

# Convegno Annuale AISIS

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# Hewlett Packard Enterprise

An industry leader

## Leadership

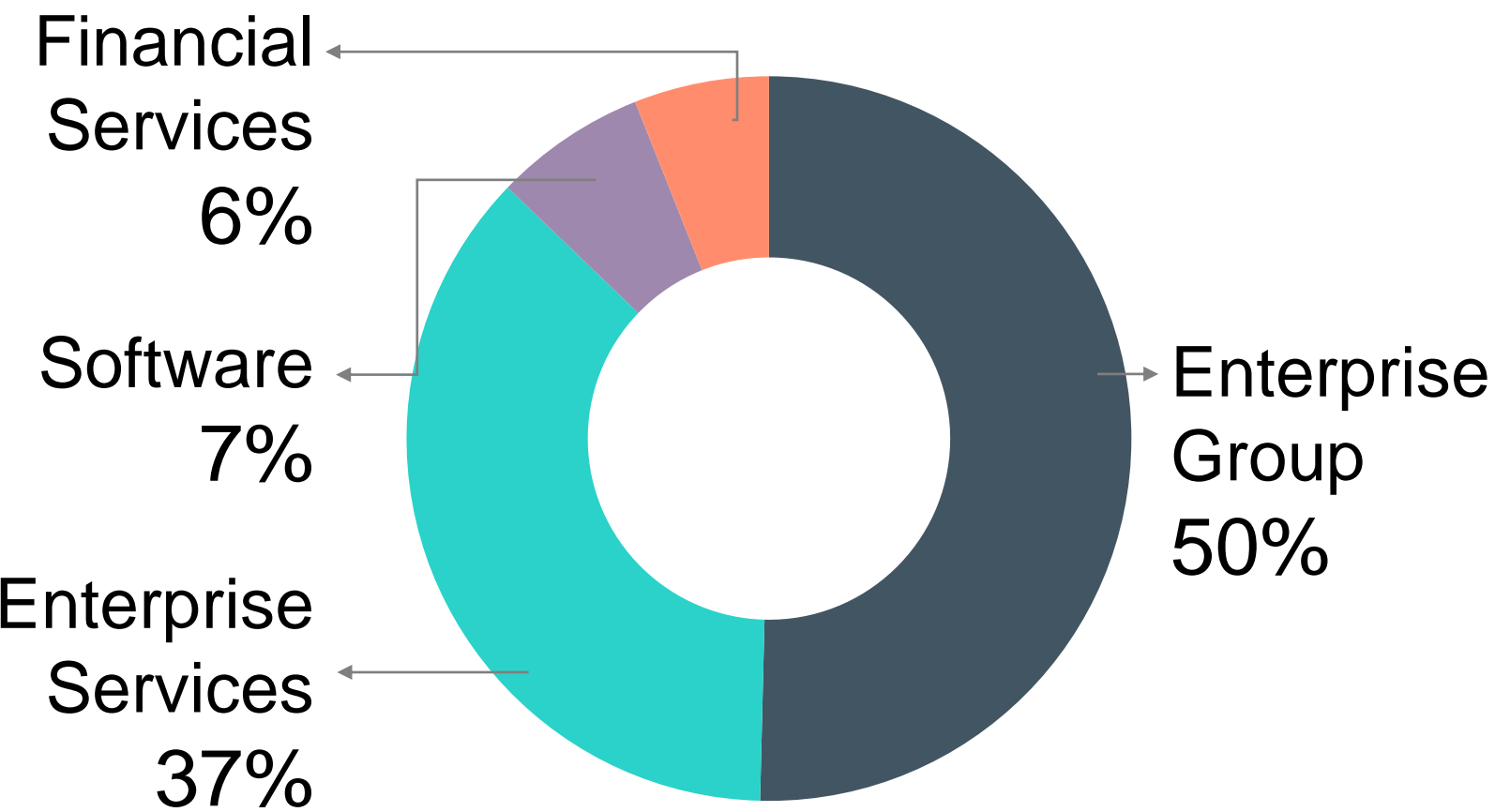


Meg Whitman  
President & CEO



Tim Stonesifer  
CFO

## HPE Revenue Mix



## FY15 Trailing Twelve Months (TTM) Financial Metrics

Revenue	Operating Profit	Operating Margin
\$52.7B	\$4.9B	9.2%

## HPE is the partner to transform your business and IT



Transform  
to a hybrid infrastructure



Protect  
your digital enterprise



Empower  
the data-driven organization

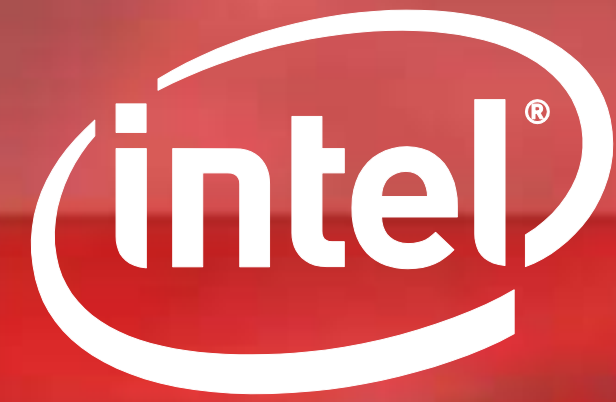


Enable  
workplace productivity





**Hewlett Packard  
Enterprise**



**Data is the lifeblood of any  
health system**

JPG

Clinical  
Reports

Audio  
Files

XDS

Outpatient  
Letters

Back  
Office

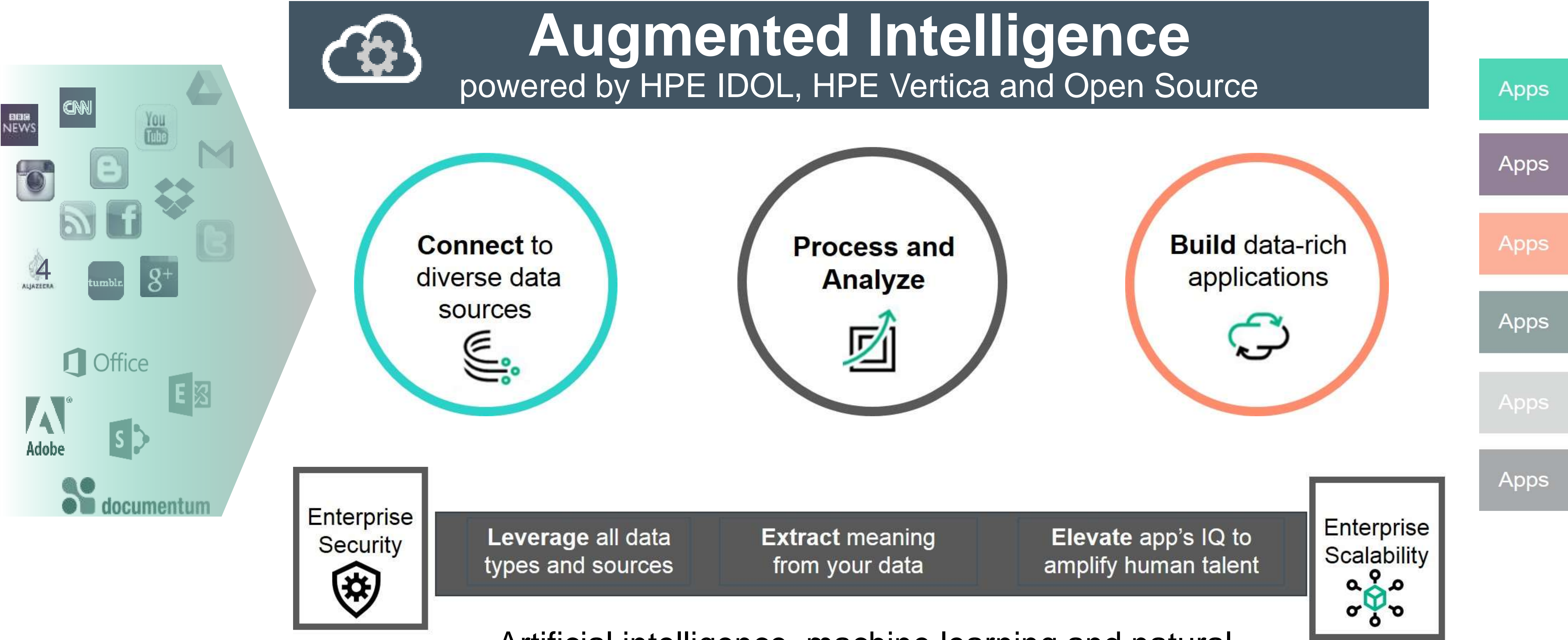
DICOM

Video  
Files



# Augmented Intelligence to power apps for competitive advantage

Pure Software Platform - On premis, on cloud, on demand

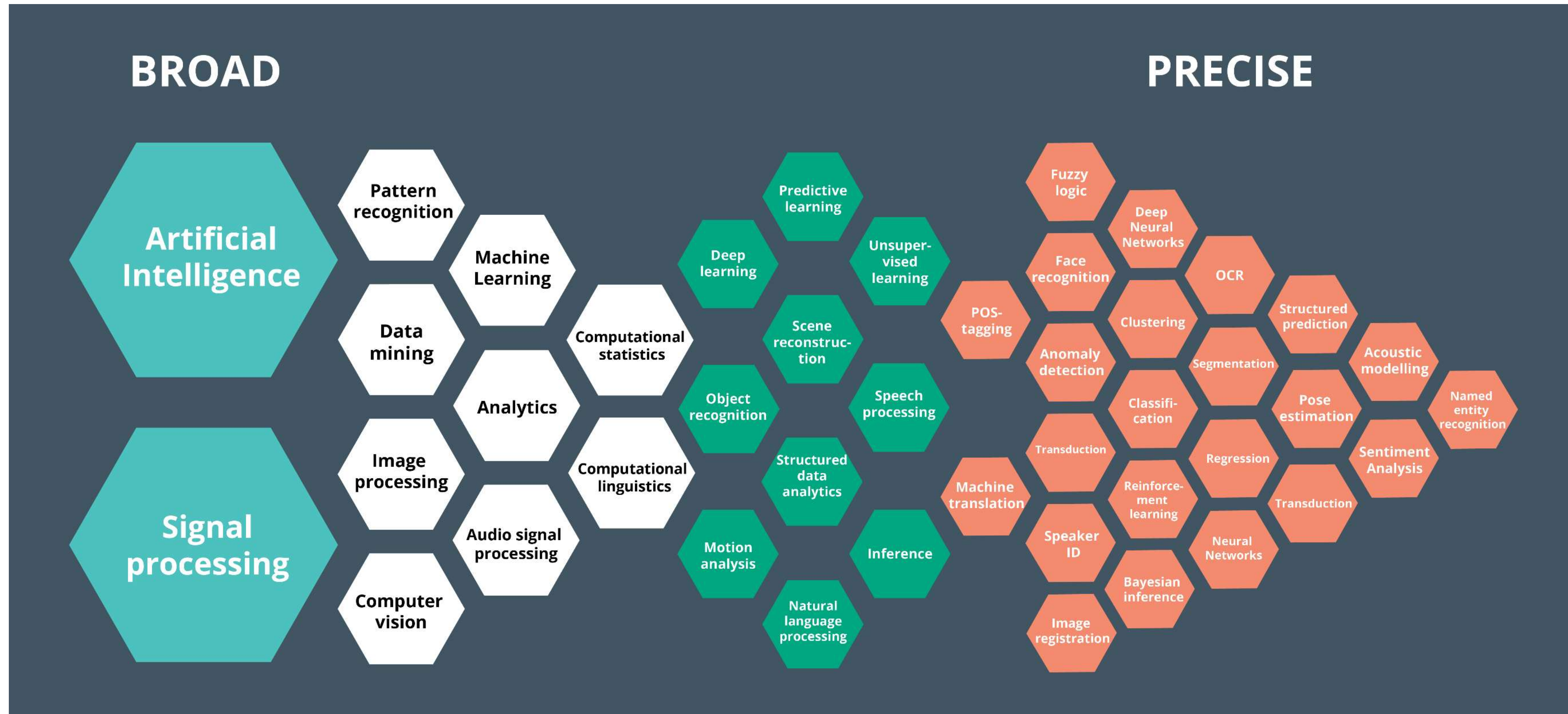


Artificial intelligence, machine learning and natural language processing using advanced analytics functions.



# Machine Learning at the Service of Business Augmented Intelligence

## Using Cognitive Analysis to form a human-like understanding of content





# Haven On Demand

HPE Haven OnDemand Developer Solutions Community Blog <sup>NEW</sup> Labs

APIs Documentation

## WELCOME DEVELOPERS

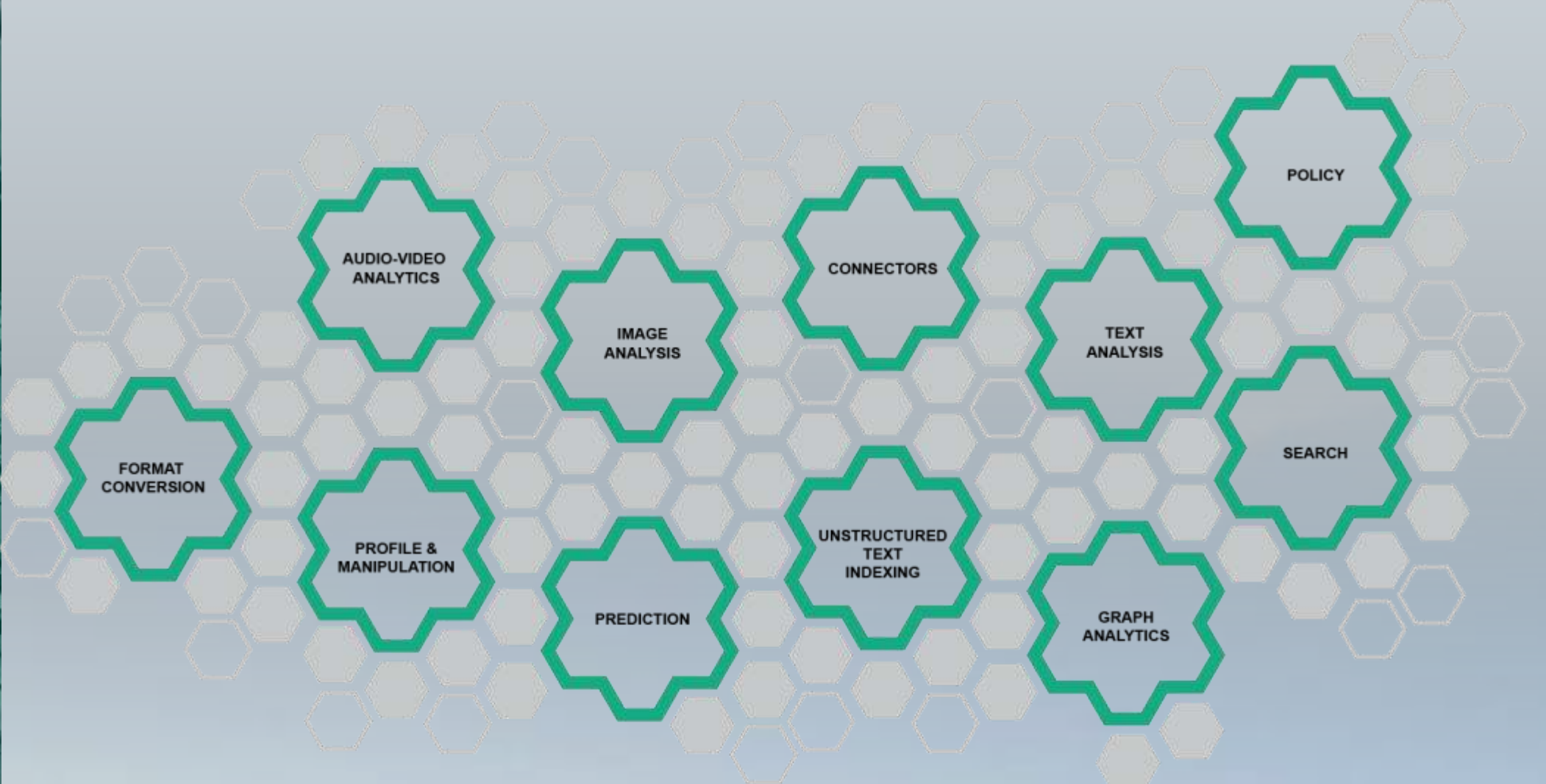
Accelerate and differentiate your data-rich apps

Register Now

GET STARTED NOW

- 1 Create an account
- 2 Read Getting Started guide
- 3 Start coding with the APIs

+70 cloud-based machine learning APIs



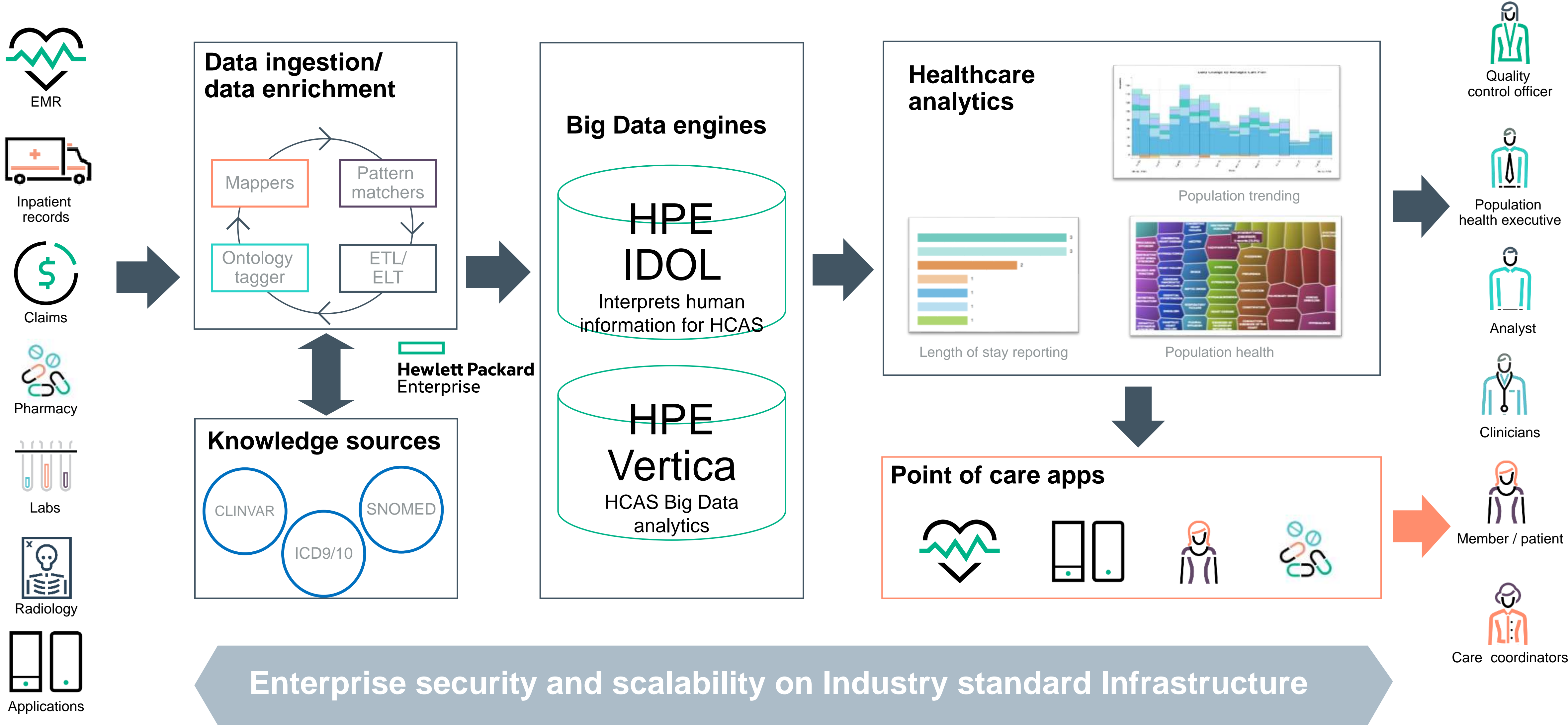
<http://www.havenondemand.com/>



**Big Data Services Award**



# HPE Big Data Healthcare Analytics Platform



# Multitude of Big Data use-cases

Improving patient care, quality outcomes, and speed to market while reducing overall costs

## Clinical / quality / operations

- Redundant lab test orders
- DRG pre/post coding efficiencies
- At-risk cohort identification/management
- Enterprise EMR search
- Undiagnosed metabolic conditions
- ICD10 quality assessment (health status)

## Medical research

- Clinical data analysis
- Pre-study statistical power analysis
- Patient record analysis
- Eligible subject recruitment
- Retrospective cohort comparison
- Genotype/phenotype correlation

## Patient engagement

- Patient behavior analysis
- Hospital operations analytics
- Marketing campaign optimization
- Social media analytics
- Patient sentiment analysis
- Healthcare brand monitoring
- Loyalty & promotion analysis

## Provider operations

- Internal risk assessment
- Logistics optimization
- Utilization analysis
- Privacy and security analytics
- Risk management

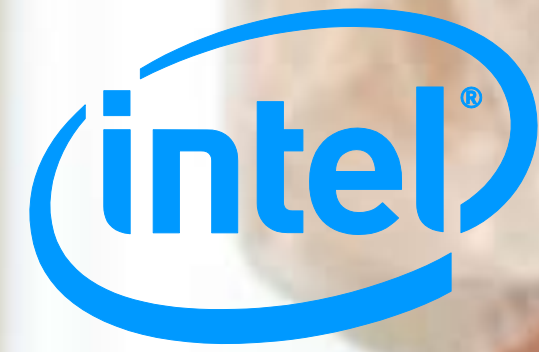
## Revenue cycle management

- Cost, utilization, performance, & quality variable analytics
- Claim and member data analytics
- Fraud detection & prevention
- Revenue assurance





**Hewlett Packard  
Enterprise**



Cerner Corporation's  
*Millennium®* solution  
Platform





# Cerner- HealthIntent – Proven Scale



**55M Persons**  
Unique Persons



**3,000,000 GB**  
Active Data



**177** Sources Live  
**156 Sources** In-Process

**15M Persons**  
HealtheRegistries

**46M Persons**  
HealtheAnalytics

**10M Linked**  
Master Person Index

**110,000**  
Daily Processing Jobs

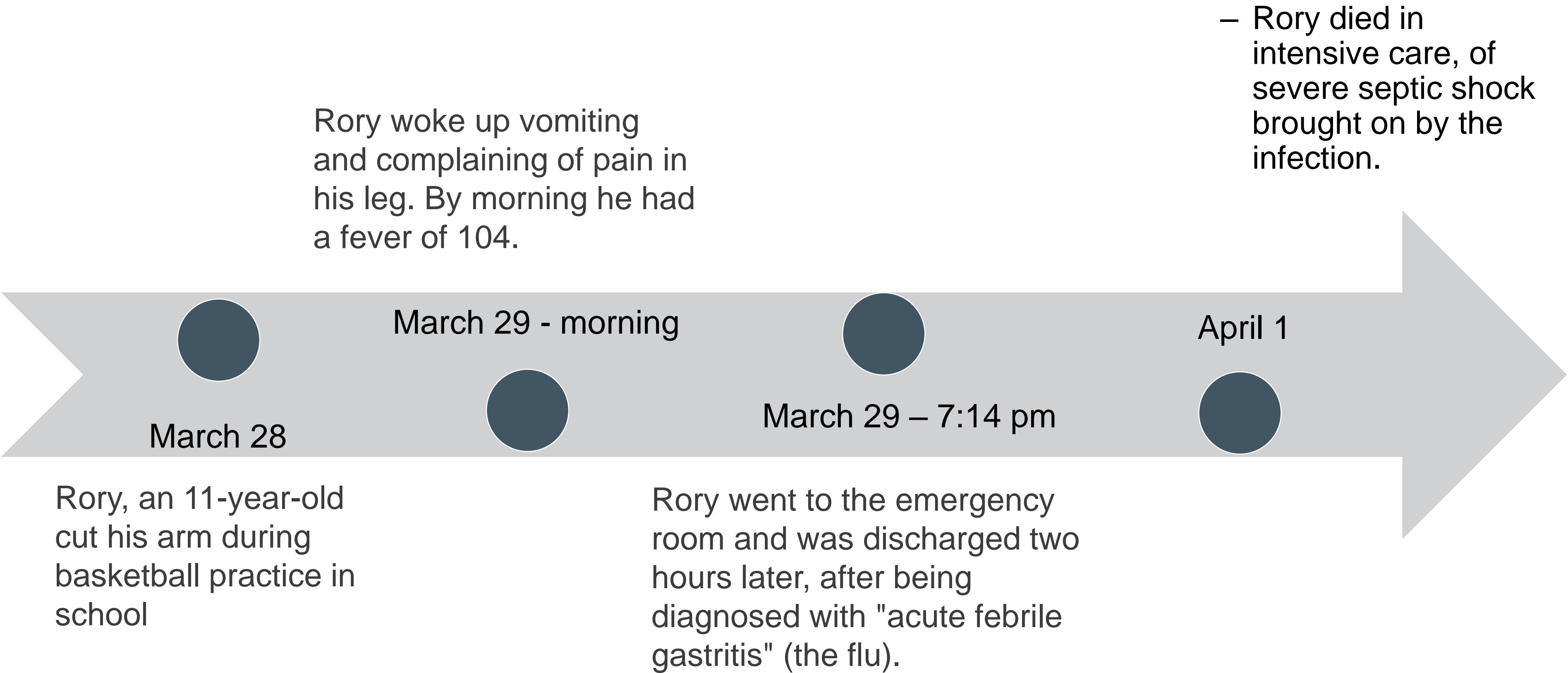
**28+** Registries  
**350+** Measures

**224,456**  
Proprietary Codes Mapped

**29,473** Concepts Curated



# Sepsis is Preventable



*We can save lives, so other families won't have to experience loss.*



# Sepsis Client Achievements



- **1,980 lives saved** since 2010
- Over \$27.3 Million in cost savings
- Sepsis mortality rate decrease by 4.2%
- Sepsis LOS reduced from 9.8 days to 8.3 days



- **156 lives saved** in FY2014
- Sepsis, any diagnosis, mortality rate decrease by 1.42%
- Nearly 1 patient saved every 2 days



- **Sepsis mortality rate dropped 20%**
- Sepsis LOS reduced from 6.3 days to 4.8 days

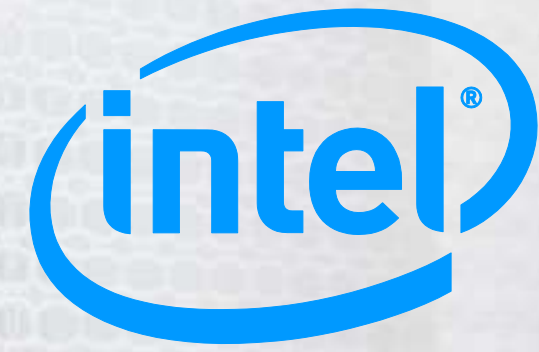


- **Sepsis mortality rate dropped 17%**





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Enterprise**



# Personalized Medicine





# Why is Personalized Medicine Important?

Healthcare tailored to individuals based on their own genome

- Doctor's have had no blueprint
- Healthcare has been about taking averages
- e.g. Adults: Take 2 aspirin
- Shaq = 4 aspirin
- Danica = 1 aspirin





# HudsonAlpha Clinical Operation

Home   Become A Clinic Patient   For Medical Providers   The Clinic Team   Support for the Clinic Mission   Clinic Features



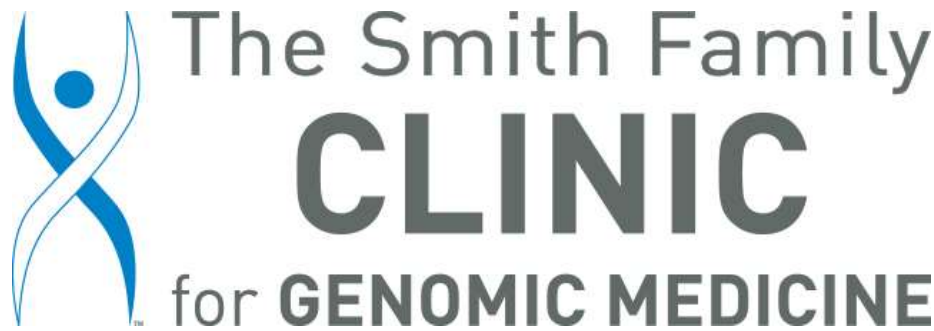
**Finding Answers in Your DNA**  
Using whole genome sequencing to uncover undiagnosed disease  
The Smith Family Clinic for Genomic Medicine has been established to use whole genome sequencing to diagnose rare,



expertise of the physicians, clinicians and scientists of HudsonAlpha Institute for Biotechnology in a clinical setting for patient care. The clinic utilizes the Genome Gateway™ patient portal, which was developed specifically for genomic medicine, to gather relevant information about the patient’s health and family history and phenotype and provide valuable information to the clinical team. Whole genome sequencing is performed in a fully certified and accredited clinical laboratory that specializes in rare and undiagnosed disease diagnosis.



**MISSION AND VISION**  
By using the power of genomics, we can solve cases of undiagnosed disease and provide answers to families and physicians. The clinic’s mission is not only to help find answers, but also to give patients the best clinical care and a positive medical experience.  
The vision for genomic medicine is for whole genome sequencing to become an increasingly valuable tool not only for diagnosis but also for prediction and prevention of disease.



...powered by

HudsonAlpha  
Institute for Biotechnology

Children’s  
of Alabama

UAB  
Medicine





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# The Story

Presented at 18 months with poor weight gain and a perianal abscess. Symptoms progressed rapidly over a few months to an unusual early onset, aggressive, refractory inflammatory bowel disease

## The beginning

- In spite of aggressive immunosuppressant therapy disease continued to progress
- Diverting colostomy at 2.5 years
- Notably poor wound healing
- Disease continues to progress
- Total colectomy at 3
- Partial ileostomy at 4; ongoing immunosuppression
- Disease continued relentless destruction
- Complete bowel rest at 4.5 years
- Host of diagnostic tests performed
- No diagnosis – no way forward
- Is this an immune defect? A GI issue?
- Attempt Immune reconstitution? Significant risk!

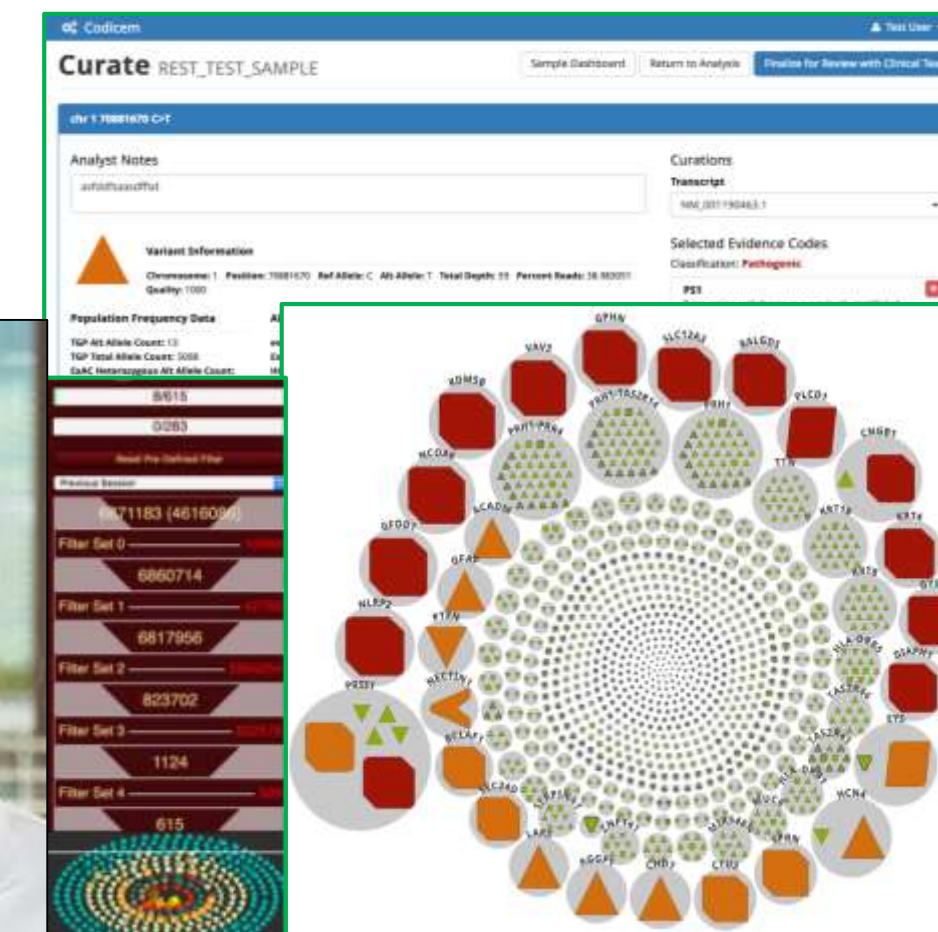
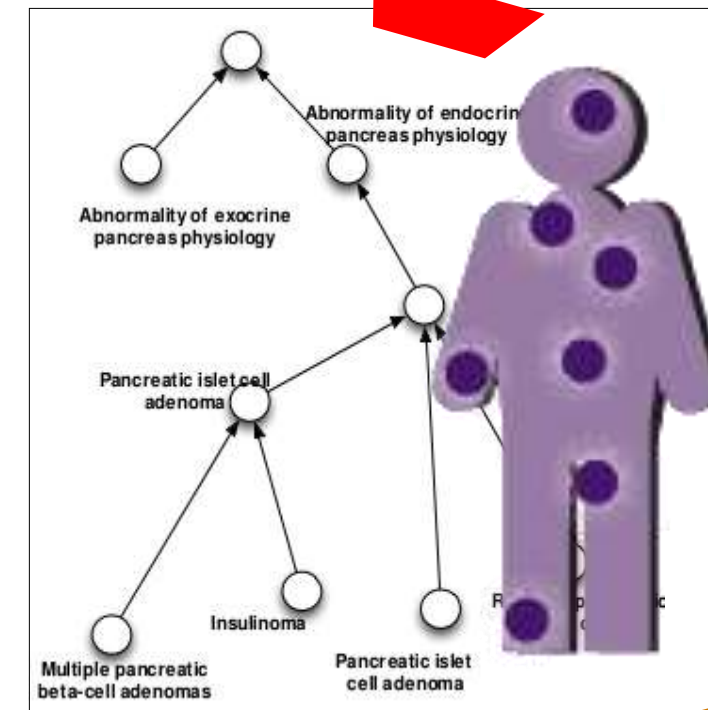
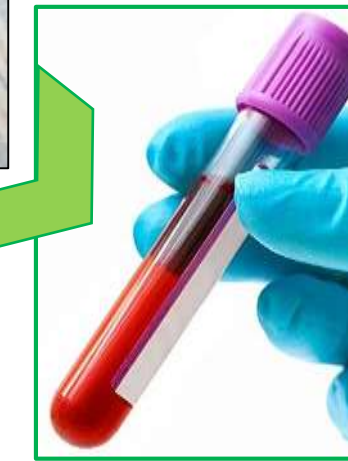
## WES to try to identify the cause

- Diagnosed with a functional defect in the XIAP protein causing an immune dysregulation syndrome, resulting in IBD
- Diagnosis guided selection of a treatment: a cord blood transplant
- This treatment saved his life
- He is active, eating, and attending school
- No recurrence of GI disease and now 10 (6.5 years post transplant)
- BUT; he has PTSD and various transplant and GI issues as expected due to his history

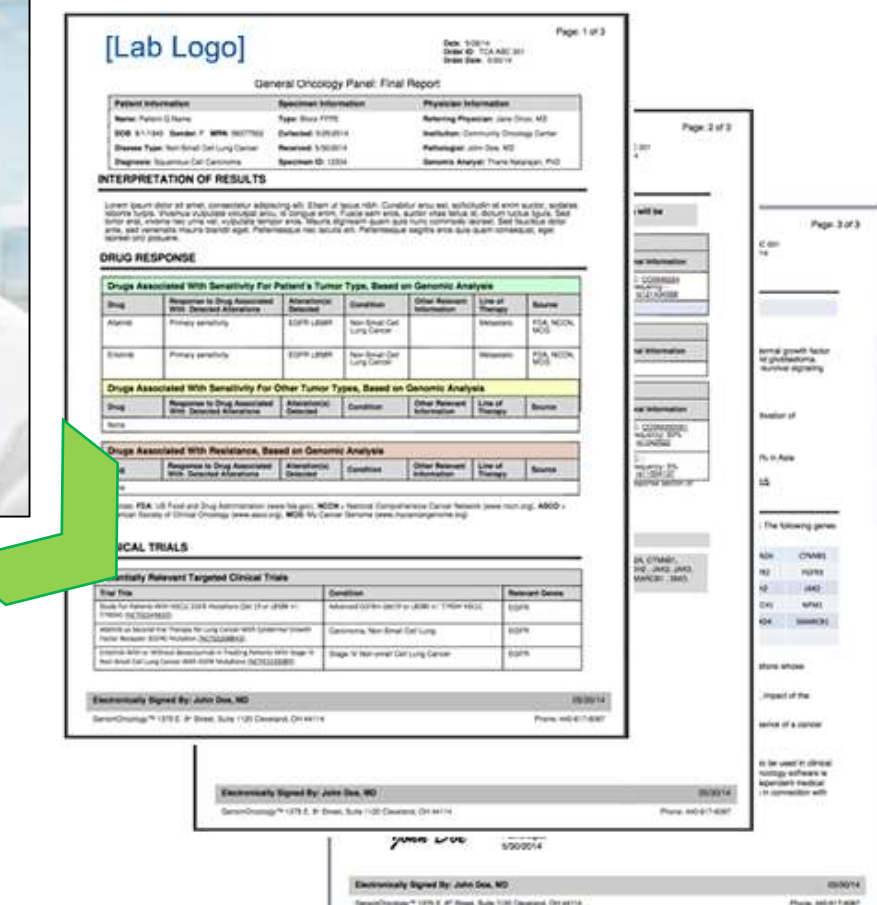


# HPE Haven platform

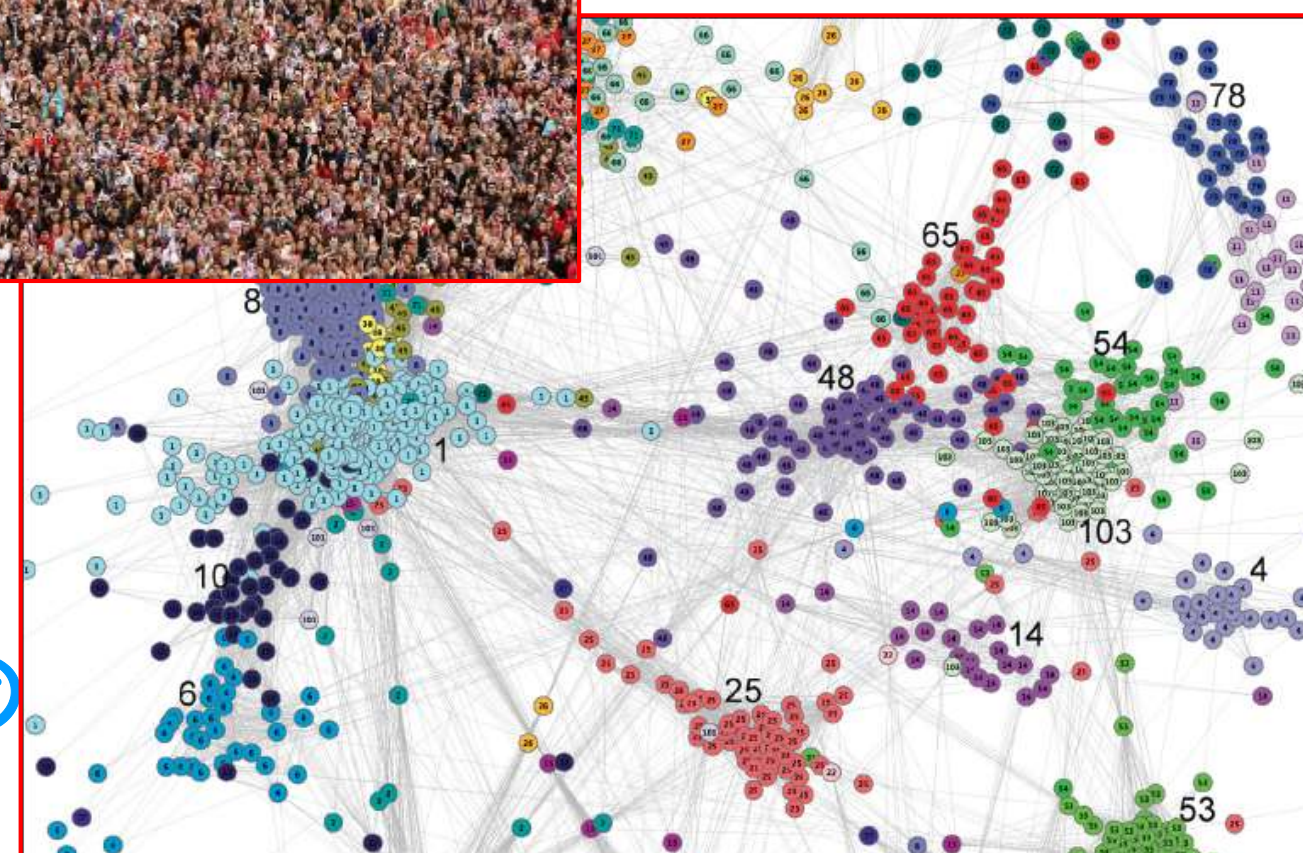
Rapid,  
comprehensive, and  
efficient extraction of  
ordered information  
from EHR or notes



```
@SRR038845.3 HWI-EAS3808:6:1.0:1938 length=36
CAACGAGTTTCACACCTTGGCCGACAGGCCCGGGTAA
+SRR038845.3 HWI-EAS3808:6:1.0:1938 length=36
BA@7>B=>:>>7
@SRR038845.4 #CHROM POS ID REF ALT
CCAATGATTTTT 20 14370 rs6054257 G A
+SRR038845.4 20 17330 . T A
BCCBA@BB@BBB
@SRR038845.5
GTTCAAAAAGAA
+INFO FORMAT
SRR038845.5 NS=2;DP=14;AF=0.5;DB;H2 GT:GQ:DP
BBCBBBBB@BB NS=2;DP=11;AF=0.017 GT:GQ:DP
```



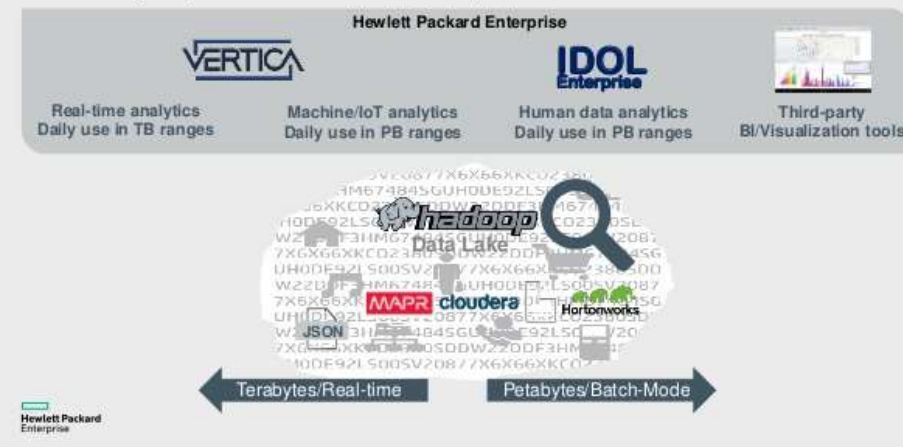
Predictive analytics - who will get which disease, when, how severe, & what will be the best treatment



Imagine  
from Søren  
Brunak et.  
al.



## Build a Data Centric Foundation: Addressing all your relevant data at the speed of business



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Enterprise

**Hewlett Packard**  
Enterprise

**Hewlett Packard**  
Enterprise



# Some case studies

## Cambridge University Hospitals NHS Foundation Trust

Department of Ophthalmology for cataract surgery. 1,200 beds and 500,000 patients a year

**day hospital** in a range from **86%** al **98%** with a dramatic reduction in the need for overnight stay. Improving the patient experience, reducing the risk of development of other diseases related to hospitalization (infections) with consequent reduction of costs



## Hospital acquired Conditions (HAC) Surveillance

750k encounters, 55k patients, ~2M notes

Initial cohort based on ICD coding is followed by time intensive manual chart abstraction. Identifies **3-5 possible VTE** events/month.

Initial cohort based on ICD coding and computerized semantic search is followed by computer assisted chart review. Identifies **15-30 possible VTE** events/month





# Some case studies



Partners Healthcare is a medical non-profit association that today can give real-time access to all patient records (140 million): this allowed to PH to study and correlate the different diagnoses and associated care different patients through a single portal from which doctors can access in real time at any time of the day and also through mobile devices

- Clinician's next gen information discovery based upon conceptual searches
- Cover patient problems, procedures, medications, allergies, health maintenance topics & encounter notes

Lucile Packard  
Children's Hospital  
AT STANFORD



The children's clinic "Lucille Packard" has implemented a platform that prevents the formation of inclusion for infections of catheters in blood for the hospitalized children or pneumonia using a system that informs about patients in real-time health status with a 'single 360 degrees and alerting in case of danger. There 's been a change in 34% of care plans after the implementation of the new information platform



NY Genome Center aggregate and analyze 20 TB of genomic data each day for sequencing the human genome and answer to the following questions

- How many patients with this genomic variant?
- How many patients with this variant who have this disease?
- How many patients have this combination of variants?
- Looking for cohorts
- .....





# Thanks

## More Resources on:

HPE Big Data Platform:

<http://www8.hp.com/us/en/software-solutions/big-data-analytics-software.html>

HPE Big Data Platform Healthcare & Life Science:

<http://www8.hp.com/us/en/software-solutions/big-data-healthcare-analytics/index.html>

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