## Disclaimer

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Haven't we been here before?
Traditional vs. Generative AI for Pharma: Insights & Reporting Case Study

Kaiwen Zhong | November 2024

I'VE BEEN
HERE BEFORE

"AI" has been around for a while in pharma ...
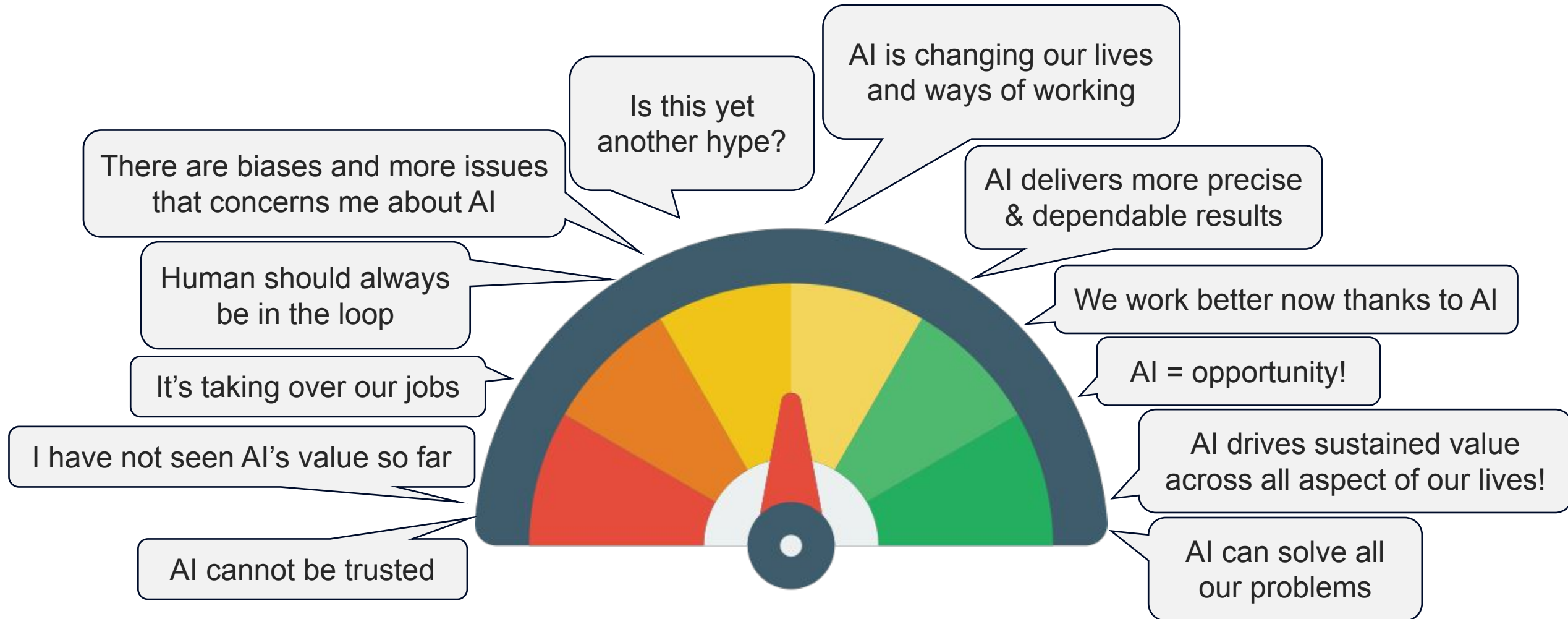
Questions in the post-ChatGPT era before your stakeholders invest in AI

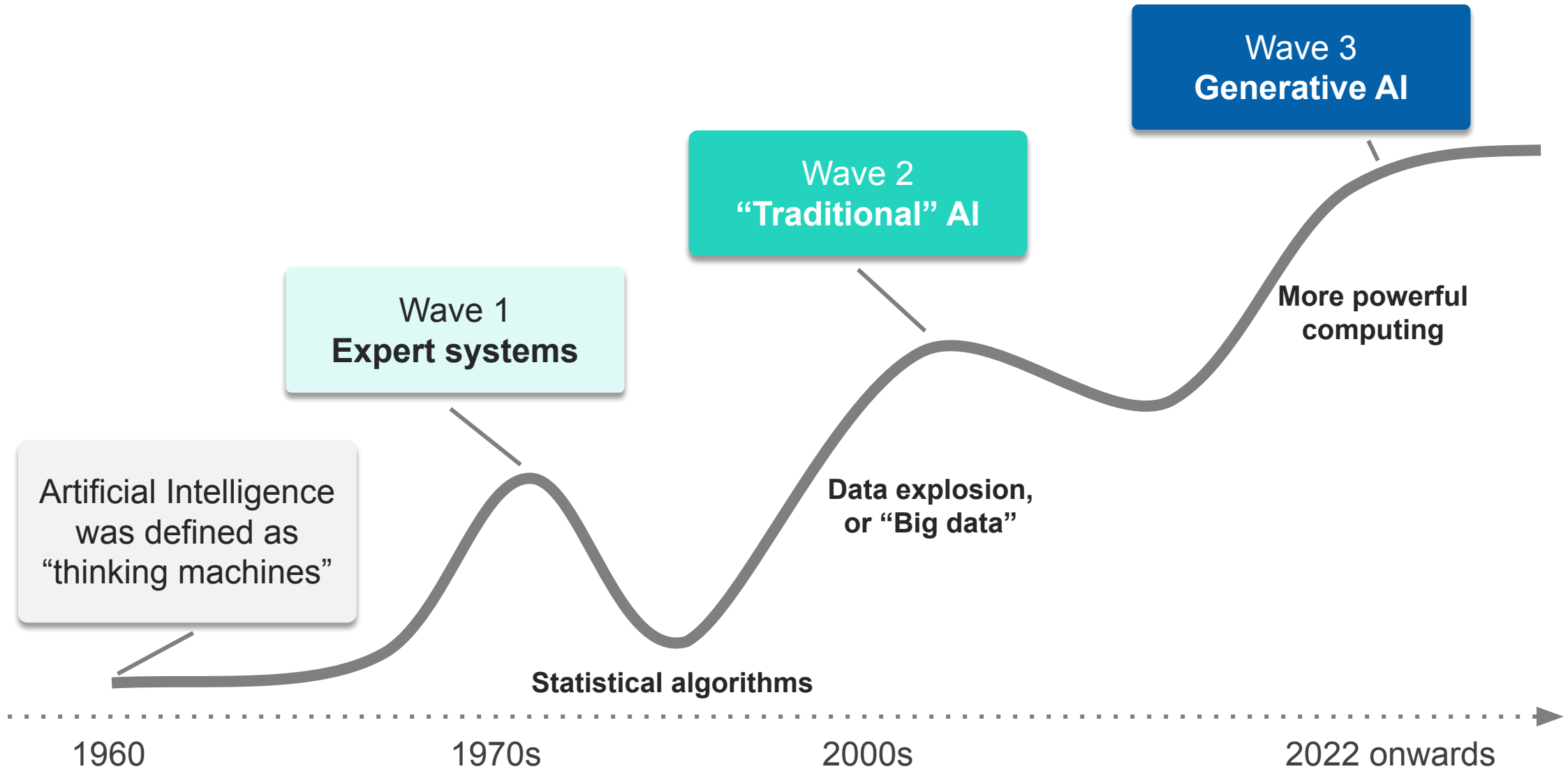**At this point, what does AI even mean?**

What can we use from previous technical investments in AI?

What can we learn from our previous experience with AI for better outcomes?

"AI" is constantly taking on new meanings

Wave 3
Generative AI

Wave 2
"Traditional" AI

Wave 1
Expert systems

More powerful
computing

Data explosion,
or "Big data"

Artificial Intelligence
was defined as
"thinking machines"

Statistical algorithms

1960   1970s   2000s   2022 onwards

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Expert systems failed to meet high expectations on "AI"

Wave 1
Expert systems

or **predictive analytics**

Applied in Pharma

IF	Dr. Smith has a new patient who is diagnosed with X,
AND	The patient previously had treatment with Product Y,
THEN	detail the doctor.
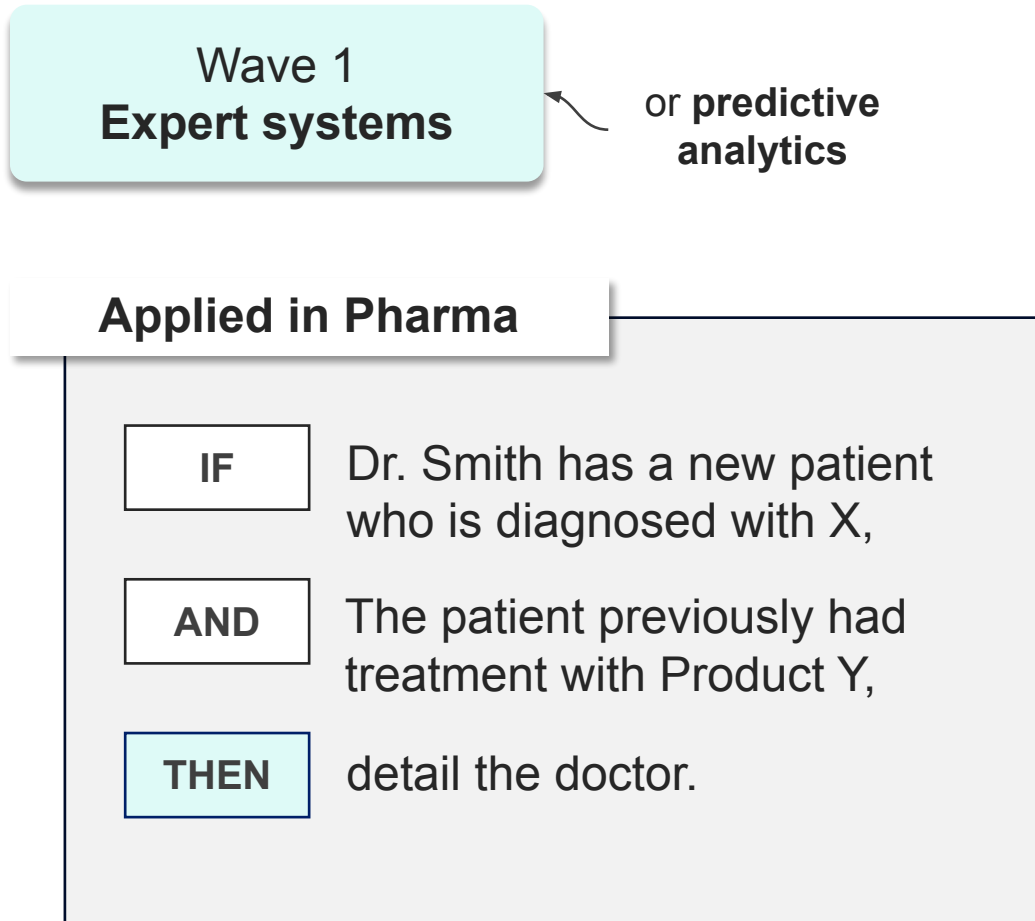
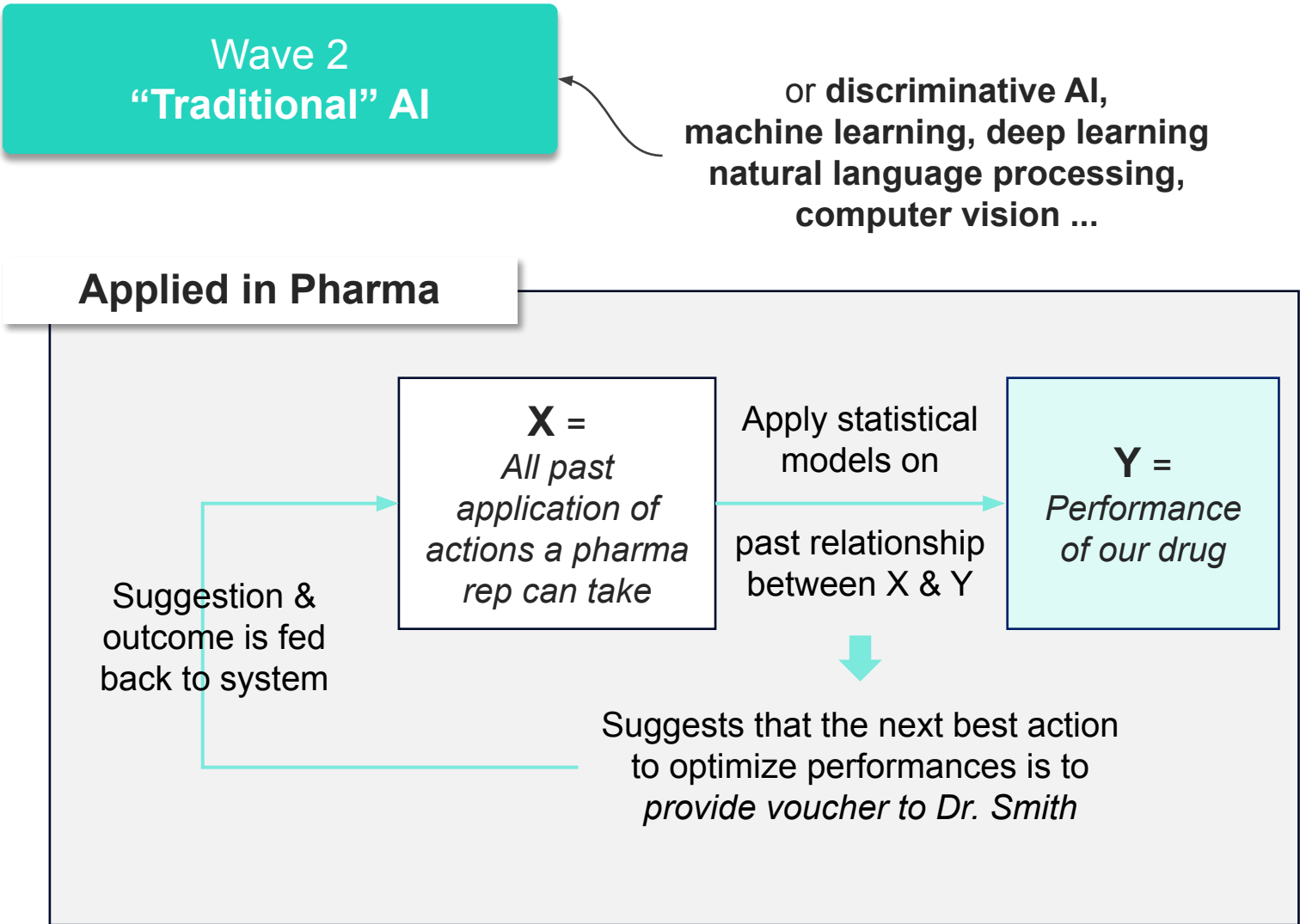👍 Still widely applied in pharma, e.g., initial Next Best Action engines

Human updates the system to change the rules

⇨ There is no "learning". Does not handle complex inputs

AI's most important feature is the feedback loop

Wave 2 "Traditional" AI

or **discriminative AI, machine learning, deep learning natural language processing, computer vision ...**

Applied in Pharma

$X =$ *All past application of actions a pharma rep can take*

Apply statistical models on

past relationship between X & Y

$Y =$ *Performance of our drug*

Suggestion & outcome is fed back to system

Suggests that the next best action to optimize performances is to *provide voucher to Dr. Smith*

Statistical models include random forest, linear regression, neural networks

Often applied wrong in pharma without the feedback loop

Generative AI created renewed excitements as it can be used by both technical and non-technical users

Wave 3
Generative AI

or **large language models**

Applied in Pharma

Document processing
for primary research, medical insights

Summarize the sentiments and key concerns by in oncologist interviews focusing on HR+, HER2 metastatic breast cancer.

Productivity enhancement
generate an email draft, summarize a meeting

What are the next steps from this email thread? Any blockers discussed?

Customer experience
Chatbots, interactive websites for patient hubs, HCP sites

Drug discovery
for new molecules, new combinations

... and more!

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Questions in the post-ChatGPT era before your stakeholders invest in AI

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Case Study: Insights & Reporting powered by both discriminative and generative AI

How might we drive patient health and business outcome

by suggesting to **general managers** of a product or therapeutic area

the **next best "focus" areas** that they could act on?

The business questions and needs evolved along with AI

Can we consolidate data sources and visualize our actions and performances?

Data & reporting platform

Can the system alert me when we need to pay attention?

Expert systems

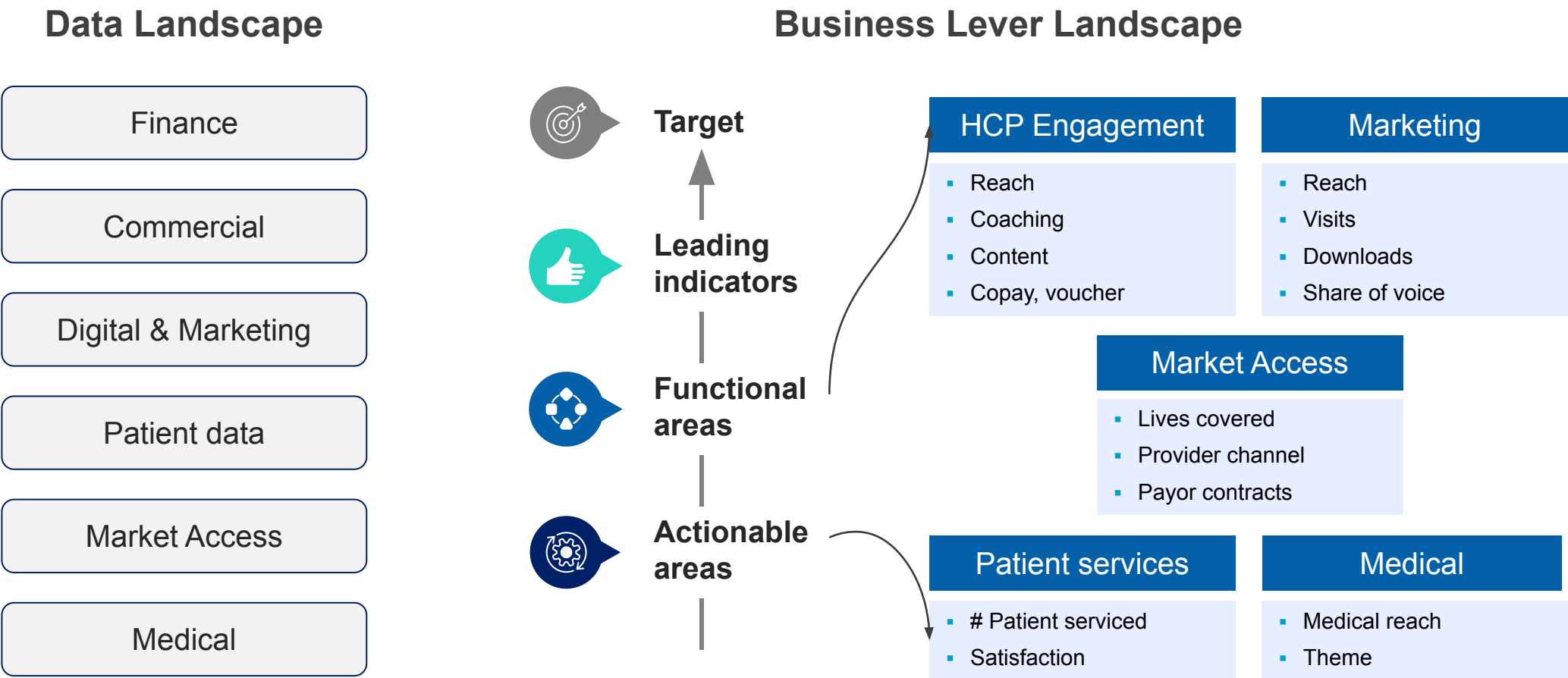Can you suggest me what functional areas to focus on based on how they drive performance?

"Traditional" AI

Can I consume data-heavy insights in a business-friendly way and ask drill down questions to get to the actionable steps?
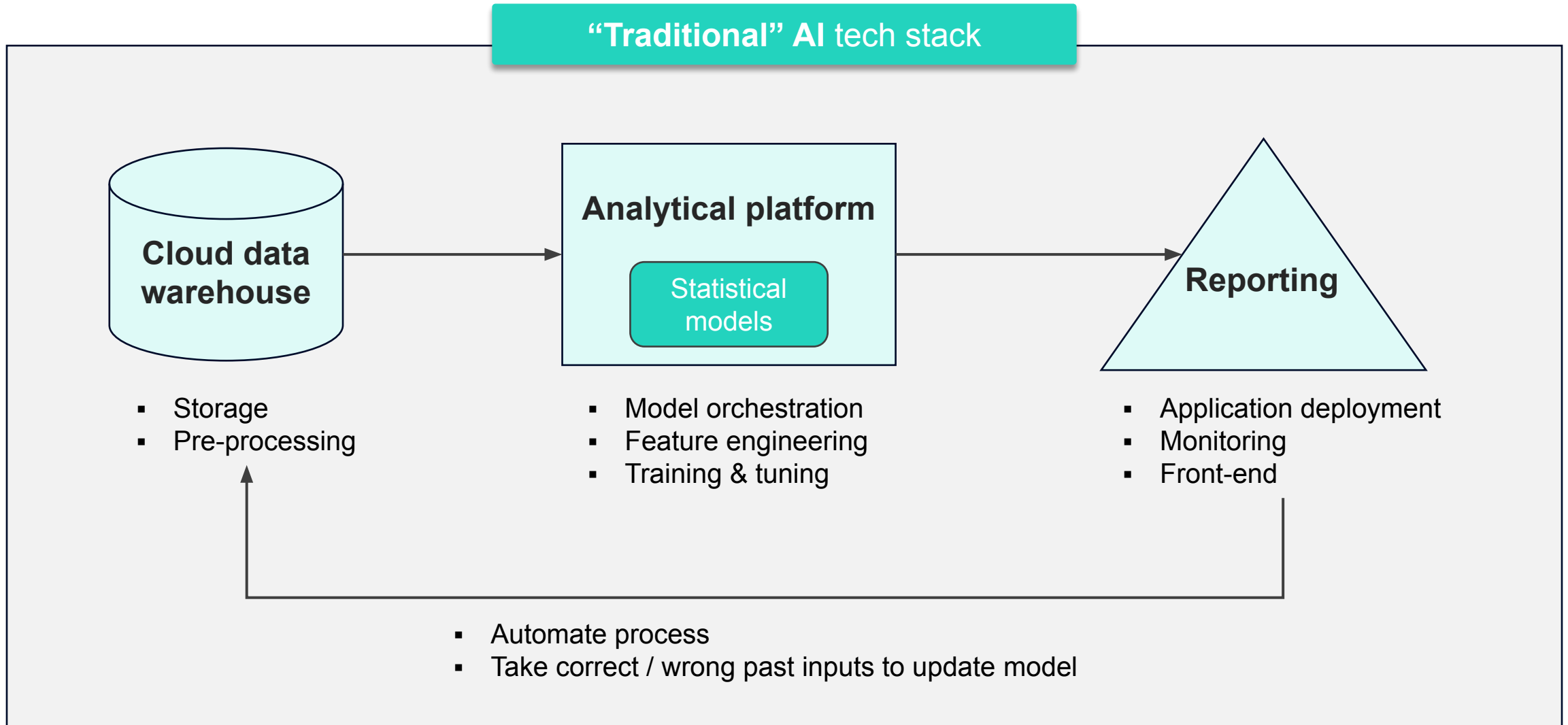
Generative AI

How might we drive patient health and business outcome

by suggesting to **general managers** of a product or therapeutic area

the **next best "focus" areas** that they could act on?

Quantify, visualize, and communicate relationship between data, actionable areas and business target

Data Landscape

- Finance
- Commercial
- Digital & Marketing
- Patient data
- Market Access
- Medical

Business Lever Landscape

Target

Leading indicators

Functional areas

Actionable areas

HCP Engagement
- Reach
- Coaching
- Content
- Copay, voucher

Marketing
- Reach
- Visits
- Downloads
- Share of voice

Market Access
- Lives covered
- Provider channel
- Payor contracts

Patient services
- # Patient serviced
- Satisfaction

Medical
- Medical reach
- Theme

Can we re-use previous technological investments in AI?

"Traditional" AI tech stack

Cloud data warehouse
- Storage
- Pre-processing

Analytical platform

Statistical models
- Model orchestration
- Feature engineering
- Training & tuning

Reporting
- Application deployment
- Monitoring
- Front-end

- Automate process
- Take correct / wrong past inputs to update model

Generative AI requires similar system with upgrades

Generative AI tech stack

Analytical platform

Cloud data warehouse

| Statistical models | LLMs | LLM prompting & tuning |

Reporting

- Storage
- Pre-processing

... Of much larger, more unstructured datasets

- Model orchestration
- Feature engineering
- Training & tuning **– requires LLM-specific training and tuning expertise**

- Application deployment
- Monitoring
- Front-end
- **More interactive interface as Generative AI allows users to directly interact with system**

- Automate process
- Take correct / wrong past inputs to update model
- **Specific tools for LLMs that chains model inputs and outputs**

AI augments the business value proposition of Big Data to uncover missed opportunities

Send alert on *"reach to Top 2 Tiers HCPs"* when prescribing trends change based on impact on TRx"

99
3.72
50
3.19   3.11
1.69
9/23/2024   9/30/2024

Market share decreased by 6.5%.

Why? TRx grew slower than competition.

Why? Patients are not following through on prescriptions.

Why? There is a perceived lack of affordability

Why? Patients are aware of more affordable alternatives.

Why? Insurance coverage is difficult to navigate.

"Traditional" AI prioritized data and insights

Generative AI makes the insights more actionable and flexible

Both "traditional" and generative AI will drive the future of pharma

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Business value-driven, product-centric approach to AI

What can we learn from our previous experience with AI for better outcomes?

Clearly **defined and explained goals and business needs**
(Use generative AI to refine!)

Product-centric approach
defining MVP but plan for incremental improvements.

Feedback loop is crucial
for any AI

Automated QA, QC
for results and model tuning, maximizing humans in the loop

We have been here before. And that's why we can do better

Is this yet another hype?

Thank you!

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