



# **Introduction to MySQL and Healthcare**

Improving Healthcare Access, Quality, and Affordability

**A MySQL White Paper**

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## Introduction

Healthcare is one of the biggest industries in the world. In 2020, healthcare expenditures in the US were \$4.1 trillion which represented 19.7% of the US economy<sup>1</sup>. By 2028, healthcare expenditures are expected to reach \$6.2 trillion.

According to RBC Capital Markets, approximately 30% of all the world's data volume is being generated by the healthcare industry and by 2025 the expected annual growth rate will be 36%. That growth rate is faster than for other industries such as manufacturing, financial services, and media and entertainment<sup>2</sup>. New medical devices, wearables, mobile applications, digital therapeutics and monitoring devices are driving this growth.

Healthcare is getting disrupted by new technologies, like what has been happening in the Retail, Travel, Media and Financial Services industries for the last 20 years. Mobile, Cloud, Artificial Intelligence (AI), Machine Learning (ML), and Analytics are helping make healthcare much more accessible to consumers and enabling providers to detect diseases early and modernize treatment, resulting in better health outcomes.

Managing and protecting this huge volume of data will become more and more challenging. Healthcare is also one of the most regulated industries to ensure the privacy and security of personal health information. Healthcare companies must comply with numerous regulations such as HIPAA and GDPR.

MySQL is a proven, scalable, cost-effective data management solution enabling a new generation of healthcare companies to innovate faster. MySQL is being used by some of the world's leading companies including Facebook, Twitter and Booking.com that are disrupting other industries. MySQL also provides robust security including encryption, privilege management and access controls, to comply with industry and government healthcare regulations.

## Healthcare Market

The healthcare market can be segmented into:

- **Provider Market:** The provider market consists of the healthcare providers delivering healthcare services including primary care physicians, hospitals, clinics, surgical centers, rehabilitation centers, and more.
- **Payer Market:** The payer market provides payment for some or all patient's procedures, supplies, and medications. The market is made of private insurance companies and public payers such as federal and state governments.
- **Supplier Market:** The market includes pharmaceuticals, medical supplies, devices, and everything else that patients may need for treatment or to manage their conditions.

This white paper will focus primarily on the Healthcare IT market and emerging Digital Healthcare sectors in the Healthcare Provider and Supplier market.

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<sup>1</sup> <https://www.cms.gov/Research-Statistics-Data-and-Systems/Statistics-Trends-and-Reports/NationalHealthExpendData/NHE-Fact-Sheet>

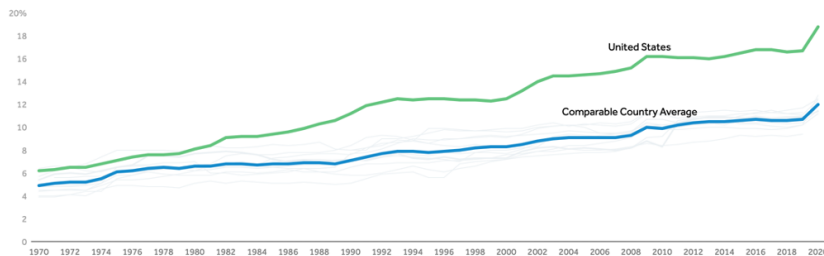
<sup>2</sup> <https://www.brunswickgroup.com/healthcare-data-i20729/>

# Healthcare Market Size

In 2020, the U.S. spent close to 20% of its GDP on health consumption, whereas other OECD countries devoted closer to 10% of their GDP to health spending. The uptick in 2020 was the result of the COVID-19 pandemic which led to both an increase in health spending and an economic downturn resulting in a shrinking GDP in every comparable country.

## Health Spending: US vs. OECD Countries – Percent of GDP

Health consumption expenditures as percent of GDP, 1970-2020



Notes: U.S. values obtained from National Health Expenditure data. Health consumption does not include investments in structures, equipment, or research. 2020 data not yet available for Australia, Belgium, Canada, Japan or Switzerland. Provisional 2020 data for Austria, Germany, Netherlands, Sweden and the United Kingdom. Provisional 2019 data for Canada. Data for Australia and Japan in 2019 and France in 2020 is estimated. France data before 1990 is not shown.

Source: KFF analysis of OECD and National Health Expenditure (NHE) data • Get the data • PNG

Peterson KFF  
Health System Tracker

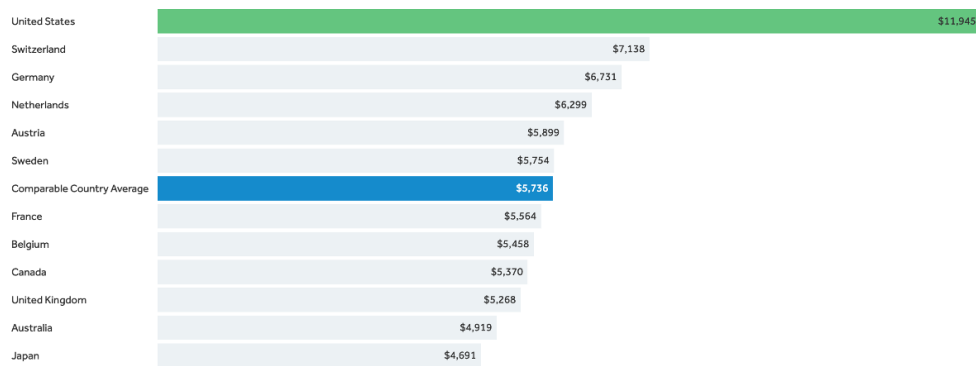
**20% of GDP**  
US Healthcare Spending

**10% of GDP**  
OECD Healthcare Spending

Health spending per person in the U.S. was \$11,945 in 2020, which was over \$4,000 more than any other high-income nation. The average amount spent on health per person in comparable countries was \$5,736, which is roughly half that of the U.S.

## Health Spending: US vs. OECD Countries – Per Capita

Health consumption expenditures per capita, U.S. dollars, PPP adjusted, 2020 or nearest year



Notes: U.S. value obtained from National Health Expenditure data. Data from Australia, Belgium, Canada, Japan and Switzerland are from 2019. Data for Austria, France, and Japan are estimated. Data for Austria, Canada, Germany, Netherlands, and Sweden are provisional. Health consumption does not include investments in structures, equipment, or research.

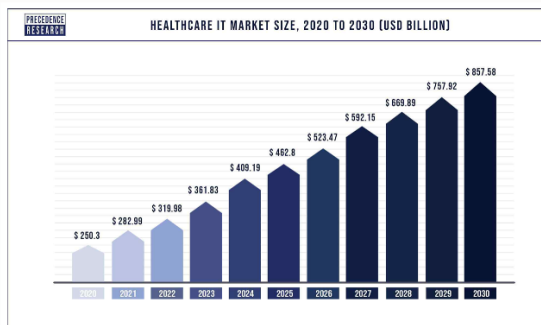
Source: KFF analysis of National Health Expenditure (NHE) and OECD data • Get the data • PNG

Peterson KFF  
Health System Tracker

## Healthcare IT Market Growth

According to Precedence Research, the global Healthcare IT market is estimated to be \$319 billion in 2022, growing to \$857 billion in 2030 at a CAGR of ~13%<sup>3</sup>. Driving the growth of the worldwide healthcare IT market are the adoption of mobile health (mHealth), digital therapeutics (DTx), AI/ML/Analytics, cloud technologies, and technologies to secure Protected Health Information (PHI) required to comply with industry healthcare regulations.

The pandemic accelerated the adoption of digital health and the funding of digital health companies reached new highs. 2021's total funding among US-based digital health startups amounted to \$29.1 billion, almost double previous investment record in 2020.

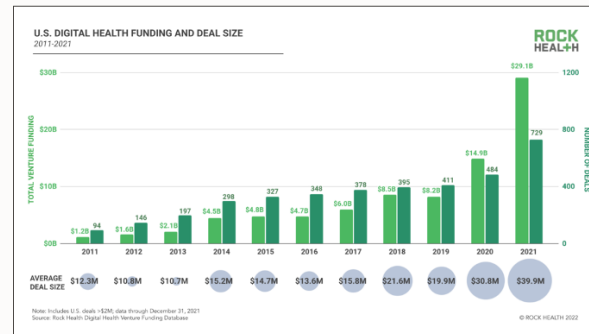


**\$319 Billion**

2022 Healthcare IT Market Size

**13.1%**

CAGR from from 2021 to 2030



**\$29.1 Billion**

2021 US Digital Health Funding

**729**

2021 US Number of Funding Deals

## Power of MySQL and Open Source Software

Open source software is the driving force behind the innovation we are seeing today. The fastest growing companies in the world are using MySQL to deliver modern applications that are disrupting entire industries including advertising, retail, media and entertainment, travel, finance and many more. Data is at the center of this disruption and healthcare providers and suppliers are following the lead of these innovators in using MySQL to build modern, agile data-driven solutions.

## Open Source in the Enterprise

In 2021, 1,250 IT leaders were surveyed to determine how they think about open source software. The results were published in The State of Enterprise Open Source Report<sup>4</sup>. The survey found that 90% of IT leaders are using open source today.

<sup>3</sup> <https://www.precedenceresearch.com/healthcare-it-market>







<sup>4</sup> <https://www.redhat.com/en/enterprise-open-source-report/2021>

One of the main drivers of the adoption of open source software is the Total Cost of Ownership savings that companies realize. Other reasons cited for using enterprise open source include higher quality software, better security, access to the latest innovations and designed to work in the cloud.

## The Most Innovative Companies Rely on MySQL

MySQL became the database of choice for web developers. It is being used by world's most innovative companies including Twitter, Facebook, Netflix and Uber. Many of these companies did not exist 20 years ago. Today they are operating at a scale that is hard to imagine. These are nimble organizations where developers have the power and resources to evolve products and services quickly and shape the user experience in new ways.

Below is a table which highlights some of the companies relying on MySQL and the scale at which they are operating.

Company	Description
	Facebook is one of the Top 10 most trafficked web sites in the world. They have 2.8 billion monthly active users. 55 million status updates and 350 million photos are uploaded every day.
	Booking.com is one of the Top 100 most trafficked web sites in the world. They have 28 million reported accommodation listings and more than 1.5 million room nights are reserved daily on their platform.
	Netflix is one of the Top 20 most trafficked web sites in the world. They have over 167 million subscribers. 165 million hours of Netflix are watched everyday across the globe.
	Twitter is one of the most widely used social media platforms in the world with over 330 million monthly active users. There are 500 million tweets sent each day or 6,000 tweets every second.
	Airbnb has about 150 million users with more than 5 million listings worldwide, covering 65,000 cities
	There are over 75 million active Uber riders across the world and Uber fulfills 40 million rides per month.

## Rise of Digital Healthcare

Digital technology is creating rapid, fundamental change in almost all aspects of our daily lives. Digital first approaches using smartphones and mobile apps are becoming the standard in consumer services, from banking and insurance, to entertainment, retail, and travel.

Historically, the Healthcare industry has been slower to adopt digital solutions than other industries. However, Covid upended the healthcare ecosystem. While most industries were shutting down and stay at home orders were put into place, healthcare providers were overwhelmed with urgently treating covid cases. The general population was delaying routine procedures and healthcare providers were dealing with staffing shortages. This resulted in lower revenue for providers and the workforce shortages reduced the capacity for them to treat patients.

Healthcare providers and a new generation of healthcare suppliers are turning to MySQL, open source and cloud technologies to alleviate these pains and achieve the following goals:












- **Lower cost:** The cost of healthcare remains a leading obstacle to staying healthy. Insurance limitations such as out of network costs, high deductibles, lack of coverage, and high prescription drug pricing are limiting factors. Younger populations were more likely to say they delayed care because of cost and affordability<sup>5</sup>. To reduce the cost, healthcare providers and consumers are turning to digital health technologies to get easier access to care, monitor their health more closely, avoid unnecessary visits and fees, and detect potential diseases early.
- **Accessibility:** Consumer demand for easier access and convenient care has skyrocketed, especially among millennials which represent about a quarter of the US population. Growing up with smartphones and social media, millennials are heavy users of digital technology. To improve access and to make it more convenient for consumers to receive healthcare, providers are increasing their virtual care options and online digital health services.
- **Improving Patient Outcomes:** The number one goal is to help patients achieve better health. Digital first healthcare initiatives are helping to improve the overall population health by giving patients easier access to healthcare, reducing medical errors with the help of Electronic Health Records (EHR), delivering personalized treatment using Digital Therapeutics (DTx), improving early disease diagnoses using AI/ML for predictive analytics, and much more.

Let's look at some of the existing and emerging digital healthcare sectors and examples of companies that are transforming healthcare.

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<sup>5</sup> <https://www.cvshealth.com/sites/default/files/cvs-health-health-care-insights-study-2021-report-executive-summary.pdf>

# Digital Healthcare Applications




Healthcare Sector	Companies
<p><b>EHR/EMR</b></p> <p>An Electronic Health Record (EHR) is used to securely document, store, retrieve, share, and analyze information about individual patient care. 75% of office-based clinicians and 96% of hospitals in the United States are using an EHR system. EHRs improve the efficiencies, reduce errors and improve the coordination of patient care.</p>	  
<p><b>Digital Patient Portals</b></p> <p>Digital Patient Portals are online portals connected to an EHR. Patients can view their test results, read visit summaries, schedule appointments, communicate with their provider, and make payments. Giving patients access to their EHR increases patient engagement with managing their overall health. The ongoing management of one's health results in lower costs both for the patient and the provider since conditions can be identified and treated earlier. Therefore, 77% of healthcare executives are investing in portals and mobile apps to boost engagement and communication<sup>6</sup>.</p>	   
<p><b>Virtual Healthcare / Telehealth</b></p> <p>During the pandemic virtual healthcare surged as consumers and providers looked for ways to safely access and deliver healthcare. After an initial spike, telehealth utilization stabilized at levels 38X higher than before pandemic<sup>7</sup> and accounts for 13-17% of patient visits. Patients are recognizing new avenues of care and using Telehealth to connect with new types of providers including nurse practitioners and physician assistants. At the same time, routine care from PCPs for a minor illness or injury has dropped from 62% in 2020 to 56% in 2021<sup>8</sup>. Investments in virtual healthcare have skyrocketed since 2020.</p>	   

<sup>6</sup> <https://www.insiderintelligence.com/content/patients-using-portals-more-than-ever-and-high-adoption-linked-shorter-hospital-stays>

<sup>7</sup> <https://www.mckinsey.com/industries/healthcare-systems-and-services/our-insights/telehealth-a-quarter-trillion-dollar-post-covid-19-reality>

<sup>8</sup> <https://www.cvshealth.com/sites/default/files/cvs-health-health-care-insights-study-2021-report-executive-summary.pdf>



<p><b>AI / ML / Analytics</b></p> <p>Health systems are increasingly turning to machine learning, artificial intelligence and predictive analytics to improve patient health. AI / ML digital healthcare vendors are combining numerous datasets to detect diseases earlier, predict outcomes and prescribe individualized treatments. Healthcare providers are building data lakes by moving sizeable data sets to the cloud for analysis. AI / ML focused healthcare companies received over \$10 billion in 2021 Venture Capital Investments, accounting for for 34% of all Digital Healthcare funding<sup>9</sup>.</p>	
<p><b>Digital Therapeutics (DTx)</b></p> <p>Digital Therapeutics enable patients to manage conditions or treat diseases with the aid of an online application or mobile device. For example, several companies offer digital therapeutics for diabetes care. Monitoring devices can share data to create a personalized, digitally enabled treatment plan. Treatment can be combined with virtual visits, offering easier and more frequent access to care. Digital therapeutics are regulated by the FDA in the US as medical devices. Insider Intelligence forecasts DTx to be a \$56 billion global opportunity by 2025.<sup>10</sup></p>	
<p><b>Digital Mental Health</b></p> <p>The Covid pandemic had a significant impact on people's mental health. People who need mental health treatment the most tend to be the least likely to seek it. Online, digital first solutions improve access and convenience and increases the likelihood of patients seeking services. Digital solutions enable data driven measurement and personalized feedback to improve outcomes. Venture Capital investment in digital mental health solutions have doubled to \$5.1 billion since the start of the pandemic<sup>11</sup>.</p>	

<sup>9</sup> <https://www.politico.com/news/2022/08/15/artificial-intelligence-health-care-00051828>

<sup>10</sup> <https://www.insiderintelligence.com/insights/digital-therapeutics-report/>

<sup>11</sup> <https://rockhealth.com/insights/2021-year-end-digital-health-funding-seismic-shifts-beneath-the-surface/>

### Workflow and Collaboration

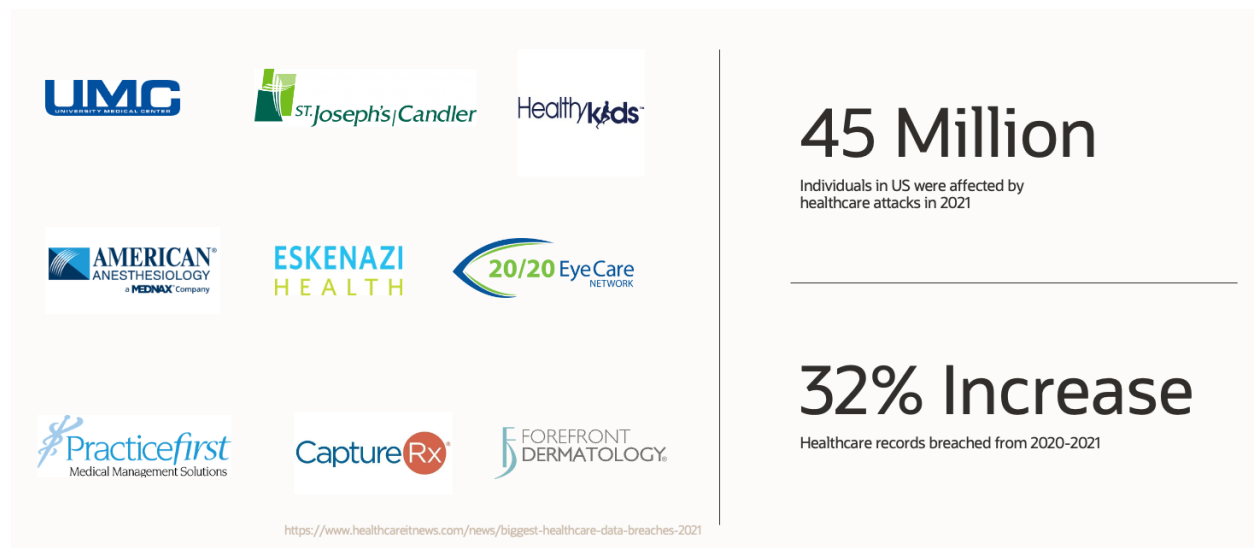
Digital Workflow and Collaboration solutions enable care teams to coordinate a patient's care. Doctors, nurses, caregivers and anyone involved in patient care can collaborate using real-time data to improve response time and reduce errors. Workflow and Collaboration solutions allow care team members to contact on-call doctors, securely message team members, manage tasks, share care plans, and hold real-time virtual visits to eliminate miscommunication.



## Security: Healthcare Data Breaches

Frontline healthcare workers continued to be understaffed and overworked from the Covid pandemic. Similarly, IT departments at healthcare organizations face critical skills and staffing shortages impacting their ability to protect patient data and respond to data breaches in a timely manner. Yet, protecting patient information is a regulatory requirement with steep fines for non-compliance.

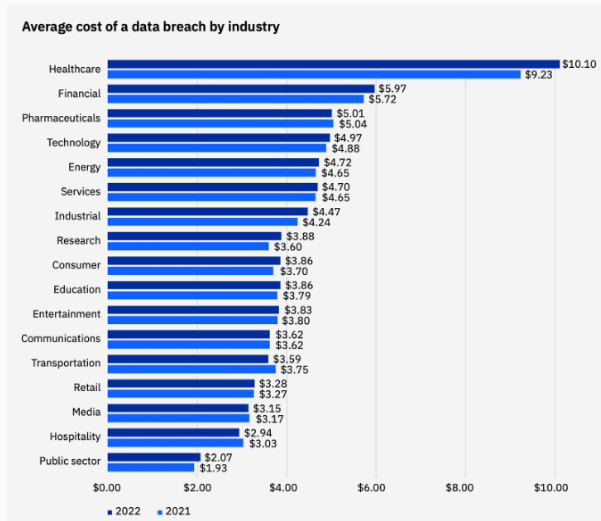
Data Breaches in the US healthcare industry hit an all-time high in 2021, exposing a record number of patients' Protected Health Information (PHI). 45 million individuals were affected by healthcare attacks, up from 34 million in 2020<sup>12</sup>. That represents a 32% increase in just one year.



Data breach costs are higher in the healthcare industry due to the regulatory fines and legal fees that are incurred for years following a breach. Also, healthcare providers are forced or proactively shutdown as a result of external attacks due to a threat to patient safety.

<sup>12</sup> <https://www.fiercehealthcare.com/health-tech/healthcare-data-breaches-hit-all-time-high-2021-impacting-45m-people>

The cost of a healthcare data breach was higher than in any other industry. The average cost of a healthcare data breach was \$10.1 million<sup>13</sup>. This is a 41% increase in data breach costs since 2020. This is not a one-time anomaly. The healthcare industry has had the highest average cost of a breach for the last 12 years.



Measured in USD Millions Source: <https://www.ibm.com/security/data-breach>

# 12 Years

Consecutive years the healthcare industry had the highest average cost of a breach.

# 41% Increase

Healthcare data breach cost since 2020.

In an August 2021 survey conducted by CyberMDX in collaboration with Philips, less than 11% of hospital IT executives said cybersecurity was a high-priority investment. At the same time, 48% of those executives reported a forced or proactive shutdown of their systems in the last six months due to ransomware attacks or queries<sup>14</sup>. As a result, ECRI identified cybersecurity attacks as the number one health technology hazard for 2022<sup>15</sup>.

## Regulatory Compliance

Healthcare is one of the more highly regulated industries and is considered critical infrastructure by the US government. A few of the more well know healthcare regulations include:

- **HIPPA** – The Health Insurance Portability and Accountability Act is a US legislation that provides data privacy and security provisions for safeguarding medical information. The Privacy Rule protects all individually identifiable health information, while the Security Rule defines standards for securing electronic protected health information.
- **HITECH** – The Health Information Technology for Economic and Clinical Health Act incentivized US healthcare providers to adopt EHR technology to improve efficiencies and care coordination. Prior to the HITECH Act, only 10% of hospitals had adopted EHRs. Today 96% of hospitals use EHRs.

<sup>13</sup> <https://www.ibm.com/reports/data-breach>

<sup>14</sup> <https://www.fiercehealthcare.com/tech/cyberattacks-top-list-2022-health-tech-hazards-ecri-report-alongside-supply-chain-problems>

<sup>15</sup> <https://www.ecri.org/press/ecri-names-cybersecurity-attacks-the-top-health-technology-hazard-for-2022>

- **GDPR** – The General Data Protection Regulation is the data privacy and security law of the EU. The GDPR requires organizations to handle data securely which includes limiting access, encrypting data, two-factor-authentication, audit controls and more. Health data is a special category of personal data in the GDPR which relates to someone's physical or mental health.

## Healthcare Regulatory Compliance

### Regulations

- HIPAA: Privacy of Health Data
- HITECH: EHR Adoption, Privacy & Protection of Health Data
- EU GDPR: Health Data Category
- Germany: Patient Data Protection Act
- ...

### Requirements

- Continuous Monitoring (Users, Schema, Backups, etc)
- Data Protection (Encryption, Privilege Management, etc.)
- Data Retention (Backups, User Activity, etc.)
- Data Auditing (User activity, etc.)



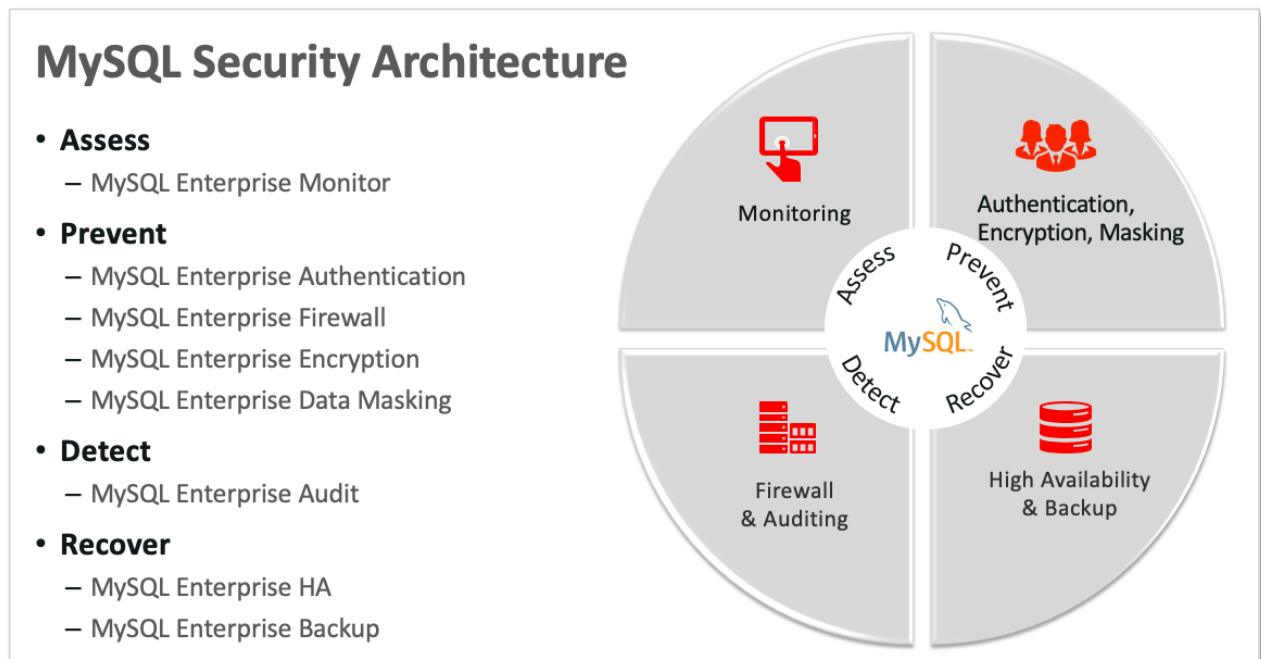
Even though individual Healthcare Regulations are separate laws, they all share common data protection requirements. They require organizations follow several guidelines to secure sensitive data.

- **Assess Security Risks** - Identify sensitive data such as Personally Identifiable Information and vulnerable configurations.
- **Manage User Privileges and Restrict Access to Sensitive Data** - Grant access to data on only a Need-to-Know basis and authenticate users with strong passwords and two factor authentication.
- **Protect Dev & Test Data** - Organizations can reduce the risk of a data breach by masking sensitive or confidential data so it can be used in non-production systems.
- **Encrypt Sensitive Data** - Implement a mechanism to encrypt data so if data is stolen, it can't be read.
- **Detect Database Activity** - Organizations must be able to detect and stop malicious database activity. In case of breach, companies must be able to determine what information was accessed and by whom.

Healthcare regulations include a breach notification rule that includes a set of standards organizations must follow in the event of a data breach containing PHI.

## MySQL Enterprise Edition

MySQL Enterprise Edition provides the essential technologies to protect sensitive data and comply with industry regulations such as HIPPA and GDPR. It also reduces the risk, cost, and complexity in developing, deploying, and managing business-critical MySQL applications.



### MySQL Enterprise Authentication

MySQL Enterprise Authentication provides ready to use external authentication modules to easily integrate MySQL with existing security infrastructures including PAM and Windows Active Directory. MySQL users can be authenticated using Pluggable Authentication Modules ("PAM") or native Windows OS services.

### MySQL Enterprise Encryption

MySQL Enterprise Encryption provides encryption, key generation, digital signatures and other cryptographic features to help organizations protect confidential data and comply with regulatory requirements.

### MySQL Enterprise Firewall

MySQL Enterprise Firewall guards against cyber security threats by providing real-time protection against database specific attacks, such as an SQL Injection. MySQL Enterprise Firewall monitors for database threats, automatically creates an allowlist of approved SQL statements and blocks unauthorized database activity.

## **MySQL Enterprise Audit**

MySQL Enterprise Audit enables you to quickly and seamlessly add policy-based auditing compliance to new and existing applications. You can dynamically enable user level activity logging, implement activity-based policies, manage audit log files and integrate MySQL auditing with Oracle and third-party solutions.

## **MySQL Enterprise Monitor**

The MySQL Enterprise Monitor and the MySQL Query Analyzer continuously monitor your databases and alerts you to potential problems before they impact your system. It's like having a "Virtual DBA Assistant" at your side to recommend best practices to eliminate security vulnerabilities, improve replication, optimize performance and more. As a result, the productivity of your developers, DBAs and System Administrators is improved significantly.

## **MySQL Enterprise Transparent Data Encryption (TDE)**

MySQL Enterprise Transparent Data Encryption (TDE) enables data-at-rest encryption by encrypting the physical files of the database. Data is encrypted automatically, in real time, prior to writing to storage and decrypted when read from storage.

## **MySQL Enterprise Masking and De-identification**

MySQL Enterprise Masking and De-identification provides an easy to use, built-in database solution to help organizations protect sensitive data from unauthorized uses by hiding and replacing real values with substitutes.

## **MySQL Document Store: NoSQL + SQL=MySQL**

MySQL Document Store allows developers to work with SQL relational tables and schema-less JSON collections. To make that possible MySQL has created the X Dev API which puts a strong focus on CRUD by providing a fluent API allowing you to work with JSON documents in a natural way. The X Protocol is a highly extensible and is optimized for CRUD as well as SQL API operations.

MySQL Document store gives users maximum flexibility developing traditional SQL relational applications and NoSQL schema-free document database applications. This eliminates the need for a separate NoSQL document database. Developers can mix and match relational data and JSON documents in the same database as well as the same application. For example, both data models can be queried in the same application and results can be in table, tabular or JSON formats

## **MySQL HeatWave**

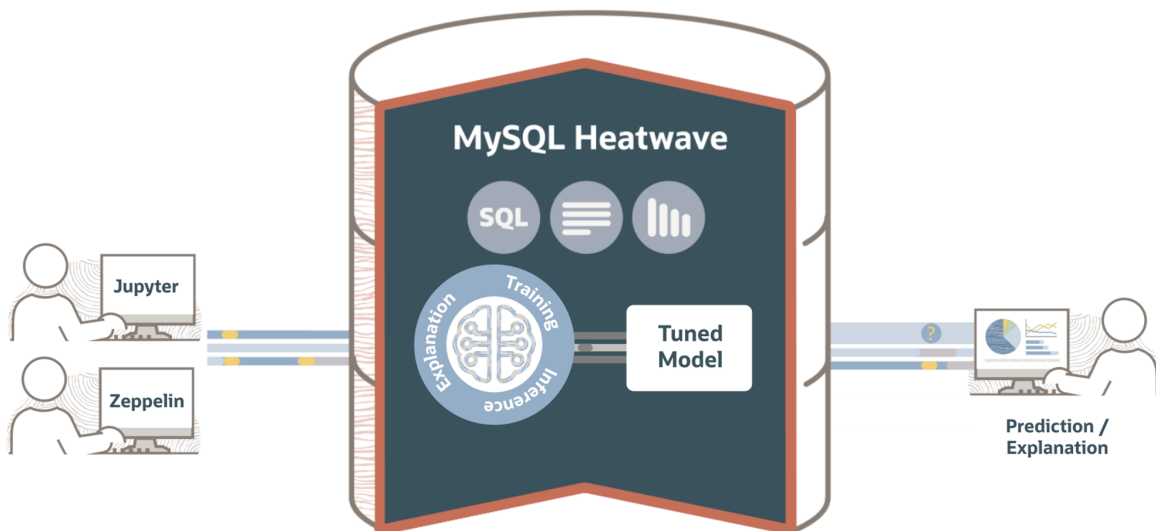
AI / ML for Predictive Analytics are playing a key role in helping improve efficiencies, detect diseases early and develop personalized treatment plans. MySQL HeatWave is one MySQL Database service for transactions, analytics, and machine learning (ML). It provides real-time, secure analytics without the complexity, latency, and cost of extract, transform, and load (ETL) duplication.

## MySQL HeatWave ML

With native, in-database machine learning in MySQL HeatWave, available at no extra cost, users don't need to move data to a separate machine learning service. HeatWave ML automates the machine learning lifecycle, including algorithm selection, intelligent data sampling for model training, feature selection, and hyperparameter tuning—saving customers significant time and effort.

Developers and data analysts can build machine learning models using familiar SQL commands; they don't have to learn new tools and languages. Additionally, HeatWave ML is integrated with popular notebooks such as Jupyter and Apache Zeppelin. HeatWave ML delivers predictions with an explanation of the results, helping organizations with regulatory compliance, fairness, repeatability, causality, and trust. Benchmarks demonstrate that, on average, HeatWave ML produces more accurate results than Amazon Redshift ML, trains models up to 25X faster at 1% of the cost, and scales as more nodes are added.

## Machine learning is easier with MySQL HeatWave

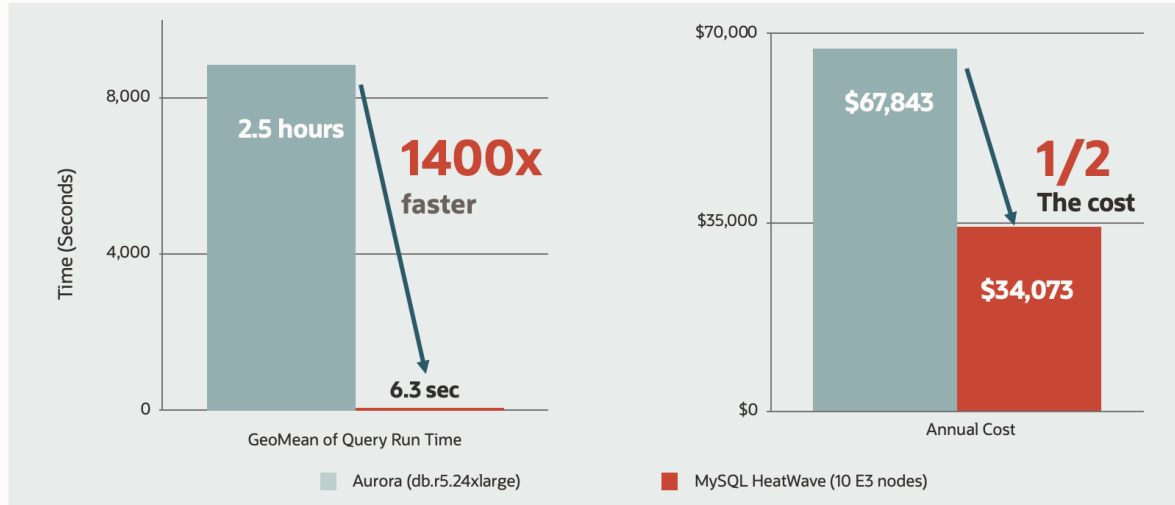


## MySQL HeatWave Performance

MySQL HeatWave accelerates MySQL performance by orders of magnitude for analytics and mixed workloads. HeatWave is 5400x faster than Amazon RDS at 2/3 the cost and 1400X faster than Amazon Aurora at half the cost.

## MySQL + HeatWave vs. Amazon Aurora

4TB



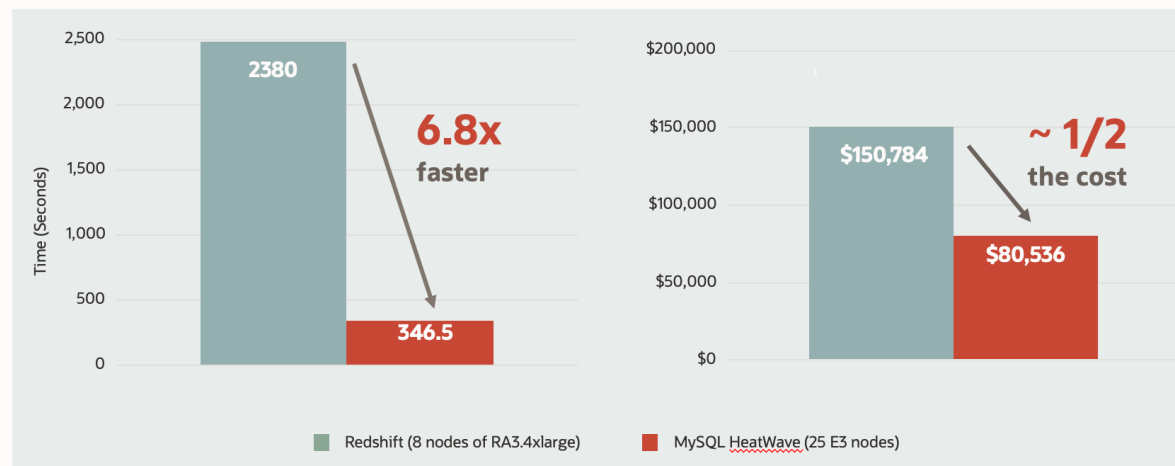
\*Benchmark queries are derived from TPC-H benchmark, but results are not comparable to published TPC-H benchmark results since they do not comply with TPC-H specification.

*MySQL HeatWave is 1400x faster than Aurora*

MySQL HeatWave is ideally suited to help healthcare providers and suppliers deliver a new generation of innovative solutions by providing an in-memory query accelerator for real-time analytics. It is 6.5X faster than Amazon Redshift at half the cost, 7X faster than Snowflake at one-fifth the cost.

## MySQL + HeatWave vs. Amazon Redshift AQUA

10TB



\*Benchmark queries are derived from the TPC-H benchmark, but results are not comparable to published TPC-H benchmark results since they do not comply with the TPC-H specification

*MySQL HeatWave is 6.8x faster than Amazon Redshift*



## MySQL Customers: Healthcare

### MySQL Enterprise Edition



"**MySQL Enterprise Edition opened up many possibilities** that we didn't have with MariaDB. The **monitoring** feature alone has been extremely helpful. We are also **very happy with the support** that we received from Oracle. We got **immediate help** whenever we had something to resolve."

#### **Richard Jans**

Database Administrator  
Great HealthWorks

### MySQL HeatWave



"MySQL HeatWave on AWS is an excellent solution for us as a small team. Having **one database for both OLTP and OLAP workloads with 6X better performance compared to AWS RDS** delivers **real-time insights** that helps us to continually enhance our iQueue platform, **improve the user experience, and reduce complexity** and administrative overhead for our team."

#### **Gokhan Oner**

Senior Engineering Manager, LeanTaaS

MySQL HeatWave

BIONIME

“MySQL HeatWave on AWS has **50X faster complex queries compared to AWS RDS** that provides us **real-time insights** to accelerate application development that us helps **improve patients’ lives**”.

**Kyle Yang**

Assistant Manager, Bionime

## Conclusion

Healthcare providers and a new breed of digital healthcare suppliers are combining modern technologies with a data driven approach to lower healthcare costs, increase access to healthcare, and improve healthcare outcomes. Many healthcare organizations are using MySQL today to enable this digital transformation. They are using MySQL Enterprise Edition and MySQL HeatWave as a proven, cost-effective database to innovate faster, protect their most critical data, and comply with healthcare regulations.

## Additional Resources

MySQL Enterprise Edition

<https://www.mysql.com/products/enterprise/>

MySQL HeatWave

<https://www.oracle.com/mysql/>

To learn more contact your Oracle/MySQL Partner