

## CASE STUDY

# AI-Powered Medical Coding for Faster Revenue Cycles



 Zemoso

## Introduction:

Revenue cycle leaders are under pressure: claim denials, staffing shortages in coding, and ever-changing regulations are tightening margins. Manual, coder-only workflows cannot keep up with volume variability and complexity.

For Revenue Cycle Management (RCM) providers, manual medical coding has become a limiting factor. Coding delays slowed claim submission, reduced cash velocity, and constrained scalability.

To address this, a Dallas-based RCM company partnered with Zemoso to build AI Coder, an AI-powered medical coding platform designed to automate code assignment while maintaining compliance, accuracy, and human oversight.

## Industry challenge:

Across healthcare, coding still runs on slow, manual work: coders read clinical notes and assign ICD-10 and CPT codes one by one, so backlogs build up and billing and reimbursement slip further behind. At the same time, hospitals are dealing with an estimated 30% shortage of medical coders, making it harder and more expensive to staff teams that can keep up with demand.

Together, this creates a chain reaction: delayed or inaccurate coding leads to denied or slowed claims, revenue leakage, and cash-flow pressure, which in turn limits what hospitals can invest in staff, equipment, and services. Patients feel this as longer wait times, reduced access, and a poorer overall care experience.

## Zemoso's partnership challenge

The client's challenge was not simply automation. It was architectural credibility.

The organization needed to:

- Reduce coding turnaround time without increasing denial rates
- Absorb volume variability without hiring proportionally
- Introduce AI without compromising audit defensibility
- Demonstrate measurable accuracy improvement over time

This required building a system capable of learning, scaling, and integrating into existing billing workflows without disrupting client infrastructure.

Zemoso's mandate was to engineer an AI solution that increased velocity while protecting compliance integrity.

## Impact created

Within six months, the solution streamlined patient record processing and shortened claim cycles, directly improving hospital cash flow.

## How did we do this?

The AI medical platform automates coding with 95% accuracy while keeping coders in charge of final decisions.

Engineering highlights:

- **Asynchronous coding pipeline:** Clinical notes are ingested via queues and processed in parallel worker flows, so volume spikes don't turn into coding backlogs.
- **Medical Knowledge Graph:** A Neo4j-based medical Knowledge Graph encodes CPT/ICD codes, hierarchies, and relationships, giving the system a structured, clinically grounded foundation instead of relying on free-text alone.
- **Hybrid search + LLM intelligence:** Deterministic graph traversal, BM25 text search, semantic vector search, and LLM-based reranking work together to turn unstructured notes into high-confidence CPT/ICD suggestions while minimizing hallucinations.
- **AI-assisted coder workspace:** Coders start from ranked AI suggestions and refine them using search, modifiers, CPT-ICD linking, and drag-and-drop priority instead of coding from scratch.
- **RCM integration:** Finalized codes flow back into existing billing and RCM systems through clean interfaces, shortening claim cycles without a rip-and-replace of the current stack.

## How did Zemoso deliver excellence

The autonomous coding solution provided the RCM company with a scalable engine that increases coding velocity while maintaining compliance integrity. It replaces linear, labor-bound workflows with structured AI augmentation, positioning the company to compete in a revenue cycle environment increasingly defined by speed, accuracy, and defensible automation.

To hire your custom product pod, write to [sales@zemosolabs.com](mailto:sales@zemosolabs.com) today!

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