



# A Tale of Two APIs

Annamarie Klose Hrubes  
Digital Initiatives Librarian  
William Paterson University



# What are APIs?

In computer programming, an **application programming interface (API)** is a set of subroutine definitions, protocols, and tools for building application software. In general terms, it is a set of clearly defined methods of communication between various software components.

Web APIs are the defined interfaces through which interactions happen between an enterprise and applications that use its assets. An API approach is an architectural approach that revolves around providing programmable interfaces to a set of services to different applications serving different types of consumers. When used in the context of web development, an API is typically defined as a set of Hypertext Transfer Protocol (HTTP) request messages, along with a definition of the structure of response messages, which is usually in an Extensible Markup Language (XML) or JavaScript Object Notation (JSON) format.

- *Application programming interface,*  
[https://en.wikipedia.org/wiki/Application\\_programming\\_interface](https://en.wikipedia.org/wiki/Application_programming_interface)



# How can you use APIs?

In the library world, vendors have created APIs that allow us to get better access to their data. As a librarian, you can retrieve a large set of records (GET command) or add/edit a large set of records (POST command). We'll focus on the GET command.

Some data download scenarios with the GET command:

- MARCXML or Dublin Core records from World Cat
- Records on a specific subject in Digital Public Library of America (DPLA)
- Statistics related to journals that your university's faculty have published in\*

More examples:

<https://www.programmableweb.com/news/49-library-apis-librarything-worldcat-search-and-bookshare/2012/11/06>

<https://libraries.mit.edu/scholarly/publishing/apis-for-scholarly-resources/>

<http://guides.lib.berkeley.edu/information-studies/apis>



# Downsides

APIs allow us to retrieve, manipulate, and provide data faster and better but there are some pitfalls to be aware of.

1. Technical errors - Poor design of API or underlying information resource. Computers are only as smart as the people who program them.
2. Data integrity issues - The data contained in the information resource is flawed or incorrect.

The moral of this story is to sample API data and examine it before engaging in large-scale projects with it.

Be aware that APIs beat manual labor but your downloaded data sets might require data clean-up efforts.



# Use sampling to get to know your API

When your data gives you questions... Examine the results.

Verify unusual results, e.g.

- Does *Journal of Celtic Linguistics* really have a CiteScore of 0.00? Yes
- Does *Pediatric Health* really have no CiteScore? Yes, coverage discontinued in Scopus.
- Why is an article indexed in Scopus but I'm not getting data for its journal? Well, sometimes this happens.
- Is there something wrong with NULL results?

Patterns will emerge that will help you understand the data you receive in the future.

However, you might also find errors...



## API reliability as illustrated by 2 examples

For my project, I used two APIs to acquire bibliographic information and statistics related to journals that WPU faculty have published in. I used this data for a database the university uses for annual reporting of faculty achievements.





# Structure of Resource

Even when APIs work as advertised, you need to be aware of the underlying structure of the information resource.

That means understanding how the resource works. APIs have rigid requirements. They either do what you want or don't. Depending on your needs, you may need to use multiple APIs at once!

APIs can only be reliable if you understand the structure that you are working with. Reliability is a function of how predictable they are.

# Ulrich's Web - Evaluating the resource structure

Enter a Title, ISSN, or search term to find journals or other periodicals:

new england journal of medicine [Advanced Search](#)

**Narrow Results**

Key Features

- Sort: Count | [Alpha](#)
- Abstracted or Indexed (54253)
- Website URL (48632)
- Referred / Peer-reviewed (40362)
- Available Online (33896)
- Copyright Clearance Center (CCC) (32971)
- Table of Contents (12209)
- Electronic-only (9273)
- Journal Citation Reports (6045)
- Open Access (5380)
- Magazines for Libraries review (4398)

Serial Types

Formats

Content Types

**1 - 25 of 151,286 results for: new england journal of medicine**

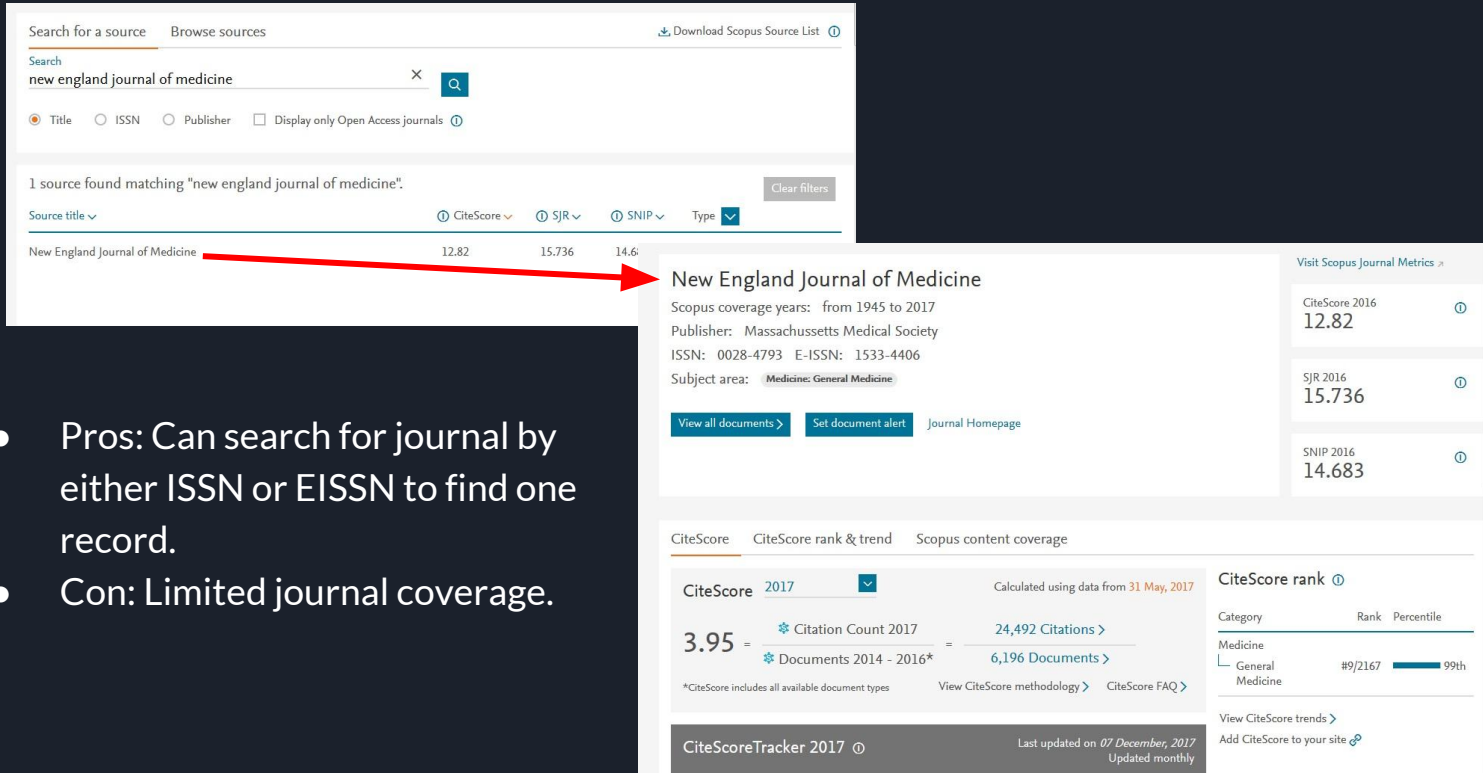
[View Details](#) [Save to List](#) [Email](#) [Download](#) [Save Settings](#) [Change Columns](#)

	Title	Publisher	ISSN	Country	Status	Serial Type	Format
<input type="checkbox"/>	<a href="#">The New England Journal of Medicine</a>	Massachusetts Medical Society	0028-4793	United States	Active	Journal	Print
<input type="checkbox"/>	<a href="#">The New England Journal of Medicine</a>	Massachusetts Medical Society		United States	Active	Journal	CD-ROM
<input type="checkbox"/>	<a href="#">The New England Journal of Medicine</a>	Massachusetts Medical Society	1533-4406	United States	Active	Journal	Online
<input type="checkbox"/>	<a href="#">The New England Journal of Medicine</a>	Massachusetts Medical Society		United States	Active	Journal	Microform
<input type="checkbox"/>	<a href="#">New England Journal of Medicine (International Edition)</a>	Massachusetts Medical Society		United States	Active	Journal	Print
<input type="checkbox"/>	<a href="#">Briefings from the New England Journal of Medicine</a>	Massachusetts Medical Society	1531-7242	United States	Active	Journal	Print
<input type="checkbox"/>	<a href="#">New England Journal of Medicine (International Edition)</a>	Massachusetts Medical Society		United States	Active	Journal	Online

- Pro: Expansive list of journals
- Neutral: Journals have different records depending on their format. Multiple records for one journal.
- Con: Ulrich's uses the same field for ISSN and EISSN numbers.



# Scopus - Evaluating the resource structure



The screenshot shows the Scopus search interface. At the top, there is a search bar with the text "new england journal of medicine" and a search button. Below the search bar, there are filter options: "Title" (selected), "ISSN", "Publisher", and "Display only Open Access journals". The search results show "1 source found matching 'new england journal of medicine'". A table lists the source: "New England Journal of Medicine" with CiteScore 12.82, SJR 15.736, and SNIP 14.6. A red arrow points from the journal name in the table to the detailed journal page.

**New England Journal of Medicine**

Scopus coverage years: from 1945 to 2017  
Publisher: Massachusetts Medical Society  
ISSN: 0028-4793 E-ISSN: 1533-4406  
Subject area: **Medicine: General Medicine**

[View all documents >](#) [Set document alert](#) [Journal Homepage](#)

Visit Scopus Journal Metrics >

CiteScore 2016	12.82
SJR 2016	15.736
SNIP 2016	14.683

**CiteScore** 2017 Calculated using data from 31 May, 2017

**3.95** =  $\frac{\text{Citation Count 2017}}{\text{Documents 2014 - 2016*}}$  =  $\frac{24,492 \text{ Citations >}}{6,196 \text{ Documents >}}$

\*CiteScore includes all available document types [View CiteScore methodology >](#) [CiteScore FAQ >](#)

**CiteScore rank** Category Rank Percentile

Medicine		
General Medicine	#9/2167	99th

[View CiteScore trends >](#)  
[Add CiteScore to your site >](#)

CiteScoreTracker 2017 Last updated on 07 December, 2017 Updated monthly

- Pros: Can search for journal by either ISSN or EISSN to find one record.
- Con: Limited journal coverage.



# Ulrich's Web - API Design Issues

**GET** [http://ulrichsweb.serialssolutions.com/api/\[API Key\]/search?query=issn:1750497X](http://ulrichsweb.serialssolutions.com/api/[API Key]/search?query=issn:1750497X)

```
{"requestStart":null,"statusMessage":null,"results":[{"keyFeatures":[],"rss":[],"tocImg":null,"languagesCSV":null,"contentTypesCSV":null,"formatsCSV":null,"availableOnlineImg":null,"openAccessImg":null,"openAccessUrl":null,"serialTypes":[],"titleId":"625520","title":"Multicultural Educational & Technology Journal","toc":false,"historicTitle":true,"refereed":false,"availableOnline":false,"openAccess":false,"reviewed":false,"price":null,"contentTypes":[],"frequency":null,"languages":[],"issn":"1750-497X","publisher":null,"startYear":null,"code n":null,"otherFeatures":[],"deweyNumbers":[],"lcnnumber":null,"historicTitleImg":null,"serialTypesCSV":null,"refereedImg":null,"reviewedImg":null,"id":"550876","country":"United Kingdom","description":null,"subject":[],"formats":[],"status":null}],"numberOfRecords":1,"requestSortOrder":null,"requestSortIndex":null,"requestRows":null,"totalRecords":1,"requestQuery":"issn:1750497X","status":"Success"}
```

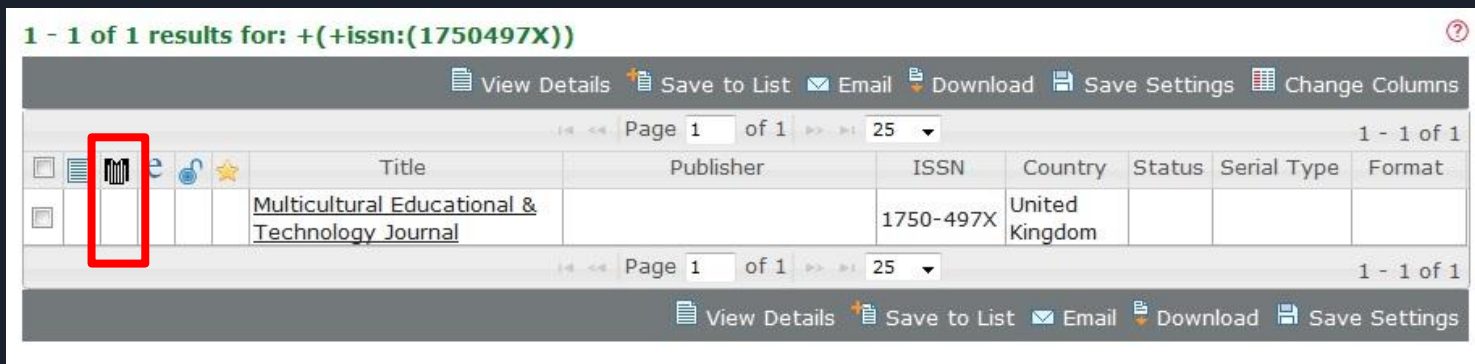
# Ulrich's Web - API Design Issues

When you look up this ISSN manually in Ulrich's Web, you find in the search results that this journal is not peer-reviewed, i.e. no refereed shirt is indicated.

1 - 1 of 1 results for: **+(+issn:(1750497X))** ?

[View Details](#) [Save to List](#) [Email](#) [Download](#) [Save Settings](#) [Change Columns](#)

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	Title	Publisher	ISSN	Country	Status	Serial Type	Format
	<a href="#">Multicultural Educational &amp; Technology Journal</a>		1750-497X	United Kingdom			

Page 1 of 1 25


[View Details](#) [Save to List](#) [Email](#) [Download](#) [Save Settings](#)

The image shows a screenshot of a search results page from Ulrich's Web. The search criteria is **+(+issn:(1750497X))**. The results table shows one entry for the journal [Multicultural Educational & Technology Journal](#) with ISSN 1750-497X, published in the United Kingdom. A red box highlights the journal icon in the first column of the table. The interface includes navigation controls like 'Page 1 of 1' and '25' items per page, and action buttons such as 'View Details', 'Save to List', 'Email', 'Download', and 'Save Settings'.

# Ulrich's Web - API Design Issues

However, clicking on the record in the summary list leads to the current version of the journal (different title and ISSN) that is peer-reviewed.

▼ Basic Description	
Title	Journal for Multicultural Education
ISSN	2053-535X
Publisher	Emerald Publishing Limited
Country	United Kingdom
Status	Active
Start Year	2007
Frequency	Quarterly
Language of Text	Text in: English
Refereed	Yes
Abstracted / Indexed	Yes
Serial Type	Journal
Content Type	Academic / Scholarly
Format	Print
Website	<a href="http://www.emeraldinsight.com/loi/jme">http://www.emeraldinsight.com/loi/jme</a>
Description	Provides an international forum to explore the learning technology and multicultural education interface in various educational settings, with a particular focus on the Americas, Europe, Asia and Africa.





## Scopus' Serial Title - API Design Issues

The same ISSN lead to different results. The Scopus' Serial Title API recognized the older ISSN (for *Multicultural Education & Technology Journal*) but gave me scores for the newer journal title (*Journal for Multicultural Education*). That was perfect for my purpose. It may not be for others.



# Data Integrity Issues

## Errors

- Some peer-reviewed journals were listed as FALSE for refereed. Some of those have since been corrected by Ulrich's Web.
- One ISSN was recorded incorrectly in a journal article indexed by Scopus. While NULL results sometimes are because of no data, this NULL was an error that required manual correction to retrieve data.
- Without adequate information, it's difficult to tell if prior versions of journals were not peer-reviewed while new ones are. FALSE values may be, well, FALSE.
- Of hundreds of records, some had to be corrected or entered manually.



# Recommendations

- Understand the underlying resource structure
- Study the API documentation carefully to construct queries
- Conduct sampling to review structure and data integrity.
- Compare data provided from different APIs to decide which to use for what. For instance, the publisher listed was different between Ulrich's Web and Scopus. The latter favored the larger, parent company of publishers.
- If necessary, clean up data after download. Excel, Google Refine, or coding languages (e.g. Python) might be utilized for bulk corrections. Some corrections might require manual work.



Thank you!

Annamarie Klose Hrubes

[klosehrubesa@wpunj.edu](mailto:klosehrubesa@wpunj.edu)