

CHRIS CHAPEL

Construction Technology · Enterprise AI · Digital Transformation

Chicago, Illinois

cchapel@tecnologicaconsulting.com · chrischapel.com

EXECUTIVE PROFILE

Technology executive, software architect, and construction technology leader specializing in the intersection of **enterprise software, construction operations, data engineering, and artificial intelligence**.

Experienced in designing and developing technology platforms that connect complex enterprise information with practical business workflows. Work spans application architecture, project controls, data integration, cloud infrastructure, enterprise reporting, and AI-powered applications.

Recent work has expanded from traditional application development into **Generative AI, enterprise AI assistants, natural-language interfaces to business data, semantic search, vector embeddings, project intelligence, and AI-powered business workflows**.

The common objective is straightforward:

Turn complex enterprise information into systems people can understand, interact with, and use.

AI & ENTERPRISE AI EXPERIENCE

From Generative AI to Project Intelligence

My AI work has evolved beyond simply integrating a language model into an application. I develop application capabilities that connect **Generative AI with enterprise data, semantic retrieval, project context, business rules, and user workflows**.

GENERATIVE AI & GEMINI

Designed and integrated Generative AI capabilities into enterprise construction applications using **Google Cloud, Google GenAI, and Gemini**.

- Integrated Gemini into ASP.NET Core enterprise applications.
- Designed AI service and client-provider architectures.
- Connected AI models with structured enterprise information for project-specific analysis.
- Developed structured AI responses and application-controlled workflows.
- Built conversational interactions between users and enterprise project information.
- Implemented streaming AI responses for interactive application experiences.
- Connected AI services to application business logic rather than treating AI as an isolated feature.

ENTERPRISE AI ASSISTANT

Developed an enterprise AI assistant that allows users to interact with construction project information using natural language.

The application connects:

User Question → AI Routing → Project Context → Enterprise Data → AI Analysis → Natural-Language Response

Capabilities include:

- Natural-language questions about construction projects.
- Project identification from conversational input.
- Retrieval of project-specific information.
- Interpretation of project milestones, updates, risks, and other structured information.
- AI-generated project analysis.
- Streaming responses within the application.
- Integration with existing application authorization and business context.

This changes the interaction model from **searching through information** to **asking questions about the information**.

NATURAL-LANGUAGE DATA INTERFACE

Developed AI-driven interfaces that allow users to ask questions about structured enterprise information without needing to understand the underlying database structure.

Work includes:

- Interpreting natural-language questions.
- Identifying relevant projects, people, statuses, risks, and business dimensions.
- Translating user intent into application-level data retrieval.
- Combining structured database results with AI-generated interpretation.
- Returning results through conversational interfaces.

This creates a bridge between **human language and enterprise data systems**.

SEMANTIC SEARCH & VECTOR EMBEDDINGS

Implemented semantic search capabilities using **vector embeddings** to retrieve construction information based on meaning and context rather than exact keyword matches.

Experience includes:

- Generating vector embeddings for enterprise construction information.
- Storing and retrieving embedding representations.
- Comparing semantic similarity between natural-language queries and enterprise content.
- Building retrieval workflows that identify conceptually related information.
- Connecting semantic retrieval with Generative AI workflows.

AI-POWERED PROJECT ANALYSIS

Developed project-specific AI workflows that combine structured construction data with Generative AI.

Project information can include:

- Project milestones
- Weekly updates
- Risks
- Project status
- Schedule information
- Project contacts
- Other structured project information

The AI layer provides contextual analysis and natural-language interaction with that information.

The objective is not simply to generate text, but to make **project information more accessible and useful to the people responsible for managing it.**

AI-POWERED BUSINESS WORKFLOWS

Integrated AI capabilities into broader enterprise application workflows rather than creating standalone AI demonstrations.

Architecture connects:

ASP.NET Core → Business Logic → SQL Server → Semantic Retrieval → Gemini → User Interface

AI is treated as another capability within an enterprise application architecture alongside databases, APIs, business rules, reporting, authorization, and user interfaces.

CORE TECHNOLOGY

APPLICATION DEVELOPMENT

- ASP.NET Core
- .NET 9
- C#
- MVC / Razor
- REST APIs
- JavaScript
- DevExtreme
- Enterprise Web Applications
- Application Architecture
- Business Logic & Workflow Design

ARTIFICIAL INTELLIGENCE

- Google GenAI
- Gemini
- Generative AI
- Enterprise AI Assistants
- Natural-Language Interfaces
- Vector Embeddings
- Semantic Search
- Retrieval Workflows
- AI-Powered Project Analysis
- Streaming AI

- AI Application Architecture

DATA & ENGINEERING

- SQL Server
- Cloud SQL
- Data Integration
- ETL / ELT
- Data Modeling
- Stored Procedures
- Enterprise Reporting
- Data Retrieval & Optimization
- Structured Enterprise Data

CLOUD & INFRASTRUCTURE

- Google Cloud Platform
- Cloud SQL
- Google Cloud AI Services
- Cloud Infrastructure
- Service Accounts & IAM
- Enterprise Application Deployment

CONSTRUCTION TECHNOLOGY

- Project Controls
- Construction Management
- Capital Programs
- Project Intelligence
- Risk Management
- Milestone Tracking
- Financial Controls
- Enterprise Construction Workflows

PROFESSIONAL EXPERIENCE

TECNOLOGICA CONSULTING

Chief Technology Officer & Partner

2024 – Present

Technology leadership focused on construction technology, enterprise software, artificial intelligence, data engineering, and digital transformation.

- Lead technology strategy and software architecture for construction-focused digital solutions.
- Design and develop enterprise applications using ASP.NET Core, .NET, C#, SQL Server, JavaScript, and cloud technologies.
- Develop and integrate Generative AI capabilities using Google Cloud, Gemini, and Google GenAI.
- Build AI assistants and natural-language interfaces that connect users with enterprise project information.

- Implement semantic search and vector-embedding workflows for construction information.
- Develop project-specific AI analysis combining structured project data with Generative AI.
- Connect AI services with application business logic, databases, authorization, and user interfaces.
- Design data integration and enterprise information architectures supporting construction operations.
- Translate complex business and construction requirements into practical software systems.

Selected Technology:

Generative AI · Gemini · Enterprise AI Assistants · Semantic Search · Vector Embeddings · ASP.NET Core · SQL Server · Google Cloud · Construction Technology

DSR GROUP

Project Controls & Technology

2021 – June 15, 2024

Worked across construction project controls, technology, data, and digital systems supporting complex capital construction programs.

- Developed technology solutions supporting construction project controls and management workflows.
- Worked with project schedules, milestones, risks, financial information, project updates, and operational reporting.
- Built data-driven applications and reporting workflows to improve visibility into project information.
- Connected construction processes with enterprise technology and structured data.
- Supported the development and evolution of digital systems used to manage project information.
- Identified opportunities to replace fragmented processes with structured, technology-enabled workflows.
- Applied software and data engineering concepts directly to construction operations and project controls.

Selected Technology:

Project Controls · Construction Technology · Data Engineering · Enterprise Reporting · Project Information · Workflow Automation

DIGIBILT, INC.

Chief Technology Officer

2018 – 2021

Led technology strategy and development for a digital construction technology organization focused on improving construction processes through technology.

- Directed software and technology development initiatives.
- Established application architecture and technology direction for digital construction solutions.
- Worked across business requirements, technology implementation, and digital transformation.
- Developed technology intended to improve visibility, productivity, process control, and operational efficiency.
- Connected construction processes with software platforms and structured information.
- Worked with business and technology stakeholders to translate operational problems into technology solutions.

Selected Technology:

CTO Leadership · Construction Technology · Software Architecture · Digital Transformation · Process Technology

SELECTED ACHIEVEMENTS & RECOGNITION

U.S. PATENTS

Method and System for Automatically Creating a Bill of Materials

U.S. Patent No. 10,997,553 B2

Issued May 4, 2021

Technology for automatically creating a bill of materials as part of a construction-oriented digital workflow.

Method and System for Automatically Creating and Assigning Assembly Labor Activities to a Bill of Materials

U.S. Patent No. 11,030,709

Issued June 8, 2021

Technology for automatically creating and assigning assembly labor activities to structured bill-of-material information.

HARVARD UNIVERSITY CASE STUDY

Technology-enabled construction planning and execution documented in a Harvard University case study, with reported results of:

43% time savings

19% cost savings

on a completed project.

CHICAGO SUN-TIMES BUSINESS INNOVATION AWARD

Recognized for innovation in applying technology to the construction industry.

TECHNOLOGY LEADERSHIP & SPECIALIZATION

CTO & TECHNOLOGY STRATEGY

Translate business objectives and operational problems into technology strategy, architecture, development priorities, and practical digital systems.

CONSTRUCTION TECHNOLOGY

Combine software, data, and construction knowledge to build systems around how construction organizations actually operate.

ENTERPRISE SOFTWARE

Design integrated applications connecting user interfaces, business logic, enterprise data, APIs, reporting, and cloud services.

ARTIFICIAL INTELLIGENCE

Apply Generative AI, semantic retrieval, embeddings, and natural-language interfaces to enterprise information and business workflows.

DIGITAL TRANSFORMATION

Modernize fragmented processes by connecting people, information, applications, and technology into integrated workflows.

SELECTED TECHNOLOGY WORK

01 — AI PROJECT INTELLIGENCE

Generative AI · Gemini · Project Analysis

AI-powered construction project analysis combining structured project information with Generative AI and natural-language interaction.

02 — ENTERPRISE AI ASSISTANT

AI Assistant · Natural Language · Enterprise Data

Conversational interface for interacting with construction project information using natural language and application-controlled project context.

03 — SEMANTIC CONSTRUCTION SEARCH

Vector Embeddings · Semantic Retrieval · AI

Semantic retrieval system connecting natural-language questions with relevant construction information based on meaning and context.

04 — CONSTRUCTION DATA INTEGRATION

SQL Server · Data Engineering · Cloud

Enterprise data architecture connecting construction systems, integrated data, SQL Server, reporting, and project intelligence.

05 — ENTERPRISE AI ARCHITECTURE

ASP.NET Core · Gemini · Cloud · AI

Application architecture integrating AI services with enterprise applications, databases, business logic, semantic retrieval, and user interfaces.

06 — CONSTRUCTION MANAGEMENT PLATFORM

Project Controls · Applications · Workflows

Technology platform supporting construction project controls, project information, workflows, reporting, risk, milestones, and operational management.

PROFESSIONAL SPECIALIZATIONS

**Construction Technology
Enterprise Software Architecture
Generative AI & Enterprise AI
AI Assistants & Natural-Language Interfaces
Semantic Search & Vector Embeddings
Data Engineering & Integration
Project Controls Technology
Digital Transformation
Cloud Application Architecture
Construction Project Intelligence
Enterprise Workflow Modernization
Technology Strategy & Leadership**

TECHNOLOGY STACK

Languages & Frameworks

C# · .NET 9 · ASP.NET Core · MVC · Razor · JavaScript

Application Technology

DevExtreme · REST APIs · Enterprise Web Applications · Application Architecture

Artificial Intelligence

Google GenAI · Gemini · Generative AI · AI Assistants · Vector Embeddings · Semantic Search · Natural-Language Interfaces

Data

SQL Server · Cloud SQL · ETL / ELT · Data Integration · Data Modeling · Stored Procedures · Enterprise Reporting

Cloud

Google Cloud Platform · Cloud SQL · AI Services · Cloud Infrastructure · IAM

Construction

Project Controls · Construction Management · Risk · Milestones · Financial Controls · Project Intelligence