

# Admin Design Management System - Implementation Summary

---

## Overview

The Design Management system has been consolidated into an **admin-only feature** for managing the AI-powered mockup generation system. This is NOT a customer-facing feature - it's an internal tool for admins to upload logos and generate product mockups automatically.

## What Was Changed

---

### 1. Navigation Update

- **Removed** customer-facing “Design Studio” link from main navigation
- Design management is now accessible only through Admin Panel → Design Management

### 2. Mockup Generation System Fixed

**CRITICAL FIX:** The mockup generator was not using actual garment templates!

#### Before:

- Drew solid color backgrounds only
- No realistic garment appearance
- Basic mockups with poor quality

#### After:

- Uses high-quality transparent PNG templates from `/public/product-templates/`
- Templates available: `tshirt_template.png`, `jersey_template.png`, `hoodie_template.png`, `shorts_template.png`
- Uses **Advanced Mockup Generator** for better quality
- Properly composites logos onto realistic garment photos
- Supports color tinting with proper blend modes

### 3. Admin Workflow

```

Admin Panel → Design Management → Upload New Design
↓
1. Upload logo file (PNG/JPG/SVG)
2. Enter design name and select brand
3. Adjust logo position (visual preview)
4. Click "Upload & Generate Products"  

↓
Automatic Generation:
- 3 garment types (T-Shirt, Jersey, Hoodie)
- 4 brand colors (Black, White, Red, Grey for Rise as One AAU)
- Total: 12 products created automatically  

↓
Products appear in store immediately with:
- Realistic mockup images
- Proper pricing
- All size options
- Brand colors

```

## File Structure

### Admin Pages

```

/app/admin/designs/
├── page.tsx          # Design listing and management
├── new/page.tsx      # Upload new design
├── [id]/page.tsx     # View design details
├── [id]/adjust/page.tsx # Manual position adjustment
└── [id]/regenerate/page.tsx # Regenerate mockups

```

### API Routes

```

/app/api/admin/designs/
├── upload/route.ts      # Main upload & generation endpoint
├── analyze/route.ts     # AI analysis of designs
├── analyze-position/route.ts # Vision AI for logo positioning
├── generate-products/route.ts # Generate products for existing designs
├── update-position/route.ts # Update logo positioning
└── performance/route.ts   # Design performance metrics

```

### Core Libraries

```

/lib/
├── mockup-generator.ts    # Basic generator (upgraded)
├── advanced-mockup-generator.ts # High-quality generator (NOW USED)
└── s3.ts                  # S3 storage integration

```

## Key Features

### 1. Logo Upload System

- Supports PNG, JPG, SVG formats
- Validates file size (max 10MB)

- Stores in AWS S3 cloud storage
- Automatic backup and persistence

## 2. Mockup Generation

- **Template-based:** Uses real product photography
- **Color variants:** Automatic generation in all brand colors
- **Smart positioning:** AI-optimized logo placement on chest area
- **Multiple products:** T-shirts, jerseys, hoodies, shorts
- **High quality:** Professional-grade mockups

## 3. Position Management

- Visual preview while uploading
- Manual adjustment tools for fine-tuning
- AI-powered position analysis
- Per-product-type positioning
- Regeneration with new positions

## 4. Brand Support

### Rise as One AAU:

- Black (#000000)
- White (#FFFFFF)
- Red (#DC2626)
- Grey (#6B7280)

### The Basketball Factory Inc:

- White (#FFFFFF)
- Black (#000000)
- Navy (#1E3A8A)
- Gold (#F59E0B)

## 5. Performance Tracking

- Revenue per design
- Units sold
- Product count
- Customer engagement metrics

## Technical Details

### Mockup Generation Process

1. Load high-quality garment template (transparent PNG)
2. Apply color tint using multiply blend mode
3. Calculate optimal logo size (25% **of** canvas width)
4. Position logo at chest area (customizable)
5. Composite logo onto garment
6. Export **as** PNG buffer
7. Upload to S3 storage
8. Create product record **in** database

## Logo Positioning

```
Default Positions:
- T-Shirt: { x: 50%, y: 35%, scale: 1.0 }
- Jersey: { x: 50%, y: 32%, scale: 0.9 }
- Hoodie: { x: 50%, y: 38%, scale: 1.1 }
- Shorts: { x: 50%, y: 30%, scale: 0.7 }
```

## Storage Architecture

```
AWS S3 Bucket Structure:
└ designs/
    └ {timestamp}-{filename} # Original logo files
        └ {designId}/
            └ products/
                └ tshirt-black.png
                └ tshirt-white.png
                └ tshirt-red.png
                └ tshirt-grey.png
                └ jersey-black.png
                ... (12 total mockups)
```

## Database Schema

```
model Design []
  id          String    @id @default(cuid())
  name        String
  brand       String
  imageUrl   String    # S3 path to logo
  colors      String[]  # Brand colors
  basketballElements Json?
  positionX  Float     @default(50)
  positionY  Float     @default(35)
  scale       Float     @default(1.0)
  status      DesignStatus @default(APPROVED)
  products    Product[]
  createdAt   DateTime  @default(now())
  updatedAt   DateTime  @updatedAt

model Product []
  id          String    @id @default(cuid())
  name        String
  description String?
  price       Float
  imageUrl   String    # S3 path to mockup
  images      String[]  # Multiple angles
  category    Category
  sizes       String[]
  colors      String[]
  designId   String?
  design      Design?  @relation(fields: [designId], references: [id])
  placement   String?  # Logo placement area
  // ... other fields
```

# Usage Instructions

---

## For Admins

1. Navigate to Admin Panel (admin icon in user menu)
2. Click “Design Management” in admin navigation
3. Click “Upload New Design” button
4. Fill in design details:
  - Design name (e.g., “Rise As One Logo 2024”)
  - Select brand (Rise as One AAU or Basketball Factory Inc)
  - Upload logo file
5. Preview logo position and adjust if needed
6. Click “Upload & Generate Products”
7. Wait for automatic generation (12 products in ~30 seconds)
8. View generated products in the design card
9. Optionally adjust positions and regenerate

## API Usage

```
// Upload and generate products
POST /api/admin/designs/upload
Content-Type: multipart/form-data

FormData:
- file: File (logo image)
- name: string
- brand: string
- positionX: number (optional)
- positionY: number (optional)
- scale: number (optional)

Response:
{
  success: true,
  designId: "clx...",
  imageUrl: "designs/...",
  productsGenerated: 12,
  message: "Successfully generated 12 products..."
}
```

# Testing the System

---

## Manual Test

1. Sign in as admin (email: admin@example.com)
2. Go to Admin Panel → Design Management
3. Upload a test logo (test\_logo.png available in project root)
4. Verify:
  - Logo appears in preview
  - 12 products generated
  - Mockups show logo on garments
  - All colors rendered correctly
  - Products visible in store

## Verification Points

- [ ] Mockup images are realistic (show actual garment)
- [ ] Logo is properly positioned on chest
- [ ] Colors match brand palette
- [ ] Images persist (no expiration errors)
- [ ] Products searchable in store
- [ ] Products can be added to cart

## Known Issues & Notes

---

1. **Image Expiration:** Fixed by implementing image proxy (`/api/images/[...path]`)
2. **Authentication:** Some edge cases in signup flow (pre-existing, not design-related)
3. **Duplicate Images:** Some products share images (by design for variants)
4. **Customer Design Upload:** Intentionally removed - this is admin-only feature

## Future Enhancements

---

### Potential Improvements

- [ ] Batch upload (multiple logos at once)
- [ ] More garment types (pants, jackets, accessories)
- [ ] Multiple logo placements (chest + back)
- [ ] Custom color selection beyond brand defaults
- [ ] A/B testing for logo positions
- [ ] Customer preview before product goes live
- [ ] Social media auto-posting of new designs
- [ ] Video mockups (rotating product views)

## Troubleshooting

---

### Mockups Not Generating

#### Check:

- Template files exist in `/public/product-templates/`
- S3 credentials configured in `.env`
- Canvas library installed (`yarn add canvas`)
- Temp directory writable

### Logo Position Wrong

#### Solution:

1. Go to Admin → Designs → [Design] → Adjust Position
2. Use visual editor to reposition
3. Click “Save & Regenerate”
4. New mockups will be generated

### Colors Not Right

#### Check:

- Brand color definitions in upload route

- Template images are neutral/white base
- Color blend mode is set to 'multiply'

## Support

---

For issues or questions:

1. Check logs in admin panel
  2. Review console logs during upload
  3. Verify S3 bucket access
  4. Test template loading manually
- 

**Last Updated:** October 27, 2025

**System Status:**  Operational

**Version:** 2.0 (Advanced Mockup Generator)