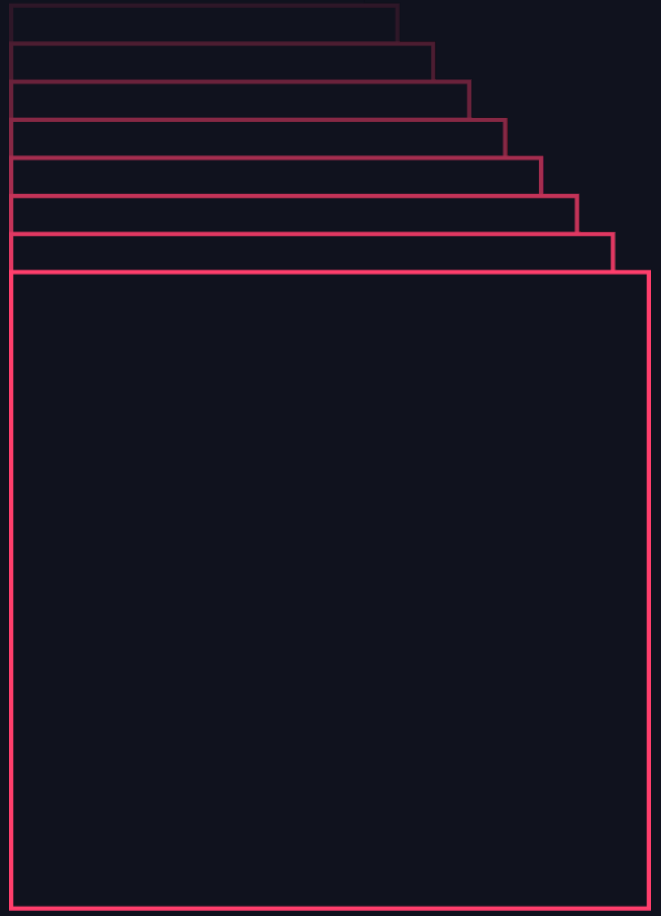
DATA+AI SUMMIT BY databricks

Providence

MLOps and AI Governance in Healthcare



Lindsay Mico and Vivek Tomer
June 12, 2024

Providence Overview

122K

CAREGIVERS

38K

NURSES

34K

PHYSICIANS

$2.1B

COMMUNITY BENEFIT

51

HOSPITALS

1000

CLINICS

29M

TOTAL PATIENT VISITS

2.6M

COVERED LIVES

1700+

PUBLISHED RESEARCH STUDIES

1

HEALTH PLAN

18

SUPPORTING HOUSING FACILITIES

HIGH SCHOOL NURSING SCHOOLS & UNIVERSITY

“Transformation and collaboration will be a consistent theme across health care in 2024. Though health care has been talking about disrupting itself for years, this will be a year of accelerated change and new innovations adopted at scale."

"The explosion of generative AI will be one of the major drivers of transformation, and we’ll see health systems partner with the tech sector to responsibly usher in new innovations.”

-Rod Hochman, President and CEO of Providence

Driving Transformation with AI

Governance & Guardrails

Enterprise Platforms

Data & Engineering Services

Enterprise Partners

TRUVETA

NUANCE DAX Copilot

Epic

Copilot

Internally Developed Innovations in Production

MedPearl™

Conversational & Navigation Platform

Automated Realtime In-basket Assistant

ProvidenceChat

1 systemwide strategy for **responsible adoption of artificial intelligence**

3+ Coalition for Healthcare AI (CHAI) Trustworthy & Responsible AI Network (TRAIN) Cybersecurity and Infrastructure Security Agency (CISA)

4 Subject Matter **Expert domain work groups**

4 Internally developed generative AI solutions **in production**

50+/50+ **Physicians directly involved** in governance, ideation and development of solutions

Data Scientists and AI experts In USA and India

~15,000 Estimated **unique internal users** of AI solutions

Advanced Analytics & Research

Large Scale Implementation

Policy & Advocacy

Assist | Augment | Automate | Accelerate

Priority Areas

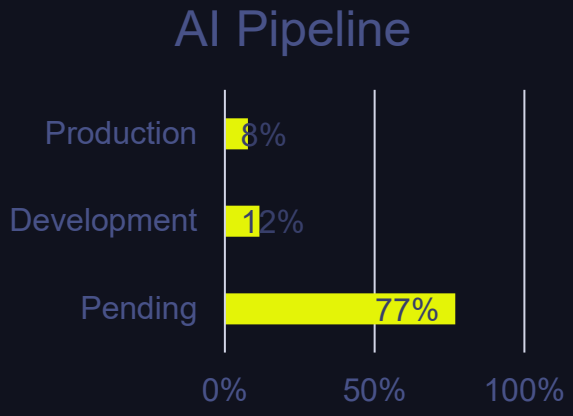
Clinical: Workflow optimization and support in documentation/charting and in-basket management

Patient/Consumer: Personalization and navigation for better self-service

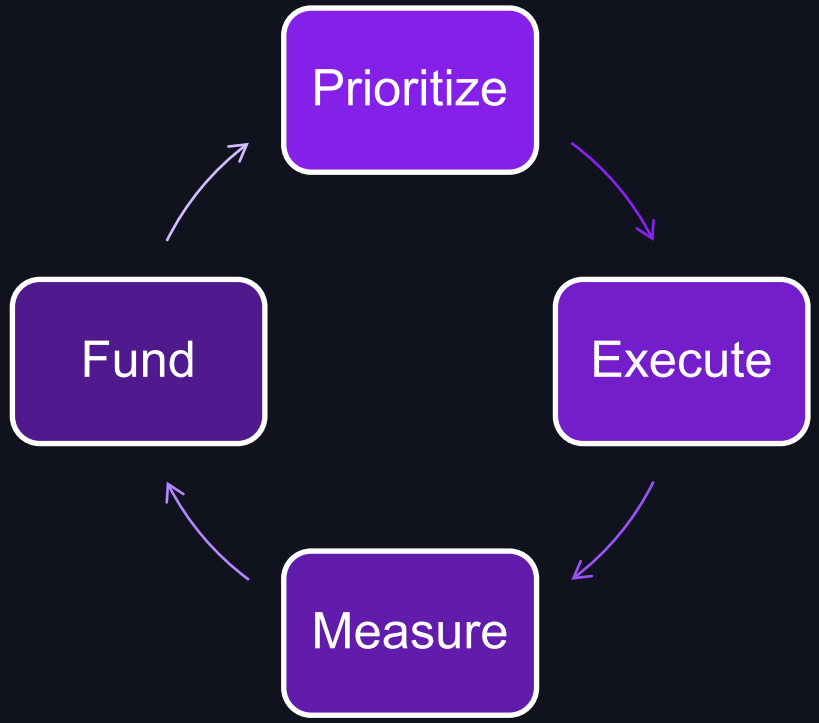
Back Office: Automation of processes that are not patient-facing / differentiating

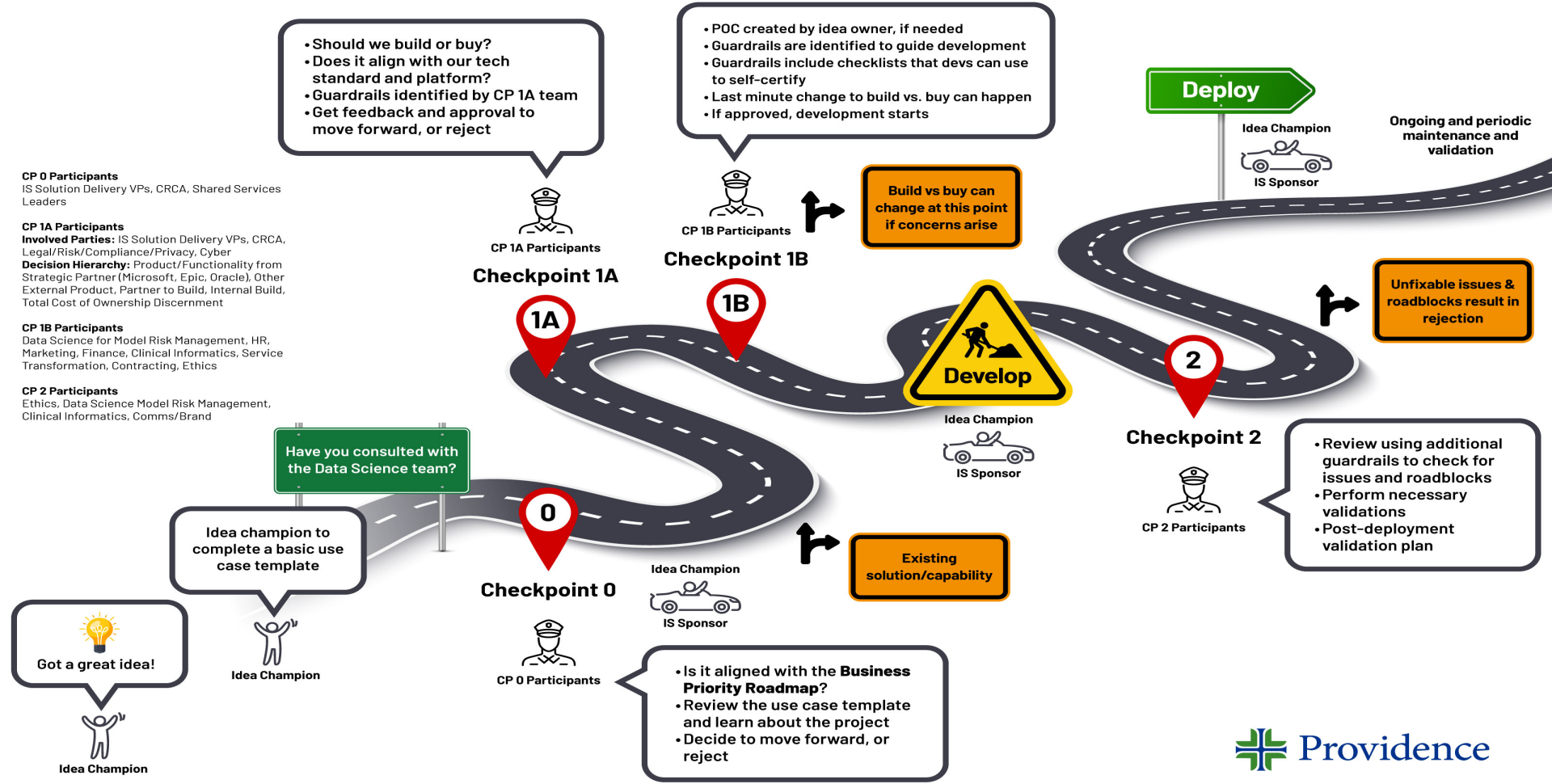
Workforce/Administrative: Augment our workforce to support productivity and reduce burden

A Tsunami of Opportunity



A Flywheel of Transformation





Checkpoints in AI Guardrails Process

Three Components of Model Risk Management (MRM)

Checkpoint 1B

- Checkpoint 1B is initial validation of the proof of concept (POC) for the internal and vendor AI/ML models.
- The advertised AI/ML performance metrics of the POC are validated and documented for future use.

Checkpoint 2

- Checkpoint 2 fully validates the AI/ML models after model development and before model deployment.
- Checkpoint 2 has three outcomes: the model is approved, the model needs improvement, and the model is not approved for deployment.

Model Monitoring

- Continuous model monitoring is performed after the model is in production to detect drift in model performance.

Development of the MLOps Platform

Objectives and MLOps Pillars

- Objective of MLOps Platform: Create a robust platform for developing, validating, and deploying a large inventory of AI/ML models at scale.

- Four Pillars of MLOps: Model development, model validation, model deployment, and model monitoring — with strategic partnership with Databricks for all four pillars.

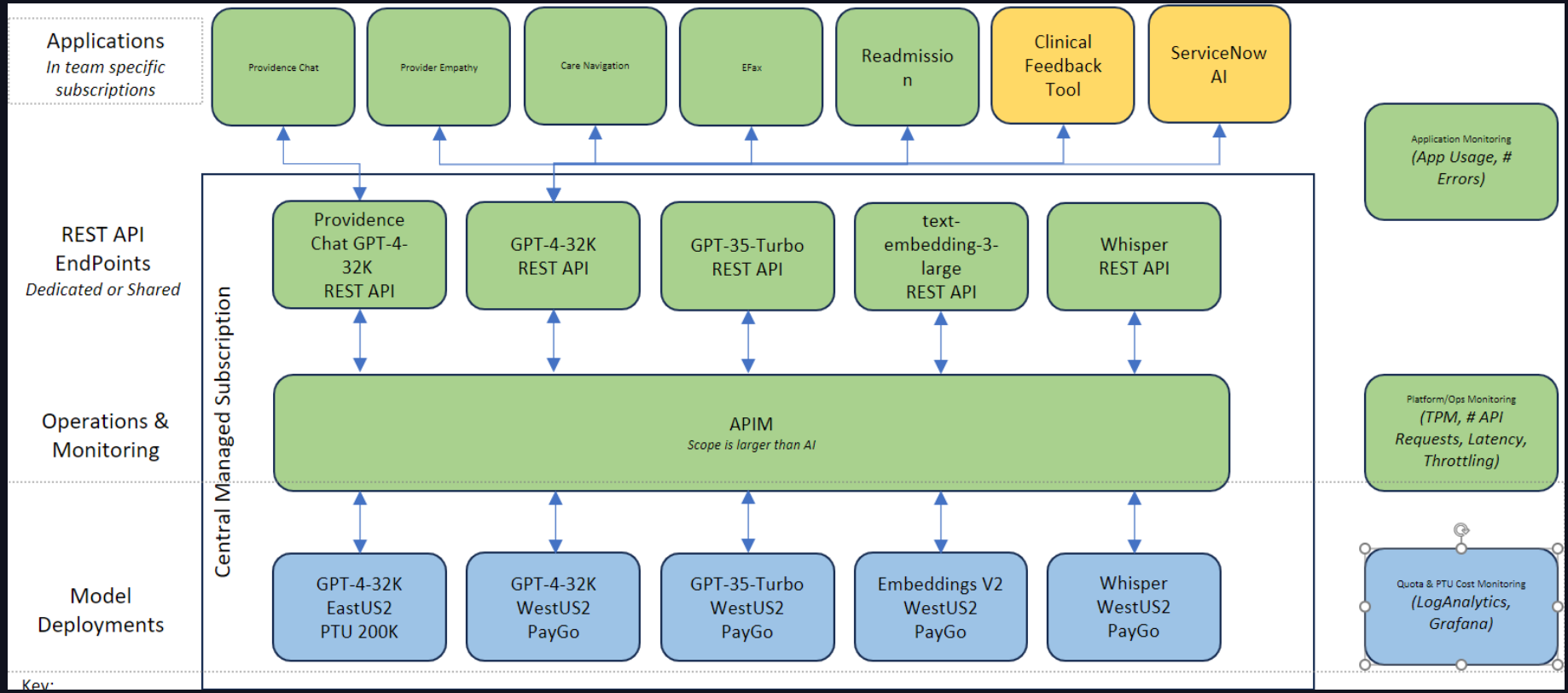
Databricks Serverless at Providence

- Databricks Serverless adds to the growing API ecosystem at Providence and extends the infrastructure needed to build AI Applications of the future.

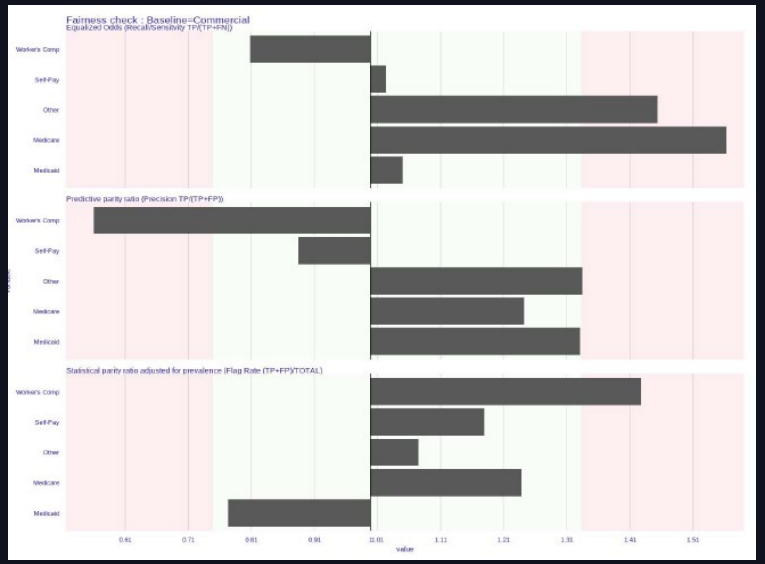
- Databricks Serverless allows us to convert our homebrewed traditional machine learning models and fine-tuned Large Language Models (LLMs) to API and share them across the enterprise.

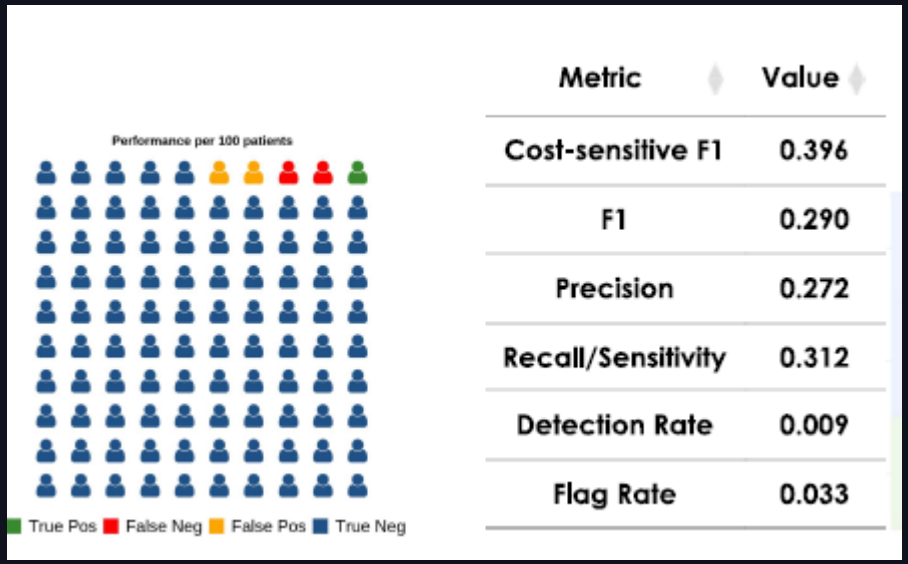
- Databricks Serverless enables the creation of API endpoints for open-source LLMs, thereby creating a low-cost alternative to OpenAI models.

Centralize AI Deployment



Model Fairness & Safety





Metric	Value
Cost-sensitive F1	0.396
F1	0.290
Precision	0.272
Recall/Sensitivity	0.312
Detection Rate	0.009
Flag Rate	0.033

Continuous Model Monitoring