

Manoj Kumar

Principal Software Consultant | Cloud Solutions Architect | AI & RAG Engineer

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PROFESSIONAL SUMMARY

Principal Software Consultant and Cloud Solutions Architect with 10+ years of professional experience designing, architecting, and delivering enterprise-grade software platforms for clients in professional services, financial services, and healthcare. Deep expertise in Microsoft Azure cloud architecture, full-stack software engineering (.NET 10/8/Core/Framework, C#, ASP.NET Core, React, Angular, TypeScript, Node.js), and applied Generative AI / Large Language Model (LLM) engineering, including Retrieval-Augmented Generation (RAG), multi-agent AI orchestration, prompt engineering, and Azure OpenAI integration. Architected a multi-vendor network security policy orchestration platform unifying 9+ vendor integrations (Cisco, VMware NSX-T, Check Point, Cilium) into a single normalized policy model, including a compliance scoring engine mapped to SOC 2, ISO 27001, NIST 800-53, PCI-DSS, and HIPAA. Currently leading design and delivery of enterprise AI-powered workflow automation and knowledge-management platforms for global professional services firms, combining event-driven architecture, human-in-the-loop AI governance, claims-based RBAC, and Azure cloud services (Cosmos DB, Azure SQL, Azure Functions, API Management, Key Vault, Microsoft Entra ID). Proven track record of independently owning full-stack delivery from client requirements gathering through production deployment, mentoring engineers, and managing stakeholder relationships. Anthropic-certified in Model Context Protocol (MCP), Claude Agent Skills, and Claude Code, with hands-on production experience building MCP servers, RAG pipelines, and AI agent orchestration. Combines strong technical architecture and hands-on engineering with technical leadership, strategic planning, and cross-functional stakeholder management.

CORE COMPETENCIES

Cloud & Architecture: Microsoft Azure Cloud Architecture, Solution Architecture, Enterprise Architecture, Event-Driven Architecture, Distributed Systems, Multi-Tenant Architecture, Clean Architecture, Microservices-Style API Design, Docker, Air-Gapped/Self-Hosted Deployment Architecture

Software Engineering: .NET 10/8/Core/Framework, C#, ASP.NET Core, ASP.NET MVC, React, Angular, TypeScript, JavaScript, Node.js, Python, RESTful & OData API Design, SOLID Principles, Design Patterns, Full-Stack Development

AI & Automation: Generative AI, Azure OpenAI, Large Language Models (LLM), Retrieval-Augmented Generation (RAG), Model Context Protocol (MCP), Prompt Engineering, Multi-Agent Orchestration, AI Agents, Human-in-the-Loop Workflow Design, Anthropic Claude API, OpenAI API

DevOps: Azure DevOps, CI/CD Pipeline Design, Infrastructure as Code (Bicep), Jenkins, Docker & Docker Compose, Git, Nginx

Leadership: Technical Leadership, Stakeholder Management, Client-Facing Requirements Gathering, Mentoring, Strategic Planning, Solo End-to-End Ownership, Cross-Functional Team Collaboration

Security & Governance: RBAC / Claims-Based Authorization, JWT & bcrypt Authentication, Row-Level Security, Compliance Mapping (SOC 2, ISO 27001, NIST 800-53, PCI-DSS, HIPAA), Network Security Policy Analysis, Azure Key Vault, Azure Active Directory / Microsoft Entra ID

TECHNICAL SKILLS

Languages: C#, TypeScript, JavaScript, Python, SQL (T-SQL), HTML5, CSS, PowerShell, Bicep

Backend & Frameworks: .NET 10/8/Core/Framework, ASP.NET Core, ASP.NET MVC, ASP.NET Web API, Razor/Razor Pages, Entity Framework Core, LINQ, WPF, FastAPI, LangChain, SQLAlchemy, Node.js 20+, Express 5

Frontend: React 19, TanStack React Query, MUI, Angular 19, jQuery, AJAX, Bootstrap, Tailwind CSS, JQWidgets, Highcharts

AI, LLM & RAG Engineering: Retrieval-Augmented Generation (hybrid dense + BM25 retrieval, Reciprocal Rank Fusion, MMR diversification, reranking), Model Context Protocol (MCP server design, tool contracts), Anthropic Claude API, Azure OpenAI (GPT models), OpenAI API, Voyage AI Embeddings, Azure AI Search, Azure Document Intelligence (OCR), Multi-Agent Orchestration, Prompt Engineering, Streaming Chat (SSE)

Databases & Caching: Microsoft SQL Server, PostgreSQL, SQLite, Azure SQL, Azure Cosmos DB, Redis / Azure Cache for Redis, Distributed & TTL Caching, Connection Pooling, Database-per-Tenant Multi-Tenancy, Repository Pattern

Cloud, DevOps & Infrastructure: Microsoft Azure, Azure Functions, Azure DevOps Services, Azure Service Bus, Azure Event Grid, Azure Blob Storage, Azure Key Vault, Azure Virtual Network/Private Endpoints, Azure API Management, Azure Application Insights, Microsoft Entra ID (Azure AD), Microsoft Graph API, Microsoft Defender for Cloud, Docker & Docker Compose, Jenkins, Git, Nginx, CI/CD Pipeline Design

Architecture & Security: Clean Architecture, SOLID Principles, Design Patterns, Dependency Injection, Event-Driven Architecture, Multi-Tenant Architecture, OData, RESTful API Design, RBAC/Claims-Based Authorization, JWT & bcrypt, Row-Level Security, Compliance Mapping (SOC 2, ISO 27001, NIST 800-53, PCI-DSS, HIPAA)

Real-Time, Background & Testing: SignalR, Azure SignalR, Hangfire, Server-Sent Events (SSE), xUnit, pytest, Vitest, API Test Automation

PROFESSIONAL EXPERIENCE

10Pearls — Karachi, Sindh, Pakistan

March 2018 – Present

Principal Software Consultant (Current)

August 2025 – Present

- Led design and delivery of an enterprise AI-powered workflow automation and case management platform for a global professional services firm, replacing manual email-based approval chains with a governed, event-driven system built on ASP.NET Core (.NET 10), React, and Azure Service Bus/Event Grid.
- Architected a human-in-the-loop workflow engine enabling AI Units (LLMs, RPA, custom ML models) to execute case-review steps with full audit traceability and structured approval gates, ensuring AI augmented rather than replaced professional judgment.
- Built multi-agent AI orchestration supporting crew-based collaboration, thought-process capture, guardrail monitoring, and iterative feedback loops between human reviewers and AI agents.
- Designed an enterprise GPT-powered conversational platform on Azure OpenAI, enabling staff at a global professional services firm to draft brand-compliant reports and query internal knowledge bases through a Retrieval-Augmented Generation (RAG) pipeline built on Azure AI Search with source-cited responses.
- Integrated Azure Document Intelligence (OCR) to power AI-driven analysis of uploaded PDF, Word, and Excel files, accelerating client document review workflows.
- Engineered scalable Azure OpenAI integration through an API Management gateway with load balancing across multiple endpoints, sustaining performance and resilience during peak enterprise demand.
- Architected persistent chat history and automated data-retention pipelines using Cosmos DB and Azure Functions, ensuring compliance with enterprise data-governance policies.
- Implemented enterprise security architecture using Azure Active Directory, Key Vault, private virtual networks, and Microsoft Defender-based document threat scanning to meet regulatory compliance requirements.

Staff Software Engineer

January 2021 – August 2025

- Architected and built an enterprise-grade multi-vendor network security policy orchestration platform (.NET 10, Angular 19, PostgreSQL) from the ground up, unifying 9+ vendor integrations (Cisco, VMware NSX-T, Check Point, Cilium) into a single normalized policy model.
- Designed a complexity-aware rule optimization engine detecting shadowed and redundant firewall rules across rule bases of thousands of entries, with automatic algorithm switching to keep analysis tractable at scale.
- Built a compliance scoring engine mapping automated checks to SOC 2, ISO 27001, NIST 800-53, PCI-DSS, and HIPAA, converting manual quarterly audits into automatically generated, evidence-backed reports.
- Engineered a configuration converter translating security policy across 5 vendor formats, plus a migration/simulation engine de-risking VM-to-container (Kubernetes) modernization prior to deployment.
- Delivered the platform as a fully air-gapped appliance for zero-internet-egress environments, replacing cloud-native dependencies with self-hosted equivalents (Hangfire, SignalR, local caching) and signed patch bundles for offline updates.
- Implemented claims-based RBAC (~30 resources, 12 action types), database-per-tenant multi-tenancy, and a 4-tier licensing model gating platform capability from a single build.
- Independently owned full-stack delivery of a companion configuration/object migration tool with dependency checking, conflict resolution, rollback support, and real-time progress tracking via SignalR.
- Developed a real-time asset tracking and visualization portal on ServiceNow, building workflows, business rules, record producers, and custom widgets, and exposing REST APIs for a downstream mobile team.

Software Engineer → Senior Software Engineer

March 2018 – December 2020

- Contributed to development and ongoing maintenance of the Networking Appliances Management System, a mission-critical enterprise platform used by large-scale clients to manage complex network infrastructure (routers, switches, load balancers, VMs, security groups, distributed firewalls).
- Delivered full-stack features using ASP.NET MVC, Razor/Razor Pages, JavaScript, jQuery, and PostgreSQL, ensuring performant, maintainable code across UI and backend layers.
- Built reusable utility components — including validation helpers and AJAX wrappers — that became standard across the codebase, reducing duplication and speeding up feature development.
- Worked independently without dedicated QA or PM support, taking full ownership of the development lifecycle from requirements gathering through deployment.
- Promoted from Software Engineer to Senior Software Engineer in recognition of technical ownership and delivery quality.

Avanza Solutions — Pakistan

Software Engineer

August 2016 – March 2018

- Led end-to-end development of the Indus Hospital ERP system, creating a fully paperless environment that significantly improved hospital efficiency and data management.
- Engineered and supported core banking solutions, including fraud detection and card management systems, directly enhancing security and streamlining financial operations.
- Architected and built web applications using .NET Core, ASP.NET MVC, and Entity Framework, adhering to industry standards for performance, scalability, and security.
- Optimized data access and application performance by implementing repository patterns and writing efficient SQL queries with LINQ.

Mexyon Private Limited — Pakistan

Software Engineer

March 2016 – August 2016

- Led end-to-end development of a web-based Islamic Banking solution, building the application from scratch and guiding it through its full lifecycle.
- Designed and implemented system architecture using C#, ASP.NET MVC, Bootstrap, jQuery, and JavaScript, delivering a scalable, secure, user-friendly platform tailored to Islamic finance principles.

Agilosoft — Pakistan

Software Engineer

August 2015 – February 2016

- Collected and analyzed client requirements during stakeholder meetings, designed implementation plans, and secured client approvals prior to development.
- Developed and implemented solutions using C#, .NET Framework, ASP.NET MVC, WPF, and SQL Server.

KEY PROJECTS

MCP SQL Console — Natural-Language-to-SQL Console & Model Context Protocol Server

TypeScript, Node.js, React 19, Express 5, Microsoft SQL Server, Model Context Protocol (MCP SDK), OpenAI API

- Architected an npm-workspaces monorepo exposing one shared database service layer through three surfaces — an MCP stdio server for Cursor/Claude Desktop, a REST API, and a React console UI.
- Designed a natural-language-to-SQL pipeline with local rule-based generation and LLM-fallback escalation heuristics, plus a heuristic query planner inferring multi-hop join paths purely from live schema metadata.
- Enforced uniform read-only SQL guardrails (single-statement, SELECT/WITH-only allowlisting) across every entry point, and built a 3-tier TTL cache with in-flight request de-duplication to cut redundant LLM calls and DB round-trips.

IntelliRAG — Enterprise Retrieval-Augmented Generation Assistant

Python, TypeScript, FastAPI, React 19, LangChain, Anthropic Claude API, Voyage AI, Docker

- Designed and built a full-stack RAG platform solo end-to-end, featuring hybrid dense (Voyage) + BM25 retrieval fused via Reciprocal Rank Fusion and diversified with MMR, plus Claude-powered streaming chat over Server-Sent Events.
- Architected the backend using Clean Architecture and SOLID principles with a dependency-injection composition root and swappable providers for embeddings, vector store, and database.
- Implemented secure, user-scoped JWT authentication with per-user document ownership, and shipped a Dockerized, multi-stage production deployment with Nginx reverse proxy and health checks.

Multi-Vendor Network Security Policy Orchestration Platform

.NET 10, Angular 19, PostgreSQL, Hangfire, SignalR, Multi-Tenant Architecture

- Unified firewall management across Cisco, VMware NSX-T, Check Point, and Cilium/Kubernetes into a single console with automated rule cleanup, compliance reporting, and migration simulation, packaged as a self-contained, air-gapped OVA appliance for defense, government, and finance clients.

CERTIFICATIONS

Introduction to Agent Skills — Anthropic — Issued June 2026 — Credential ID: vBocmspk7ugm

Introduction to Model Context Protocol — Anthropic — Issued June 2026 — Credential ID: jqBzwxlvg3

Claude Code in Action — Anthropic — Issued March 2026 — Credential ID: cdehms94tu7c

Front-End JavaScript Frameworks: AngularJS — Coursera — Issued September 2016

Server-side Development with NodeJS — Coursera — Issued October 2016

Multiplatform Mobile App Development with Web Technologies — Coursera — Issued October 2016

Front-End Web UI Frameworks and Tools — Coursera — Issued August 2016

HTML, CSS and JavaScript — Coursera — Issued June 2016

EDUCATION

Master of Science, Computer Science — Muhammad Ali Jinnah University — Aug 2021 – May 2023 (Focus: Deep Learning & Information Retrieval Techniques)

Bachelor of Science, Computer Science — National University of Computer and Emerging Sciences — 2011 – 2015

Post Graduate Diploma, Entrepreneurship & SME Management — Virtual University of Pakistan — Aug 2018 – Oct 2019