# Interoperability Technology in Healthcare

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## Introduction

Interoperability in healthcare refers to the ability of different information systems and software applications to communicate, exchange, and use data in a coordinated manner. [1] In this report, we will explore the various trends of interoperability technology, focusing on Health Information Exchange (HIE), Trusted Exchange Framework and Common Agreement (TEFCA) QHIN offerings, and Fast Healthcare Interoperability Resources (FHIR) standards and derive insightful inferences about scope and growth of the interoperability technology.

## Evolution of interoperability

The concept of bidirectional data sharing dates to at least the development of the first electronic health records (EHRs) in the **mid-1960s**. Since then, after a long journey of research and development, the Office of the National Coordinator for Health Information Technology’s (ONC) **Cures Act Final Rule (Cures Rule)** was released last year. The Cures Rule set new technical standards for certified health IT developers to follow and finalized information-blocking requirements. [2] Fast Healthcare Interoperability Resources (FHIR) APIs will now be required for certified health IT developers, and the US Core Data for Interoperability (USCDI) provides the minimum data set that must be exchanged. [3] Together, Rest APIs implementing **FHIR, coupled with the USCDI**, ensures a standardized technical stack to support interoperability. Although, information-blocking exceptions create guidelines for when actors can decline data sharing. These exceptions ensure policy and business alignment to support interoperability and move the data sharing paradigm from permitted sharing to required sharing. To overcome these issues, the Trusted Exchange Framework and Common Agreement (**TEFCA**), now in the late stages of development, is the answer to having a unified network of trusted Health Information Networks or QHINs and a **regulatory system** governing the data exchange network, unleashing true interoperability. [4]

## Opportunities

TEFCA is the next step in unification of the healthcare industry. Despite the efforts of many years of perfecting the models of information exchange, lack of governance and standardization among multiple networks was the element missing from complete interoperability. But with TEFCA in scope, the interoperability technology

* Will be much more streamlined and consistent in a **nation-wide** scope. Having a Common Agreement contract between all the QHINs poses a huge opportunity of having a virtually **centralized data flow** anywhere in the US. [4]
* Will form an efficient and easier data exchange frameworks. With the Trusted Exchange Framework concept of TEFCA, large Information Networks will be able to share data easily. Hence, the **ease of exchange** of data will be improved.

## Threats

Although this is a next step in creating a one true network, there are some arguments which might pose as a problem in future of interoperability like

* The resources and timelines of achieving a unified network might be an issue for small scale health providers. Although 6 giants in healthcare industry have agreement signed and there are potentially more networks willing to contribute to the TEFCA network [5], not all healthcare providers might possess the infrastructure and resources to contribute to the unified network of TEFCA, even if they are, it might be laborious and time-consuming to onboard all the QHINs.
* **Security** possesses a huge threat to interoperability in healthcare industry. Healthcare continues to be plagued by data breaches and ransomware attacks that continually put patient data at risk. Hence, security measures should be considered while taking next steps towards new advancements in exchange frameworks.

## Potential strategies and opportunities

With the increasing need of data exchange and unification of all the data networks, scalability and robustness becomes an important criterion for technology adoption in healthcare industry. With new policies and frameworks coming up like TEFCA, the adoption of data exchange frameworks like FHIR becomes a challenge if we limit it to a small scope.

Hence, scalable cloud APIs are the absolute necessity if we want to advance into a larger and collective data front. One such example is **Google healthcare APIs**. Google provides a sophisticated architecture of healthcare APIs which are extremely easy to use and highly scalable. They support frameworks since HL7v2 to FHIR among others. You can customize your services and come up with a viable solution as per google pricing which fits your needs based on factors such as how much traffic you are handling and how much data is captured etc. [6]

Such cloud-based APIs or any alternative scalable solutions (in house / otherwise) are a must if we want to proceed further in the growing industry, to collect, maintain and analyse properly structured data.

## Conclusion

Interoperability technology in healthcare is at a crucial juncture, marked by significant advancements such as the implementation of FHIR APIs and the impending rollout of TEFCA. While these developments promise streamlined data exchange and nationwide standardization, challenges like security threats and data breaches need careful consideration. Embracing scalable cloud APIs, exemplified by solutions like Google's healthcare APIs or embracing secure cloud technologies to engineer a sophisticated REST APIs, becomes imperative for the industry's growth. As we navigate these complexities, the commitment to interoperability remains pivotal for the seamless flow of structured healthcare data, ultimately contributing to improved patient care and healthcare outcomes.

## References

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