MAHMOUD ASHRAF

Principal Product Architect & Systems Engineer | Multi-Platform Systems

Cairo / Giza, Egypt
● **Available Worldwide (Remote & Relocation)**

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EXECUTIVE SUMMARY

Hands-on Systems Architect & Lead Product Engineer with 6+ years of production experience architecting, building, and deploying mission-critical multi-platform systems across Mobile (iOS/Android), Web, and Desktop (macOS/Windows/Linux). Proven track record scaling B2B enterprise ecosystems to 10,000+ active professional users, reverse-engineering proprietary hardware communication protocols, and engineering zero-knowledge cryptographic vaults. Bridges high-level system design with deep code execution (Rust/Tauri, Flutter, React, Native Messaging IPC) and practical cybersecurity analysis (SOC & Penetration Testing certified).

TECHNICAL EXPERTISE & SYSTEMS ARCHITECTURE

Architecture & Design: Clean Architecture, Offline-First Sync Engines, DDD, Zero-Knowledge Crypto, Event-Driven / Reactive (BLoC), IPC.

Languages & Core: Dart, Rust, TypeScript / JavaScript, Python, C/C++ interop, HTML5 / CSS3 / SCSS, Shell Scripting.

Multi-Platform & UI: Flutter (iOS, Android, macOS, Windows, Web), Tauri 2, React, Next.js, Capacitor, Chrome Extensions (MV3).

Security & Low-Level: Argon2id, AES-256-GCM, Secure Storage, Native Messaging IPC, TryHackMe Certified (SOC & Pentesting).

Cloud, Data & AI: Firebase (Firestore, Cloud Functions, FCM, Auth), Cloudflare R2/Pages, Redis, Algolia, LLM / Gemini API.

DevOps & Stores: Apple App Store & TestFlight, Google Play Console, Fastlane CI/CD, Docker, Git, Inno Setup, Codesigning.

PROFESSIONAL EXPERIENCE

Enterprise Platforms & Cybersecurity

2024 – Present | Cairo, Egypt

Lead Systems Architect & Security Consultant `Institutional Systems`

Architecture: Microservices, Multi-Tenant RBAC, Cryptographic Auditing, OWASP Compliance, Zero-Trust

- Architected enterprise Governance, Risk, and Compliance (GRC) engines and secure workflow systems for institutional clients.
- Designed granular multi-tenant Role-Based Access Control (RBAC) and immutable cryptographic audit logging for mission-critical operations.
- Conducted threat modeling, vulnerability assessments, and penetration testing on production APIs, mitigating OWASP Top 10 vectors.
- Spearheaded secure code review practices and automated security checks within enterprise CI/CD deployment pipelines.

Alagenda Alaqdayia (الأجندة القضائية)

Nov 2023 – Present | Giza, Egypt

Founder & Principal Software Architect `10,000+ Active B2B Lawyers`

Tech Stack: Flutter, Firebase (Auth, Firestore, Cloud Functions, FCM), Clean Architecture, BLoC, Gemini API, Cloudflare R2, Fastlane

- Founded and architected Egypt's premier digital legal management ecosystem, scaling to over **10,000 active Egyptian legal professionals**.
- Engineered an offline-first distributed synchronization engine ensuring seamless real-time access to litigation schedules, court deadlines, and case dockets.
- Integrated Gemini API with function calling to convert unstructured Arabic legal text into structured database records and automated deadline calculations.
- Built an enterprise React web portal and companion cross-platform mobile apps with automated PDF court docket generation and Cloudflare R2 document storage.
- Established automated release pipelines via Fastlane, handling end-to-end continuous deployment to Google Play and iOS TestFlight.

Router Console

Sep 2026 – Present | Cross-Platform

Founder & Principal Systems Architect `Systems & Hardware IPC`

Tech Stack: Tauri 2, Rust, React, TypeScript, Capacitor, Low-Level Network Protocol Reverse-Engineering

- Architected a cross-platform desktop & mobile network gateway management suite running on macOS, Windows, Linux, and Android.
- Engineered the core desktop engine with Tauri 2 and Rust, reducing memory consumption by **85%** compared to legacy Electron wrappers.
- Reverse-engineered proprietary ZTE router firmware communication protocols, replacing slow browser admin portals with direct, sub-100ms API telemetry and controls.
- Implemented native multi-platform bridging with Capacitor, automated secure OTA update channels, and encrypted local credential storage.

PROFESSIONAL EXPERIENCE (CONTINUED)

Mushaffar (مُشفر) — mushaffar.com

Oct 2025 – Present | Multi-Platform

Founder & Systems Architect `Zero-Knowledge Cryptography`

Tech Stack: Flutter, Dart, Argon2id, AES-256-GCM, Chrome Extension (MV3), Native Messaging IPC, Google Drive API, Inno Setup

- Designed and shipped a production zero-knowledge password manager and 2FA authenticator across **Apple App Store**, **Google Play**, macOS, and Windows.
- Engineered client-side cryptographic pipeline utilizing Argon2id for key derivation and AES-256-GCM for vault encryption; mathematical guarantees prevent server-side data exposure.
- Developed companion Chrome Extension utilizing Native Messaging IPC to communicate seamlessly with the local desktop binary for instant credentials autofill.
- Implemented decentralized, zero-backend encrypted backup and synchronization protocol utilizing user-owned Google Drive app storage.

Qyd App (قيد) — qydapp.com

Nov 2024 – Present | iOS & Android

Founder & Product Engineer `10x Query Speedup`

Tech Stack: Flutter, Firebase, Algolia, Clean Architecture, Paymob & XPay Gateways, Obsidian Graph Model

- Built an advanced reading productivity platform featuring quotation indexing, knowledge-graph relationships, and social sharing.
- Optimized local cache indexing and database query structures, slashing 10,000+ record load times from **5.0s to 0.5s (10x performance gain)**.
- Integrated Algolia full-text search, Kindle/PDF highlight ingestion pipelines, and dual payment gateways (Paymob & XPay) supporting recurring subscriptions.
- Shipped dynamic social sharing engines generating branded vector quote cards and cross-platform reading habit analytics.

Typal Hub (تايبال هب) — typalhub.com

Dec 2025 – Present | Web Platform

Founder & Systems Engineer `First Arabic Touch-Typing Platform`

Tech Stack: Flutter Web, Dart, Firebase, HTML5 Canvas Engine, Arabic Typography Optimization

- Engineered the first specialized Arabic touch-typing education platform utilizing classical literature, Seerah, and Hadith corpora.
- Developed real-time typing telemetry tracking Words-Per-Minute (WPM), character accuracy, and keystroke error patterns with sub-millisecond precision.
- Designed a responsive, low-latency UI tailored for right-to-left (RTL) Arabic typography across all modern desktop and mobile browsers.

KEY SYSTEMS ARCHITECTURE & ENGINEERING HIGHLIGHTS

Hardware Gateway Protocol Reverse-Engineering
Dissected ZTE gateway web APIs and session authentication protocols to create direct low-latency desktop controls in Rust, bypassing brittle browser GUIs.

Zero-Knowledge Cryptographic Vault Pipeline
Engineered client-side Argon2id key derivation and AES-256-GCM encryption with local IPC autofill, ensuring zero server-side secret exposure.

Distributed Offline-First Synchronization
Architected conflict-resolution and optimistic local caching synchronization serving 10,000+ simultaneous legal practice workflows across mobile and web.

Enterprise Multi-Tenant RBAC & Audit Engine
Designed granular access control hierarchies and cryptographic tamper-proof audit trails for institutional GRC platforms meeting regulatory compliance.

EDUCATION & ACADEMIC HONORS

B.Sc. in Business Information Systems (BIS)
Helwan University — Faculty of Commerce & Business Admin
2019 – 2023 | Cairo / Giza, Egypt

Grade: 3.4 / 4.0 — Very Good with Honors (مرتبة الشرف)

Focus: Enterprise Information Architecture, Relational Database Systems, Systems Analysis & Distributed Software Design.

SECURITY & ARCHITECTURE ACCREDITATIONS

TryHackMe Cybersecurity Paths
- **Jr Penetration Tester:** Practical exploitation & auditing
- **Jr SOC Analyst Tier 1:** Incident triage & log monitoring
- **Cyber Security 101 & Pre-Security:** Network defenses

Software Architecture & Engineering
- **Clean Architecture & DDD:** Production patterns (Udemy)
- **Advanced Reactive Systems:** BLoC & State (Udemy)
- **Adaptive UI Engineering:** Multi-platform design (Udemy)

App Stores: Verified Apple Developer & Google Play Developer

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