DataSpring
Powered by CAQH

Issue Brief

Implementing APIs and HL7 FHIR Technology

A Vendor Perspective

REGULATORY LANDSCAPE

Seamless information sharing between healthcare systems is no longer just an aspiration: it's a regulatory requirement driving transformative change through application programming interfaces (APIs) and HL7® (Health Level Seven) FHIR® (Fast Healthcare Interoperability Resources). The 21st Century Cures Act,[1] signed into law in 2016, established interoperability and information blocking provisions that led to federal requirements for standardized APIs to facilitate the access, exchange, and use of electronic health information. To implement the interoperability provisions of the Cures Act, the Centers for Medicare and Medicaid Services (CMS) and the Assistant Secretary for Technology Policy/Office of the National Coordinator for Health Information Technology (ASTP/ONC) released two final rules that establish API requirements, designating HL7 FHIR Release 4.0.1 (R4) as the public standard for interoperable data exchange. FHIR is a health data exchange standard developed by the standards development organization HL7 and widely used to support interoperable APIs.

Implementation of the Cures Act continues, building on the foundational requirements established in the CMS Interoperability and Patient Access Rule[2] and the ASTP/ONC Cures Act Final Rule.[3] New regulations have introduced key exchange and certification requirements, such as those outlined in the CMS Interoperability and Prior Authorization Final Rule (CMS 0057-F)[4] and the ASTP/ONC Health Data,

Technology, and Interoperability (HTI) rule series.[5] The promise of HL7 FHIR-based APIs is alluring to many organizations, and many are eager to use HL7 FHIR-based APIs to improve care coordination and enable seamless administrative data exchange.

HIGHLIGHTING THE VENDOR PERSPECTIVE

DataSpring conducted a series of focus groups to assess the impact of federal action on industry interoperability strategies. Published findings feature the perspectives of providers[6] and health plans,[7] with both groups highlighting the benefits and barriers to HL7 FHIR-based API use. This issue brief outlines the perspective of vendors that, as stakeholders answer questions of whether to "build or buy" solutions, play a role in the timely and compliant implementation of requirements through the development of comprehensive and modular solutions.

Key insights from the vendor perspective include a high-level understanding of how API technology has impacted the revenue cycle to date and how advancements in standard formats and business rules can positively impact future implementations and data exchange needs. Although vendor participants had varying levels of experience with specifics related to CMS interoperability rules and FHIR, they reported meeting client needs through robust planning and defined interoperability strategies.

Federal rule making is often an engine for standards-based, interoperable data exchange. The 21st Century Cures Act stimulated the promulgation of regulations that establish requirements for the build, content, and intended users of HL7 FHIR-based APIs.

- **Provider Directory API:** Requires CMS-regulated health plans to make provider directory information publicly available. Enforced since July 1, 2021.
- **Patient Access API:** Requires providers and CMS-regulated health plans to enable direct patient access to their electronic health information and allow third parties to access the data. Enforced since July 1, 2021 with enhancements mandated for inclusion by January 2027.
- **Provider Access API:** Requires CMS-regulated health plans to establish and maintain APIs to facilitate data exchange to providers, including claims and prior authorization information. Mandated for use by January 2027.
- **Payer-to-payer API:** Requires CMS-regulated health plans to build an API that facilitates the exchange of claims and encounter data, data classes and data elements consistent with adopted ONC standards, and information about prior authorizations between payers. Mandated for use by January 2027.
- **Prior Authorization API:** Requires CMS-regulated health plans to build APIs that automate the prior authorization workflow from initial request, to the identification of documentation requirements, to submission. Mandated for use by January 2027.

These API requirements, typically regulated by CMS, are supported and strengthened by comprehensive technical and data content certification criteria maintained by ASTP/ONC. Further, they are empowered through the consensus-based creation and maintenance of HL7 FHIR Implementation guides, including many developed through the HL7 Da Vinci Project.

UNDERSTANDING OF APIS AND HL7 FHIR

All vendor focus group participants exhibited high levels of understanding of API technology and its potential impact. Significantly, they cited examples of how APIs are used at their organization and how they have been employed to enhance key revenue cycle functions for their clients.

In contrast, though appreciative of its potential, participants had varying levels of FHIR-specific knowledge. Particularly, their ability to recognize its details and intricacies was limited, as well as its application to revenue cycle use cases outside of prior authorization.

Vendor participants further demonstrated variable understanding about the CMS Interoperability Rules, sharing insights that ranged from very general to very nuanced. While the focus group revealed that most vendor organizations are aware of the rules, they have not taken direct steps to implement them.

INTEROPERABILITY STRATEGY

Overall, participants indicated that their organizations have a well-defined interoperability strategy as it relates to APIs and the implementation of existing standards and other technologies. The vendors use an array of tools to meet their clients' data exchange needs, including APIs, artificial intelligence (AI), robotic process automation (RPA), X12 transactions, custom-client solutions, or a combination of these solutions. However, in line with the broader healthcare industry, the approaches for FHIR-based API implementations are still emerging and return on investment data is not yet available.

To comply with new regulations that impact FHIR adoption, vendor participants indicated they are updating their interoperability strategies. Traditionally, vendor unwillingness to adopt FHIR-based technologies was driven by the lack of regulation compelling implementation. Now that CMS and ASTP/ONC are promulgating regulations requiring the use of HL7 FHIR, vendors are integrating the technology into their solutions.

VENDOR BENEFITS OF IMPLEMENTING APIS AND HL7 FHIR

Improved holistic data

The participants agreed APIs and FHIR can make healthcare data more accessible. APIs and FHIR have the potential to unite and connect segregated data sets, such as clinical, medical, financial, and revenue cycle. Standardization of data through FHIR can allow for new analyses and comparisons. Access via APIs can greatly accelerate interoperability.

Generally, APIs force greater standardization of data content because the use cases are specific and often limited to just the data needed for that function or decision. This allows for more discernible data, which has positive, actionable impacts on workflows. Additionally, consistent data and infrastructure create the foundation for automated processes, such as AI and RPA.

Automated processes can then replace specific steps within a workflow or entire manual processes. For example, one participant explained how they use large language models (LLMs) and generative AI to streamline the revenue cycle by generating consistent data from claim status inquiries and automating tasks such as claims processing, re-billing, and payment posting.

Increased productivity with real-time responses

FHIR integrations allow vendors to access information in real-time, reducing the effort required to manually search and gather patient information from various sources. API data exchange can speed up the transmission of transactions and augment them by adding information beyond what is included in the standard. Vendors also see an opportunity to help providers implement the prior authorization requirements of the Interoperability and Prior Authorization regulation (CMS 0057-F) and optimize workflows using APIs. This can be particularly useful given the known burden prior authorization places on providers.[8]

VENDOR CHALLENGES IMPLEMENTING APIS AND HL7 FHIR

Differing priorities and resources leads to varied API adoption

The primary challenge of API adoption is obtaining buy-in from healthcare organizations, especially health plans. Regulatory requirements often serve as the catalyst for adoption, but when organizations identify a strong business need for data exchange, they demonstrate a willingness to implement proprietary API solutions tailored to specific use cases. This highlights the potential for broader adoption as organizations recognize the value of enhanced interoperability.

Adoption of FHIR, as required under CMS and ASTP/ONC regulations,[9] is principally the responsibility of health plans. But implementation specificity, as guided by regulation, may result in greater standardization and encourage other entities, like vendors and providers, to adopt HL7 FHIR-based APIs in their workflows, even if they are not explicitly identified in regulation.

A participant confirmed this, indicating that they will support the HL7 FHIR-based APIs required by CMS regulation for all lines of business (plan types), not just those required by mandate. The participant noted they believe most health plans want to implement APIs for all lines of business but are unable to due to limited resources.

Inconsistent implementation

There is variability across every health plan's systems. While there are some similarities, no two implementations are the same, making true interoperability difficult due to inconsistent data content and infrastructures that impact formatting and structure.

Greater standardization can be achieved through extensive "mapping" initiatives that unify the data content used by health plans. For example, a vendor participant noted that APIs permit the use of specific, actionable response codes used when replying to claim status requests; however, these response codes are often unique between health plans, limiting interoperability and perpetuating proprietary implementations.

Aligning industry to common data sets reduces the need for proprietary solutions and permits an intentional, ground-up design of APIs that emphasizes the universality of data content and infrastructure requirements. Vendor participants emphasized their central role in supporting the common interpretation of FHIR Implementation Guides (IG). They contribute to solutions that address system usage, data definitions, and coding inconsistencies across health plans, providers and other customers in a standardized way.

Standards lack flexibility

There was agreement within the vendor focus group that current data exchanges – both the method and the data – are often not flexible enough to accommodate all business use-cases. Healthcare organizations prefer to communicate using more contemporary methods, such as APIs, but a lack of standard flexibility and inconsistent data means that business needs are not met without workarounds. This gives rise to non-standard APIs and manual processes.

For example, a participant detailed how they use API calls to enhance the claim status response beyond what is returned in the HIPAA-mandated X12 277. Strategies like this are employed because health plans have not fully implemented the X12 277 transaction, and workarounds are necessary to take full advantage of the situational data in the transaction.

Proprietary solutions using APIs, HL7 FHIR, X12, or a combination thereof, may provide a temporary solution for a particular business case but may negatively impact scalability and weaken interoperable data exchange. Consensus-based business rules can enhance the implementation of standards, reducing the need for proprietary workarounds. Vendors can act as a key player in driving uniform solutions.

Alignment of regulations

One of the advantages of electronic exchanges, whether conducted via X12, HL7 FHIR, or proprietary API formats, is the ability for health plans to respond near-instantaneously (real-time) to provider requests. As industry moves toward the adoption of FHIR-based APIs to support exchanges for revenue cycle operations, like prior authorization, regulatory requirements must align with technical capabilities to take full advantage of real-time exchange.

For example, FHIR-based prior authorization APIs required in CMS 0057-F, and supported by voluntary certification criteria in the proposed HTI-2 regulation,[10] are landmark in their ability to promote rapid data exchange for this burdensome process. Though these requirements strengthen and streamline exchange of information and accommodate more regular communication between health plans and providers, aspects of the process, like final determination, are not completed in real-time by plans removing some of the advantages of rapid data exchange.

Thinking about revenue cycle operations, vendor participants expressed enthusiasm about the potential application of FHIR-based APIs but emphasized the importance of corresponding action to ensure optimal utilization of real-time exchange capabilities. There is precedent for this type of action, exhibited by the federally required Eligibility and Benefits and Claim Status Infrastructure Operating Rules that create foundational requirements for complete data sets to be exchanged between trading partners in real-time using the appropriate X12 transactions.

INDUSTRY NEEDS FOR SUCCESSFUL API AND HL7 FHIR IMPLEMENTATION AND INTEROPERABILITY

Education – information sharing and collaboration

All participants highlighted the need for industry-wide education to provide clarity to an environment still in flux. The potential of HL7 FHIR-based APIs has been advanced through meaningful legislative and regulatory action. As these requirements are promulgated, industry stakeholders must have resources that allow them to stay abreast of new requirements, realize essential dependencies, and prepare their implementations to facilitate a clear return on investment (ROI).

All three focus groups stressed the importance of involving impacted stakeholders within their organizations early in the implementation process. Industry-wide education can be used to gain understanding and buy-in from key staff involved in implementation, including business analysts, operations teams, IT specialists, and clinicians. Engaging these groups early and often adds value to development and helps prevent potential problems while addressing implementation challenges.

Consistent business rules

The speed of data exchange using APIs is irrelevant if it is not sent uniformly and securely. APIs and FHIR must align to standard data content, like industry recognized code sets, and infrastructure requirements to avoid the persistent use of proprietary APIs. Business rules developed through industry consensus can standardize these implementations and foster adoption of these emerging, yet promising solutions.

A compelling example was provided by a vendor participant who highlighted the importance of standard authorization and security requirements to simplify implementations. They cited authorization and security token exchange (identity verification) as their organization's primary issue with API implementation and maintenance. This issue is often handled differently depending on the implementation specification of the standard in question. Consensus-based business rules can provide clarity to these processes and reduce implementation burdens.

Return on investment

It is clear from participant feedback shared in all three focus groups that the primary driver of API and HL7 FHIR adoption is regulatory action. This is consistent with perceptions that, in our current resource-constrained environment, most healthcare organizations only invest money and resources when it is required.

The benefits of HL7 FHIR must be well understood for organizations to willingly adopt new technologies and implement new workflows.

While there is some information to support these benefits, given limited implementation to date, there is a lack of data and measurement on the return on investment (ROI) associated with HL7 FHIR. Without a clear understanding of the ROI, organizations have difficulty justifying and prioritizing resources for system updates. The healthcare industry must work together to measure associated values and benefits to foster greater adoption. HL7 FHIR ROI should evaluate overall accrued benefits across the entire healthcare system, patient benefits, and improved health equity.

As the industry continues to promote interoperability and engage with HL7 FHIR, organizations emphasized the value of sharing experiences and lessons learned. Collaboration plays a vital role in fostering the widespread use of APIs and HL7 FHIR by providing insights and guidance on effective implementation strategies.

---

1. 21st Century Cures Act, Public Law 114-255. Enacted December 13, 2016.
2. CMS Interoperability and Patient Access Final Rule. May 1, 2020.
3. 21st Century Cures Act: Interoperability, Information Blocking, and the ONC Health IT Certification Program. May 1, 2020.
4. Medicare and Medicaid Programs; Patient Protection and Affordable Care Act; Advancing Interoperability and Improving Prior Authorization Processes (CMS 0057-F). February 8, 2024.
5. Health Data, Technology, and Interoperability Rules (HTI). February 18, 2026.
6. CAQH (2024). Implementing FHIR Technology: A Provider Perspective.
7. CAQH Insights: Payer-to-Payer Data Sharing.
8. 2023 CAQH Index Report | 2023 MGMA Regulatory Burden Report.
9. Ibid, 2–5.
10. Aspects of HTI-2 remain in proposed rule phase. Other components, such as those related to the governance of TEFCA, are set for publication to the Federal Register in a Final Rule.

