**I. Customer Frontend**

Goal: Create a visually stunning, user-friendly, and conversion-focused online presence that showcases your photographic talent, details your services, and makes booking seamless.

Key Sections/Pages:

* **Homepage:** 
  + Hero Section: High-resolution, full-screen background video or an interactive carousel of your absolute best, most impactful images. A compelling, concise headline and sub-headline emphasizing your unique style or specialization. Clear, contrasting Call-to-Action (CTA) buttons (e.g., "Explore Our Work," "Book Your Session Now").
  + Introduction/Brand Story: A brief, engaging section about your studio's philosophy, passion, and what makes you different. Link to the full "About Us" page.
  + Mini-Portfolio Showcase: A curated grid or slider featuring a few standout images from key service categories.
  + Services Overview: Visually appealing cards or sections summarizing your main services (e.g., Wedding, Portrait, Commercial) with icons, brief descriptions, and links to dedicated service pages.
  + Testimonial Snippets: Feature 2-3 impactful client quotes with names and possibly photos. Link to a dedicated testimonials page.
  + 'Why Choose Us?' Section: Highlight key benefits (e.g., unique style, experience, quick turnaround, custom packages).
  + Blog Highlights (Optional): Teasers for recent blog posts.
  + Final Call to Action: A visually distinct section encouraging users to book or get in touch.
  + Footer: Standard links (Privacy Policy, Terms), social media icons, contact details, copyright, possibly a mini sitemap.
* **Portfolio/Galleries:** 
  + Structure: Multiple dedicated gallery pages categorized by service type or theme (Weddings, Engagements, Families, Headshots, Events).
  + Layout: Masonry, justified grid, or full-width sliders for visual appeal.
  + Functionality: High-resolution image viewing (lightbox/modal), easy navigation between images, potentially "favorite" or "share" options. Client-specific private galleries with password protection. Advanced filtering/sorting options (e.g., by location, style). Lazy loading and responsive images are crucial.
* **Services:** 
  + Dedicated Pages: Each service needs its own detailed page.
  + Content: In-depth description of the service, what the experience is like, detailed package options with clear pricing or starting prices, specific examples of work for that service, FAQs related to the service, and a prominent booking CTA.
* **Booking:** 
  + Process: Multi-step form for clarity (Select Service -> Select Date/Time -> Enter Details -> Confirm/Pay Deposit).
  + Calendar Integration: Real-time availability calendar showing open slots. Consider integration with tools like Calendly or building a custom solution.
  + Information: Clear details on deposit requirements, payment methods, cancellation policy. Confirmation screen and automated email confirmation upon submission.
* **About Us:** 
  + Content: Detailed studio story, founder/team bios with professional photos, your artistic philosophy, mission/values, studio photos (if applicable), maybe a "behind-the-scenes" video or gallery.
* Testimonials:
  + Layout: Dedicated page with a visually appealing layout showcasing numerous testimonials. Include client names, photos (if permitted), and potentially the type of session they booked. Consider video testimonials.
* **Blog (Highly Recommended):** 
  + Content Strategy: Share session highlights, photography tips, venue spotlights, behind-the-scenes looks, industry thoughts. Great for SEO and client engagement.
  + Features: Categories, tags, search functionality, comment section (optional).
* **Contact:** 
  + Form: Simple, clear contact form with necessary fields (Name, Email, Subject, Message).
  + Direct Info: Prominently display email, phone number, studio address (with embedded map if a physical location exists). Include business hours.

*Design Principles:*

* + Visual Storytelling: Let the photos dominate and tell the story.
  + Elegant & Professional: Clean layout, sophisticated typography, consistent branding.
  + Mobile-First: Design for mobile first, then scale up. Performance is key.
  + User Experience (UX): Intuitive navigation, clear CTAs, fast loading times, accessible design.

**II. Admin Panel**

Goal: A secure, efficient, and intuitive interface for managing all aspects of the website and business operations.

Key Sections/Pages:

* **Dashboard:** 
  + At-a-Glance: Key stats (upcoming bookings, pending inquiries, revenue overview), activity feed, quick action buttons (Add Photo, New Booking, Create Blog Post). Customizable widgets. Visual charts for booking trends and revenue.
* **Portfolio Management:** 
  + Uploads: Drag-and-drop interface, bulk uploads, automatic resizing/optimization options.
  + Organization: Easy creation/editing/deletion of galleries. Assign images to multiple galleries. Add captions, alt text (for SEO), tags. Reorder images and galleries easily. Optional: Client gallery management (creating private, password-protected galleries). Watermarking options.
* **Service & Package Management:** 
  + CRUD Operations: Full control to add, edit, duplicate, and delete services and packages. Define details like duration, deliverables, pricing, add-ons.
* **Booking Management:** 
  + Calendar: Interactive calendar view (day/week/month) with color-coding for booking status (Pending, Confirmed, Completed, Cancelled). Click events to view details.
  + List View: Searchable and filterable list of all bookings with key details. Bulk actions (e.g., mark multiple as completed).
  + Booking Details: View full client info, session details, payment status, internal notes. Manually create bookings. Send/resend confirmation or reminder emails.
* **Client Management:** 
  + Database: Centralized list of all clients. Searchable and filterable.
  + Client Profile: View contact info, complete booking history, notes, communication log. Ability to link family members or related clients.
* **Content Management System (CMS):** 
  + Page Editor: User-friendly editor (like a block editor or enhanced WYSIWYG) for managing content on pages like About Us, Contact, Service descriptions.
  + Testimonial Management: Add, edit, approve, and feature client testimonials.
  + Blog Management: Create, edit, schedule, and publish blog posts with support for categories, tags, featured images.
* **Settings:** 
  + General: Site title, logo, contact info, social links, default SEO settings.
  + Booking: Set business hours/availability rules, blackout dates, booking lead times, deposit requirements, payment gateway configuration (Stripe/PayPal integration), automated email templates.
  + Users: Manage admin accounts and roles/permissions (if needed).
  + Integrations: API keys for Google Maps, analytics, email marketing services.

*Enhanced Design Principles:*

* + Clarity & Efficiency: Task-oriented design. Minimize clicks to perform common actions. Consistent UI patterns.
  + Data Visibility: Clear tables, dashboards, and visualizations. Robust search and filtering.
  + Security: Role-based access control, secure login, activity logs.
  + Responsiveness: Ensure usability on tablets and desktops.

**III. Enhanced Unified Backend**

Goal: A robust, scalable, and secure engine powering both the frontend and admin panel via a well-defined API.

Key Components & Functionality:

* **API Layer (RESTful or GraphQL):** 
  + Public Endpoints (for Frontend): Securely expose data needed for the customer site (portfolio, services, availability, testimonials, blog posts). Handle booking submissions and contact forms.
  + Admin Endpoints (for Admin Panel): Secure endpoints requiring authentication/authorization for all management tasks (CRUD operations for portfolio, services, bookings, clients, content, settings).
  + Authentication/Authorization: Implement JWT (JSON Web Tokens) or session-based authentication for admin users. Role-based access control for different admin functionalities.
* **Business Logic Layer:** 
  + Service Layer: Encapsulate core logic (booking validation, availability checks, email notifications, payment processing logic, content updates).
  + Image Processing: Handle image uploads, resizing, optimization, and watermarking upon upload.
  + Scheduling/Availability Engine: Complex logic to manage available slots based on existing bookings, business hours, lead times, and blackout dates.
  + Notification System: Manage and send various emails (booking confirmation, reminders, contact replies, password resets). Consider SMS notifications as an add-on.
* **Data Layer:** 
  + ORM (Object-Relational Mapper): Use Sequelize (as specified) or similar (like TypeORM for TypeScript) to interact with the database efficiently.
  + Database: PostgreSQL (as specified) is a solid choice for relational data.
  + Data Models: Well-defined models for User (Admin), Client, Service, Package, Booking, PortfolioItem, Gallery, Testimonial, BlogPost, Setting, etc.. Define relationships clearly (e.g., a Booking relates to a Client and a Service).
* **External Service Integrations:** 
  + Payment Gateway: Securely integrate with Stripe, PayPal, or other providers. Handle payment intents, webhooks for confirmation.
  + Cloud Storage: Integrate with AWS S3 (as specified) for scalable and reliable storage of images and potentially other assets.
  + Email Service: Use a transactional email service (e.g., SendGrid, Mailgun, AWS SES) for reliable email delivery.
  + Calendar API (Optional): Potentially sync bookings with Google Calendar.
* **Security:** 
  + Input validation (server-side). Protection against common threats (XSS, CSRF, SQL Injection). Rate limiting on APIs. Secure password hashing. Regular security audits. HTTPS enforcement.
* Testing:
  + Implement unit tests, integration tests, and end-to-end tests (using Jest as specified).

**IV. Enhanced Technology Stack**

The provided stack is modern and suitable. Here are minor enhancements and considerations:

* **Frontend:** 
  + React: Excellent choice. Consider Next.js for benefits like Server-Side Rendering (SSR) or Static Site Generation (SSG) which improve SEO and performance.
  + State Management: React Query is great for server state. For complex global client state, Redux Toolkit.
  + Styling: CSS-in-JS (like Styled Components or Emotion) or Tailwind CSS are alternatives/additions to Sass + Material UI.
  + Forms: Formik/Yup is solid. React Hook Form is another popular, performant alternative.
  + JavaScript (ES6+)
  + CSS3 (with Sass)
  + Material UI
  + Framer Motion
  + Axios
  + React Router
  + React Helmet (SEO)
* **Backend:** 
  + Node.js/Express: Standard and effective. Consider TypeScript for better type safety and maintainability in larger projects. NestJS is a framework built on Node/Express with strong opinions that can speed up development.
  + Database/ORM: PostgreSQL + Sequelize is good. Ensure you leverage migrations for database schema changes.
  + Real-time (Optional): Socket.IO is listed. Useful for real-time admin dashboard updates or notifications, but might be overkill initially.
  + API Specification: Consider using OpenAPI (Swagger) to document your API endpoints.
  + JWT
  + Jest
* **Other Essentials:** 
  + Git for version control.
  + npm for package management.
  + Webpack for bundling frontend assets.
  + Nginx as a web server/reverse proxy.
  + AWS S3 for storing images and other static assets.
  + Cloud platform AWS for deployment.
  + Containerization: Docker for consistent development and deployment environments.
  + CI/CD: Set up Continuous Integration/Continuous Deployment pipelines (e.g., using GitHub Actions, GitLab CI, Jenkins) for automated testing and deployment.
  + Monitoring/Logging: Implement tools for monitoring application performance (e.g., Sentry, Datadog) and logging.