FinAware — System Architecture

Process-Isolated Microservices | Next.js 14 + Express + Prisma + SQLite

CLIENT

Web Browser	Session Cookies	Tailwind CSS	Recharts	Zod Validation	Client State
React 18 CSR + SSR	httpOnly, SameSite=lax	Responsive UI	Data Visualization	Runtime Type Safety	useState / useEffect

FRONTEND — Next.js 14 App Router (Port 30005)

Pages:

/login	/join	/fica-verification	/dashboard	/identity	/debts	/income-expense	/rehab	/help

Components:

Sidebar, MetricCard, RiskBadge	LandingForm, DebtsManager	Donut + Line Charts	IdentityForm, HelpRequestForm	IncomeExpensePlanner	AiRecommendationsCard	DownloadOverviewButton

MIDDLEWARE & API ROUTES

middleware.ts — Auth guard, FICA redirect, Route protection	API Handlers: /api/microservices/*, /api/ai-recommendations, /api/pdf, /api/health	Session: getSessionUserId(), cookie ops (httpOnly)	Zod: authLogin, createDebt, consultation, pdfPassword

SERVICE PROXY

lib/microservices/proxy.ts — callService() / callServiceJson() — HTTP fetch to localhost:41xx	Service Discovery: AUTH_SERVICE_URL, DASHBOARD_SERVICE_URL, IDENTITY/DEBTS/REHAB/HELP/PDF_SERVICE_URL

MICROSERVICES — 7 Independent Express Processes

Auth Service :4101

POST /auth/login
GET /auth/users/:id
POST /auth/fica/verify

loginOrCreateUser()
Simulated Profile Generation
SA ID Validation (Luhn)
Passport (11 countries)
Risk: ID suffix → Level

W: Users, CreditProfile, Debts
PaymentHistory, LegalRecords
Providers
R: Users

Dashboard Svc :4102

GET /dashboard/
overview/:userId

calculateDashboardMetrics()
getFinancialAgeDetails()
getRiskFactors()
buildScoreProjection()
Debt Composition Map
Chart Data (6-month)

R: Users, Debts

Identity Svc :4103

GET /identity/profile/:id
PATCH /identity/profile/:id

Profile Read/Update
Download Password Hash
Immutable: ID/Passport
identityUpdateSchema

R/W: Users

Debts Service :4104

GET /debts/:userId
POST /debts/:userId
PATCH /debts/:id

CRUD (no delete — history)
refreshCreditProfileTotals()
GARNISHED → LegalRecord
Payment History Tracking

R/W: Debts, CreditProfile
LegalRecords, PaymentHistory

Rehab Service :4105

POST /rehab/plan/:userId

Strategy by Risk Level:
HIGH → Urgent Intervention
MED → Stabilize & Repair
LOW → Maintenance & Growth
AI 4-Week Action Plan
Fallback: deterministic recs

R: Users, Debts
W: AiRecommendations

Help Service :4106

GET /help/requests/:id
POST /help/requests/:id

Consultation Requests
WhatsApp Click-to-Chat
Provider Lookup
Advisor: Financial/Debt/Legal

R/W: ExpertRequests, Providers

PDF Service :4107

POST /pdf/overview/:id

Password Gate (ID or hash)
pdf-lib Generation
Watermark Overlay (-30deg)
Protected PDF Export
User Profile + All Metrics

R: Users, CreditProfile, Debts

DATABASE — Prisma + SQLite

Users	CreditProfile	Debts	PaymentHistory
Identity, Income, Risk FICA, Employment	Score, Total Debt Monthly Obligations	Creditor, Type, Balance Interest Rate, Status	Due Date, Paid Missed Tracking

LegalRecords	ExpertRequests	AiRecommendations	Providers
Judgments, Garnishee Orders, Descriptions	Advisor Type, Message Consultation Log	Risk Level JSON Snapshots	WhatsApp Numbers Provider Types

Users 1→* Debts | Users 1→1 CreditProfile | Users 1→* LegalRecords | Debts 1→* PaymentHistory | Users 1→* ExpertRequests
Users 1→* WealthAssets

EXTERNAL SERVICES

OpenAI API (gpt-4.1-mini)	WhatsApp (Click-to-Chat)
Structured JSON Schema	AI Recommendations Summary, Actions, 4-Week Plan, Warnings	External redirect to wa.me/{number} Financial Advisor / Debt Counsellor / Legal

Risk Simulation Engine	pdf-lib
Deterministic: ID suffix "999"→HIGH "555"→MED else→LOW Drives: credit score, debt count, employment	PDF Generation + Watermark Overlay Password-protected export with profile

DEPLOYMENT & INFRASTRUCTURE

Docker Compose — 9 containers + SQLite vol	Kubernetes — Deployments, Services, Ingress	Helm Charts — Dev / Staging / Prod	Health Probes — /health/live, /health/ready	HPA — CPU-based Horizontal Autoscaler	PVC — SQLite Persistent Volume Claim

Legend: ☐ Client ☐ Frontend ☐ Middleware ☐ Proxy ☐ Microservices ☐ Database ☐ External ☐ DevOps ---▶ Data Flow

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