

CARECRAFTER ENTERPRISE CASE STUDY

JUPERRA HEALTHCARE PLATFORM

CareCrafter's Next-Generation Home Care Delivery & Nurse Workforce Ecosystem

CARE CRAFTER PARTNERED WITH XENELSOFT TECHNOLOGIES

Full-Stack Healthcare Technology Partner | Multi-Tier Verification, AI Engine & Stripe Financial Routing

Healthcare & Fintech Mastery

CareCrafter chose Xenelsoft for deep expertise in HIPAA compliance, medical license automation, and Stripe Connect marketplace split payouts.

Concurrent Dual Engineering

Xenelsoft rapidly delivered both **Juperra Connect** and **Juperra Caregiver** simultaneously with zero architectural bottlenecks.

AI & Automation Excellence

Xenelsoft engineered sub-second AI caregiver matching and the **Care Angel AI** conversational assistant for 24/7 patient guidance.

SECURITY	IDENTITY	CHECK	LICENSE	PAYMENT	AI BOT
Auth0	Persona	Checkr	Nursys / MQA	Stripe Connect	Care Angel
SSO & MFA Security	ID & Liveness Scan	Background Checks	License Automation	Split Payout Routing	24/7 AI Guidance

1. Executive Summary & Strategic Platform Vision

Empowering CareCrafter home care delivery through a unified dual-application architecture designed by Xenelsoft Technologies.

The Home Healthcare Challenge

CareCrafter recognized that traditional home care services suffer from fragmented coordination, slow manual caregiver onboarding (taking weeks to verify credentials), unreliable background verification, and lack of real-time care visibility for patients and families.

Xenelsoft's Unified Solution

Xenelsoft Technologies architected and built the complete **Juperra Healthcare Ecosystem** for CareCrafter — comprising two interconnected native mobile/web applications (**Juperra Connect** and **Juperra Caregiver**) powered by an automated microservices backend.

Core Platform Pillars Engineered by Xenelsoft

- **Dual-App Synergy:** Real-time sync between Caregiver workforce and Connect family clients.
- **Automated Compliance Pipeline:** Multi-agency verification (Persona, Checkr, Nursys, MQA, Versys).
- **Automated Financial Distribution:** Direct Stripe Connect split payout routing.
- **AI-Powered Intelligence:** Smart matching engine and Care Angel conversational health assistant.
- **Document Expiry Engine:** Automated tracking of insurance, CPR, and state medical licenses.

100% Automated
License Verification

< 5 Minutes
Identity Verification (Persona)

Instant Split Payouts
Stripe Connect Routing

24/7 AI Guidance
Care Angel Health Assistant

2. Dual Application Architecture: Connect vs. Caregiver

Deep integration between Juperra Connect (Family/Patient) and Juperra Caregiver (Nurse/Aide Workforce).

Juperra Connect (Patient & Family App)

Designed specifically for CareCrafter care seekers, patients, and family guardians to manage home health needs effortlessly:

- **Care Service Booking:** On-demand & scheduled home care requests.
- **Caregiver Discovery:** Search certified RNs, LPNs, and HHAs by skills.
- **Real-Time Shift Monitor:** Track caregiver arrival, live GPS & shift status.
- **Care Angel AI Integration:** 24/7 medical & health question guidance.
- **Transparent Billing:** Secure card payments via Stripe & invoice tracking.

Juperra Caregiver (Workforce & Nurse App)

Dedicated mobile workspace for professional nurses and home health aides to deliver exceptional care:

- **Shift Management:** Accept/decline incoming shifts matching criteria.
- **Onboarding Verification Hub:** Submit Persona, Checkr & licenses.
- **Geo-Fenced Clock-In:** Verified arrival & departure at patient location.
- **Stripe Connect Earnings:** Direct payouts and earnings analytics.
- **Document Expiry Alerts:** Automatic warnings for insurance & CPR.

Shared Real-Time Engine & Data Synchronization

Xenelsoft built both applications on top of a unified state-synchronized architecture: **Socket.IO real-time event pipeline** for immediate shift status changes, shared **RESTful Dio API layer**, encrypted local storage, and bi-directional notification infrastructure via Firebase Cloud Messaging (FCM).

3. Enterprise Security & Authentication (Auth0)

HIPAA-compliant, multi-tenant authentication engine securing CareCrafter user identities across both applications.

Auth0 Security Implementation

Security and privacy are non-negotiable in healthcare. Xenelsoft integrated **Auth0** as the central identity provider to deliver bank-grade security across the entire ecosystem.

- **Single Sign-On (SSO):** Unified identity across Web, Caregiver App, and Connect App.
- **OAuth 2.0 & OIDC Standard:** Secure token issuance with short-lived JWTs.
- **Biometric Authentication:** FaceID and TouchID integration for fast app unlock.
- **Multi-Factor Authentication (MFA):** SMS OTP and Authenticator app support.

Role-Based Access Control (RBAC) Architecture

Xenelsoft implemented strict RBAC policies within Auth0 token claims to enforce absolute data isolation:

1. **Caregiver Role:** Restricted to assigned shift data, earnings wallet, and credential uploads.
2. **Patient / Family Role:** Access to personal care plans, booking management, and payment methods.
3. **Admin / Compliance Officer Role:** Full override access for credential verification and system audits.

Security & Token Management Highlights

- **Automatic Token Refresh:** Custom Dio interceptor automatically handles silent token renewal before expiration.
- **AES-256 Encryption:** All localized credentials and refresh tokens stored securely via `encrypt` and iOS Keychain / Android Keystore.

4. Identity & Background Verification Pipeline

Automated multi-tier screening using Persona Flutter SDK and Checkr criminal verification engine.

Persona Identity Verification Integration

To prevent identity fraud and ensure patient safety, Xenelsoft embedded the **Persona Flutter SDK** (`persona_flutter``) directly into the onboarding workflow:

- **Government ID Scan:** Real-time extraction of Driver's Licenses, Passports, and State IDs.
- **Biometric Liveness Detection:** 3D facial selfie matching against ID document photo.
- **SSN Validation:** Instant social security number matching for legal employment verification.
- **Automated Webhook Handshake:** Secure server-to-server confirmation of verification status.

Checkr Background Verification Engine

Every caregiver must pass a comprehensive background check powered by the **Checkr API** before receiving patient assignments:

- **County & National Criminal Search:** Automated screening of federal & state databases.
- **Sex Offender Registry Check:** Continuous cross-referencing against national registries.
- **Motor Vehicle Record (MVR):** Driving history validation for transport-enabled caregivers.
- **Continuous Monitoring:** Automated re-checks to flag post-onboarding violations.

Step 1: Caregiver Reg. Auth0 & Profile Creation	Step 2: Persona Scan ID & Liveness Check	Step 3: Checkr Check Criminal Background	Step 4: Status Webhook Auto-Approve / Review
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5. Medical License Verification Automation (MQA, Nursys, Versys)

Direct API integration with national and state medical licensing boards for real-time validation.

Automated Multi-Board Query Engine

To guarantee that every active caregiver holds an active, unencumbered license, Xenelsoft built direct integrations with key licensing authorities:

- **NURSYS API Integration:** Automated queries to NCSBN for RN, LPN, and APRN licenses across multi-state compacts.
- **Florida MQA (Medical Quality Assurance):** Direct integration with Florida Dept of Health MQA database for instant medical license verification.
- **VERSYS Engine:** Automated verification for specialized healthcare credentials and allied health certifications.

Automated & Manual Hybrid Review Pipeline

Xenelsoft implemented a resilient dual verification model:

1. **Automated Pre-Screening (Fast Path):** Board APIs return active license status -> Instant profile badge activation.
2. **Discrepancy Exception Handling:** Name mis-matches or multi-state compact edge cases trigger an automatic queue for compliance review.
3. **Admin Override Portal:** Compliance team can inspect original board records and manually verify/reject credentials with full audit trail.

Verification System	Target Credentials	Verification Speed	Automation Status
NURSYS	Registered Nurse (RN), LPN, APRN	Real-Time API (< 3 sec)	100% Automated
Florida MQA	Florida Health Dept Licenses & CNA	Instant DB Query	100% Automated
VERSYS	Allied Health & Specialty Certs	Batch / API Lookup	Automated + Fallback

6. Document Expiry & Compliance Lifecycle Management

Proactive tracking engine ensuring zero unverified or expired caregivers work active shifts.

Proactive Expiry Tracking Engine

Healthcare compliance requires continuous monitoring beyond initial onboarding. Xenelsoft developed an automated lifecycle tracking engine that monitors expiration dates for:

- **Professional Liability Insurance:** Annual policy renewal tracking.
- **CPR / BLS Certifications:** Biennial renewal validation.
- **State Driver's License & Auto Insurance:** For transport care.
- **Medical Licenses (RN/LPN/CNA):** State board renewal cycle monitoring.

Multi-Tier Warning & Auto-Lockout Workflow

Xenelsoft implemented an automated multi-tier alert and lockout enforcement system:

- **30 Days Prior:** In-app banner & push notification to renew document.
- **14 Days Prior:** Email warning + SMS alert detailing upload link.
- **7 Days Prior:** Urgent warning badge on Caregiver dashboard.
- **Day 0 (Expiration): Automated Safety Lockout** — Caregiver account is automatically hidden from matching engine and restricted from shift acceptance until renewed.

Code Base Reference: Modular Expiry UI Widgets

In `jupera_caregiver`, Xenelsoft engineered modular UI widgets (`common_insurance_section.dart`, `common_certification_section.dart`, `common_issue_expiry_fields.dart`) that handle date pickers, instant file upload, document previewing, and real-time status pill badges (`Active`, `Expiring Soon`, `Expired`, `Under Review`).

7. Financial Operations & Payment Distribution (Stripe Connect)

End-to-end automated payment routing, split fees, escrow holding, and direct payouts.

Stripe Connect Express / Custom Integration

Xenelsoft integrated **Stripe Connect** (``flutter_stripe_connect`` & ``flutter_stripe``) to manage complex healthcare marketplace financials with complete tax & payout compliance:

- **Caregiver Onboarding:** Embedded Stripe KYC, bank account linking, and tax form (W-9 / 1099) verification.
- **Split Payment Architecture:** Patient payment on Juperra Connect automatically splits between Caregiver earnings and Juperra platform commission fee.
- **Escrow & Hold Engine:** Patient payment is authorized prior to shift start and captured upon successful shift completion.

Payout Modes & Financial Auditing

Flexibility for caregivers paired with strict financial auditing for platform operators:

- **Instant Payouts:** Caregivers can request immediate transfer of completed shift funds to their debit card.
- **Scheduled Weekly Payouts:** Automated direct deposit payouts processed every week.
- **In-App Wallet & Earnings Ledger:** Real-time transaction history, itemized shift rates, and downloadable pay stubs.
- **Refund & Dispute Resolution:** Automated escrow release adjustments in case of shift cancellations.

1. Patient Books Shift

Card Authorized via Stripe

2. Shift Executed

GPS Verified Check-out

3. Escrow Captured

Funds Moved to Stripe Escrow

4. Split & Payout

Platform Fee + Direct Payout

8. Technical Challenge: Data Mapping & License Verification

Harmonizing disparate third-party schemas into a unified, high-performance database model.

The Data Schema Mapping Challenge

Integrating external APIs (Checkr JSON, Persona webhooks, Nursys REST/SOAP, and Florida MQA DB dumps) presented significant architectural challenges due to non-standardized field names, varying date formats, state-specific license numbering, and asynchronous webhook delivery.

Xenelsoft's Data Normalization Pipeline

Xenelsoft engineered a resilient **Data Mapping Transformer Layer** in the backend that standardizes all inbound payloads into Juperra's core database models.

Schema Normalization Architecture

- **Idempotent Webhook Processing:** Guarantees event delivery without duplicating verification updates.
- **Unified Status Enum:** Maps 15+ external status strings into 4 normalized internal states (`Pending`, `Verified`, `ActionRequired`, `Expired`).
- **Audit Trail Logging:** Preserves raw JSON payloads alongside normalized records for legal compliance.
- **Automated Retries:** Exponential backoff queue for handling temporary state board API downtime.

External Provider	Raw Payload Fields	Juperra Unified Database Field	Transformation Logic
Persona SDK	`inquiry.attributes.status`	`user.identity_status`	Maps `approved` -> `Verified`
Checkr API	`candidate.report.status`	`caregiver.background_status`	Maps `clear` -> `Passed`
NURSYS API	`lic_status`, `compact_flag`	`caregiver.license_active`	Validates multi-state compact rules
Florida MQA	`lic_exp_date`, `board_action`	`license.expiry_date`	Parses ISO8601 & flags board actions

9. Technical Challenge: Multi-Factor AI Matching Engine

Algorithmic caregiver-to-patient dispatch balancing proximity, skills, schedules, and preferences.

The Care Matching Problem

Matching a vulnerable patient with the right home caregiver requires evaluating multiple complex variables simultaneously. Manual matching leads to delayed care, high travel times, and skill mismatches.

Xenelsoft's AI Matching Algorithm

Xenelsoft developed a real-time **Multi-Factor Scoring Algorithm** that ranks and dispatches shifts to available caregivers in milliseconds based on a weighted matrix.

Matching Engine Ranking Criteria

1. **Geofenced Proximity (Weight 30%):** Spatial indexing using Google Maps API & Haversine formula.
2. **Skill & Certification Match (Weight 25%):** Mandatory matching of care level (e.g. RN for IV therapy vs HHA for companionship).
3. **Schedule & Availability (Weight 20%):** Real-time calendar overlap calculation (`table\_calendar`).
4. **Rate Preference (Weight 15%):** Hourly rate alignment via dynamic price slider preferences.
5. **Historical Rating Score (Weight 10%):** Past patient reviews & reliability metrics.

Algorithmic Dispatch Performance Metrics

- **Sub-Second Execution:** Evaluates 500+ candidate caregivers in < 250 ms.
- **94% Acceptance Rate:** Smart matching significantly increases caregiver shift acceptance on first notification dispatch.
- **35% Lower Travel Time:** Proximity optimization reduces caregiver commute distance.

10. Care Angel: Conversational AI Health Assistant

Empowering patients and caregivers with 24/7 intelligent medical guidance and symptom insights.

Care Angel AI Overview

Integrated into **Juperra Connect** (via `CareAngelRepository``), **Care Angel** is an intelligent conversational AI assistant built to support families and patients with healthcare questions and daily wellness management.

- **Medical Health Q&A;**: Natural language responses to medical inquiries, drug interactions, and care instructions.
- **Pre-Care Symptom Assessment**: Guided triage asking clinical questions before requesting a nurse.
- **Daily Health Log & Insights**: Generates trend reports (`CareAngelInsightsResponse``) for family visibility.

Safety & Emergency Escalation Protocol

Healthcare AI requires strict medical safety guardrails. Xenelsoft implemented safety protocols within Care Angel:

- **Red-Flag Symptom Detection**: Real-time sentiment & keyword analysis detecting red flags (e.g. chest pain, severe dyspnea).
- **Automated Emergency Escalation**: Immediately prompts 911 dispatch and alerts assigned caregiver & family contacts.
- **Medical Disclaimer Guardrails**: Ensures AI recommendations comply with clinical informational guidelines.

Codebase Architecture Reference (`CareAngelRepository``)

In `juperra_connect``, Xenelsoft structured Care Angel using clean architecture repositories:

- `sendMessage(CareAngelSendMessageRequest)`` — Asynchronous LLM conversational endpoint.
- `getChatHistory(page, limit)`` — Paginated local & cloud conversation memory.
- `getInsights()`` — AI synthesis of patient daily health metrics for family updates.

11. Real-Time Shift Operations & Geo-Fenced Tracking

Complete shift state machine with GPS verification, active task logging, and digital signatures.

GPS Geo-Fenced Check-In / Check-Out

To guarantee shift honesty and billing accuracy, Xenelsoft built location-verified shift check-ins using ``geolocator`` and ``google_maps_flutter``:

- **Radius Geo-Fence:** Caregiver can only clock in when physically within 100 meters of patient home.
- **Continuous Location Heartbeat:** Background location updates during active shift for safety monitoring.
- **Offline Location Queue:** Stores check-in timestamps locally if cellular connectivity drops.

Care Task Logging & Digital Signatures

Comprehensive clinical documentation completed directly at the point of care:

- **Care Plan Task Checklist:** Itemized care activities (medication administration, vitals check, mobility assistance).
- **Digital Signature Capture:** Embedded ``signature`` canvas for patient or guardian sign-off at shift end.
- **Instant PDF Care Summary:** Generates downloadable shift report stored in cloud storage.

1. Shift Dispatch AI Match & Accept	2. En Route Track Live Map on Connect	3. Geo Clock-In Verified Radius Check	4. Tasks & Sign Digital Sign-Off	5. Auto Payout Stripe Connect Split
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12. Platform Impact & Xenelsoft Engineering Excellence

How Xenelsoft Technologies Transformed CareCrafter's Digital Healthcare Operations.

85% Reduction
In Caregiver Onboarding Time

99.8% Accuracy
In Medical License Verification

100% Zero-Trust
Compliance Safety Lockout

Sub-Second
AI Caregiver Match Speed

Xenelsoft Core Achievements for CareCrafter

- **End-to-End Dual Engineering:** Concurrent development and seamless integration of both Juperra Connect and Juperra Caregiver apps.
- **Multi-API Orchestration:** Seamless integration of 6+ major third-party APIs (Auth0, Persona, Checkr, Nursys, MQA, Stripe Connect).
- **High-Performance Codebase:** Built using clean Flutter architecture, robust GetX/Bloc state management, and optimized Dio HTTP caching.

Why CareCrafter Chose Xenelsoft Technologies

- **Healthcare & Fintech Expertise:** Deep understanding of HIPAA guidelines, medical licensing, and complex Stripe marketplace payments.
- **Full-Stack Capability:** Mobile, web, cloud infrastructure, AI models, and real-time backend microservices under one roof.
- **Commitment to Quality:** Zero compromise on security, scalability, performance, and user experience.

XENELSOFT TECHNOLOGIES — TRANSFORMING HEALTHCARE THROUGH INNOVATION