# Hortonworks

# Deliver better care and streamline operations

**Healthcare Does Hadoop**

Every day, healthcare professionals must make critical decisions–often times without sufficiently accurate and transparent data. At the same time, patients are being confronted with rising costs without a corresponding increase in health security or the reliability of clinical outcomes. Apache™ Hadoop® can help resolve these challenges by making data less expensive, better organized, and more readily available.

## Healthcare applications include:

### Monitor Patient Vitals in Real Time

In a typical hospital setting, nurses manually monitor and record patient vital signs during rounds. But between scheduled visits, a patient's vitals may decline. In situations like this, the ability to respond immediately can have a huge impact on a patient's well being.

New wireless sensors can capture and transmit patient vitals with much greater frequency, and stream these measurements into a Hadoop cluster. These signals can then trigger real-time alerts, enabling caregivers to respond more promptly to unexpected changes. Over time, this data can be analyzed by algorithms to proactively predict the likelihood of an emergency, and alert caregivers to respond accordingly.

### Reduce Cardiac Readmittance Rates

Patients with heart disease can be closely monitored while they're in the hospital, but when those patients go home, they may skip their medications or ignore dietary and self-care instructions prescribed by their doctor.
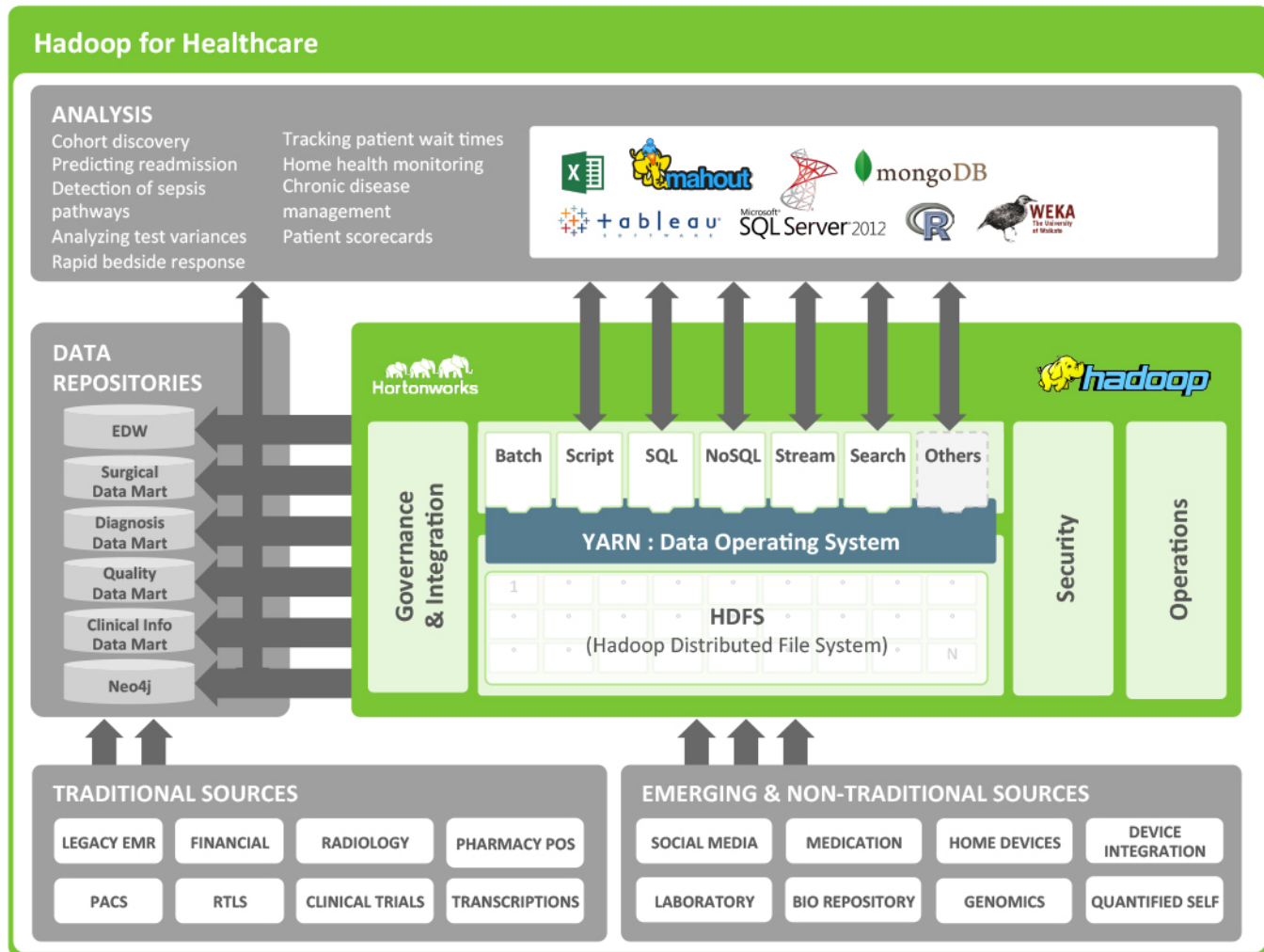
Congestive heart failure causes fluid retention, which leads to weight gain. In one innovative program at UC Irvine Health, patients can return home with a wireless scale and weigh themselves at regular intervals. Algorithms running in Hadoop determine unsafe weight gain thresholds and notify a physician to see the patient proactively, before an emergency readmittance is required.

### Access Genomic Data for Medical Trials

Matching a particular drug to a specific genomic profile is a Big Data challenge. Each individual's genome is about 1.5 gigabytes of data. Massive data storage and processing power are required to analyze data on a drug's interactions with different genetic combinations. For example, just focusing on 20 genes is a 20,000-choose-20 calculation, with $4.3 \times 10^{67}$ possible combinations.

Researchers are turning to Apache Hadoop as a cost-effective, reliable platform for storing genomic data and combining that with other data sets (e.g., demographics, trial outcomes) to find out which drugs and treatments work best for groups of patients across the genetic spectrum.

# Hortonworks Data Platform 2.0

## Hadoop for Healthcare

### ANALYSIS

Cohort discovery
Predicting readmission
Detection of sepsis
pathways
Analyzing test variances
Rapid bedside response

Tracking patient wait times
Home health monitoring
Chronic disease
management
Patient scorecards

X | mahout | mongoDB
tableau | Microsoft SQL Server 2012 | R | WEKA The University of Waikato

### DATA REPOSITORIES

**Hortonworks**

EDW
Surgical Data Mart
Diagnosis Data Mart
Quality Data Mart
Clinical Info Data Mart
Neo4j

**Governance & Integration**

Batch | Script | SQL | NoSQL | Stream | Search | Others

**YARN : Data Operating System**

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|---|---|---|---|---|---|---|
|   |   | **HDFS** |   |   |   |   |

(Hadoop Distributed File System)

N

**hadoop**

**Security**

**Operations**

### TRADITIONAL SOURCES

LEGACY EMR | FINANCIAL | RADIOLOGY | PHARMACY POS

PACS | RTLS | CLINICAL TRIALS | TRANSCRIPTIONS

### EMERGING & NON-TRADITIONAL SOURCES

SOCIAL MEDIA | MEDICATION | HOME DEVICES | DEVICE INTEGRATION

LABORATORY | BIO REPOSITORY | GENOMICS | QUANTIFIED SELF

## Apache™ Hadoop®: Enterprise-class, Enterprise-ready

Apache™ Hadoop® has evolved significantly to meet enterprise requirements, and now encompasses the functional areas that are foundational to any platform technology.

### Data Management

Store and process vast quantities of data in a scale-out storage layer.

### Data Access

Access and interact with your data in a wide variety of ways– spanning batch, interactive, and real-time use cases.

### Data Governance and Integration

Quickly and easily load data, and manage according to policy.

### Security

Address requirements of Authentication, Authorization, Accounting and Data Protection.

### Operations

Provision, manage, monitor and operate Hadoop clusters at scale.

## Hortonworks. We do Hadoop.

Hortonworks is a leading commercial vendor of Apache Hadoop, the open source platform for storing, managing and analyzing Big Data. Our distribution of Apache Hadoop, Hortonworks Data Platform, provides an open and stable foundation for enterprises and a growing ecosystem to build and deploy Big Data solutions.

Hortonworks is the trusted source for information on Hadoop, and together with the Apache community, Hortonworks is making Hadoop an enterprise data platform. Hortonworks provides unmatched technical support, training and certification programs for enterprises, systems integrators and technology vendors.

To learn more, visit
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