Connected Health Science:
Interoperability Meets Augmented Intelligence

A SCALABLE HEALTH WHITE PAPER

SCALABLE HEALTH CONNECTED SCIENCE PLATFORM

SCALABLE HEALTH

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INTRODUCTION

The healthcare landscape is evolving quickly to be always-on, always connected, always-engaged driving patient experiences, creating efficiencies and delivering intelligence to continue to iterate and innovate. With advanced technologies like 5G coupled with data analytics and machine learning, the healthcare digital landscape has transformed benefiting payers, providers and patients alike.

So, what is standing in the way of true digital transformation? The answer is the lack of interoperability. Payers, providers and patients are hindered by disparate data sources resulting in delays or incomplete medical histories. Decision makers may be at various levels of the ecosystem from the payer approving treatment, to specialists advising on areas of expertise to the provider and patients making informed choices on care options. These healthcare professionals need to be able to communicate in real-time supported by Augmented Intelligence allowing for the sharing of information to the right parties at the right time to make informed decisions.

Healthcare ecosystems have evolved over decades built on legacy systems. These systems are expensive and embedded in our culture, so obviously they won't disappear overnight but their existing limitations, such as siloed data, need to be addressed. This is accomplished through APIs.

Application programming interfaces (APIs) allow developers to create standards-based solutions to exchange disparate data. APIs allow programmers to create channels to share disparate data by creating a standard protocol for data exchanges. API create interoperability between both internal and external systems.

API-enabled technology creates a common platform through which healthcare professionals can coordinate care, ensure accuracy in billing and collection, and monitor aftercare remotely driving a better overall patient experience.

Advances in technology won't replace care providers. While Artificial Intelligence may out perform its human counterparts. The best outcomes are when intelligence is coupled with professional experience to offer an augmented approach to problem solving. It is essential for healthcare organizations to leverage data analytics to enable care-gap analysis and patient risk identification, and track operational metrics to drive efficiencies. In healthcare, having the right information available at the right time in a standardized format available on any systems leads to improved efficiency, safety and patient outcomes.

Fast Healthcare Interoperability Resource (FHIR) based patient data platforms deliver seamless care coordination services across the care continuum in a secure and HIPAA compliant manner.

INTEROPERABILITY CHALLENGES

INTEROPERABILITY DELIVERS

INTEROPERABILITY BENEFITS

Payers

Improved Reimbursement

Providers

Real-time Information

Patients

Greater Mobility

Vendors

Industry-Wide Compatibility

DISPARATE DATA HINDERS OUTCOMES

Today's healthcare environment is overwhelmed with data. Internal data from EHRs and legacy systems, external patient data generated by IoT and Wearables, and third-party data from disparate sources that manage receivables, approvals, vendors and much more. In addition, as the patient moves through various health ecosystems, his data is captured in a format that is tied to a particular system, thus preventing a holistic approach to his care that is agnostic of the source.

Further, as wearables become more of a staple in healthcare, healthcare organizations will have to integrate a variety of devices, apps and tools all generating data in disparate formats. As patients become more empowered, they will demand access to their patient data including data from a variety of sources including prescriptions, lab results, and medical history. This will allow them to better care for themselves without having to travel to a doctor's office to get basic medical information.

Health insurance companies need a constant flow of data to develop appropriate coverage plans, attract members and ensure a quality member experience. They need to communicate with providers for timely approvals, accurate billing info and population health trends to ensure they can proactively manage the member populations, drive wellness and preventative initiatives to create efficiencies and cost effective coverage options.

APIs and Microservices create the bridges between these systems to keep the intelligence flowing.

FHIR, A STANDARD FOR HEALTHCARE DATA

Healthcare organizations need to ensure there is a flow of data both in and out of the organization in a format readable at any authorized endpoint. APIs and Microservices allow parties to share data with existing systems and across disparate platforms. This enables healthcare organizations to share data and intelligence with insurance companies, other providers and their patient population. APIs need to be designed to grant access, as well as, ensure security across healthcare ecosystems.

Facilitating the exchange of intelligence should not be an after - thought or a layer to be added on top of existing systems. Going forward it has to be a part of the development strategy. Healthcare organizations must adopt a Design for Interoperability mentality. Data is crucial to making good care decisions and everything that is being built has to follow the data-centric mindset. The organization has to develop a digital strategy that is championed by management and becomes part of the company culture.

Further, the industry as a whole must mature to develop digital solutions that benefit all parties. Standards such as Health Insurance Portability and Accountability Act (HIPAA) set guidelines for the protection of sensitive health data. Health Level Seven (HL7) and FHIR are two of the key international standards, which drive efforts to improve healthcare interoperability. FHIR specifically provides standardized data formats for exchanging Electronic Health Records (EHRs) based on web-based APIs to facilitate data exchanges between legacy healthcare systems and other devices such as smartphones, tablets and apps and third-party developers.

This format makes sharing data as simple as sharing an URL to access patient specific data such as prescriptions, test results or patient histories. The standard was supported by American Medical Informatics Association and most prominent EHR vendors.

This standard has been adopted by healthcare leaders including Johns Hopkins Medicine, Cedars-Sinai, Penn Medicine, NYU-Langone Medical Center, and Dignity Health. Furthermore, Apple has announced that its iPhone Health App will support users viewing FHIR-compliant personal health records.

SECURITY BY DESIGN

As healthcare organizations are encouraged to open their data sources and share intelligence across platforms, we cannot ignore the inherent risks of opening our platforms to the outside world. Patient data is highly sensitive and healthcare organizations must ensure that patient privacy and data protection are of utmost importance within our ecosystems. To understand the seriousness of these risks, we only need to turn to the numerous breaches in recent months exposing millions of patient data to nefarious organizations.

These breaches undermine patient trust. In addition, they compromise brand reputations and potentially subject entities to financial and regulatory penalties.

Security needs to be designed according to the infrastructure. Any exchange of sensitive patient data must include authentication, authorization, encryption, and signatures to ensure secure connections. Development of security standards and protocols that are monitored for adherence.

This needs to be a top-down driven initiative to develop a security first company focus. Staff must be properly trained and tested to ensure security compliance. Furthermore, organizations must hire domain experts in areas like API security to maintain a secure-by-design culture.

MICROSERVICES FOR GREATER FLEXIBILITY

Beyond security, another network building consideration is structure and focus. There is a growing trend towards microservices. Microservices offer greater enterprise flexibility by allowing for faster application development. Microservices are is a method of developing software systems that try to focus on building single-function modules with well-defined interfaces and operations.

Microservices support agile development goals creating scalable, testable software that can be delivered in short sprints of a few days to weeks. This allows development teams to iterate and drives continuous improvement. Outcomes result in improved efficiencies, shorter development cycles and greater team satisfaction.

Microservices are module in nature, allowing for changes without disrupting the entire network. It allows developers to focus on specific, targeted areas for greatest impact. Each service can be independently deployed in scalable, dynamic environments making them simpler to update, faster error detection as they are isolated and minimizes the risk of change.


XRAY:
BROKEN BONE

BENEFITS AND USE CASES

The healthcare landscape is shifting and APIs provide a means to allow disparate data sources to be collected, analyzed and insight gained to meet the growing needs from an always-on healthcare environment. Whether its connecting legacy systems or sharing data across platforms such as wearables, smartphones or the cloud, APIs facilitate the connections to make it all work.

Microservices support the agile development of APIs for greater efficiencies, faster development cycles and cost savings. They allow developers access to specific problems without risking disrupting the entire network. They offer the enterprise greater flexibility and growth potential.

These advances support the ever-changing nature of today's healthcare. It allows us to continue to derive value from existing legacy systems, while at the same time capturing and integrating data from IoT services. This ability will allow healthcare organizations to operate with real-time data and generate intelligence to the right parties at the right time to enable the best care decisions.

Use case examples include –

- **Payers** – Insurance companies contract with providers to provide care services. To evaluate and reimburse said services, payers collect data such as lab results, admission records and preventative care outcomes. Interoperability leads to timely approvals and payment of services.
- **Providers** – As a result of legacy systems and acquisitions, many departments operate their own information systems making interdepartmental communication. Standardized data protocols allow organizations to aggregate data across disparate systems, including EMR, PACS and billing & scheduling applications to build a unified patient record.
- **Patients** – In today's mobile society it is not uncommon to relocate to meet career objectives or to simply go for vacation in new and exotic locales. Often, this means medical histories are left behind or unavailable in acute situations. Standardized data platforms provide personalized patient data access to physicians at point of care, where ever there is access to the cloud.
- **Vendors** - Adoption of common protocols and standards across will create a more uniform market for health IT equipment, software and services assuring compatibility between systems. This will allow for vendor-neutral and FHIR-based patient data platforms with shared access across the globe.

API ROADMAP AND STRATEGY

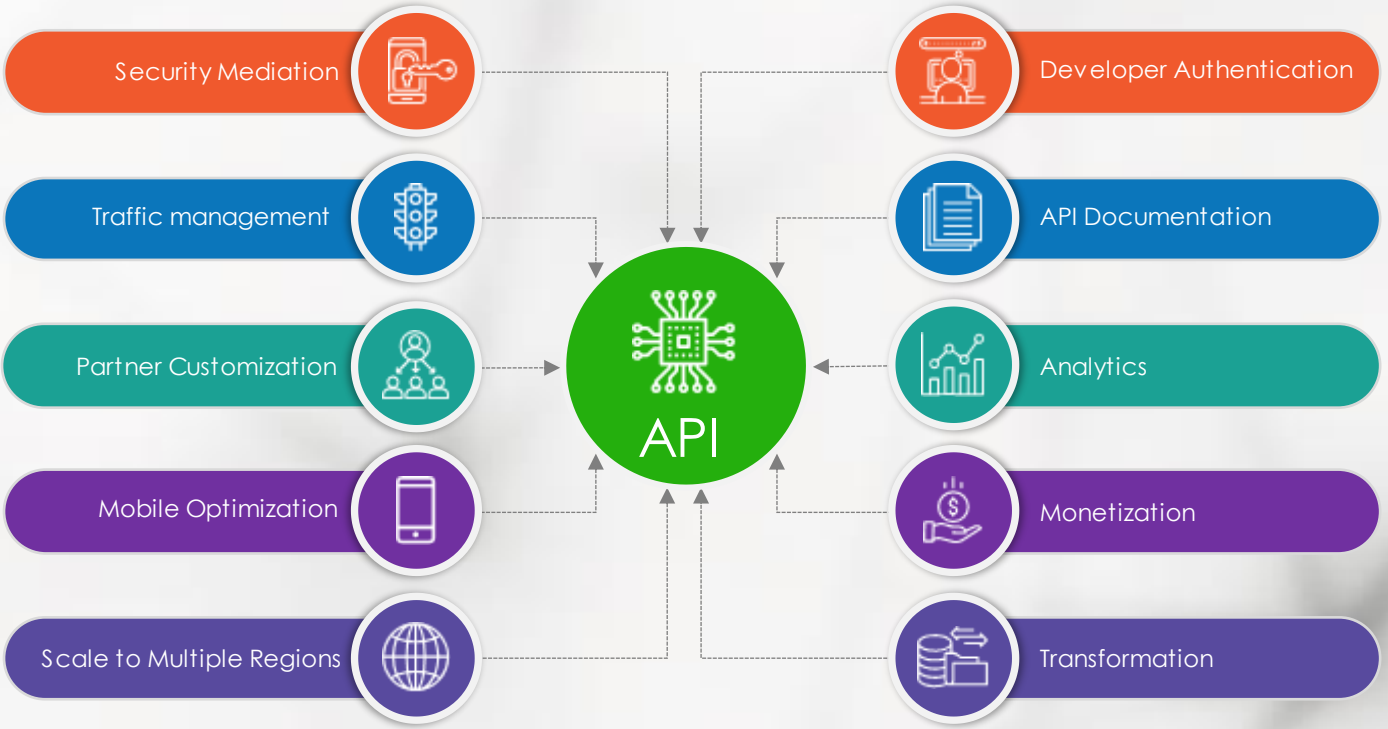
At Scalable Health, we help healthcare organizations reimagine the way they do business through intelligent services. Our API strategy is a rich suite of cognitive computing services for the advancement of predictive systems, visual computing applications, cognitive process automation and digital virtual agents. Using our API Strategy, enterprises can connect all their IoT devices to the cloud platform & support deep learning capabilities.

Using our API strategy services, enterprises can automate certain processes and drive efficiencies, make strategic business decisions that were not possible in the past.

- Facilitate communications between payers, care providers, and patients by adopting a FHIR-based data platform with shared access across the care network.
- Implement seamless care coordination in a secure and HIPAA compliant manner.
- Supports bi-directional workflow interaction between third-party applications and EHRs with extensive, on-demand read-write capabilities.
- Drive digital health transformation initiatives by the adoption of common protocols and standards for health IT equipment, software and services enabling compatibility between systems.

Leverage the data-driven design capabilities and services of Scalable's Digital API strategy, which lets you turn data into smart actions, and systematize highly repetitive tasks.

Furthermore, Scalable Health offers a healthcare data integration and collaborative platform that enables seamless integration and exchange of information across various healthcare systems both within the organization as well as across organizations to improve care coordination across different settings.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Partner Customization
Mobile Optimization
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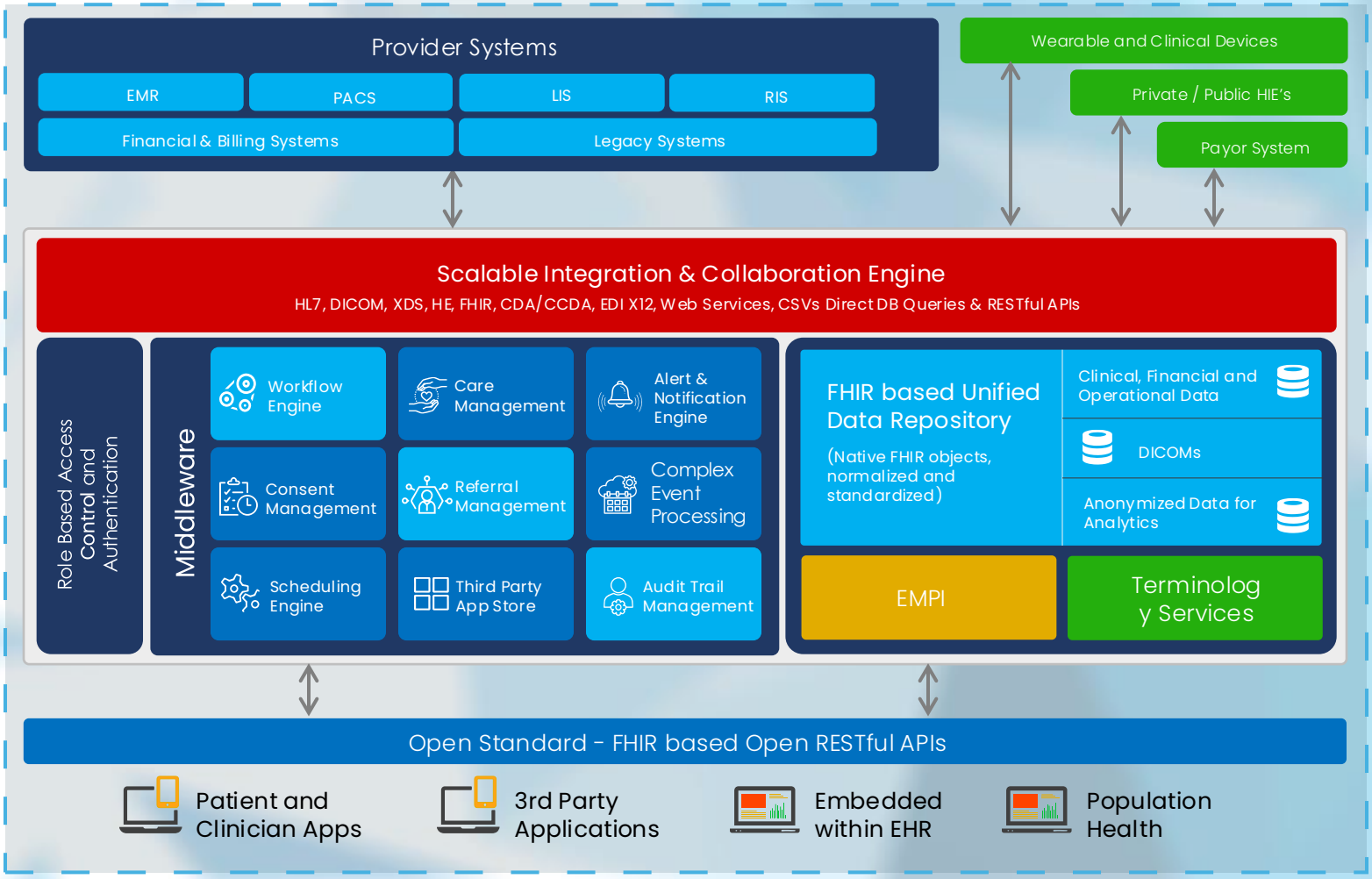
Developer Authentication
API Documentation
Analytics
Monetization
Transformation
API

INTEROPERABILITY REFERENCE ARCHITECTURE



About Scalable Health

Scalable Health is healthcare division of Scalable Systems focused on providing innovative products and solutions in healthcare and life sciences market.

www.scalablehealth.com

About Scalable Systems

Scalable Systems is a Data, Analytics & Digital Transformation Company focused on vertical specific innovative solutions. By providing next generation technology solutions and services, we help organizations to identify risks & opportunities, achieve sales and operational excellence to gain an innovative edge.

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