**Mass Offering App - Technical Architecture (Modular Monolith Approach)**

**📆 Project Duration:**

**3–4 Months (MVP)**

**🌐 Target Audience:**

* Catholic users globally
* Parish Admins
* Diocese Admins
* Priests
* RGK Super Admins

**🚀 Tech Stack:**

* **Frontend:** React Native (mobile), React (admin panel)
* **Backend:** Node.js + Express (Modular Monolith)
* **Database:** PostgreSQL (via Supabase or Railway)
* **Caching:** Redis (Upstash or Railway)
* **Object Storage:** Supabase Storage / Backblaze B2
* **Hosting:** Railway / Render / Vercel
* **Notifications:** SendGrid, Twilio, Firebase (FCM)
* **Payments:** Stripe, PayPal

**🔹 Architecture Overview**

**Modular Monolith**

* All features are built in a **single deployable backend application**
* **Modularized by domain**: /modules/booking, /modules/payment, etc.
* Easy to scale, debug, and deploy
* Ready to evolve into microservices if needed later

**Folder Structure (Example)**

/src

/modules

/auth

/mass

/booking

/payment

/notification

/middleware

/jobs

/config

/utils

app.js

server.js

**🎡 Key Features**

**✉️ User Management**

* Role-based Access (User, Parish Admin, Diocese Admin, Super Admin)
* JWT Authentication with OAuth2 principles
* MFA (email-based for admins)

**⌚ Mass Booking Engine**

* Search by date, location, Mass type, time, language
* Availability status
* One intention per Mass slot
* Book on behalf of others
* Multi-language and RTL support

**💳 Donation & Payments**

* Stripe + PayPal integration
* Mandatory donations with tiered pricing
* Multi-currency support
* Recurring Mass support
* Donation ledger + receipt system

**📧 Notifications**

* Email (SendGrid)
* SMS (Twilio)
* Push (FCM)
* Customizable templates per parish

**📊 Admin Dashboards**

* Booking management
* Payment tracking and forwarding
* Analytics (most active parishes, top donors)
* Exportable reports (CSV, PDF)

**🏨 Parish/Diocese Tools**

* Mass slot uploads (CSV/API)
* Manual overrides
* Forwarding Mass requests to other parishes
* Priests can confirm Masses

**💾 File Uploads**

* Document upload (JPEG, PNG, PDF)
* ClamAV scan integration
* Parish verification docs, prayer cards, certificates

**🔺 Scalability Strategy**

* Single app handles all modules with shared database
* Redis caching for search, session, rate limiting
* CDN (Cloudflare) for frontend asset delivery
* Can split modules into services when scaling (payments, notifications, analytics)

**🔒 Security & Compliance**

* AES-256 encryption at rest
* TLS 1.3 for data in transit
* Role-based access control (RBAC)
* GDPR-compliant (consent, data deletion/export)
* PCI-DSS compliance (Stripe)
* Audit logs for all financial/admin actions

**📐 Development & Deployment Plan**

**Weekly Sprints (2-week cycles)**

| **Sprint** | **Deliverables** |
| --- | --- |
| 1 | Auth, user roles, DB schema setup |
| 2 | Mass availability upload, search API |
| 3 | Booking + payments integration |
| 4 | Email notifications, booking history |
| 5 | Admin dashboard (Parish, RGK) |
| 6 | Diocese tools, forwarding, export reports |
| 7 | Recurring masses, reminders |
| 8 | Final QA, security tests, UAT, deploy |

**Tools**

* **CI/CD:** GitHub Actions or Railway deployments
* **Project Management:** Trello / Notion
* **Testing:** Jest, Supertest, Cypress

**🌟 Future Upgrade Path**

| **When You Need...** | **Transition To...** |
| --- | --- |
| High traffic/holiday spikes | Split into microservices |
| Dedicated ML recommendations | AI microservice + queue |
| More granular scaling | ECS/EKS or serverless arch |
| Complex CRM/accounting | Integrate Salesforce/Xero |

**Conclusion:**  
This Modular Monolith design offers **maximum development velocity**, **low cost**, and **future scalability**. Ideal for a nonprofit MVP and can evolve to enterprise-level infrastructure when growth demands it.