

# ServicePro White-Label Super-System

## Complete Fusion & Implementation Plan

**Version:** 2.0 - Repository-Informed  
**Date:** November 5, 2025  
**Status:** Production-Ready Implementation Plan  
**Target:** Multi-Million Dollar Multi-Tenant SaaS Platform

### Executive Summary

This document provides a **complete, production-grade implementation plan** to fuse Clean Machine Auto Detail (CM) and ServicePro (SP) into a unified whitelabel "super-system." The plan preserves CM's battle-tested features while transforming both into a multi-tenant SaaS platform that any service business owner can deploy with **zero code**.

#### Key Tech Stack (Preserved):

- **Frontend:** React + TypeScript + Vite + Tailwind CSS + shadcn/ui
- **Backend:** Express.js + TypeScript (ESM modules)
- **Database:** PostgreSQL (Neon serverless) + Drizzle ORM
- **Auth:** Session-based (express-session + passport-local) + JWT for widget
- **Storage:** Google Drive for photos

#### Core Architectural Principles:

1. **Non-destructive migration:** Clean Machine continues as ROOT tenant
2. **Additive approach:** No breaking changes to working CM features
3. **Monorepo structure:** Core SDK + Adapters + Tenant isolation
4. **Onboarding-first UX:** Zero-code setup for non-technical users
5. **Feature flags:** Safe rollouts, instant rollbacks
6. **Multi-tenant by default:** Row-level isolation, encrypted secrets vault

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# 1) Architecture & Code Organization

## 1.1 Monorepo Structure (Replit-Compatible)



servicepro-monorepo/

- ├── .replit # Replit configuration
- ├── replit.nix # Nix dependencies
- ├── package.json # Workspace root
- ├── tsconfig.json # Base TypeScript config
- ├── turbo.json # Turborepo for caching
- ├── .env.example
- ├── .gitignore

├── packages/

- ├── core/ # Business logic SDK (Clean Machine → ServicePro)

- ├── src/

- ├── scheduling/

- ├── domain/

- ├── scheduler.ts

- ├── availability-checker.ts

- ├── conflict-detector.ts

- ├── weather-aware-scheduler.ts

- ├── buffer-calculator.ts

- ├── recurring-service-engine.ts

- └── google-calendar-sync.ts

- ├── ports/

- ├── calendar-port.ts

- ├── weather-port.ts

- ├── notification-port.ts

- └── geocoding-port.ts

- ├── use-cases/

- ├── book-appointment.ts

- ├── check-availability.ts

- ├── reschedule-for-weather.ts

- ├── create-recurring-service.ts

- ├── process-recurring-batch.ts

- └── sync-with-google-calendar.ts

- ├── telephony/

- ├── domain/

- ├── sms-template-engine.ts

- ├── voice-call-handler.ts

- ├── missed-call-auto-sms.ts

- ├── voicemail-to-sms.ts

- └── consent-tracker.ts

- tcpa-compliance.ts

- two-leg-calling.ts

- click-to-call.ts

- ports/

- telephony-provider-port.ts

- transcription-port.ts

- recording-storage-port.ts

- use-cases/

- send-sms.ts

- handle-incoming-call.ts

- process-voicemail.ts

- auto-respond-missed-call.ts

- initiate-two-leg-call.ts

- track-sms-consent.ts

- handle-stop-start-help.ts

- weather/

- domain/

- weather-analyzer.ts

- reschedule-rules.ts

- industry-thresholds.ts # Auto-detail vs lawn care

- forecast-evaluator.ts

- ports/

- weather-provider-port.ts

- use-cases/

- check-weather-impact.ts

- auto-reschedule-appointment.ts

- notify-customer-of-reschedule.ts

- maps/

- domain/

- service-area-validator.ts

- geocoder.ts

- eta-calculator.ts

- route-optimizer.ts

- ports/

- geocoding-port.ts

- use-cases/

- validate-service-area.ts

- calculate-technician-eta.ts

- geocode-address.ts

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|
|
|
|
|----- knowledge-base/
|
|----- domain/
|
|----- kb-matcher.ts
|
|----- response-generator.ts
|
|----- confidence-scorer.ts
|
|----- sheets-kb-sync.ts # Google Sheets integration
|
|----- ports/
|
|----- kb-store-port.ts
|
|----- ai-provider-port.ts
|
|----- sheets-port.ts
|
|----- use-cases/
|
|----- answer-customer-question.ts
|
|----- suggest-ai-response.ts
|
|----- sync-kb-from-google-sheets.ts
|
|
|----- technicians/
|
|----- domain/
|
|----- technician-profile.ts
|
|----- bio-coach.ts # AI-powered bio improvement
|
|----- photo-validator.ts
|
|----- onboarding-checklist.ts
|
|----- pto-manager.ts
|
|----- shift-trader.ts
|
|----- applicant-pipeline.ts
|
|----- time-tracker.ts
|
|----- ports/
|
|----- ai-coach-port.ts
|
|----- storage-port.ts
|
|----- calendar-port.ts
|
|----- use-cases/
|
|----- create-technician.ts
|
|----- improve-bio-with-ai.ts
|
|----- inject-profile-in-otw-message.ts
|
|----- request-ptd.ts
|
|----- trade-shift.ts
|
|----- track-applicant.ts
|
|
|----- billing/
|
|----- domain/
|
|----- invoice.ts
```

└── third-party-payer.ts # Complex multi-role billing

└── gift-billing.ts

└── company-po-billing.ts

└── deposit-rules.ts

└── payment-methods.ts

└── role-based-notifications.ts

└── ports/

└── payment-provider-port.ts # Stripe + PayPal

└── invoice-store-port.ts

└── notification-port.ts

└── use-cases/

└── authorize-third-party-payer.ts

└── collect-deposit.ts

└── finalize-invoice.ts

└── process-gift-payment.ts

└── handle-company-po.ts

└── notify-payer-recipient-separately.ts

└── messaging/

└── domain/

└── multi-channel-router.ts # SMS, web, FB, IG

└── unified-inbox.ts

└── ai-takeover-manager.ts

└── manual-override.ts

└── message-rephraser.ts # GPT-4o-mini

└── ports/

└── sms-port.ts

└── facebook-port.ts

└── instagram-port.ts

└── webchat-port.ts

└── use-cases/

└── route-inbound-message.ts

└── send-multi-channel-message.ts

└── takeover-from-ai.ts

└── handoff-to-ai.ts

└── rephrase-message-for-tone.ts

└── quotes/

└── domain/

└── quote-request.ts

└── photo-analyzer.ts # AI vision for damage assessment

- └── damage-assessor.ts
- └── custom-pricing-engine.ts
- └── specialty-job-workflow.ts

- └── ports/
  - └── storage-port.ts # Google Drive
  - └── ai-vision-port.ts
  - └── notification-port.ts

- └── use-cases/
  - └── create-quote-request.ts
  - └── analyze-damage-photos.ts
  - └── generate-custom-quote.ts
  - └── approve-and-book-quote.ts

- └── loyalty/

- └── domain/
  - └── points-engine.ts
  - └── tier-manager.ts # Bronze/Silver/Gold/Platinum
  - └── achievement-tracker.ts
  - └── reward-redeemer.ts

- └── ports/
  - └── points-store-port.ts
  - └── notification-port.ts

- └── use-cases/
  - └── award-points.ts
  - └── check-tier-upgrade.ts
  - └── unlock-achievement.ts
  - └── redeem-reward.ts

- └── ai-chatbot/

- └── domain/
  - └── conversation-manager.ts
  - └── intent-classifier.ts
  - └── context-builder.ts
  - └── gpt4o-orchestrator.ts
  - └── booking-assistant.ts
  - └── damage-assessment-assistant.ts
  - └── service-recommender.ts
  - └── upsell-detector.ts # Detect selling/lease-return

- └── ports/
  - └── ai-provider-port.ts
  - └── kb-port.ts

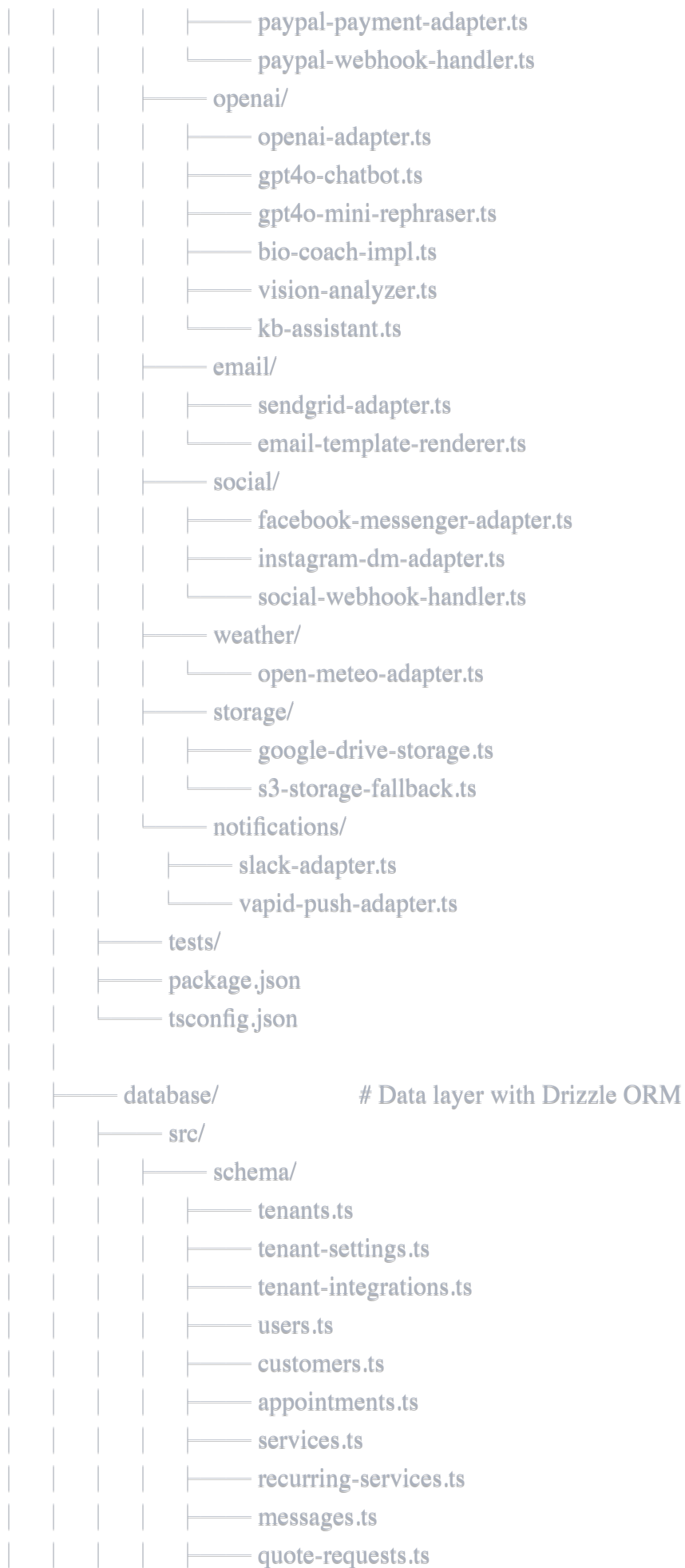
- calendar-port.ts
- customer-store-port.ts
- use-cases/
  - handle-customer-message.ts
  - book-appointment-via-ai.ts
  - assess-vehicle-damage.ts
  - recommend-service.ts
  - suggest-upsell.ts
- templates/
  - domain/
    - template-engine.ts
    - variable-injector.ts
    - industry-defaults.ts
    - personalization.ts
    - rich-sms-templates.ts # Technician bio + ETA
  - use-cases/
    - render-template.ts
    - validate-template.ts
    - inject-technician-profile.ts
    - generate-otw-message.ts
- notifications/
  - domain/
    - notification-router.ts
    - push-manager.ts # VAPID PWA push
    - slack-notifier.ts
    - email-notifier.ts
  - ports/
    - push-port.ts
    - slack-port.ts
    - email-port.ts
  - use-cases/
    - send-push-notification.ts
    - send-slack-alert.ts
    - send-email-campaign.ts
- shared/
  - errors/
    - domain-error.ts
    - validation-error.ts



- not-found-error.ts
  - consent-violation-error.ts
- types/
  - common.ts
  - value-objects.ts
  - tenant-context.ts
- validation/
  - phone-validator.ts
  - email-validator.ts
  - address-validator.ts
  - consent-validator.ts
- utils/
  - date-time.ts
  - formatters.ts
  - rate-limiter.ts
- tests/
- package.json
- tsconfig.json

- adapters/ # Infrastructure implementations

- src/
    - twilio/
      - twilio-telephony-adapter.ts
      - twilio-webhook-handler.ts
      - a2p-registration-service.ts
      - messaging-service-manager.ts
      - signature-validator.ts
      - transcription-adapter.ts
      - campaign-helper.ts
    - google/
      - google-calendar-adapter.ts
      - google-maps-adapter.ts
      - google-sheets-adapter.ts
      - google-drive-adapter.ts
      - service-account-manager.ts
    - stripe/
      - stripe-payment-adapter.ts
      - stripe-webhook-handler.ts
      - idempotency-manager.ts
      - payment-intent-handler.ts
    - paypal/



				employee-profiles.ts
				loyalty-points.ts
				loyalty-tiers.ts
				achievements.ts
				third-party-contacts.ts
				push-subscriptions.ts
				call-logs.ts
				industry-packs.ts
				feature-flags.ts
				docs.ts
				widget-tokens.ts
				audit-logs.ts
				consent-logs.ts
				index.ts
			repositories/	
				base-repository.ts
				tenant-repository.ts
				user-repository.ts
				customer-repository.ts
				appointment-repository.ts
				service-repository.ts
				recurring-service-repository.ts
				message-repository.ts
				quote-repository.ts
				technician-repository.ts
				loyalty-repository.ts
				third-party-contact-repository.ts
				call-log-repository.ts
				industry-pack-repository.ts
				feature-flag-repository.ts
				docs-repository.ts
				consent-log-repository.ts
			migrations/	
				0001_baseline_clean_machine.sql
				0002_add_tenants_table.sql
				0003_add_tenant_id_to_users.sql
				0004_add_tenant_id_to_customers.sql
				0005_add_tenant_id_to_appointments.sql
				0006_add_tenant_id_to_all_tables.sql
				0007_backfill_root_tenant.sql
				0008_create_secrets_vault_table.sql

```
| | | | |—— 0009_create_industry_packs.sql
| | | | |—— 0010_seed_industry_packs.sql
| | | | |—— 0011_create_feature_flags.sql
| | | | |—— 0012_create_docs_table.sql
| | | | |—— 0013_create_widget_tokens.sql
| | | | |—— 0014_create_audit_logs.sql
| | | | |—— 0015_create_consent_logs.sql
| | | | |—— 0016_add_composite_indexes.sql
| | | | |—— rollback/
| | | | |—— [reverse migrations]
| | | |—— seeds/
| | | | |—— 0001_root_tenant_clean_machine.ts
| | | | |—— 0002_industry_packs.ts
| | | | |—— 0003_demo_tenant.ts
| | | | |—— 0004_docs_content.ts
| | | | |—— 0005_default_feature_flags.ts
| | | |—— db.ts
| | | |—— migrate.ts
| | |—— drizzle.config.ts
| | |—— tests/
| | |—— package.json
| | |—— tsconfig.json
| |——
|—— shared/                # Shared utilities
| |—— src/
| | |—— tenant-context/
| | | |—— tenant-context.ts
| | | |—— tenant-resolver.ts # Subdomain + custom domain
| | | |—— tenant-middleware.ts
| | |—— secrets-vault/
| | | |—— vault-client.ts
| | | |—— encryption-service.ts # AES-256-GCM
| | | |—— key-rotation-service.ts
| | | |—— secrets-cache.ts
| | |—— feature-flags/
| | | |—— flag-service.ts
| | | |—— flag-evaluator.ts
| | | |—— flag-middleware.ts
| | |—— auth/
| | | |—— session-service.ts # express-session
| | | |—— passport-local-strategy.ts
```

```
| | | |—— password-hasher.ts # bcrypt
| | | |—— jwt-service.ts # For widget tokens
| | | |—— widget-token-service.ts
| | |—— logging/
|
```