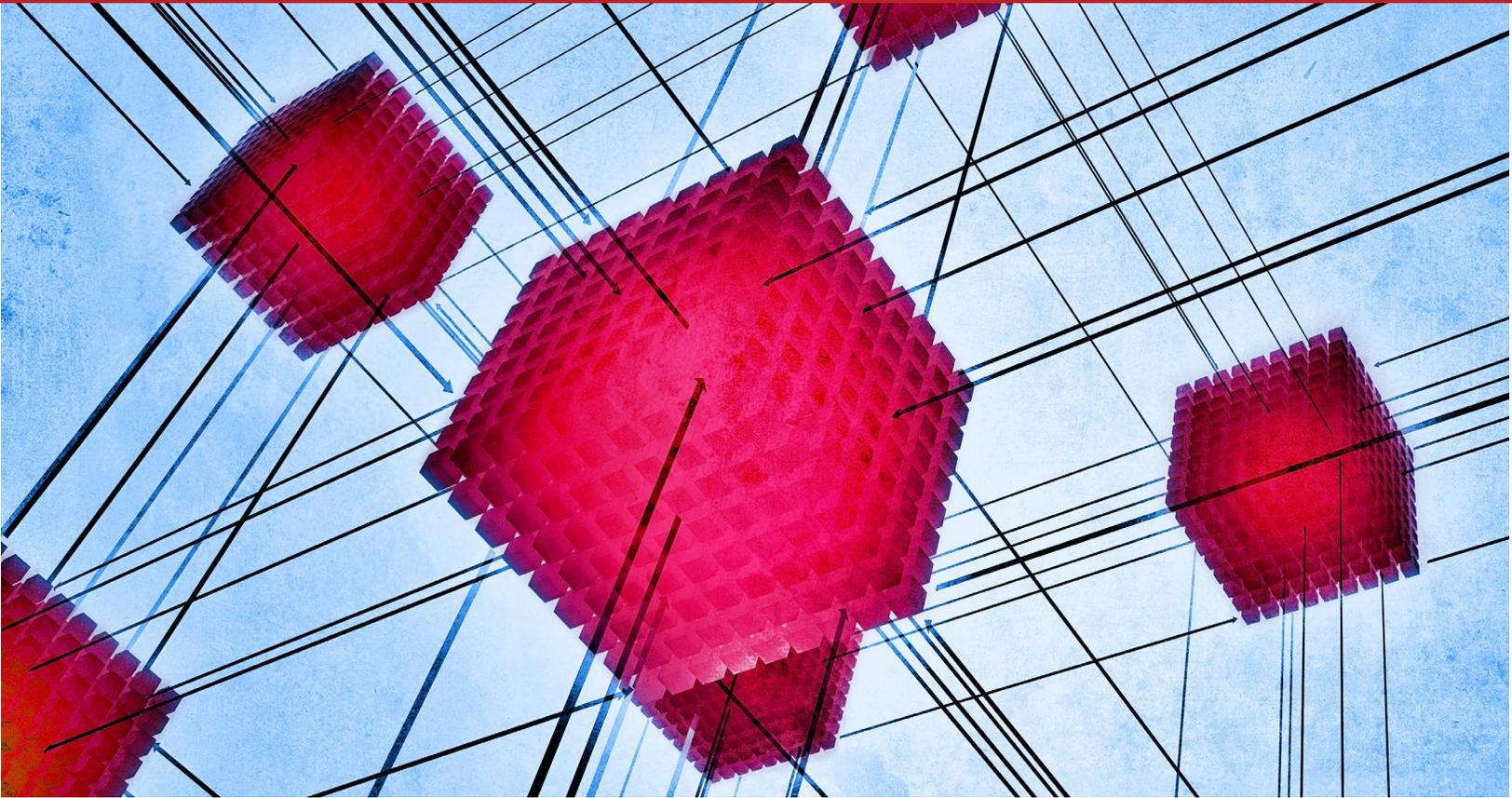


INTEGRATION INFRASTRUCTURE



BUILDING 21ST CENTURY HEALTH
INFORMATION TECHNOLOGY



A MARKET TRENDS REPORT EXCERPT PREPARED FOR

PHILIPS

This document contains an excerpt of the recent Chilmark Research *2021 Integration Infrastructure Market Trends Report*, released April 2021, specifically prepared for Philips Healthcare Solutions. It is intended to make the key findings of the report more accessible to a broader strategic audience and highlight the performance of the company relative to other major vendors in this subvertical of the healthcare IT market.

Click below to learn more about the full report:

[2021 Integration Infrastructure Market Trends Report](#)

Executive Summary

While much attention has been focused on how the 21st Century Cures Act will expand data availability across healthcare, the new rules are just one of the reasons that the industry is looking to leverage data across applications and organizations in new ways. Faster and less costly alternatives to existing integration techniques and approaches have also emerged in response to several factors: the maturation of FHIR, broader acceptance of API-based development and integration, changing payment models, new pressures to deliver quality care at lower cost, and the long-term effects of the pandemic. The current market is transitioning to new approaches to development and integration, enabling more effective access to data across organizations and applications.

The full *2021 Integration Infrastructure Market Trends Report* describes and evaluates the available offerings from 14 vendors (this excerpt only contains Philips Healthcare Solutions' profile and specific takeaways from the report). The report reviews the current state of the market, categorizes the different kinds of vendors and solutions, and describes in some detail vendors' capabilities for meeting the needs of their customers.

Traditional EHR integrations, built as one-off interfaces that require ongoing and expensive maintenance, are giving way to API-based access to data and transactions for new projects. While the usage of modern APIs is still in its infancy, many vendors are significantly enhancing their API-related services and tools in addition to expanding their API catalogs. Building the data stores behind APIs, creating cohort-level data on demand, and supporting analytics on demand are examples of growing market needs.

Finally, integrating data and functionality directly into clinical and administrative workflows is the most promising way to address clinician burden. Organizations and vendors need ways to experiment and iterate to have a realistic chance of delivering improved workflows.

This report also looks closely at some of the offerings of the public cloud vendors. These companies are already well established in healthcare as providers of hosted computer and storage services. Their general-purpose development and integration capabilities are also used in healthcare. Increasingly, they are touting their healthcare-specific development and integration capabilities, a leading indicator of their larger ambitions to contribute to healthcare.

The report includes a forecast of total spending by healthcare enterprises (providers, payers, and healthcare-oriented ISVs) on integration products and services over the next five years. It has a separate forecast of potential spending by non-traditional users of these tools such as life sciences, clinical research, and digital health vendors.

KEY TAKEAWAYS

The 21st Century Cures Act sets a tone for the next phase of healthcare interoperability.

- > Cures Act establishes framework for expanded availability of patient data across healthcare
- > APIs and FHIR are not widely adopted yet but will become dominant in the healthcare industry
- > Healthcare enterprises will adopt API-based development and integration as the go-forward approach for new development and integration projects

A large number of relatively narrow cases will justify new projects.

- > The Cures Act is no substitute for a business case.
- > Fastest growing vendors support many and varied use cases, each with narrow justification and ROI.

Many healthcare players want – and will pay for – access to high-value provider data.

- > 14% CAGR is predicated in products and services spending over 5 years on integration projects.
- > By 2025, it is anticipated that the market for non-traditional buyers – Life Sciences, Clinical Research, and Digital Health – will surpass the traditional market opportunity for payers and providers.

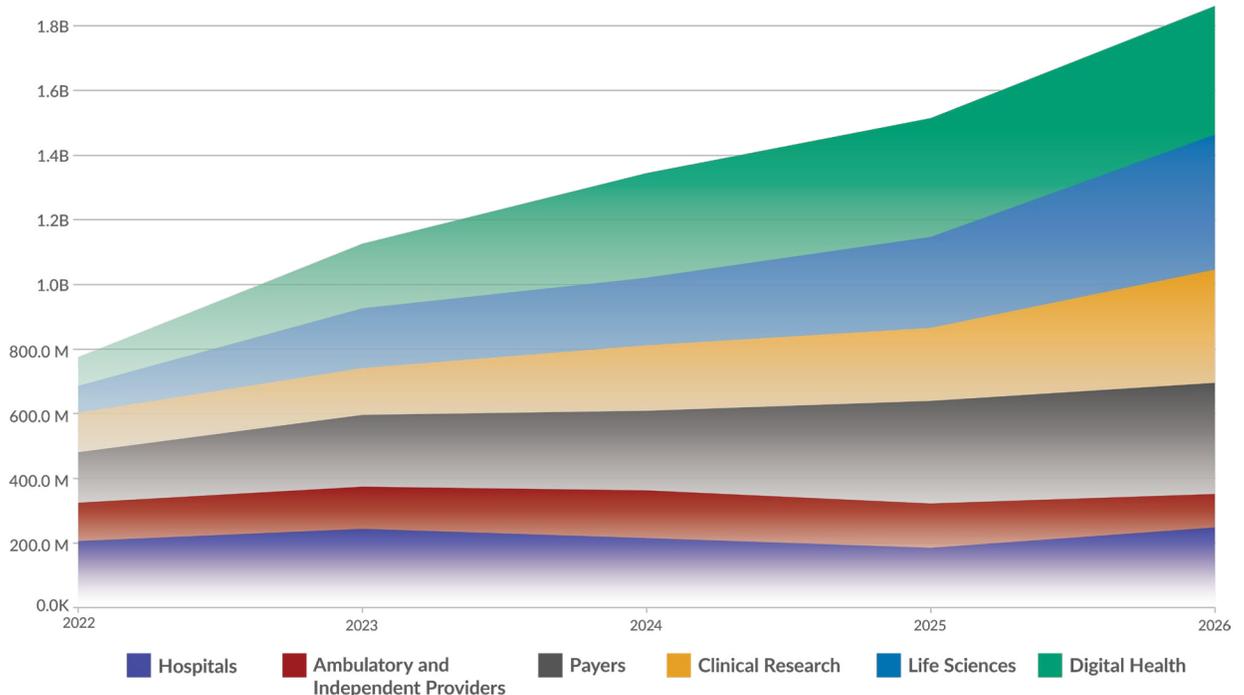


Figure 1: Projected Market Growth for Integration Infrastructure

Forecast Notes

- > The focus of this spending will be on accessing and using provider data, followed by payer data. Clinical data has highest value. Payers and health plans have valuable data as well.
- > Providers and care delivery organizations have high quantities and diverse data types.
- > Providers will want revenue share from integration vendors for some projects.
- > Info blocking provisions and acceptability of real-world evidence will loosen provider’s grip and increase demand for access to patient data.
- > Strong demand for provider data from non-traditional users of this data in coming years. Life sciences, clinical research, and digital health could dominate spending, primarily for access and aggregation.
- > Projecting CAGR of 32% in non-traditional markets over 5 years



WHAT IS INTEGRATION INFRASTRUCTURE?

Software or services to enable information exchange and integration across applications and organizations.

- > Combines data or adds functionality to applications from somewhere else
- > From the perspective of a developer or integrator

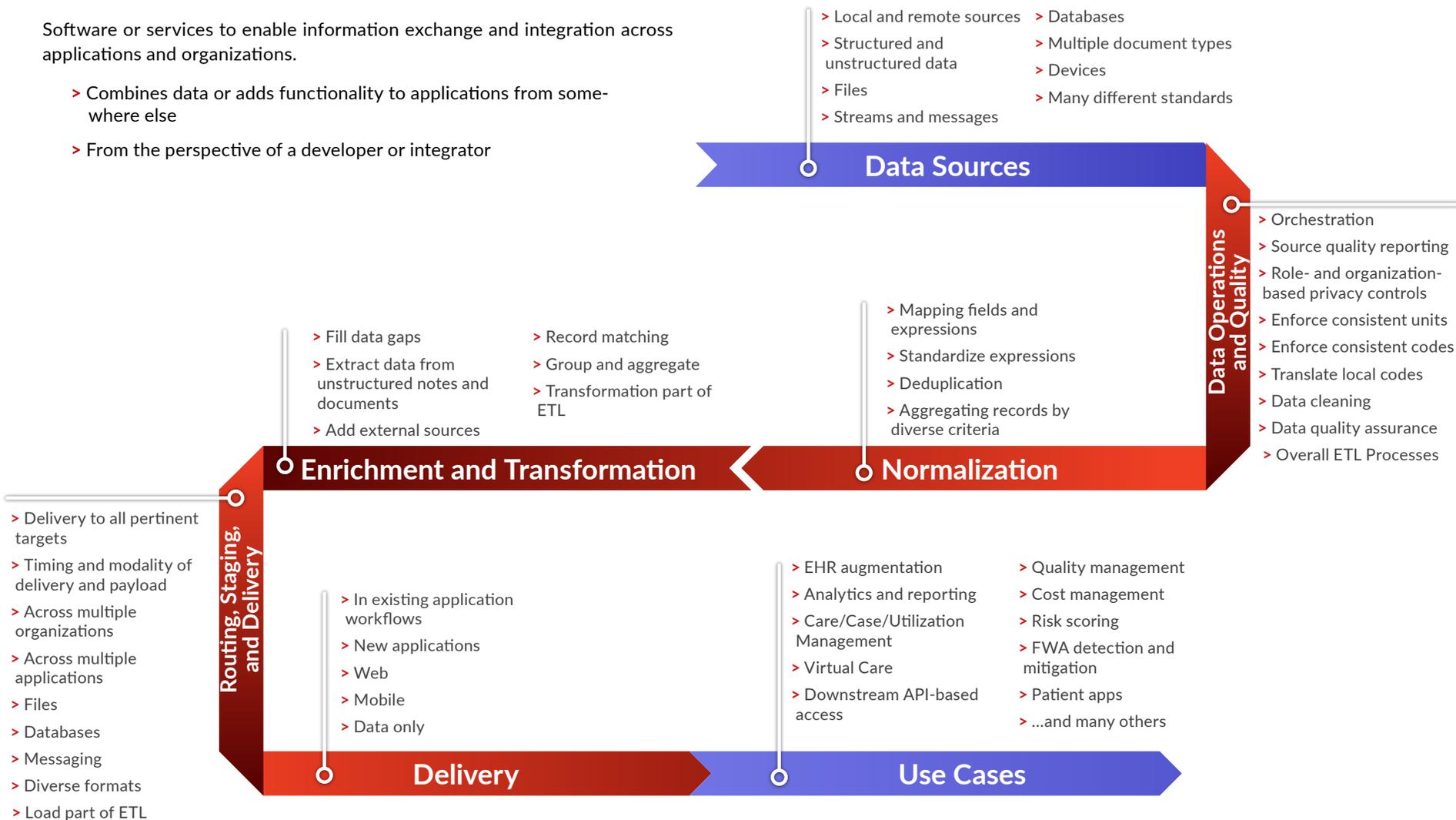


Figure 2: What is Integration Infrastructure?

Vendor Evaluations

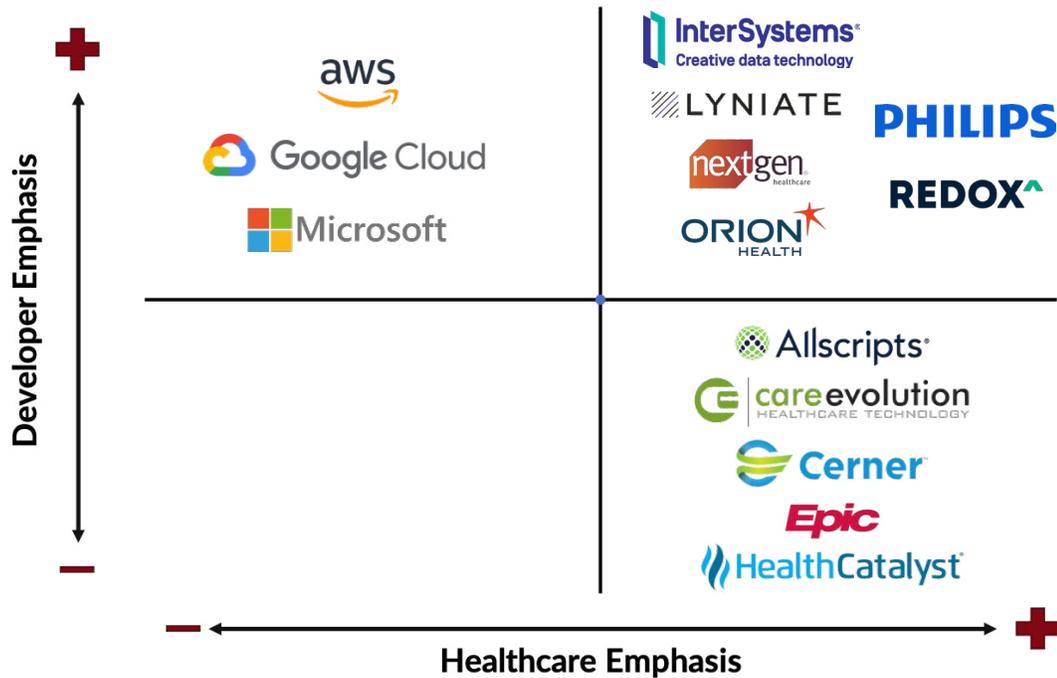


Figure 3: Integration Infrastructure Vendors Evaluated in Report

The vendors profiled in this report offer a variety of new and different approaches to healthcare development and integration that will better harness data across organizations and applications. Some vendors offer functionality on a self-service basis while others offer managed services, though these two approaches are not mutually exclusive. Most vendors employ some combination of on-premises and cloud-based deployment options. Vendors also have different strengths and competencies when it comes to their healthcare industry expertise and developer support, as you can see in Figure 3 above.

Inclusion Criteria

To be included in this report, vendors must have:

1. Three live customers
2. \$2 million in relevant revenue in 2020 or 2021
3. Live customers unrelated to other product lines

We looked at technology from dozens of different vendors over the course of the last two years. Some vendors did not meet these criteria. There are also vendors that likely meet these criteria that we were unable to include because we were unable to gather enough information. The 14 profiles contained here describe companies and offerings that meet all these criteria.

CHILMARK BEARING – INTEGRATION INFRASTRUCTURE

We evaluate each vendor and its offering with respect to Product Capabilities and Market Categories, described in the following section. For each vendor profiled in the report, a rating is assigned for every Product Capability and Market Category that our research identified as critical to addressing current market expectations. Detailed ratings can be seen in individual vendor profiles. These are aggregated into letter grades that are used to determine how vendors compare in the Chilmark Bearing (above).



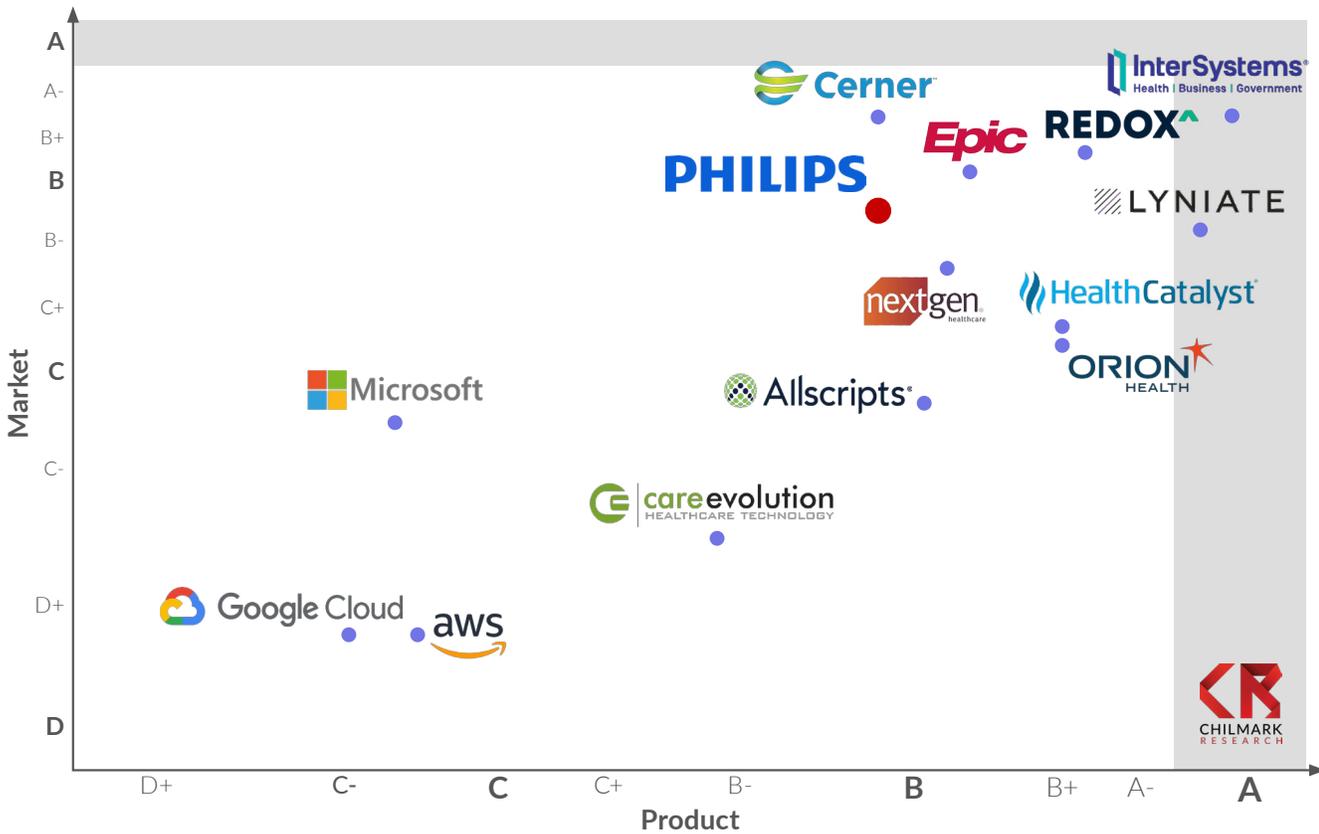


Figure 4: Chilmark Bearing for Integration Infrastructure

Product Capabilities

Data Cleaning

- > **Innovation:** Deliver consistent, computable data for any processing purpose.
- > **Description:** For examining data derived from any application or organizational source and identifying and performing transformations that mitigate variations, errors, duplication, and omissions of content, formatting, placement, or sequencing.

Terminology Normalization

- > **Innovation:** Deliver uniformly expressed coded data to developers, applications, and users.
- > **Description:** For translating any standards-based, external, local, or variant expressions into a single expression for a specific purpose. Also considers the ability to evaluate any given data source to understand the variability of coded data elements.

Data Operations

- > **Innovation:** Enable management and control of the process of creating infrastructure and data.
- > **Description:** For monitoring and controlling the supply and provisioning diverse data feeds, ensuring that data is received and provisioned at the time and in the quantities anticipated, and that variations and exception conditions are identified and resolved.

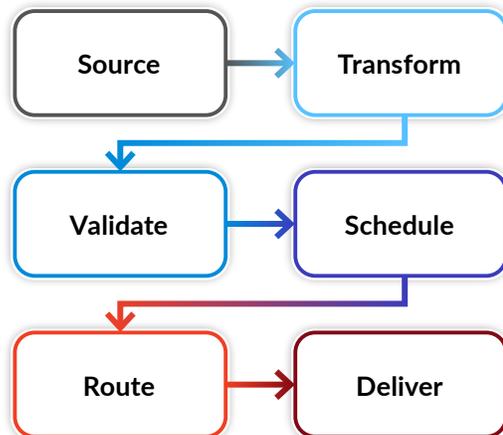


Figure 5: Data Operations

Focused on the needs of developers, administrators, and operators to build, test, deploy, optimize, and administer the resulting infrastructure. Includes APIs, development and test tools, sandboxes, configuration aids, containerization and orchestration support, and simulation capabilities.

Record Matching

- > **Innovation:** Link data from disparate organizations and applications based on a common data element.
- > **Description:** The ability to associate or link disparate records based on a common or suspected identifier such as patient, family, episode, condition, clinician, organization, encounter, health plan, cohort, or other special-purpose identifier, including the elimination of duplicate records.

Standards Support

Category	Description
CDA Support	For building, deploying, and using CDA-based documents in applications and workflows.
HL7 Support	For building or maintaining applications that involve HL7-based events, messages, documents, or transactions
FHIR Support	For building and maintaining FHIR-based resources, documents, and transactions in applications and workflows.
X12 Support	For building EDI-based transactions and documents in application workflows.
IHE Support	For building and deploying IHE-based flows, profiles, and applications.

Device Support

- > **Innovation:** Incorporate and use data from devices in and out of the healthcare system.
- > **Description:** The ability to source, store, and make available data from a range of different devices and IoT entities (ie. consumer wearables, remote monitoring medical devices, etc).

API Manager

- > **Innovation:** Permit programmatic access to data, transactions, and user flows for developers and integrators.
- > **Description:** For building and deploying APIs and underlying data or infrastructure for any use case or purpose. Includes considerations of the extent of available functionality and data.

Aggregation

- > **Innovation:** Build data stores organized around an identifier from disparate applications and organizational data sources.
- > **Description:** Combining diverse data sources in bulk and providing a developer-accessible data model that provides access and supports processing using criteria such as contract, cohort, condition, episode, drug class, or other identifiers and data elements.

User and Organizational Messaging

- > **Innovation:** Enable different kinds of messaging to deliver data to individuals and applications.
- > **Description:** For transmission, delivery, and incorporation of data in secure or non-secure messages, notifications, with content payloads among individuals, organizations, and applications, including the ability for senders and receivers to configure and control content, timing, and method.



Workflow Integration

- > **Innovation:** Support blending of diverse user applications and workflows.
- > **Description:** For incorporating data and/or functionality into existing applications and workflows.

Documentation, Training and Support

- > **Innovation:** Efficient development of skill, knowledge, and abilities for developers, integrators, operators, and users..
- > **Description:** The range of educational and support resources available to developers and others including virtual, on-site, community, and third-party offerings.

Deployment and Hosting

- > **Innovation:** Support optimal, cost-effective deployment.
- > **Description:** The range of different options available to customers for deployment of infrastructure, including on-premises, remote-hosted, SaaS, public, private, or hybrid cloud.

Depth and Breadth

- > **Innovation:** Estimates the current reach of product or services for existing customers
- > **Description:** Summarizes the current functional scope of the vendor's offering based on the range of functional capabilities, the variety of potential use cases, and its impact on implementing organizations.

Extensibility

- > **Innovation:** To permit implementers to apply the offering in diverse and new use cases and settings.
- > **Description:** How readily the offering adapts to evolving needs of existing users and organizations, new clinical or administrative circumstances or programs, and expanding customer requirements.

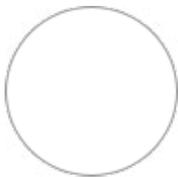
Market Categories

Category	Description
Hospital or Health System	Any facilities-based care delivery organization that own or control hospitals.
Independent Community Provider	Any care delivery organization that is not owned by, controlled by, or sited in hospital or health system.
Community Organization	Any care delivery organization that is not owned by, controlled by, or sited in hospital or health system.
Health Information Network	Any public or private network that carries and delivers data or transactions between unaffiliated organizations involved in the healthcare delivery or payment.
Clinical Research	Organizations that design and perform basic investigation and research with actual or anticipated clinical application or ramifications.
Government	Federal or state network that carries or delivers data or transactions that support information flow for government programs.
Payers and Health Plans	Any organization that pays for healthcare services on behalf of its members.
Public Health	Public or private agencies and organizations that collect, compile, and se data on diseases, conditions, or the environment to support health programs or aims.
Digital Health	Independent companies that develop digital health offerings.
Life Sciences	Companies primarily involved in pharmaceutical or medical device manufacturing and/or development.
Life and Disability	Companies involved in underwriting and issuing life and/or disability insurance contracts.
Independent Software Vendors	Any organization engaged in the development and sale of software-based offerings based on the vendor's offering to any healthcare customer.

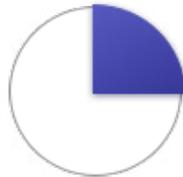
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Harvey Ball Ratings Key

- > Every vendor receives a rating in every Product and Market Category.
- > Most vendors do not offer functionality in every category.
- > Harvey ball rating is relative to all other vendors in report and product requirements defined in the broadest sense.



Not Applicable



Meets some market requirements



Meets market requirements



Exceeds market requirements



Market Leading



Product Capabilities	Market Execution
B	B-

Product

Product(s): HealthSuite Interoperability (formerly IntelliBridge Enterprise, Forcare), HealthSuite Platform
 Deployment: On-premises, cloud, or hybrid
 Pricing: License or subscription

Top Market Differentiators

- > Philips has significant expertise making IoT and device-derived data available to diverse healthcare applications.
- > EHR and IT vendor agnostic with presence across the care continuum.
- > Deep expertise with device and consumer data integration (Philips and 3rd party) for multiple use cases.

Philips leverages a product and services offering geared towards heterogeneous, multivendor ecosystems and hybrid deployments. It offers strong support for leveraging AI/ML and can be implemented under OPEX or CAPEX business models.

The **HealthSuite Digital Platform (HSDP)** supports all major healthcare standards, data types, integration styles, and care venues. It is organized to accept device and non-device data from any healthcare application. The system APIs serve up data and services to third parties, customers, and Philips developers, enabling the generation of a federated longitudinal record. The Information Language System (ILS) provides semantic consistency for developers and integrators across data types.

HealthSuite Interoperability consolidates two product suites: IntelliBridge Enterprise and Forcare. It provides HL7 integration between devices, departments and Information systems to support standard or non-standard in-hospital workflows. It also supports IHE-XDS profiles and is a comprehensive solution for cross-enterprise document exchange workflows.

Product Ratings



Market

Target Markets: IDNs, hospitals and health systems, home health, life sciences, population-health management organization

Notable Customers: Advent Health, Advocate, Beth Israel Lahey Health, Kentucky Health Information Exchange, Miami Jackson, Trinity Health, VA, UCSF

Notable Partners: AWS, Lyniate, Deloitte

Philips has a global market presence, and near ubiquity in the hospital market. Its solutions are EHR and IT vendor agnostic. Well-versed in post-acute care, as well as home care, Philips has a robust history in consumer markets.

The acquisition of Capsule Technologies in January 2021 points to Philips looking to integrate its technology and mostly hospital customer set over time. This will aid their already strong participation in hospital EHR partnership programs, including their app stores.

Market Ratings



About the Author



BRIAN MURPHY - REPORT AUTHOR

Director of Research

Brian Murphy joined Chilmark Research as an industry analyst in August 2012 and brings a wealth of experience to the table. He is an outspoken advocate for true interoperability being the key to unlocking the potential of health IT and has centered the majority of his research efforts with Chilmark around this subject. He also currently heads research for the Analytics domain.

Brian has worked in the IT business for over 25 years, beginning his career in the field-sales organization of IBM. He then joined Yankee Group as an analyst, where he managed an enterprise software service and led research on the dynamics of the database market. Leaving Yankee, Brian joined Eclipsys prior to its acquisition by Allscripts in 2010. At Eclipsys, Brian worked with product managers to refine and harmonize value propositions in light of the organization's broader goals.

Brian is a graduate of both Harvard College and Suffolk Law School. When not thinking about health IT, he's a runner and armchair Boston historian.

Scope and Methodology

To compile this report, Chilmark Research combined extensive primary and secondary research techniques to create a composite profile for each vendor. Primary research was divided into two distinct steps, beginning with soliciting targeted vendors for their involvement in the research.

We asked participating vendors to complete a detailed questionnaire whose purpose was to collect qualitative and quantitative information about the company and the markets it serves. Questions included among others: 2020 revenue, number of employees, target market, number of organizations currently using its solution, and more in-depth questions regarding features and functions.

Upon receiving the completed questionnaire, we conducted a follow-up interview with each vendor. These in-depth telephone interviews typically lasted 60-90 minutes and were for a product demonstration and to clarify responses to the questionnaire. This portion of the research effort also focused on topics that cannot easily be captured within the context of a written questionnaire including competitive positioning, product roadmap, partnership strategy, and which solution features are most attractive to prospective customers.

Chilmark Research performed a final analysis of the vendors via secondary research and telephone interviews with end users and consultants that have advised on, deployed, or used a vendor's system. This information was compiled to provide the in-depth profile and ratings of each vendor. Prior to publication, all vendors were given an opportunity to review their profile narratives for accuracy. Their comments and feedback were considered and where relevant, incorporated into the final profile narratives.

In compiling this extensive report, Chilmark Research maintained absolute objectivity throughout the entire research process and it is our sincere hope that this report brings greater clarity to this developing market.



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