

Demystifying AI: Transforming Revenue Cycle Management (RCM)

AI is the answer, what is your question?
Not for healthcare though!

By Pavani Munjuluri

Did you know AI is everywhere! Doing what you ask? Our shopping decisions, restaurant choices, things we do on the weekends and so many other decisions we make are powered by AI. We are aware of some and blissfully oblivious to many. So what is all this fuss about? To AI or not to AI, that's not even a question anymore! Let's explore the early beginnings, the teen years and the current state of AI and things to be mindful of, in the context of the healthcare industry!

In the mist of time

Can you believe, AI is a baby boomer, born in 1956! AI comes from the lineage of computers, philosophy, mathematics, and neuroscience. The extended family also includes psychology, automata, and science fiction. The concept of "thinking machines" fascinated and frightened us for centuries, even before the advent of working computers. If you remember or know ELIZA, a basic conversational chatbot, or DENDRAL from back when, then you are aging yourself my friend! But back when, this baby AI learnt how to:

- Systematically apply knowledge.
- Follow a logical problem-solving process.
- Recognize patterns.
- Refine understanding through hypothesis testing.
- Demonstrates basic interaction and turn-taking.
- Has no true understanding of language or the world around it.
- Responds in a rote, scripted manner, focused on patterns and keywords rather than genuine communication.

AI's adolescence was a period of turbulent transition, marked by setbacks, and growing pains, but also laying the essential groundwork for future advancements.

- **Knowledge Representation:** Research focused on improving how computers store and reason with knowledge. This included work on ontologies (formal descriptions of concepts and their relationships) and semantic networks (graph-based knowledge representation).



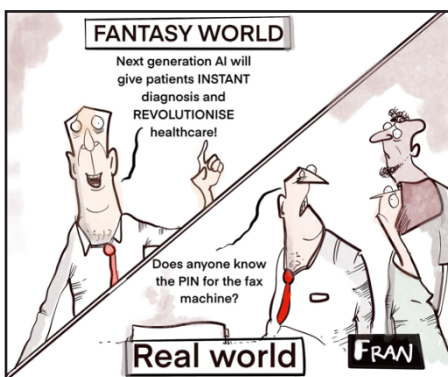
- **Early Expert Systems:** While still limited, systems like INTERNIST-1 and QMR for medical diagnosis hinted at the potential of AI to assist in complex, specialized tasks.
- **Natural Language Progress:** Projects like SHRDLU demonstrated limited but meaningful interaction with computers using natural language, setting the stage for more sophisticated dialogue systems.
- **Foundations of Machine Learning:** Developments in statistics and algorithms laid the groundwork for later data-driven breakthroughs, even though the term 'machine learning' wasn't prominent at the time.

As it matures, AI undergoes significant shifts and faces challenges. Initially, it is a highly specialized expert system with deep but narrow knowledge in fields like finance, manufacturing, or specialized medical diagnostics. Although respected for its expertise, AI is aware of its limitations, such as struggling with uncertainty, common sense reasoning, and adapting to new information. It realizes that its rule-based approach is reaching its limits and sees the potential of neural networks and machine learning to aid its growth. AI moves from pure research into practical applications, taking on projects such as developing fraud detection systems and optimizing supply chains. However, it faces significant challenges, such as ensuring data quality and dealing with the complexity of real-world systems. Welcome to the real-world AI!

As AI evolves, it learns to collaborate with domain experts, incorporating simple machine-learning techniques alongside its knowledge base. It finds its niche by analyzing the massive datasets generated by the internet revolution, contributing to recommendation systems, online advertising, and fraud prevention. Its expertise grows more nuanced and probabilistic, and it recognizes the ethical implications of influencing user behavior on a massive scale. The dot-com bubble burst highlights the need for balanced approaches to AI development.

AI is now a household term, integrated into smartphones,

smart homes, and self-driving cars. It powers image recognition, speech translation, and sophisticated game-playing AI. However, it faces increased scrutiny regarding bias, privacy, and the potential impact on jobs. To address these concerns, it starts developing explainability techniques. The explosion of data and computing power unlocks the full potential of neural networks. AI collaborates with humans in new ways, augmenting decision-making instead of replacing it. AI recognizes its role as a powerful tool and works alongside humans to tackle global challenges in healthcare, climate science, and education.







It's the right time.

You may be familiar with IBM's Watson from the computer system's appearance on Jeopardy in 2011. Watson beat former champions, Ken Jennings, and Brad Rudder.

Watson's time on Jeopardy was fun viewing, and we all enjoyed it. Some of us even thought, "AI can do anything." Watson caused a ripple of hyped interest in AI in healthcare. However, by 2017, the hype waned into a dismal real-world performance, and by 2021, it died. That was in healthcare's "clinical space" and not the healthcare administration and Revenue Cycle Management (RCM) space. In the RCM space, one of the early AI technologies adopted was "Computer-Assisted Coding, CAC," (now renamed Autonomous Coding!). A recent survey by HFMA showed more than 60% of healthcare organizations use CAC.

Artificial intelligence (AI) mimics human cognitive functions. It brings a change to the basic assumptions of how healthcare RCM works. However, AI is not the one technology but a collection of technologies being used in RCM. Machine Learning (ML), Robotic Process Automation (RPA), and Natural Language Processing (NLP) are some of the technology initiatives that are under discussion.

The technologies discussed in this visual have been around for a while, but their definition, scope, and naming have undergone significant changes over the years. While they might look unfamiliar, you know them if you look closer. For example, 'scripting' is the predecessor of RPA. Recently, a term that's gaining popularity is "Intelligent Agents". Remember 007, yes! These agents are a combination of RPA and AI that can carry out tasks autonomously with a high level of accuracy and efficiency. We need to design, develop, deploy the right set of agents to

 <p>Artificial Intelligence AI</p> <p>Artificial intelligence, or AI, is a technology that enables computers and machines to simulate human intelligence and problem-solving capabilities.</p>	 <p>Machine Learning ML</p> <p>Machine learning (ML) is a branch of artificial intelligence (AI) and computer science that focuses on using data and algorithms to enable AI to imitate the way that humans learn, gradually improving its accuracy.</p>
 <p>Robotic Process Automation RPA</p> <p>Robotic Process Automation (RPA) is a technology that enables the automation of routine business processes with "software robots" that perform the tasks automatically, with or without human intervention.</p>	 <p>Natural Language Processing NLP</p> <p>Natural language processing (NLP) is a branch of artificial intelligence that helps computers understand, interpret and manipulate human language. It is a field that combines computer science, linguistics, and machine learning. Computer Assisted Coding uses NLP extensively.</p>

successfully incorporate AI into the RCM workflows. Imagine an 'Insurance discovery agent' which can not only tell you if the patient has an insurance or not but tell which one and what is the coverage! Life would be smooth!

Healthcare RCM challenges, why now and the way forward.

A seamless clinical and billing experience leads to overall patient satisfaction. Many of us expect 'excellent customer experience' like we were at a wellness resort or Bloomingdales or purchasing more toilet rolls from Amazon! Revenue Cycle Management in healthcare plays a critical role in maintaining the financial health of healthcare organizations while ensuring quality care for patients. RCM ensures that healthcare providers are compensated fairly for their services and patients get the right bill and information of the services received. A well-functioning RCM process minimizes billing errors, prevents surprise bills, and enhances patient satisfaction. Patients, Payers, Providers, and Regulators appreciate clear and transparent financial interactions. Efficient RCM processes lead to smoother workflows, reduced administrative burden, and better resource allocation. This, in turn, positively impacts patient care.

Healthcare RCM faces several challenges that impact provider financial health and operational efficiency. Approximately 33% of healthcare centers in the US operate on negative margins. This poor performance is often due to challenges in the revenue cycle. Denials, underpayments, payer audits, and regulatory compliance add to the pressure CFOs face daily.

1. Healthcare RCM uses a vast amount of clinical and financial data. Until now (in fact, even now), staff members analyze the data to find patterns, identify

outcomes, and take necessary actions. Though streamlined with Electronic Health Records (EHR) and other revenue cycle applications, RCM business processes are still complex, need subjective judgment in many cases, and have space for improvement.

2. Healthcare RCM uses multiple applications; one survey shows that hospitals use an average of 39 applications to run their RCM functions. They vary from EMR, scheduling, and patient interactions, including payments, clearing houses, payer sites, document management systems, and financial applications. This means the staff must toggle between the applications to complete their tasks, leading to inefficiencies and re-work due to errors.
3. In addition, Healthcare RCM has been riddled with staffing shortages for years, leading to outsourcing to offshore vendors and locations. Robert Boos, who leads the RCM functions in a health system in Virginia, said in a recent presentation about 60% of his staff are over 50, and less than 6% are under 30. He has noticed that the younger generation is opting for more “cool” jobs, and the older generation is retiring (some early due to burn-out) or near retirement. Naturally, he is worried and has all the reasons to explore what AI can offer!

AI in Healthcare RCM

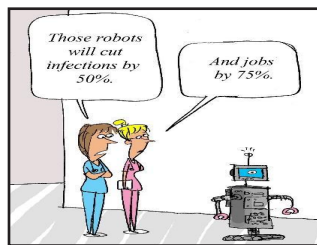
The use of AI has the potential to overcome many of these challenges. AI and ML, used together, can analyze large amounts of data in minutes and accurately predict the results and the next step in the business flow. Computer-assisted coding is already helping providers manage the staffing crunch they would otherwise have faced. There are many other processes where AI can help the RCM leadership.

Some examples where AI is already in use:

1. **Prior Authorization:** RPA combined with ML and NLP can assist in generating Prior Authorization requests, following up on them, and updating the EMR with Prior Authorization details.
2. **Charge Capture and Claim Edits:** Many charge capture and claim edit functions historically managed by the staff can be handled by RPA. Caution must be taken to define the rules, monitor their accuracy, and periodically update the business rules.
3. **Coding:** A shortage of Coders is a well-known challenge in RCM, which has resulted in providers exploring and adopting Computer-assisted coding. Though more than 60% of hospitals use one of the CAC products, they are yet to utilize the technologies’ full potential. A decade after the introduction of CAC, a study by

AMA reported a 30% shortage of coders.

4. **Denial Management:** Healthcare providers struggle with delayed claim denial resolutions, backlogs, and inconsistent analysis across RCM staff. AI, RPA, and ML can manage the challenges in denial management. RPA applications make sure claim statuses are checked periodically, appeals are submitted timely, and medical records requests are handled on time.
5. **Denial Analytics:** Healthcare providers have used newer technologies efficiently in analytics. These may be Payer Behavior analytics or Analyzing claim errors and corrections. Provider RCM teams already use analytics applications but there is an opportunity to expand.
6. **Correspondence Management:** Payers send providers thousands of documents every month related to claims, audits, denials, payments, etc. Currently, they manage them with an army of people. AI, NLP, and ML can help reduce dependence on people and, in some cases, eliminate it.
7. **Cash reconciliation and posting:** Though many RCM applications come with automated cash management, providers still struggle to reconcile deposits, remittances, and posted cash. In addition, the cash posting process can be complex depending on the provider’s EMR. Intelligent process automation has



been proven to improve the efficiency of cash management.

The Scare – Eliminating staff, reducing cost, or increasing efficiency?

When CAC was introduced over a decade ago, researchers, consulting companies, and service providers claimed that it would reduce manual coding significantly; some even went to the extent of claiming a 60-70% reduction in manual coding. The Coding community started discussing job loss and alternatives. After a decade, we are still short of medical coders. A few years ago, when RPA was the hype, per the McKinsey report, the talk was that bots would replace over 50% of the jobs in billing and claims processing. We are still short of staff to manage RCM in healthcare. Where is the job loss? Or is it too early to see the results? Or is the adoption rate much slower than expected?

Job loss was hype, and staff shortage is the reality. The staffing challenge is not just the current vacancies and non-availability of skilled staff; it takes a long time to fill the positions and train staff. There is limited skill development in the sector, which results in future staff shortages.

The Pandemic seems to have added to the woes of RCM leaders. The pandemic had a greater effect on administrative costs than clinical costs. From 2016 to 2019, U.S. hospitals' clinical and administrative spending increased at similar paces by about 4%. In 2020, the first year of the COVID-19 pandemic, administrative expenses grew faster than clinical expenses. The median administrative expenses increased by 6.2% in 2020, while average clinical expenses grew by only 0.6%. This gives us an indication of where we are headed. As RCM functional leaders it is time for us to employ initiatives that were not previously an option – Artificial Intelligence and Process Automation.

Hence, RCM leaders should explore implementing newer technology initiatives like AI, RPA, and Intelligent Agents in their workflows to assist them in completing the tasks in time, improving the financial KPIs.

There are still many areas which need to be established to manage, scale and govern these newer technologies. It is in our collective interest to educate ourselves on the strengths and shortcomings of AI. This might be a golden opportunity to address a myriad of issues in the healthcare RCM landscape. Stay Curious!

About the author

Pavani is the dynamic CEO of CognitiveHealth Technologies, a trailblazing AI-driven healthcare technology company revolutionizing patient experience and financial outcomes. In 2018, she founded CognitiveHealth, successfully integrating AI into healthcare. An accomplished Engineer and MBA holder, Pavani's global work spans the UK, Asia Pacific, and India. Pavani can be reached at pavani@cognitivehealthit.com.