

Can API Standardization Ensure Fair Competition with the Tech Giants?

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Bio

- Endowed chair a Case Western Reserve University, Phd in Computer science (software design methods)
- Worked on telecommunication standards (NMT, GSM, 3G), EDI and XML standards
- Both standard making processes and standard diffusion



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Agenda

- API's and their nature
- Why would we need standards for API's or between API's
- Challenges in defining and standardizing APIs
- Where will the power emerge to standardize



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Defining APIs

- An application programming interface (is a computing interface which) defines interactions between (multiple) software intermediaries. It defines the kinds of calls or requests that can be made, how to make them, the data formats that should be used, the conventions to follow, etc (Wikipedia 2020)



```
1  Wed, 07 Jun 2018 02:00:57 -0800 [POST]
2  Content-Type: text/javascript; charset=UTF-8
3  Accept: */*
4  User-Agent: Mozilla/5.0 (Macintosh; Intel Mac OS X 10_13_4; rv:61.0) Gecko/20100801 Firefox/61.0
5  Accept-Language: en-US,en;q=0.5
6  Accept-Encoding: gzip, deflate, br
7  Host: www.google.com
8  Connection: keep-alive
9  Referer: https://www.google.com/
10  Origin: https://www.google.com
11  Content-Length: 1024
12  Content-Disposition: form-data; name="subject"
13  subject=
14  Content-Disposition: form-data; name="to"
15  to=
16  Content-Disposition: form-data; name="from"
17  from=
18  Content-Disposition: form-data; name="body"
19  body=
20  Content-Disposition: form-data; name="header"
21  header=
22  Content-Disposition: form-data; name="subject"
23  subject=
24  Content-Disposition: form-data; name="to"
25  to=
26  Content-Disposition: form-data; name="from"
27  from=
28  Content-Disposition: form-data; name="body"
29  body=
30  Content-Disposition: form-data; name="header"
31  header=
```

Header	
From	To
Subject	

Body	

Footer	



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Defining APIs

- Extensible beyond application and beyond single organization
- Often externalized and offered as a black-boxed service
- Can cover any computable function that can be offer as a functional interface
- Typically cover services at the ‘service layer’ that assume an access to content layer (e.g. Mapping APIs)



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Why would we need standards for API's or between API's

- Anybody can build an API on some web-service platform (Java, Python) and offer them publicly on a specific service layer (Azure, AWS, Wordpress etc)
- Moving concern from **ways of expressing** (programming languages, operating systems) to **what is expressed** (semantics of functions expressed)
- Leading to similar **incompatibility issues** as with programming languages or OS- use of APIs and their meaning not compatible and usable across service 'ponds'
- Many APIs also **common good utilities** with related problems of regulation (Mapping, identification, security)



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Challenges

- Compatibility issues at semantic layer are not similar to compatibility issues at physical layer (e.g. radio interface) – bridging is easier enabling adaptability, also late binding compatibility possible
- Compatibility not necessary before the use- but during the use- calling for adaptability
- Scoping of standards hard- what should be standardized- expression formats, semantics (and how to agree on semantics- c.f. semantic web), or some elements, fragments of it?
- How to agree the form and expression of a =metastandard- how to express mappings- lots of experience from XML which only focused on data structures and semantics



Where will the power emerge?

- Scope, scale and speed of API use quite different from past domains of standardization
- Key actors have currently little interest to standardize and it will not emerge through current standardization domains and institutions
- May call for two pronged solutions: effective and implementable meta-standard, and industry or domain based coordination for specific domains (such as mapping)
- May not emerge unless specific anti-trust initiatives and monopolistic effects emerge around API use



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