

Cloudwick

From Hurdles to Opportunities: Taking a Managed System Integration (SI) Approach to Drive Data and AI Adoption in HCLS

Streamline your data complexity, overcome regulatory hurdles, and ensure interoperability





Data and AI are unlocking opportunities for Healthcare and Life Sciences (HCLS) companies. Establishing a cloud-based data and analytics platform is the first essential step towards improving healthcare outcomes.

While larger companies and biotech startups have already embraced this "data-first" approach, most HCLS companies face difficulties in taking this first step due to the complexity of healthcare data. In this white paper, we look into:

- Key challenges posed by HCLS data workloads
- Different approaches for staging a healthcare data and analytics platform
- How can companies effortlessly jump on the data and AI bandwagon by taking a managed cloud SI approach.

Data and Artificial Intelligence: The fuel for driving healthcare outcomes

According to a report by the McKinsey Global Institute, AI has the potential to create an additional \$13 trillion in economic value by 2030. Within the healthcare industry, AI and data-driven technologies are playing a critical role in transforming the way healthcare services are delivered, accessed, and reimbursed.

The University of California, San Francisco (UCSF) Medical Center has developed an AI-powered platform to predict patient deterioration and enable early intervention. The platform uses machine learning algorithms to analyze vital signs and lab results, alerting clinicians to patients at risk of deterioration up to six hours before traditional warning signs.

Moderna could deliver their first drug candidate for a COVID-19 vaccine in 42 days. They could leverage the cloud's scalable compute and storage infrastructure to design and analyze mRNA sequences for protein targets in record time.

Numerous instances exist where HCLS companies leverage data and AI technologies to achieve speed-to-market and promote business innovation. Although these examples showcase innovation in different healthcare sectors, they share a commonality in their use of cloud computing, data, and artificial intelligence, facilitated through a cloud-based data and analytics platform.



The science behind mRNA medicines is advancing at a rapid pace, and building Moderna's technology platform on AWS gives our scientists the insights, agility and security they need to continue to lead in the industry.

Stephane Bancel
CEO Moderna

The stringent demands of HCLS: Managing data complexity, Ensuring regulatory compliance, and Facilitating interoperability

The data workloads of the HCLS industry are characterized by complex requirements that must be met by a cloud-based data and analytics platform to achieve successful outcomes. These requirements encompass a range of factors, including diverse data sources, complex data processing, regulatory compliance, interoperability, and collaboration.

Diverse Data Sources:

The HCLS industry generates data from various sources, including medical imaging, electronic health records, clinical trials, and patient-generated data. The data must be collected, integrated, and analyzed to ensure meaningful insights and decision-making. As a result, the HCLS industry requires robust data management and processing systems capable of handling diverse data sources.

Complex Data Processing:

The sheer volume and complexity of HCLS data make it challenging to process and analyze. The data processing systems must be capable of handling large datasets, complex algorithms, and machine learning models to derive valuable insights. The HCLS industry requires specialized tools and infrastructure to support these demanding data processing requirements.

Regulatory Compliance:

The HCLS industry operates under strict regulatory frameworks, which mandate data privacy, security, and confidentiality. Compliance with regulations such as HIPAA, GDPR, and FDA guidelines is crucial to ensure that patient data is protected, and data-driven insights are accurate and reliable. The HCLS industry must adhere to strict regulatory standards while using data to drive innovation and improve patient outcomes.

Interoperability:

The HCLS industry comprises various stakeholders, including healthcare providers, insurers, researchers, and patients. These stakeholders generate and consume data through different systems, platforms, and formats, making interoperability a crucial requirement for data sharing and collaboration. The HCLS industry needs interoperable data standards and systems that allow stakeholders to share and exchange data seamlessly.

Collaboration:

Collaboration is essential for driving innovation in the HCLS industry. Effective collaboration between stakeholders is crucial for ensuring that data is shared, analyzed, and acted upon to improve patient outcomes. The HCLS industry requires collaboration tools and platforms that enable stakeholders to work together effectively, share data, and co-create solutions.



Managed system integration is a coherent approach for HCLS data workloads

A good way to arrive at the best approach for managing data and AI workloads in the HCLS industry is to look at other industries that have faced similar challenges. One such industry is telecommunications, which has also dealt with complex data management issues. In the telecommunications industry, managed system integration (SI) approaches have been widely adopted to simplify data complexity, ensure regulatory compliance, and achieve better interoperability. Similarly, HCLS companies can benefit from a managed SI approach to overcome the challenges posed by complex healthcare data and improve healthcare outcomes.

Additionally, by outsourcing their SI needs to a managed service provider, HCLS companies can free up resources and focus on their core competencies.

In terms of suitability for HCLS data workloads, the managed cloud SI approach is still likely the most suitable due to its customization flexibility, scalability, ongoing support with optimization and integration with multiple vendors. The multi-vendor aspect of this solution can provide access to a wider range of services and tools that can be tailored to the specific needs of HCLS data workloads. Additionally, ongoing support and maintenance can ensure that the platform remains secure and compliant with regulatory requirements. However, there may be some potential vendor lock-in, as well as a reliance on the third-party provider.

Overall, the similarities between the telecommunications and HCLS industries suggest that a managed SI approach is a coherent and effective way for HCLS companies to manage their data and AI workloads.

Taking a Closer Look at a Managed Cloud SI Solution for HCLS on AWS

In today's rapidly evolving healthcare domain, cloud-based solutions have become essential for managing large volumes of data, ensuring data interoperability, and maintaining regulatory compliance. Amazon Web Services (AWS) is one of the leading cloud platforms that provide a wide range of services for HCLS organizations.

However, managing these services can be complex and challenging. To address this issue, several managed cloud service providers have emerged, offering tailored solutions for HCLS on AWS. In this section, we will take a closer look at a managed cloud solution for HCLS on AWS, provided by Cloudwick. Cloudwick leverages the capabilities of Amorphic for complex data management, Redox for data interoperability, and ClearData for regulatory compliance.

Amorphic is Cloudwick's last mile integration platform that cuts down time to production and skills to half with its pre-built functions. It extends the power of AWS services to handle large datasets, complex algorithms, and machine learning models, deriving valuable insights from vast amounts of HCLS data. Cloudwick plays a crucial role as a system integrator, providing professional services that enable seamless integration of these multi-vendor platforms for HCLS organizations. Figure 1 illustrates the high level schematic for a managed cloud SI solution on AWS followed by a small description of the role each component plays.

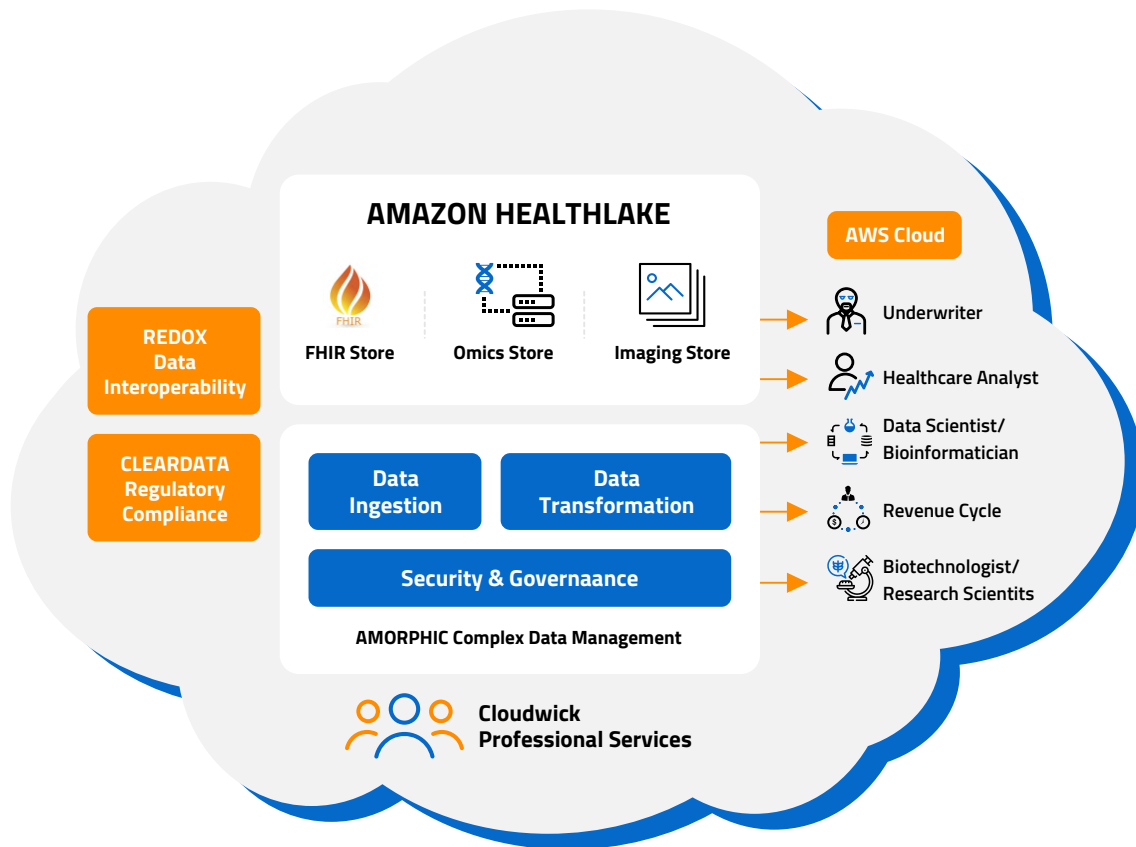


Figure 1: High-level schematic for a managed cloud SI solution for HCLS

Amorphic offers HCLS organizations a data integration and management platform to access, harmonize, and analyze data from different sources, helping them gain valuable insights from their data and drive innovation in healthcare. Amorphic's data cloud provides out-of-the-box data stores for FHIR, Image, and Omics to store various types of data using AWS native services, enabling customers to build use cases such as Patient Health Record, Clinical Decision Support, Radiology, Precision Medicine, and more. FHIR is a standard for exchanging healthcare information electronically, while Image store stores and manages medical images, and Omics store stores and manages genomic, transcriptomic, proteomic, and metabolomic data.

Redox offers a standardized and secure way to exchange healthcare data between different healthcare systems, including the Amorphic powered by Amazon HealthLake. Through a centralized architecture that accommodates a wide range of data standards and communication preferences, Redox facilitates connectivity, data translation, and data delivery to ensure data is exchanged consistently. The Redox Platform also offers a REST-inspired API, allowing organizations to access and interact with a variety of healthcare-related data securely and conveniently. With real-time, bidirectional EHR data exchange and managed services, Redox has connected to over 1,200 healthcare organizations and 85 different EHRs and HIEs. Additionally, Redox is HITRUST certified and SOC II compliant, offering bi-directional, real-time data exchange with provider EHRs, payers, clearinghouses, and HIEs.

ClearDATA offers a comprehensive solution to integrate security and compliance practices from design throughout the application's lifecycle, enabling healthcare organizations to confidently accelerate their IT initiatives and business objectives. The platform automatically configures controls to protect, monitor, and remediate non-compliant activity, while proprietary reference architectures mapped to HIPAA, HITRUST, and GDPR integrate the highest security standards. Real-time dashboards provide full control, even at the application level.

ClearDATA's Automated Safeguards Reference Architecture steps:

- Amorphic deploys the AWS infrastructure
- Resource provision or update is detected
- ClearDATA Automated Safeguards are notified
- Resource is evaluated for compliance & remediated if non-compliant
- Evaluation results recorded and notification sent

Cloudwick's managed SI solution in action

In this section, we will delve into the managed SI solution in action for the HCLS industry. The Cloudwick solution comprises six critical steps, each designed to enhance the ingestion, management and transformation of HCLS data for maximum impact. The diagram below outlines these six steps, highlighting the specific actions taken at each stage to ensure continuous compliance, diverse data ingestion, data masking, downstream transformation, and end-user consumption.

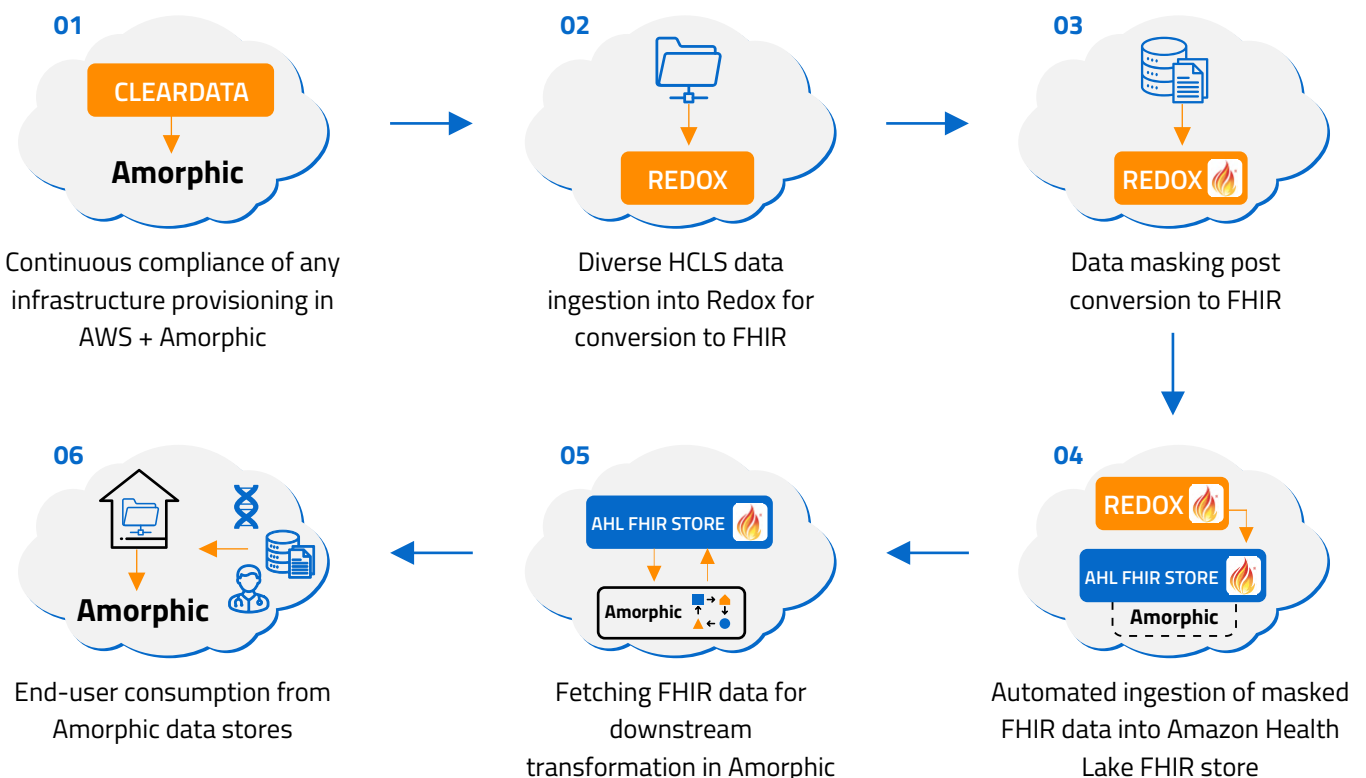


Figure 2: Cloudwick's managed AWS SI solution for HCLS in action

Conclusion

In conclusion, the combination of Amorphic, Redox, and ClearData presents a powerful data analytics solution for healthcare and life sciences organizations. With the support of Cloudwick's professional services, these platforms enable organizations to optimize their data analytics workflows, access diverse data sources, maintain data security and compliance, and ultimately leverage valuable insights to enhance patient outcomes.

By leveraging these cutting-edge technologies and services, HCLS organizations can unlock the full potential of their data and drive innovation in the healthcare industry.