

# INTRODUCTION & CONSENT

## **National Survey on Progress and Challenges with APIs: Perspectives from Digital Health Companies**

This national survey of digital health companies is part of an ongoing biennial study. The goal of this survey is to help national decision-makers, and those involved in federal regulation of application programming interfaces (APIs), understand the challenges that you face in the digital health industry, as well as the progress you've made, in integrating digital health tools with commercial electronic health records (EHRs) and other systems.

**The questions are likely best answered by someone on the product side but may require some technical expertise as well. Feel free to involve any relevant members of your team in responding. Participation is completely voluntary and will contribute to a research study. By completing this survey, you are consenting to participate in the study.** Thank you in advance for your time.

### **Data Access: Who Will Have Access to Individual, Identified Survey Responses?**

The research team at the University of California San Francisco (UCSF) that is collecting the data will have access to fully identified survey responses. In addition, the Office of the Assistant Secretary for Technology Policy (ASTP, formerly the Office of the National Coordinator for Health IT (ONC)), and project collaborators ScaleHealth, and Clinovations will be given a dataset containing identifiable survey responses. ASTP may choose to share all or part of the dataset with ASTP contractors only for the purpose of conducting contract work and abiding by the same reporting/disclosure terms as described below. Data access is for statistical purposes only and will not be used to determine conformance with certification requirements or other regulations.

### **Data Reporting: What Data & Derivative Results Will be Reported?**

No individual respondents or responses will ever be identified or reported publicly. All data will be reported at an aggregate level (e.g., across all survey responses). For example, we may report that 50% of surveyed digital health companies have attempted an integration with a commercial EHR vendor. UCSF, ASTP, ScaleHealth, Clinovations, and any ASTP contractors receiving the data will abide by these terms.

## **INSTRUCTIONS**

- Continue to [Section 1 \(Organization Characteristics\)](#)

## SECTION 1: ORGANIZATION CHARACTERISTICS

1. Is your organization or company **public** *[Hover mouse over bolded text for definitions]* *[Hover over bold text: Has shares that can be traded on a stock exchange]* or **private?** *[Hover over bold text: Does not have shares that can be traded on a stock exchange]?*

- Public
- Private, for profit**
- Private, non-profit (e.g. 501(c)3) or not-for-profit (e.g. 501(c)7)
- Other (please specify):
- Don't know

### Display if response in Q1 is "Private, for profit"

1a. In what stage of development is your company?

- Incubation (Pre-Seed, Seed)
- Early stage (Series A & B)
- Development, Growth (Series C or later)
- Other (please specify):

### Display if response in Q1 is "Private, non-profit or not-for-profit"

1b. In what stage of development is your organization?

- Idea stage
- Start-up
- Growth
- Mature
- Decline

2. Approximately how many full-time equivalent (FTE) employees work at your organization?

- 1-10
- 11-50
- 51 – 100
- 101 - 250
- 251- 500
- More than 500

3. Which of the following best describes your organization's relationship with Protected Health Information (PHI)? *[Hover mouse over bolded text for definitions]*

- Healthcare Provider** *[Hover over: A doctor, hospital, physician group, clinic, pharmacy, or other entity that provides health treatment or services in the regular course of business]* or **Other Covered Entity** *[Hover over: A health care provider such as a doctor, hospital, physician group, clinic, or pharmacy, and others that provide health treatment or services and that file health claims or prepare other insurance transactions electronically; or A health plan; or A health care clearinghouse]*
- Business Associate of a Covered Entity** *[Hover over: A business associate is a person or entity that performs certain functions or actions that involve the use or disclosure of individually identifiable health information on behalf of, or in service to, a covered entity. Some examples include: Electronic medical record vendors, medical billing companies, document storage or disposal companies, and data analysis service providers; Any organization that provides data transmission services to a covered entity and that requires access to the individually identifiable health information it transmits on a routine basis is considered a business associate. An example of this type of business associate is a health information exchange organization]*

- Access PHI through consumers outside Business Associate or Covered Entity Relationship
- Other (please specify):
- Not applicable

4. Fast Healthcare Interoperability Resources (FHIR) is a standard describing data formats and elements. Do you use FHIR in your product(s)?

- Extensively
- In a limited way
- Not at all
- Don't know

**Display if response in Q4 is "Extensively" or "In a Limited Way."**

4a. If you have developed FHIR-based products, do your products routinely access FHIR servers using SMART on FHIR authorization(s)?

- Yes
- No
- Don't know

## **INSTRUCTIONS**

- Continue to [Section 2 \(Experience with Electronic Health Record Integrations\)](#)

## SECTION 2: EXPERIENCE WITH ELECTRONIC HEALTH RECORD (EHR) INTEGRATIONS

The subsequent questions ask about integrations with commercial electronic health records (EHRs).

We are interested in your experiences using **RESTful and non-RESTful Application Programming Interface (API) approaches**. RESTful APIs are a type of web API that uses internet URLs to securely access data from a website or server (i.e., those using HTTP protocols). Standards-based RESTful APIs refer to the APIs required under the 21<sup>st</sup> Century Cures Act, as implemented by CMS and ASTP (formerly ONC). Common examples of **non-RESTful APIs and other non-API based approaches to EHR integration** include HL7v2/v3, CDA exchange, flat files over SFTP (secure file transfer protocol), and RPA (robotic process automation).

5.

Has your organization attempted any of the following integrations with commercial EHR(s)?

**Instructions:** For each row, select the one option that best describes your current state. If more than one option applies, choose the column furthest to the left.

- If you have an integration in production, select “Yes, in Production.”
- If you have an integration in progress but not in production, select “Yes, In Process but not in Production.”
- If you started an integration but stopped, select “Yes, but Stopped.”
- If none apply, select “No” or “Don’t Know.”

**Example:** If you have an integration in production, choose “Yes, in Production” even if you have other integrations that are still in process or were stopped.

**Note that responses for Q5 are enforced. i.e. one response per row is required before proceeding.**

Integration with commercial EHR(s) via...	Yes, In Production (Currently or previously)	Yes, In Process but Not In Production	Yes, but Stopped (Started but did not complete)	No	Don't Know
<u>Proprietary RESTful APIs</u> [Hover over: A proprietary RESTful API is one that is built, used, and/or maintained by the EHR vendor and does not use a standardized data format or vocabulary.]	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<u>Standards-based RESTful APIs</u> [Hover over: A standards-based RESTful API is one that uses a standardized data format or vocabulary like FHIR or USCDI. The standards are developed and maintained by a third-party entity and not by the EHR vendor.]	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<u>An API-based outsourced third-party integration engine</u> (e.g., Redox,	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

1upHealth) or <u>in-house third-party integration engine</u> (e.g. Mirth Connect, Cloverleaf)					
<u>Non-RESTful APIs</u> such as Remote Procedure Calls (RPC)	<input type="checkbox"/>				
<u>Non-API based integration</u> such as <u>HL7v2/v3 and flat files over SFTP</u>	<input type="checkbox"/>				

**Display if in Q5 there are any “Yes in Production,” “Yes in Process,” or “Yes but Stopped” responses in rows 1-4 (proprietary RESTful APIs, standards-based RESTful APIs, an API-based third-party integration engine, non-RESTful APIs).**

6. Did any API-based integrations with commercial electronic health record (EHR) vendors occur before January 2021?

- Yes  
 No  
 Don't Know

7. Please list the number of commercial EHR vendors in each box below with which you have expended minimal, moderate, or substantial effort/ resources to **establish** integrations (Enter 0 for any that are 0).

**Only display rows for which in Q5 there are any “Yes in Production,” “Yes in Process,” or “Yes but Stopped” responses.**

	INITIAL IMPLEMENTATION EFFORT			Don't Know
	Minimal	Moderate	Substantial	
Integration with commercial EHR(s) via... <i>proprietary</i> RESTful APIs				
<i>standards-based</i> RESTful APIs				
<u>an API-based third-party integration engine</u> (e.g., Redox, 1upHealth)				
<u>non-RESTful APIs</u>				
<u>non-API based integration</u>				

8. Please list the number of commercial EHR vendors in each box below with which you have expended minimal, moderate, or substantial effort/ resources to maintain integrations (Enter 0 for any that are 0)

**Only display rows for which in Q5 there are any “Yes in Production,” “Yes in Process,” or “Yes but Stopped” responses.**

	ONGOING USE/MAINTENANCE EFFORT			Don't Know
	Minimal	Moderate	Substantial	
Integration with commercial EHR(s) via... <i>proprietary</i> RESTful APIs				
<i>standards-based</i> RESTful APIs				
<u>an API-based third-party integration engine</u> (e.g., Redox, 1upHealth)				
<u>non-RESTful APIs</u>				
<u>non-API based integration</u>				

**Display if in Q5 row 3 (an API-based third-party integration engine) there is a “Yes in Production,” “Yes in Process,” or “Yes but Stopped” response.**

9. What is your rationale for working with an API-based third-party integration engine(s)? Select all that apply.

- Allows us to focus on our own core competencies
- Our customers have existing contracts with 3<sup>rd</sup> party integration engines and prefer/require us to use them
- Doing so offloads integration customization from our team
- Doing so decouples application code from integration code
- It's easier
- It's more cost effective
- Other (please specify)
- Don't know

### **INSTRUCTIONS**

Please proceed to the **first** section that applies to you:

- If ANY “Yes, in Production” or “Yes, in Process” Responses in Q5 rows 1-5 go to [Section 2A](#)
- If ANY “Yes, but Stopped” in Q5 rows 1-5, go to [Section 2B](#)
- If All “NOs” or “DON'T KNOWs” in Q5 rows 1-3, go to [Section 2C](#)

## Section 2A: ANY “YES, IN PRODUCTION” OR “YES, IN PROCESS” RESPONSES IN Q5

**Please respond to the following questions based on your product(s) that integrate with commercial EHRs.**

10. Who is the primary buyer(s) and user(s) of your product(s) that integrate with commercial EHRs? Select all that apply.

	<b>Buyer(s)</b> <i>Those who <u>pay you</u> for your products that integrate with commercial EHRs</i>	<b>User(s)</b> <i>Those who <u>use</u> your products that integrate with commercial EHRs</i>
Individual Clinician	<input type="checkbox"/>	<input type="checkbox"/>
Patient or Caregiver	<input type="checkbox"/>	<input type="checkbox"/>
Provider Organization	<input type="checkbox"/>	<input type="checkbox"/>
Payer	<input type="checkbox"/>	<input type="checkbox"/>
Public Health Organization	<input type="checkbox"/>	<input type="checkbox"/>
Other Government Agency	<input type="checkbox"/>	<input type="checkbox"/>
Digital Health Company	<input type="checkbox"/>	<input type="checkbox"/>
Pharmaceutical Company	<input type="checkbox"/>	<input type="checkbox"/>
Other (please specify):	<input type="checkbox"/>	<input type="checkbox"/>
Not Applicable (e.g. We only integrate for internal business purposes, and don't sell those services to others). <b>For anyone who selects BOTH BUYERS and USERS in this row take them directly to <a href="#">Concluding Questions</a></b>	<input type="checkbox"/>	<input type="checkbox"/>

11. In which of the following regions do you have existing clients of your product(s) that integrate with commercial electronic health records (EHRs)? Select all that apply.

- |   |   |
|---|---|
| <input type="checkbox"/> US<br><input type="checkbox"/> Canada<br><input type="checkbox"/> Mexico | <input type="checkbox"/> Europe<br><input type="checkbox"/> Asia/Pacific<br><input type="checkbox"/> Africa/Middle East<br><input type="checkbox"/> Central/South America |
|---|---|

12. How many UNIQUE products do you make available that integrate with commercial EHRs?

- 1  
 2-5  
 6+  
 Don't know the number

Display if in Q5 there is a “Yes, in Production” or “Yes, in Process” response in more than one of the following groupings rows 1-3 OR row 4 OR row 5 but NOT if there is a “Yes, in Production” or “Yes, in Process” response in only one of those groupings.

13. Of the [Pipe in answer choice selected in Q12] unique products you make available that integrate with commercial EHRs, how many fall into the type(s) of integration category(ies) shown in the column heading(s) below, recognizing that some products may fall into more than 1 type?

Based on responses in Q5, display only the columns that are relevant (e.g., if respondents selected “Yes, in Process” or “Yes, in Production” for proprietary or standards-based RESTful APIs, they will be displayed the “RESTful API based” column)

	RESTful API based	Non-RESTful API based	Non-API based
1	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2-5	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6+	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

14. What are the primary application domains of your CURRENT product(s) “In Production” or “In Process but Not Yet in Production” that integrate with commercial EHRs? Select all that apply.

Based on responses in Q5, display only the columns that are relevant (e.g., if respondents selected “Yes, in Process” or “Yes, in Production” for proprietary or standards-based RESTful APIs, they will be displayed the “RESTful API based” column)

	RESTful API based	Non-RESTful API based	Non-API based
Administrative (e.g., scheduling, billing, check-in)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Care Delivery, not limited to Treatment (e.g., clinical decision support, care coordination, telehealth, remote patient monitoring, clinical messaging)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Clinical Research	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Patient Access and Management of Health Record Data (e.g., patient portals, tools for viewing and sharing health records)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Population Health (e.g., analytics, measurement, and chronic disease management reporting)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Public Health (e.g., disease surveillance, vaccination campaigns, emergency)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>



From this point forward, the term APIs is used to refer to RESTful APIs

18. With how many *client EHR instances*\* have you:

**Based on responses in Q5, only display the rows for which there was a “Yes, in Production” or “Yes, in Process” or “Yes, but Stopped” response in rows 1-3 (proprietary RESTful APIs, standards-based RESTful APIs or an API based third-party integration engine)**

	1-5	6-9	10-99	100+	Don't Know
<b>Successfully integrated using APIs</b>	<input type="checkbox"/>				
<b>Begun an API-based integration effort that is currently underway</b>	<input type="checkbox"/>				
<b>Attempted API-based integration but stopped</b>	<input type="checkbox"/>				

\* For example, if you have a single client that has 5 different EHR instances with which you integrated/attempted to integrate, **count as 5**

**Only display if in Q5 there was any “Yes, in Production” or “Yes, in Process” response in rows 1-3 (proprietary RESTful APIs, standards-based RESTful APIs or an API based third-party integration engine)**

19. With which specific commercial EHR vendors have you:

	Successfully integrated using APIs	Undertaken an API-based integration that is <u>still underway</u>	Attempted API-based integration but stopped	Never attempted an API-based integration
Altera Digital Health (e.g. Sunrise, Touchworks)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
athenahealth	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
eClinicalWorks (Healow)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
CGM (eMDs, Aprima)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Epic	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Greenway Health	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Meditech	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Modernizing Medicine	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
NextGen	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Oracle Health (Cerner)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Veradigm	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Other (please specify):	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Display if responses to Q5 are “Yes, in Production” or “Yes, in Process” to BOTH row 1 (proprietary) and row 2 (standards-based)

20. To what extent are you currently working with commercial EHR vendors' proprietary APIs versus standards-based APIs?

Predominantly proprietary APIs	Mostly proprietary APIs	Working about equally with both	Mostly standards-based APIs	Predominantly standards-based APIs	Don't Know
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Display if in Q5 there are any “Yes, in Production,” “Yes, in Process,” or “Yes, but Stopped” responses in rows 1-3 (proprietary RESTful APIs, standards-based RESTful APIs, an API-based third-party integration engine).

21. To what extent is each dimension critical to your ability to successfully work with APIs:

Critical Dimensions	To a great extent	Moderately	Minimally	Not at all
Technical performance (e.g., response time)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Cost (e.g., fees)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Quality of API documentation	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
EHR vendor support during development and implementation	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Breadth of data elements available	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Amount of effort required to implement	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Adherence to standards	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Customer or provider organization IT support	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Other (please specify):	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

22. Based on the critical dimensions you rated "to a great extent" or "moderately" above, how would you rate the change over the past year in the APIs you gained access to in the course of the integration process?

**Based on responses in Q5, only display the rows for which there was a "Yes, in Production" or "Yes, in Process" responses in rows 1-3 (proprietary RESTful APIs, standards-based RESTful APIs or an API based third-party integration engine)**

Integration with commercial EHR(s) via...	Much better (than 12 mos ago)	Somewh at better	About the same	Somewh at worse	Much worse	N/A	Don't Know
<i>proprietary</i> RESTful APIs	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<i>standards-based</i> RESTful APIs	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
An API-based outsourced third-party integration engine (e.g., Redox, 1upHealth) or in-house third-party integration engine (e.g. Mirth Connect, Cloverleaf)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

23. Based on the critical dimensions you rated "to a great extent" or "moderately" above, rate your satisfaction with the commercial EHR vendor(s) with whom you have integrated or are in the process of integrating.

**Only display the rows below that were selected in Q19 for columns 1, 2, or 3 (successfully integrated, integration attempt underway, or integration attempted but stopped).**

	Very satisfied	Somewhat satisfied	Neither satisfied nor dissatisfied	Somewhat dissatisfied	Very dissatisfied
<i>Altera Digital Health (e.g. Sunrise, Touchworks)</i>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<i>AthenaHealth</i>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<i>eClinicalWorks (Healow)</i>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<i>CGM (eMDs/Aprima)</i>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<i>Epic</i>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<i>Greenway Health</i>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<i>Meditech</i>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<i>Modernizing Medicine</i>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<i>NextGen</i>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<i>Oracle Health (Cerner)</i>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<i>Veradigm</i>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<i>Other:</i>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Display if in Q5 there are any “Yes, in Production,” “Yes, in Process,” or “Yes, but Stopped” responses in rows 1-3 (proprietary RESTful APIs, standards-based RESTful APIs, an API-based third-party integration engine).

24. Please indicate the current level of use for your API-based commercial EHR integrations

Functions	CURRENT USE		
	Use extensively	Use in a limited way	Do not use
Create (“write”)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Read	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Update	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Delete	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

**INSTRUCTIONS**

Please proceed to the **first** section that applies to you:

- IF ANY response in Q5 is “Yes, but Stopped,” go to [Section 2B](#)
- If ALL responses in Q5 rows 1-3 are “NOs” or “DON’T KNOWs” go to [Section 2C](#)
- If none of the above apply, continue to [Section 3](#)

## SECTION 2B: ANY RESPONSE IN Q5 ROWS 1-5 IS “YES BUT STOPPED”

**For this section, for any “Yes but stopped” response in Q5– filter which questions below are shown:**

25. Please indicate reason(s) why you stopped integration with **proprietary** RESTful EHR APIs. Select all that apply.

- Integration did not add sufficient value to our product(s) or service(s) (e.g., data were not helpful, data did not enhance our product or service)
- Integration required too much engineering effort or other human capital costs
- Integration fees were too costly
- Continued fees were too costly
- Technical challenges
- Stopped this method of integration to pursue another method
- Other: please list
- Don't know

26. Please indicate reason(s) why you stopped integration with federally-regulated, **standards-based** RESTful EHR APIs. Select all that apply.

- Integration did not add sufficient value to our product(s) or service(s) (e.g., data were not helpful, data did not enhance our product or service)
- Integration required too much engineering effort or other human capital costs
- Integration fees were too costly
- Technical challenges
- Stopped this method of integration to pursue another method
- Other: please list
- Don't know

27. Please indicate reason(s) why you stopped integration with an API-based **third-party integration engine** (e.g., Redox, 1upHealth). Select all that apply.

- Integration did not add sufficient value to our product(s) or service(s) (e.g., data were not helpful, data did not enhance our product or service)
- Integration required too much engineering effort or other human capital costs
- Integration fees were too costly
- Technical challenges
- Stopped this method of integration to pursue another method
- Other: please list
- Don't know

28. Please indicate reason(s) why you stopped integration with **non-RESTful APIs**. Select all that apply.

- Integration did not add sufficient value to our product(s) or service(s) (e.g., data were not helpful, data did not enhance our product or service)
- Integration required too much engineering effort or other human capital costs
- Integration fees were too costly
- Technical challenges
- Stopped this method of integration to pursue another method

- Other: please list  
 Don't know

29. Please indicate reason(s) why you stopped integration with **non-API based approach(es)**. Select all that apply.

- Integration did not add sufficient value to our product(s) or service(s) (e.g., data were not helpful, data did not enhance our product or service)
- Integration required too much engineering effort or other human capital costs
- Integration fees were too costly
- Technical challenges
- Stopped this method of integration to pursue another method
- Other: please list
- Don't know

### **INSTRUCTIONS**

Please proceed to the first section that applies to you:

- If all responses in Q5 rows 1-3 are "NOs" or "DON'T KNOWs" go to [Section 2C](#).
- If the above does not apply to you, continue to [Section 3 \(Barriers\)](#).



## SECTION 2C: ALL RESPONSES IN Q5 ROWS 1-4 ARE “NO” or “DON’T KNOW”

**Display if responses in Q5 rows 1-3 (proprietary RESTful APIs, standards-based RESTful APIs or an API based third-party integration engine) are “No” or “Don’t Know”**

30. Please indicate reason(s) why you have not integrated with commercial EHR(s) using RESTful APIs. Select all that apply.

- Integration did not add sufficient value to our product(s) or service(s) (e.g., data were not helpful, data did not enhance my product or service)
- Integration required too much engineering effort or other human capital costs
- Integration fees were too costly
- Technical challenges
- Other: please list:
- Don't know

**Display only if response in Q5 row 5 (non-API based integrations) is “Yes, in Production” or “Yes, in Process.”**

31. What non-API-based integrations with commercial EHRs does your company currently do? Select all that apply.

- Flat file drop/transfer
- SFTP
- HL7 interfaces
- Direct database integration
- Other: please list:
- Don't know

### **INSTRUCTIONS**

- Continue to [Section 3: Barriers \(Specific to Nos\)](#)

## SECTION 3: BARRIERS TO COMMERCIAL EHR INTEGRATIONS

Display this section if any response in Q5 row 1-3 (proprietary RESTful APIs, standards-based RESTful APIs, API-based third-party integration engine) is “Yes, in Production,” “Yes, in Process,” or “Yes, but Stopped”

Considering your current integrations across all commercial EHRs, please respond to the following questions:

32. When thinking about the effort to initiate testing with Commercial EHRs, how satisfied are you with the following aspects of registering your app(s)?

	Very Satisfied	Somewhat satisfied	Neither satisfied nor dissatisfied	Somewhat dissatisfied	Very dissatisfied	Don't know
Hover over bold text for details						
<b>Authentication</b> [Hover over: Registration requirements to confirm identity]	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>Verification</b> [Hover over: Verification of app credentials complies with standards]	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>Timeliness</b> [Hover over: Time required for registration]	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>Overall Process</b> [Hover over: Registration process, from authentication to approval]	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

33. Across all of your current commercial EHR integrations, how would you **rate the overall quality of the commercial EHR vendors' API documentation**? Please select the option that best completes the following statement.

Overall, documentation included...

- All of the necessary information
- Most of the necessary information
- Some of the necessary information
- Little of the necessary information
- None of the necessary information
- Documentation was not available
- Not applicable
- Don't know

34. Across all of your current commercial EHR integrations how would you **rate the overall quality of data (e.g. clinical or administrative data) in the commercial EHR vendors' testing environments** needed for your product?

- Testing environments included a lot of realistic testing data relevant to my needs
- Testing environments included some realistic testing data relevant to my needs
- Testing environments included little realistic testing data relevant to my needs

- Testing environments included no realistic testing data relevant to my needs
- Not applicable
- Don't know

35. Across all of your current commercial EHR integrations, **how often are the API endpoints of the end-users' organizations (e.g. healthcare provider organizations) findable?**

- Endpoints are always easy to find
- Endpoints are often easy to find
- Endpoints are sometimes easy to find
- Endpoints are rarely easy to find
- Endpoints are never easy to find
- Not applicable
- Don't know

**Display only if response to Q35 is NOT "Not Applicable"**

36. Across all of your current commercial EHR integrations, **how often are the API endpoints of the end-users' organizations (e.g. healthcare provider organizations) easy to connect to?**

- Endpoints are always easy to connect to
- Endpoints are often easy to connect to
- Endpoints are sometimes easy to connect to
- Endpoints are rarely easy to connect to
- Endpoints are never easy to connect to

37. Based on your experience with current or ongoing API integrations with commercial EHRs, to what extent have each of the following posed a barrier to establish or maintain integration?

	Substantial barrier	Moderate barrier	Minor/not a barrier	N/A or Don't know
<b>TECHNICAL PERFORMANCE</b>				
Length of access/refresh token	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
High volume of API calls needed to access data	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Difficulty with identity matching or management	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>DATA AND AVAILABILITY</b>				
API(s) do not provide access to data elements of interest/value	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Access to a workflow/usability testing environment	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>STANDARDS IMPLEMENTATION</b>				
Lack of standardized data elements	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Lack of provider support for standards-based APIs	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Lack of availability of standards-based APIs <b>from EHR vendor</b>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

BUSINESS PRACTICES & FEES				
<b>EHR vendor</b> denied our access to their API due to concerns about usability or security	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>Provider organization</b> denied our access to their API due to concerns about usability or security (e.g. HITRUST, SOC2, or other security certification)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
High fee(s) associated with accessing vendor API or other non-API interface.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Contracting terms with <b>EHR vendor</b> (e.g. that inhibited our ability to keep intellectual property)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Backlogs or limited resources at client sites to gain data access, including barriers to getting a Business Associate Agreement (BAA)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>EHR vendor</b> will only respond if asked by large provider client	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>EHR vendor</b> responsiveness is inadequate in general	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

38. Please share any other thoughts or comments on barriers encountered or the general process of integrating with commercial EHRs using APIs.

**INSTRUCTIONS**

- Continue to [Section 4 \(Policy Efforts\)](#)

## SECTION 3: BARRIERS (SPECIFIC TO NOs)

Display this section if responses in Q5 rows 1-3 (proprietary RESTful APIs, standards-based RESTful APIs, an API-based third-party integration engine) are all “No” or “Don’t Know”

39. If relevant, to what extent did each of the following barriers contribute to your decision to not integrate your product(s) with commercial EHRs using APIs?

	Substantial barrier	Moderate barrier	Minor/not a barrier	N/A or Don't know
TECHNICAL PERFORMANCE				
Length of access/refresh token	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
High volume of API calls needed to access data	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Difficulty with identity matching or management	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
DATA QUALITY AND AVAILABILITY				
API(s) did not provide access to data elements of interest/value	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
STANDARDS IMPLEMENTATION				
Lack of standardized data elements	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Lack of provider support for standards-based APIs	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Lack of availability of standards-based APIs <b>from EHR vendor</b>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Difficulty accessing <b>provider organization</b> API endpoints	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Provider organization API endpoints, even when available, lack sufficient information (e.g provider organization directories)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
TECHNICAL SUPPORT				
Difficulty accessing <b>EHR vendor</b> testing environment	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Difficulty accessing <b>EHR vendor</b> technical API documentation	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Difficulty accessing <b>provider organization</b> testing environment	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Lack of ability to integrate and test with security framework	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Lack of realistic clinical testing data in testing or development environments	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
BUSINESS PRACTICES & FEES				

<b>EHR vendor</b> denied our access to their API due to concerns about usability or security	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
High fee(s) associated with accessing vendor API or other non-API interface.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Contracting terms with <b>EHR vendor</b> (e.g. that inhibited our ability to keep intellectual property)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>Provider organizations</b> required HITRUST, SOC2 or other security certifications	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Backlogs or limited resources at client sites to gain data access, including barriers to getting a Business Associate Agreement (BAA)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>EHR vendor</b> will only respond if asked by large provider client	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>EHR vendor</b> responsiveness is inadequate in general	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

40. Please share any other thoughts or comments on barriers encountered or the general process of integrating with commercial EHRs using APIs.

**INSTRUCTIONS**

- Continue to [SECTION 4: POLICY EFFORTS](#)

## SECTION 4: POLICY EFFORTS

41. Are you aware of the Trusted Exchange Framework and Common Agreement, also known as “TEFCA”?

- Yes, and I am a participant in at least one Qualified Health Information Network (QHIN)  
 Yes, and I have plans to participate  
 Yes, but I do not currently have plans to participate  
 No

**Display if response in Q41 is “Yes, and I am a participant” OR “Yes, and I have plans to participate.”**

42. For what TEFCA exchange purposes do you currently or plan to use to electronically exchanged information?

Exchange purpose	Currently exchange	Plan to exchange
Treatment	<input type="checkbox"/>	<input type="checkbox"/>
Payment	<input type="checkbox"/>	<input type="checkbox"/>
Healthcare Operations	<input type="checkbox"/>	<input type="checkbox"/>
Individual Access (e.g., patient engagement via API or other platform)	<input type="checkbox"/>	<input type="checkbox"/>
Public Health	<input type="checkbox"/>	<input type="checkbox"/>
Government Benefits Determination	<input type="checkbox"/>	<input type="checkbox"/>

43. Has your organization attempted API-based integrations with any of the following entities? Select all that apply.

**Instructions:** For each row, select the one option that best describes your current state. If more than one option applies, choose the column furthest to the left.

- If you have an integration in production, select “Yes, in Production.”
- If you have an integration in progress but not in production, select “In Process but not in Production.”
- If you started an integration but stopped, select “Yes, but Stopped.”
- If none apply, select “No” or “Don’t Know.”

**Example:** If you have an integration in production, choose “Yes, in Production” even if you have other integrations that are still in process or were stopped.

	Yes, In Production (Currently or previously)	Yes, In Process but Not In Production	Yes, but Stopped (Started but did not complete)	No
Payers	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Regional, state, or local health information exchange organizations (HIEs/HIOs)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Other exchange networks (e.g., eHealthExchange or CommonWell Health Alliance)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Other (please specify):	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

44. To what extent are you investing in future plans to develop products around:

	To a great extent	Moderately	Minimally	Not at all	Don't know
Provider-facing EHR APIs (EHR APIs that make data available to providers)	<input type="checkbox"/>				
Patient-facing EHR APIs (EHR APIs that make data available to patients)	<input type="checkbox"/>				
Provider-facing Payer APIs (APIs on payer systems that make data available to providers)	<input type="checkbox"/>				
Patient-facing Payer APIs (APIs on payer systems that make data available to patients)	<input type="checkbox"/>				
Payer-to-Payer APIs (APIs on payer systems that make data available to other payers)	<input type="checkbox"/>				

45. To what extent is each of the following making it easier to use APIs to integrate with commercial EHRs, payers, or other entities: *Hover mouse over bolded text for definitions.*

	To a great extent	Moderately	Minimally	Not at all	Don't know
ASTP/ONC EHR API regulations	<input type="checkbox"/>				
ASTP/ONC "Information Blocking" regulations	<input type="checkbox"/>				
Centers for Medicare & Medicaid Services (CMS) Payer API regulations	<input type="checkbox"/>				
<b>CMS Health Technology Ecosystem/Interoperability Framework</b> [Hover over: A 2025 CMS initiative to improve patient access and empowerment; provider access and delegation; data availability and standards compliance; network connectivity and transparency; and identity, security, and trust.]	<input type="checkbox"/>				
<b>CMS Blue Button 2.0</b> [Hover over: Blue Button 2.0 is a standards-based application programming interface (API) that delivers Medicare Part A, B, and D data for over 60 million people with Medicare. Blue Button 2.0 allows you to share your data with third-party applications, doctors, research programs, and more. It also gives beneficiaries and their caregivers	<input type="checkbox"/>				

<a href="#">more options and control over your claims data]</a>					
Trusted Exchange Framework and Common Agreement (TEFCA)	<input type="checkbox"/>				
HL7 FHIR Accelerators (e.g., CARIN, Argonaut, Da Vinci, Gravity, Helios)	<input type="checkbox"/>				

46. Please share any other thoughts or comments on current or future directions for policy efforts in promoting or enforcing access to APIs and standards to integrate with commercial EHR vendors, payer IT systems, TEFCA, or other entities.

### INSTRUCTIONS

- Continue to [Concluding Questions](#)

## CONCLUDING QUESTIONS

47. Please change the question to "Please indicate the roles/perspectives of individuals involved in responding to this survey. Select all that apply.

- CEO
- CTO
- Other General Executive(s). Please specify:
- Product
- Engineering/Development
- Other: please specify:

48. We will produce a publicly available report of the aggregated survey findings. As per the consent information at the start of this survey, no individual respondents or responses will ever be identified or reported publicly. All data will be reported at an aggregate level (e.g., across all survey responses). However, to promote the work you do, we plan to feature the names of the companies that responded to the survey on the report (company name only, not individual survey responses). Would you like your company's name to appear on this report?

- Yes
- No