

Sharing SEER Program Data and Algorithms via Web Services



SEER API

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Overview

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- **Background**
- **Definitions**
 - API
 - Web Services
- **SEER's Web Services**
 - Collaborative Stage
 - Hematopoietic Lymphoid and Neoplasm DB
 - NAACCR documentation
 - SEER*Rx (Antineoplastic Drugs Database)
 - SEER Site Recodes

Background - SEER Support

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- **Develops numerous software systems**
 - Analytic Software
 - Registry Software
 - Other software and algorithms
- **Maintains numerous databases and websites**
 - SEER Incidence Research DB
 - NCHS Mortality
 - Census Population Data
 - Hematopoietic DB
 - SEER*Rx (treatment data)

Background - Hurdles

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- Code overlap. Many algorithms and data sets are used by multiple projects.
- Shared modules:
 - SEER Edits Engine
 - SEER*Rx Drug Database
 - Hematopoietic and Lymphoid Neoplasm Database
 - Collaborative Staging
 - Parsing NAACCR files
 - Site Recodes
 - And many more...

Background – SEER*Utils

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- Create a shared library that can be used by different projects.
- **Java library (SEER*Utils)**
 - Hematopoietic and Solid Tumor data
 - SEER Edits engine and logic
 - SEER*Rx Drug data
 - Many other utilities

Background – Issues with SEER*Utils library

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- **SEER*Utils**
 - can only be used by Java projects
 - is barely known outside of IMS
 - is updated often

- **APIs and Web Services provide a much better solution**

Definitions – What is an API?

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- Application Programming Interface (API)

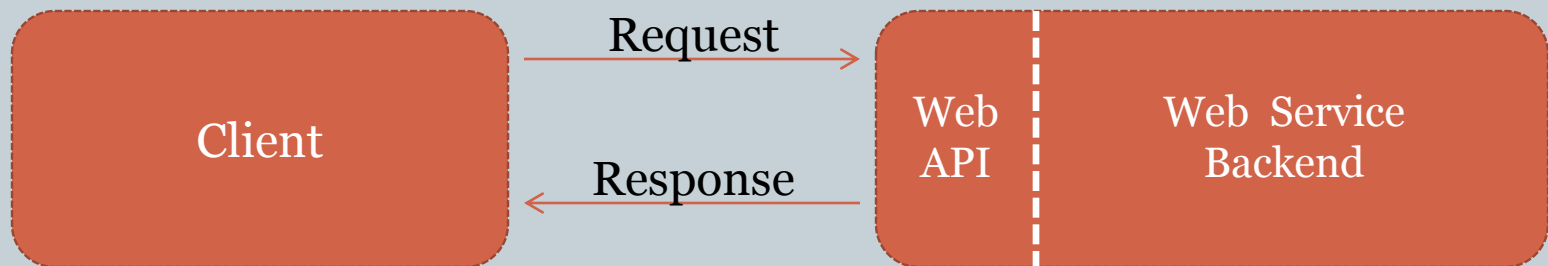
- Wiki definition:

An application programming interface (API) is a specification of how some software components should interact with each other.

Definitions - Web Services

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A Web Service represents a platform independent way of exchanging data.



A Web API exposes a set of data and functions to facilitate interactions between computer programs and allows them to exchange information over the World Wide Web.

Definitions – Web Service Examples

- National weather forecasters provide them to supply data to web sites and news orgs
- Stock prices are provided this way by major exchanges and corporations
- Google maps offers numerous APIs for mapping
- Geocoding system on the NAACCR server is an API provided by Texas A&M, NAACCR, and the NCI

Definitions - Web Services

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- Web services allow different applications from different sources to communicate with each other
- Web services do **not** require the use of browsers
- Web services are not tied to any one operating system or programming language.

Definitions - Web Services

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A typical RESTful Web Service request is in the following form:

http://domain_name.com/some/other/structure/function?params

Web services return data from the HTTP request in a standard format for parsing and/or processing by your application.

How to access SEER*API

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<https://api.seer.cancer.gov>

- Request an Account
- Assigned an API key
- Within your application
 - Build and send a request
 - Receive and process the response

Sample – Results

https://api.seer.cancer.gov/rest/cstage/020440/schema?id=44&api_key=

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Load JSON Data from URL:

https://api.seer.cancer.gov/rest/cstage/020440/schema?id=44&api_key=

Process

Clear

Formatted JSON Data:

```
{ "name" : "Stomach",
  "note" : [ "C16.1 Fundus of stomach",
            "C16.2 Body of stomach",
            "C16.3 Gastric antrum",
            "C16.4 Pylorus",
            "C16.5 Lesser curvature of stomach, NOS",
            "C16.6 Greater curvature of stomach, NOS",
            "C16.8 Overlapping lesion of stomach",
            "C16.9 Stomach, NOS"
  ],
  "num_tables" : 43,
  "revision_date" : "10/25/2011",
  "schema_number" : 44,
  "site_summary" : "C16.1-C16.6, C16.8-C16.9",
  "ssf" : [ { "already_collected" : false,
              "clinically_significant" : false,
              "default_value" : "999",
              "name" : "Clinical Assessment of Regional Lymph Nodes",
              "needed_for_staging" : true,
```

SEER Web Services - Currently Implemented APIs

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<https://api.seer.cancer.gov/>

- Collaborative Staging
- Hematopoietic and Lymphoid Neoplasm Database
- NAACCR Documentation
- SEER*Rx – Antineoplastic Drugs Database
- SEER Incidence Site Recode

SEER Web Services – Collaborative Stage - APIs

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- Return a list of all the schema numbers and names.
- Return whether a site and histology combination represents a valid schema and also whether that combination requires a discriminator (SSF25) to make its schema selection.
- Return a single schema based on either schema ID or the combination of primary site, histology and site-specific factor 25.
- Return information about the passed code including its validity and whether it is obsolete.
- Return a table that contains all the information about the desired schema and field.
- Calculate collaborative stage.
- Return information about all the supported versions of Collaborative Stage including version number key and number of supported schemas.

SEER Web Services – Hematopoietic and Lymphoid Neoplasm DB - APIs

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- Return the entire list of disease names and identifiers.
- Search the diseases using the provided query string. Return the results.
- Return a single disease, specified by the id parameter.
- Return true or false indicating whether the 2 histologies represent multiple primaries.
- Return a list of information about all supported Hematopoietic database versions.

SEER Web Services – NAACCR Documentation - APIs

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- Return all item numbers and item names in the NAACCR Data Standards Volume II.
- Return a single NAACCR field, specified by the item parameter.
- Return a list of information about all supported NAACCR versions.

SEER Web Services – SEER*Rx – Antineoplastic Drugs Database - APIs

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- Return the entire list of drug names and identifiers.
- Return drugs that match a specified query.
- Return a single drug, specified by the id parameter.
- Return the entire list of regimen names and identifiers.
- Return regimens that match a specified query.
- Return a single regimen, specified by the id parameter.
- Return the version of the SEER*Rx database.

SEER Web Services – SEER Incidence Site Recode - APIs

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- Return the SEER Site Group for the site/histology combination, or 99999 if the combination is unknown.
- Return the version of the SEER Site Recode database.

Future APIs

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- SEER Historic Stage
- ICD Coding
- Solid Tumor Data
- ???

Thanks!

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Web Site: <https://api.seer.cancer.gov>

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- Sponsors

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- Developers

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