Academic Data Hubs in the Era of Cloud and AI

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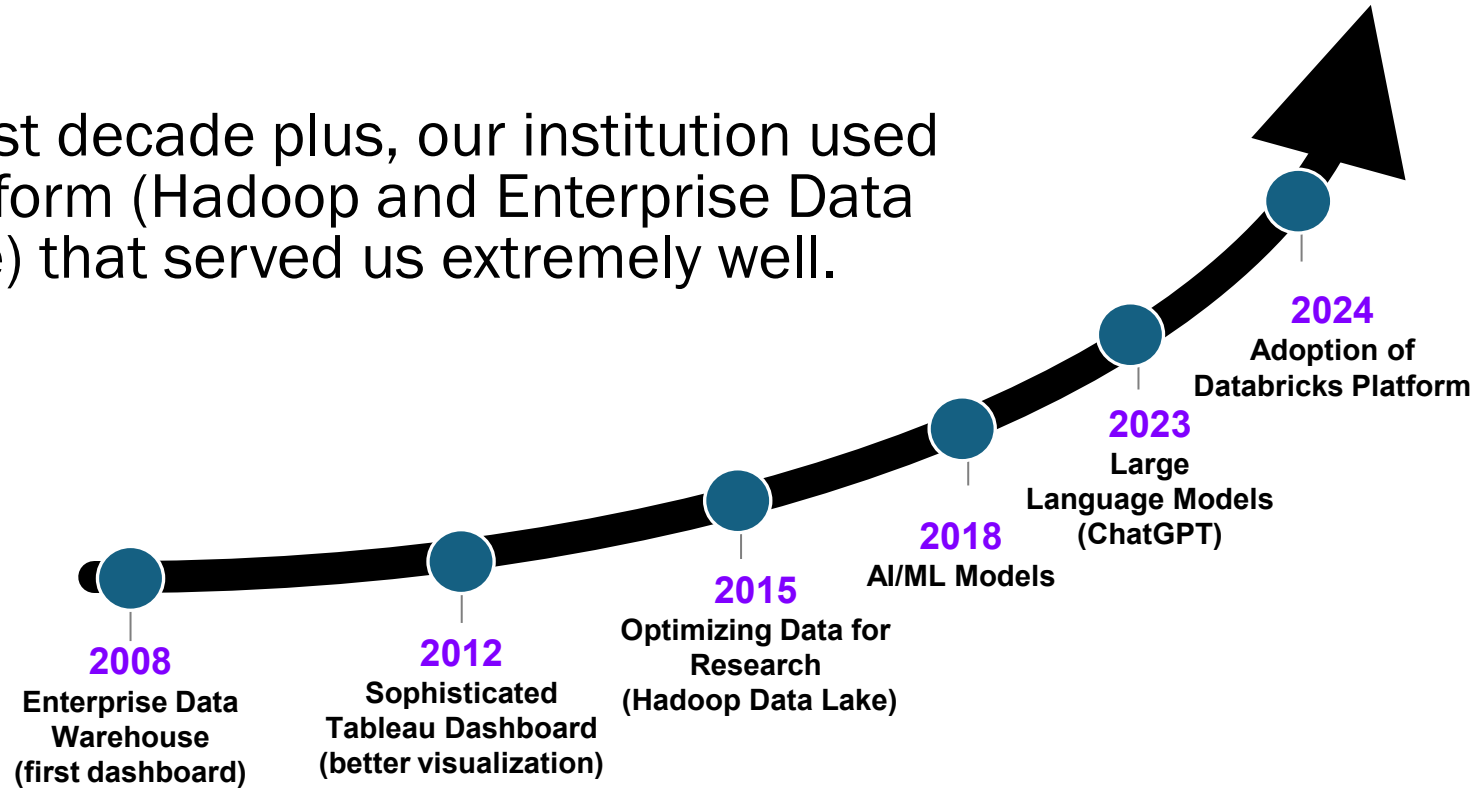
NYU Langone Health

Evolution of Data and AI at NYU Langone Health

We have a culture of data and metrics, using over 80+ dashboards and 750+ metrics.

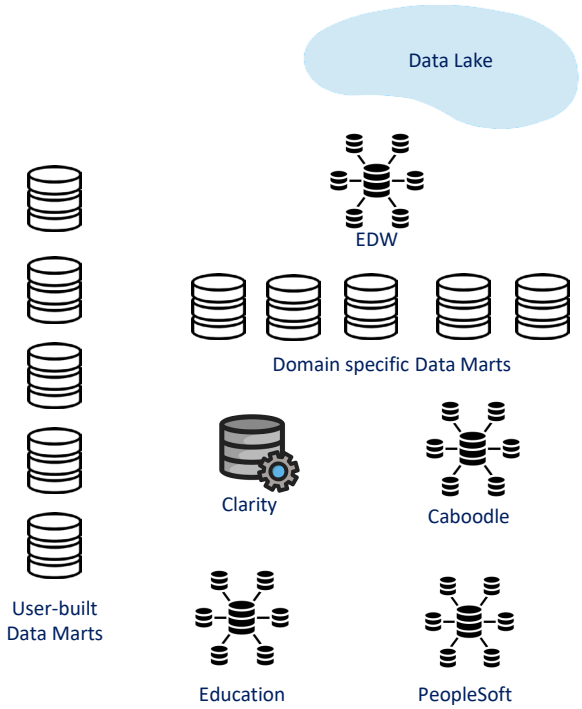
Over the last decade plus, our institution used a data platform (Hadoop and Enterprise Data Warehouse) that served us extremely well.



Now, we are moving toward a more robust cloud-based platform that can support our institutional aspiration for data analytics and AI

Why Data Modernization?

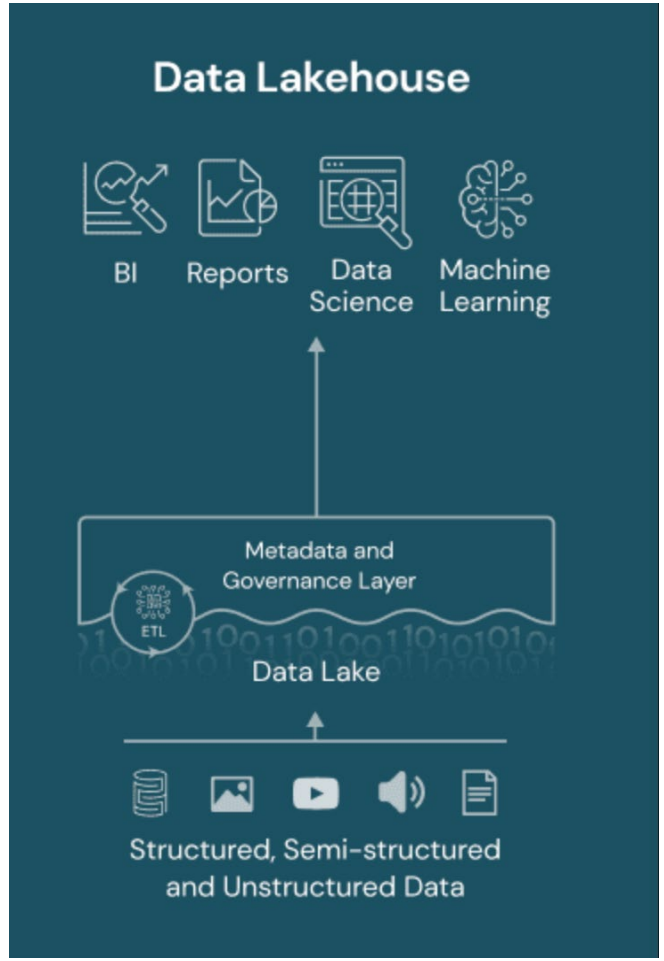
Legacy Architecture



- Multiple data warehouses/ Data Marts
- Siloed data sources
- Ad hoc governance, inconsistent policies, separately managed security
- Duplication of data
- Limited support for streaming
- Multiple databases and hardware to support
- Multiple ETL tools and security models

Modern Data Lakehouse Architecture

- Single platform to support data lake and data marts
- Eliminates need for siloed data
- Centralized governance and security
  Highly scalable
- Reuse data without copying tables
- Support for streaming and unstructured data
- Tools and optimized architecture for AI/ML/LLMs
- Easy to share data externally
- Time Travel



Unified Data Hubs: Data Repository + Data Governance + Data Services

- Integrated data across multiple data sources
- Documents, Images, Videos
- Real-time Data
- Data Governance
- Self-service Reporting & Analytics
- AI/ML

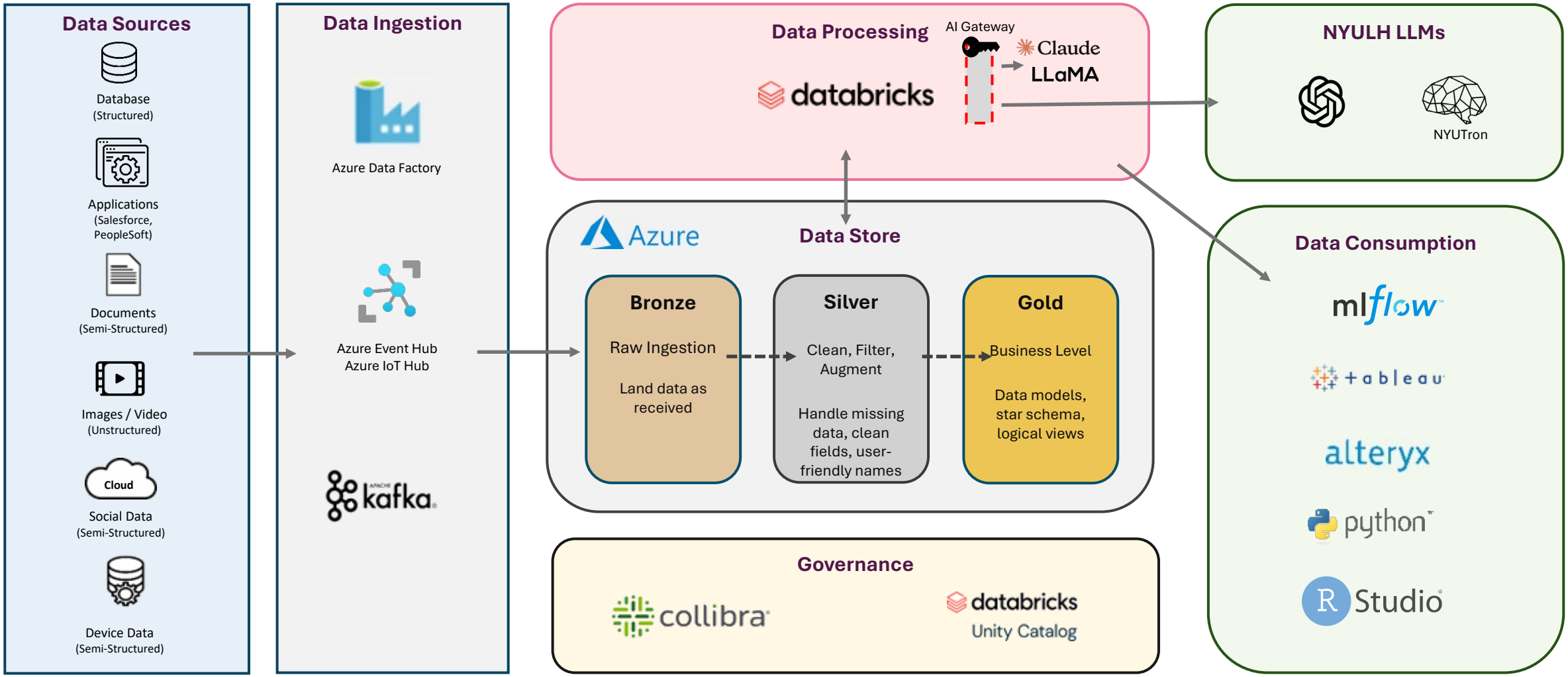
Reporting

- Dashboards
- Reports
- Analytics and Queries

AI Models

- Documentation
- Predictive
- Chatbots
- Clinical Analysis
- Other AI Models

NYU Langone Cloud Lakehouse Architecture



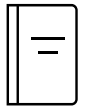
Data Governance and Management

Data Domains

Roles and Responsibilities

Approval Processes

Access Control



Data Catalogs/Metadata

Data Lineage

Data Certification/Quality

Education Key Initiatives

Precision Education & Learning for Students & Residents

Deliver personalized learning journeys driven by AI and clinical data:

– AI-powered feedback and advising
– Epic-integrated learning
– Personalized nudges and chatbots

Accelerated 3-year MD Curriculum

Support curriculum innovation using digital technologies, data, and AI to streamline:

– Innovative curriculum design & management
– Curriculum Evaluation and Quality Improvement (CQI)
– Student assessment & outcomes tracking

Education Digital Experience

Enhance digital experience for students, residents, faculty and staff:

– Modern platforms and tools for teaching & learning
– Improved Faculty experience
– Streamlined operations & support

Research & Innovation

Drive cutting-edge immersive training, educational research and AI-driven innovation:

– Evolving AI strategy
– Simulation & immersive technologies
– Rapid, Research-driven innovations

AI

Education + Clinical + Research Data

Evaluations & Assessments

- Exams (preclinical, shelf, USMLE, ITE, certification)
- OSCEs
- EPAs, OPAs, Milestones
- …

Experiences & Educational Exposures

- Case/procedure logs
- Simulations
- Curricular content, sequencing
- Advising, goals
- …

Transitions & Handovers

- Admissions: AMCAS, ERAS
- ILPs
- Coaching handovers
- …

Precision Education Data Hub

Trainees

Education Data ~~Warehouse~~ Hub

Data Scientists & Informaticists

Clinical & Educational Experts

Programs

In-Training Clinical Data

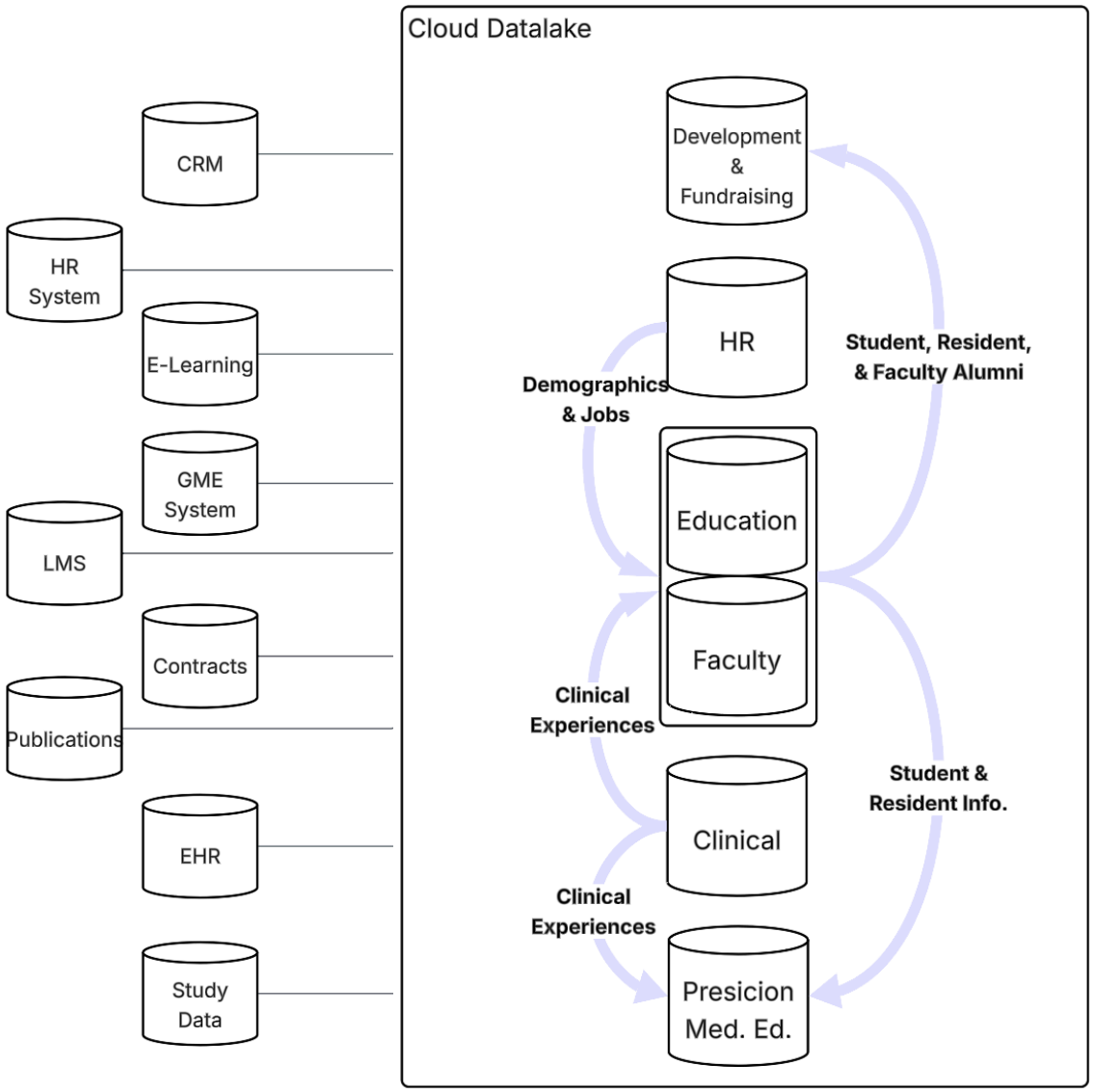
- EHR metadata (e.g. Signal)
- Diagnostic exposures
- Attributable care measures (RSQMs, TRACERs)
- Traditional CPMs (e.g. HEDIS)
- …

Unsupervised Practice

- Claims-based practice patterns
- Faculty appointments
- Research grants
- Workforce measures
- …

Our Data Hubs

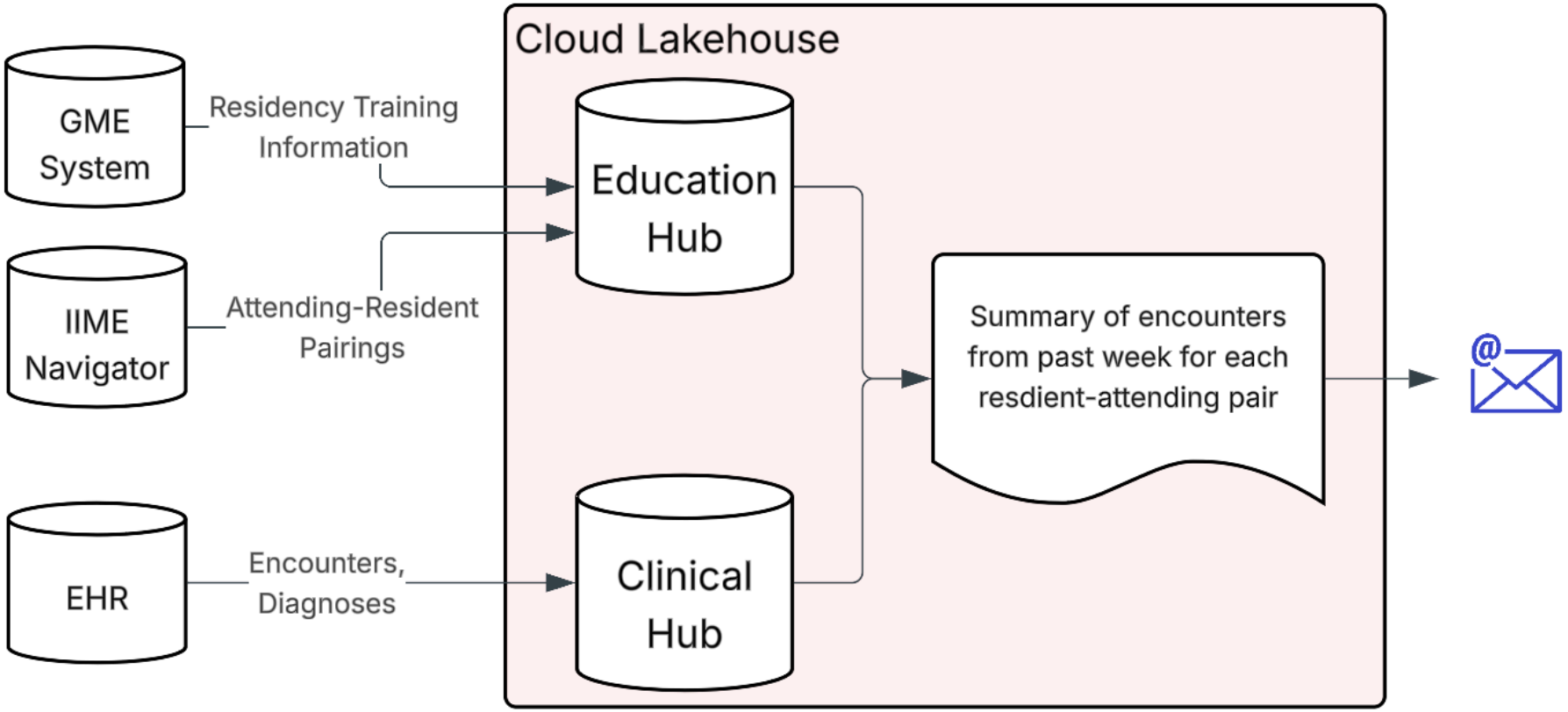
Data Engineers + Data Stewards + Business Owners



Case-Based Precision Feedback

Challenge: End of rotation feedback can be generic, and it is difficult to recall specific instances

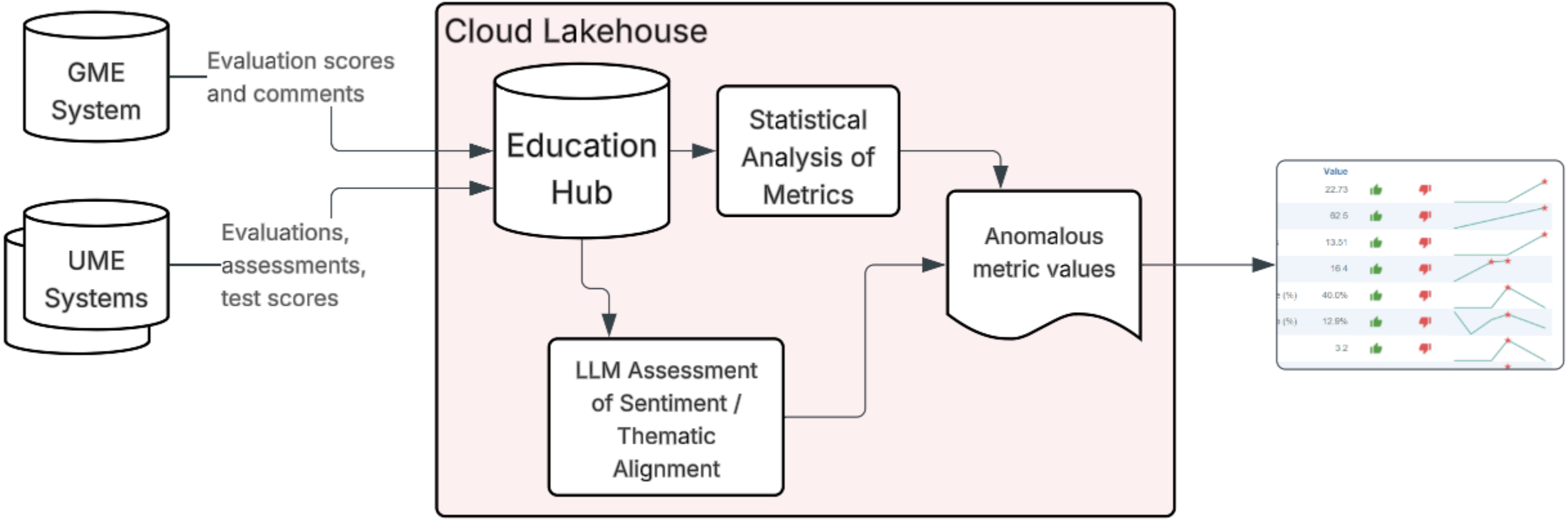
Solution: Prompt attendings to provide feedback on individual cases while providing the details of those cases in a weekly digest



AI-Supported Education Metric Alerts

Challenge: With numerous metrics from UME and GME, covering evaluations, assessments, and outcomes, it is nearly impossible to review them all

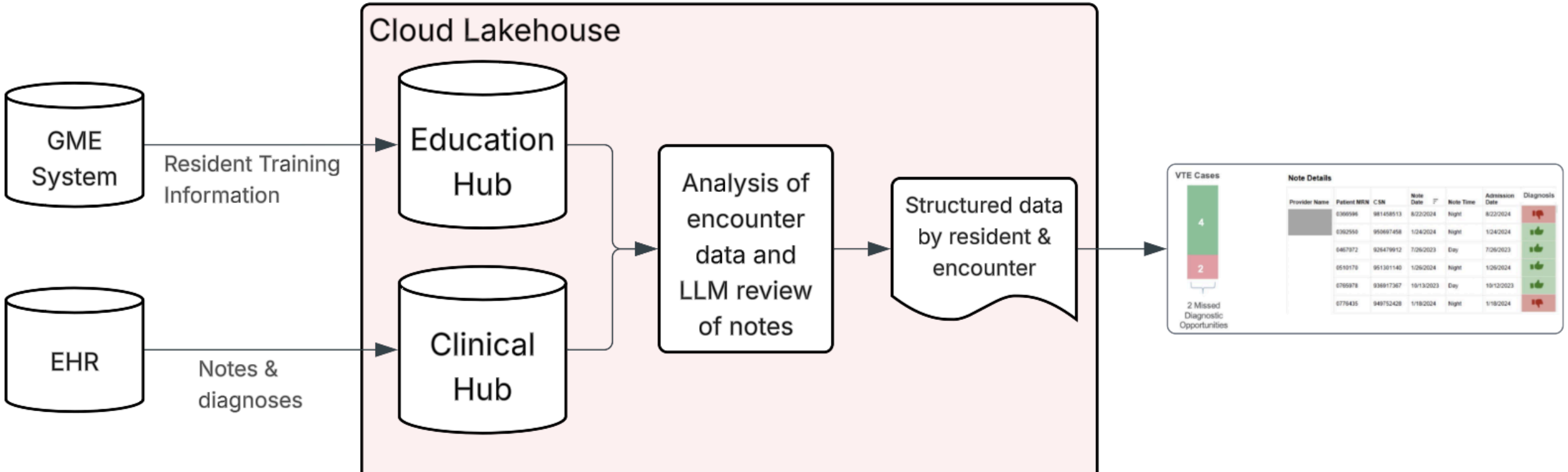
Solution: Provide alerts for existing metrics, analyzing for anomalies, plus process unstructured data to gain new insights



DxAID Research Project

Challenge: Residents working patient admissions do not always see the full encounter and later diagnoses that might have been identified earlier

Solution: Track patients receiving specific diagnoses (e.g., VTEs) later in the encounter and alert the residents; share analysis of admission notes and testing patterns

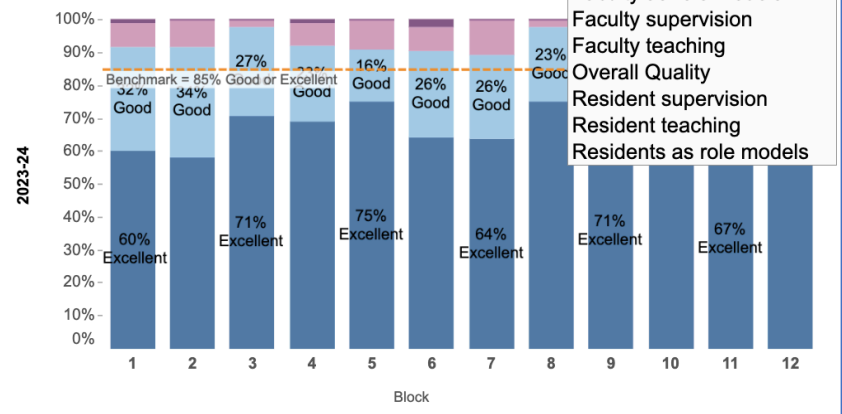


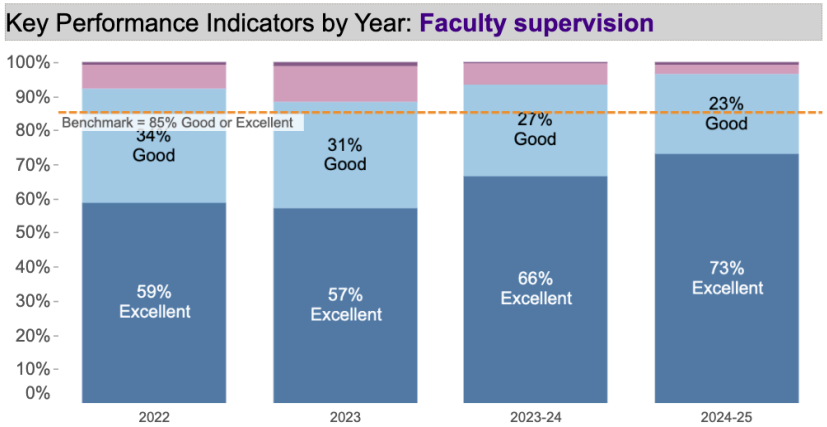
Natural Language Query (Genie)

Student Rating of Selected Clerkship Quality

Core Or Advanced: Core | **Clerkship:** (All) | **Clerkship Year:** 2022 | 2023 | 2023-24 | 2024-25 | **KPI:** Faculty supervision

	Key Performance Indicators	Selected Clerkship YTD	All Clerkships YTD
	Overall Quality	96%	96%
	Faculty supervision	93%	93%
	Faculty as role models	99%	99%
2023-24	Resident teaching	97%	97%
	Resident supervision	97%	97%
	Faculty teaching	96%	96%
	Residents as role models	98%	98%





what is the average score for the faculty role models question for each clerkship in 2024?

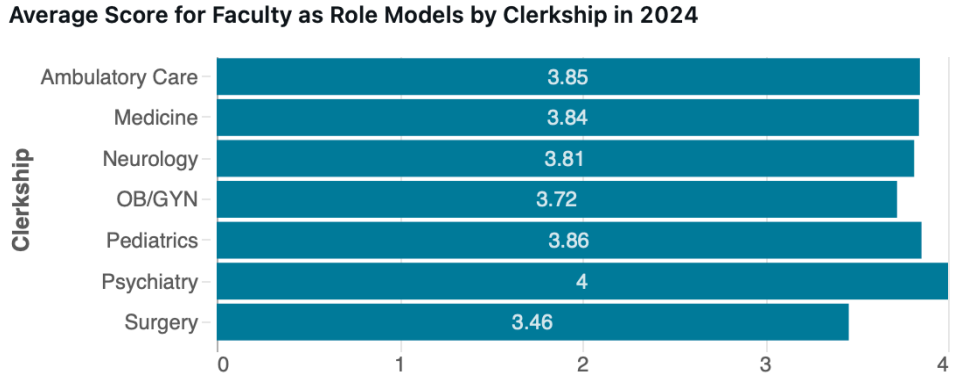
This analysis provides the average scores for the question regarding "Faculty as role models" across different clerkship departments for the academic year 2024, focusing solely on Core clerkships.

clerkships_genie_demo_v | what's the distribution of respo...

7 rows | Add as instruction | Show code

	department_name	average_score
1	Ambulatory Care	3.85
2	Medicine	3.84
3	Neurology	3.81
4	OB/GYN	3.72
5	Pediatrics	3.86
6	Psychiatry	4
7	Surgery	3.46

Can you make a horizontal bar chart with labels?



NYU Langone Health

COACH AI

COACHING PORTFOLIO | NOTES AND MEETINGS | COACH AI Beta

These AI generated responses may contain errors, be out of date, or may produce inaccurate information about people, places, or facts. Do not rely on the responses from this system without doing your own independent research.

Academic Performance Analysis

This student has demonstrated exceptional academic performance, consistently ranking in the top quintile of their class. Their average exam score of 95.151% is significantly above the class average of 92.3%, and their Step 2 score of 276.0 is well above the average for competitive specialties. They have achieved honors in all seven clerkships, indicating strong clinical performance. Faculty comments highlight their exceptional clinical skills, intellectual curiosity, and professional behavior. Areas for improvement include asking more discussion-oriented questions and making presentations more concise.

Strategies for Student Goals

Although the student has not set specific goals, their strong interest in Ophthalmology is evident. To further enhance their candidacy, they should:

- Engage in more Ophthalmology-related research and seek opportunities for publications.
- Continue to build strong relationships with faculty and mentors for robust letters of recommendation.
- Participate in Ophthalmology interest groups and attend relevant conferences to expand their network.

Competitiveness for Residency Application

Neurology

The student is highly competitive for Neurology, given their top quintile academic performance and strong clinical evaluations. Their Step 2 score of 276.0 far exceeds the average of 250.79 for successful applicants from NYU. They have completed a Neurology elective, which aligns with the recommended exposure. To further strengthen their application, they should consider engaging in Neurology-related research and securing strong letters of recommendation.

Ophthalmology

The student is a strong candidate for Ophthalmology, with a Step 2 score of 276.0, well above the average of 252.91 for successful applicants. They have completed multiple Ophthalmology electives and research, demonstrating a clear commitment to the specialty. To enhance their competitiveness, they should aim to complete at least two away electives, as this is the average for successful applicants. Additionally, they should focus on obtaining strong letters of recommendation and consider leadership roles in Ophthalmology-related activities.

Summary Recommendations

- Encourage the student to engage in more Ophthalmology-related research and seek publication opportunities.
- Advise the student to complete at least two away electives in Ophthalmology to align with successful applicants.
- Support the student in obtaining strong letters of recommendation from faculty and mentors in their chosen specialties.
- Recommend participation in Ophthalmology interest groups and conferences to expand their professional network.

The content on this page was AI-generated on 03/04/2025

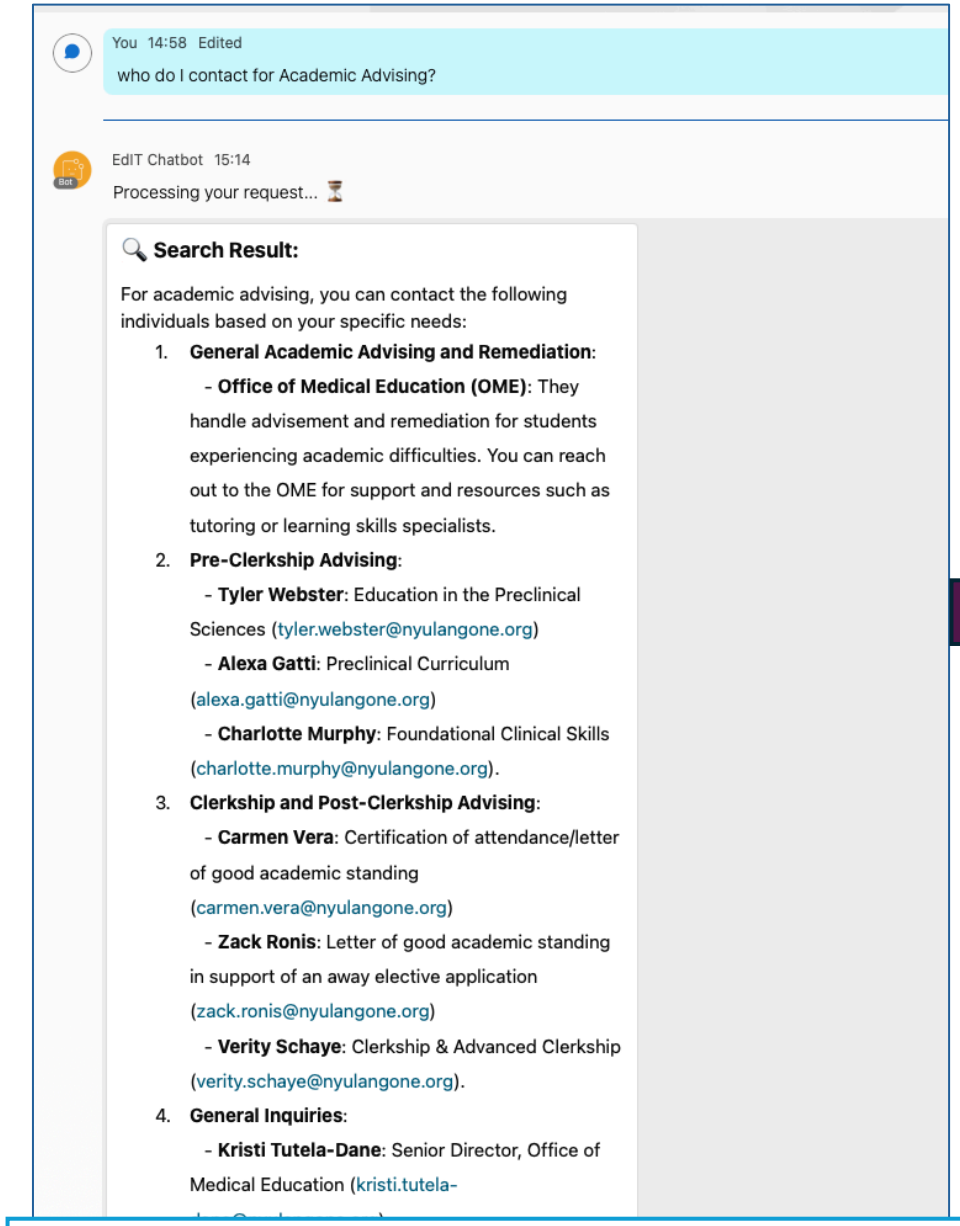
Synthesizes student / resident data:

- performance
- narrative assessments
- specialty selections
- research interests
- clinical experiences

→ Generates specialty recommendations & learning plans

+ OSCEs, Patient Encounters, Feedback Sessions, CCCs…

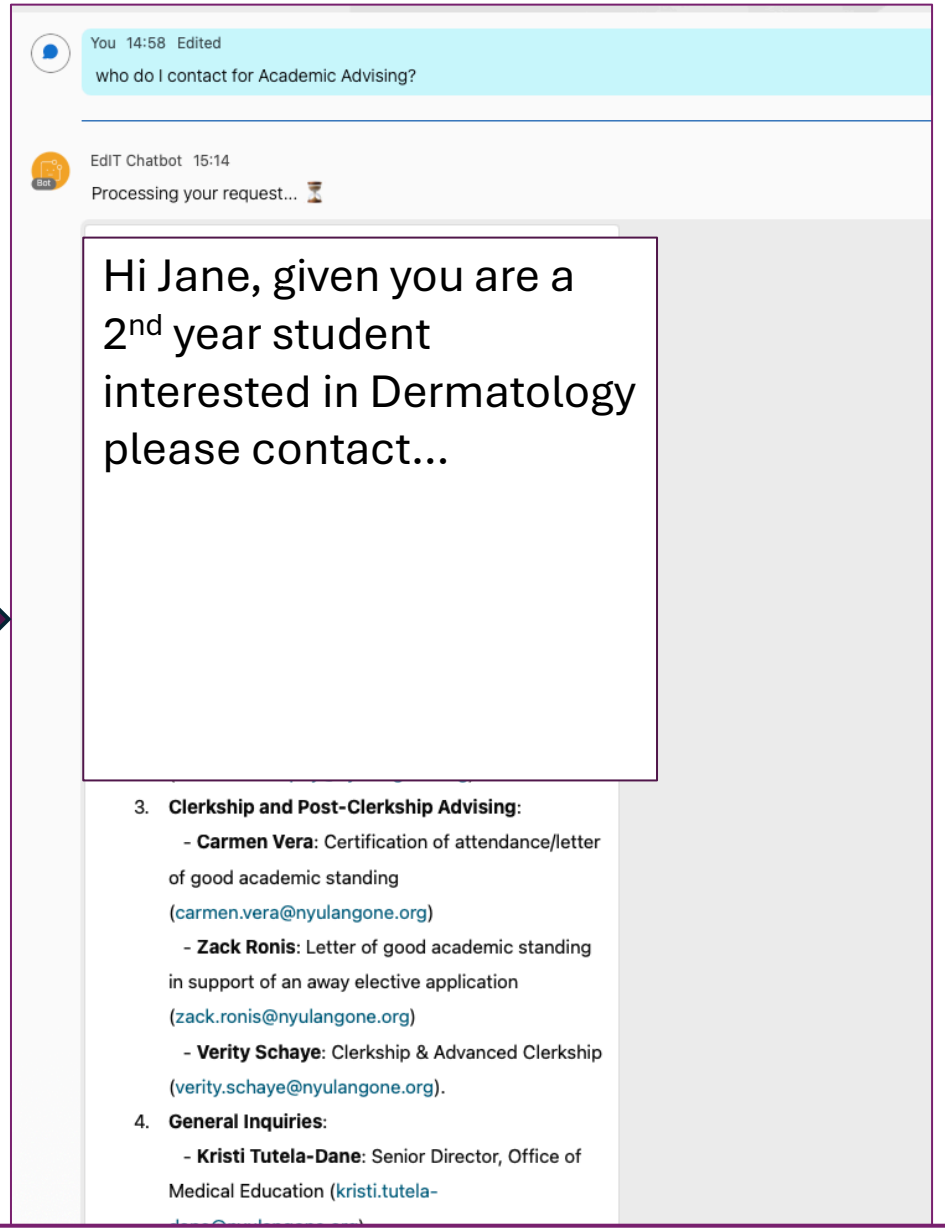
Student InfoBot



General Curriculum, LMS, Contact List...

Personalized

Student Assistant Bot

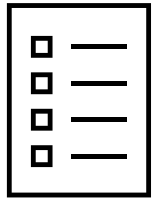


+ Student status, Interests, Performance, Experience

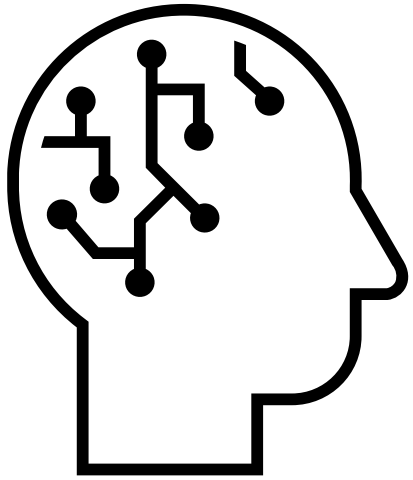
AI – Driven Curriculum Monitoring

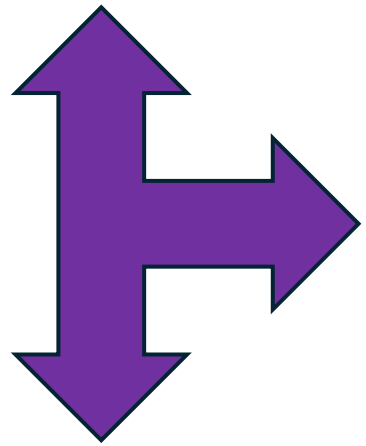
Lecture Materials & Delivery

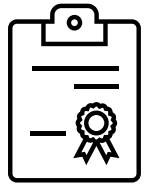
Clinical Teaching



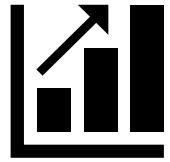
Assessment Habits







Quality



Feedback

Lessons Learned / Challenges / Our Approach / Successes

- Challenge: Education is always at the bottom of the priority list
- Our Approach: be a pioneer, insert yourself/your team into the process, be the Guinea pig, drive the priorities

- Challenge: new platform = new skills to learn = change management
- Our Approach: Educate your stakeholders, explain "why", show the possibilities, get them excited

- Have Fun! Be passionately contagious!

Thank you!

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