

A healthcare professional in blue scrubs is using a tablet in a hospital setting. The background is slightly blurred, showing a hospital bed and other medical equipment. The text is overlaid on the image.

# Using health care data for analytics and research

Jeremy Petch, PhD

Director, CREATE, Hamilton Health Sciences

Assistant Professor, University of Toronto

# CREATE (CentRE for dAta science and digiTal hEalth)

CREATE was founded to support innovation and research at Hamilton Health Sciences.

Our multidisciplinary team is made up of specialists in health systems, data engineering, data science, software engineering and interoperability.

Our mission is to partner with scientists and innovators to invent the future of health care.

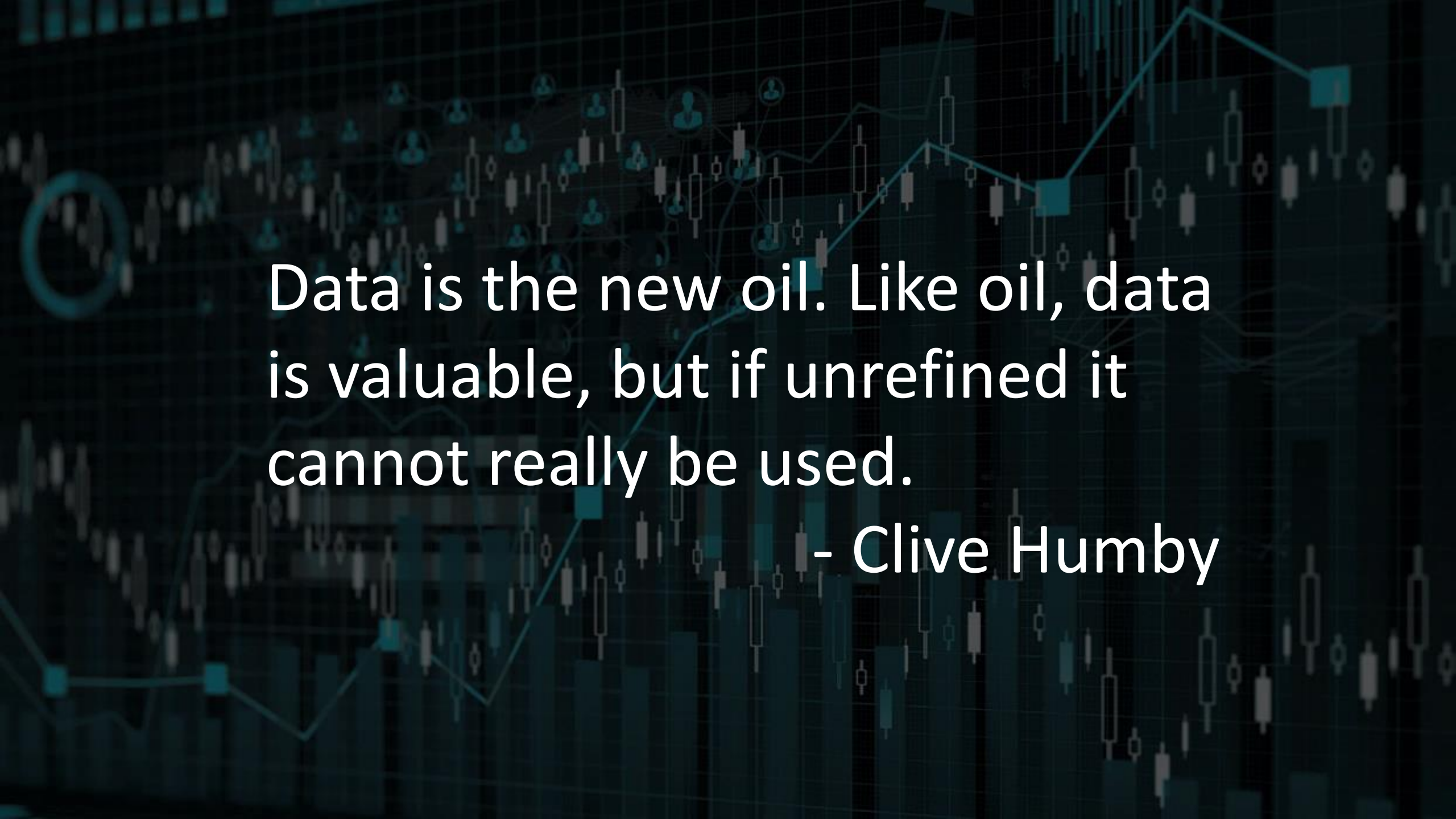


**Warning: Cliché incoming**





Data is the new oil.



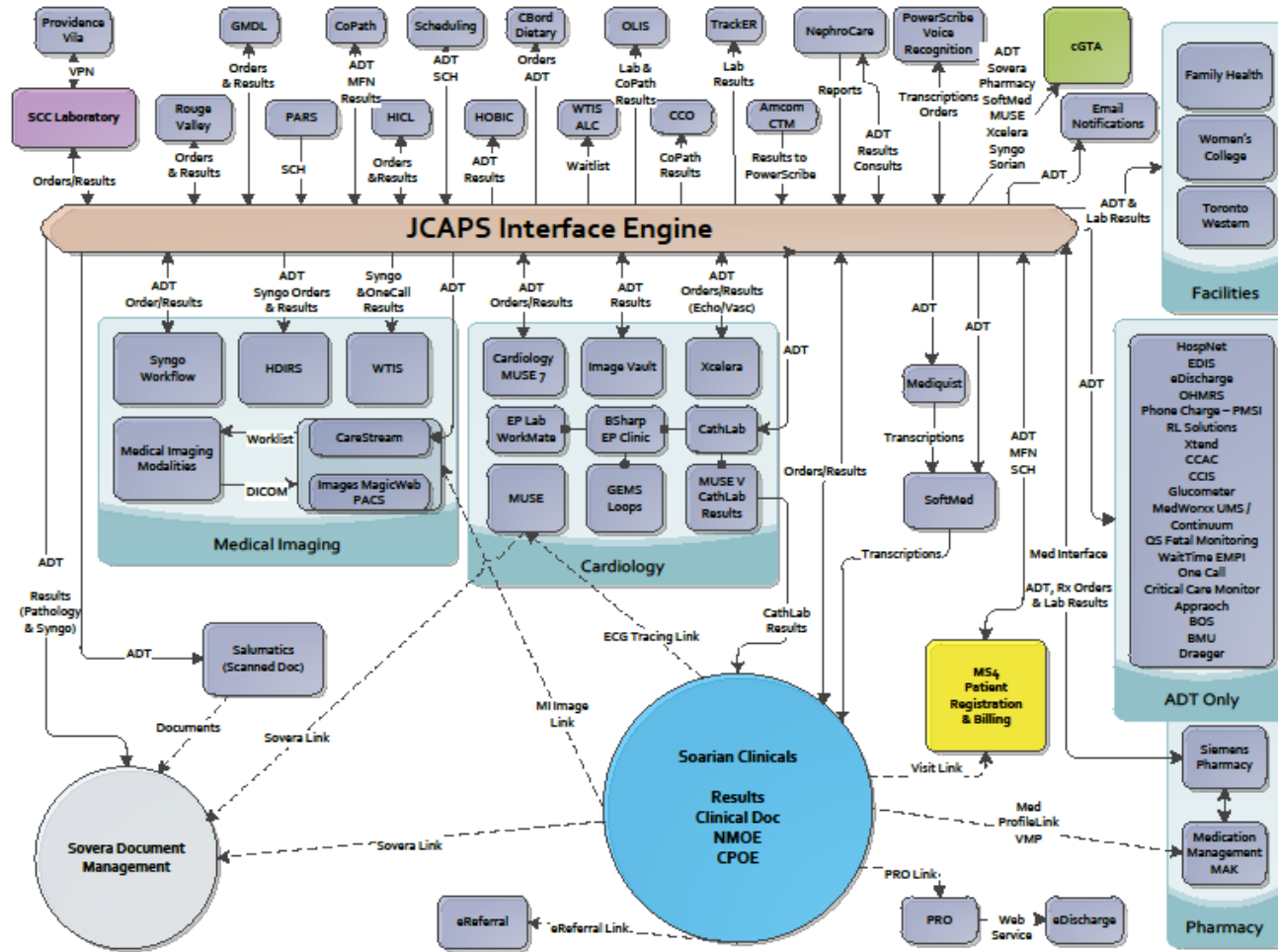
Data is the new oil. Like oil, data is valuable, but if unrefined it cannot really be used.

- Clive Humby

**What does it take to turn routinely collected health care data into something useful?**



# Information flows at modern hospitals are complex



# At many organizations this leaves data siloed



**In some organizations, including primary care,  
accessing data directly is impossible**



# Granular clinical information is often in free text

Dear Dr Doctor

Mr I. Person was seen in the Tuberculosis clinic Oct 20, 2016, with the aid of an interpreter. He is a 75 year old Tagalog speaking man who presents with symptoms and imaging suggestive of active pulmonary TB.

Mr Person has had a cough “lifelong”. Over the past 6 to 7 months it is increasing in frequency and severity, and is now accompanied by shortness of breath. It is non-productive; there is no fever, chest pain, hemoptysis, night sweats or changes in his weight. His appetite remains intact, but his energy level is diminished. He typically can walk an 18 hole golf course to play a round; this summer he had to take a golf cart due to shortness of breath and disabling fatigue.

He presented to you approx. 1 month ago. A CXR was reported as showing a left upper lobe infiltrate. A course of moxifloxacin was administered with slight symptomatic improvement. A repeat CXR revealed non resolution of the infiltrate and the reporting radiologist included the possibility of TB in the differential. He presents today for urgent assessment.

Mr Person was born in the Phillipines, and immigrated to Canada in 1999. He has a past history of previous TB approximately 40 years ago, which was treated in the Phillipines for a number of months. He is unable to recall the names of any of the drugs or the specific duration of therapy. He is otherwise well and denies any chronic illness, or maintenance medications, although prior to his visit to yourself in the walk in clinic, he had not sought medical attention since arrival in Canada. He has no known drug allergies.



# User variation exists even within a single group practice



# Warehouses and lakes



# Why does data integration take so much time and money?



What the CTO thinks a data warehouse build should be like



What a data warehouse build is actually like



# Can we make money off this?!?



# Multi-center research amplifies all these challenges



# Federate learning isn't the "Holy Grail" for solving the challenges of multi-center data usage



