

Hammad Afzal

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SUMMARY

Architecture-first full-stack TypeScript engineer having experience of building scalable, modular backends across the Node.js ecosystem (NestJS, Express, Fastify). Focused on real-time, event-driven systems and LLM-powered agents – voice agents, tool/function calling, and self-learning knowledge bases – backed by clean-architecture design, hands-on React delivery, and a strong grounding in security (WebAuthn, E2EE).

SKILLS

Languages	JavaScript, TypeScript, Python, SQL, HTML5, CSS3
Backend & APIs	Node.js, NestJS, Express.js, Fastify, FastAPI, REST APIs, Swagger, Microservices, Stripe, Twilio, MFA, WebAuthn
Frontend	React, Redux Toolkit, Next.js, Tailwind CSS, MUI
Data & ORMs	PostgreSQL, MongoDB, Redis, TypeORM, Mongoose, Knex.js
Messaging & Real-time	RabbitMQ, Apache Kafka, Azure Service Bus, Socket.IO
AI & Agents	LLM-powered agents, tool/function calling, OpenAI, ElevenLabs voice agents, dynamic & self-learning knowledge bases, call/meeting transcription pipelines
Architecture	Clean Architecture, Modular Monoliths, Design Patterns (Adapter, Strategy), SOLID & DRY, Docker, Lerna Monorepo

WORK EXPERIENCE

TapTap Technologies – Full Stack TypeScript Developer

Remote | Dec 2025 – Present

Backend-leaning full-stack engineer on an AI-native Sales CRM (a Salesforce/HubSpot competitor) and a UK automotive sales platform, owning service architecture across NestJS modular monoliths and microservices with real-time and LLM-agent capabilities.

- Own backend service architecture across NestJS modular monoliths and microservices, applying Clean Architecture and the Adapter pattern to keep core business domains isolated from third-party APIs.
- Lead delivery of the CRM's AI voice-agent capabilities end to end – inbound/outbound agents, LLM tool calling, and a self-learning knowledge base – coordinating across telephony, transcription, and CRM data.
- Integrate billing, security, and messaging infrastructure (Stripe, MFA, Redis, RabbitMQ) and partner with frontend on real-time React features surfacing agent activity and lead timelines.

PureSquare - Gaditek (via 360XpertSolutions) – Full Stack Developer

On-site | Contractual | Karachi | June 2025 – Dec 2025

Engineered full-stack solutions for the PureKeep password manager – secure vault sharing, roaming authenticators (passkeys), and standalone binaries for on-premises client deployments.

- Orchestrated end-to-end cryptographic ceremonies (attestation & assertion) for a WebAuthn-compliant passkey provider using the native Web Crypto API.
- Architected the compilation of a Node.js server into a self-contained executable, safeguarding proprietary source code for secure on-premises enterprise deployments.
- Developed a secure E2EE sharing mechanism with cryptographic key wrapping for zero-knowledge transfer of vault items and large file attachments.

360XpertSolutions – Full Stack Developer

On-site | Karachi | Nov 2023 – June 2025

Led full-stack development across 4 projects: an Inventory & Employee Management System, an E-invoicing System, a Parcel Delivery Platform (BYKEA), and the backend of an AI-powered Community App.

- Implemented real-time communication with Socket.IO, designing for reliability with acknowledgments, retry logic, and seamless reconnection for fault-tolerant interactions.
- Applied Clean Architecture for maintainable, testable codebases and delivered structured REST APIs with clear Swagger documentation for easy integration.
- Applied Strategy and other design patterns to implement dynamic business rules and extensible workflows, promoting DRY and improving flexibility, maintainability, and scalability.

PROJECTS

Orbit (AI Ad-Campaign Platform) | NestJS | Next.js | React Native (Expo) | TypeScript | PostgreSQL | Redis | BullMQ | Stripe | OpenAI/OpenRouter

- Led a ground-up migration of a monolithic Express backend to a NestJS service on Clean Architecture, splitting the platform into isolated domain modules across auth, billing, campaigns, integrations, and publishing.
- Built an end-to-end AI campaign pipeline — market research, strategy, ad creative, and image generation — driven by structured LLM outputs with automatic schema-repair on malformed responses, plus an agentic chat assistant using tool/function calling to query live campaign data and act on the user's behalf.
- Integrated OAuth2 across Meta, LinkedIn, and Google Ads/Analytics with automated ad-account and Page discovery, alongside a Stripe-backed billing system spanning subscriptions, metered usage pools, webhooks, and admin-configurable pricing.
- Engineered BullMQ/Redis job queues for image generation and scheduled publishing, and a circuit-breaker/retry/timeout layer around every third-party API call — root-caused and fixed a timeout-library bug silently breaking OAuth callbacks, backed by an automated Jest and Playwright test suite with a custom OAuth-mocking framework for deterministic auth-edge-case testing.

Sales CRM (AI-Native) | NestJS | TypeScript | PostgreSQL | MongoDB | Redis | RabbitMQ | ElevenLabs | Twilio | OpenAI | Socket.IO

- Built an AI-native CRM positioned against Salesforce/HubSpot, with configurable inbound/outbound voice agents assembled from ElevenLabs voices, models, and languages, and phone numbers provisioned via Twilio.
- Wired agent tooling (meeting scheduling, note-taking) through LLM function calling and attached a dynamic per-agent knowledge base, with full lead-timeline event tracking (lead created, meeting scheduled etc).
- Engineered a self-learning knowledge base where agents synthesize call, meeting, and debrief transcripts into new KB articles automatically, growing the system's knowledge over time.
- Added a real-time meeting agent (Vexa) that DMs live suggestions to reps and a debrief agent that review each call and auto-creates targeted LMS skill tasks; integrated SMTP/SMS for meeting links and follow-ups.

Vanaways CRM | NestJS | TypeScript | PostgreSQL | TypeORM | Azure Service Bus | Socket.IO

- Designed the full NestJS boilerplate and backend architecture on Clean Architecture with the Adapter pattern for a UK mini-truck sales business.
- Built three modular-monolith portals: a dynamic Quotation service (Hire Purchase, balloon, and other finance/leasing options), a Dealer portal for stock upload and sales, and a Customer portal for quotation review and acceptance.
- Implemented the end-to-end sales journey including document signing, with Azure Service Bus queues passing data between portals and Socket.IO powering notifications.

PureKeep | Node.js | TypeScript | PostgreSQL | Lerna Monorepo | Web Extension API | Web Crypto API

- Built a phishing-resistant passkey provider from the ground up on the native Web Crypto API, positioning PureKeep for a password less future.
- Engineered compilation of the server into a single self-contained executable, unlocking on-premises deployment for clients in regulated industries (full data sovereignty).
- Extended E2EE sharing beyond organizational boundaries, letting users securely transfer secrets to any external recipient by email while preserving zero-knowledge guarantees.

Bykea Parcel Delivery App | Node.js | Fastify | PostgreSQL | Typeorm | Socket.IO | Redis | Next.js | Redux Toolkit

- Architected a multi-tenant delivery platform enabling independent businesses to onboard and manage their own drivers, orders, and operations from a single shared codebase, with tenant-scoped data isolation and enforce strict operational boundaries.
- Designed a role-based access control system spanning tenants, drivers, businesses, and super admins, with route-level guards and scoped permissions to prevent cross tenant data access.
- Engineered real-time driver location tracking over Socket.io to give dispatchers and businesses live visibility into deliveries, backed by a full order-lifecycle audit trail (created -> assigned -> picked up -> delivered) enabling dispute resolution and operational reporting.

EDUCATION

Sir Syed University of Engineering & Technology

B.S. Electrical Engineering | 2017 – 2021