

ABSTRACT IP INVENTION DISCLOSURE

Health Record Curation Using Automated Retrieval Across Health Systems

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Matter: Health Record Curation

Inventor: Johnny Appleseed

Client: Abstract Labs

1. BACKGROUND

Patients often receive care from multiple doctors and health systems (118) over time. A current doctor (126) may have access only to a limited subset of a patient's prior health records (122), such as records from a particular year forward or records maintained by a particular provider. As a result, historical records from other providers, locations, or time periods may be missing when the patient visits a new doctor. Although patients may have a legal right to access their own health data, collecting records from multiple sources can be burdensome.

2. SUMMARY OF THE INVENTION

As shown in FIG. 1, the disclosed system (100) enables a patient to request collection of the patient's health records (122) through a user device (104), such as by speaking or typing a health-record request (106). In response, the system attempts to gather records from multiple health systems (118) using one or more retrieval paths, including browser agents (110), application programming interface access paths (112), website access paths (114), and potentially phone conversation access paths (116). The system may use patient history information, such as locations where the patient has lived, to identify health systems or hospitals to query. Retrieved records from different providers, time periods, or geographic regions are collected and combined into a concatenated health record output (124), such as a report, a document, or, as shown in FIG. 3, an application output (300) with a table view (302) of health-record entries (304). A patient may select or access individual records and send the resulting collected records to a current doctor (126).

3. BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 illustrates system overview for gathering health records from multiple health systems.

FIG. 2 illustrates workflow for locating, retrieving, and concatenating health records.

FIG. 3 illustrates application output showing collected health records in a table view.

4. DETAILED DESCRIPTION

As shown in FIG. 1, in one implementation, a patient interacts with a user device (104) by speaking or typing a request such as a health-record request (106) to obtain the patient's health records (122). The health record curation system (100) receives the request and initiates retrieval activity directed to multiple health systems (118). The retrieval activity may include sending browser agents (110), hitting application programming interfaces via API access paths (112), accessing websites via website access paths (114), and using other paths for obtaining records from providers.

As shown in FIG. 2, the system may determine where to search based on information about the patient. For example, the patient may provide locations where the patient has lived, and the system may query hospitals or health systems in those areas to determine whether the patient has a record in those systems. The system may also use information about doctors or types of doctors the patient has visited to guide the search.

When records are obtained, the system collects records from different sources and time periods. For example,

records from 2021 to 2023 in New York may be combined with records from California. The collected records may be concatenated or otherwise assembled into a consolidated output (124). The output may be a report, a document, or an application interface of an application output (300) that presents a table view (302) of different health-record entries (304). In the application interface, the patient may click into individual records. The patient may also send the collected output to a current doctor (126).

The retrieval process may encounter provider-specific access procedures, including multi-factor authentication (120). The system may use different paths to reach the needed data depending on what is effective for a particular provider or health system.

5. EXAMPLE IMPLEMENTATION

A user speaks or types into a device to request health records. The system sends browser agents, hits APIs, and performs retrieval across different health systems to determine whether the user has a record in those systems. The system may use information such as where the user has lived to query hospitals in the relevant areas. Retrieved records are combined into a report, document, or app table view, and the user can click into records and send them to a current doctor.

6. ALTERNATIVE EMBODIMENTS

Retrieval paths may include phone conversations, websites, browser agents, and APIs. Outputs may include a report, a document, or an app with a table view of health records.

7. ERROR AND EDGE-CASE HANDLING

Retrieval may encounter multi-factor authentication. Records may be distributed across different providers, different time periods, and different geographic regions, including records in New York and records in California.

8. DATA SECURITY AND PRIVACY

The system is based on the patient's ability to request and collect the patient's own health data. Access to provider systems may involve multi-factor authentication.

9. DETAILED DESCRIPTION OF THE DRAWINGS

FIG. 1. illustrates a health record curation system in which a user 102 provides a health-record request 106 by speaking into or typing into a user device 104. The request 106 is received by a record-gathering agent 108. The record-gathering agent 108 accesses different health systems 118 using multiple supported access paths, including a browser agent 110, an API access path 112, a website access path 114, and a phone conversation access path 116. One or more of the access paths may encounter a multi-factor authentication hurdle 120. The health systems 118 return health records 122 to the record-gathering agent 108. The record-gathering agent 108 combines the received health records 122 into a concatenated health record output 124, such as a report, document, or application-based view, which may be provided to a current doctor 126.

FIG. 2. illustrates a workflow for curating health records. A request-receiving stage 202 receives a user request to collect health records. A personal-history stage 204 obtains information about the user's history, including where the user has lived and doctors the user has visited. A provider-identification stage 206 identifies hospitals or health systems in the relevant areas. A provider-querying stage 208 queries the identified providers using available paths, such as websites, APIs, browser agents, or phone conversations, and may address a multi-factor authentication hurdle. A record-existence determination stage 210 determines whether the user has a record in a queried health system. A record-retrieval stage 212 retrieves available health records. A concatenation stage 214 combines records from different places and periods, including records from New York during 2021 to 2023 and records from California. An output-generation stage 216 generates a document, report, or application table view. A doctor-sending stage 218 enables the curated output to be sent to the user's current doctor.

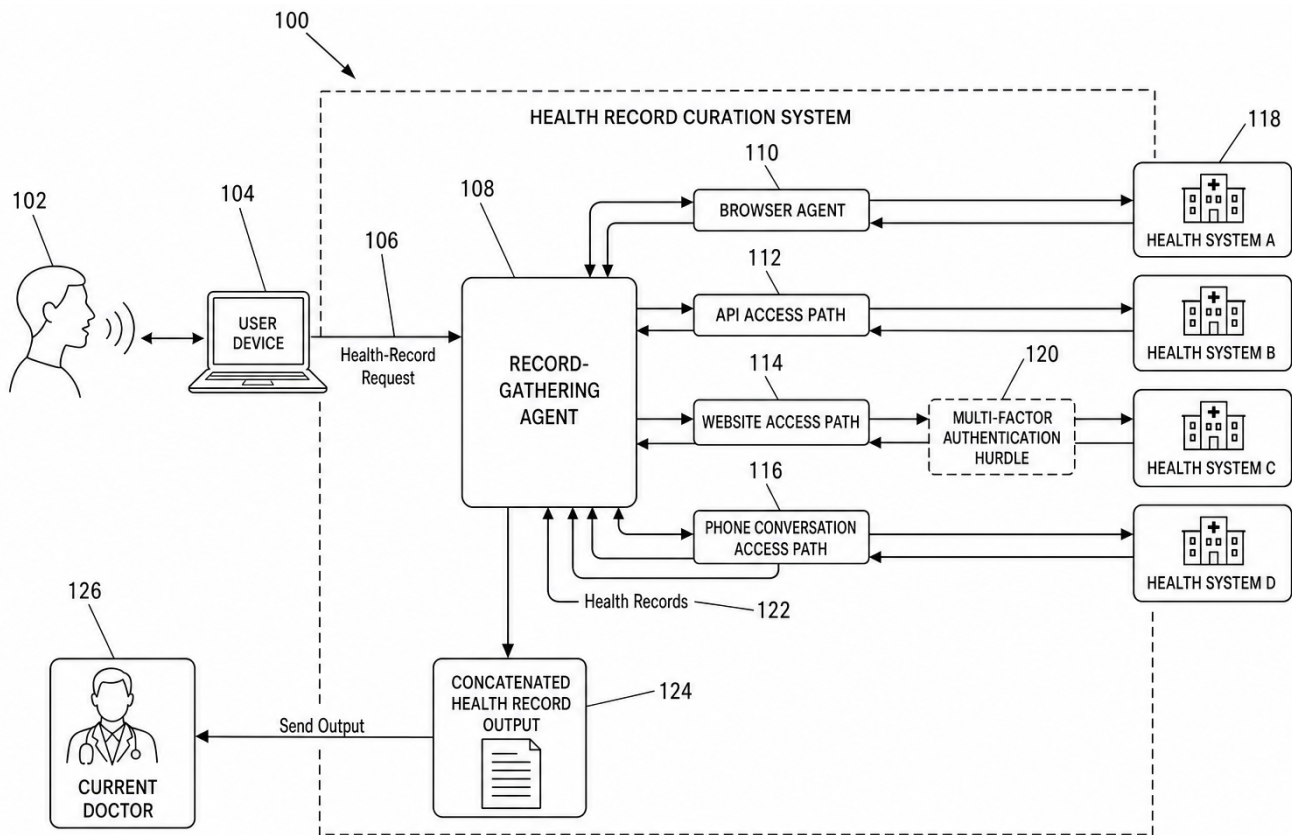
FIG. 3. illustrates an application output 300 generated from collected health records. The application output 300 includes a table view 302 containing multiple health-record entries 304 obtained from different health systems, including entries representing New York records from 2021 to 2023 and California records. A selected entry 306 may be clicked to present additional detail for that record. A send control 308 enables the user to send the collected records to the current doctor. The application output 300 thereby presents the concatenated records in an accessible form after collection by the record-gathering agent.

10. CLAIMS SKETCH

1. A computer-implemented method comprising: receiving, via a user device (104), a health-record request (106) from a patient to obtain health records (122) of the patient; identifying a plurality of health systems (118) to search for records of the patient; initiating automated retrieval operations directed to the plurality of health systems using at least one of a browser agent (110) or an application programming interface access path (112); determining whether one or more of the plurality of health systems maintains a record for the patient; obtaining health records of the patient from at least two different sources; and generating a consolidated output (124) comprising the obtained health records.
2. The method of claim 1, wherein receiving the request comprises receiving a spoken request from the patient.
3. The method of claim 1, wherein receiving the request comprises receiving a typed request from the patient.
4. The method of claim 1, wherein identifying the plurality of health systems comprises receiving information indicating one or more locations where the patient has lived and selecting hospitals or health systems associated with the one or more locations.
5. The method of claim 1, wherein identifying the plurality of health systems comprises using information concerning doctors visited by the patient.
6. The method of claim 1, wherein the automated retrieval operations comprise accessing website access paths (114) of respective health systems.
7. The method of claim 1, wherein the automated retrieval operations comprise using multiple retrieval paths for different health systems.
8. The method of claim 1, further comprising performing an access procedure for a health system that includes multi-factor authentication (120).
9. The method of claim 1, wherein generating the consolidated output comprises concatenating records obtained from different geographic regions.
10. The method of claim 1, wherein generating the consolidated output comprises combining records corresponding to different time periods.
11. The method of claim 1, wherein the consolidated output comprises a report.
12. The method of claim 1, wherein the consolidated output comprises a document.
13. The method of claim 1, wherein the consolidated output comprises an application interface presenting a table view (302) of a plurality of health-record entries (304).
14. The method of claim 13, further comprising receiving a selection of a health record in the table view and displaying a selected entry detail (306) of the selected health record.
15. The method of claim 1, further comprising transmitting the consolidated output to a current doctor (126) of the patient.
16. A system (100) comprising: one or more processors; and one or more memories storing instructions that, when executed by the one or more processors, cause the system to receive a patient request to obtain health records, query a plurality of health systems using at least one browser agent or application programming interface, obtain records of the patient from multiple health systems, and generate a consolidated output comprising the obtained records.

17. The system of claim 16, wherein the instructions further cause the system to identify health systems to query based on locations where the patient has lived.
18. The system of claim 16, wherein the consolidated output is an application output (300) comprising a table of health records selectable by the patient.
19. A non-transitory computer-readable medium storing instructions that, when executed by one or more processors, cause the one or more processors to perform operations comprising: receiving a request from a patient to collect health records; searching across a plurality of health systems for records of the patient; retrieving health records from at least two of the plurality of health systems using one or more of a browser agent, a website access path, or an application programming interface access path; and producing a consolidated record output for access by the patient.
20. The non-transitory computer-readable medium of claim 19, wherein the operations further comprise providing the consolidated record output for sending to a current doctor of the patient.

FIG. 1 — System overview for gathering health records from multiple health systems

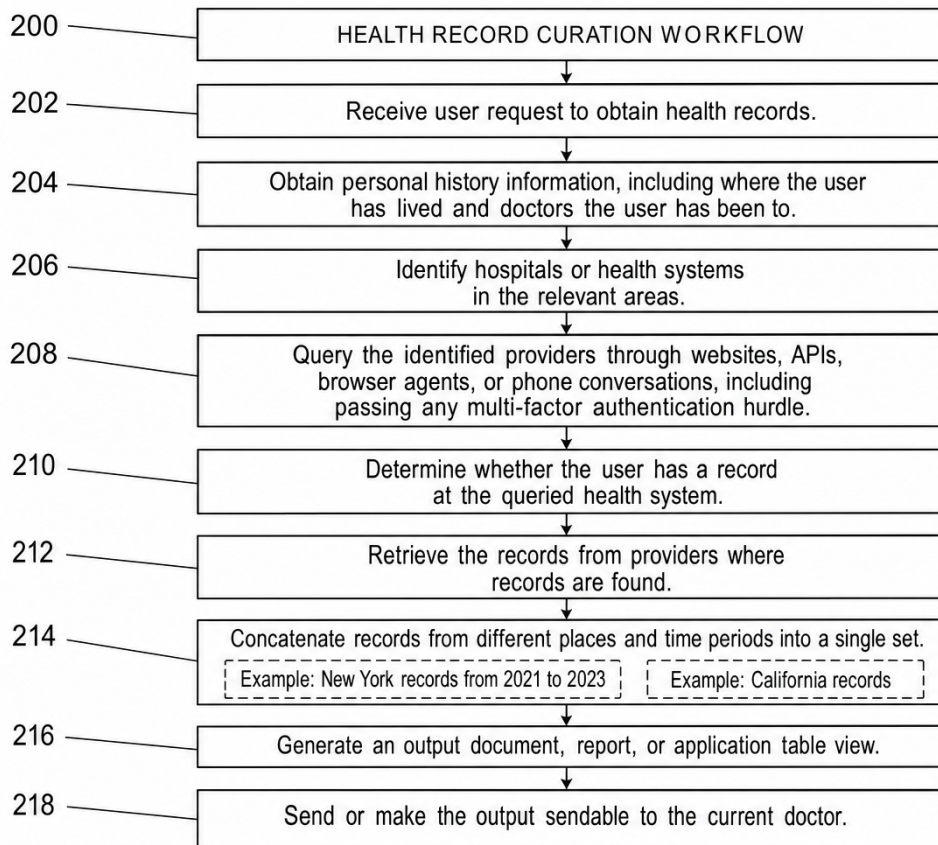


Description. FIG. 1 illustrates a health record curation system in which a user 102 provides a health-record request 106 by speaking into or typing into a user device 104. The request 106 is received by a record-gathering agent 108. The record-gathering agent 108 accesses different health systems 118 using multiple supported access paths, including a browser agent 110, an API access path 112, a website access path 114, and a phone conversation access path 116. One or more of the access paths may encounter a multi-factor authentication hurdle 120. The health systems 118 return health records 122 to the record-gathering agent 108. The record-gathering agent 108 combines the received health records 122 into a concatenated health record output 124, such as a report, document, or application-based view, which may be provided to a current doctor 126.

Reference numerals.

- 100 health record curation system — Overall system for collecting and curating health records from different providers.
- 102 user — Person requesting collection of the user's health records.
- 104 user device — Device into which the user speaks or types the request.
- 106 health-record request — Request asking the system to get the user's health records.
- 108 record-gathering agent — Agent that seeks and retrieves records across different health systems.
- 110 browser agent — Automated browser-based access path used by the record-gathering agent.
- 112 API access path — Access path by which the agent hits APIs of health systems.
- 114 website access path — Access path through provider websites.
- 116 phone conversation access path — Access path involving phone conversations to obtain records.
- 118 health systems — Different hospitals or provider systems queried for user records.
- 120 multi-factor authentication hurdle — Authentication barrier that may be encountered while accessing provider systems.
- 122 health records — Records returned from the different health systems.
- 124 concatenated health record output — Combined output formed from the retrieved records, such as a report, document, or application view.
- 126 current doctor — Doctor to whom the collected record output can be sent.

FIG. 2 — Workflow for locating, retrieving, and concatenating health records



Description. FIG. 2 illustrates a workflow for curating health records. A request-receiving stage 202 receives a user request to collect health records. A personal-history stage 204 obtains information about the user's history, including where the user has lived and doctors the user has visited. A provider-identification stage 206 identifies hospitals or health systems in the relevant areas. A provider-querying stage 208 queries the identified providers using available paths, such as websites, APIs, browser agents, or phone conversations, and may address a multi-factor authentication hurdle. A record-existence determination stage 210 determines whether the user has a record in a queried health system. A record-retrieval stage 212 retrieves available health records. A concatenation stage 214 combines records from different places and periods, including records from New York during 2021 to 2023 and records from California. An output-generation stage 216 generates a document, report, or application table view. A doctor-sending stage 218 enables the curated output to be sent to the user's current doctor.

Reference numerals.

200 health record curation workflow — Overall process for locating, collecting, and outputting health records.

202 request-receiving stage — Receives the user's request to get health records.

204 personal-history stage — Obtains information about where the user has lived and doctors the user has been to.

206 provider-identification stage — Identifies hospitals or health systems in areas associated with the user's history.

208 provider-querying stage — Queries providers through websites, APIs, browser agents, or phone conversations and may encounter multi-factor authentication.

210 record-existence determination stage — Determines whether the user has a record in a queried health system.

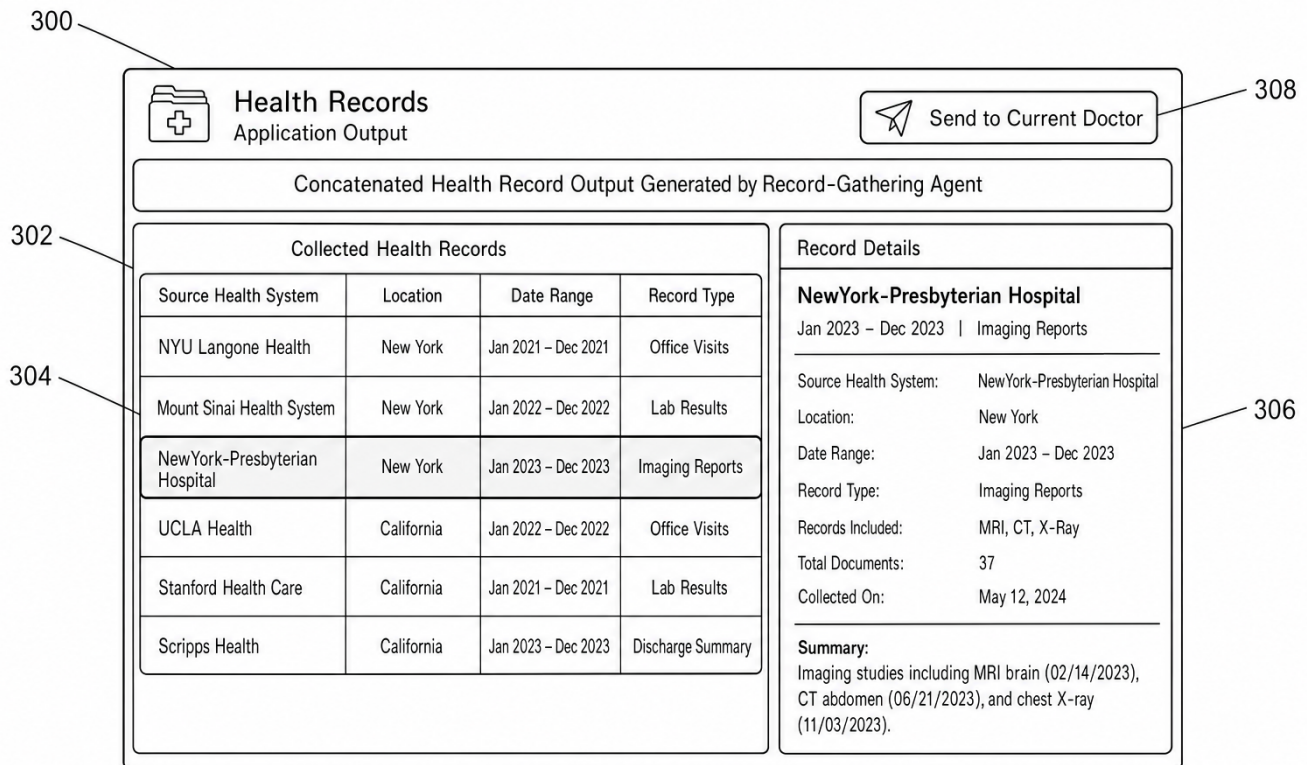
212 record-retrieval stage — Retrieves health records from providers where records are found.

214 concatenation stage — Combines records from different locations and periods into a single set.

216 output-generation stage — Generates an output document, report, or application table view.

218 doctor-sending stage — Provides the curated records to, or makes them sendable to, the current doctor.

FIG. 3 — Application output showing collected health records in a table view



Description. FIG. 3 illustrates an application output 300 generated from collected health records. The application output 300 includes a table view 302 containing multiple health-record entries 304 obtained from different health systems, including entries representing New York records from 2021 to 2023 and California records. A selected entry 306 may be clicked to present additional detail for that record. A send control 308 enables the user to send the collected records to the current doctor. The application output 300 thereby presents the concatenated records in an accessible form after collection by the record-gathering agent.

Reference numerals.

300 application output — App-based output presenting collected health records.

302 table view — View listing a bunch of different health records.

304 health-record entries — Entries corresponding to collected records from different health systems or locations.

306 selected entry detail — Detail area shown when a health-record entry is clicked.

308 send control — Control for sending the collected records to the current doctor.