



ArtBranch: High-Scale Creator Platform & Monetization Ecosystem

Architecting Australia's Premier Digital Network for Multi-Disciplinary Artists Featuring Real-Time Social Graph Engines, Geo-Spatial Discovery, and Automated Subscription Monetization.

System Architect: TacTech

Platform Domain: Social Media, Fine Arts, Portfolios & Creator Monetization

Official Web Portal: artbranch.com.au

Architecture Pattern: Serverless Edge + Relational Social Graph Engine

Integrated Tech Stack: Supabase Auth (RBAC), Supabase Realtime, PostgreSQL, Edge Functions, Stripe API

Deployment Status: Active Production Platform

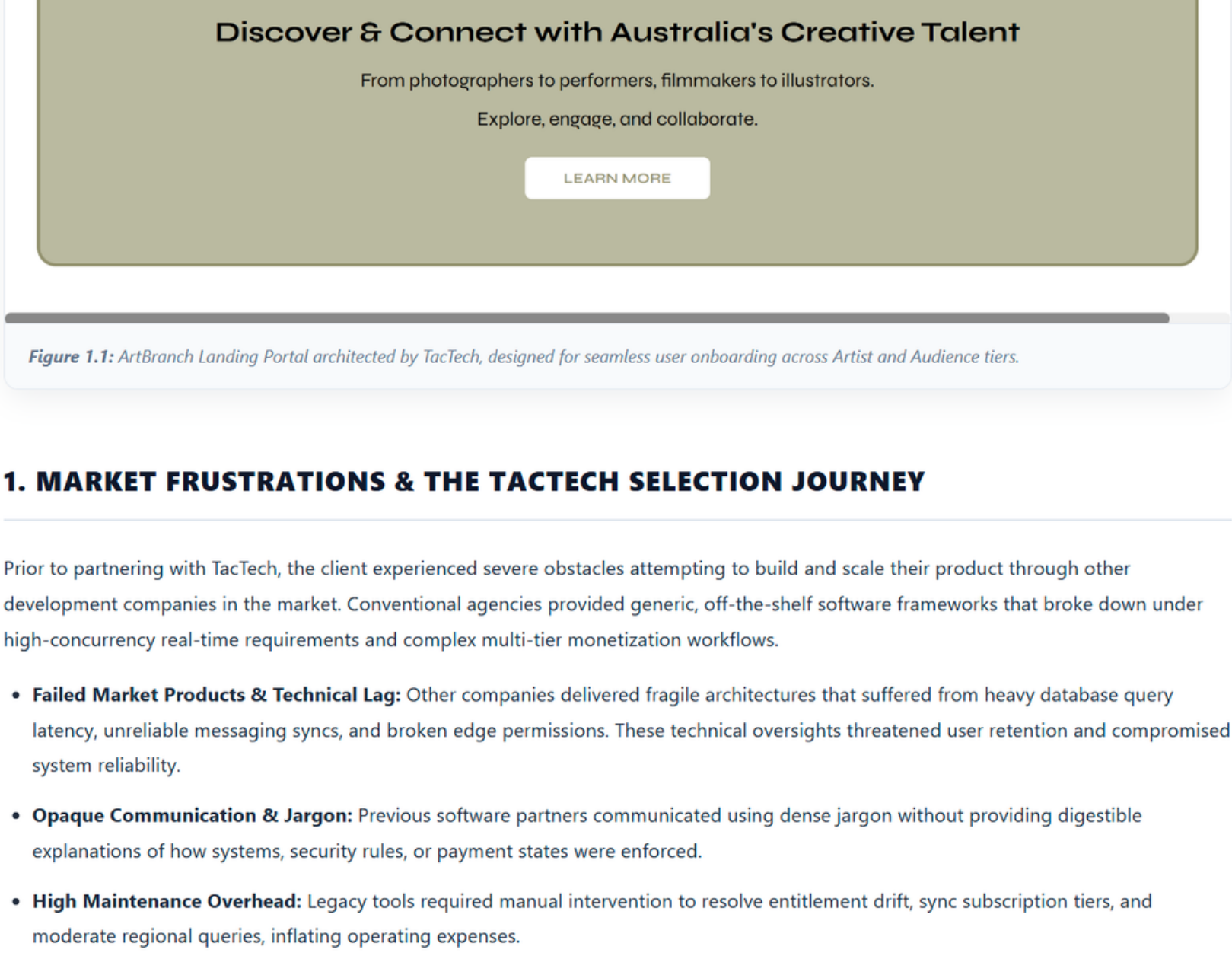


Figure 1.1: ArtBranch Landing Portal architected by TacTech, designed for seamless user onboarding across Artist and Audience tiers.

1. MARKET FRUSTRATIONS & THE TACTECH SELECTION JOURNEY

Prior to partnering with TacTech, the client experienced severe obstacles attempting to build and scale their product through other development companies in the market. Conventional agencies provided generic, off-the-shelf software frameworks that broke down under high-concurrency real-time requirements and complex multi-tier monetization workflows.

- Failed Market Products & Technical Lag:** Other companies delivered fragile architectures that suffered from heavy database query latency, unreliable messaging syncs, and broken edge permissions. These technical oversights threatened user retention and compromised system reliability.
- Opaque Communication & Jargon:** Previous software partners communicated using dense jargon without providing digestible explanations of how systems, security rules, or payment states were enforced.
- High Maintenance Overhead:** Legacy tools required manual intervention to resolve entitlement drift, sync subscription tiers, and moderate regional queries, inflating operating expenses.

2. EXECUTIVE SUMMARY & PLATFORM VISION

The contemporary creator economy demands digital ecosystems that transcend traditional social media models. Conventional centralized platforms prioritize ad-driven engagement algorithms that often obscure local creative talent and restrict direct fan monetization. The Australian creative community lacked a centralized, non-algorithmic digital platform where multi-disciplinary artists—ranging from painters and sculptors to filmmakers, musicians, architects, and performing artists—could host professional portfolios, engage directly with audiences, and monetize their work.

To address this gap, TacTech was commissioned to design, engineer, and deploy the complete digital infrastructure for **ArtBranch** (artbranch.com.au). Built on **Supabase Auth**, **Supabase Realtime**, **PostgreSQL Edge Automation**, and **Stripe Webhooks**, TacTech created an advanced social graph and portfolio engine. The platform empowers Australian creatives with state-level geo-spatial discovery, instant social interaction channels, and automated monthly subscription streams.

3. MARKET OPPORTUNITY & STRATEGIC GOALS

Australian artists and creative enterprises have historically faced fragmented digital distribution channels. Social networks separate public portfolios from direct fan messaging and payment processing, forcing artists to stitch together multiple third-party services. ArtBranch was designed to consolidate these core functions into a unified, high-performance ecosystem.

- Centralized Multi-Disciplinary Hub:** Unifying visual arts, performing arts, audio, and architectural media into a single high-resolution web platform.
- Localized Discovery Engine:** Providing state-by-state geographic filtering so local galleries, curators, and art enthusiasts can discover creators in their region.
- Native Creator Monetization:** Enabling artists to launch tiered monthly fan subscriptions with gated media access, reducing reliance on external patronage tools.
- Algorithm-Free Community Feed:** Delivering a transparent, chronological activity feed where fan engagement is driven by direct relationships rather than black-box sorting algorithms.

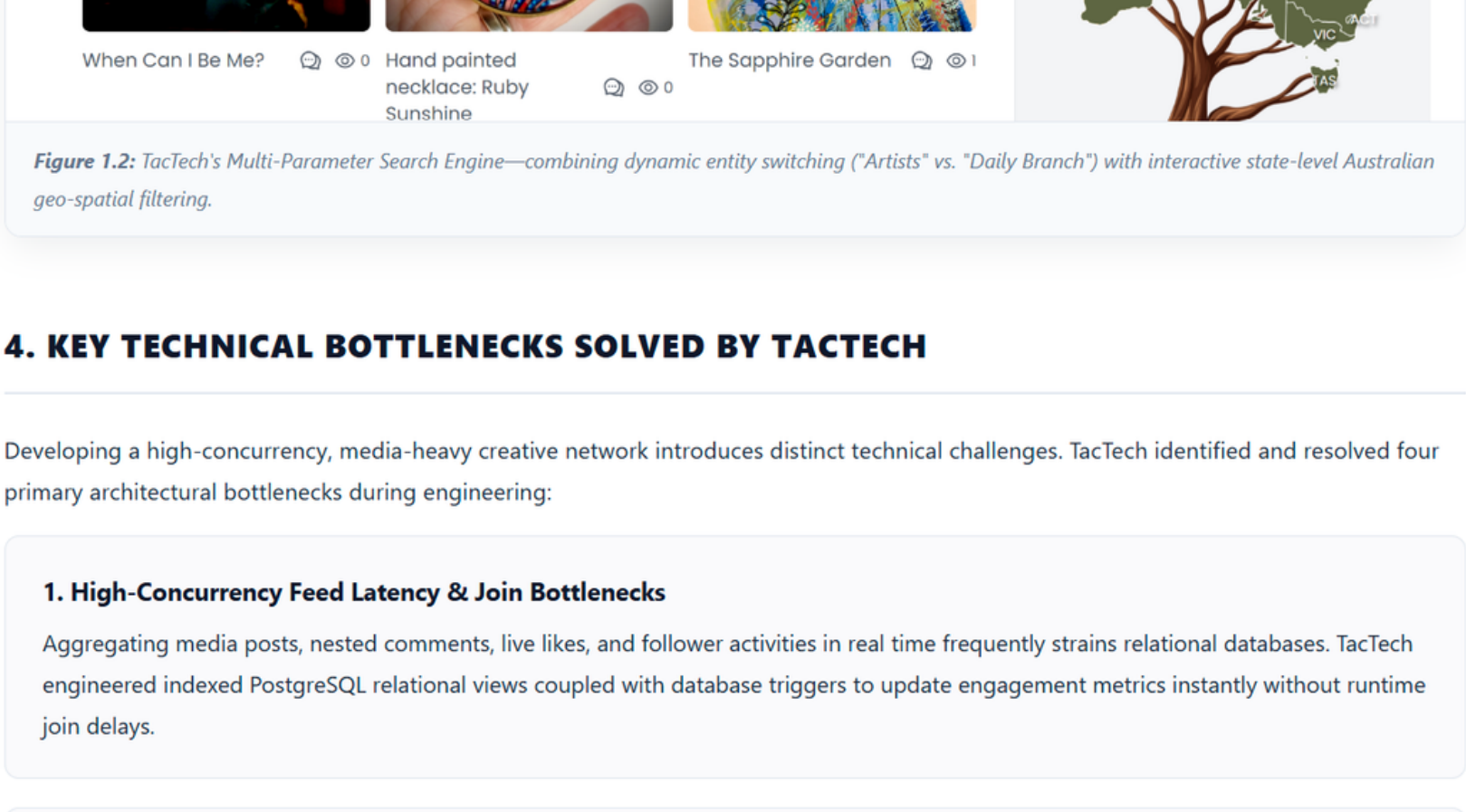


Figure 1.2: TacTech's Multi-Parameter Search Engine—combining dynamic entity switching ("Artists" vs. "Daily Branch") with interactive state-level Australian geo-spatial filtering.

4. KEY TECHNICAL BOTTLENECKS SOLVED BY TACTECH

Developing a high-concurrency, media-heavy creative network introduces distinct technical challenges. TacTech identified and resolved four primary architectural bottlenecks during engineering:

- High-Concurrency Feed Latency & Join Bottlenecks**
Aggregating media posts, nested comments, live likes, and follower activities in real time frequently strains relational databases. TacTech engineered indexed PostgreSQL relational views coupled with database triggers to update engagement metrics instantly without runtime join delays.
- Complex Multi-Parameter Geo-Spatial Discovery**
Searching across diverse creative disciplines (Photography, Cinematics, Architecture, Performing Arts) alongside state-level geographic boundaries (NSW, VIC, QLD, WA, SA, TAS, ACT, NT) can slow database queries. TacTech built optimized SQL indexes and cached query routes, delivering sub-200ms search responses.
- Tiered Content Protection & Row-Level Security**
Restricting subscriber-only portfolios and premium creator posts requires server-side enforcement. TacTech implemented native PostgreSQL Row-Level Security (RLS) policies tied to Supabase Auth cryptographically signed tokens.
- Payment Synchronization & Entitlement Drift**
Preventing access drift between active Stripe billing events and creator profile permissions requires reliable handling. TacTech deployed idempotent TypeScript Edge Functions that process Stripe Webhooks instantly to manage user permissions.

5. PLATFORM ARCHITECTURE & INTEGRATED STACK OVERVIEW

To ensure long-term stability and minimal operational maintenance, TacTech chose a serverless edge architecture combined with an enterprise-grade relational database.

Database Core (PostgreSQL)
Stores normalized user profiles, relational social graphs, media metadata, comments, and payment logs with automated PL/pgSQL database triggers.

Auth & RBAC Controls
Provides JSON Web Token (JWT) handling for secure user sessions, enforcing strict role isolation between standard audience members and creators.

Real-Time Layer (Supabase Realtime)
Manages persistent WebSocket connections to stream notifications, feed activities, and direct messaging instantly across connected clients.

Serverless Edge Functions
Executes serverless TypeScript code on edge nodes for high-speed API endpoints, payload validation, and asynchronous Stripe webhook parsing.

6. REAL-TIME SOCIAL GRAPH & ACTIVITY FEED ENGINE

Social interactions on ArtBranch are powered by a real-time event pipeline. Rather than forcing client applications to continuously poll servers for new content, TacTech implemented a WebSocket pub/sub architecture using Supabase Realtime.

Technical Social Graph Workflows

- Action Event Dispatch:** When a user likes a post, posts a nested comment, or follows a creator, a payload is written directly to the PostgreSQL database.
- Trigger Execution:** Automated PL/pgSQL functions increment engagement counters, update feed index tables, and generate structured notification events.
- WebSocket Broadcast:** Supabase Realtime broadcasts these changes over open WebSocket channels subscribed to by target user sessions in under 100 milliseconds.
- Optimistic UI Rendering:** The React frontend updates local UI states instantly, ensuring a responsive user experience.

7. INTERACTIVE DISCOVERY & GEO-SPATIAL SEARCH MECHANICS

A core differentiator of ArtBranch is its localized search functionality. Australian creators can be discovered through both creative categories and state-level geographic filters.

- State Boundary Indexing:** Users can filter creators and art listings specifically within New South Wales, Victoria, Queensland, Western Australia, South Australia, Tasmania, ACT, or Northern Territory.
- Entity Mode Switching:** Search queries can toggle between individual verified "Artists" or daily community posts ("Daily Branch") using indexed SQL views.
- Multi-Category Filtering:** Combining geographic tags with discipline-specific categories (e.g., "Cinematics in VIC" or "Architecture in NSW") executes in sub-200ms query windows.

8. FINE ART PORTFOLIO & MULTI-MEDIA DELIVERY PIPELINE

Visual presentation is essential for fine artists, architects, and filmmakers. TacTech constructed an asset delivery pipeline designed to display high-resolution artwork cleanly without sacrificing page load speeds.

- Automated Media Processing:** Uploaded portfolio assets pass through cloud transformation pipelines, generating optimized WebP variants for desktop, tablet, and mobile displays.
- Lazy Loading & Progressive Rendering:** Portfolio galleries utilize blur-up placeholders and progressive image loading to maintain fast initial page render speeds.
- Multi-Format Media Support:** Supports high-resolution imagery, embedded video, audio tracks, and PDF portfolio documents within creator showcase profiles.

9. MONETIZATION ARCHITECTURE & STRIPE INTEGRATION

Monetization on ArtBranch is powered by an integration with the Stripe API, enabling artists to establish monthly fan subscription tiers directly on their profiles.

Subscription Lifecycle Workflow

- Tier Configuration:** Creators set up customized monthly subscription pricing tiers within their account settings dashboard.
- Checkout Session:** Fans initiating a subscription are routed through secure Stripe Checkout sessions generated via TypeScript Edge Functions.
- Webhook Processing:** Upon payment confirmation, Stripe sends a signed "customer.subscription.created" webhook to ArtBranch's edge endpoint.
- Entitlement Unlocking:** The edge function updates the subscriber's database role record, unlocking gated content and private communication channels instantly.

10. ENTERPRISE SECURITY, AUTH & RBAC CONTROLS

Data security and user privacy were built into the core database design from day one using PostgreSQL Row-Level Security (RLS).

User Role Tier	Authentication Level	Data Access & Functional Rights
Anonymous Visitor	Unauthenticated	Read-only access to public landing pages, explore search, and public artist portfolios.
Audience Member	JWT (Supabase Auth)	Can follow artists, like posts, comment, and purchase monthly subscriptions.
Verified Artist	Verified JWT + Profile Metadata	Full portfolio creation, post publishing, media gating, and Stripe payout configuration.
Platform Administrator	Cryptographic Admin Role	Platform moderation, content safety reviews, user management, and platform metrics dashboard.

11. PERFORMANCE BENCHMARKS & QUANTIFIABLE IMPACT

TacTech's custom architectural implementation established ArtBranch as a resilient, market-ready enterprise platform:

Engineering Domain	Standard Industry Baseline	TacTech Engineered Core
Feed & Interaction Speed	1.0s – 2.5s polling latency	Sub-100ms instant updates via Realtime Websockets
Search Query Performance	1.2s+ table scans on combined filters	Sub-200ms Geo-Spatial Execution via SQL Indexing
Data Protection Standard	Middleware API route validation	Database-Native Row-Level Security (RLS)
Payment & Entitlement Sync	Manual queue or delayed polling syncs	Instant Idempotent Edge Function Processing
Infrastructure Efficiency	Heavy server provisioning costs	Zero-Maintenance Serverless Cloud Core

12. WHY ENTERPRISE CLIENTS PARTNER WITH TACTECH

This engagement highlights TacTech's core expertise: **engineering high-performance web applications that transform complex business logic into scalable software products.**

- Mastery of Edge & Database Engineering:** Deep experience with Supabase, PostgreSQL triggers, serverless execution, and real-time WebSocket infrastructure.
- High-Converting UI/UX Engineering:** Building modern, accessible frontends that elevate client brand identities and streamline user onboarding.
- Enterprise Security & Monetization Design:** Proven expertise in implementing secure payment gating, cryptographic RBAC systems, and strict data privacy protections.

13. CLIENT REVIEW & SATISFACTION

The operational transformation delivered by TacTech provided immediate strategic impact and complete peace of mind to leadership:

"Working with TacTech was a complete breath of fresh air after our previous experiences with other development agencies. Where other companies gave us fragile tools that constantly broke and explained things in technical jargon, TacTech broke down complex real-time systems in a clear, user-friendly manner. They engineered a robust, automated architecture that handles our community feeds, search, and creator monetization without errors. TacTech far exceeded our expectations!"

Key Client Outcome Highlights

Total Operational Freedom
Platform social feeds, geo-spatial discovery, and creator subscription workflows run autonomously 24/7 without manual intervention.

Flawless Technical Execution
100% precision across real-time WebSocket broadcasts, database Row-Level Security policies, and Stripe entitlement processing.