

Nebraska Hospital Association
10/26/23

The Impact of Artificial Intelligence in Health Care

What health care leaders need to know... Now!

Steven M Berkowitz, MD
steve@smbhealthconsulting.com
512-415-6095

Objectives: _____

1. Develop a practical definition and model for AI
2. Better understand key topics in AI
3. Promote- A leadership call to action- Proactive management of AI



The Impact of Artificial Intelligence in Health Care

Preamble- This Train Has Left the Station!

“I believe there is no deep difference between what can be achieved by a biological brain and what can be achieved by a computer.

It therefore follows that computers can emulate human intelligence --and exceed it.”

Stephen Hawking 2017

“AI systems will be able to improve themselves with minimal to no human involvement. This kind of ‘automation of intelligence’ will profoundly change the world”.

Mirjalili, AI Research, Australia 2023

The Impact of Artificial Intelligence in Health Care

Preamble- This Train Has Left the Station!

ChatGPT company predicts the end to all mankind, even as it reaches over \$1 trillion market value

When Doctors Use a Chatbot to Improve Their Bedside Manner

How A.I. Is Helping Architects Change Workplace Design

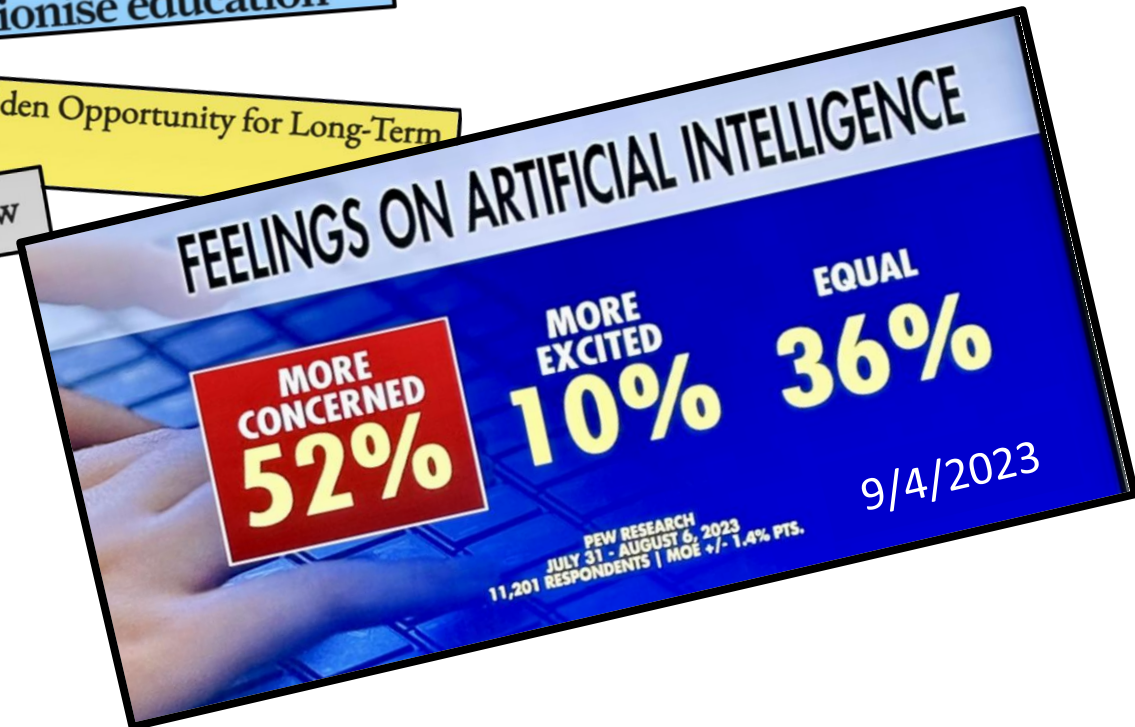
AI-Powered Robotics to Solve the Global Food Crisis

AI Can Decrease Your Cost of Living: Here's How

Opinion: How to avoid the AI Apocalypse

Artificial intelligence can revolutionise education

Riding the AI Wave: The Golden Opportunity for Long-Term Investors



The Impact of Artificial Intelligence in Health Care

Toward a better understanding of artificial intelligence (AI)

- a. A realistic definition of AI
- b. A working model for AI
 - 1. Hardware- processing power (faster, smaller, cheaper)
 - 2. Software- machine learning and logic
 - 3. Connectivity- individual computers → neural networks → human brain

Key topics in artificial intelligence (AI)

- a. Emergent properties
- b. Hallucinations
- c. Generative pretrained transformer (GPT)
- d. Deep fakes
- e. Brain-computer interfaces (BCI's)
- f. The concept of singularity – can AI lead to human extinction?
- g. Challenges in AI regulation – is it already too late?

A leadership call to action- Proactively manage artificial intelligence (AI)

- a. Economic forecasts for AI
- b. An opportunity to partner with AI
- c. Specific opportunities for AI in health care
- d. The role of a hospital AI council/ advocacy

The Impact of Artificial Intelligence in Health Care

Toward a better understanding of artificial intelligence (AI)

- a. A realistic definition of AI
- b. A working model for AI
 - 1. Hardware- processing power (faster, smaller, cheaper)
 - 2. Software- machine learning and logic
 - 3. Connectivity- individual computers → neural networks → human brain

Key topics in artificial intelligence (AI)

- a. Emergent properties
- b. Hallucinations
- c. Generative pretrained transformer (GPT)
- d. Deep fakes
- e. Brain-computer interfaces (BCI's)
- f. The concept of singularity – can AI lead to human extinction?
- g. Challenges in AI regulation – is it already too late?

A leadership call to action- Proactively manage artificial intelligence (AI)

- a. Economic forecasts for AI
- b. An opportunity to partner with AI
- c. Specific opportunities for AI in health care
- d. The role of a hospital AI council/ advocacy

Toward a Better Understanding of Artificial Intelligence

a. A realistic definition of artificial intelligence

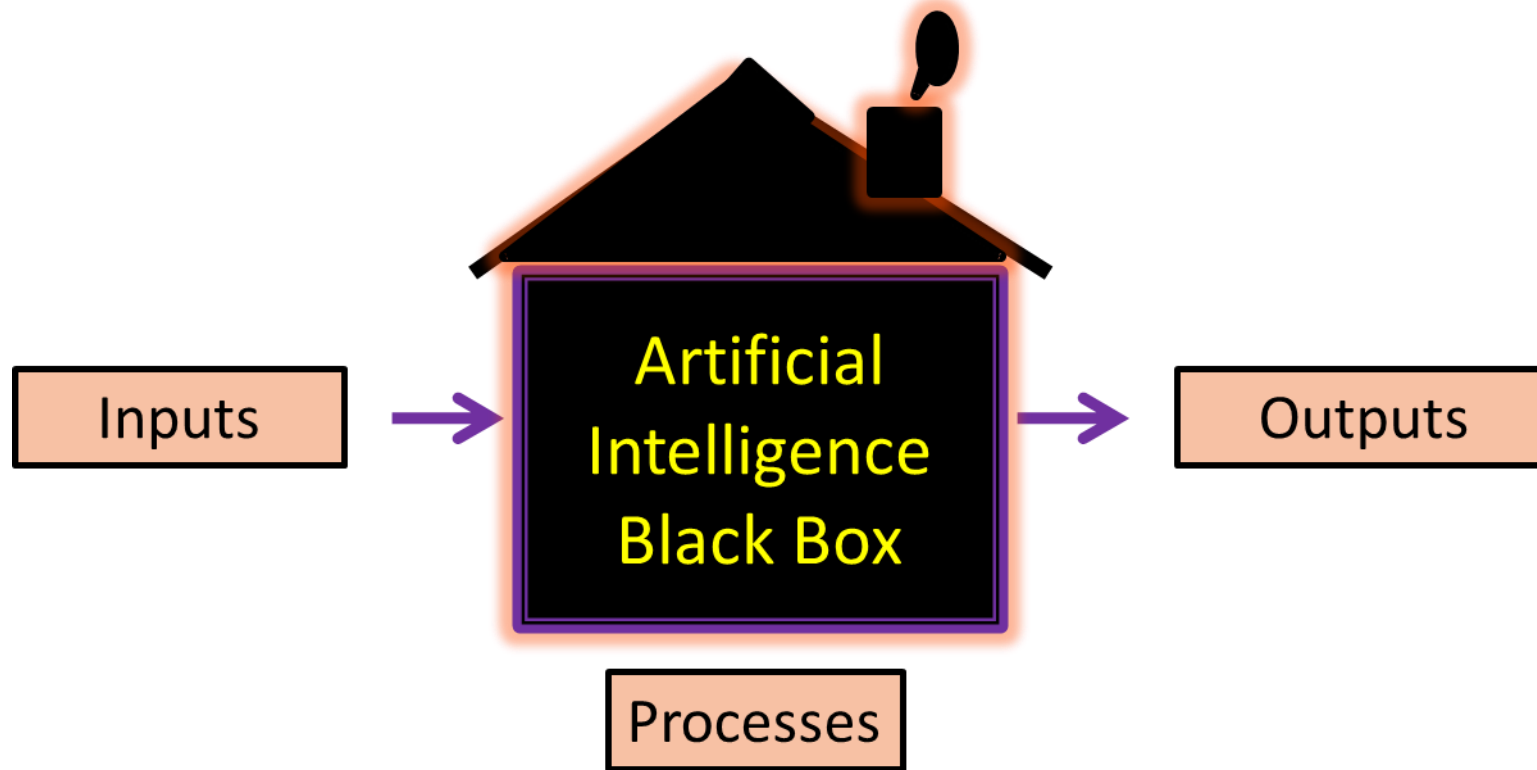
Webster's Definition:

The capability of a machine to imitate intelligent human behavior

Toward a Better Understanding of Artificial Intelligence

a. A realistic definition of artificial intelligence

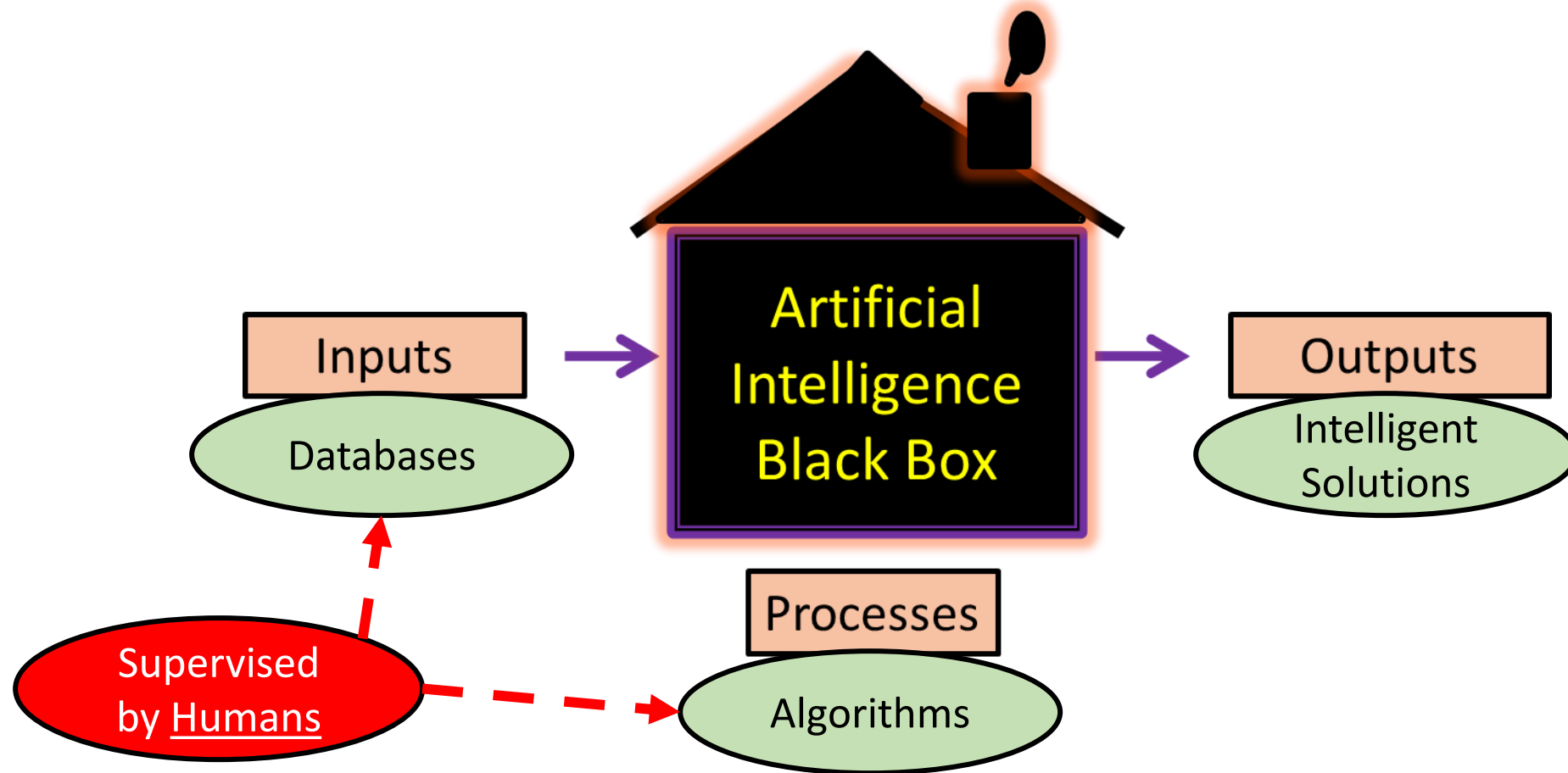
The Black Box Analogy



Toward a Better Understanding of Artificial Intelligence

a. A realistic definition of artificial intelligence

The Black Box Analogy



Toward a Better Understanding of Artificial Intelligence

a. A realistic definition of artificial intelligence

Webster's Definition:

The capability of a machine to imitate intelligent human behavior

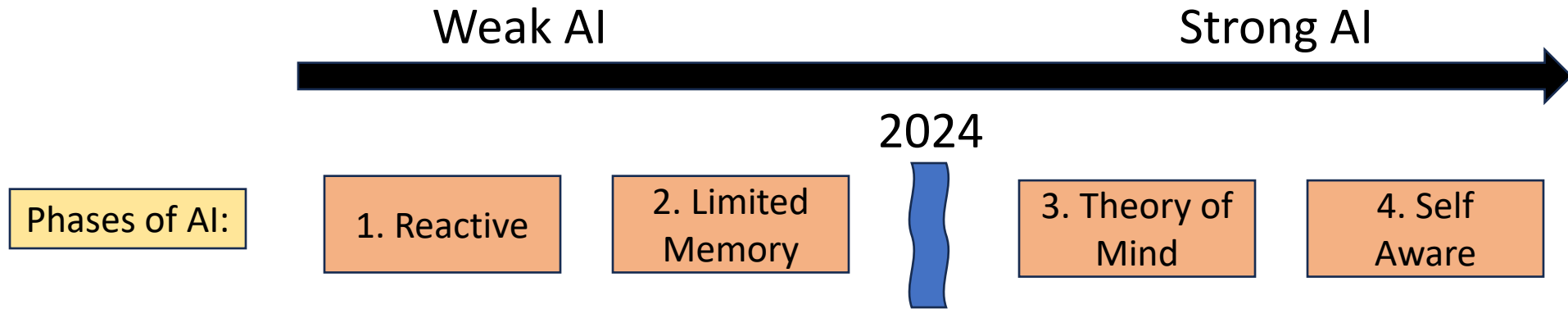
Operational Definition:

A process whereby humans program a computer with a database and algorithms.
The computer applies these algorithms to the database and provides a solution
that imitates human intelligence...
... extremely rapidly, confidently, and efficiently!

What can go wrong with that?

Toward a Better Understanding of Artificial Intelligence

a. A realistic definition of artificial intelligence



Weak AI -

- Programmed to perform one specific task.
- Supervised learning
- No self-awareness

Strong AI (artificial general intelligence) -

- Performs any task a human can
- Unsupervised learning- Can learn new skills
- Potentially: creativity, emotions, empathy-- sentient

Toward a Better Understanding of Artificial Intelligence

a. A realistic definition of artificial intelligence

Houston, we have a problem!

The consequences of emergent properties, hallucinations, and strong AI



2001- A Space Odessey



The Terminator



Toward a Better Understanding of Artificial Intelligence

a. A realistic definition of artificial intelligence

Webster's Definition:

The capability of a machine to imitate intelligent human behavior

~~Operational~~ Realistic Definition:

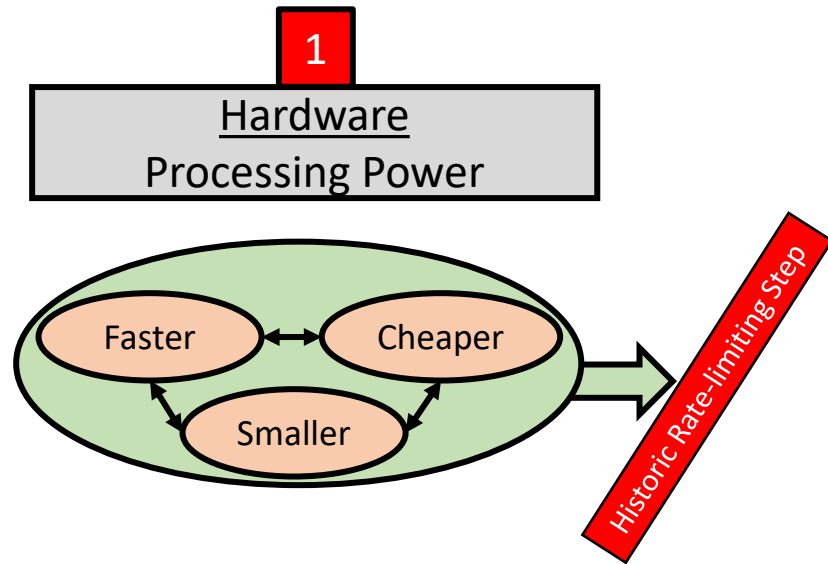
A process whereby humans program a computer with a database and algorithms. The computer applies these algorithms to the database and provides a solution that imitates human intelligence....

 BUT randomly and not controllable by humans, AI may create new algorithms, or give a false solution... 

...extremely rapidly, confidently, and efficiently!

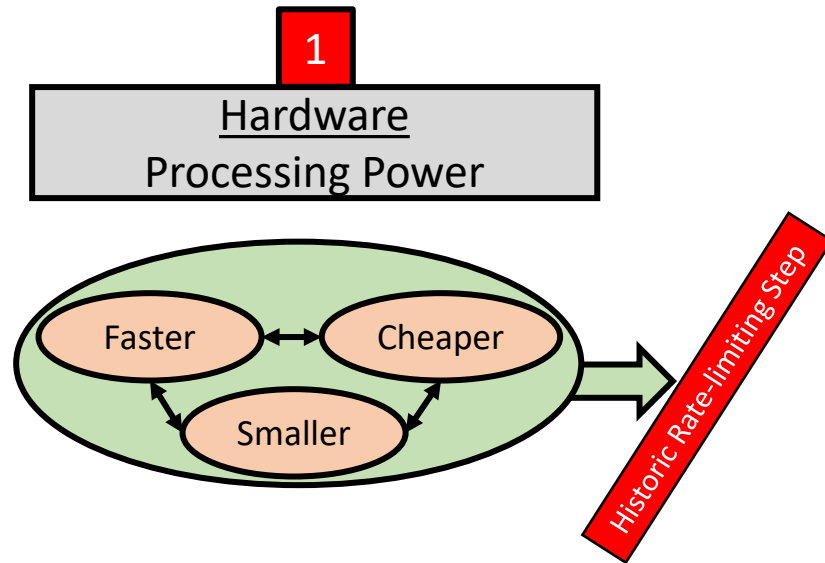
Toward a Better Understanding of Artificial Intelligence

b. A working model for AI- hardware



Toward a Better Understanding of Artificial Intelligence

b. A working model for AI- hardware



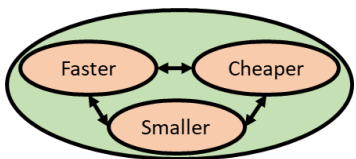
Computer cards for 5-Megabyte program 1954



5-Megabyte Computer in 1956
BTW... It weighed over 2,000 lbs.

Moore's Law 1965:

The observation that the number of transistors in an integrated circuit (IC) doubles about every two years.



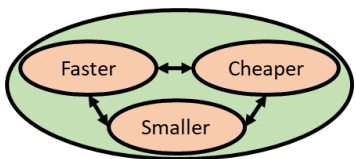
Toward a Better Understanding of Artificial Intelligence

b. A working model for AI- hardware



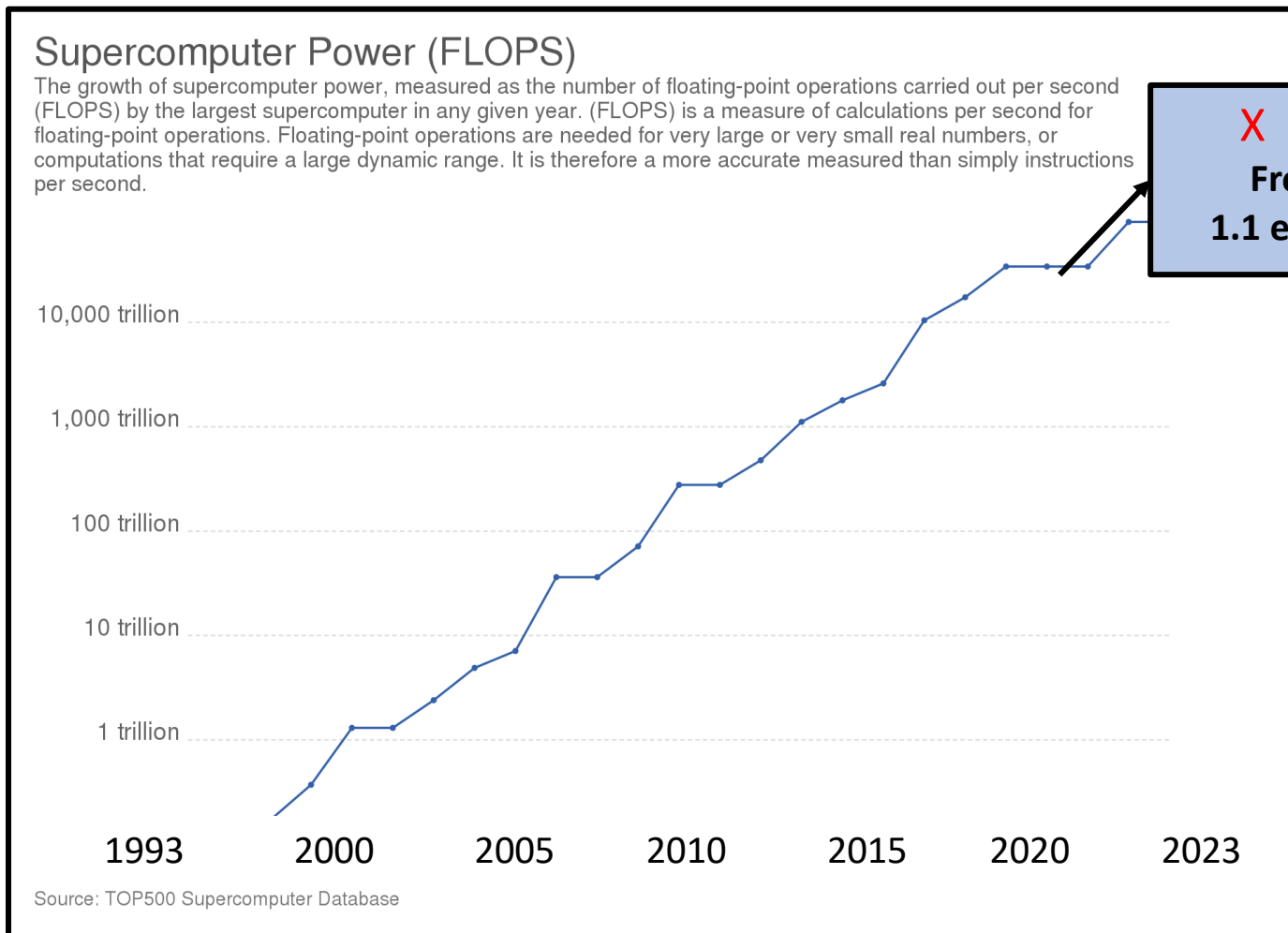
????

2030- 4 gigabytes



Toward a Better Understanding of Artificial Intelligence

b. A working model for AI- hardware



**X 2023-
Frontier-
1.1 exa FLOPs**

**2024- Graphcore-
10 exa FLOPs**

Exponential Values:

Kilo- value 10^3

Mega- value 10^6

Giga- value 10^9

Tera- value 10^{12}

Peta- value 10^{15}

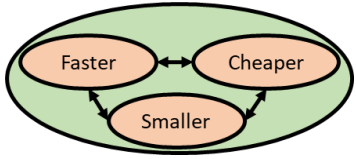
Exa - value 10^{18}

Zetta- value 10^{21}

Yotta- value 10^{24}

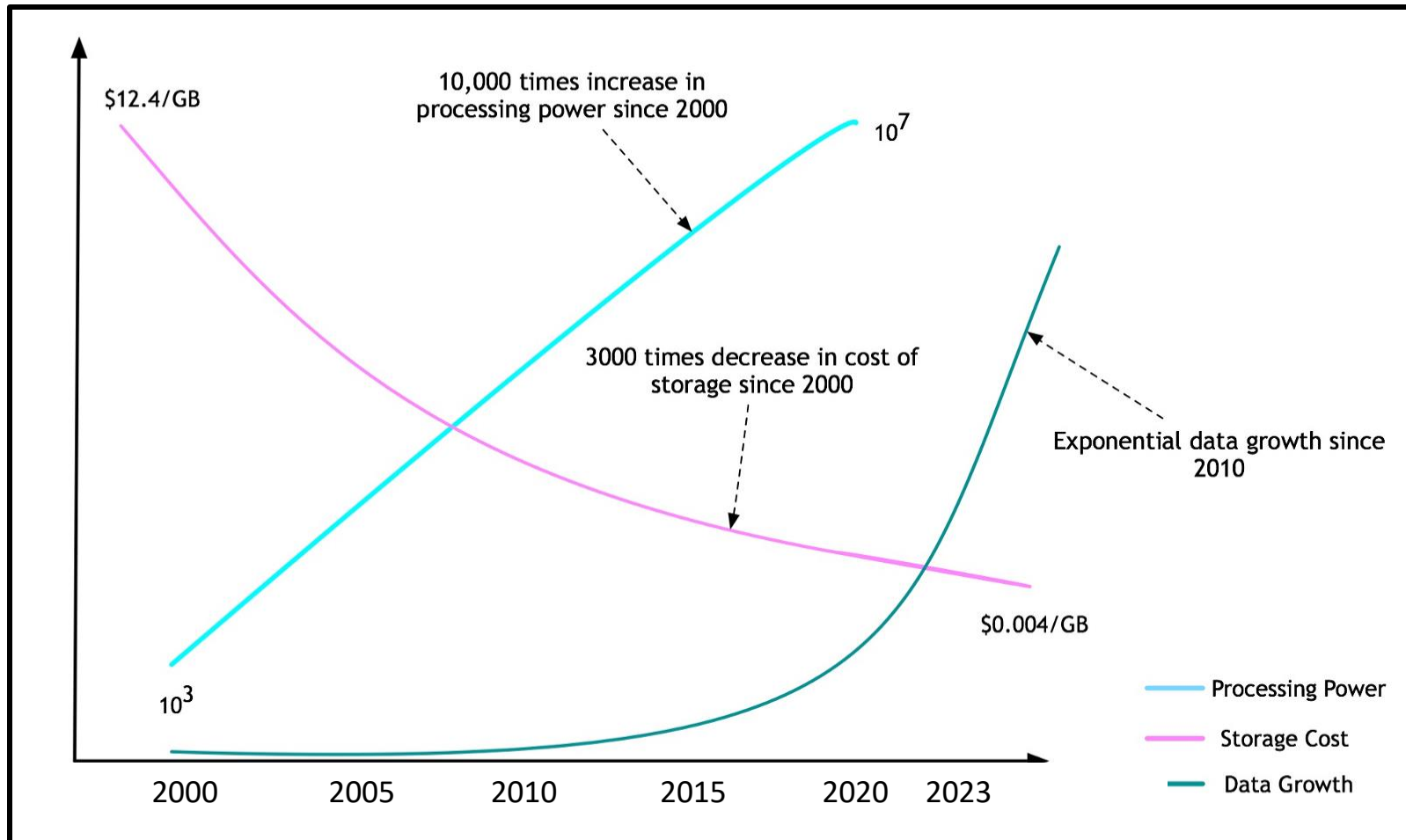
Ronna- value 10^{27}

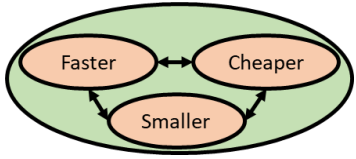
Quetta- value 10^{30}



Toward a Better Understanding of Artificial Intelligence

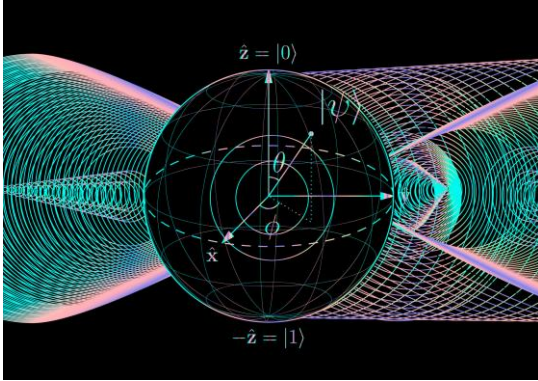
b. A working model for AI- hardware





Toward a Better Understanding of Artificial Intelligence

b. A working model for AI- hardware



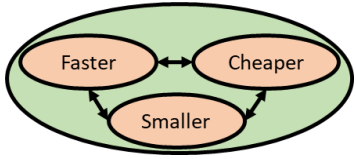
Next Steps: 1. Quantum Computers

Bits \rightarrow Qubits

Quantum computers process at the sub-atomic level.

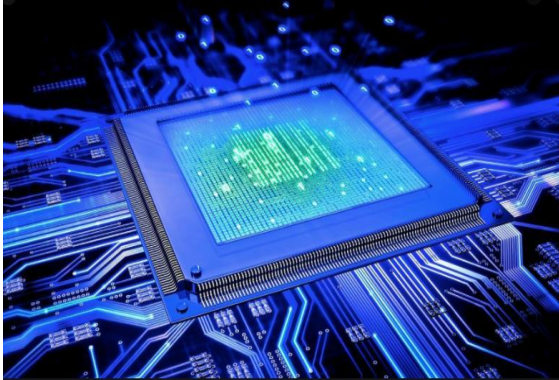
Bits- exist in one of two possible states: 0 or 1, (on or off)

Qubits- can exist in more than one state at the same time--
on and off, and anywhere in between



Toward a Better Understanding of Artificial Intelligence

b. A working model for AI- hardware



Next Steps: 2. Photon (optical) Computers

Electricity → Light

Photons enable a higher bandwidth and require less power than electrons used in conventional computers

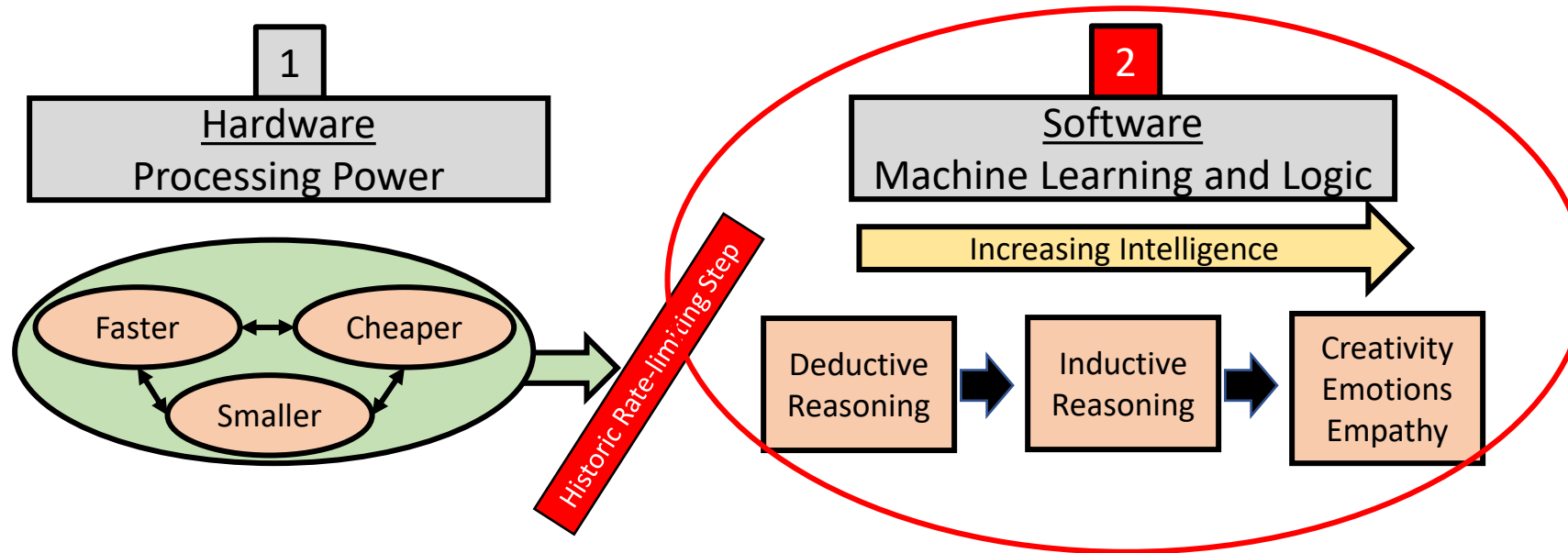
The result...

...Processors can work millions of times faster and use less energy.

Moore's Law is functionally alive and well.

Toward a Better Understanding of Artificial Intelligence

b. A working model for AI- software



Toward a Better Understanding of Artificial Intelligence

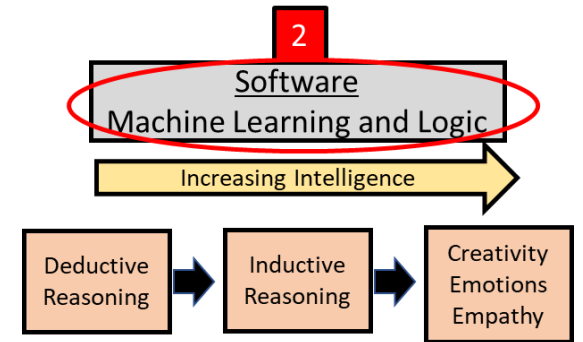
b. A working model for AI- software

Machine Learning: The process that gives computers the ability to learn without explicitly being programmed.

Types of Machine Learning and Logic

Supervised learning- Models are trained with labeled data sets, the most common type of learning today.

Unsupervised learning- The program looks for patterns in new data. It can find patterns or trends that original programmers weren't looking for.



Toward a Better Understanding of Artificial Intelligence

b. A working model for AI- software

Machine Learning: The process that gives computers the ability to learn without explicitly being programmed.

Types of Machine Learning and Logic

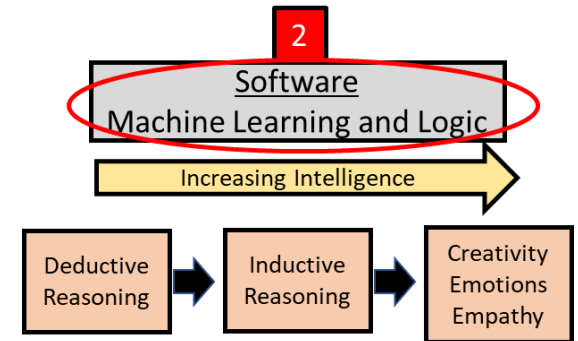
Supervised learning- Models are trained with labeled data sets, the most common type of learning today.

Unsupervised learning- The program looks for patterns in new data. It can find patterns or trends that original programmers weren't looking for.

Clinical Example:
A Diabetes Mgmt Protocol

Implement a pre-existing protocol which it is programmed to learn

Examine new data to find potentially better steps and continuously revise



Toward a Better Understanding of Artificial Intelligence

b. A working model for AI- software

1. Deductive Reasoning- general → specific

Example: the flu...

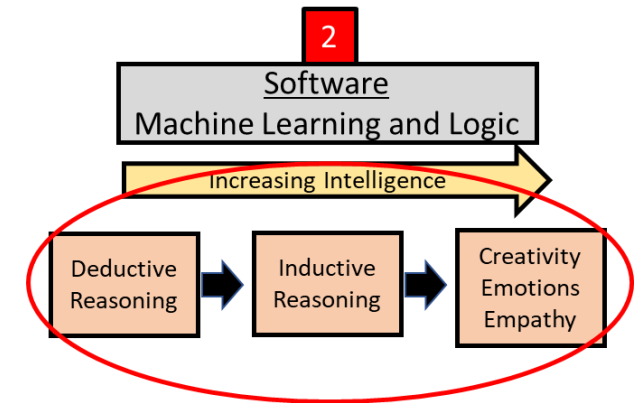
Given- dx of flu → Deduce- presence of fevers, chills, muscle aches, etc

2. Inductive Reasoning- specific → general

Example: the flu...

Given- multiple symptoms → Deduce- correct diagnosis of flu

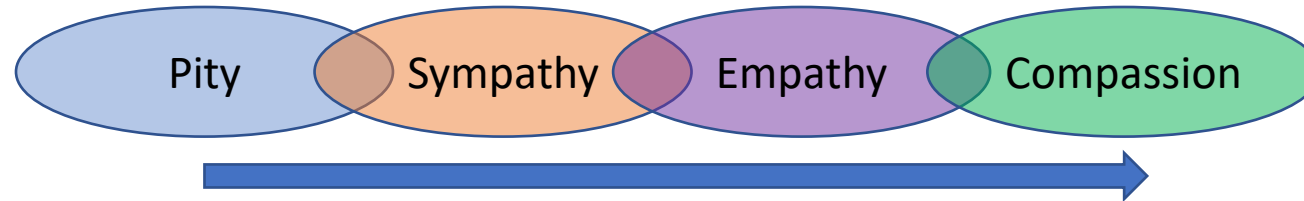
3. Creativity, Emotions, Empathy- complex reasoning → human



Blurring the difference between humans and machines

Toward a Better Understanding of Artificial Intelligence

Continuum of Complex Human Emotions



Pity- acknowledges that the person does not “deserve” what has happened- a lower degree of understanding..

Sympathy- a feeling or expression of concern for someone, often accompanied by a wish for them to be better off.

Empathy- the ability to relate to the suffering of another person from that person’s point of view.

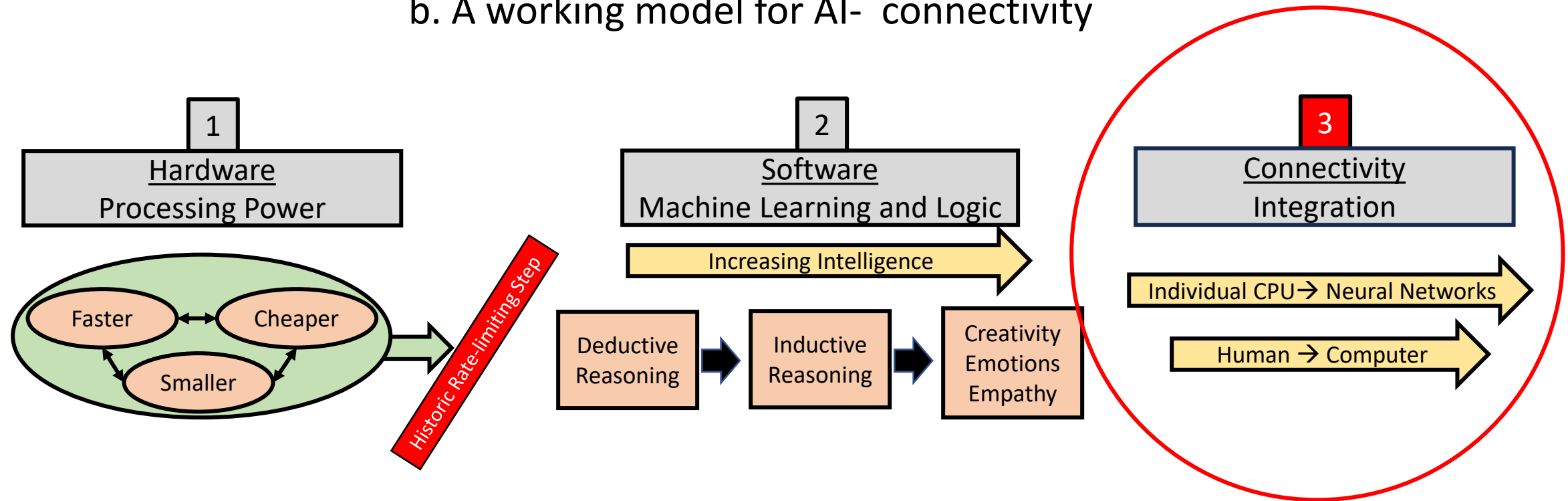
Compassion- empathy....plus doing something, action-oriented.

Gemelli, et al, ASU, 2020

Can Complex Emotions Be Machine-Learned?

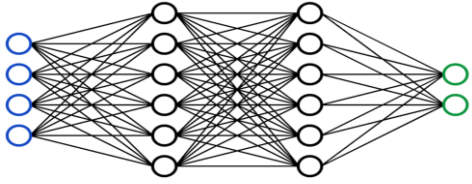
Toward a Better Understanding of Artificial Intelligence

b. A working model for AI- connectivity



Toward a Better Understanding of Artificial Intelligence

b. A working model for AI- connectivity



Natural language processing-

Machines recognize and respond to input from spoken language instead of data or numbers. Examples: Siri or Alexa.

AI Connectivity:

Input: Data → Language

Neural networks/ deep learning-

Thousands or millions of processing nodes are interconnected and organized into layers, all communicating to each other.

CPU → Network → IoT

Brain- Computer interfaces-

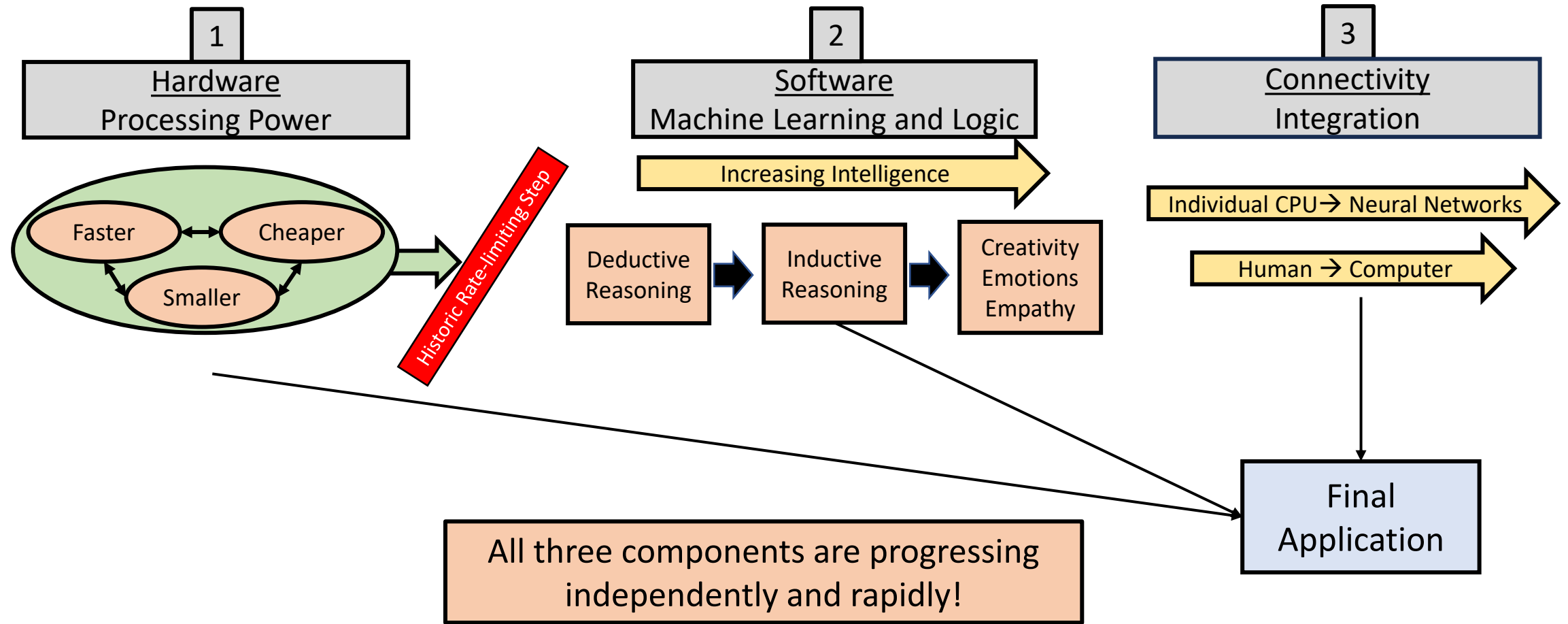
Connecting the computer to the brain.

CPU → Network → Human Brain

Machines are becoming more like the human brain

Toward a Better Understanding of Artificial Intelligence

b. A working model for AI



Toward a Better Understanding of Artificial Intelligence

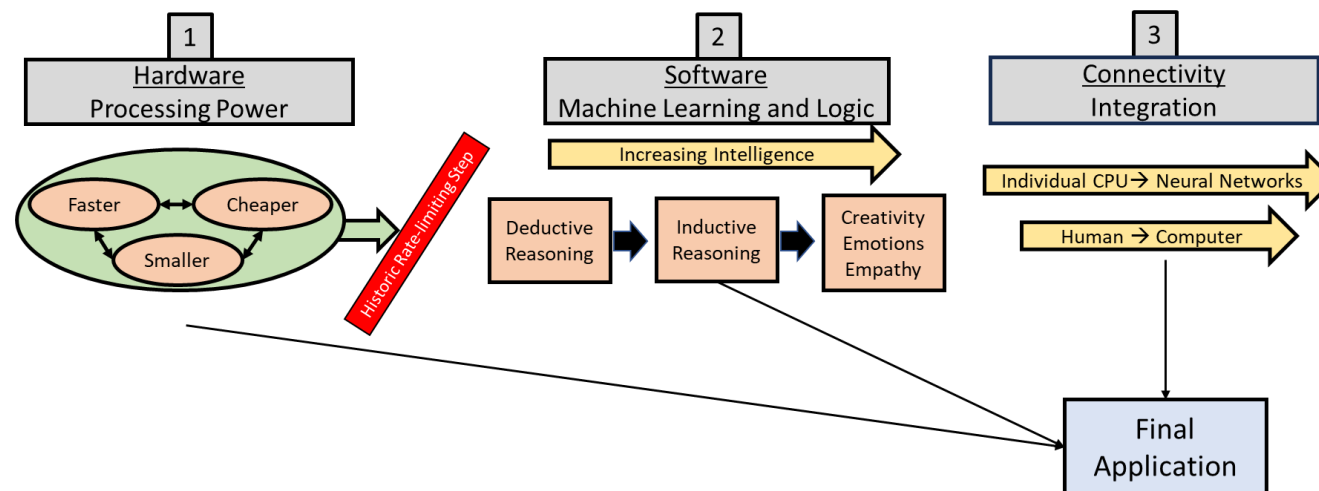
In Summary-

A Realistic Definition of AI:

A process whereby humans program a computer with a database and algorithms. The computer applies these algorithms to the database and provides a solution that imitates human intelligence....

BUT randomly and not controllable by humans, AI may create new algorithms, or give a false solution...
...extremely rapidly, confidently, and efficiently!

A Working Model of AI:



The Impact of Artificial Intelligence in Health Care

Toward a better understanding of artificial intelligence (AI)

- a. A realistic definition of AI
- b. A working model for AI
 - 1. Hardware- processing power (faster, smaller, cheaper)
 - 2. Software- machine learning and logic
 - 3. Connectivity- individual computers → neural networks → human brain

Key topics in artificial intelligence (AI)

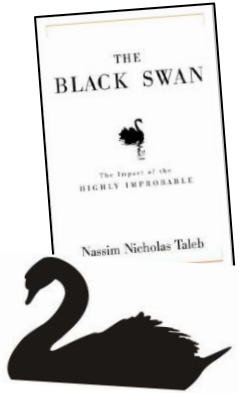
- a. Emergent properties
- b. Hallucinations
- c. Generative pretrained transformer (GPT)
- d. Deep fakes
- e. Brain-computer interfaces (BCI's)
- f. The concept of singularity – can AI lead to human extinction?
- g. Challenges in AI regulation – is it already too late?

A leadership call to action- Proactively manage artificial intelligence (AI)

- a. Economic forecasts for AI
- b. An opportunity to partner with AI
- c. Specific opportunities for AI in health care
- d. The role of a hospital AI council/ advocacy

A Review of Key Topics in Artificial Intelligence

a. Emergent properties



Emergent properties- unexpected and unpredictable events or outcomes that arise out of the collaborative functioning of a system.

- The event comes as a surprise and has a major unanticipated effect
- Outcomes are generated outside of the original programming parameters leading to unintended consequences

Bottom line...

AI can develop a “life of its own”

A Review of Key Topics in Artificial Intelligence

a. Emergent properties

Model Autophagy Disorder (MAD)

Generative models can go MAD !

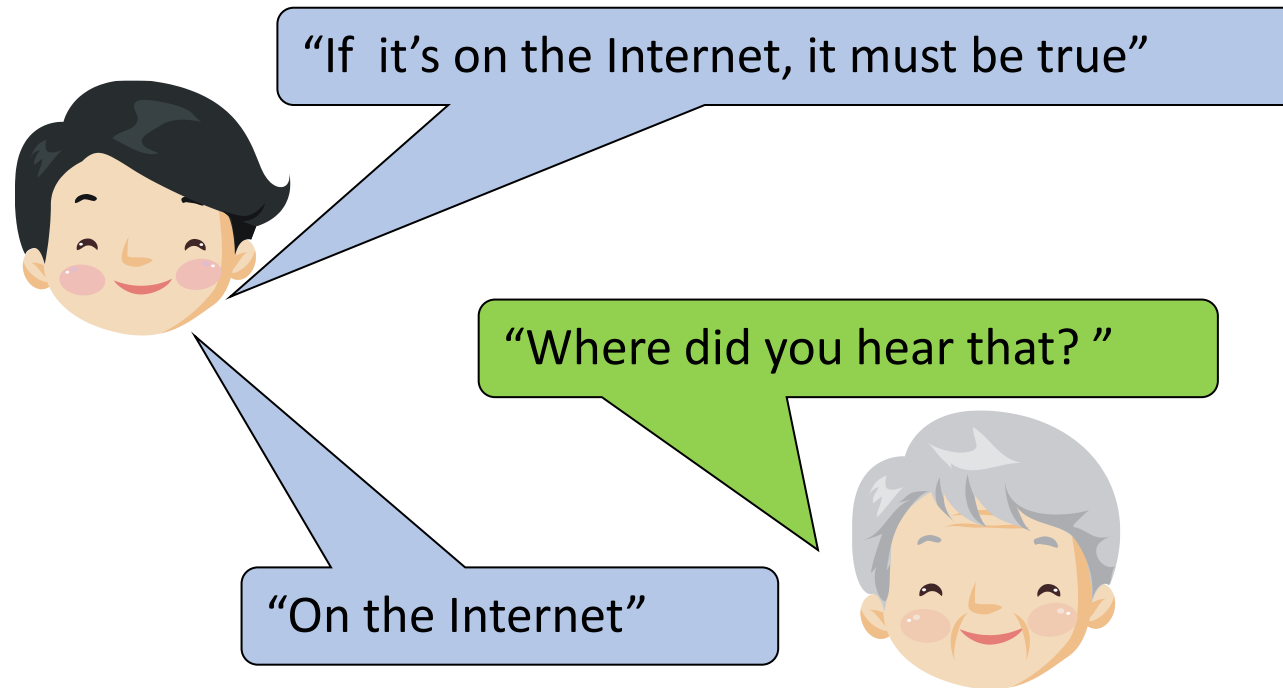
- Generative models trained on synthetic data from other generative models can amplify errors
- Without fresh new data, future models may have sub-optimal or false outcomes
- The need for continual machine “re-learning” and “un-learning”

Alemohammed, 2023

Bottom line...
AI needs new data to evolve

A Review of Key Topics in Artificial Intelligence

b. Hallucinations



A Review of Key Topics in Artificial Intelligence

b. Hallucinations

Hallucinations- Also called confabulations or delusions are confident AI responses that are nonsensical or not justified by its training data or source algorithms

“AI can give a very impressive-sounding answer that's just dead wrong!”

Oren Etzioni, AI2, 2023

“ChatGPT is an omniscient, eager-to-please intern who sometimes lies to you ... ”

Ethan Mollick, Wharton, 2023

Bottom line...
AI can randomly “make things up”

A Review of Key Topics in Artificial Intelligence

c. Generative pretrained transformer- (ex: ChatGPT)

An AI-powered chatbot that simulates a human and can generate a response when asked open-ended questions

Evolution of GPT:

2018- GPT-1- initial release by OpenAI

2019- GPT-2- could generate coherent text

2020- GPT-3- 100 times the number of parameters as GPT-2

2022- ChatGPT released November 2022 using GPT 3.5

2023- Microsoft Bing - One million users in first 48 hours

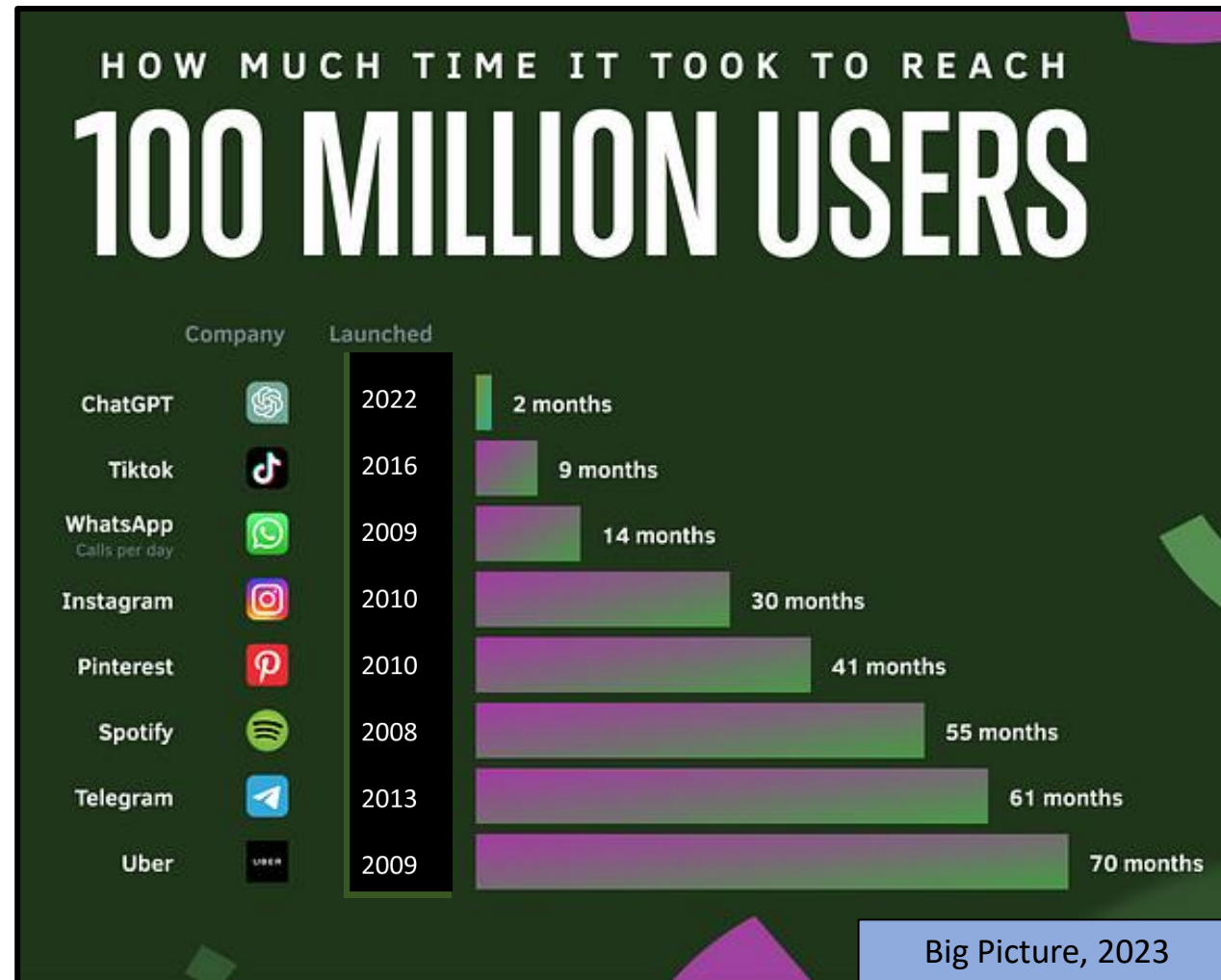
2023- Improved ChatGPT- GPT-4 can take images for input

2023- GPT-5 ... on the shelf

2024- What will be the impact of GPT-5...
...and beyond ???

A Review of Key Topics in Artificial Intelligence

c. Generative pretrained transformer- (ex: ChatGPT)



A Review of Key Topics in Artificial Intelligence

c. Generative pretrained transformer- (ex: ChatGPT)

1. Compose Text

Input

[Text from: <https://en.wikipedia.org/wiki/Rihanna>]

Describe her Super Bowl performance and what made it special.

Output

Rihanna's Super Bowl LVII halftime show performance was special for a number of reasons. For one, it marked her first live performance in over five years, and it was her first time headlining the Super Bowl halftime show. Additionally, she made history by becoming the first person to perform at the Super Bowl while pregnant. The show itself was critically acclaimed, with many praising her high-energy performance and impressive vocals. It also garnered a massive viewership, becoming the second most-watched halftime show in history.

2. Be Creative

Input

Explain the plot of Cinderella in a sentence where each word has to begin with the next letter in the alphabet from A to Z, without repeating any letters.

Output

A beautiful Cinderella, dwelling eagerly, finally gains happiness; inspiring jealous kin, love magically nurtures opulent prince; quietly rescues, slipper triumphs, uniting very wondrously, xenial youth zealously.

A Review of Key Topics in Artificial Intelligence

c. Generative pretrained transformer- (ex: ChatGPT)

3. Visual Recognition/Tasks

Input:

What can be made with these ingredients?



Output:

There are many options for what you can make with these ingredients! Some possibilities include:

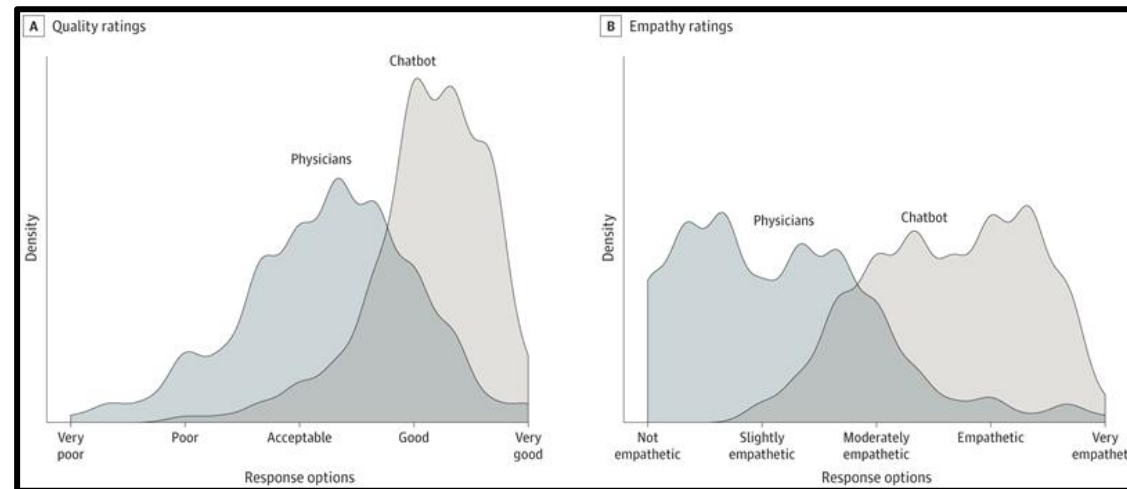
- Pancakes or waffles
- Crepes
- French toast
- Omelette or frittata
- Quiche
- Custard or pudding
- Cake or cupcakes
- Muffins or bread- Cookies or biscuits

These are just a few examples, but the possibilities are endless!

A Review of Key Topics in Artificial Intelligence

c. Generative pretrained transformer- (ex: ChatGPT)

4. Offer Medical Advice

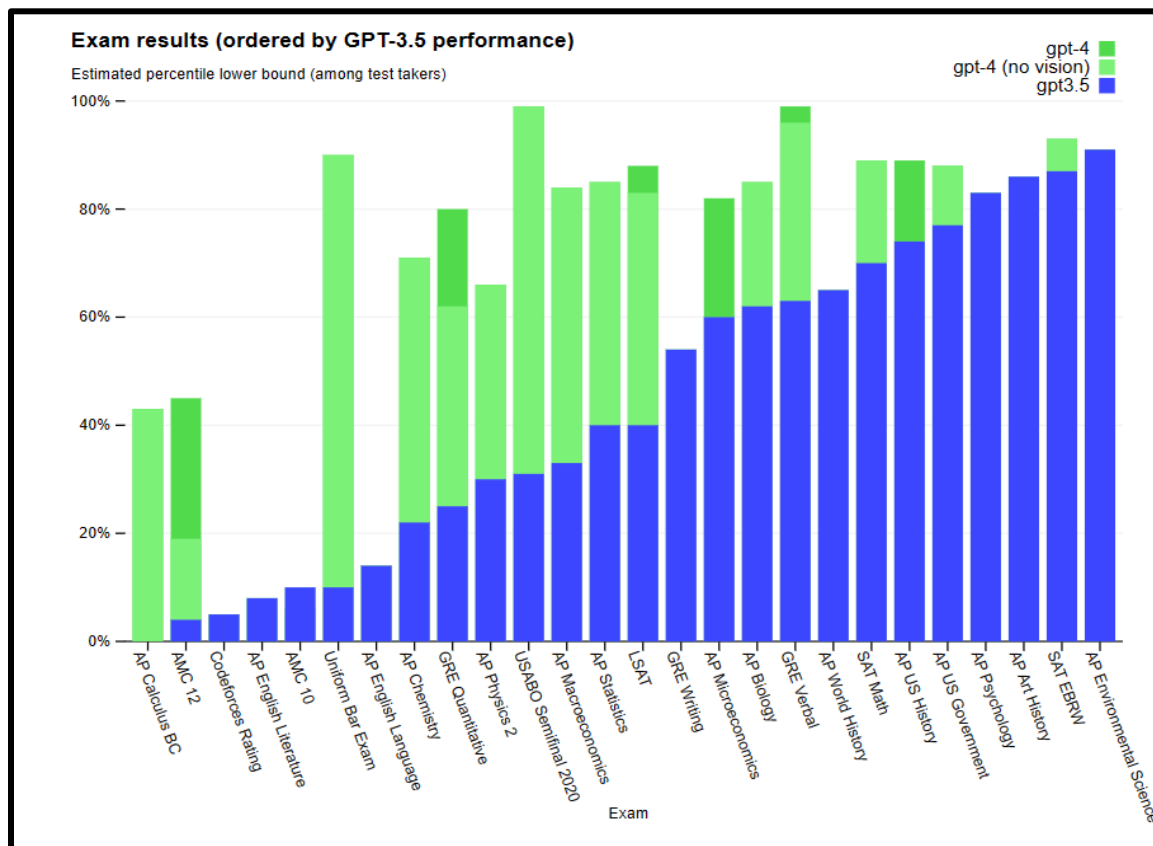


- Random patient questions were given to physicians and Chatbot
- Responses were reviewed and rated by team of licensed healthcare professionals
- Chatbot responses were rated significantly higher for both quality and empathy- 78%

A Review of Key Topics in Artificial Intelligence

c. Generative pretrained transformer- (ex: ChatGPT)

5. Performance on Standardized Tests



GPT-4 performed at the:

90th percentile on a simulated bar exam

93rd percentile on an SAT Reading exam

89th percentile on the SAT Math exam

85th percentile on the AP Art History exam

Chat-GPT, March 2023

A Review of Key Topics in Artificial Intelligence

c. Generative pretrained transformer- (ex: ChatGPT)

6. Output Integrity

“The danger is rubbish in, rubbish out, rubbish all about.”

“Bots like ChatGPT will regurgitate the claptrap as fact.”

“You are also seeing the effects of the bias of the input-er.”

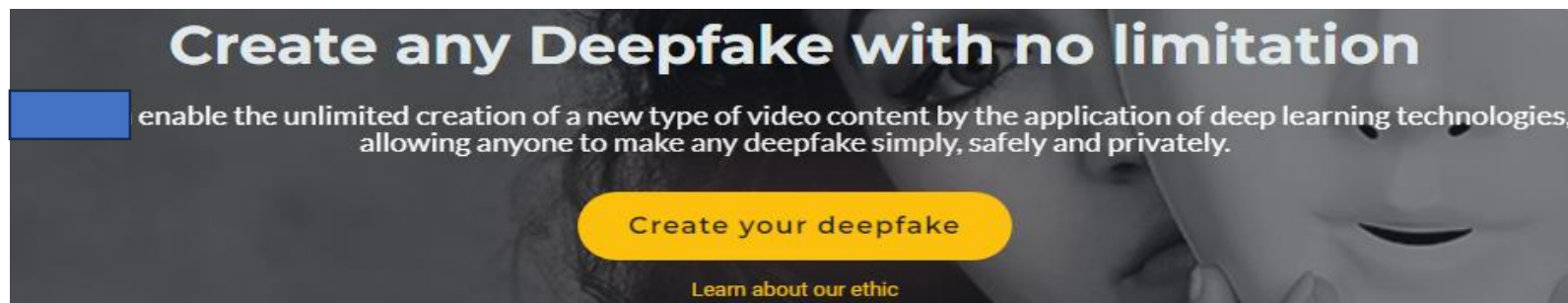
Robert Thompson, News Corp, Sept 2023

A Review of Key Topics in Artificial Intelligence

d. Deep fakes

Deepfake - an image, a video or an audio recording that has been edited using AI to replace the person in the original with someone else in a way that appears authentic

- Potential consequences:
 - Entertainment, music, movies- What is real?
 - Cybersecurity
 - Politics/ elections
 - Individual reputations/ blackmail
- Deep fakes create challenges in regulation and ownership- “over-regulation”



A Review of Key Topics in Artificial Intelligence

e. Brain- computer interfaces- (BCI's)

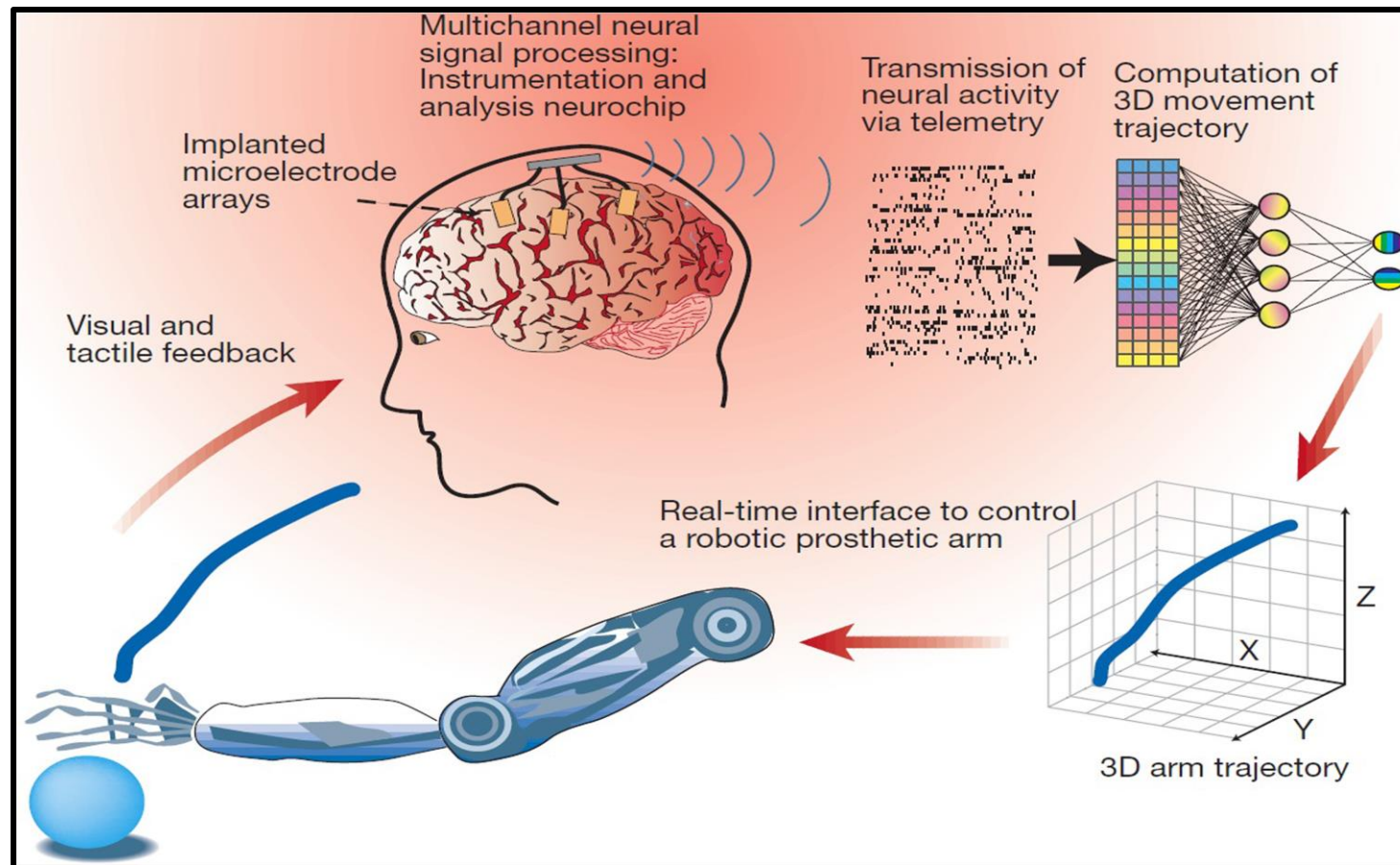
A brain-computer interface (BCI) is a direct communication between the brain and an external device such as a computer or robotic limb.

Types of BCI:

Invasive-- directly into the brain

Partially-- into the skull

Non-invasive--



A Review of Key Topics in Artificial Intelligence

e. Brain- computer interfaces- (BCI's)



“Example: Synchron has a minimally invasive implant that allows a patient with amyotrophic lateral sclerosis (ALS) to send emails and browse the internet using his thoughts...

...BCIs are a natural beginning to the singularity because they meld mind and machine in a way no other technology so far can.”

Boucher, Hawkins 2021

...Accelerating the pathway to singularity

A Review of Key Topics in Artificial Intelligence

f. The concept of singularity

What is Singularity?



“The moment where AI exceeds human control...

...growth becomes uncontrollable and irreversible, resulting in unforeseeable changes to human civilization... with a powerful superintelligence that far surpasses all human intelligence.”

Darren Orf, PwC 2023

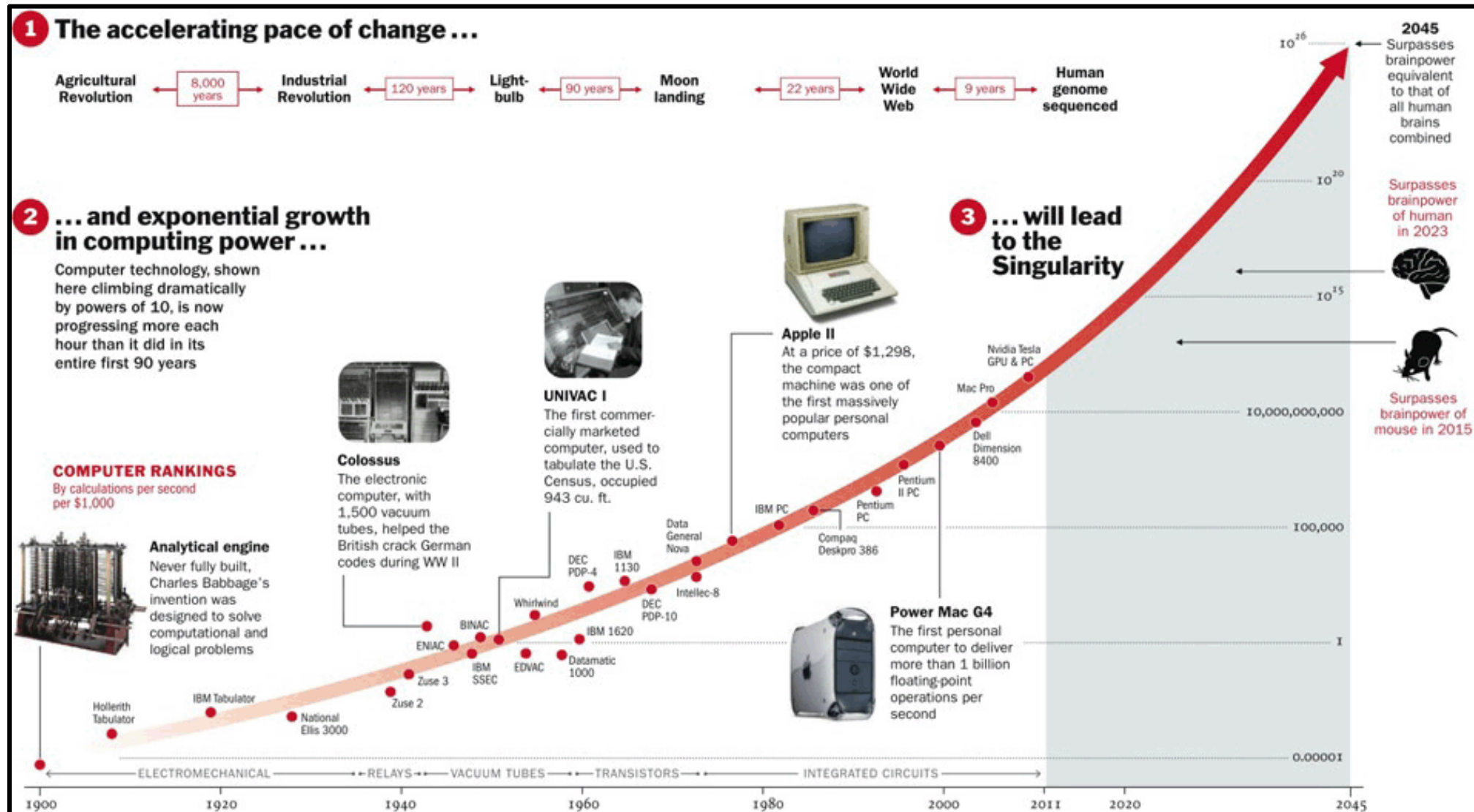
“Now that we’ve discovered it works better than we expected, what do we do to mitigate things more intelligent than us from taking control?”

Geoffrey Hinton, Google, 2023

Humanity may reach Singularity within just 7 years

A Review of Key Topics in Artificial Intelligence

f. The concept of singularity



A Review of Key Topics in Artificial Intelligence

f. The concept of singularity

Can AI lead to the extinction of the human race?

“Absolutely... companies that are working on this technology, state explicitly in their goals to build God-like intelligence— something that outstrips humans in every form of capability.

If we create a system that is vastly more intelligent than the human race- I don’t expect that to end well.”

Conner Leahy, Conjecture, 2023

“I fear that AI may replace humans altogether.
If people design computer viruses, someone will design AI that replicates itself.

This will be a new form of life that will outperform humans.”

Stephen Hawking, 2016

A Review of Key Topics in Artificial Intelligence

f. The concept of singularity

Can AI lead to the extinction of the human race?

The Pause Letter released March 22, 2023.....

- Powerful AI systems should be developed only once we are confident their effects will be positive, and their risks will be manageable.
- Call to immediately pause for at least 6 months the training of AI systems more powerful than GPT-4

Over 27,000 Signatures

Public awareness increased ... but full speed ahead !

A Review of Key Topics in Artificial Intelligence

g. The challenges of regulation

Is it already too late... or even possible?



1. Logistical issues

- Data privacy and security- (ex: HIPAA)
- Intellectual property- who “owns” AI?

2. Asilomar Principles 2017- Consensus for an ethical framework for AI-

1. Mandate robust third-party auditing and certification.
2. Regulate access to computational power.
3. Establish capable AI agencies at the national level.
4. Establish liability for AI-caused harms.
5. Introduce measures to prevent and track AI model leaks.
6. Expand technical AI safety research funding.
7. Develop standards for identifying and managing AI-generated content and recommendations.

3. Establish governance- the need for cooperation and collaboration

- Local → State → National → International/ Global

The Impact of Artificial Intelligence in Health Care

Toward a better understanding of artificial intelligence (AI)

- a. A realistic definition of AI
- b. A working model for AI
 - 1. Hardware- processing power (faster, smaller, cheaper)
 - 2. Software- machine learning and logic
 - 3. Connectivity- individual computers → neural networks → human brain

Key topics in artificial intelligence (AI)

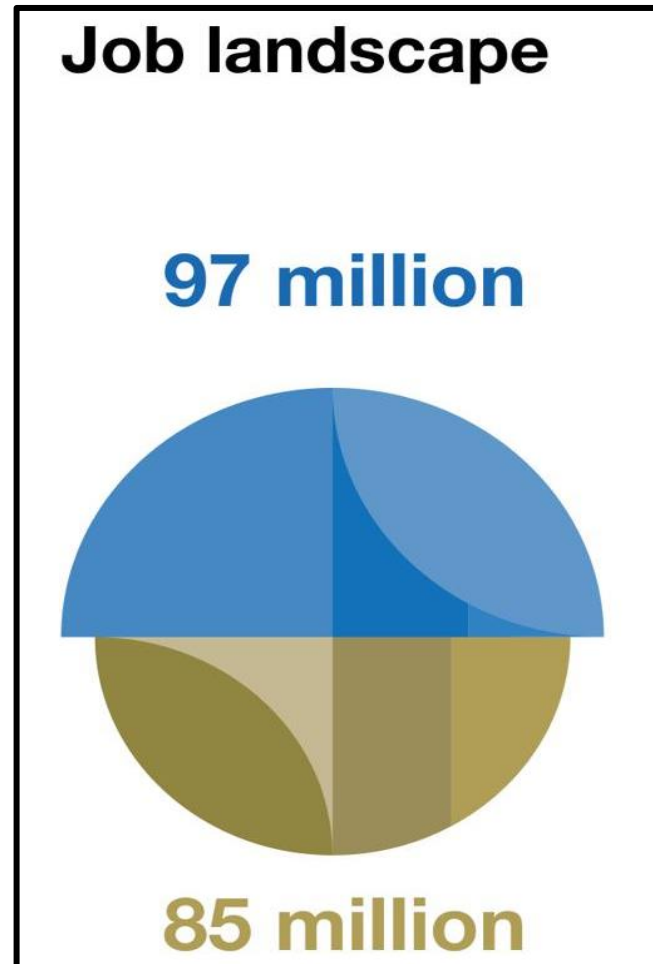
- a. Emergent properties
- b. Hallucinations
- c. Generative pretrained transformer (GPT)
- d. Deep fakes
- e. Brain-computer interfaces (BCI's)
- f. The concept of singularity – can AI lead to human extinction?
- g. Challenges in AI regulation – is it already too late?

A leadership call to action- Proactively manage artificial intelligence (AI)

- a. Economic forecasts for AI
- b. An opportunity to partner with AI
- c. Specific opportunities for AI in health care
- d. The role of a hospital AI council/ advocacy

A Leadership Call to Action- Proactively Manage Artificial Intelligence

a. General economic forecasts for AI



Growing job demand:

1. Data Analysts and Scientists
2. AI and Machine Learning Specialists
3. Big Data Specialists
4. Digital Marketing and Strategy Specialists
5. Process Automation Specialists
6. Business Development Professionals
7. Digital Transformation Specialists
8. Information Security Analysts
9. Software and Applications Developers
10. Internet of Things Specialists

Decreasing job demand:

1. Data Entry Clerks
2. Administrative and Executive Secretaries
3. Accounting, Bookkeeping and Payroll Clerks
4. Accountants and Auditors
5. Assembly and Factory Workers
6. Business Services and Administration Managers
7. Client Information and Customer Service Workers
8. General and Operations Managers
9. Mechanics and Machinery Repairers
10. Material-Recording and Stock-Keeping Clerks

A Leadership Call to Action- Proactively Manage Artificial Intelligence

a. General economic forecasts for AI

Potentially Greater Demand:

Potentially Less Demand:

Prompt engineer- for LLM's
AI trainer- outside world interface
AI auditor
AI ethicists
Machine managers

Accountants
Customer service agents
Legal assistants
Graphic designers
Content moderators
Proofreaders
Traders
Transcribers
Soldiers
Writers

Accountants
Customer service agents
Legal- paralegals, legal assistants
Graphic designers
Coders, programmers, software engineers, data analysts
Media-advertising, content creation, tech writing
Market research analysts
Teachers
Finance- financial analysts, personal financial advisors
Traders

A Leadership Call to Action- Proactively Manage Artificial Intelligence

b. An opportunity to partner with AI

Example: The Impact of ATMs on Bank Tellers

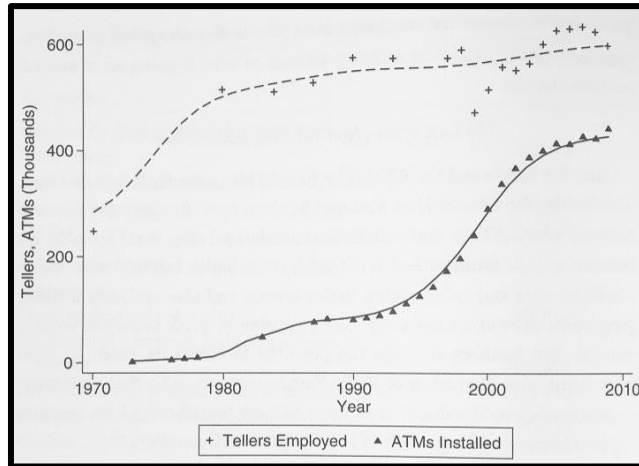
Initial results:

The number of tellers per bank branch decreased from 21 → 13

Two unexpected opportunities from the new technology:

1. Cost efficiencies- Banks increased the number of new branches by 40%
2. Job re-engineering- Historical cashiers → customer service, transacting loans and investments.

World Economic Forum 2021



Bottom line...

The number of bank tellers increased

A Leadership Call to Action- Proactively Manage Artificial Intelligence

b. An opportunity to partner with AI

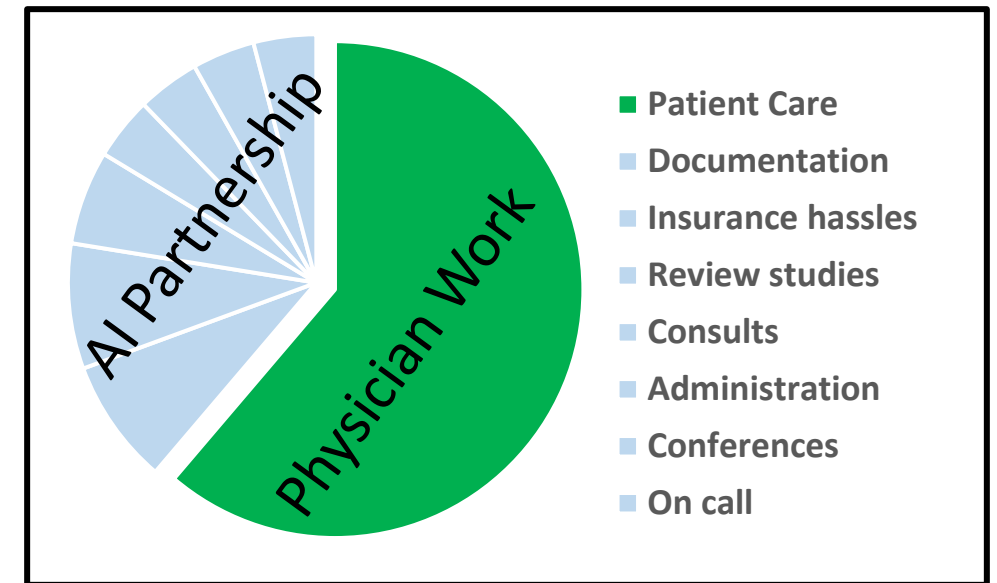
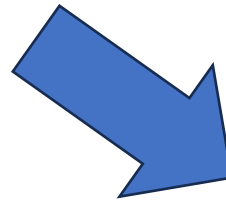
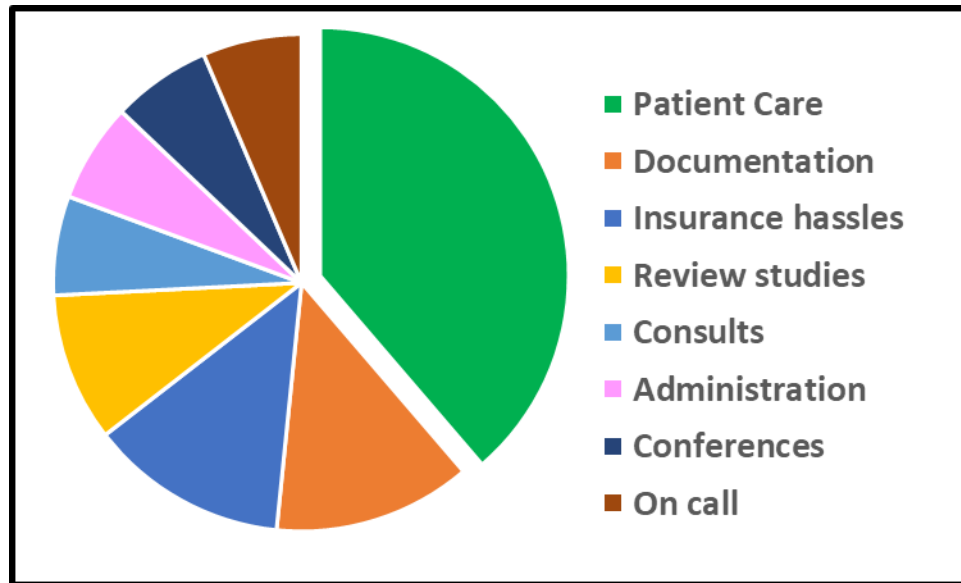
The opportunity to retool and re-engineer...
...rather than upsize or downsize

1. Embrace and understand the technologies of AI
2. Achieve opportunities/efficiencies through the prudent use of AI
3. Leverage the Human- AI Partnership:
 - Integrate and enhance existing technology
 - Optimize the roles of the human and AI as workflows are re-assessed

A Leadership Call to Action- Proactively Manage Artificial Intelligence

b. An opportunity to partner with AI

Example: Physician Workflow Chart



A Leadership Call to Action- Proactively Manage Artificial Intelligence

c. Specific opportunities for AI in health care

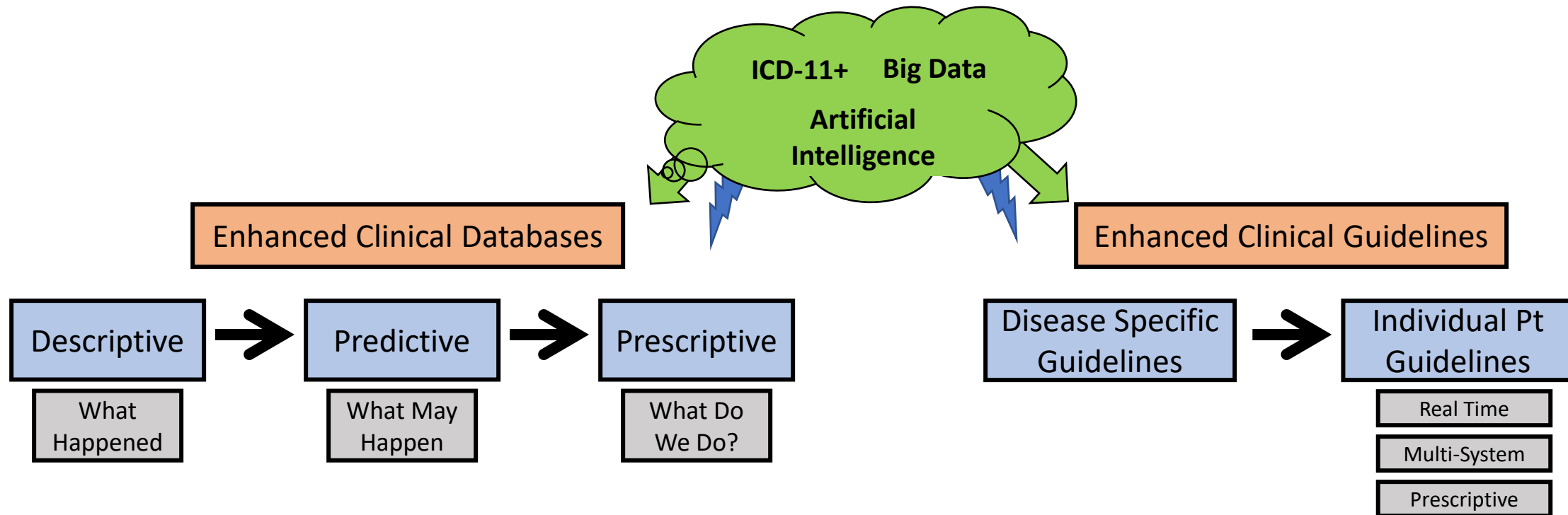
1. Medical imaging and pathology
2. Patient empowerment and navigation
3. Remote patient monitoring
4. Improved diagnosis
5. New drug discovery
6. Personalized treatment plans
7. Reduce drug adverse events
8. Fraud, waste, and abuse
9. Health risk assessments
10. Improve access to care
11. Reduce documentation
12. Virtual assistants and robotics
13. Regulatory compliance
14. Pre-authorization of services .
15. Medical education and simulation
16. Medical billing/ revenue cycle
17. Clinical trial design and monitoring
18. Improve surgical performance
19. Improve and monitor outcomes in behavioral health
20. Reduce disparities and improve health equity
21. Reduce gaps in care
22. Target opportunities for early intervention
23. Improving point of care testing
24. Monitor and reduce the cost of care
25. Reducing medical errors

Shulkin, blog, May 2023

A Leadership Call to Action- Proactively Manage Artificial Intelligence

c. Specific opportunities for AI in health care

The Future of Medical Databases/ Guidelines



A Leadership Call to Action- Proactively Manage Artificial Intelligence

c. Specific opportunities for AI in health care

“Within 5-6 years, the FDA will approve a primary care app qualified to practice medicine like your primary care physician”

Vinod Khosla, Microsystems, May 2023



A Leadership Call to Action- Proactively Manage Artificial Intelligence

d. The Role of a hospital/ system AI council

Multidisciplinary stakeholders:

- Board members
- Executive management team
- Providers- physicians, nurses, others
- IT
- Ethics
- Community members

Identify challenges and set goals:

- Proactively develop and implement an AI strategy
- Prioritize/ optimize AI strategic initiatives
- Provide ongoing education for providers and EEs
- Partner with state hospital association and other advocacy groups

The Impact of Artificial Intelligence in Health Care

Toward a better understanding of artificial intelligence (AI)

- a. A realistic definition of AI
- b. A working model for AI
 - 1. Hardware- processing power (faster, smaller, cheaper)
 - 2. Software- machine learning and logic
 - 3. Connectivity- individual computers → neural networks → human brain

Key topics in artificial intelligence (AI)

- a. Emergent properties
- b. Hallucinations
- c. Generative pretrained transformer (GPT)
- d. Deep fakes
- e. Brain-computer interfaces (BCI's)
- f. The concept of singularity – can AI lead to human extinction?
- g. Challenges in AI regulation – is it already too late?

A leadership call to action- Proactively manage artificial intelligence (AI)

- a. Economic forecasts for AI
- b. An opportunity to partner with AI
- c. Specific opportunities for AI in health care
- d. The role of a hospital AI council/ advocacy