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Global Use of HL7 Standards Driving Better Interoperability

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Interoperability Project to
Improve Healthcare Services in
One of the Largest Insurance
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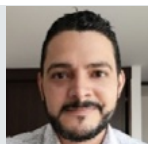
Improving Healthcare Services in One of the Largest Insurance Companies in Colombia

Interoperability Project Brings Better Healthcare

Successful case in healthcare interoperability to improve healthcare services in one of the main insurance companies in Colombia, from the implementation of an interoperability solution based on the HL7 FHIR standard (Google Healthcare API) to analytical models and the use of artificial intelligence.

SURA, an organization with 80 years of history in Colombia, has emphasized in its last decade in transforming its model in health services to be a company at the forefront in managing trends and risks that generate wellbeing for people and competitiveness for companies.

This permanent interest in transformation has involved components in digital health, where management models in individual and population health, disease prevention and continuity of care have been enhanced by making use of technological pillars such as interoperability, to



By Carlos David Arango Castaño, Head of Relevant, a Digital Platform by SURA and Google Cloud; and Dr. Juan Fernando Zapata Cardenas, MD, MSC, Telehealth, Leader of Health Interoperability

facilitate the exchange of information between the information systems that support the provision of internal health services of SURA and the network of external health provider organizations, a component that added to other initiatives in which the organization has been advancing, allows impacting more than 10 million patients (about three times the population of Uruguay or twice the population of Costa Rica) in the Colombian territory.

SURA has been utilizing electronic healthcare records (EHRs) for several years now. However, among the opportunities for improvement, the need to resolve existing information gaps is evident. This information flows where users are attended to in services or in healthcare organizations with information systems outside the company's network, affecting the continuity of care and the patient's experience.

In this way, the project was conceived with an interoperability component that would go beyond the development of interfaces to a strategic vision with an operational impact that would involve data governance, the relevance of organizational processes and an interoperability architecture in accordance with current paradigms where, in addition to the exchange of information, the availability and reuse of data would be facilitated. Thus, achieving a more comprehensive vision of the patient in their health processes and an improvement in the timeliness of health personnel to support clinical, administrative, and operational decision making.

Project History

In seeking to address this need, SURA tested various technologies over the course of the previous 7 years, including an early implementation of HL7 FHIR DSTU2 (2016), without fully achieving the fundamental purpose of real-time data interoperability across its delivery network, under an optimal and cost-efficient model.

In 2022, SURA explores Google Cloud health services and in December of the same year takes the decision to design the architecture of health interoperability in the Google Cloud, using

Healthcare API as the main service to support the interoperability of electronic healthcare records adopting the HL7 FHIR R4 standard.

The implementation began in February 2023, with the support of the consulting firm Zentricx, starting with the development of an implementation guide that includes 51 FHIR resource profiles, taking as a reference the Colombian CORE specification suggested by the HL7 affiliate in the country.

The purpose is to enable the exchange of information between the multiple points of care in the company's own health network and health care provider and external organizations. And, in the future, to connect with the platform deployed by the Colombian government for the exchange of a type of FHIR document called Registro Digital de Atención – RDA (Digital Attention Record), a Colombian implementation guide for FHIR profiles, based on the FHIR IG International Patient Summary - IPS.

The first release to early production in August of the same year.

Developments continued until the first connections were made with the information systems of health care institutions in October. Final implementations during 2023 also included a comprehensive patient clinical information visualization tool, based on the HL7 FHIR standard, and production release in December.

With this, the goal of improving the visualization of historical information on patients' clinical care, whose data comes from both the company's own software applications and from the software of the network of external provider organizations, was achieved. This provides a tool for health professionals to have a timely understanding and optimal contextualization of the health condition of the patients they serve and to make clinical decisions based on data with a comprehensive vision, impacting the quality of care, offering an experience in less time and greater satisfaction.

To achieve the above, SURA implemented a strategy based on the needs of patients and health care organizations, whose materialization is achieved through technology.

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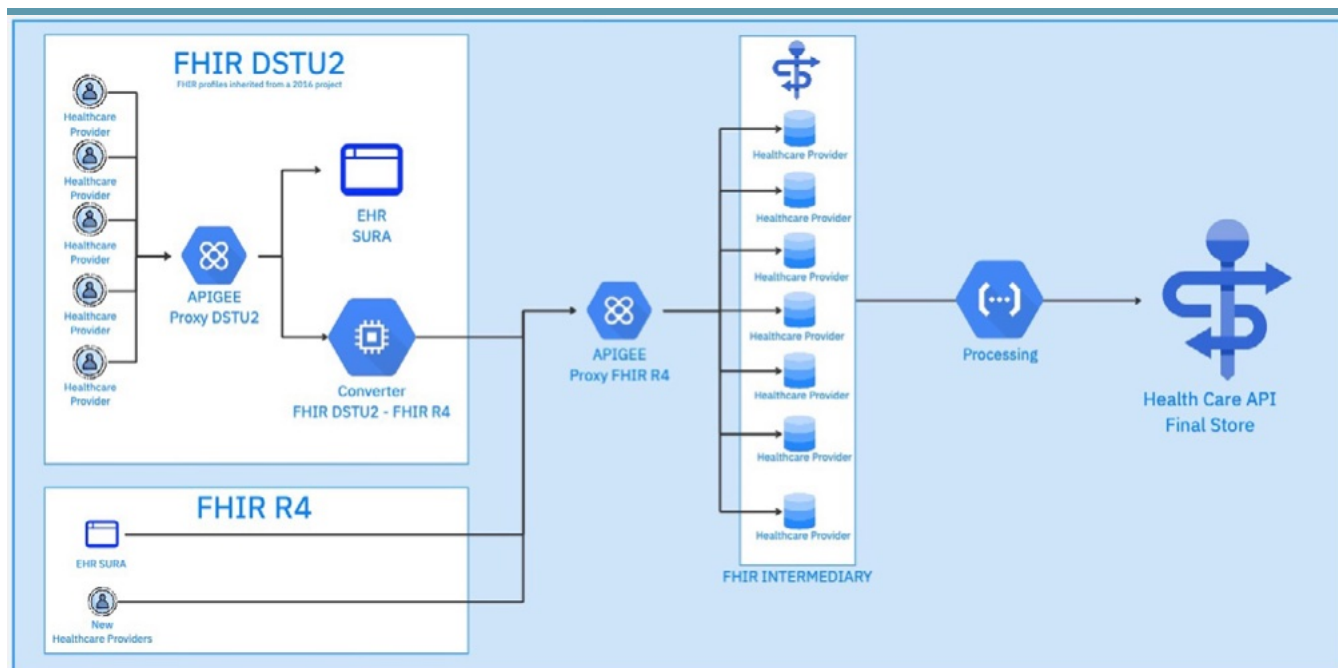


Figure 1: SURA FHIR R4 and FHIR DSTU2 connection diagram with healthcare provider network. Source: SURA.

Features and advantages of the digital ecosystem

The following advantages of using Healthcare API and the Google Cloud ecosystem in this project are highlighted:

- **Compatibility and backward compatibility with the standard:** Healthcare API offers a complete capability statement with respect to the HL7 FHIR R4 specification, facilitating the implementation of interoperability solutions according to the specific needs of the organization.
- **Cybersecurity:** Due to the sensitivity of healthcare data, information security in this type of project is a relevant aspect. Healthcare API allows to shield interoperability processes with privacy and security policies supported by Google.
- **Scalability:** Healthcare API is designed to handle large volumes of information; this ensures agile scaling through Cloud Spanner as a large-scale storage engine.
- **Access to advanced services in Digital Healthcare:** Google offers advanced healthcare services through artificial intelligence that can be leveraged in its ecosystem. Some of these services are image analysis of diagnostic aids, natural language processing for electronic healthcare records, and clinical decision support tools.
- **Applicability of analytical models and artificial intelligence:** Integrations in the Google Cloud ecosystem with Big Query and Vertex to enhance the analytical and artificial intelligence strategies to be implemented in the use cases.
- **Native APIs:** Healthcare API allows a native handling of APIs, which speeds up development times, focusing the team on the specific functionality of the application.

Taking Google Cloud and HL7 best practices as a reference, SURA performs the implementation under the high-level model seen at the top of the page.

Benefits

With the implementation of the interoperability service, SURA aims to find benefits in health processes, some of them are:

- Early detection of chronic and oncological diseases.
- Reduction of hospital costs.
- Relevance in sending diagnostic aids.
- Reduction in the duplication of medication prescriptions.
- Updating of efficient and automated processes.

Key aspects of success

Finally, as key aspects in the experience that SURA has had in the last 12 months in the implementation and production of interoperability in healthcare, the following are highlighted:

- **Standards and interoperability solutions:** The solution was based on the adoption of standards and interoperability solutions as a basis for the evolution and development of clinical services based on a strategy of data processing, analytical models, and artificial intelligence models for medical care.
- **Use of healthcare digital ecosystem:** Leveraged the digital ecosystem in the Google Cloud and Healthcare API to accelerate developments and achieve early wins in a timeline of less than 12 months.
- **Collaboration:** Joint work was carried out with the HL7 affiliate in Colombia to contribute to the development of the CORE implementation guide for HL7 FHIR resources for the country.
- **Implementation support:** A joint work was carried out with the consulting company Zentricx, an expert partner in Google Cloud health solutions, which allowed shortening the learning and implementation time curves.
- **Design and development of software applications based on HL7 FHIR:** Clinical software applications were designed based on the use of HL7 FHIR resources to deliver information to health professionals and optimize health care encounters, designing processes focused on better patient experiences.
- **Continuous improvement:** Once the health interoperability platform was implemented as a service, the process continues with the updating of processes and interfaces of medical systems for the use and fulfillment of performance indicators, thus maintaining the permanent evolution of the solution. ■