

# Denis Knaack

## AI Engineering - Agentic Systems - .NET

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### ABOUT

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I build production-grade AI systems in .NET: multi-agent orchestration, MCP/A2A integrations, retrieval over large codebases, and LLM grounding. My focus is where many initiatives get stuck: moving AI from prototype to stable, maintainable production systems. Behind that work are more than 25 years of professional software engineering and deep backend experience in C#.NET – from the first API design to deployment. TypeScript, React, and modern frontends remain part of my product reach, but the sharp edge is clear: agentic systems for .NET and enterprise environments. I work remotely, independently, and conceptually. You provide the goal and context; I deliver against the specification with low overhead, clear communication, and ownership from architecture to delivery.

### CORE TECHNOLOGIES

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Specialization	Agentic AI	LLM Integration	MCP/A2A	RAG/Retrieval	.NET/C#		
Core stack	C#	.NET	TypeScript/Node	PostgreSQL	SQL Server	Azure	Docker
Platform & delivery	CI/CD	GitHub Actions	Cloudflare	AWS	Clean Architecture		
Also experienced in	React	Vue	Svelte	Flutter	Electron	GraphQL	

### EXPERIENCES

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**AI Engineer - Agentic Systems (.NET)** 2015 — Present

**KNAACK.IT**

Self-employed as AI Engineer and Software Architect. Development of production-grade agentic systems in .NET, MCP/A2A integrations, retrieval/RAG over large codebases, LLM grounding, and backend/cloud integration for maintainable production systems.

.NET	C#	LLM/AI Agents	MCP	RAG/Retrieval	Azure	TypeScript
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**CTO Co-Founder** 2016 — 2021

**CUESIC Solutions GmbH**

I led the technological strategy and architecture. Patenting a logic for automated analysis of complex media formats and music recognition for generating GEMA reports.

.NET	Typescript	Electron
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**Software Development Professional** 2012 — 2015

**Omniga GmbH & Co. KG**

Development of proprietary shop systems. Implementation of new features including checkout processes, member areas, and payment provider integrations.

[.NET](#) [PHP](#) [Microsoft SQL Server](#)

## Senior Manager Software Development

2011 — 2012

### SmilingBits GmbH & Co. KG

Technical design and implementation of complex e-commerce projects. Responsible for architecture decisions and performance optimization.

[.NET](#) [PHP](#) [Microsoft SQL Server](#)

## Manager Software Development

2008 — 2011

### SmilingBits GmbH & Co. KG

Migration of legacy systems to modern .NET architectures. Developed and optimized shop systems serving hundreds of thousands of end customers.

[Cold Fusion](#) [.NET](#) [PHP](#) [Microsoft SQL Server](#)

## Manager Software Development

2003 — 2008

### GoNamic GmbH

Development of e-commerce platforms using Cold Fusion and PHP. Introduced .NET technologies to modernize the system landscape.

[Cold Fusion](#) [.NET](#) [PHP](#) [Microsoft SQL Server](#)

## IT Specialist Apprenticeship

2000 — 2003

### HIW Software Solutions

Apprenticeship as IT specialist with focus on application development. Learning the fundamentals of software development and practical application in client projects.

[Borland Delphi](#) [PHP](#) [Microsoft SQL Server](#)

## SELECTED PROJECTS

For detailed project case studies, technical deep-dives, and more information visit [knaack.it](https://knaack.it)

### Multi-Agent Orchestration with .NET

Development of a .NET-based orchestration platform for AI agents, workflows, guardrails, and integrations with modern agent protocols.

[C#](#) [.NET](#) [AI Agents](#) [MCP](#) [A2A](#) [AG-UI](#) [Workflow DSL](#)

'Details at [knaack.it/en/projects/multi-agent-orchestration-dotnet](https://knaack.it/en/projects/multi-agent-orchestration-dotnet)

### Codebase Retrieval for AI Agents

Token-efficient retrieval layer for large codebases with AST indexing, BM25 search, and fast symbol lookup.

[C#](#) [.NET](#) [Tree-sitter](#) [BM25](#) [AST Indexing](#) [AI Agents](#)

'Details at [knaack.it/en/projects/codebase-retrieval-ai-agents](https://knaack.it/en/projects/codebase-retrieval-ai-agents)

### LLM-ready Web Search and Extraction

Web search and extraction toolkit for reliable grounding in LLM applications.

[C#](#) [.NET](#) [Web Extraction](#) [Search](#) [LLM Grounding](#) [HTML Parsing](#)

'Details at [knaack.it/en/projects/llm-web-search-extraction](https://knaack.it/en/projects/llm-web-search-extraction)

## Package Manager for AI Workflows

CLI tool for installing and reusing agents, skills, and workflows across software projects.

[C#](#) [.NET](#) [CLI](#) [Developer Tools](#) [AI Workflows](#) [Automation](#)

'Details at [knaack.it/en/projects/package-manager-ai-workflows](https://knaack.it/en/projects/package-manager-ai-workflows)

## Self-Optimizing ML Pipeline (AutoML)

Development of a framework for automated feature selection, model validation, and cross-platform deployment via ONNX.

[Python](#) [LightGBM](#) [ONNX](#) [C#](#) [System.ML](#)

'Details at [knaack.it/en/projects/automl-pipeline-onnx](https://knaack.it/en/projects/automl-pipeline-onnx)

## .NET Bindings for an Embedded Graph Database

Idiomatic .NET bindings for Kuzu with LINQ queries, dependency injection, and native interop integration.

[C#](#) [.NET](#) [Kuzu](#) [Graph Database](#) [LINQ](#) [Native Interop](#) [C++](#)

'Details at [knaack.it/en/projects/dotnet-bindings-graph-database](https://knaack.it/en/projects/dotnet-bindings-graph-database)

## Local-first Issue Tracker with SQLite

A local issue tracker as a .NET library and CLI that works without a server using a single SQLite file.

[C#](#) [.NET](#) [SQLite](#) [CLI](#) [Local-first](#) [Developer Tools](#)

'Details at [knaack.it/en/projects/local-first-issue-tracker-sqlite](https://knaack.it/en/projects/local-first-issue-tracker-sqlite)

## .NET/Rust Bridge for HTTP Automation

.NET bridge for an HTTP client with browser-grade TLS fingerprinting and native Rust interop.

[C#](#) [.NET](#) [Rust](#) [HTTP](#) [TLS](#) [Native Interop](#) [Docker](#)

'Details at [knaack.it/en/projects/dotnet-rust-http-automation](https://knaack.it/en/projects/dotnet-rust-http-automation)

## Fintech Foundation: API 1.0 Architecture

Building the technological foundation for a startup. High-availability REST API, PCI-DSS compliant processes, and microservices.

[C#](#) [.NET Core](#) [MS SQL](#) [REST API](#) [Azure](#)

'Details at [knaack.it/en/projects/fintech-api-architecture](https://knaack.it/en/projects/fintech-api-architecture)

## Strategic Migration: ColdFusion to .NET

Initiation and technical leadership of migrating a monolithic ColdFusion landscape to a modern .NET ecosystem.

[C#](#) [.NET](#) [ColdFusion](#) [SQL Server](#)

'Details at [knaack.it/en/projects/coldfusion-dotnet-migration](https://knaack.it/en/projects/coldfusion-dotnet-migration)

## Fintech Security & Visa Compliance

Implementation of critical security updates and new Visa policies for a fintech platform.

[C#](#) [.NET](#) [Payment Gateways](#)

'Details at [knaack.it/en/projects/fintech-security-visa](https://knaack.it/en/projects/fintech-security-visa)

## Automated Settlement Email Dispatch

Development of an automated system for time-critical dispatch of settlement emails in the fintech sector.

[C#](#) [.NET](#) [SMTP](#) [MS SQL](#) [Azure](#)

'Details at [knaack.it/en/projects/fintech-settlement-emails](https://knaack.it/en/projects/fintech-settlement-emails)

## Automated Web Scraping Tools

Development of specialized data mining software for automated data extraction from websites.

[C#](#) [WinForms](#) [Regex](#) [HTML Parsing](#) [HTTP Automation](#)

'Details at [knaack.it/en/projects/automated-web-scraping](https://knaack.it/en/projects/automated-web-scraping)

## Email Tracking System

Implementation and documentation of a comprehensive email tracking system for marketing and transactional emails.

[C#](#) [.NET](#) [REST API](#) [MS SQL](#) [JavaScript](#)

'Details at [knaack.it/en/projects/email-tracking-system](https://knaack.it/en/projects/email-tracking-system)

## Technical Audit & Legal Disclosure

Technical representation of the company in a complex legal dispute, including code disclosure and expert witness communication.

[Tech Consulting](#) [Code Analysis](#) [Forensics](#) [Communication](#)

'Details at [knaack.it/en/projects/technical-audit-legal](https://knaack.it/en/projects/technical-audit-legal)

## Plugin Architecture in C#

Design and implementation of a flexible plugin architecture for extensible .NET applications.

[C#](#) [.NET](#) [Reflection](#) [MEF](#) [Dependency Injection](#)

'Details at [knaack.it/en/projects/plugin-architecture-csharp](https://knaack.it/en/projects/plugin-architecture-csharp)

## Secure Authentication with Hash & Salt

Implementation of a secure authentication system with modern hashing algorithms for web applications.

[C#](#) [.NET](#) [ASP.NET](#) [Cryptography](#) [MS SQL](#)

'Details at [knaack.it/en/projects/secure-authentication](https://knaack.it/en/projects/secure-authentication)

## Post-Hack Recovery & Operations

Secure relaunch of a web application with tens of thousands of users after a hacker attack.

[Operations](#) [Database Management](#) [Payment Systems](#) [Incident Response](#)

'Details at [knaack.it/en/projects/post-hack-recovery](https://knaack.it/en/projects/post-hack-recovery)

## CI/CD & DevOps Automation

Transformation of manual release processes into fully automated pipelines using Docker and Kubernetes.

[GitHub Actions](#) [GitLab CI](#) [Docker](#) [Kubernetes](#)

'Details at [knaack.it/en/projects/devops-cicd-automation](https://knaack.it/en/projects/devops-cicd-automation)

## Desktop Applications with JavaScript

Cross-platform desktop applications with Electron and TypeScript.

[Electron](#) [TypeScript](#) [Node.js](#) [React](#) [C#](#) [IPC](#)

'Details at [knaack.it/en/projects/desktop-system-tools](https://knaack.it/en/projects/desktop-system-tools)

## Modern Web & GraphQL Consulting

Architecture consulting for replacing monolithic REST structures with scalable GraphQL federations.

[GraphQL](#) [Node.js](#) [TypeScript](#) [React](#) [PostgreSQL](#) [Apollo](#)

'Details at [knaack.it/en/projects/graphql-modern-web](https://knaack.it/en/projects/graphql-modern-web)

## Portfolio Website [knaack.it](https://knaack.it)

Development of a high-performance portfolio site using a modern web stack, optimized for Edge deployment.

[Astro 5](#) [TypeScript](#) [Tailwind CSS](#) [Cloudflare](#)

'Details at [knaack.it/en/projects/portfolio-knaack-it](https://knaack.it/en/projects/portfolio-knaack-it)

## Social Media App Development

Native Android development of a successful social media platform within an agile freelance team.

[Java](#) [Android SDK](#) [Android Studio](#) [Mobile First](#)

'Details at [knaack.it/en/projects/social-media-app-android](https://knaack.it/en/projects/social-media-app-android)

## COVID Scanner & QR Processing

Development of a high-performance mobile app for offline validation of digital certificates focusing on data privacy.

[React Native](#) [Expo](#) [TypeScript](#) [Cryptography](#)

'Details at [knaack.it/en/projects/covid-scanner-app](https://knaack.it/en/projects/covid-scanner-app)

## NNTP Client for Windows

Development of a modern Usenet newsreader with WPF for Windows platforms.

[C#](#) [WPF](#) [XAML](#) [.NET Framework](#) [NNTP](#)

'Details at [knaack.it/en/projects/nntp-client-wpf](https://knaack.it/en/projects/nntp-client-wpf)

## Software Patent & Technological Innovation

Development and patenting of a system for automated extraction of music data from various media formats and creation of royalty lists for collective management organisations.

[Algorithm Design](#) [Audio Processing](#) [Pattern Matching](#) [Data Extraction](#)  
'Details at [knaack.it/en/projects/software-patent-innovation](https://knaack.it/en/projects/software-patent-innovation)

## CONTACT

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Have an AI/agentive .NET project or need to harden an AI prototype for production? Feel free to reach out.

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