Break Down Digital Health Barriers and Transform Care with FHIR

Streamline Interoperability, Improve Workflows, Increase Data Insights

Introduction

HL7® **FHIR®** (Fast Healthcare Interoperability Resources) is an international standard for accessing, exchanging, and managing healthcare information electronically. Unlike previous standards, FHIR lets you easily build innovative applications that efficiently gather, aggregate, and analyze diverse healthcare and administrative data from disparate sources. Healthcare delivery organizations, payers, government agencies, life sciences companies, medical device manufacturers, and MedTech companies leverage FHIR to streamline information flows, increase data insights, and improve clinical outcomes and business results.

FHIR is based on popular web technologies like JSON, HTTP, and REST. With FHIR, software developers without a healthcare IT background, can use familiar development tools and open-source technologies to quickly and easily address the requirements of clinicians, researchers, healthcare workers, and other stakeholders and innovators.

FHIR is a flexible and adaptable healthcare data model that is easily customized to enable interoperability for a wide array of use cases. FHIR consists of discrete, computable data objects called Resources for optimal efficiency. With FHIR Resources, applications can access individual healthcare record elements without retrieving all of the data contained in a summary document.

This paper reviews practical applications for FHIR and provides real-world examples of how InterSystems customers use FHIR to connect disparate systems, accelerate digital transformation, and increase data insights.
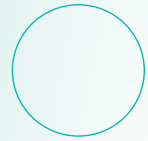
InterSystems®
Creative data technology

FHIR Opportunities Abound

FHIR is transforming healthcare data access and exchange. Whether you work for a healthcare provider, a public health agency, an insurance company, or a medical technology provider, FHIR can help you efficiently retrieve and share disparate healthcare data from various sources like EHR systems, smart medical devices, wearables, clinical trials, and public health surveillance systems.

You can use FHIR for a variety of purposes, in a variety of deployment scenarios. The tables below summarize some of the current applications and potential future use cases for FHIR in different industry segments.

Hospitals and Healthcare Systems

Use case	Opportunity
Patient access APIs	Comply with the US Centers for Medicare & Medicaid Services CMS-9115-F Interoperability and Patient Access Rule, which requires providers give patients programmatic access to their health data (medical history, lab results, treatment plans, etc.) via standards-based (FHIR) APIs.
Clinical decision support	Use FHIR to improve clinical decision systems insights. Forward real-time EHR data to an external system for analysis. Return recommendations to help clinicians make informed decisions. Unlike with previous standards and approaches, with FHIR you can embed clinical decision support functionality directly into an EHR to streamline clinician workflows and improve user experiences.
Provider-payer data exchange and CMS prior authorization compliance	Leverage FHIR to automate the exchange of data between healthcare providers and payers. Eliminate resource-intensive, time-consuming, manual processes. Allow providers to forward EHR data directly to payers without human intervention. Simplify US Centers for Medicare & Medicaid Services CMS-0057-F Prior Authorization Processes Rule compliance.
Clinical trials and research	Use FHIR to seamlessly share patient data for recruitment and analysis in clinical trials, speeding up clinical research processes.

Device Manufacturers, Medtech Companies, and Application Developers

Use case	Opportunity
Telemedicine and remote monitoring	Use FHIR to enable the secure transfer of patient data from home-based medical devices to healthcare providers so they can effectively monitor and manage patients remotely.
Mobile health apps	Adhere with US Federal rules requiring that an EHR can connect with SMART on FHIR apps to ensure patient data privacy and security.
Chronic disease management apps	Use FHIR to seamlessly share patient data across healthcare providers to enable consistent monitoring and coordinated care plans.
Medication management apps	Create versatile medication management apps for clinicians and caregivers. Use FHIR to efficiently share prescription information, medication schedules, and pharmacy records across healthcare platforms.

Life Sciences Companies, Government Agencies, and Payers

Use case	Opportunity
Health information exchanges	Use FHIR to allow payers to efficiently access member data for quality assessment, gaps in care identification, claims adjudication, etc.
Care management initiatives	Leverage FHIR to enable multi-organizational care teams—physicians, home health workers, community caregivers, family members, etc.—to seamless exchange information. Allow diverse healthcare systems to communicate effectively. Ensure all care team members have up-to-date patient information.
Public health reporting	Streamline public health reporting by using FHIR to efficiently aggregate and share patient data for surveillance and population health management. Take advantage of EHR bulk retrieval capabilities, which have been a mandatory requirement for all EHR systems since 2022.

Streamline FHIR Initiatives with InterSystems

InterSystems is a leader in healthcare data technology and standards-based interoperability. We have the products and expertise to help you develop and deliver scalable and resilient FHIR applications—quickly, efficiently, and cost-effectively.

Comprehensive FHIR Solutions

InterSystems IRIS for Health™ is a wide-ranging digital health development platform that provides all the building blocks you need to work with FHIR data and develop FHIR applications. You can use InterSystems IRIS for Health to build a wide array of healthcare applications including standalone, EHR-independent SMART on FHIR applications. The InterSystems platform includes both an enterprise-grade FHIR Server and a robust **FHIR Repository** for retrieving and storing FHIR data at scale, as well as a **Bulk FHIR** utility with an intuitive GUI interface for easily and efficiently importing or exporting large FHIR datasets.

InterSystems IRIS for Health includes a **FHIR SQL Builder** that lets data analysts and business intelligence developers work with FHIR data using familiar tools such as ANSI SQL, Power BI, or Tableau, so they don't have to learn a new query syntax. FHIR SQL Builder lets you create custom SQL schemas based on data in an InterSystems IRIS for Health FHIR Repository without moving data to a separate SQL repository. Unlike competitive solutions, with the InterSystems IRIS for Health FHIR SQL Builder, you can analyze data in-place, in real-time, for ultimate speed and efficiency. The solution "projects" FHIR resource strings as Resource tables with rows and user-defined columns, enabling real-time FHIR analytics without replicating data.

InterSystems HealthShare® Health Connect™ is a highly available, high-performance data integration engine that provides all the technology interfaces you need to handle FHIR requests. It includes a FHIR client and supports an optional FHIR Server.

InterSystems FHIR Transformation Service lets you convert legacy healthcare data formats such as HL7 v2 or CDA to FHIR. You can use it with IRIS for Health, Health Connect, or any other application using RESTful APIs.

InterSystems HealthShare Care Community® makes it easy for extended teams to create, customize, update, and share comprehensive digital care management plans. The FHIR-enabled solution breaks down information silos and interoperability barriers, providing a common data model and consistent experience for all users.

Vast FHIR Experience

InterSystems has helped drive the development and adoption of the FHIR standard, and has practical, hands-on experience with real-world FHIR implementations. We have been actively involved in FHIR Accelerator projects like **Project Vulcan**, which aims to bridge the gap between clinical care and clinical research. InterSystems has also participated in FHIR **Connectathons** since the first release of the FHIR standard, and we continue to do so.

For more information on InterSystems FHIR solutions and expertise please read our **Streamline HL7 FHIR Initiatives with InterSystems** white paper.

FHIR in Action: Real-World InterSystems Customer Examples

Hospitals and healthcare systems, payers, technology providers, and researchers all over the world use InterSystems solutions to break down interoperability barriers and streamline FHIR application development and delivery efforts.
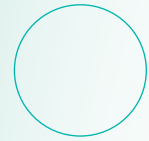
SMART on FHIR Applications

Hixny, a New York State health information network, developed a SMART on FHIR app for Healthix, the largest public Health information exchange in the US, using InterSystems HealthShare Unified Care Record®. The innovative application displays a patients' social and medical history side by side whenever a clinician views a patient record. The solution streamlines interactions and improves provider efficiency by allowing clinicians to assess social determinants of health and make social service referrals directly from their existing applications and workflows. HealthShare Unified Care Record makes it easy for Hixny to maintain all data in a single, consistent format, regardless of source.

Data Transformation

Lincolnshire NHS in the UK uses InterSystems HealthShare and InterSystems HealthShare Care Community to power an integrated care portal and provide individualized care plans to local care teams and patients. The InterSystems solutions enable doctors, nurses, health practitioners, care providers, and care managers to efficiently share information and coordinate care from any setting. Care Community helps care providers save time and effort, and improve care quality and patient experience by providing full and instant access to accurate treatment plans and patient preferences. Clinicians use the care portal to review patient records and care plans in advance of visits, improving readiness and simplifying consultations and community-based visits. This approach helps the NHS improve population health and reduce care costs by moving care out of hospitals and closer to the citizens of Lincolnshire.

Leumit Health Services, one of the four Israeli health maintenance organizations, uses InterSystems IRIS for Health to exchange data between payer and provider systems as part of a patient kiosk project. The integrated solution improves patient experiences by electronically verifying a patient's insurance eligibility upon check-in, replacing a time-consuming, manual process. Leumit implemented the InterSystems FHIR Server as a FHIR façade to simplify and speed up the integration effort. (A FHIR facade is middleware that interworks a modern FHIR application with a legacy healthcare system by converting legacy data to FHIR format.) With a façade approach, legacy data remains in its original source, in its original format. The InterSystems FHIR Server automatically translates and transforms the data to FHIR format in real-time in response to queries, without requiring additional data storage.

A **private hospital group in the Middle East** uses InterSystems HealthShare Health Connect to power a remote patient monitoring application. The InterSystems solution breaks down interoperability barriers, transforming FHIR-formatted data to XML, seamlessly connecting in-home patient monitoring systems with the hospital group's EHR systems and other clinical applications. The remote monitoring program helps the hospital group contain care costs and improve clinical outcomes and patient satisfaction by improving in-home care and reducing hospital readmissions.

Querying FHIR Data

Pria, an innovative MedTech company, uses InterSystems HealthShare Health Connect as the foundation for its health-at-home solution for senior citizens. The Pria Wellhub is a voice-activated, interactive, home-health platform that includes health management and monitoring tools, and provides real-time alerts and communications capabilities. Pria uses HealthShare Connect to connect the Wellhub platform to disparate EHR systems and healthcare apps. The InterSystems solution makes it easy for Pria to disseminate FHIR-formatted, home-hub data to clinicians and personal caregivers.

FHIR for Analytics

A **leading medical device manufacturer** uses InterSystems IRIS for Health to gather and analyze device data at speed and scale. The InterSystems solution transforms device performance data, patient-reported outcomes measures (PROMs) data, and other data into a common FHIR format for straightforward analysis. The solution obviates the need for a separate analytics repository, eliminating expense and complexity. InterSystems IRIS for Health SQL Builder lets the manufacturer's data scientists efficiently query and analyze data using familiar SQL analysis tools. The solution enables the manufacturer to provide evidence of device compliance to regulators. It also improves visibility into population health data and provides actionable insights to help individual patients better manage diseases and detect early warning signs.

The **Israeli Ministry of Health** uses InterSystems IRIS for Health to efficiently store and analyze population health data from disparate hospital EHR systems scattered across the country. InterSystems IRIS for Health SQL Builder makes it easy to examine large FHIR-formatted datasets, helping the Ministry streamline epidemiological investigations, accelerate discoveries, and contain the spread of infectious diseases. In addition, it gathers information in FHIR format such as genetic diseases, deaths, and other population statistical data.

eHealth Exchange is a Network of Networks connecting US federal agencies and non-federal healthcare organizations so medical data can be exchanged nationwide. Active in all 50 states, eHealth Exchange is built on InterSystems HealthShare and is the largest query-based, health information network in the country. The US Food and Drug Administration's **Biologics Effectiveness and Safety** (BEST) initiative uses eHealth Exchange to retrieve population health data from EHR systems. More specifically, BEST uses FHIR to query EHR systems for data about individuals who have had adverse reactions to biologic products. The solution streamlines surveillance and epidemiologic studies, helping the FDA ensure the safety and effectiveness of the nation's vaccines, blood products, and advanced therapeutics.

Conclusion

FHIR can help you break down interoperability barriers and transform raw health and care data into meaningful and actionable information. It can help you improve the quality, efficiency, and safety of just about any healthcare service, process, or product by enabling faster and easier access to data from different sources.

InterSystems has the products, expertise, and partners to help you develop, deliver, and scale FHIR applications with confidence. To learn more about how InterSystems can help your organization streamline FHIR initiatives and accelerate results visit **www.intersystems.com/solutions/fhir**.

Next Steps

Want to experiment with FHIR? InterSystems has developed a fully functional, containerized online lab experience on the InterSystems IRIS for Health platform where you can interact with FHIR. Check out our **FHIR Integration QuickStart** to get started. Or **download** the no-cost Community Edition of InterSystems IRIS for Health to test-drive the product and start developing FHIR solutions today.

About InterSystems

Established in 1978, InterSystems is the leading provider of next-generation solutions for enterprise digital transformations in the healthcare, finance, manufacturing, and supply chain sectors. Its cloud-first data platforms solve interoperability, speed, and scalability problems for large organizations around the globe. InterSystems is committed to excellence through its award winning, 24×7 support for customers and partners in more than 80 countries. Privately held and headquartered in Cambridge, Massachusetts, InterSystems has 36 offices in 25 countries worldwide.

For more information, please visit **InterSystems.com**.

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