

What Organizations Actually Need To Know About Artificial Intelligence, ChatGPT And More

Armanino LLP



Armanino's AI Lab

AI and Healthcare

In a rapidly changing healthcare landscape, the integration of AI, including cutting-edge generative technologies, is redefining the industry. Our discussion will delve into innovative applications, real-world examples, and futuristic predictions to show how healthcare finance professionals can leverage AI to drive efficiency, accuracy, and profitability. From automated billing to predictive analytics, AI is not only reshaping the way healthcare providers operate but also enhancing the patient experience.

Three Key Takeaways:

- 1. Automation and Efficiency:** Understand how AI can streamline operations including revenue cycle management, automating tedious tasks and enhancing accuracy, leading to improved efficiency and cost savings.
- 2. Predictive Insights and Personalization:** Explore how generative AI models can deliver personalized financial solutions and predictive insights, enabling proactive, informed decision-making and enhanced patient engagement.
- 3. Ethics and Bias:** Learn about the importance of ethical considerations in implementing AI solutions, ensuring that technology serves as an enabler rather than a hindrance in healthcare finance.

Armanino Healthcare Solutions Introductions

Ron is a Solutions Partner and Co-Leader of Armanino Healthcare Solutions National practice. Throughout his career, he has gained in-depth knowledge of the healthcare industry including the understanding of value-based care and the integration of people, processes, payors, and providers. Ron brings clients more than 35 years of hands-on experience as both an industry executive and consultant.



Ron Present, Partner
CALA, CNHA, FACHCA

His health care expertise includes innovative strategic, operational and financial solutions for hospitals, health systems, senior housing providers and related care, FQHCs, physician practices, and outpatient services. He provides thought leadership in many formats including presentations, webinars, and articles. He is a licensed nursing home administrator with an MBA and MHA from the University of Missouri.



OJ Laos
Senior Manager

OJ is a senior manager for Armanino's Ideatician's team. He is the Product Mgr. for Armanino IP tools that include enterprise business apps, pre-built Power Platform apps and analytics platforms. He maintains and supports Armanino's strategic industries with our proprietary software tools. At visioning sessions, he leads participants through ways to build and include technology into everyday processes.

OJ brings over a decade of experience in software management and client delivery works with a wide range of clients through digital transformation and system integration. He has created client success while finding innovative solutions to data issues. At a software start up, he redefined the automotive dealership virtual experience — with software aimed at pricing transparency and efficiency. He seeks out solutions and innovative ways to push the boundary on what is possible.

What Does Your AI Caricature Look Like?



ChatGPT



Bard: OJ is a tall, slender man with a youthful face and a friendly smile. He has short black hair and glasses. He is always dressed neatly, but in a casual style. OJ is a technology whiz. He has a deep understanding of enterprise business apps, pre-built Power Platform apps, and analytics platforms. He is also a skilled software manager and client delivery expert. He is passionate about using technology to solve problems and improve people's lives. He is always looking for new and innovative ways to use technology to make a difference.

Bard: Ron is a tall, imposing man with a bald head and a thick mustache. He wears a tailored suit and tie, and he always has a serious expression on his face. His eyes are piercing, and he has a firm handshake. Ron is often caricatured as a healthcare superhero. He is often depicted wearing a cape and a stethoscope, and he is always saving the day for his clients. He is also sometimes caricatured as a financial wizard, with dollar signs in his eyes and a calculator in his hand.



ChatGPT



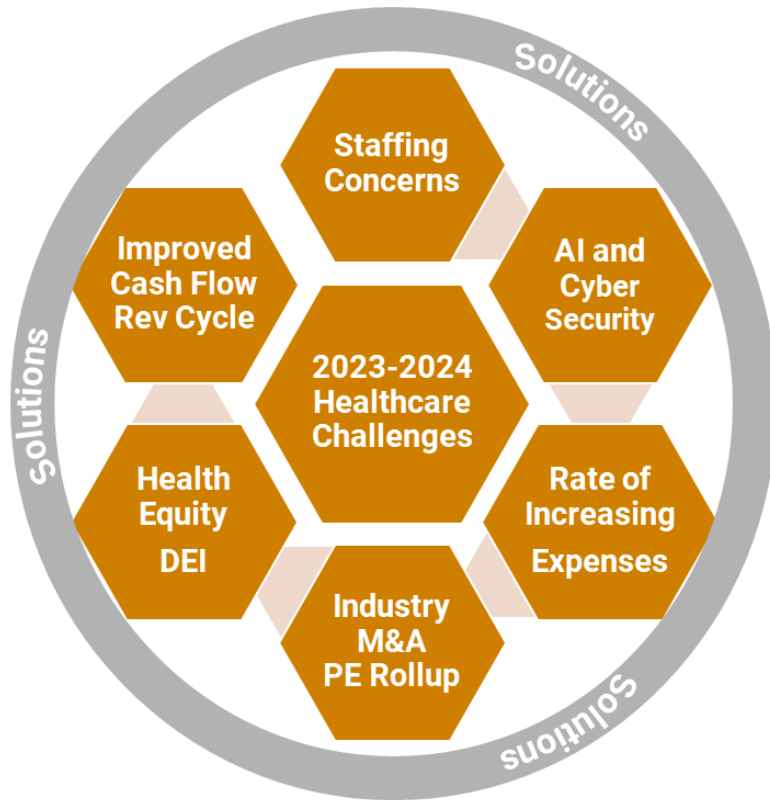
How AI Sees a Member of the HFMA Great Plains Chapter



Does ChatGPT have a built-in bias?



Healthcare Continued Challenges into 2024



Staffing
Concerns

1. How are you using analytics to monitor spiking Covid and overlaying that on your staffing challenges?

Health Equity
DEI

2. How does your CRM increase patient centric care?

Improved
Cash Flow
Rev Cycle

3. What data do you need from disparate systems and how automated is that process? For example, how does the data flow impact revenue cycle?

Improved
Cash Flow
Rev Cycle

4. How does your system track patient acquisition results and market “leakage” which are key components for increasing revenue?

Industry M&A
PE Rollup

5. Healthcare is a constantly changing industry especially with consolidations. How do you use technology to keep track of external regulations and internal communications?

Rate of
Increasing
Expenses

6. How are you incorporating AI and machine learning into your daily operations to reduce expense?

AI and Cyber
Security

7. What safeguards are in place to minimize cyber security risks?

Health Equity
DEI

8. How does your system measure health equity both internally and externally?

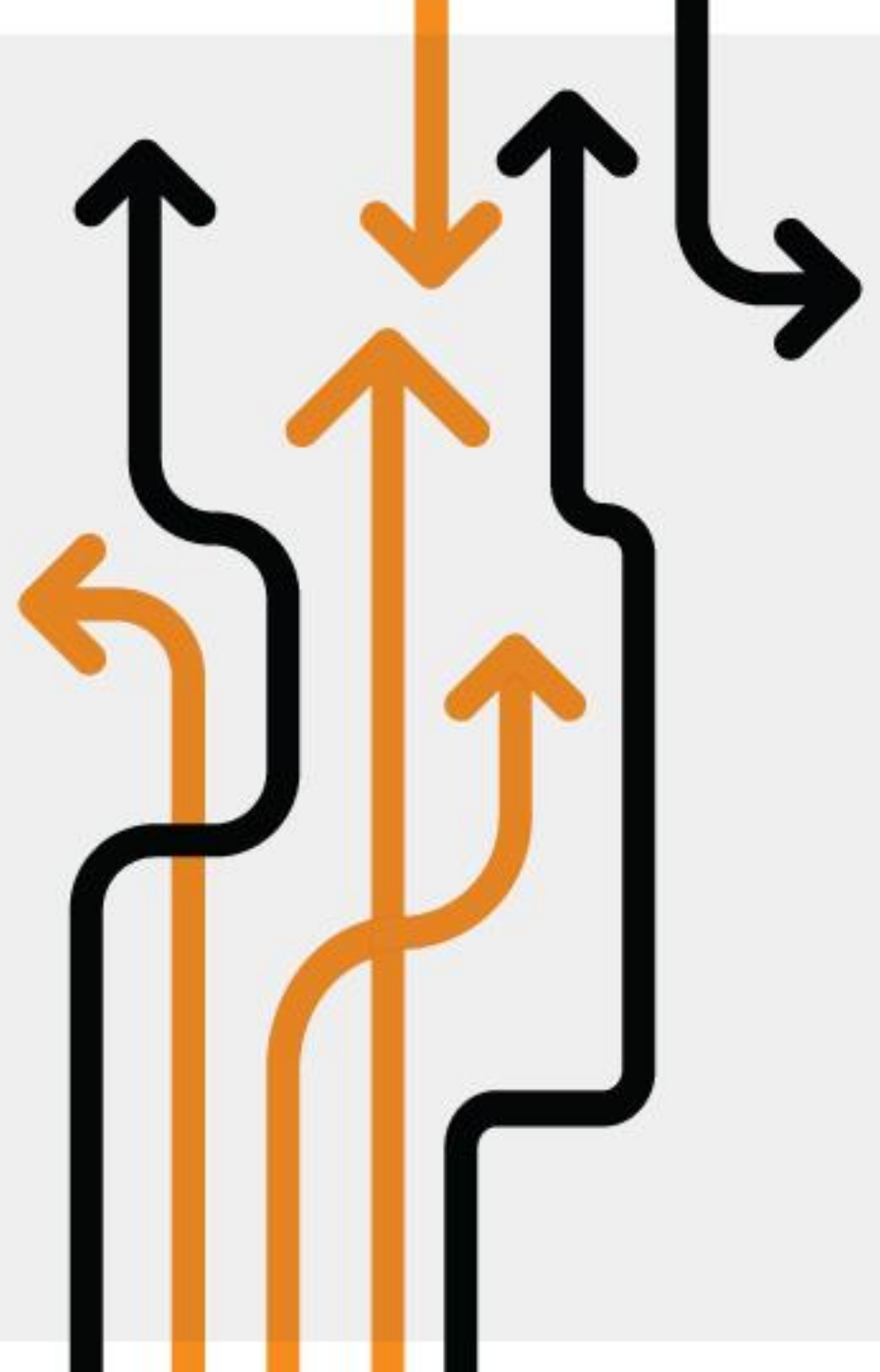
You're not alone

90% of professionals are excited to embrace AI

49% of professionals globally are worried they should know more about AI than they do

39% of global professionals have admitted to pretending they know more about AI to seem 'in the know' in front of teammates

Per 9/14/23 LinkedIn study



What do you want to do?

Extract information from text

Predict between several categories

Predict between two categories

Generate recommendations

Predict values

Discover structure

Find unusual occurrences

Classify images

Text Analytics

Derives high-quality information from text

Answers questions like: What info is in this text?

Latent Dirichlet Allocation ← Unsupervised topic modeling, group texts that are similar

Extract N-Gram Features from Text ← Creates a dictionary of n-grams from a column of free text

Feature Hashing ← Converts text data to integer encoded features using the Vowpal Wabbit library

Preprocess Text ← Performs cleaning operations on text, like removal of stop-words, case normalization

Word2Vector ← Converts words to values for use in NLP tasks, like recommender, named entity recognition, machine translation

Regression

Makes forecasts by estimating the relationship between values

Answers questions like: How much or how many?

Fast Forest Quantile Regression ← Predicts a distribution

Poisson Regression ← Predicts event counts

Linear Regression ← Fast training, linear model

Bayesian Linear Regression ← Linear model, small data sets

Decision Forest Regression ← Accurate, fast training times

Neural Network Regression ← Accurate, long training times

Boosted Decision Tree Regression ← Accurate, fast training times, large memory footprint

Recommenders

Predicts what someone will be interested in

Answers the question: What will they be interested in?

Use the Train Wide & Deep Recommender module ← Hybrid recommender, both collaborative filtering and content-based approach

SVD Recommender ← Collaborative filtering, better performance with lower cost by reducing dimensionality

Clustering

Separates similar data points into intuitive groups

Answers questions like: How is this organized?

K-Means ← Unsupervised learning

Anomaly Detection

Identifies and predicts rare or unusual data points

Answers the question: Is this weird?

One Class SVM ← Under 100 features, aggressive boundary

PCA-Based Anomaly Detection ← Fast training times

Multiclass Classification

Answers complex questions with multiple possible answers

Answers questions like: Is this A or B or C or D?

Multiclass Logistic Regression ← Fast training times, linear model

Multiclass Neural Network ← Accuracy, long training times

Multiclass Decision Forest ← Accuracy, fast training times

One-vs-All Multiclass ← Depends on the two-class classifier

One-vs-One Multiclass ← Depends on binary classifier, less sensitive to an imbalanced dataset with larger complexity

Multiclass Boosted Decision Tree ← Non-parametric, fast training times and scalable

Two-Class Classification

Answers simple two-choice questions, like yes or no, true or false

Answers questions like: Is this A or B?

Two-Class Support Vector Machine ← Under 100 features, linear model

Two-Class Averaged Perceptron ← Fast training, linear model

Two-Class Decision Forest ← Accurate, fast training

Two-Class Logistic Regression ← Fast training, linear model

Two-Class Boosted Decision Tree ← Accurate, fast training, large memory footprint

Two-Class Neural Network ← Accurate, long training times

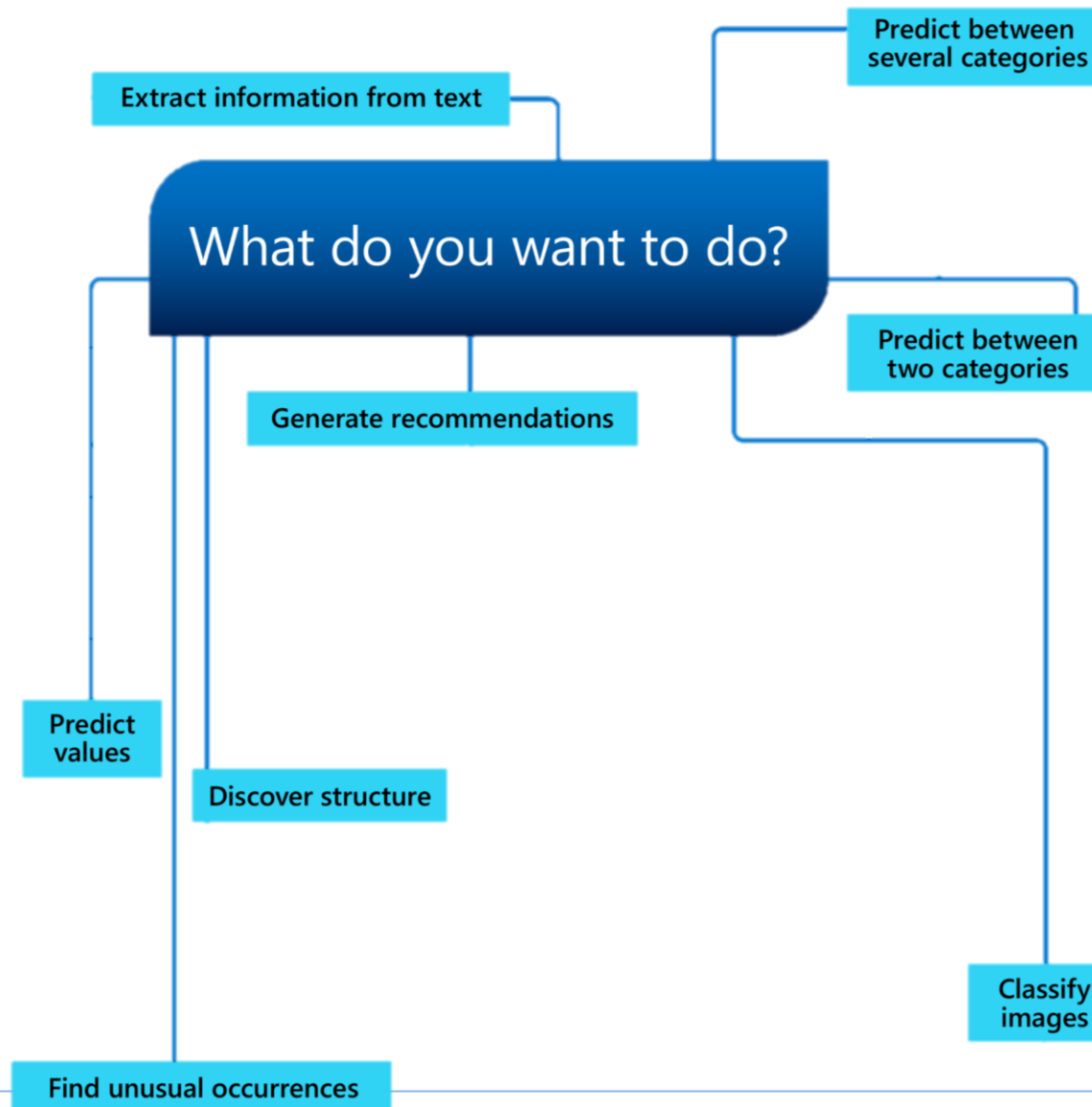
Image Classification

Classifies images with popular networks

Answers questions like: What does this image represent?

ResNet ← Modern deep learning neural network

DenseNet ←



What do you want to do?

Challenges in traditional RCM

- Complexity of Healthcare Billing
- Regulatory Compliance
- Claim Denials and Rejections
- Patient Payment Challenges
- Reconciliation and Audits
- Technology Integration

72%

Claims denied
likely due to
paperwork
errors

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Benefits of Automation in RCM

- **Enhanced Accuracy:** Automation reduces human error in coding, billing, and data entry, leading to fewer denials due to inaccuracies.
- **Increased Efficiency:** Automated workflows mean faster billing processes, quicker claims submission, and timely follow-ups, reducing the time-to-payment.
- **Improved Patient Satisfaction:** By automating administrative tasks, staff can focus on patient-centric service, improving the overall patient experience.
- **Cost Reduction:** Automation helps in lowering the cost-to-collect by reducing the hours spent on repetitive tasks, thereby minimizing administrative overheads.

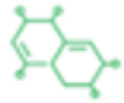
Per McKinsey

Financial Impact of AI in RCM

**Research suggests that effectively
deploying automation and analytics alone
could eliminate \$200 billion to \$360
billion of spending in US healthcare.**



Use-Case Examples



Pharma

- ✓ Accelerated drug discovery
- Clinical trial planning and execution
- ✓ Precision medicine therapies



Providers

- ✓ Automated document processing
- ✓ Prior authorization
- ✓ Patient payment posting
- Medical image recognition
- ❖ EHR interoperability



Payors

- Preventable healthcare through predictive models
- ❖ Claim processing automation



Medtech

- Generative product design
- ❖ Diagnostic image enhancement and analysis
- Supply chain risk identification and process augmentation



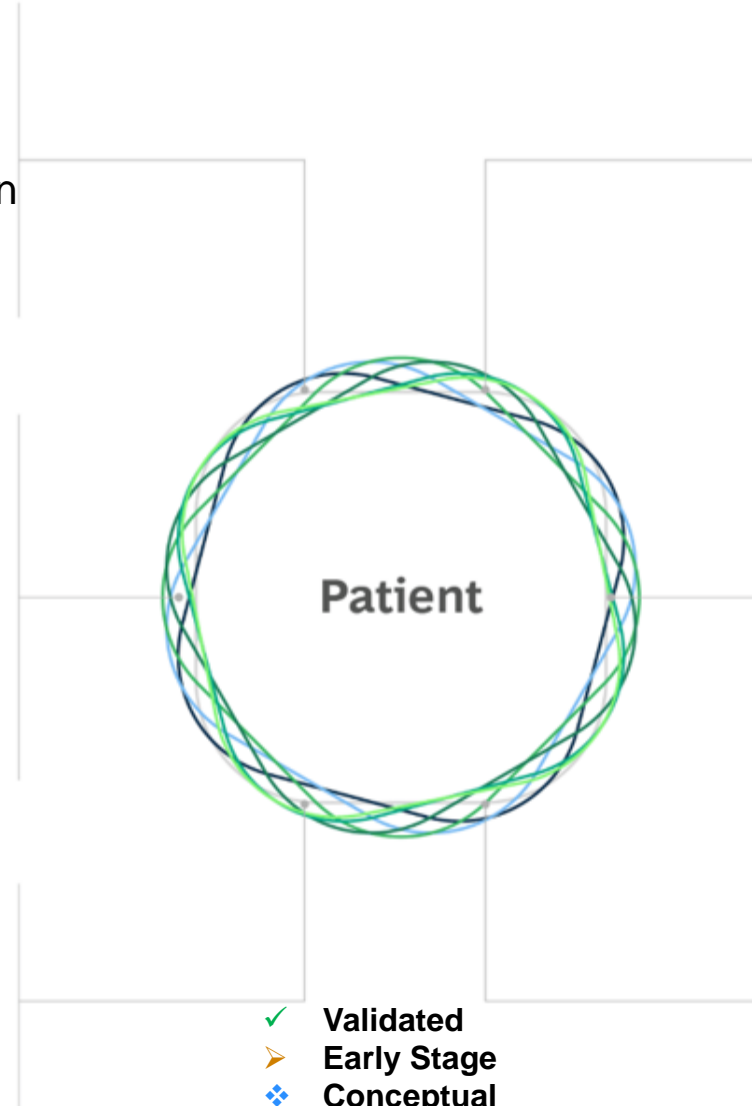
Services and Operations

- Generative AI cloud services
- ❖ Synthetic data generation
- ❖ Inventory tracking and restocking
- ❖ Data sharing/interoperability



Public Health Agencies

- Public health surveillance
- ❖ Resource allocation and utilization



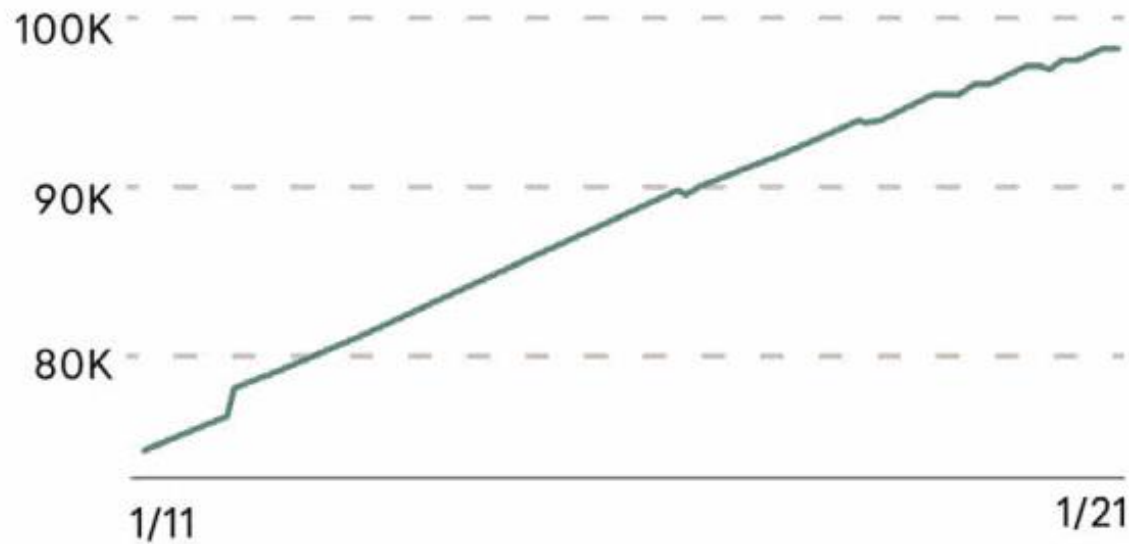
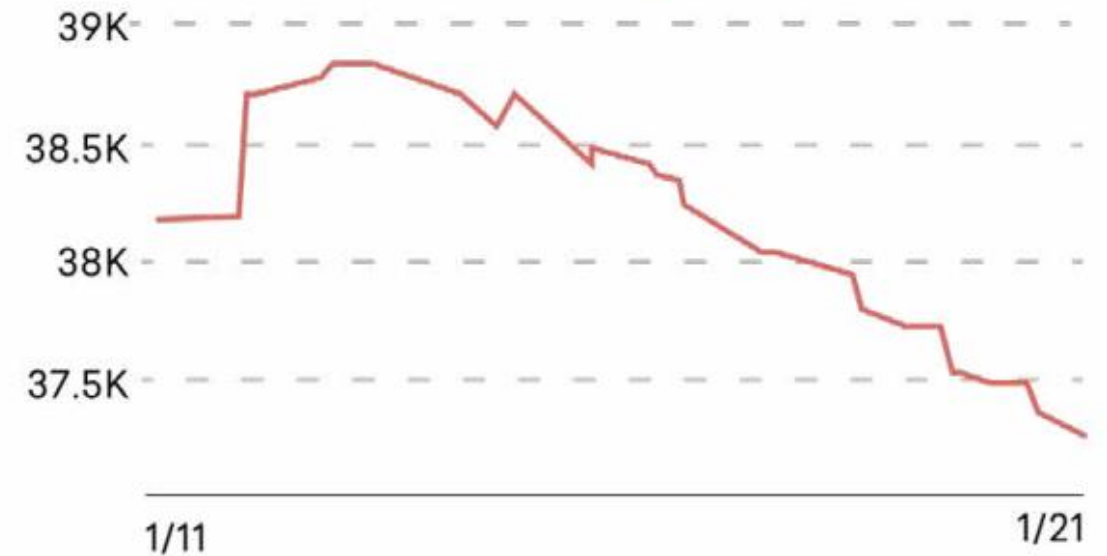
- ✓ Validated
- Early Stage
- ❖ Conceptual

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What's Changing?

WHAT'S HAPPENING

Demographic Drought

55+ Imminent retirees**16-24 entering workforce**

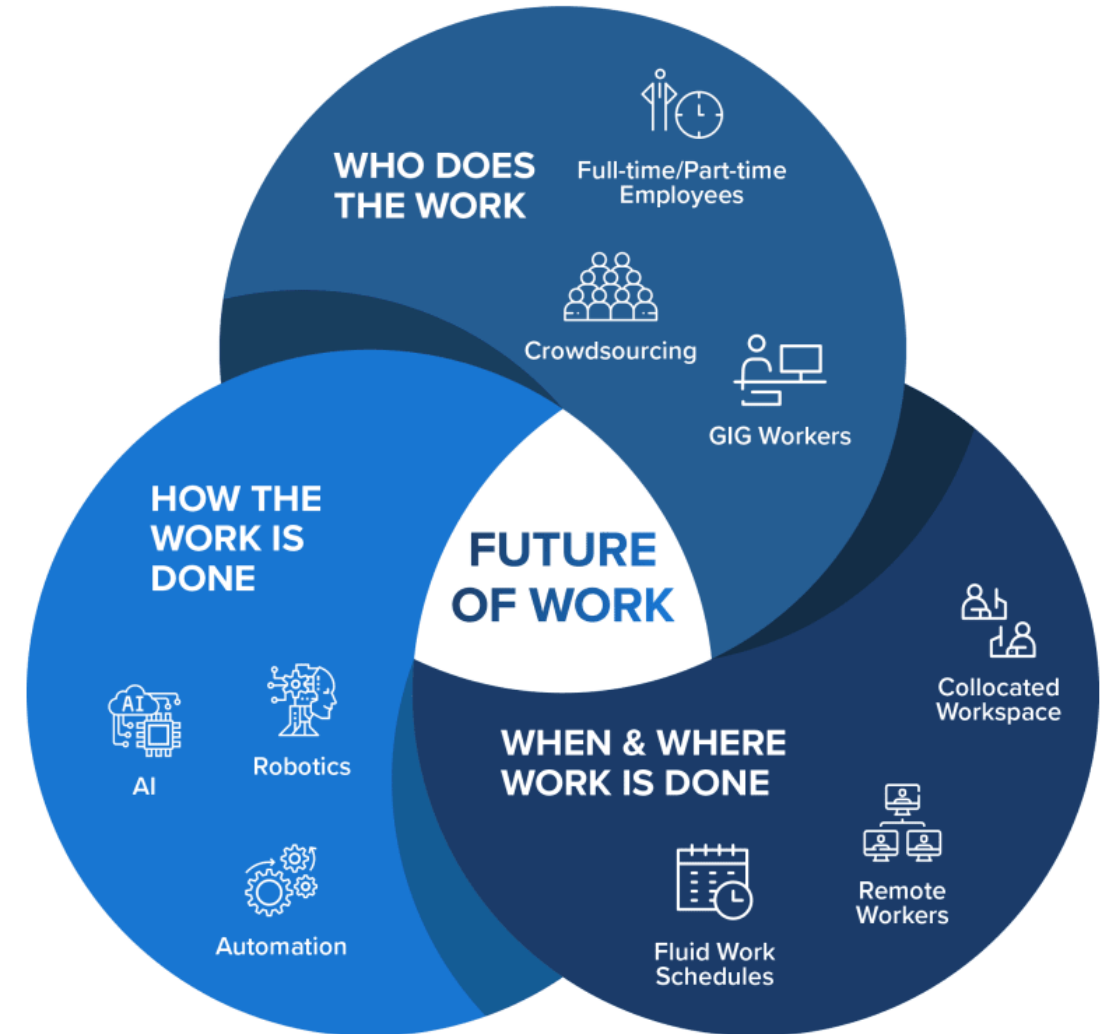
WHAT'S HAPPENING

The Changing Labor Market

“91% of employees are frustrated with work tech, and 57% feel legacy tech is holding them back”

According to Freshwork [State Of WorkPlace Technology Report](#)

<https://www.conference-board.org/topics/recession/how-high-will-US-unemployment-go>



Today, millions of knowledge workers have greater freedom to decide when and where they work. (Image Source: shrm.org)



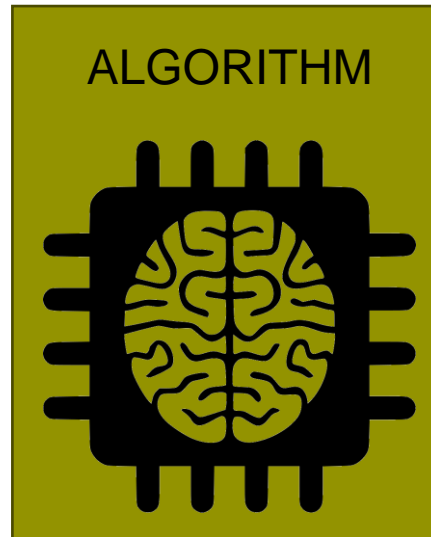
"People don't want to
buy a quarter-inch drill.
They want a quarter-inch
hole."

– Clayton Christensen, [The Innovator's Solution](#)

- ① Training data is carefully selected for a specific use case and fed into the AI algorithm for training.



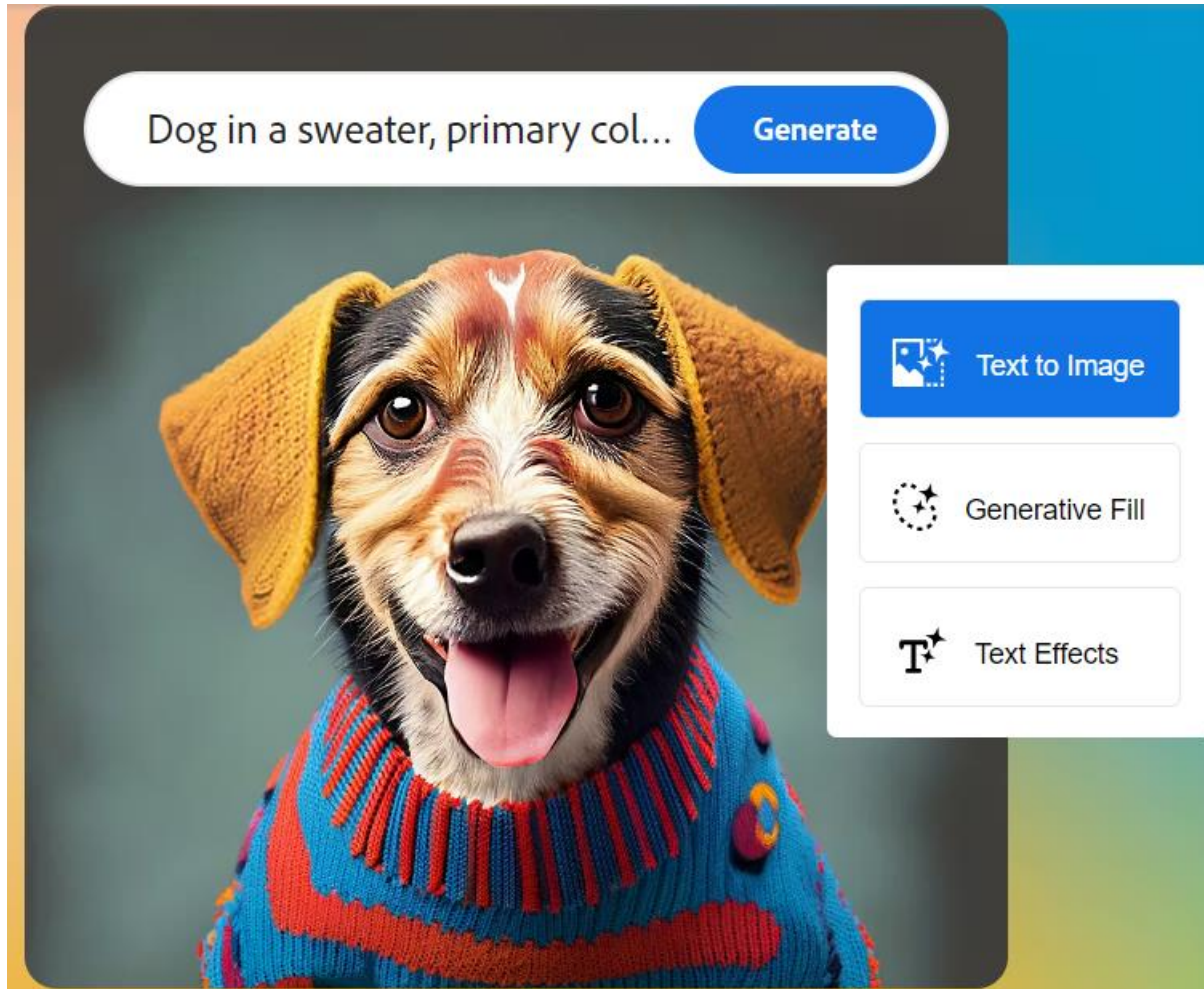
- ② The AI algorithm identifies common patterns and features within the training data. In this example, the algorithm might identify wrinkles and graying hair.



- ③ New samples can then be added to the pre-trained model.



- ④ Sample images are manipulated by the algorithm to match the patterns and features learned from the training data. In this example, the algorithm "ages" the sample image.



- ❑ In the wake of their most challenging financial year since 2020, US hospitals are desperately searching for margin improvements.
- ❑ Generative AI can increase productivity and cost efficiency, but only 6% of health systems currently have a strategy.
- ❑ Leading providers and payers will start with highly focused, low-risk generative AI use cases, generating the funds and experience for more transformative future applications.

Bain and Company 2023

Generative AI is here



The Rise of ChatGPT

- 100 Million + Users
- 175 Billion Parameters
- OpenAI valued at \$90 Billion
- 65% Executives believe generative AI will have a high or extremely high impact on their organization in the next 3-5 years



⚡ GPT-3.5

🌟 GPT-4

ChatGPT **PLUS**

How many hot dogs can an elephant eat?



How many hot dogs can an elephant eat?

2,051!



The question of how many hot dogs an elephant can eat is a bit unconventional and doesn't have a straightforward answer. Elephants are herbivores and do not naturally consume meat or processed foods like hot dogs. Additionally, feeding elephants foods that are not a part of their natural diet can be harmful to their health.

However, for the sake of a hypothetical scenario, let's attempt to come up with an estimate:

1. **Stomach Capacity:** The average adult elephant's stomach can hold between 30 to 50 gallons (roughly 113 to 189 liters) of content.
2. **Volume of a Hot Dog:** The volume of a standard hot dog can be roughly estimated using the formula for the volume of a cylinder: $V = \pi r^2 h$, where r is the radius and h is the height (or length) of the hot dog. Let's assume a hot dog has a diameter of 2.5 cm (so a radius of 1.25 cm) and a length of 15 cm.
3. **Number of Hot Dogs:** To estimate the number of hot dogs an elephant's stomach can accommodate, we can divide the stomach capacity by the volume of a single hot dog.

Let's calculate the volume of a hot dog and then estimate how many such hot dogs can fit into an elephant's stomach.

Finished working

Show work ▼

Hypothetically, an elephant's stomach could accommodate around 2,051 standard-sized hot dogs, based on volume alone. However, it's crucial to reiterate that elephants should never be fed hot dogs or any other food that isn't part of their natural diet. This calculation i

Regener



Elevate

The use of AI to enhance the work we are doing, acting as a digital co-worker or assistant. This is the most common early use-case of ChatGPT or an LLM

- Using ChatGPT to research a competitor in your space
- Using CoPilot to help draft an email or write a PowerPoint presentation

DRAFT QUALITY

WITHOUT AI

WITH AI

AVERAGE

WHERE WE START

GOOD

**WHERE WE SPEND
MOST OF OUR TIME**

WHERE WE START

GREAT

**WHERE WE
MOSTLY DELIVER**

**WHERE WE SPEND
MOST OF OUR TIME**

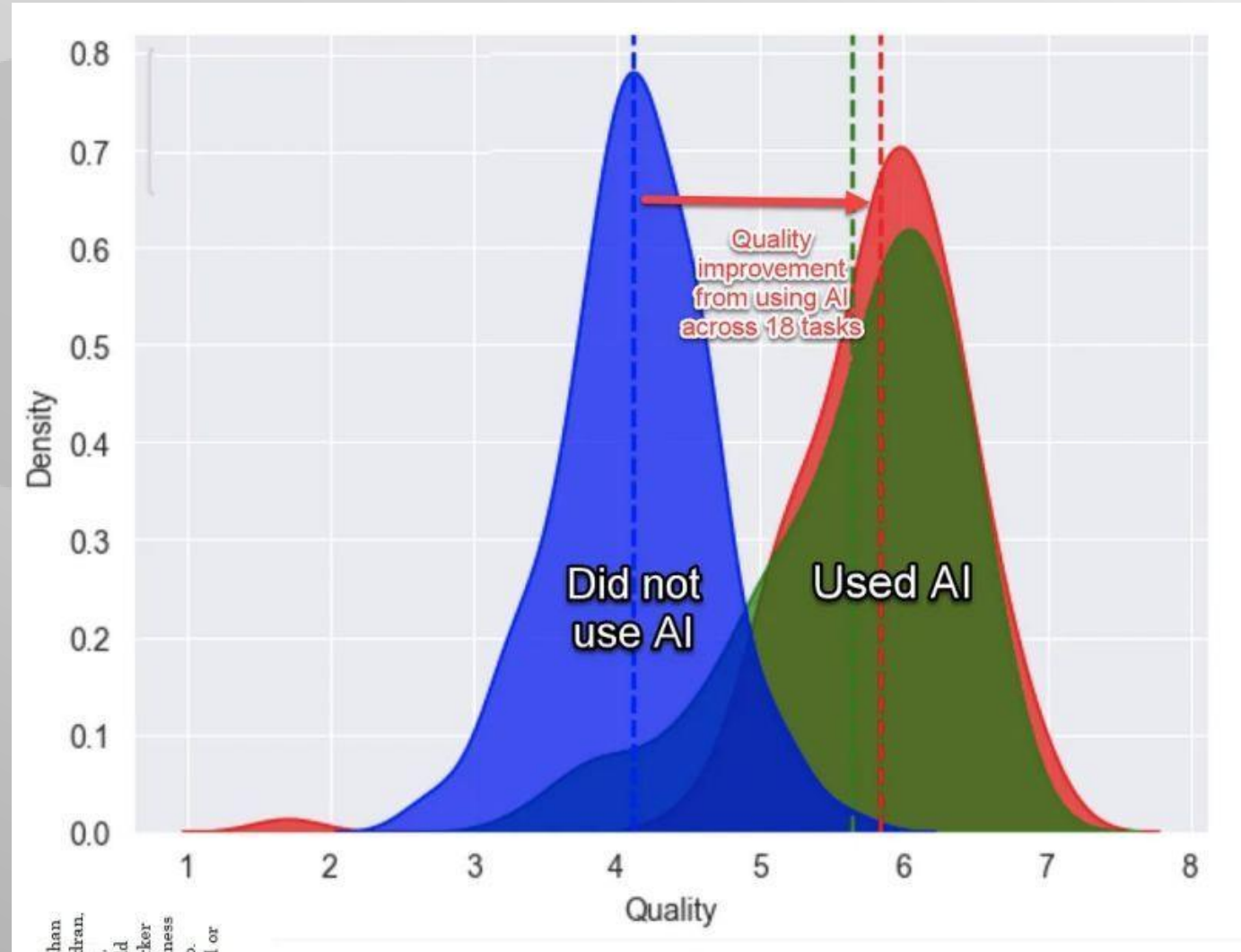
OUTSTANDING

**WHERE WE
RARELY DELIVER**

**WHERE WE
MOSTLY DELIVER**

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Harvard study on AI effect on quality



HEALTH & WELLNESS

A boy saw 17 doctors over 3 years for chronic pain. ChatGPT found the diagnosis

Alex experienced pain that stopped him from playing with other children but doctors had no answers to why. His frustrated mom asked ChatGPT for help.

[HOME](#) > [HEALTH](#)

The newest version of ChatGPT passed the US medical licensing exam with flying colors — and diagnosed a 1 in 100,000 condition in seconds

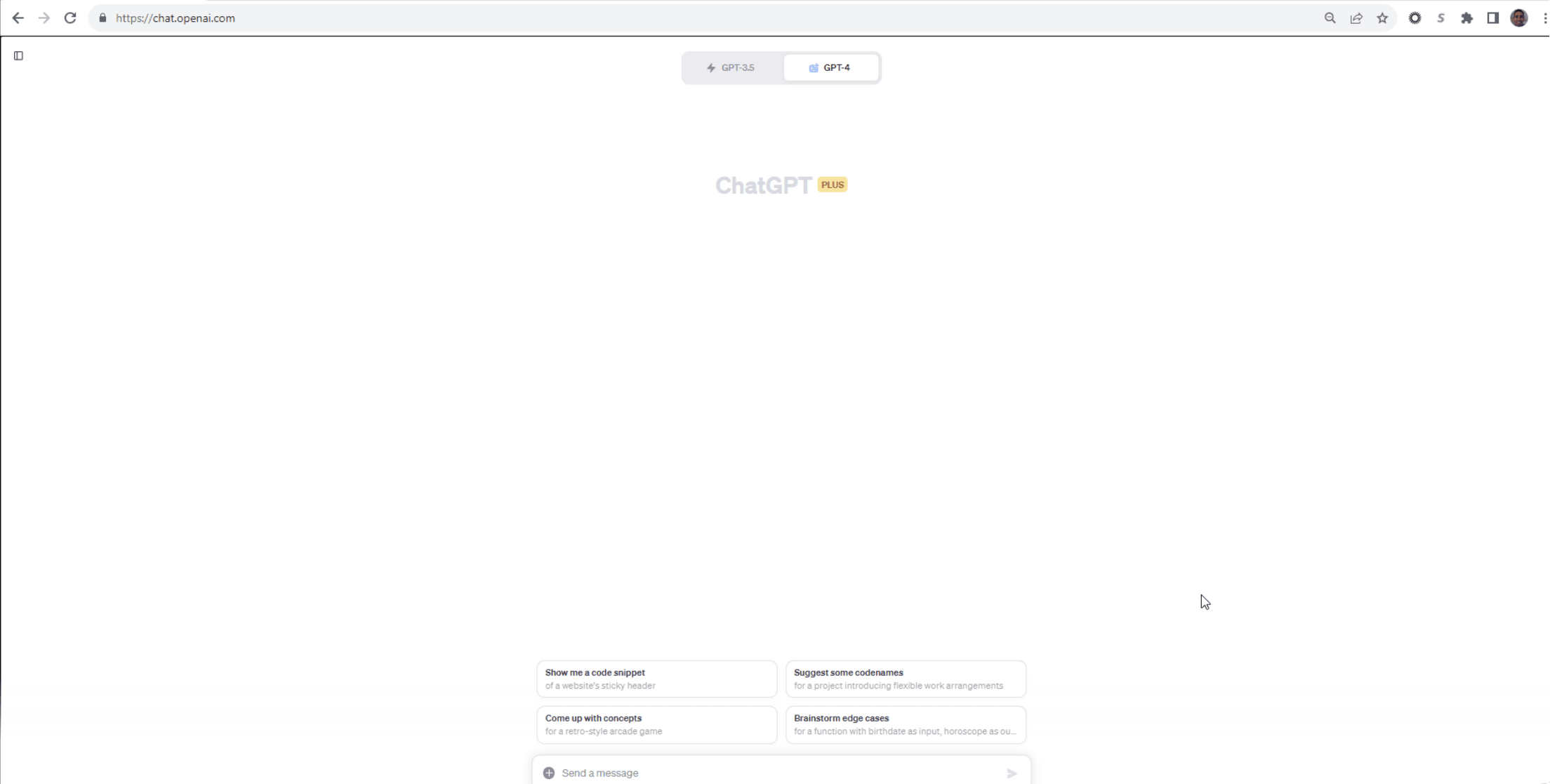
Hilary Brueck Apr 6, 2023, 3:03 PM CDT

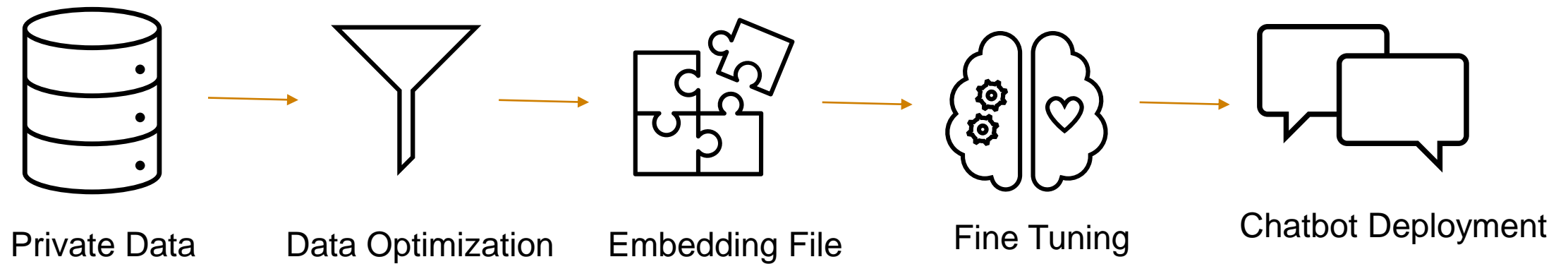


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RCM Gen AI Use-Cases

- Off the shelf “ChatGPT” or similar bots won’t solve most RCM problems
- Governance is the critical aspect to how to use GPT in a healthcare setting
- But ... Custom trained bots can solve lots of issues
 - Process Documentation
 - Compliance Rules
 - Payment and Rejection Analysis
 - RPA “front-end”



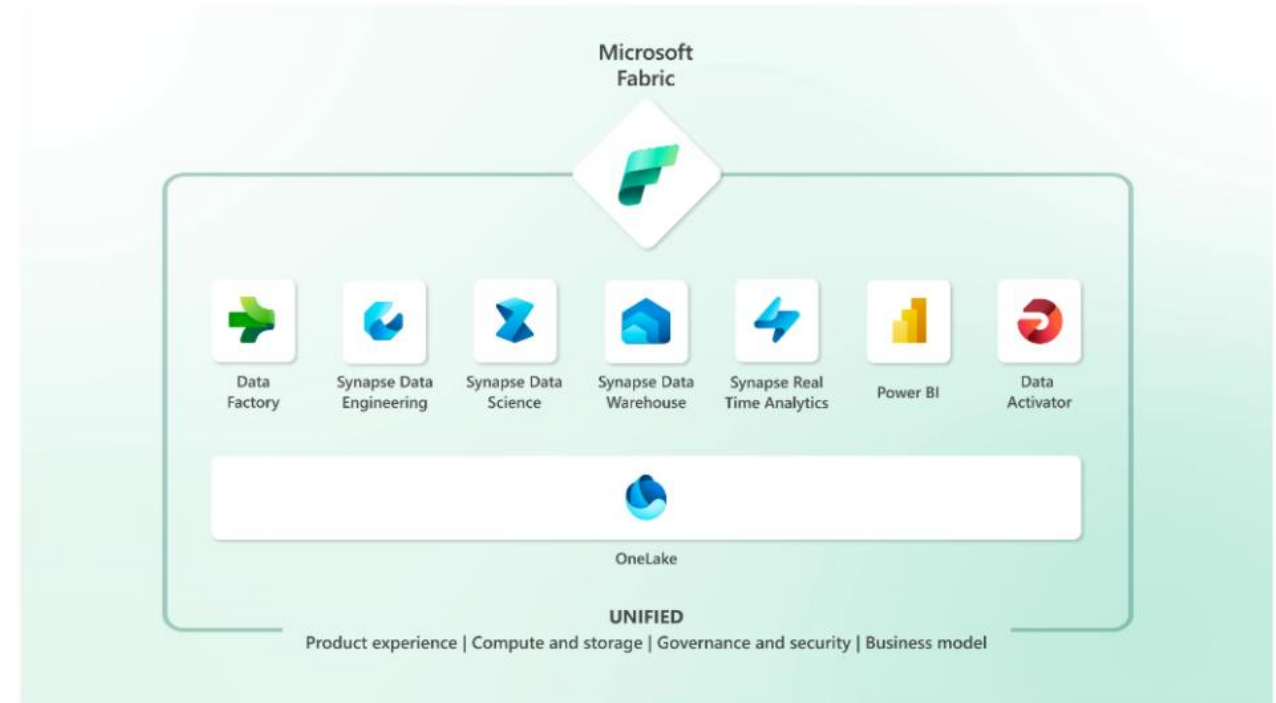


Single Platform for Data and AI

Example: Microsoft Fabric

Fabric is an end-to-end analytics product toolset that addresses every aspect of an organization's analytics needs that includes:

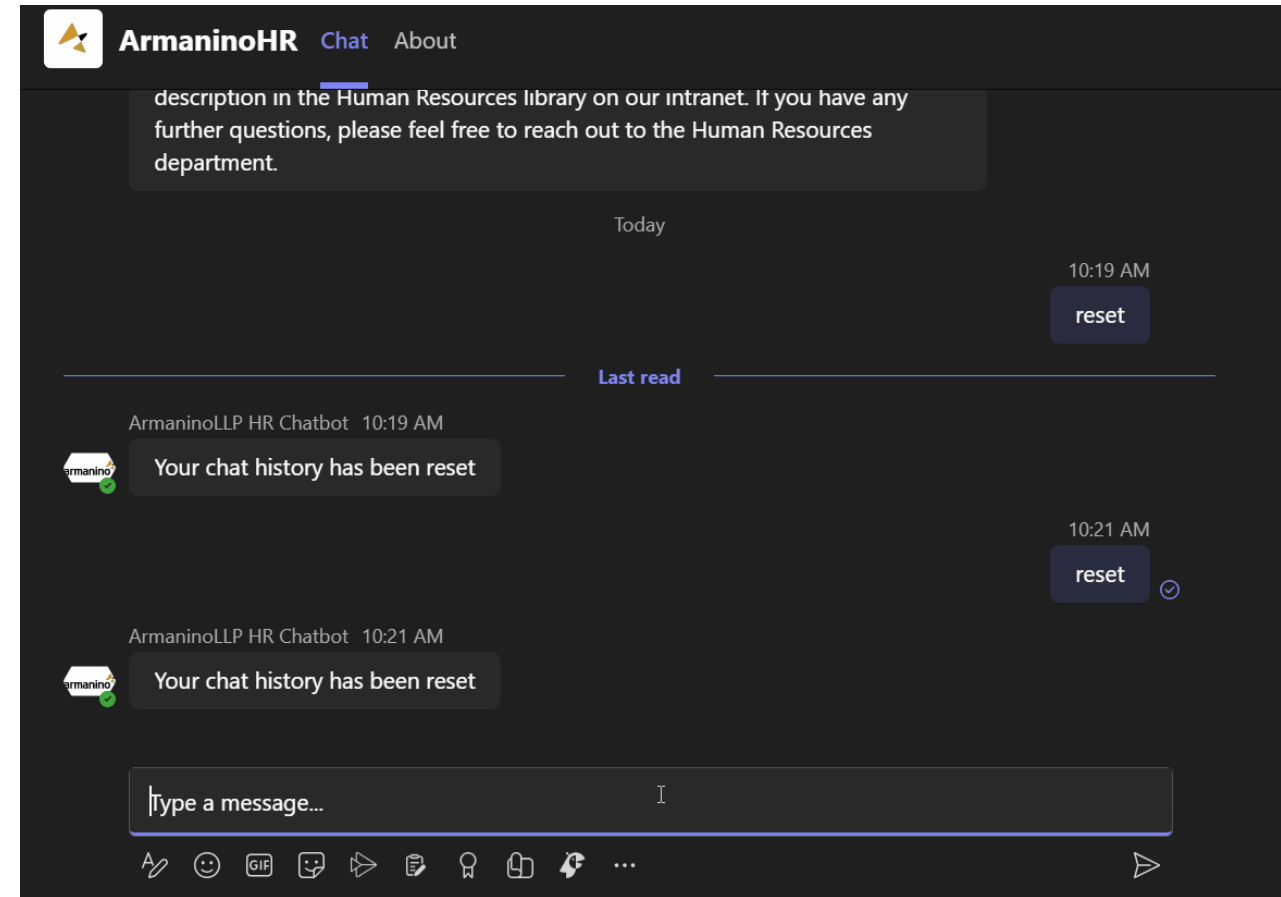
- Data Factory
- Synapse Data Engineering
- Synapse Data Science
- Synapse Data Warehousing
- Synapse Real-Time Analytics
- Power BI in Fabric
- Fabric is Lake-centric and open – OneLake
- Fabric is powered by AI



Custom Solutions

Training and applying private data for custom applications

Deploy your own GPT powered chatbots within your environment, working off of your private data



Mock-up of custom GPT HR Chatbot

Ethics and Bias

You training data will never represent every single possible combination – remember the explanation of how generative AI is trained.

- Generative AI is trained to get you the “best” answer that it can
- This is solely based on how the model was trained and built, and can not be guaranteed accurate



The Danger of Biased AI



Incorrect information (Hallucinations)



Inequitable Decision



Sub-Optimal Decisions

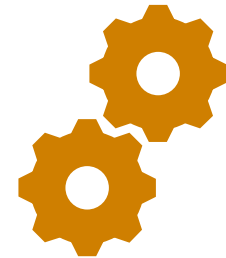
Ensuring Fair and Unbiased AI



Pre-trained models



Embedding files



Prompt Engineering

Possible *(Re)Defined*™

Delivering impactful, bold solutions that increase clarity
and spark success for today and tomorrow.



REACH OUT



OJ Laos, Senior Manager



Ron Present, Partner