

# PROJECT SPECIFICATION: 3D Printing E-Commerce & Service Platform

## PROJECT NAME: 3D Print Studio MVP

### 1. PROJECT OVERVIEW

Build a responsive, modern web application for a 3D printing business. The platform has two main functions:

1. **Store:** Sell pre-printed items (starting with customizable keychains).
2. **Service:** Allow users to upload custom 3D models (.STL files) for a price quote.

### 2. TECH STACK RECOMMENDATIONS

*The AI should generate code based on this stack for best performance and ease of use:*

- **Frontend:** React.js (Vite) OR Next.js
- **Styling:** Tailwind CSS (for rapid, responsive UI)
- **Icons:** Lucide-React or FontAwesome
- **State Management:** React Context API (for Shopping Cart)
- **Backend/Database (Optional for MVP, recommended for functionality):** Firebase (Firestore + Storage) OR Supabase.
  - *Note to developer:* If no backend is provided, use LocalStorage for the cart and mock data for products.

### 3. CORE FEATURES & REQUIREMENTS

#### A. Navigation & Layout

- **Navbar:** Logo, Links (Home, Shop, Custom Print, About), Cart Icon with counter.
- **Footer:** Social links, Copyright, Contact Info.
- **Responsive Design:** Must work perfectly on Mobile and Desktop.

#### B. Landing Page (Home)

- **Hero Section:** High-quality background (dark/tech theme), headline "Turn Ideas into Reality", CTA buttons ("Buy Keychains", "Upload Model").
- **Features Section:** Icons explaining the process (Select -> Customize -> Print -> Ship).
- **Showcase:** Carousel or Grid of best-selling items.

#### C. The Shop (Product Catalog)

- **Product Grid:** Display products with Image, Title, Price, and "Add to Cart" button.

- **Filtering:** Filter by Category (Keychains, Figures, Parts).

## D. Product Details Page (The "Keychain" Logic)

- **Customization Fields:** Crucial for the keychain business.
  - *Text Input:* "Enter name to print on keychain" (Limit 10-15 chars).
  - *Color Selector:* Dropdown or Color Swatches (Red, Blue, Black, White, Glow-in-dark).
  - *Material Selector:* PLA (Default) vs PETG (+\$2.00).
- **Price Calculation:** Dynamic price update based on material selection.

## E. "Upload Your Model" Page (Service)

- **File Upload Zone:** Drag & drop area accepting .stl and .obj files only.
- **File Validation:** Max file size limit (e.g., 50MB).
- **Contact Form:** Fields for Name, Email, Description of request.
- **Action:** On submit, store the file and send a notification (or save to DB) for manual review/quoting.

## F. Shopping Cart & Checkout

- **Cart Drawer/Page:** List of items, quantities, subtotal, and remove buttons.
- **Checkout Form:**
  - Shipping Details (Name, Phone, Address, City).
  - Shipping Method: Integration placeholders for "Econt/Speedy" (Courier).
  - Payment Method: "Cash on Delivery" (Default for MVP).
- **Order Summary:** Final total including shipping cost.

# 4. DATA STRUCTURE (Schema)

## Product Object (JSON)

```
{
  "id": "keychain-001",
  "name": "Custom Name Keychain",
  "basePrice": 12.00,
  "category": "keychains",
  "image": "/images/keychain_mockup.jpg",
  "options": {
    "colors": ["Black", "White", "Red", "Blue"],
    "materials": ["PLA", "PETG"]
  },
  "customizable": true
}
```

## Cart Item Object (JSON)

```
{  
  "productId": "keychain-001",  
  "selectedColor": "Red",  
  "customText": "IVAN",  
  "material": "PLA",  
  "quantity": 2,  
  "totalPrice": 24.00  
}
```

## 5. UI/UX GUIDELINES

- **Color Palette:**
  - Primary: Indigo/Violet (tech feel).
  - Background: White/Light Gray for content, Dark Slate for Hero sections.
  - Accents: Neon Blue or Green for "Success" states.
- **Typography:** Sans-serif (Inter or Roboto) for clean readability.
- **Animations:** Subtle hover effects on buttons and product cards.

## 6. IMPLEMENTATION STEPS (For the AI)

1. **Setup:** Initialize React project with Tailwind.
2. **Components:** Build reusable UI components (Button, Card, Input).
3. **Pages:** Construct the routed pages (Home, Shop, Product, Upload).
4. **Logic:** Implement CartContext for global state management.
5. **Integration:** Connect forms to data handling logic.