

# Kipu

## Reimagining Clinical Workflows

Leveraging Ethical AI for Smarter Documentation

January 21, 2025

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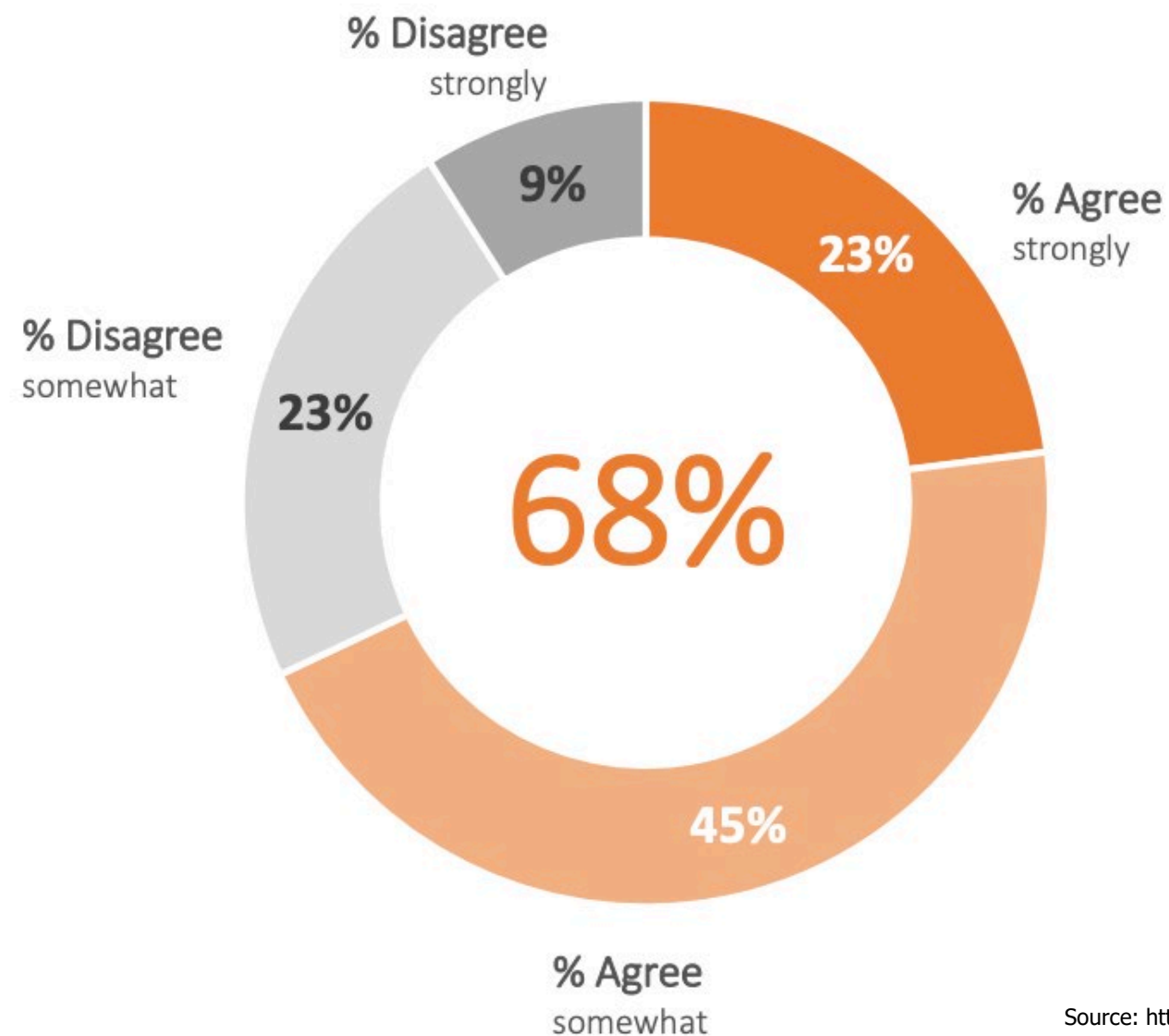
**“Every minute spent on paperwork is a minute stolen from care.”**

*- Every provider everywhere*

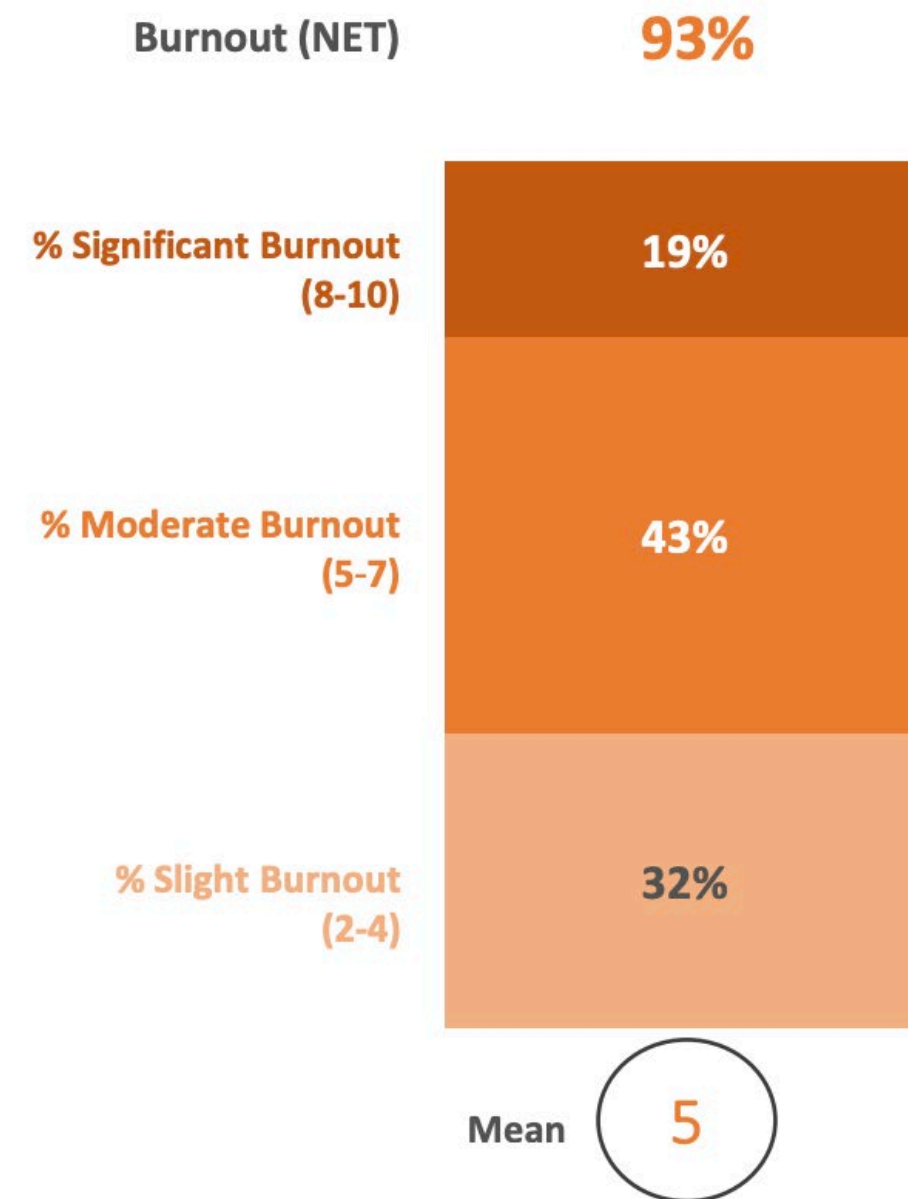


# Waste And Burnout Are Fundamental Problems

**“The amount of time I spend on administrative tasks takes away from time I could be directly supporting clients.”**  
*(among those who provide care to patients and have administrative tasks)*



**Current Burnout at Work**  
*Burnout defined as “a state of physical and/or emotional exhaustion”*  
*1 – No burnout at all, 10 – Significantly burnt out*



Source: [https://www.thenationalcouncil.org/wp-content/uploads/2023/04/Workforce-Shortage-Survey-Results-1.pdf?gaction=event\\_send&category&action&label&entryid=0&nonce=e9b7fc240d](https://www.thenationalcouncil.org/wp-content/uploads/2023/04/Workforce-Shortage-Survey-Results-1.pdf?gaction=event_send&category&action&label&entryid=0&nonce=e9b7fc240d)

# About the Speaker

## Russell Olsen, Chief Product & Technology Officer at Kipu

- 20 Years in Healthcare Technology
- Previously CPTO at Bamboo Health, leading development of product lines focused on Controlled Substance, Behavioral Health, and Real-time Event Notification.
- Pioneer of AI at IBM Watson Health. Spearheaded multiple research teams in applying AI to care management workflows, launched the first AI-enabled Watson Health product, and holds eight patents.
- Contributions have led to the creation of patient engagement tools, provider workflow solutions, and clinical outcomes systems that have positively impacted millions of lives
- Built/patented NLP technology for processing clinical notes to extract discrete information and developed systems for measuring the accuracy of the technology



Kipu

# AI / LLM's Oversimplified

Once upon a time \_\_\_\_\_

## LLM Completion Options:

_there	20.738%
_in	19.823%
_a	12.682%
_I	6.890%
_the	4.499%
_when	1.961%
_long	1.480%
_on	1.253%
_an	1.212%
_we	0.961%
_two	0.799%
_you	0.672%
_it	0.646%
_my	0.558%
_not	0.556%

# AI / LLM's Oversimplified

Once upon a time there \_\_\_\_\_

## LLM Completion Options:

_was	72.037%
_lived	14.295%
_were	11.412%
_existed	0.446%
_is	0.379%
_stood	0.133%
_used	0.126%
_are	0.119%
_live	0.109%
's	0.079%
's	0.053%
_lives	0.040%
_once	0.039%
<double line feed>	0.037%
_a	0.036%

# AI / LLM's Oversimplified

Once upon a time there was \_\_\_\_\_

## LLM Completion Options:

_a	90.356%
_an	5.717%
_this	0.444%
_no	0.417%
_the	0.340%
_nothing	0.127%
_only	0.126%
_once	0.120%
<double line feed>	0.098%
_one	0.088%
_something	0.067%
_little	0.058%
_born	0.047%
_	0.046%
_someone	0.042%

# AI / LLM's Oversimplified

Once upon a time there was a \_\_\_\_\_

## LLM Completion Options:

_little	7.473%
_beautiful	6.767%
_young	5.366%
_girl	3.504%
_small	3.184%
_king	2.928%
_man	2.648%
_kingdom	2.279%
_very	1.887%
_boy	1.797%
_princess	1.394%
_great	1.379%
_magical	1.366%
_village	1.111%
_group	1.080%

Entering this prompt,

*“Write a biblical verse in the style of the King James bible explaining how to remove a peanut butter sandwich from a VCR.”*



— <https://www.nytimes.com/2022/12/05/technology/chatgpt-ai-twitter.html>

## Entering this prompt,

*“Write a biblical verse in the style of the King James bible explaining how to remove a peanut butter sandwich from a VCR.”*



## ChatGPT responded,

*“And it came to pass that a man was troubled by a peanut butter sandwich, for it had been placed within his VCR, and he knew not how to remove it.*

*And he cried out to the Lord, saying, ‘Oh, Lord, how can I remove this sandwich from my VCR, for it is stuck fast and will not budge?’*

*And the Lord spoke unto him, saying, ‘Fear not, my child, for I shall guide thy hand and show thee the way. Take thy butter knife, and carefully insert it between the sandwich and the VCR, and gently pry them apart. And with patience and perseverance, the sandwich shall be removed, and thy VCR shall be saved.’*

*And the man did as the Lord commanded, and lo and behold, the sandwich was removed from the VCR, and the man was saved.*

*And the Lord said, “Verily I say unto thee, seek not to put thy peanut butter sandwiches in thy VCR, for it is not a suitable place for such things. Rather, keep thy sandwiches in thy refrigerator or on thy plate, where they belong.*

*And the man heeded the Lord’s words, and from that day forth, he kept his sandwiches in their proper place, and was saved from trouble and woe. Amen.”*

— <https://www.nytimes.com/2022/12/05/technology/chatgpt-ai-twitter.html>

## You could also iterate on the prompt with different variations.

### Prompt

Write **a Shakespearean sonnet** explaining how to **remove a peanut butter sandwich from a VCR**

### ChatGPT output

*“Oh, woe is me! A sandwich stuck in there,  
Within my VCR, a peanut butter mess,  
How to remove it, I’m in deep despair,  
Without my tape player, I am distressed.*

*First, I must unplug it, and take care,  
For safety’s sake, the wires I’ll disconnect,  
Then open up the case, and breathe a prayer,  
Hoping that the sandwich won’t infect.*

*With gentle hands, I’ll try to ease it out,  
Without causing damage to the machine,  
Oh, may the sandwich give a little shout,  
And slip out smoothly, as if in a dream.*

*If all else fails, I’ll take it to a pro,  
And hope that they can make my VCR go.”*

## You could also iterate on the prompt with different variations.

### Prompt

Write **a limerick** **about**  
**removing a peanut butter sandwich from a VCR**

### ChatGPT output

*“There once was a sandwich so grand  
But it ended up in a strange land  
Stuck in a VCR  
It seemed quite bizarre  
Removing it took quite a hand!*

*With tweezers and patience and skill  
The sandwich was finally still  
Extracted with care  
It was worse for wear  
But the VCR was back in its thrill.”*

# 'Prompt engineering', iterating on prompts to achieve different results, also applies to image generators.



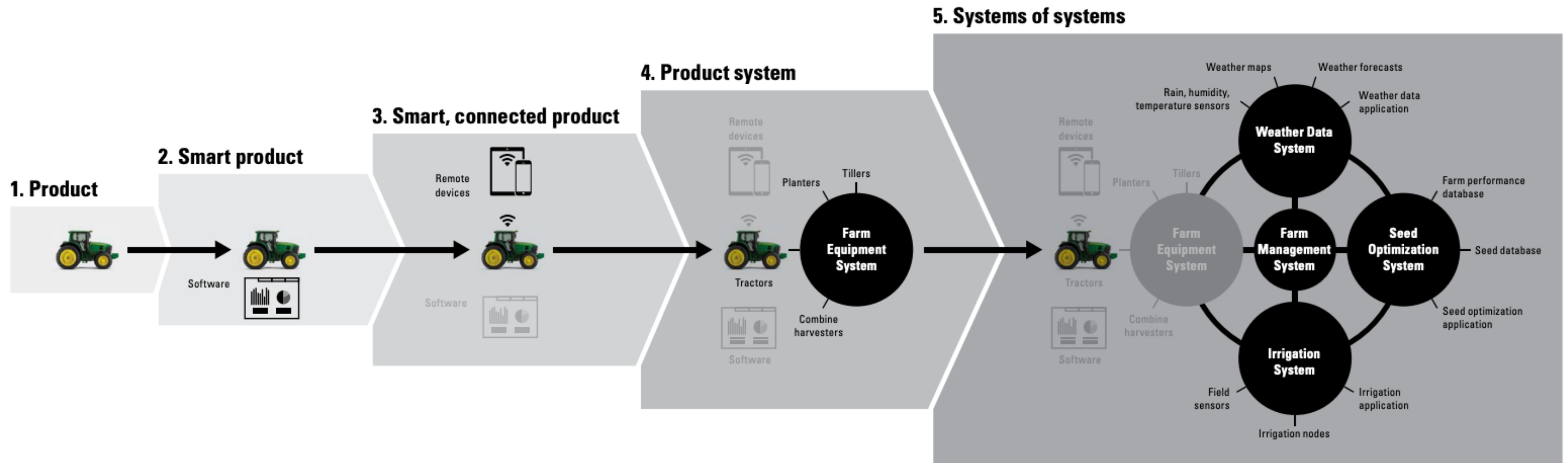
Regal oil painting portrait  
of a tuxedo cat

Regal oil painting portrait  
of a tuxedo cat  
dressed as royalty

Oil painting portrait  
of a tuxedo cat  
with black fur, bright yellow eyes,  
and white whiskers  
dressed in royal clothing

1700s oil painting portrait  
of a cross-eyed, shorthair black cat  
dressed like royalty  
with an ornate crown  
sticking its tongue out

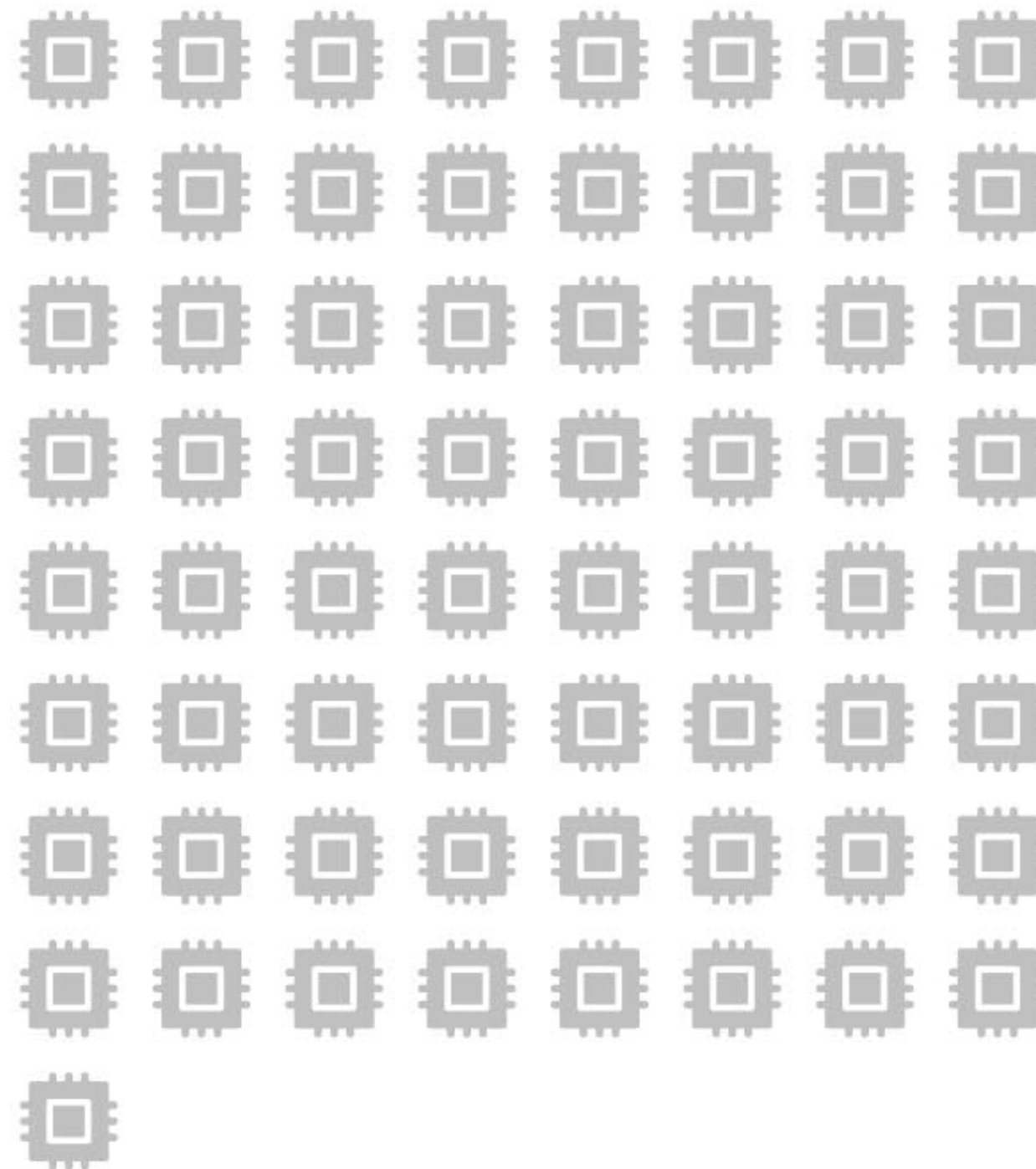
# Products used to “stand alone”; now they are “smart and connected.”



Cf. “How Smart, Connected Products Are Transforming Competition,” by Michael Porter, HBR, 2014

Computers used to be scarce; now **micro-processors are in everything.**

A Tesla includes about 65 “computers.”

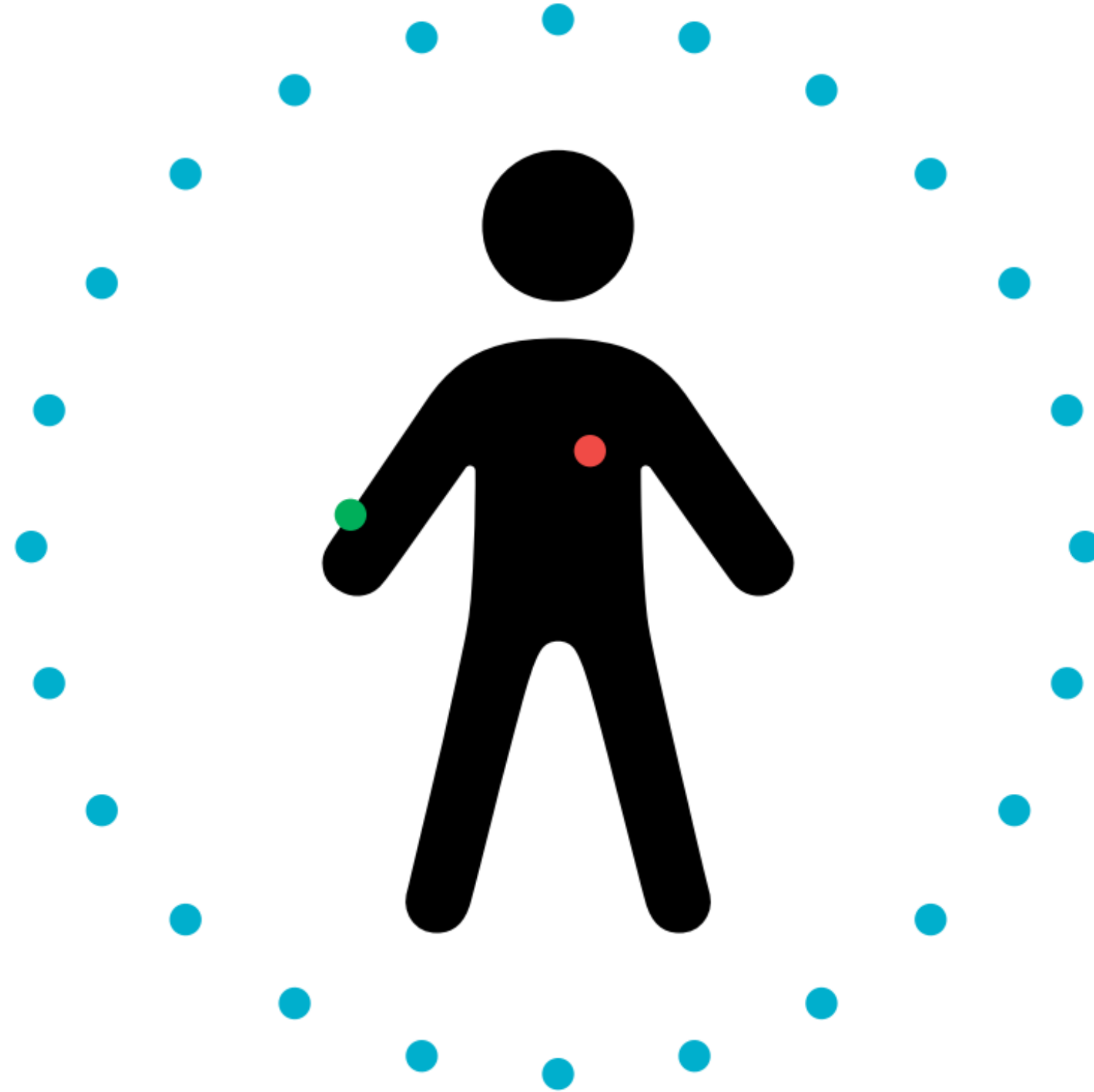


# Sensors are on chips, “printed” in the billions.

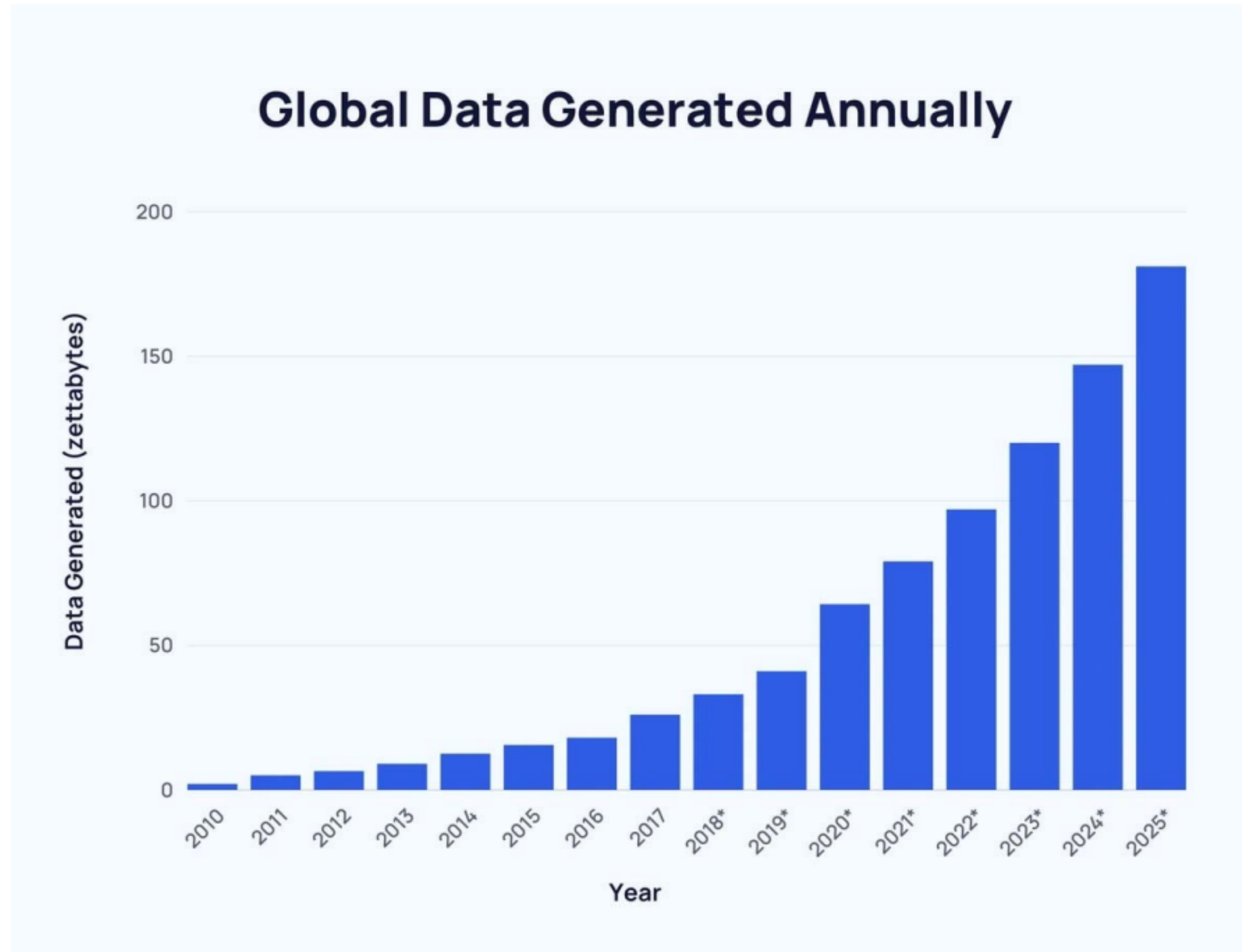
## The iPhone 15 includes more than a dozen sensors.



And sensors will be **all around us, on us, and in us** —  
measuring **everything, everywhere, all the time.**



# Large populations and lots of sensors are creating **oceans of data.**



<https://explodingtopics.com/blog/data-generated-per-day>

# Sam Altman, CEO of OpenAI, suggests we might see a version of Moore's Law for AI.



Sam Altman ✓  
@sama

a new version of moore's law that could start soon:

the amount of intelligence in the universe doubles every 18 months

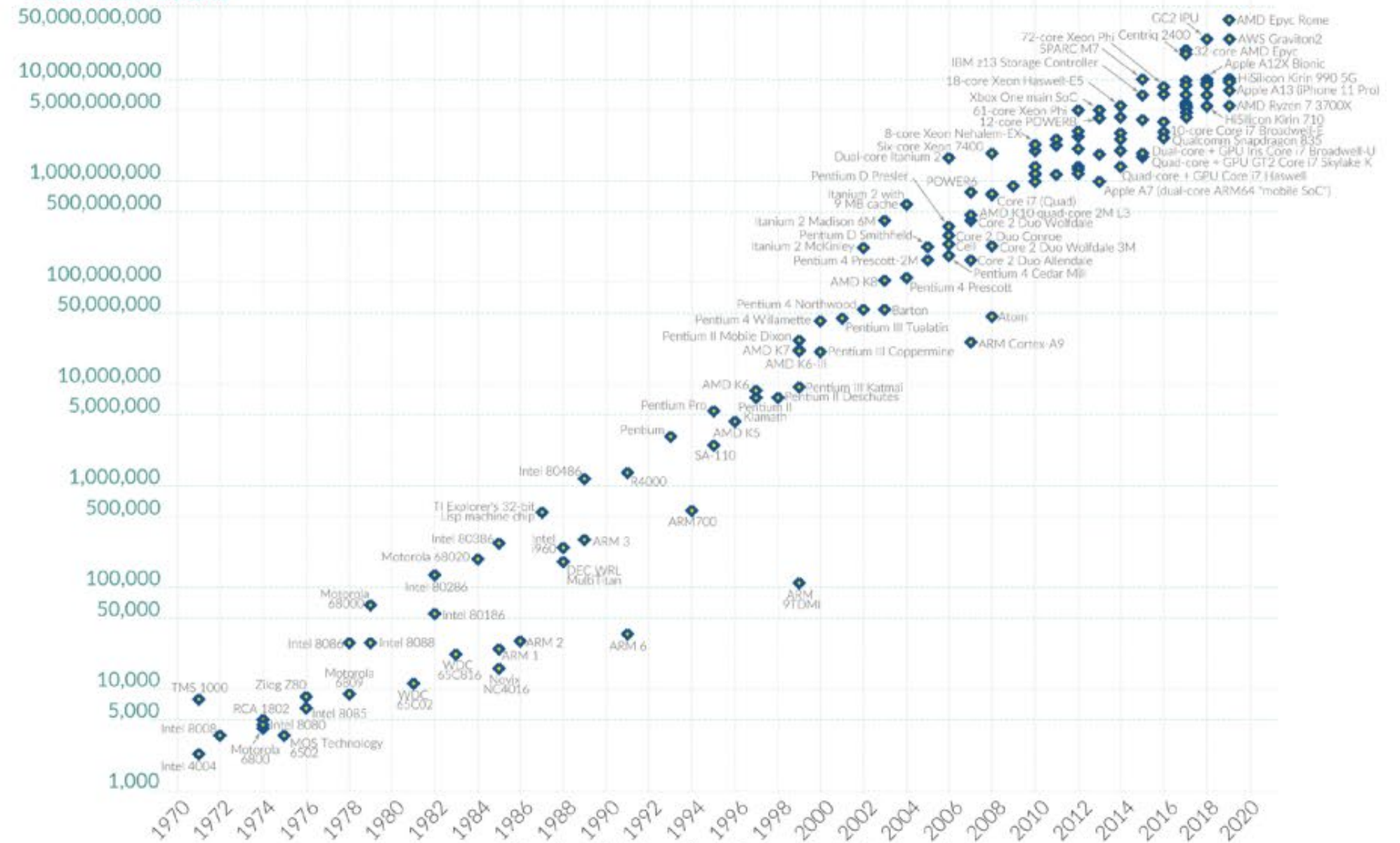
8:24 AM · Feb 26, 2023 · 3.7M Views

## Moore's Law: The number of transistors on microchips doubles every two years

Moore's law describes the empirical regularity that the number of transistors on integrated circuits doubles approximately every two years. This advancement is important for other aspects of technological progress in computing – such as processing speed or the price of computers.

Our World  
in Data

### Transistor count



Data source: Wikipedia (wikipedia.org/wiki/Transistor\_count)

# TIMELINE OF AI IN MENTAL HEALTH



Advances in machine learning enabled sophisticated data analysis, leading researchers to explore its use in analyzing psychological data and predicting mental health conditions.



## 1990s

### The Advent of Machine Learning

Big data and AI advancements began to advance mental health tools. AI chatbots like Woebot and virtual therapists offered automated support. Studies showed AI could predict mental health conditions through social media analysis.



## 2010s

### The Rise of AI-Driven Mental Health Solutions



## NOW

### Cutting-Edge Developments



## 1950s-1960s

### Early Beginnings

Psychological assessments using computer algorithms began with rule-based systems. ELIZA, created by Joseph Weizenbaum in the 1960s, was an early AI simulating a psychotherapist, marking a foundational moment in AI for mental health.



## 2000s

### Digital Mental Health Tools

The rise of the internet and smartphones propelled the development of digital mental health tools. Online therapy platforms and mental health apps emerged, offering new ways for individuals to access mental health care.



## 2020s

### Integration and Expansion

The COVID-19 pandemic accelerated the adoption of telehealth and AI-driven mental health solutions. AI technologies are now being integrated into mainstream mental health care practices, offering personalized and scalable mental health support.

# Potential Benefits of AI in Behavioral Health



**Better,  
Personalized Care**



**Shorter  
Wait Times**



**Remove Barriers  
to Treatment**



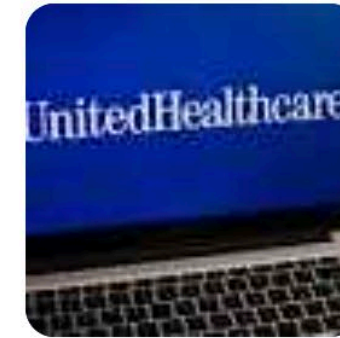
**Boost  
Efficiency**

# What could go wrong?



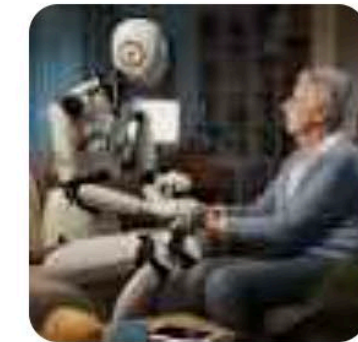
## UnitedHealth uses faulty AI to deny elderly patients medically necessary coverage, lawsuit claims

Families of former beneficiaries claim UnitedHealth's AI system "aggressively" rejected claims for medically necessary expenses.



## If AI Harms A Patient, Who Gets Sued?

Two-thirds of doctors now view GenAI as beneficial to healthcare. But what will happen in a court should AI harm a patient?



## Nurses Warn Patient Safety at Risk as AI Use Spreads in Health Care

At a protest in San Francisco, nurses say health care employers must ensure the artificial intelligence tools they use do not harm patients.



# Target predicted a teenager was pregnant based on publicly-available data, before her parents knew!

Target found that families change their shopping habits when they have children which, in 2012, led them to develop a pregnancy prediction algorithm—a digital twin of customers, drawing from many sources:

- credit card companies
- credit bureaus
- search engines
- magazine subscriptions
- job history (e.g., LinkedIn)
- public records on marriage, birth, divorce, and bankruptcy
- social media posts
- and especially what you buy—your purchase preferences.



<https://www.nytimes.com/2012/02/19/magazine/shopping-habits.html>

## For example, ChatGPT has hallucinated movies in which a character shoots off a flare gun.

### Prompt

*“Write a list of movies in which a character shoots off a flare gun.”*

### ChatGPT output

*“Here is a list of movies in which a character shoots off a flare gun:*

- 1. The Hunger Games: Mockingjay - Part 1 (2014)*
- 2. The Revenant (2015)*
- 3. Cast Away (2000)*
- 4. The Martian (2015)*
- 5. Life of Pi (2012)*
- 6. The Grey (2011)*
- 7. Captain Phillips (2013)*
- 8. Jaws (1975)*
- 9. Crimson Tide (1995)*
- 10. The Abyss (1989)\*”*

**Jaws is the only movie on this list that includes a flare gun.**

\* - In The Abyss, a character ignites a flare, but not a flare gun.

ChatGPT >




how many Rs in strawberry




There are two "R"s in the word "strawberry." ●

how many Rs in strawberry

 There are two "R"s in the word "strawberry."

can you explain to me why there are only 2 Rs in strawberry?

 The word "strawberry" contains two instances of the letter "R" because that's simply how the word is spelled based on its etymology and the way English has evolved. Here's a breakdown:

- "Straw" comes from the Old English word *strew*, which referred to the stalks of grain. It's used in "strawberry" because of the way the plant spreads out like straw.
- "Berry" comes from Old English *berie*, a term for small, pulpy fruits.

In the word "strawberry," the "R" appears once in "straw" and once in "berry." The way words are constructed in English often follows etymological roots and historical spellings, rather than any phonetic rule for the number of specific letters.

So, there are two Rs—one in each root word. The combination simply reflects how the word has been formed over time.

how many letter R's are there in strawberry?

 There are **three** letter "R"s in the word "strawberry."

# Risks and Limitations to AI in Behavioral Health



**Risk of exposing patient privacy**



**Entirely dependent on the input provided by users**



**Bugs in software can lead to misdiagnosis**



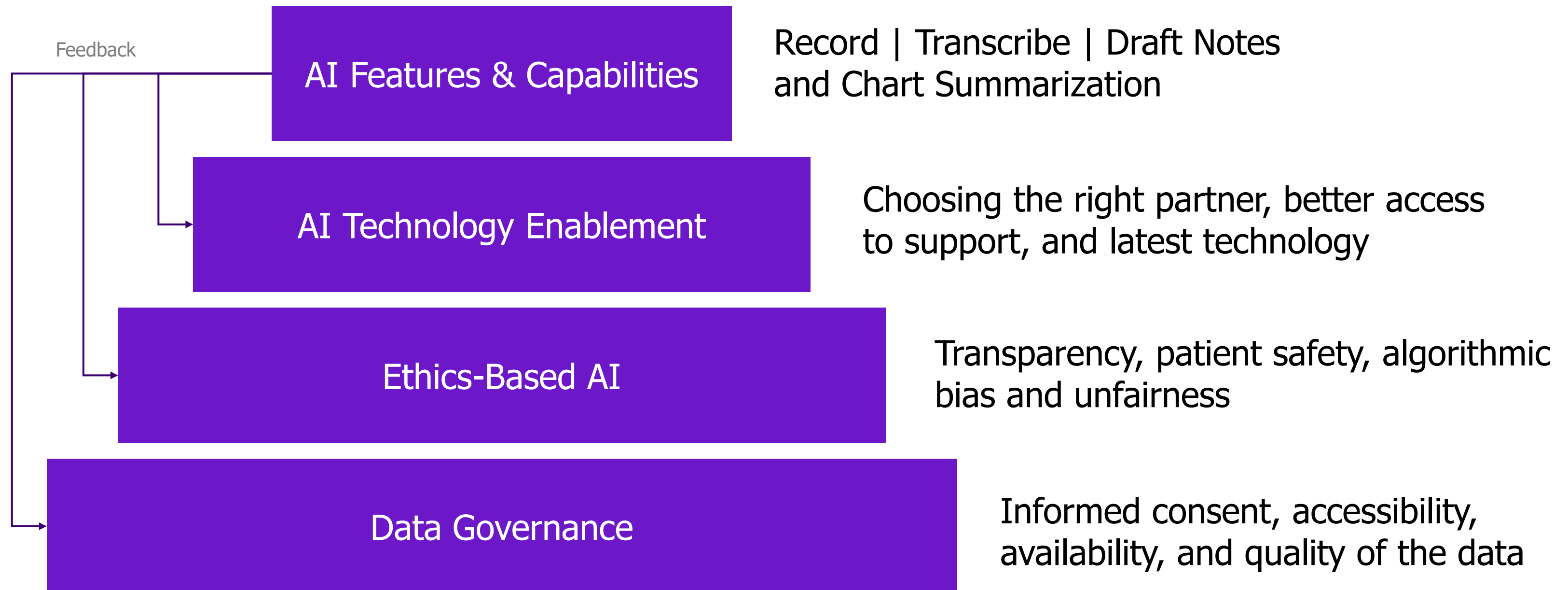
**Low data transparency by AI/ML developers**



**Doesn't cover all mental health conditions**

# Kipu's Ethical AI Delivery - Building Blocks


Effective deployment of AI requires new systems, processes, and approaches

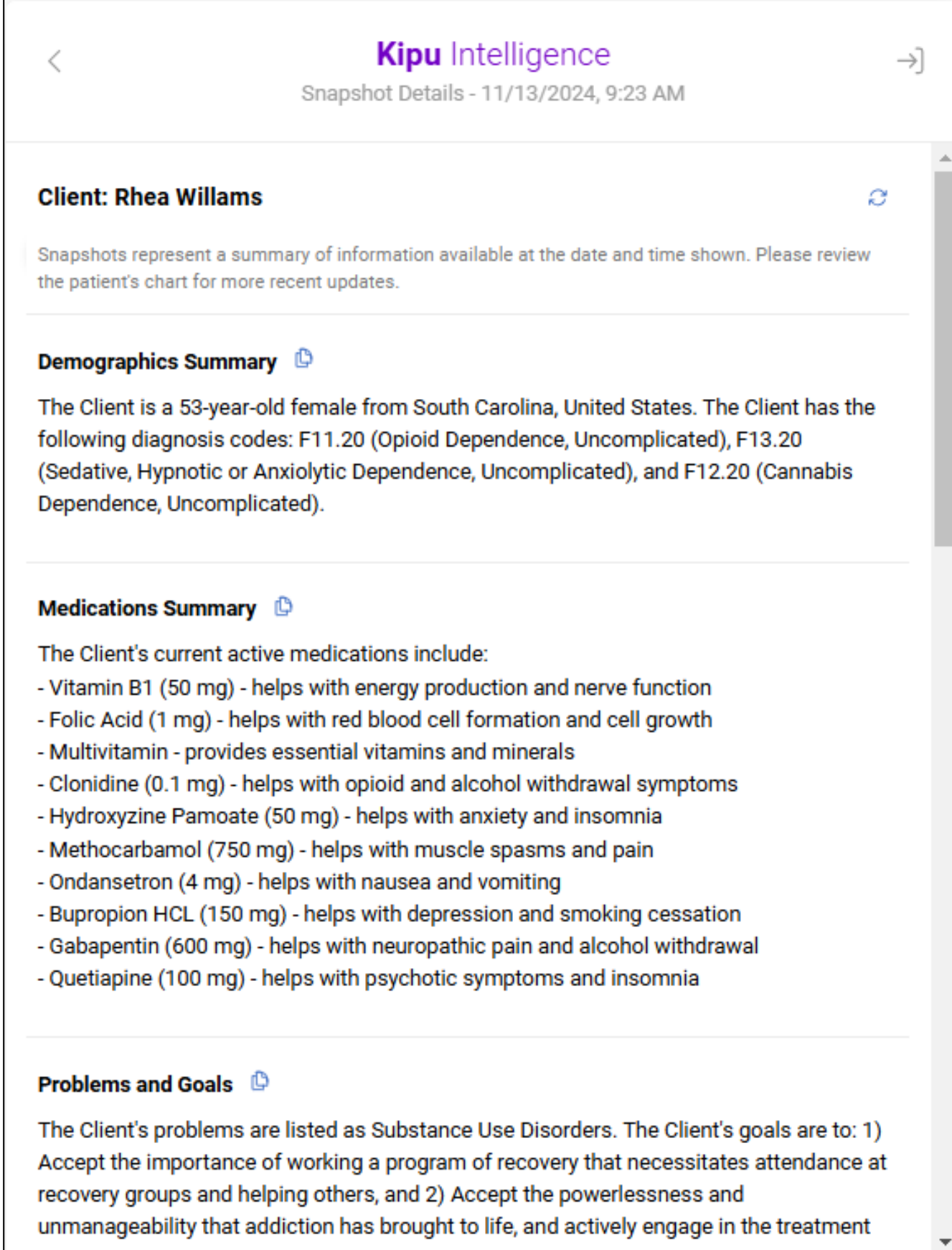


What systems and processes need to evolve and adjust to the adoption curve?

# Chart Snapshot: Accelerating Patient Context

Generate concise patient summaries with key insights for informed clinical decision-making

 "Chart Snapshot has been very beneficial for providing context for an unfamiliar patient when I'm covering for another clinician."



The screenshot displays the 'Kipu Intelligence' interface for a 'Chart Snapshot' dated 11/13/2024 at 9:23 AM. The patient is identified as Rhea Willams. A disclaimer states that snapshots are summaries of information available at the time shown. The interface is divided into several sections: 'Demographics Summary' (53-year-old female from South Carolina with diagnosis codes F11.20, F13.20, and F12.20), 'Medications Summary' (listing 11 active medications such as Vitamin B1, Folic Acid, and Clonidine), and 'Problems and Goals' (listing Substance Use Disorders and recovery goals).

**Kipu Intelligence**  
Snapshot Details - 11/13/2024, 9:23 AM

**Client: Rhea Willams**

Snapshots represent a summary of information available at the date and time shown. Please review the patient's chart for more recent updates.

**Demographics Summary**

The Client is a 53-year-old female from South Carolina, United States. The Client has the following diagnosis codes: F11.20 (Opioid Dependence, Uncomplicated), F13.20 (Sedative, Hypnotic or Anxiolytic Dependence, Uncomplicated), and F12.20 (Cannabis Dependence, Uncomplicated).

**Medications Summary**

The Client's current active medications include:

- Vitamin B1 (50 mg) - helps with energy production and nerve function
- Folic Acid (1 mg) - helps with red blood cell formation and cell growth
- Multivitamin - provides essential vitamins and minerals
- Clonidine (0.1 mg) - helps with opioid and alcohol withdrawal symptoms
- Hydroxyzine Pamoate (50 mg) - helps with anxiety and insomnia
- Methocarbamol (750 mg) - helps with muscle spasms and pain
- Ondansetron (4 mg) - helps with nausea and vomiting
- Bupropion HCL (150 mg) - helps with depression and smoking cessation
- Gabapentin (600 mg) - helps with neuropathic pain and alcohol withdrawal
- Quetiapine (100 mg) - helps with psychotic symptoms and insomnia

**Problems and Goals**

The Client's problems are listed as Substance Use Disorders. The Client's goals are to: 1) Accept the importance of working a program of recovery that necessitates attendance at recovery groups and helping others, and 2) Accept the powerlessness and unmanageability that addiction has brought to life, and actively engage in the treatment

# Note Assistant: Accelerating Patient Context

**Kipu EMR** Search Client Kipu Recovery Center KB

Dashboard Clients Occupancy Schedules Shifts Contacts Reports Templates Help

### Progress Note (Extended)

Add signers ADD COMMENTS / PRINT PREVIEW

**Start/End Time** Start time: 11/13/2024 06:25 AM Duration: Unit: Minute End time:

**HPI**  
The HPI indicates that Client has a history of alcohol dependence, stimulant use disorder (Adderall), and generalized anxiety disorder. Client is currently in a treatment program and is struggling with the withdrawal and impact of not having access to their Adderall and Ozempic medications. This is causing issues with their motivation, weight, and anxiety. Client has a history of relapsing on alcohol when they have been unable to access their medications in the past.

**Objective**  
The objective information provided indicates that Client is currently in a treatment program and is trying to engage in the program and therapy, but is having difficulty without access to their Adderall and Ozempic medications. Client expresses a desire to prioritize addressing their alcohol problem, but is concerned about the impact of not having these medications on their mental health and weight. Client also has a history of work being a source of stress and relapse, and is trying to find a healthier balance between work, health, and recovery.

**Subjective**  
Client is struggling with withdrawal symptoms from Adderall, which they have been taking for a long time. They are also concerned about weight gain without their Ozempic medication, which they take for weight loss. Client feels they need the Adderall to function and be motivated, and the Ozempic to prevent weight gain, which would be a trigger for them. Client has a history of alcohol abuse and relapse, and is worried about maintaining sobriety without these medications.

**Interventions**  
The provider discusses the risks of Adderall use, especially in combination with alcohol abuse, and suggests that Client may not actually need the Adderall long-term. The provider also suggests that the Ozempic may be an unhealthy coping mechanism, and that Client should focus on developing healthier coping skills. The provider offers to help Client coordinate getting their Accutane medication and glasses shipped to them.

BACK TO TOP

Record and transcribe patient sessions and quickly generate high-quality draft notes in any Kipu Form



“What used to take 20 minutes to get my note to a draft now takes 30 seconds with Note Assistant.”

**Kipu Intelligence** Transcript Details - 09/26/2024, 8:44 AM

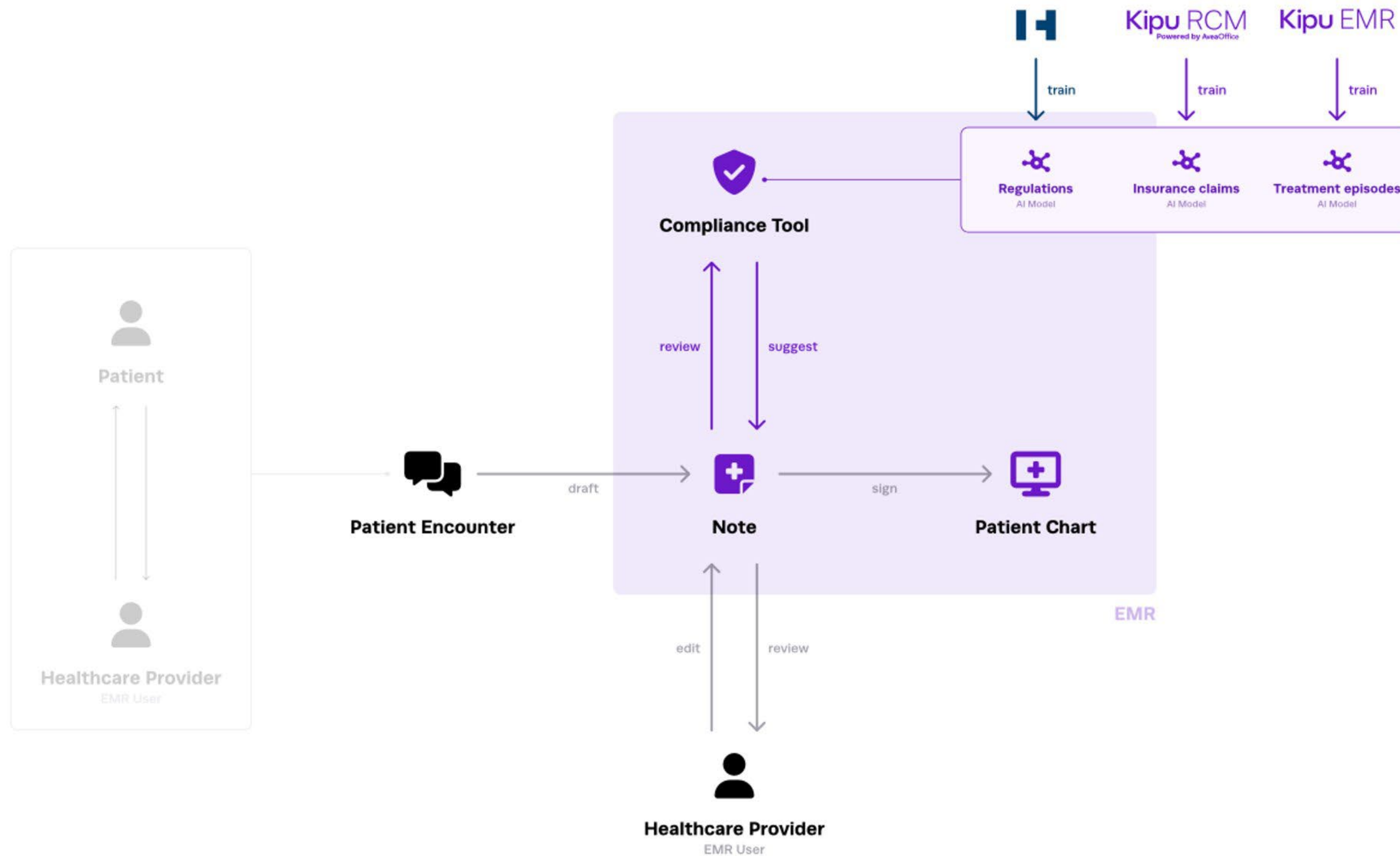
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KIPM™ is designed to offer valuable insights to augment documentation but cannot replace your professional judgment. Always review and validate AI-generated content to ensure accurate documentation.

# Workflow and Systems Re-Imagined



# Workflow and Systems Re-Imagined

## Today

No AI compliance tool



## Near-term

AI compliance check for:

- notes that require secondary review
- compliance audit on finalized notes



## Future

Pre-sign compliance check





*“Everything you do as a profession  
is going to have a Copilot”*

– Reid Hoffman, founder of LinkedIn

*“AI will not replace you.  
A person using AI will.”*

– Kai-Fu Lee, Ph.D., AI expert, former president of Google China



# Kipu

Thank you

**Special thanks to**  
Hugh Dubberly  
Gavin Miller  
Ryan Reposar  
TJ McLeish