

EXECUTIVE SUMMARY

The Healthcare Industry represents 1/6 of the U.S. Economy; the world's largest national economy estimated to be between \$8 to 10 Trillion dollars. The industry is comprised of 5,284 hospitals, 15,643 skilled nursing facilities, 744 ACOs, and 230,197 medical practices staffed by 897,000 doctors and over 3 million nurses and other medical professionals.

The U.S Department of Health and Human Services announced it will invest \$840 million over four years to help 150,000 clinicians improve patient outcomes, reduce unneeded tests, and avoid unnecessary hospitalizations.

Provider organizations are under increasing directives to move the needle on these high-priority targets as we shift from “volume to value”. Thus, achieving better clinical care/outcomes is no longer optional. “Value” means targeting better care of chronic and acute diseases while not causing patient’s unnecessary harm. There are now outcome measurements associated with these treatments; and performance on those measurements are driving reimbursement to providers of Healthcare.

True interoperability is defined by the ability to exchange a complete dataset, bi-directionally, securely, with proper validation, business rules, and error handling, on a timely basis between two systems.

Harmony Solutions Healthcare “Harmony” has the technical expertise to commercialize the Fast Health Interoperability Resources technology platform known simply as FHIR (pronounced “fire”), that will significantly advance the ability of Electronic Medical Record (EMR) and Electronic Health Record (EHR) providers to communicate across disparate platforms in real time. Our technology allows this connectivity without prolonged Research & Development time with greatly reduced costs as respective EHR’s no longer must create their own Application Programming Interfaces or API’s. **Harmony is the solution for interoperability and mobility.**

FHIR DEFINED

Fast Healthcare Interoperability Resources (FHIR) is an interoperability standard for electronic exchange of healthcare information. FHIR was developed by Health Level Seven International (HL7), a not-profit organization accredited by the American National Standards Institute that develops and provides frameworks and standards for the sharing, integration and retrieval of clinical health data and other electronic health information.

Paraphrasing Russell Leftwich, MD, senior clinical advisor of interoperability at InterSystems

and member of the HL7 board of directors. FHIR will be essential in the next few years as it evolves.

FHIR will contribute to the development of technology apps both inside and outside the hospitals and clinics. Apps and devices allowing patients to use their phones or portable devices that to measure insulin or other blood levels that are automatically sent wirelessly to the doctor and updating the patient's records. The results reviewed by the lab, then the doctor, then sent off to the pharmacy for a needed refill or medication adjustment, and a message sent back to the user's phone. Real time triggers and events.

FHIR is akin to the progression of smartphones technology. Example: using an iPhone 3G; it can do exciting tasks not available on standard phone. Although 3G doesn't have nearly the functions of the next generation iPhone 7; it is still useful in its current form. These realities confound the concept of a "draft standard" because people are using it. Thus, FHIR is more conceptual as new operational standards evolve with technological advancements. EHR's use the current version because it has value. The F in FHIR stands for fast, thus less lead time to develop and implement applications as they operate in this everchanging technology world that the older standards could not access and become obsolete if providers are to continue to provide better Healthcare outcomes.

Why FHIR is important

Health IT and electronic health records (EHRs) continued to be plagued by interoperability problems. FHIR emerged in 2014 as a draft trail standard that enabled health IT developers to build quicker and less complex applications for EHRs and to exchange and retrieve data faster.

Initially FHIR was an experimental project for HL7. It quickly acquired support from fiercely competitive EHR vendors such as Epic Systems Corp., Cerner Corp. and AthenaHealth Inc. Also, an HL7-backed consortium "The Argonaut Project" that includes the two EHR giants Epic Systems Corp, and Cerner Corp. and other major health IT vendors such as AthenaHealth Inc, collaborated and moved FHIR forward to the point where in February 2017 it became a full standard.

In the industry where the need is created by value-based health care models, now more than ever, patients, providers and payers, need to concentrate on population health and the systems that best benefit those systems. FHIR is built from the ground up for this outcome and allows all of the systems to work together in real time to work together for the best decision-making processes.

Why Harmony Solutions Healthcare FHIR solutions are further advanced than competitors.

Harmony's Platform described below uses a unique middleware comprised of FHIR and customized modules to support legacy API calls to provide a complete range of solutions from standard plain FHIR, to completely customizable solutions.

Harmony Solutions has a vision for extending the use of FHIR to maximize the technology's benefits

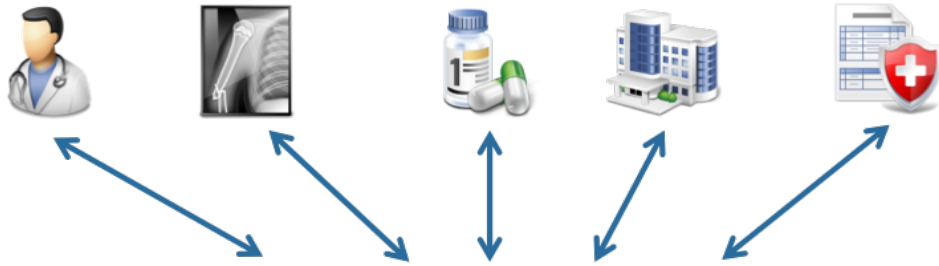
Healthcare alerts require a complete and precise longitudinal chart, EMRs currently do not have the data to offer that functionality. Tools used for population health management should inherently offer such a complete longitudinal chart, but they do not.

The FHIR specification provides for an Alert API capability with critical functions currently not available in the marketplace. When employed rather than leaving their EMR, providers can have their EMR call the Alert API of their population health management tool, get the alert data immediately, and have the EMR render it in real time in the patient's chart. Harmony Solutions can create these tools and technologies into our own applications or to license to Private Label Partners (PLP).

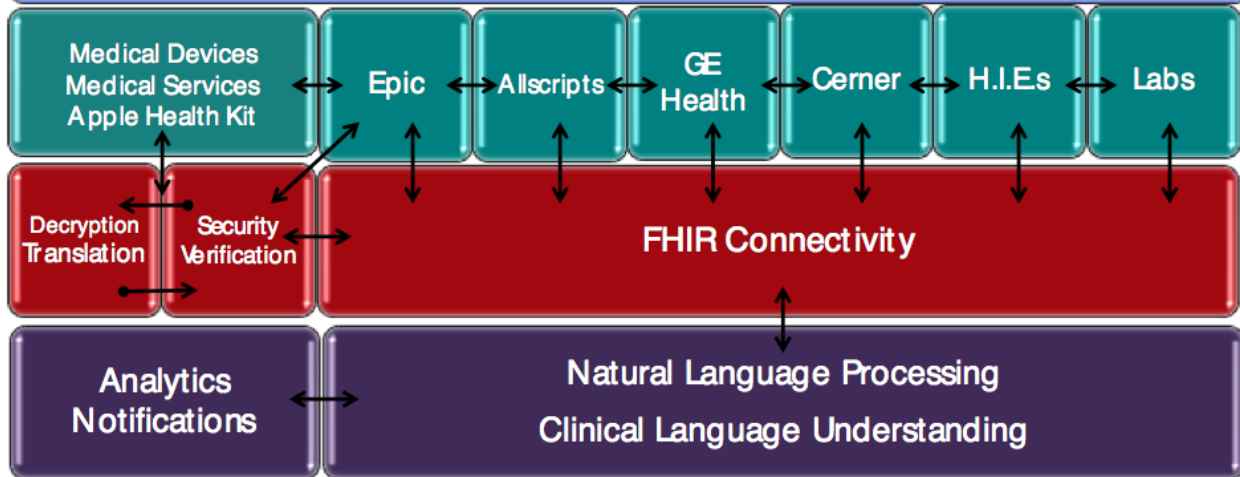
Key to this technology is the capability integrate test requests, results, and complete patient information on demand and then analyze and act on all this data in near real time. For example, with access to complete patient information, lab applications can flag requests for duplicate or expensive tests for review to ensure that the tests are necessary, and that time and money aren't wasted. Technology is moving beyond "just connecting" systems to work with data in-flight to drive workflow, analyze patient data in real time, and expand health care providers able to interact with patient data as it changes.

Value-based care requires more coordination of information and care teams now rely on it more than ever before to produce better patient outcomes. Interoperability is moving from point-to-point to broadcast mode, sharing data with all approved members of the care team instantly and in real time.

Beyond traditional interoperability, middleware must also do more to bring new clinical data to various clinician types. Most clinicians only see the patient data pertinent to their specific task. In a value-based world, each clinician requires more clinical context, which comes from other systems, and middleware is the vehicle to facilitate aggregating and sharing that expanded set of patient information.



Harmony's Medical Information Delivery Platform



Harmony Solutions Medical Information Delivery Platform

Is fully customizable and serves as a secure standardized solution for virtually any legacy EHR provider

Allows practitioners to use MedMaster at multiple facilities that may each be running a different EHR/EMR system

Interface is intuitive, efficient, and provides a level of accuracy never possible using speech recognition, navigation, and Clinical Language Understanding powered by Nuance Healthcare.

Allows mobility concurrently and independent of the underlying system that it is connected to consists of a cross-platform interface engine that enables bi- directional sending of application-specific and custom messages between HIT health systems

Contains several layers; each specialized for specific high-level tasks, such as communications, database handlers, translation engines, etc. Each layer is highly modularized with each module performing a specialized task while at the same time being interconnected with other modules to create optimization of process and custom workflow concepts

The modules themselves use range of just about any common web and programming languages such as PHP, Java, Perl, ASP, .NET as needed with the bulk of the middleware being written in PHP.

The communications layer uses a variety of multiple transport options, anything from simple calls like web pages (HTTP* / HTTPS*), API programming web connections that use the web (SOAP*, REST*, TCP*/IP*), file transfers (FTP*, file system), direct database connectors, etc.

Based on REST and is encrypted end-to-end using 256-bit AES (and can also auto-generate HL7* acknowledgement responses and data access logging

The translation layer processes the original data format received such as an SQL* query result, XML*, HL-7*, CDA*, etc. and returns a customized XML* document that the mobile application is designed to read

Customized XML* format uses a set of standard items taken from HL7*, CDA*, and some custom predictive tags that enable ease of development on the iOS side with less complexity of the underlying data source and structure.

Acronym	Description
AES	Advanced Encryption Standard – The Advanced Encryption Standard, or AES, is a symmetric block cipher chosen by the U.S. government to protect classified information and is implemented in software and hardware throughout the world to encrypt sensitive data
CDA	Clinical Document Architecture – Clinical Document Architecture (CDA) is a popular, flexible markup standard developed by Health Level 7 International (HL7) that defines the structure of certain medical records, such as discharge summaries and progress notes, as a way to better exchange this information between providers and patients. These documents can include text, images and other types of multimedia -- all integral parts of electronic health records
EHR	Electronic Health Record - An electronic health record (EHR) is an individual's official health document that is shared among multiple facilities and agencies. The role of EHRs is becoming increasingly influential as more patient information becomes digital and larger numbers of consumers express a desire to have mobile access to their health records.
EMR	Electronic Medical Record - An electronic medical record (EMR) is a digital version of the traditional paper-based medical record for an individual. The EMR represents a medical record within a single facility, such as a doctor's office or a clinic.
HL7	Health Level 7 - HL7 (Health Level Seven International) is a family of standards for the exchange of electronic health information.
HTTP	HyperText Transfer Protocol – HTTP (Hypertext Transfer Protocol) is the set of rules for transferring files (text, graphic images, sound, video, and other multimedia files) on the World Wide Web . As soon as a Web user opens their Web browser , the user is indirectly making use of HTTP. HTTP is an application protocol that runs on top of the TCP/IP suite of protocols (the foundation protocols for the Internet).
HTTPS	Secure HyperText Transfer Protocol - S-HTTP (Secure HTTP) is an extension to the Hypertext Transfer Protocol (HTTP) that allows the secure exchange of files on the World Wide Web. Each S-HTTP file is either encrypted, contains a digital certificate , or both. For a given document, S-HTTP is an alternative to another well-known security protocol, Secure Sockets Layer (SSL). A major difference is that S-HTTP allows the client to send a certificate to authenticate the user whereas, using SSL, only the server can be authenticated. S-HTTP is more likely to be used in situations where the server represents a bank and requires authentication from the user that is more secure than a user ID and password.
REST	Representational State Transfer – REST (REpresentational State Transfer) is an architectural style for developing web services. REST is popular due to its simplicity and the fact that it builds upon existing systems and features of the internet's HTTP in order to achieve its objectives, as opposed to creating new standards, frameworks and technologies.
SOAP	Simple Object Access Protocol – SOAP (Simple Object Access Protocol) is a messaging protocol that allows programs that run on disparate operating systems (such as Windows and Linux) to communicate using Hypertext Transfer Protocol (HTTP) and its Extensible Markup Language (XML).
SQL	Structured Query Language - SQL (Structured Query Language) is a standardized programming language used for managing relational databases and performing various operations on the data in them. Initially created in the 1970s, SQL is regularly used by database administrators, as well as by developers writing data integration scripts and data analysts looking to set up and run analytical queries.
TCP	Transmission Control Protocol – TCP (Transmission Control Protocol) is a standard that defines how to establish and maintain a network conversation via which application programs can exchange data. TCP works with the Internet Protocol (IP), which defines how computers send packets of data to each other. Together, TCP and IP are the basic rules defining the Internet. TCP is defined by the Internet Engineering Task Force (IETF) in the Request for Comment (RFC) standards document number 793.
XML	eXtensible Markup Language – Extensible Markup Language (XML) is used to describe data . The XML standard is a flexible way to create information formats and electronically share structured data via the public Internet , as well as via corporate networks .