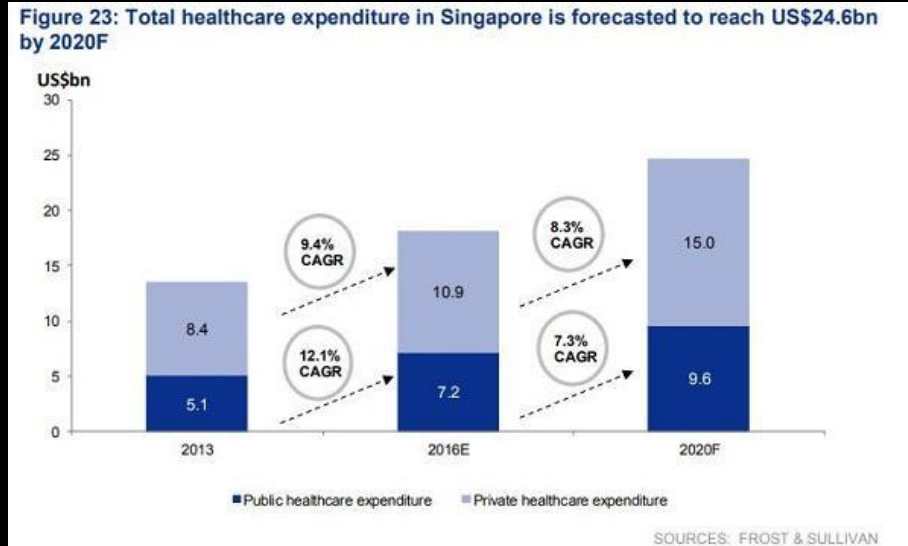


Powerful Outcomes Data and AI in Healthcare



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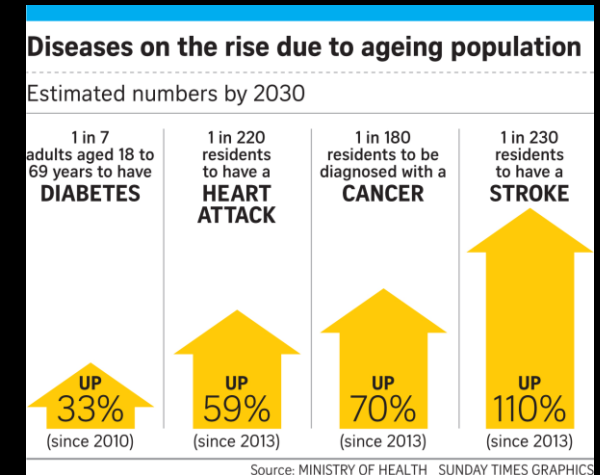
1. Singapore's healthcare expenditure to hit US\$24.6b by 2020



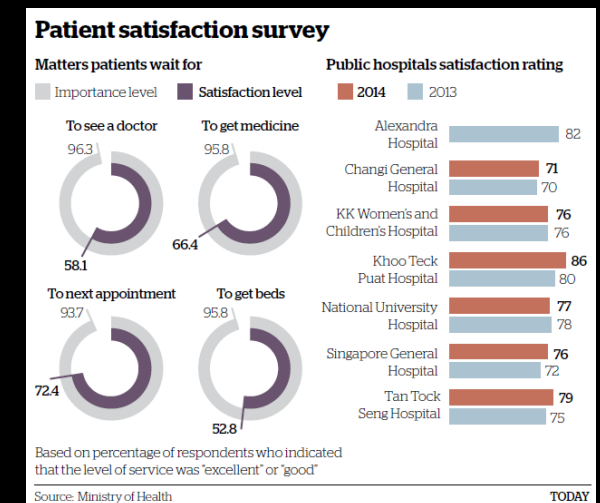
Singapore PM warns that healthcare spending is rising faster than GDP

The government's healthcare expenditure exceeds \$9b a year.

2. Chronic diseases in Singapore on rise due to ageing population



3. Patient satisfaction in Singapore on decline



Healthcare needs to

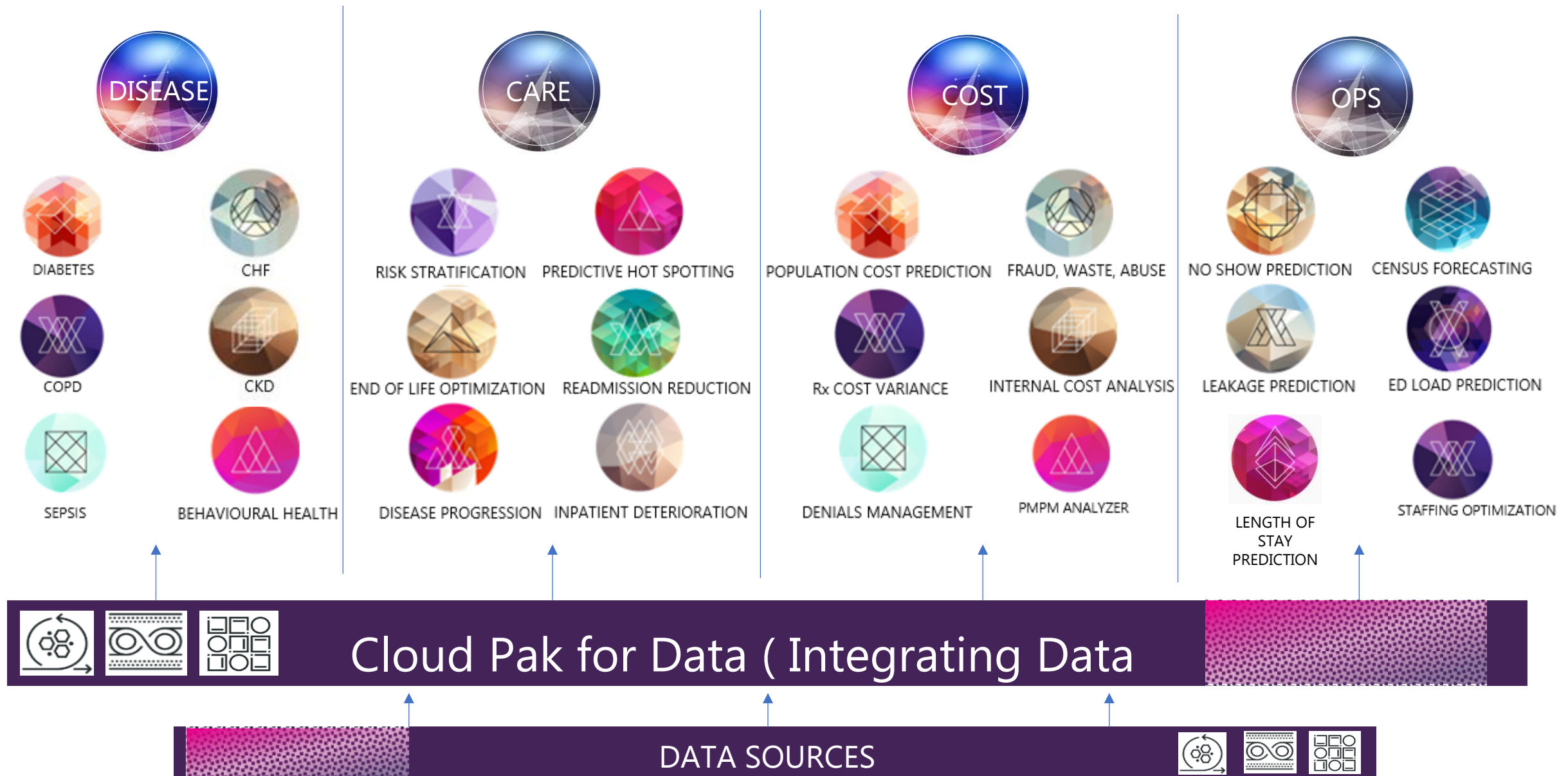
- Improve patient experience
- Improve health of population
- Reduce the per capita cost of healthcare



Quality care is less expensive care.

It is better, more efficient, and by definition, less wasteful. It is the right care, at the right time, every time.

DATA AND AI USE CASES SPECTRUM



Challenges to get Data and AI activated in Healthcare

Data is fuel for Artificial intelligence solutions

- 1) Data is in Siloes
- 2) Data Governance, Security and Trust.
- 3) AI operationalization @ scale

Where Is the Healthcare Data?

Connecting all the data is Tip of the Iceberg for getting value out of all Data

Provider

- EMRs / EHRs
- Testing / Machines
- Population Health
- Intake
- Payer Data
- Fees / Fines / Compliance
- Legal

Pharma & Devices

- Clinical Studies
- Device Readings
- Software Logs
- Device Diagnostics
- Chemical Compounds
- Genomic Sequencing
- Environmental Interactions
- R&D
- Quality / Testing

Operations & IOT

- System Finance
- Sensors
- Video / Surveillance
- Staffing / Scheduling
- Medical Inventory
- Utilization / Throughput
- Facilities

Comms, CRM & Payers

- Customer Service
- Website / SEO
- Surveys

Demographic & Census

- Policy / Regulation
- Demographic / Census
- Psychographic
- Inflation / Macroeconomic
- Gas Prices
- Labor Statistics
- Social / Search
- Public Health Data
- Industry Research

AI Model to Predict and Manage Heart Attack Patients



Do this patient's symptoms indicate a heart attack?

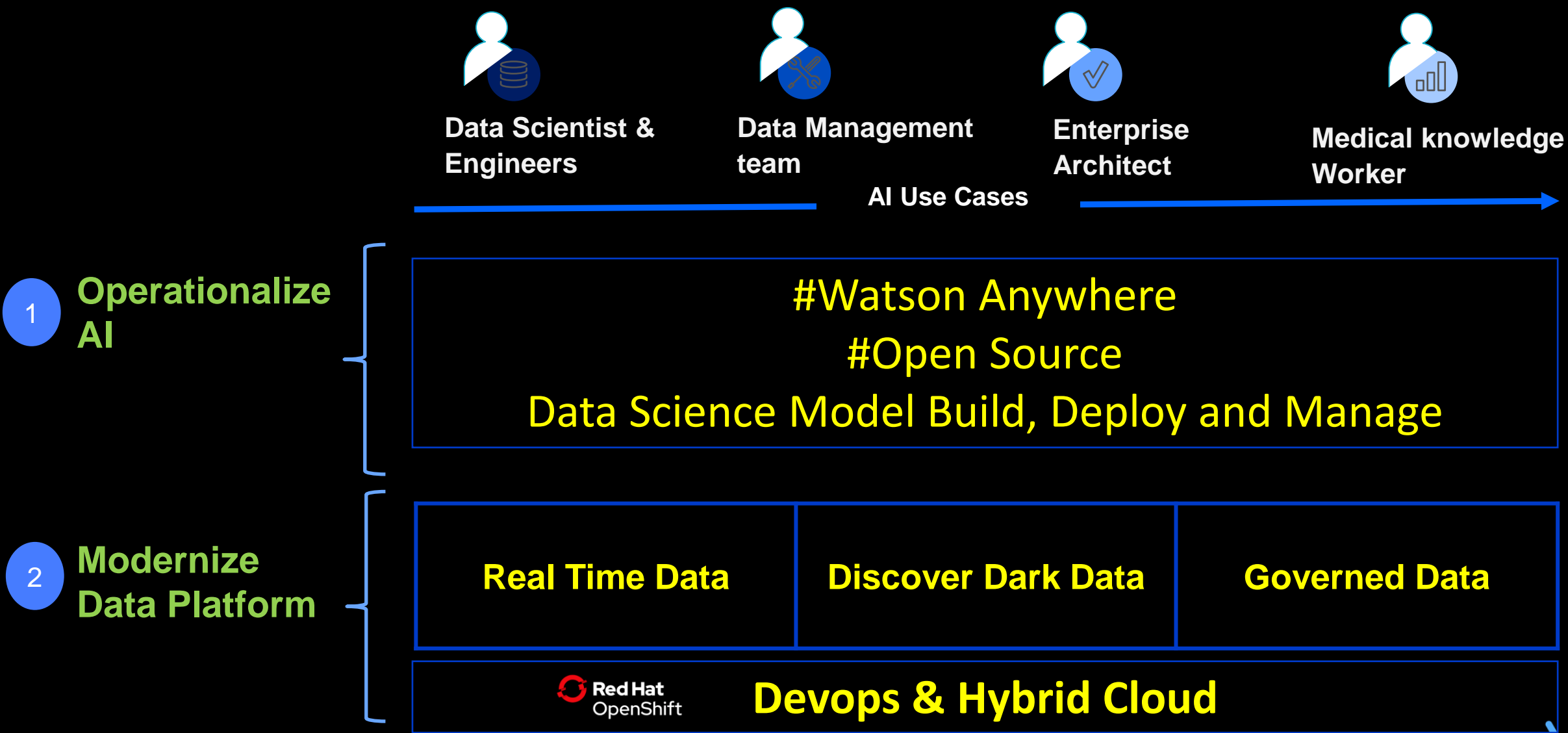
When patients across Singapore with similar demographics, lifestyles and medical histories to this one have had chest pain, what were they diagnosed for?

A photograph of a hospital gurney in a hallway. The gurney is silver with a blue sheet on the mattress. It has large wheels and a wire basket underneath. The hallway has a tiled floor and white walls. A purple text box is overlaid on the upper part of the image.

**How much did NUH spend on
diabetes treatments last year?**

**Who is at risk for diabetes, and what proactive measures can we
recommend now to avoid future onset?**

Cloud Pak for Data = Data Management + AI



The ability to learn from a patient's data provides opportunities to reinvent client engagements



Case Studies

A healthcare provider in Israel improves quality of care by more in its obstetrics department using NLP¹



Uses NLP to draw correlation within a corpus of medical best practices and historical patient records

The company is enhancing the expertise of physicians with cognitive computing technology

60% quality improvement with personalized plans

Boosts performance and consistency of physicians

Improves decision making with adherence to insurance guidelines

A children's hospital to become UK's first 'Cognitive Hospital'²



Watson technology will be applied to improve patient experience in the United Kingdom

To provide cognitive analytics that deliver insights enabling the hospital to think, sense and feel what is happening with a patient

Greatly enhance patient's experience

Identify **patient anxieties** and providing information and reassurance

Remind young patients and their parents about appointments

Sources : See notes below



Cognitive support on mobile devices is helping to improve diagnosis and treatment by taking real time decisions

Digitize and streamline processes

Case Studies

A information service provider uses cognitive to search comprehensive medical data and inform answers to complex diagnostic questions



The solution uses natural language processing to decipher what physicians are seeking and to offer best potential answers

Interactive technology to facilitate content searching, note taking and deliver information related to diagnosis, treatment and symptom management

Rapid curated responses to clinical queries with **79%** accuracy

Supports more **personalized** treatment plans

Improves ability to treat and manage rheumatoid arthritis by **75%**

Sources : See notes below



Forrester Wave: Enterprise Insight Platforms, Q1 2019

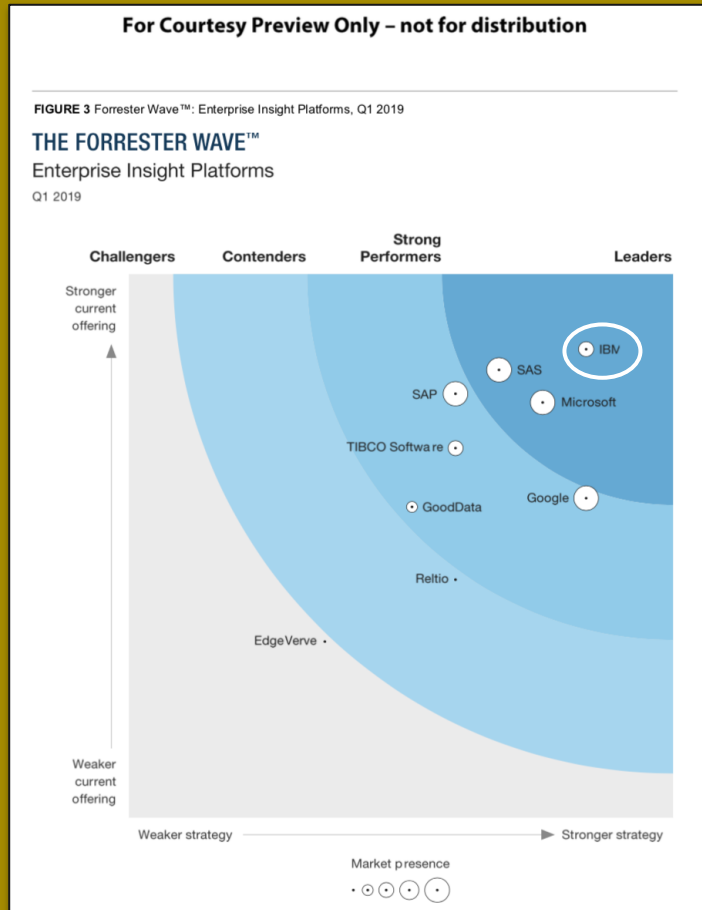


FIGURE 4 Forrester Wave™: Enterprise Insight Platforms Scorecard, Q1 2019

	Forrester's weighting	EdgeVerve	GoodData	Google	IBM	Microsoft	Reltio	SAP	SAS	TIBCO Software
Current offering	50%	1.62	2.86	2.94	4.31	3.82	2.19	3.90	4.12	3.40
Data management	25%	0.75	1.80	2.00	5.00	3.50	3.10	4.30	4.30	3.80
Analytics tools	35%	1.80	2.80	2.40	4.40	4.20	0.70	4.80	5.00	4.20
Insight app development tools	15%	2.60	3.40	3.40	4.00	3.70	1.70	2.60	3.60	2.60
Platform	25%	1.66	3.66	4.34	3.66	3.66	3.66	3.00	3.00	2.34
Strategy	50%	1.80	2.60	4.20	4.20	3.80	3.00	3.00	3.40	3.00
Product vision	20%	3.00	5.00	3.00	5.00	5.00	3.00	1.00	3.00	5.00
Past performance	20%	0.00	3.00	5.00	1.00	5.00	3.00	1.00	5.00	3.00
Innovation road map	20%	3.00	1.00	5.00	5.00	1.00	3.00	3.00	3.00	3.00
Delivery model	20%	3.00	3.00	3.00	5.00	3.00	5.00	5.00	3.00	1.00
Partner ecosystem	20%	0.00	1.00	5.00	5.00	5.00	1.00	5.00	3.00	3.00
Market presence	0%	1.00	2.00	5.00	3.00	5.00	1.00	5.00	5.00	3.00
Revenue	50%	1.00	1.00	5.00	5.00	5.00	1.00	5.00	5.00	3.00
Number of customers	50%	1.00	3.00	5.00	1.00	5.00	1.00	5.00	5.00	3.00

All scores are based on a scale of 0 (weak) to 5 (strong).

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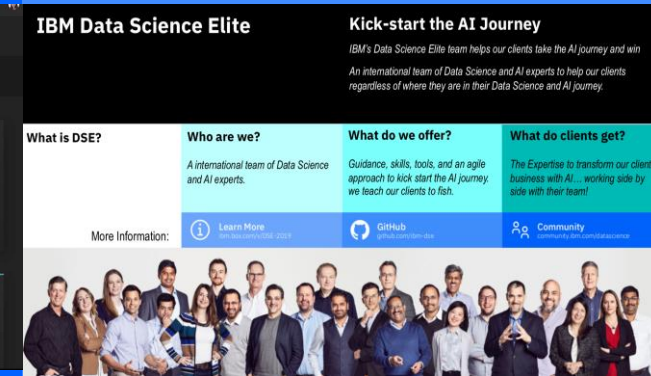
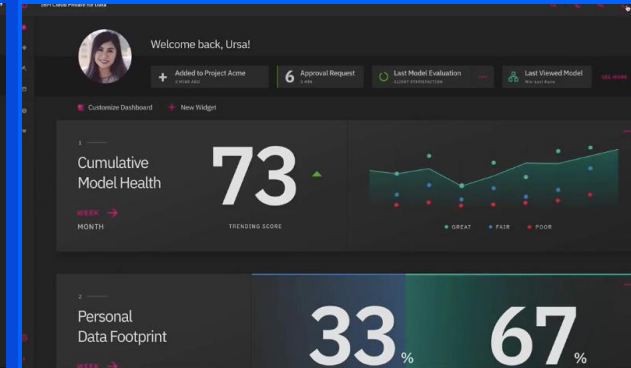
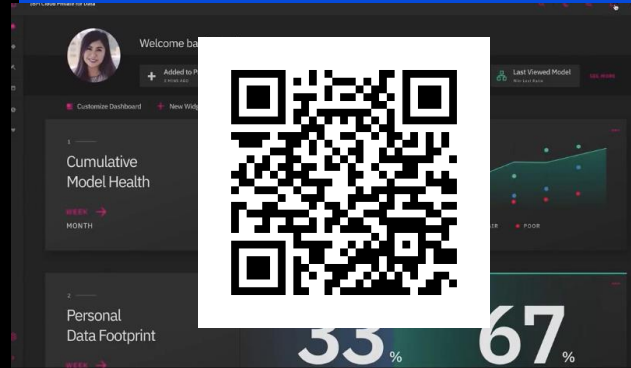
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