypeScript interfaces for:

- Canvas element (position, size, type, properties)

- Template (name, dimensions, device type)

- Layer hierarchy

- Project state

Phase 2: Canvas Foundation

2.1 Canvas Implementation

- Create main canvas component with pan and zoom capabilities

- Implement viewport transformation (translate, scale)

- Add infinite canvas feel with grid background

■ Handle mouse events (click, drag, scroll)

2.2 Element System

Base element class/interface with common properties:

■ Position (x, y)

■ Dimensions (width, height)

■ Rotation

■ Opacity

■ Z-index for layering

■ Element rendering engine

■ Selection system (single and multiple selection)

2.3 Transform Controls

■ Resize handles (8-point bounding box)

■ Rotation handle

■ Drag to move functionality

■ Snap to grid/guidelines

Phase 3: Template System

3.1 Predefined Templates

Create template presets:

■ **Desktop:** 1920x1080, 1440x900, 1366x768

■ **Tablet:** 768x1024 (iPad), 834x1194 (iPad Pro)

■ **Mobile:** 375x812 (iPhone X), 390x844 (iPhone 12), 360x800 (Android)

3.2 Template Selector

■ Modal or sidebar with template cards

■ Visual preview of each template

■ "Create Custom Size" option

■ Template categories/filters

3.3 Artboard Implementation

■ Multiple artboards on single canvas

■ Artboard boundaries and labels

- ■ Background color per artboard
- ■ Export individual artboards

Phase 4: Essential Design Elements

4.1 Layout Components

- ■ **Container/Frame:** Grouping element with padding
- ■ **Flexbox container:** Row/column layout with gap, justify, align
- ■ **Grid container:** Define columns, rows, and gaps
- ■ Auto-layout properties (spacing, alignment)

4.2 Typography System

Text element with properties:

- ■ Font family (system fonts + Google Fonts integration)
- ■ Font size, weight, line height
- ■ Letter spacing, text alignment
- ■ Color and opacity

- ■ Rich text editing capabilities
- ■ Text styles/presets (H1, H2, Body, etc.)

4.3 Shape Elements

- ■ Rectangle (with border radius)
- ■ Circle/Ellipse
- ■ Line
- ■ **Basic properties:** fill color, stroke, shadow

4.4 Image Support

- ■ Upload images (drag-drop or file picker)
- ■ Image element with crop/fit options
- ■ Placeholder images for mockups
- ■ Basic filters (grayscale, blur, brightness)

Phase 5: Core Tools & Interactions

5.1 Toolbar Implementation

- **Selection tool (V):** Default cursor for selecting/moving

- **Frame tool (F):** Draw containers

- **Text tool (T):** Add text elements

- **Shape tools (R):** Rectangle, Circle

- **Image tool (I):** Place images

- **Hand tool (H):** Pan canvas

5.2 Properties Panel

- Context-sensitive panel showing selected element properties

  Quick access to:

- Position & size inputs

- Layout properties (flexbox/grid settings)

- Typography controls

- Color pickers

- Opacity slider

5.3 Layers Panel

- Hierarchical tree view of all elements

- Drag to reorder layers

- Toggle visibility

- Lock/unlock elements

- Group/ungroup functionality

Phase 6: Responsive Design Features

6.1 Responsive Constraints

- Pin to edges (top, right, bottom, left)

- Fixed vs. fluid width/height

- Scale proportionally option

6.2 Device Preview

- Quick toggle between device sizes

- Preview how design adapts to different screens

- Side-by-side view option

6.3 Component Variants

■ Create mobile/tablet/desktop variants of components

■ Quick duplicate to other artboards

■ Link variants for easy switching

Phase 7: Essential Features

7.1 Undo/Redo System

■ Command pattern implementation

■ History stack (limit to last 50 actions)

■ Keyboard shortcuts (Cmd/Ctrl + Z, Cmd/Ctrl + Shift + Z)

7.2 Keyboard Shortcuts

■ **Selection:** V

■ **Frame:** F

■ **Text:** T

■ **Shape:** R

■ **Delete:** Backspace/Delete

■ **Duplicate:** Cmd/Ctrl + D

■ **Copy/Paste:** Cmd/Ctrl + C/V

■ **Group:** Cmd/Ctrl + G

■ **Zoom:** Cmd/Ctrl + +/-

7.3 Alignment & Distribution

■ Align left, center, right, top, middle, bottom

■ Distribute horizontally/vertically

■ Smart guides during drag

7.4 Copy/Paste & Duplicate

■ Copy style properties

■ Duplicate elements

■ Clipboard handling

Phase 8: Project Management

8.1 Save/Load System

■ Local storage auto-save

■ Export project as JSON

■ Import project from JSON

■ Project metadata (name, last modified)

8.2 Export Functionality

■ Export artboards as PNG/JPG

■ Export individual elements

■ Export at different scales (1x, 2x, 3x)

■ Export all artboards as ZIP

Phase 9: Polish & Testing

9.1 UI/UX Refinement

■ Dark/light theme

■ Smooth animations

■ Loading states

■ Empty states with helpful guidance

9.2 Performance Optimization

■ Canvas rendering optimization (only redraw changed areas)

■ Debounce property updates

■ Lazy loading for heavy operations

■ Virtual scrolling for layers panel

9.3 Testing

■ Test all tools and interactions

■ Cross-browser testing (Chrome, Firefox, Safari)

■ Responsive UI testing

■ Edge cases (empty canvas, many elements, large images)

9.4 Documentation

■ In-app tooltips

■ Keyboard shortcut reference

- Quick start guide

- Template library showcase

- Additional Features for Future Iterations

- Color styles/design tokens

- Components library

- Collaboration (real-time editing)

- Version history

- Comments/annotations

- Plugin system

- More export formats (SVG, PDF)

- Asset library

- Prototyping links

— End of Plan —