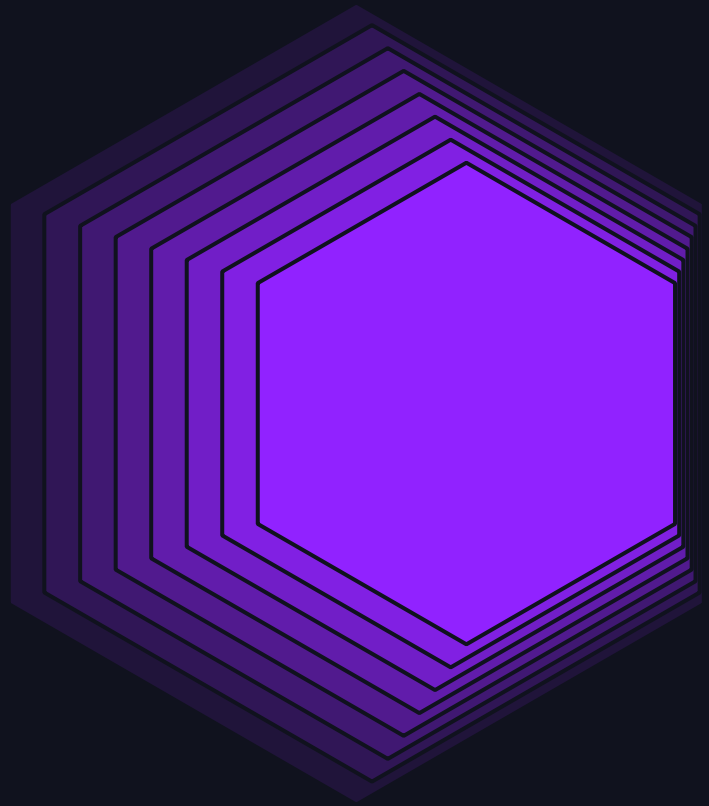
DATA+AI SUMMIT BY databricks

POWERING THE NEXT-GEN GLOBAL MEDICAL AFFAIRS



Mathias Faux (Vertex Pharma) | Unmesh Kulkarni (Tredence)
June 13, 2024

YOUR SPEAKERS TODAY

VERTEX

MATHIAS FAUX

Director of Analytics and Innovation – Medical Affairs

TREDENCE

Unmesh Kulkarni

Senior Vice President Generative AI

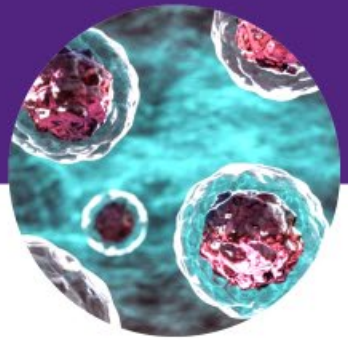
WHAT WE ARE GOING TO COVER

1. Introduction of Vertex and Tredence
2. Orientation of the role Global Medical Affairs plays
3. The business problem
4. Hi-level solution and architecture
5. Learnings through the journey

WE ARE VERTEX

We invest in scientific innovation to create transformative medicines for people with serious diseases with a focus on specialty markets.

Patients are at the heart of everything we do



We strike at the core of serious diseases to change people's lives

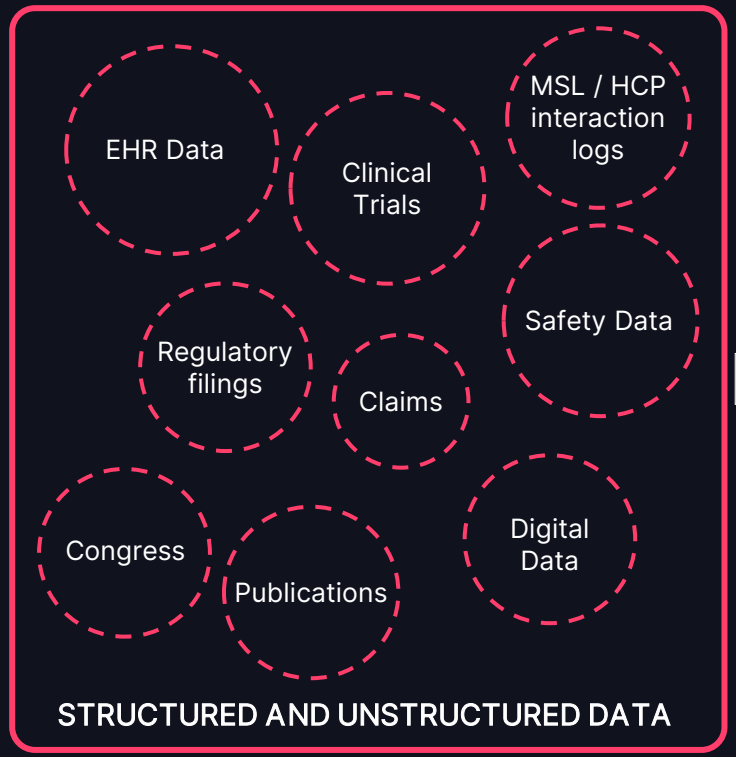
We're not afraid to take on the impossible

For the lives we have changed and for those who are still waiting, we will never stop fighting until we discover cures.

MEDICAL AFFAIRS - THE BRIDGE BETWEEN SCIENTIFIC EXCELLENCE AND PATIENT VALUE

Medical Information, Communication, and Education	Stakeholder engagement	Insight Generation
Disseminate accurate, up-to-date medical and scientific information and lead educational healthcare initiatives	Build and maintain relationships with Key Opinion Leaders and other stakeholder in the medical and scientific communities	Generate insights and inform research and commercial strategy

WIDE VARIETY OF DISPARATE DATA SOURCES ARE LEVERAGED TO GENERATE INSIGHTS



INSIGHTS / EVIDENCE

- Market Trends
- Competitive Intelligence
- Evidence Generation
- Clinical Practice Trends
- Scientific Exchange
- Physician Feedback
- Post-Market Surveillance
- Omnichannel Optimization

ABOUT TREDENCE

Who we are...

7 Business Verticals

8 Practices (DE, DS & AI CoE, CXM, ML Ops, SCM, IoT, Studio)

94% NPS

104 Customers
6 out of Top 10 fortune 500

2500+ Members
1200 DE practitioners
600 DS practitioners
300+ BI practioners
200+ Industry SMEs
200+ functional SMEs

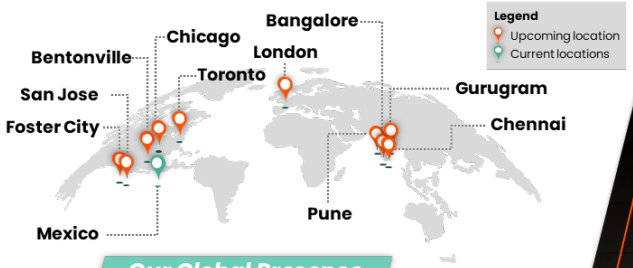
Great Place To Work. Certified FEB 2023 – FEB 2024 INDIA

Inc. 5000

Fastest Growing
US private companies
7 years in a row

FORRESTER WAVE LEADER 2023
Customer Analytics Service Providers

Gartner
"Market Guide for Data Analytics & Intelligence Platforms in Supply Chain 2024



Our Global Presence

What we do...

Data Foundation
Enable data foundation to help harness full potential of data assets

Platform Support & Governance
Built infrastructure for effective data management & analytics, driving data quality, privacy, security and operational efficiency

BI and Analytics
Harness full potential of data through actionable customer insights from the reporting layer.
AI CoE: ML Anomaly engine, Conversational AI

AI and GenAI
Data Foundation & LLMOps Framework for GenAI
GenAI Foundry & Factory to enable use case led rapid prototyping to LLM productionalization

How we differentiate...

Atom.ai
Sancus D-Quest Data Quality
ML Works
T-Ingestar
Customer Cosmos

Our Accelerators

dbt
databricks
Alation
salesforce
aws
Google Cloud Platform
Azure
SAP

Our Partners

VERTEX
CVS
Lilly
Walgreens
BSV bringing life to life
MILLENNIUM PHYSICIAN GROUP

Marquee HLS Clients

WE SELECTED TWO AREAS TO PROVIDE 10X PRODUCTIVITY LIFT

HANDLING MASSIVE UNSTRUCTURED DATA

Problem Statement: Large amount of scientific knowledge is trapped in:

- **50K+** MSL/HCP conversations logged in CRM
- **100K+** scientific publications
- **2K+** Clinical trial narratives
- **5M+** social media conversations from top HCPs
- **10K+** congressional excerpts
- **6K+** internal reports / surveys

Knowledge is getting created and made available at 20 times the speed at which Medical Directors and scientists can process it. They spend 100s of hours to go over the corpus manually to search for information

KOL IDENTIFICATION FROM A VAST HCP NETWORK

Problem Statement: Vertex Pharma is making a strategic pivot from rare therapies (like CF and SCD) to mass-market therapies with acute pain

- **92K** patients → **80M** patients
- **Home** settings → **2000+** hospitals/**150+** IDNs
- **10K+** physicians → **280K** physicians
- **10 times more HCPs** to cover per MSL

MSL capacity is limited to target such a large HCP population. There is a need to algorithmically determine the right KOLs (“top voices”) who can influence a large number of HCPs in their communities.

DEVELOPED SOLUTIONS THAT INVOLVED NLP, MEDICAL LLMS, AND GRAPH NETWORKS

HANDLING MASSIVE UNSTRUCTURED DATA

Solution: Leverage NLP techniques and proven medical LLMs on the large unstructured corpus.

Developed a smart natural language Q&A engine for the Medical Directors and scientists that allows

- searching and asking scientific questions
- answers with reference to the documents / notes
- summaries across multiple document sources
- emerging topic detection

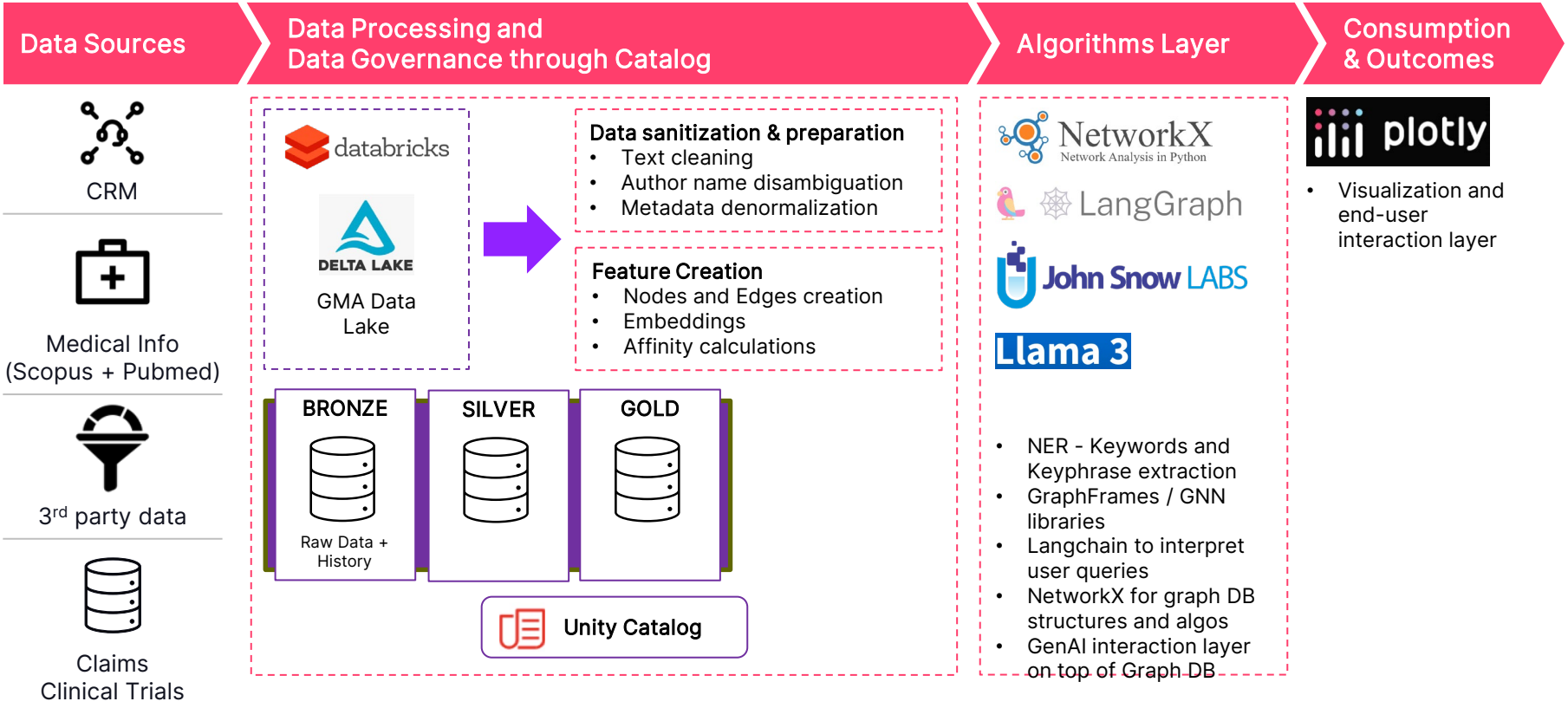
KOL IDENTIFICATION FROM A VAST HCP NETWORK

Solution: Leverage the power of graph networks to connect the large number of HCPs using their hospital affiliations, co-authoring of papers with peer HCPs and so on

Developed a KOL mining solution with pre-built graph models for the data analysts to:

- select publications for specific therapy area, geo
- cleanse and transform the publication metadata
- run the pre-built graph analytics algorithms
- detect communities of HCPs
- detect influential HCPs (KOLs)
- ranking of Vertex literature compared to peers

ILLUSTRATIVE HI-LEVEL ARCHITECTURE



KEY LEARNINGS WITH AI-POWERED APPS

Start from the business goal	• Clear understanding of the end-user personas and the types of insights to be delivered • How would the insights be leveraged by business users • Estimate the impact on business metrics from leveraging the insights produced by the solution
Invest in Data Governance – clean data is key	• List all the internal and external data sources – evaluate feasibility to procure each data source • Thorough EDA on each source (quality, relevance, ability to join, etc) before accepting into the mix • Use a data catalog (like UC) for governance • Spend time in automatically collecting, cleaning, joining and modelling the various datasets
Real-world validation and fine-tuning	• Starting with a prototype / MVP is key to win end-users trust before investing in scale • End users who "act" on the insights must provide feedback on its real-world usefulness • Fine-tune the algorithms based on feedback • Design for automated feedback capture and adjusting the algorithms in the long-run
Design for reliability – repeatable responses	• Regulated domains require responses to be same for same / similar questions • Effective prompt engineering vital for predictable high-quality responses • Create pre-built prompt libraries - map the incoming prompts to one of the pre-built prompts • Control for hallucinations and have no response when outside of prompt library

KEY LEARNINGS

Design for flexibility – leverage multi-LLM	• Different LLMs excel at different tasks -text generation, summarization, translation, sentiment analysis, etc • Design for multi-LLM architecture to classify requests, route to appropriate LLMs and aggregate responses • The space is rapidly evolving - regularly evaluate response quality and add / update new or existing LLMs
Design for efficient API cost economics	• Have a thorough understanding of cost of each data source, API calls, cloud services • Deploy design patterns that caches results locally for limited time and avoids repeated API calls • During POC phase, study the cost drivers and design for avoiding redundant costs

IMPACT POTENTIAL

70-80%	Reduction in manual efforts of medical directors and scientists to extract information from thousands of literature artefacts
40-50%	Increase in MSL efficiency as they get summaries of key scientific topics before they meet their target HCPs
15-20X	Boost in reach as MSLs target the most influential KOLs identified with the help of network algorithms. Also reduce overlap with commercial teams in HCP reachout
DISCOVER UNKNOWNS	Unknown topics / new correlations were unearthed from the vast literature mined

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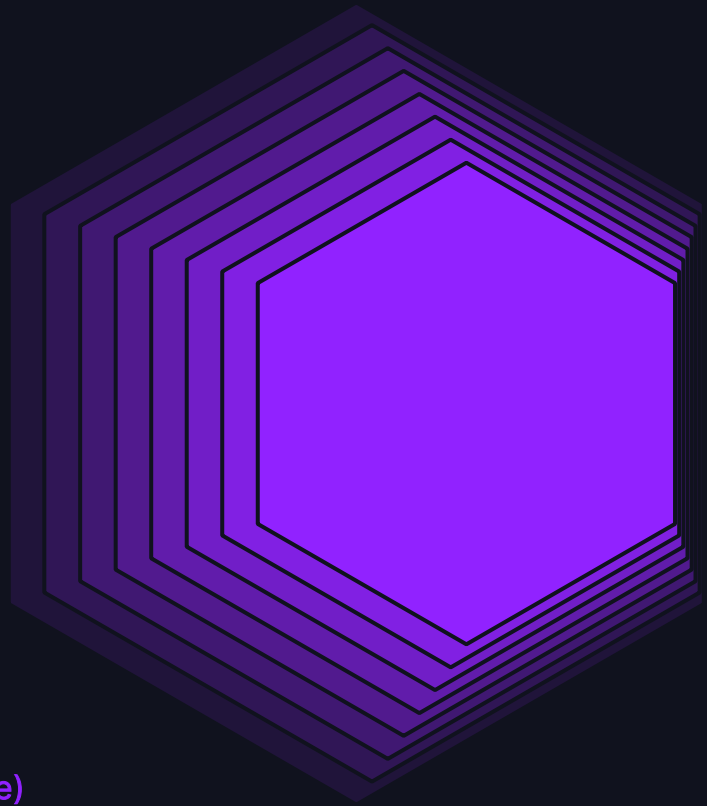
THANK YOU



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JUNE 2024