



Interoperable Serendipity

Noel De Martin @ Solid World

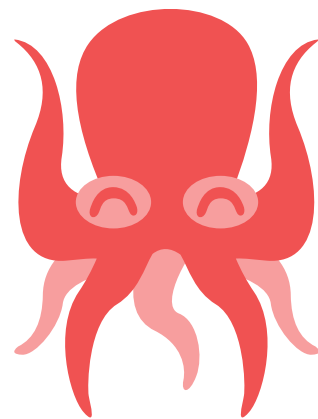


Hello, my name is Noel!

I've built a few Solid Apps...



Focus



Media Kraken



Umai

Find them at noeldemartin.com/projects

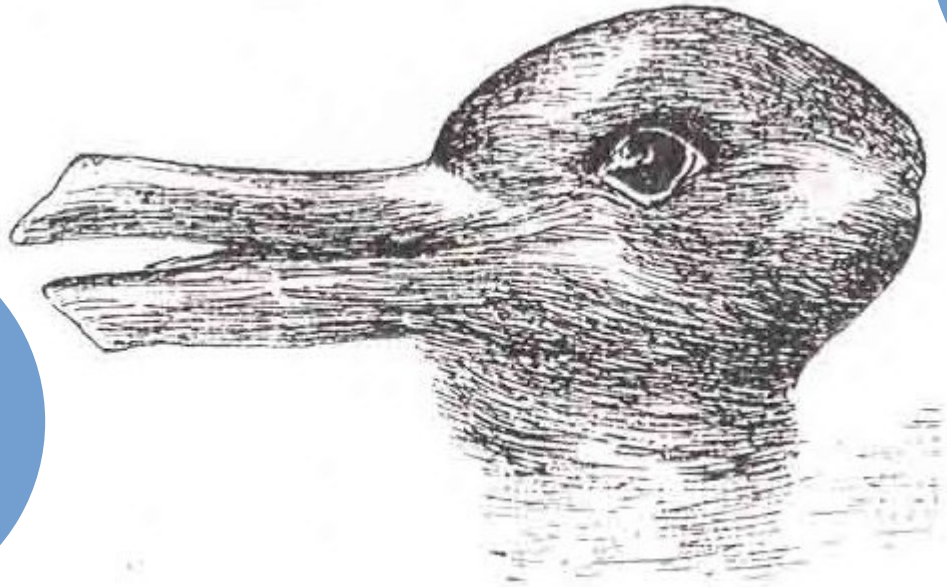


Interoperable?
Serendipity?

What do you see?

Rabbit

Duck



Why Solid?

Privacy

Own
Your
Data



...

Own Your
Network

Interoperability

Interoperability



Interoperability

“There is no killer app, and it’s also not desirable [...] We need **an interoperable app ecosystem** that is aware of all relevant knowledge and the context we are currently in.”

— [Angelo Veltens \(A Vision for Personal Knowledge Graphs\)](#)

Interoperability

“Interoperability is a characteristic of a product or system to work with other products or systems.”

— [Wikipedia](#)

Examples of interoperability

Email

 @gmail.com

 @proton.me

 @hey.com

...

RSS

 Apple Podcasts

 Pocket Casts

 AntennaPod

...

The Web

 Google Chrome

 Safari

 Firefox


...

The future in a Solid World

Apps

 @gmail.com

 @proton.me

 @hey.com

 Apple Podcasts

 Pocket Casts

 AntennaPod

 Google Chrome

 Safari

 Firefox

Interoperability

Interoperability

A taxonomy of interoperability

By Cory Doctorow from [Interoperability: Fix the Internet, Not the Tech Companies](#)

Indifferent



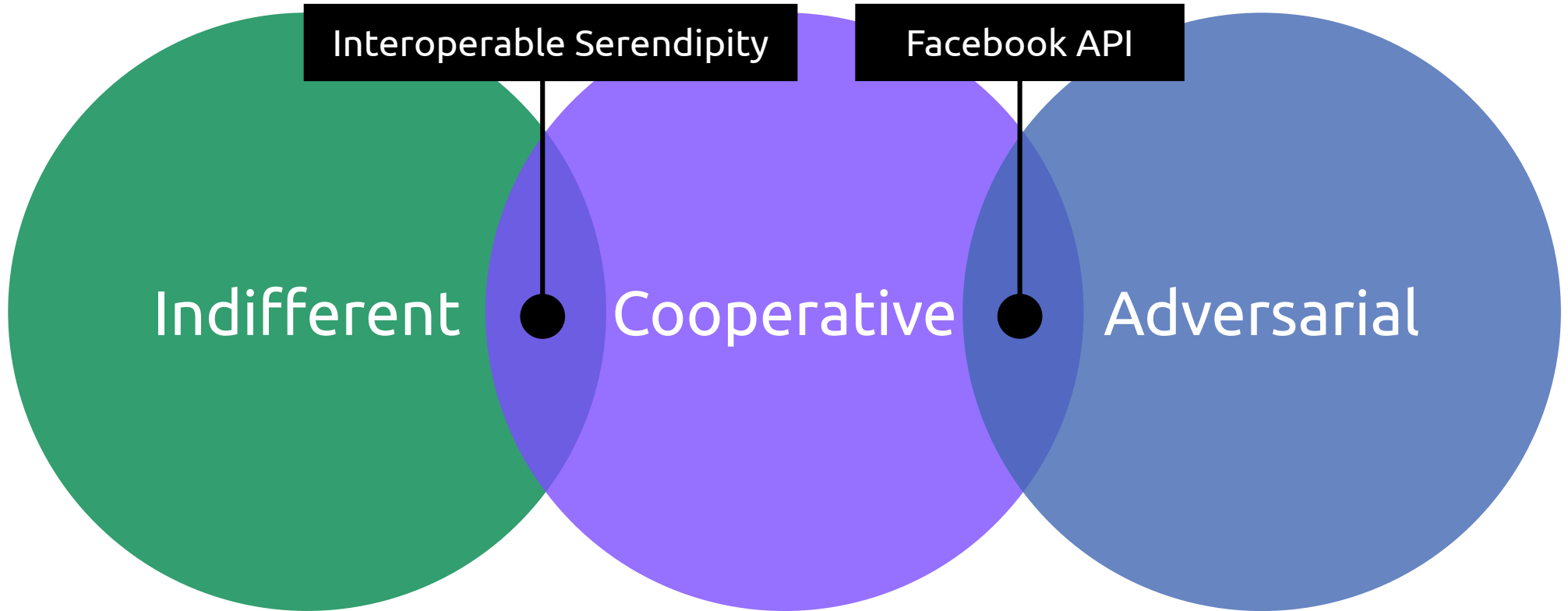
Cooperative






Adversarial



A taxonomy of interoperability

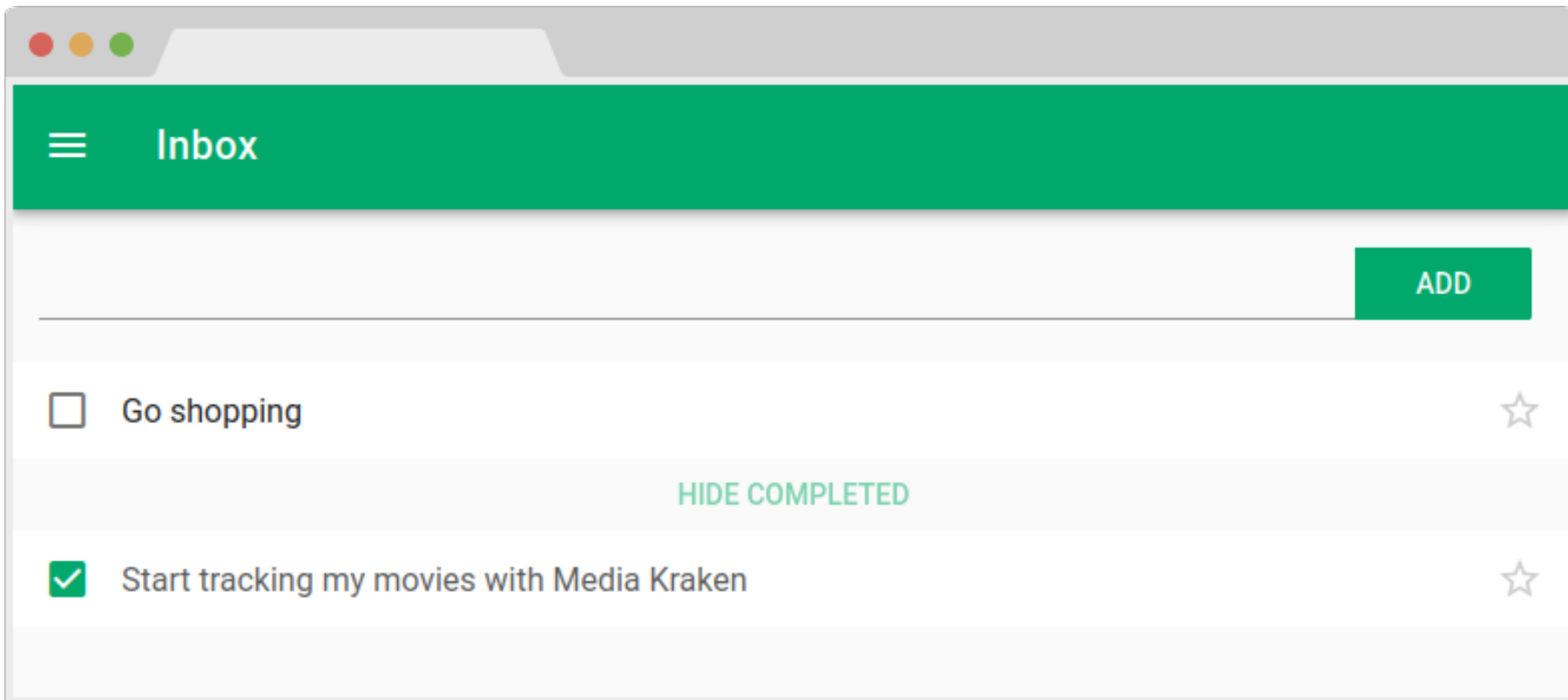


Cooperative interoperability

- Level 1: Obfuscated interoperability
- Level 2:  ???
- Level 3:  ???
- Level 4:  ???

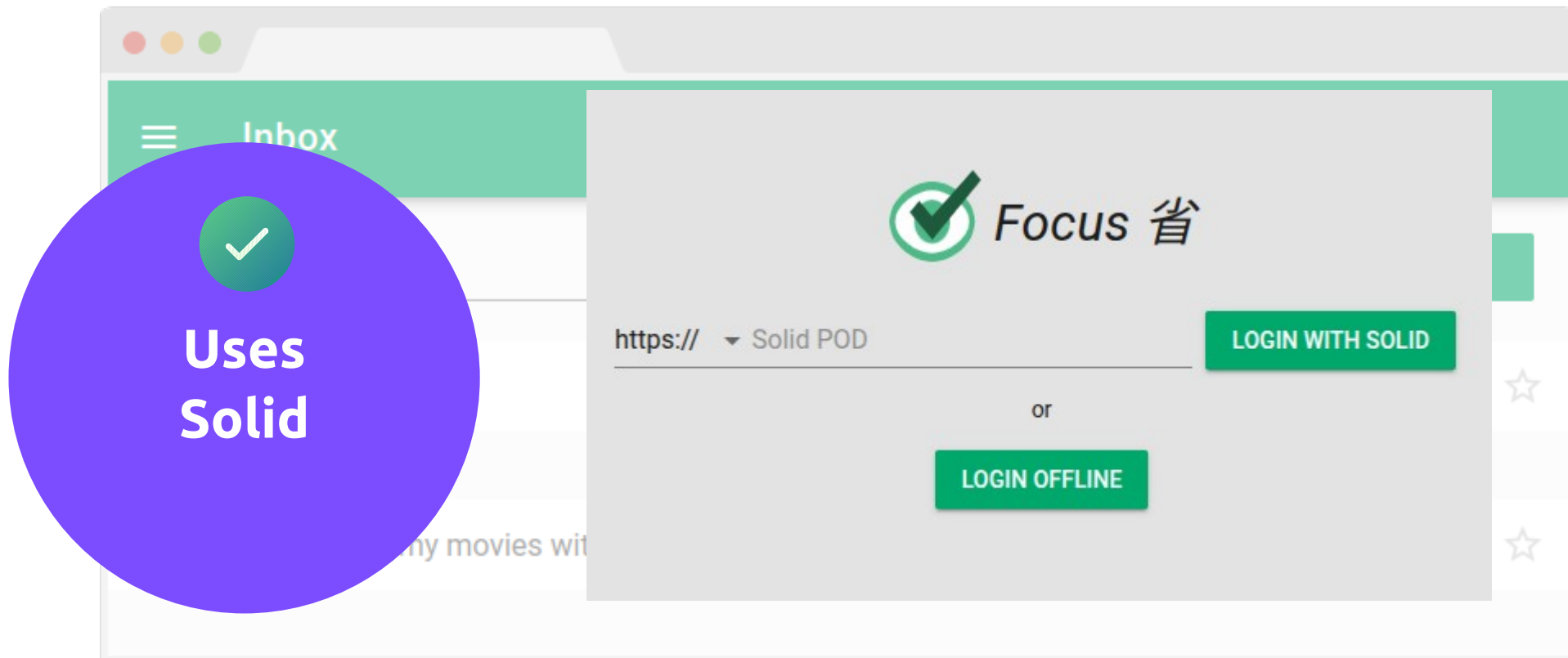
Obfuscated interoperability

Solid Focus (my first app!)



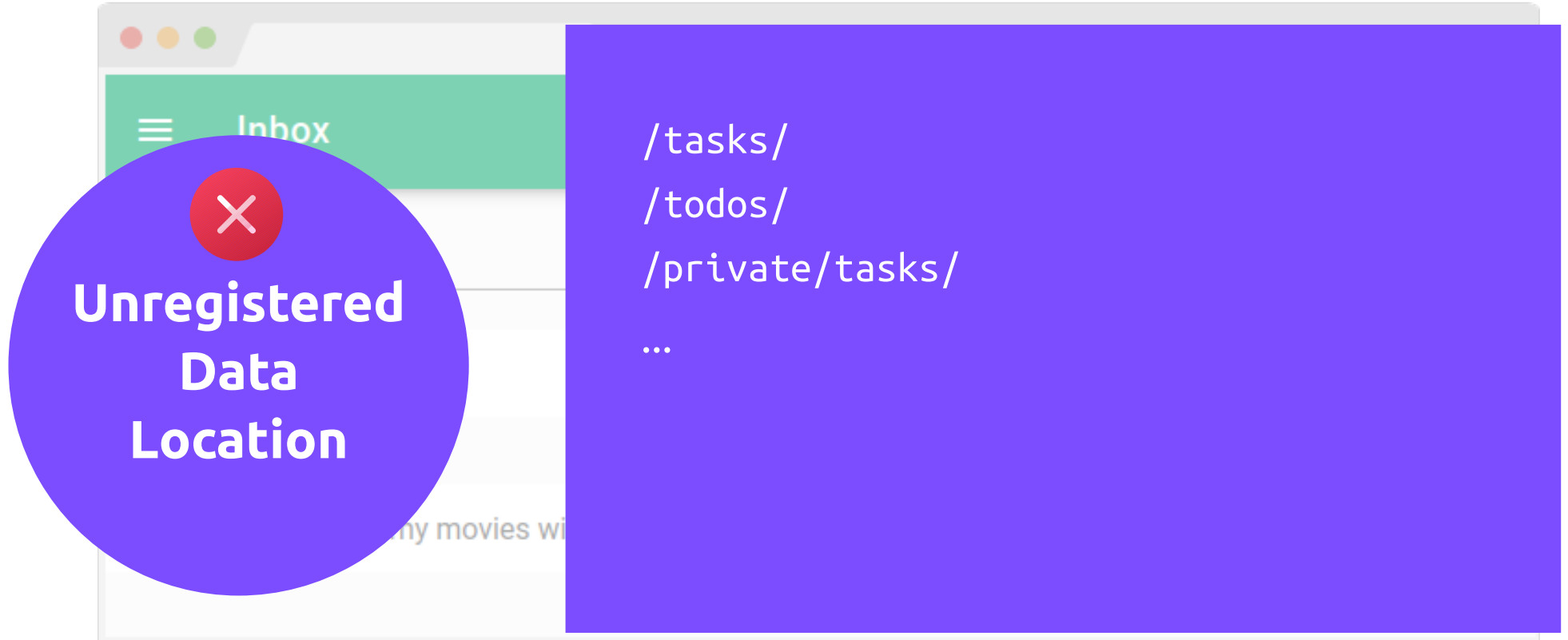
Obfuscated interoperability

Solid Focus (my first app!)



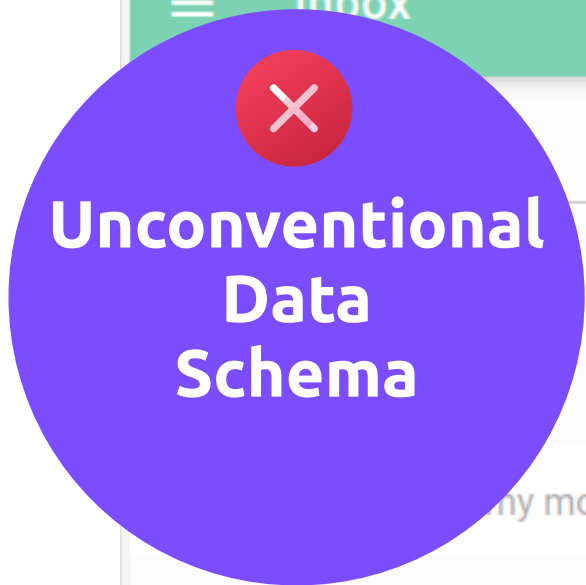
Obfuscated interoperability

Solid Focus (my first app!)



Obfuscated interoperability

Solid Focus (my first app!)



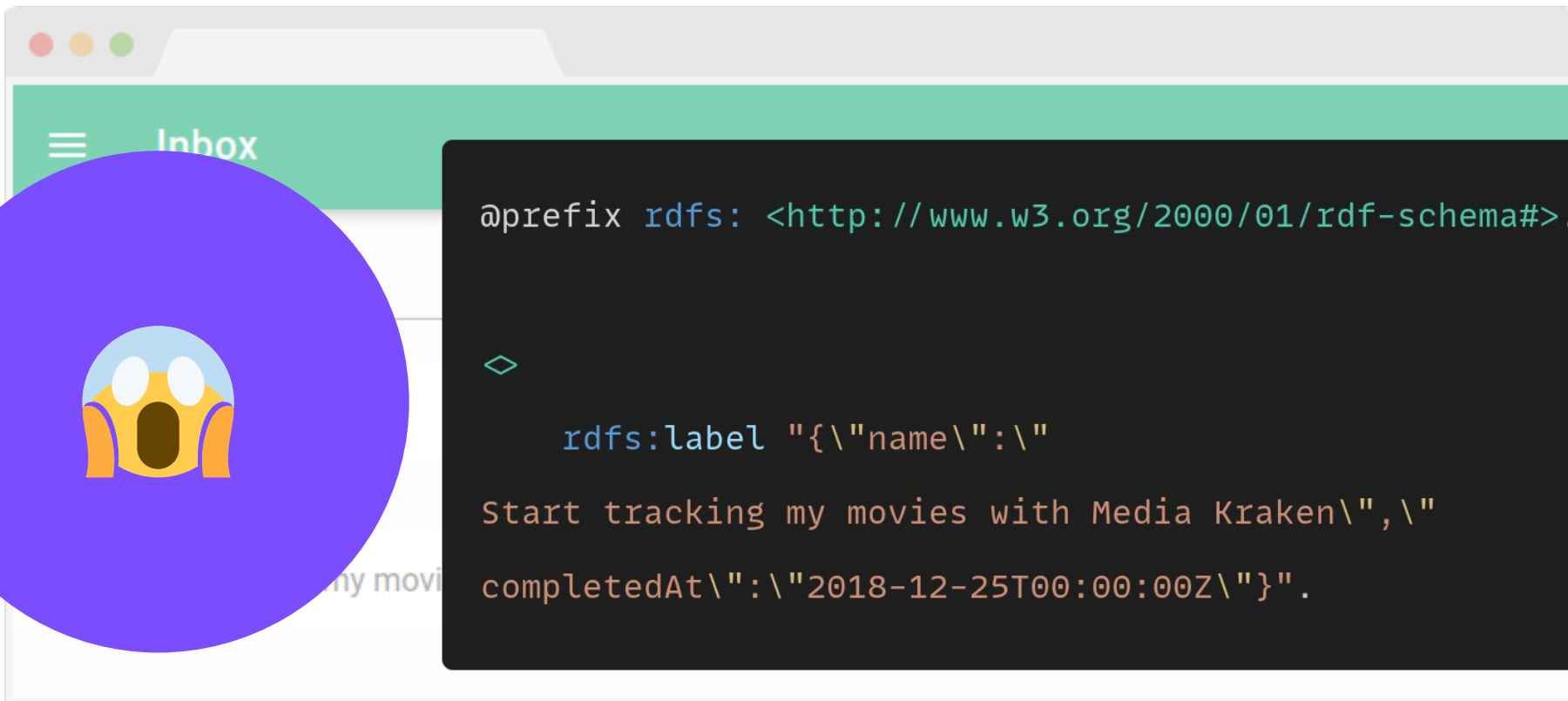
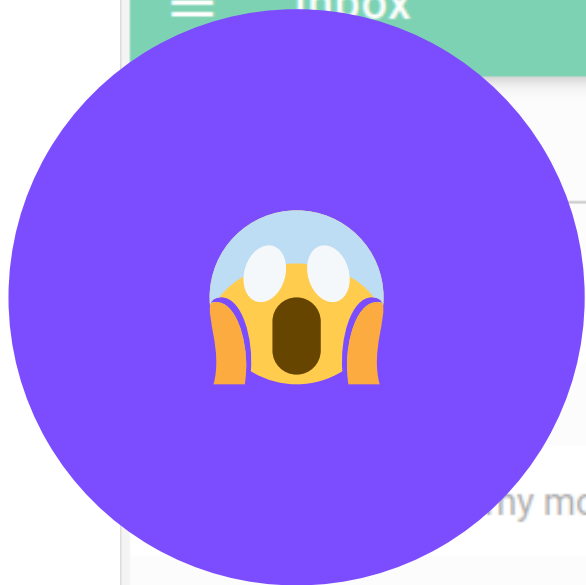
```
@prefix lifecycle: <http://purl.org/vocab/lifecycle/schema#>.
@prefix xml: <http://www.w3.org/2001/XMLSchema#>.
@prefix rdfs: <http://www.w3.org/2000/01/rdf-schema#>.
@prefix ical: <http://www.w3.org/2002/12/cal/ical#>.

<
  a lifecycle:Task;
  rdfs:label "Start tracking my movies with Media Kraken";
  ical:completed "2018-12-25T00:00:00Z"^^xml:dateTime.

```

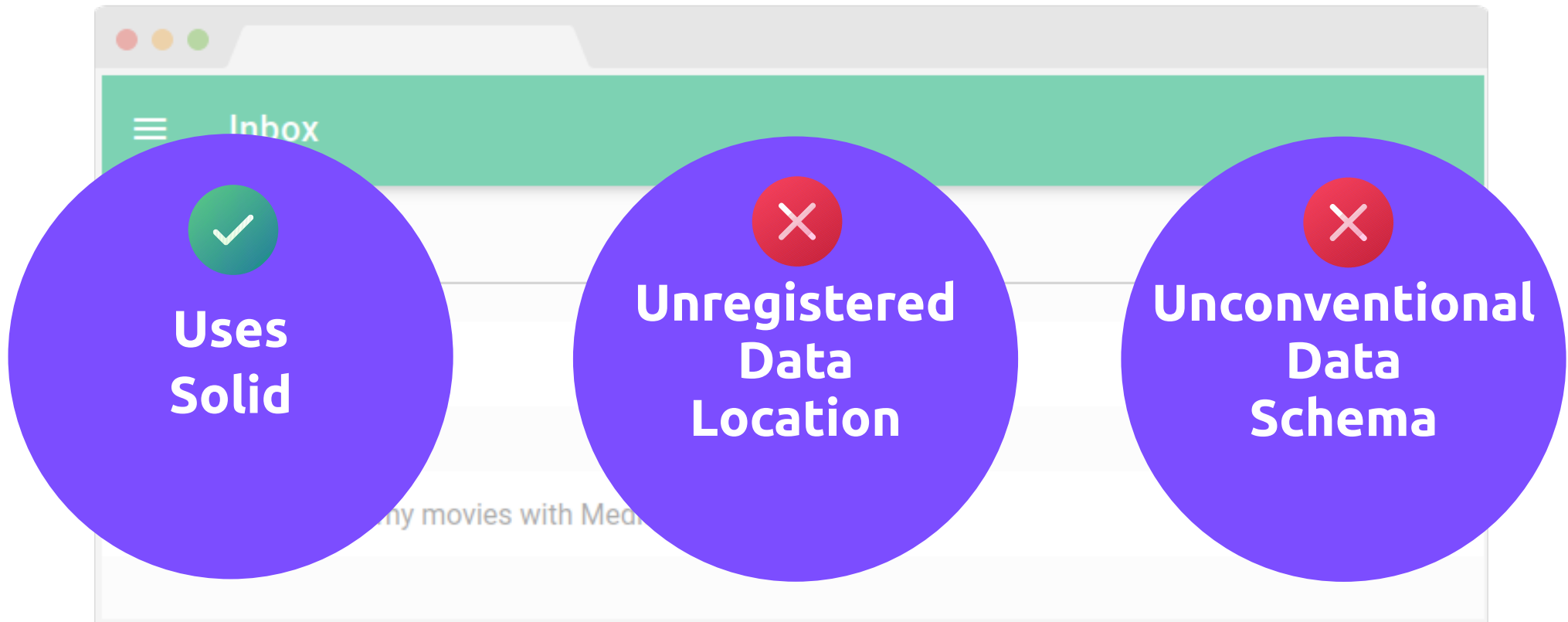
Obfuscated interoperability

Solid Focus (my first app!)


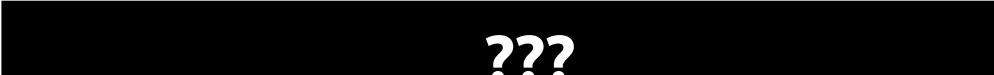


Obfuscated interoperability

Solid Focus (my first app!)

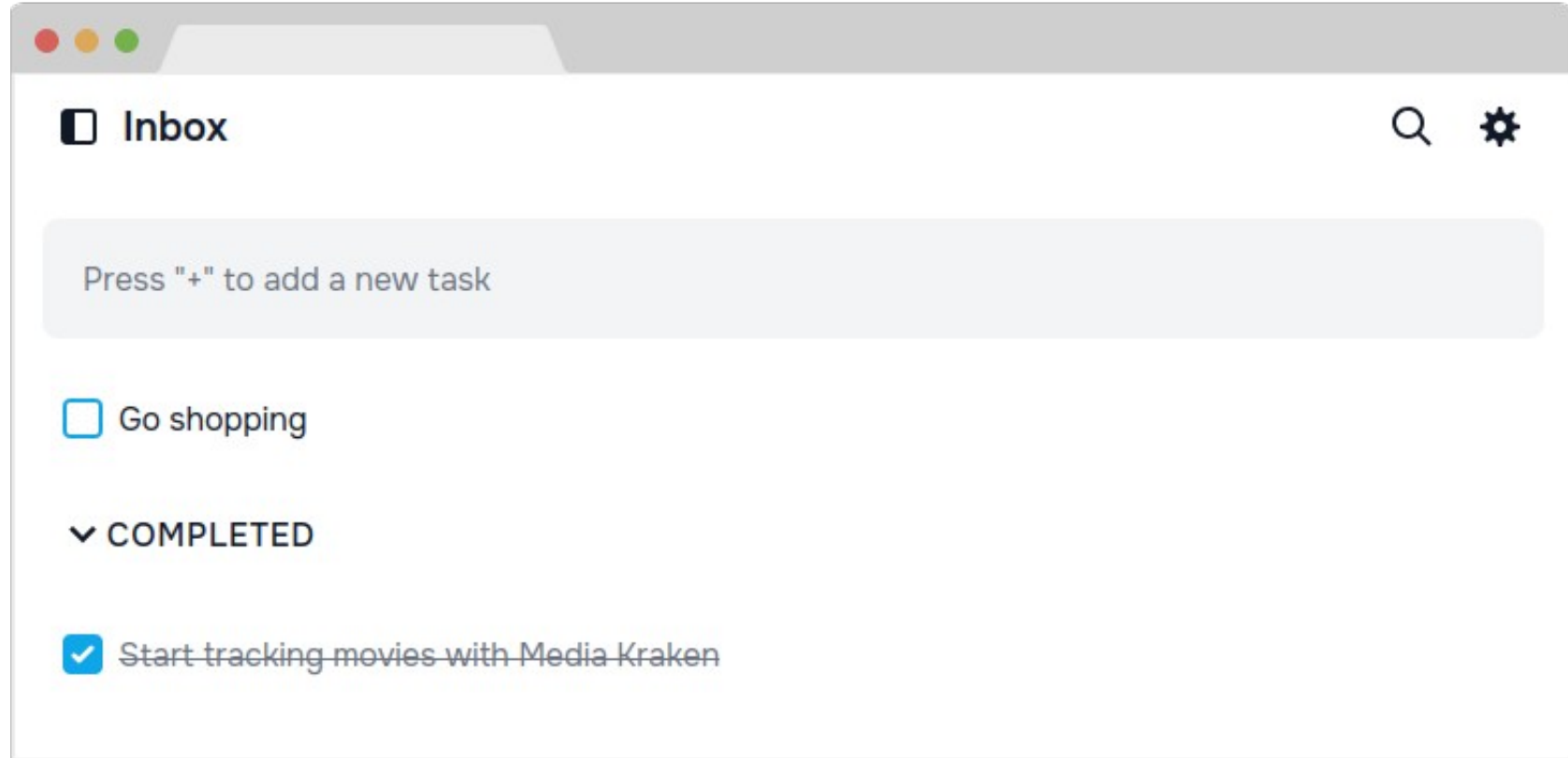


Cooperative interoperability

- Level 1: Obfuscated interoperability
- Level 2: Intentional interoperability
- Level 3:  ???
- Level 4:  ???

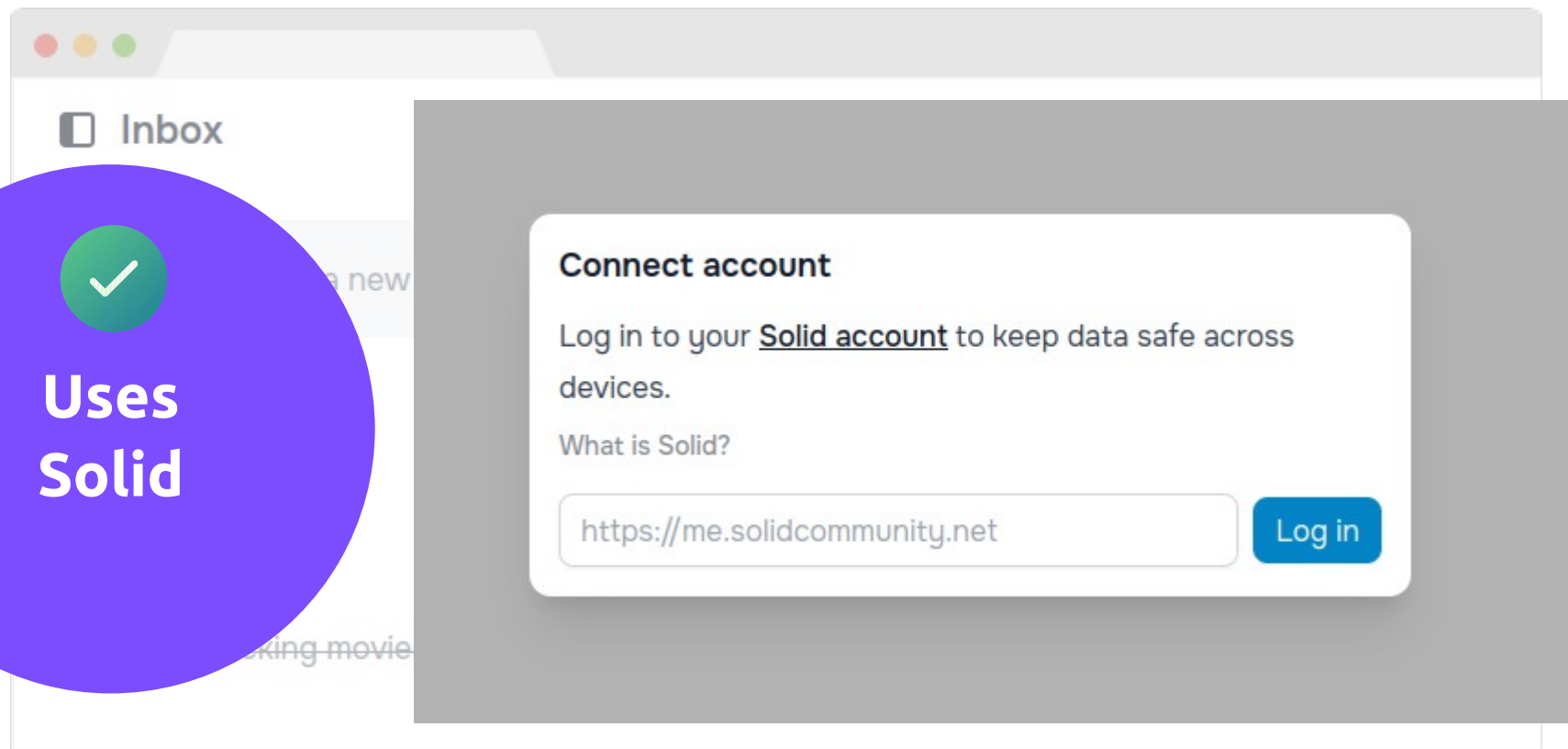
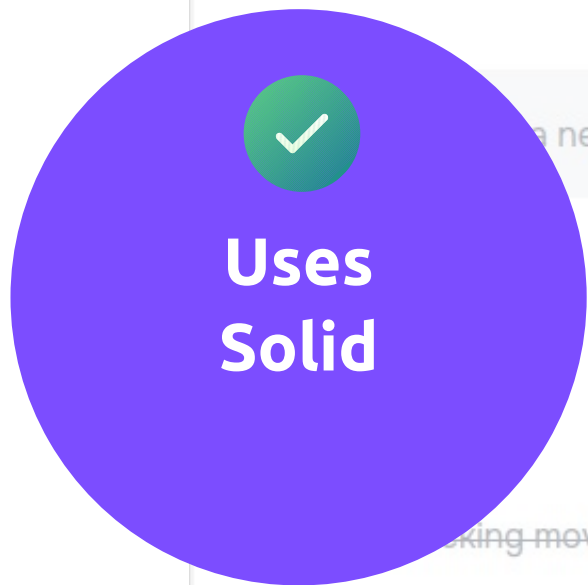
Intentional interoperability

Focus v2



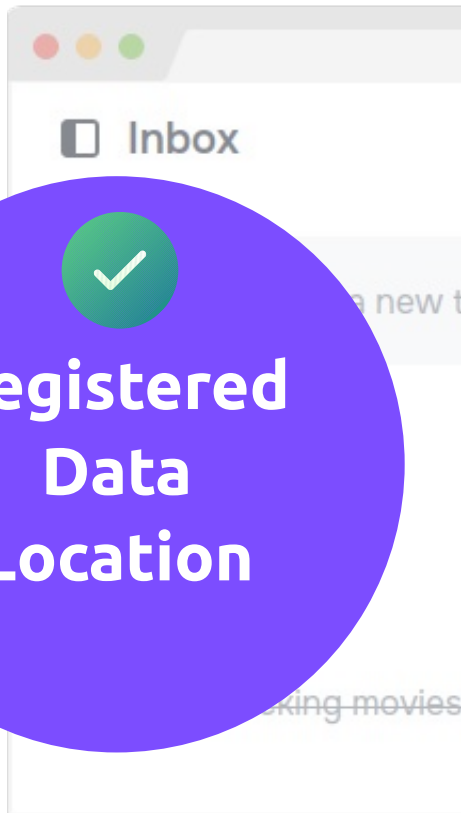
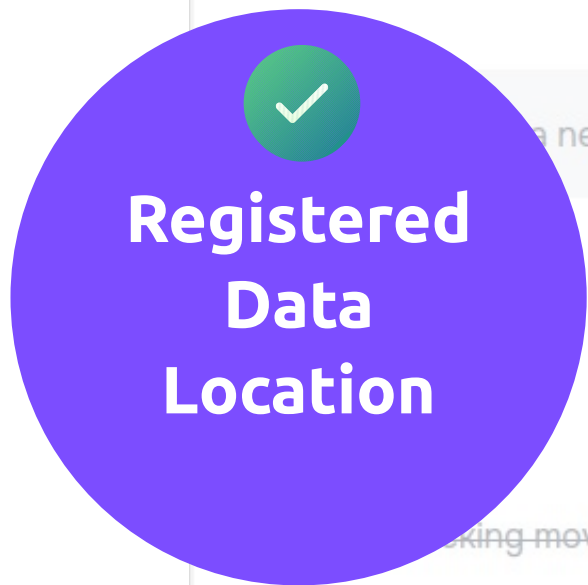
Intentional interoperability

Focus v2



Intentional interoperability

Focus v2



```
@prefix solid: <http://www.w3.org/ns/solid/terms#> .
@prefix schema: <https://schema.org/> .
@prefix ical: <http://www.w3.org/2002/12/cal/ical#> .

<> a solid:TypeIndex, solid:UnlistedDocument.

<#tasks>
  a solid:TypeRegistration;
  solid:forClass schema:Action, ical:Vtodo;
  solid:instanceContainer </tasks/>.
```

Intentional interoperability

Focus v2

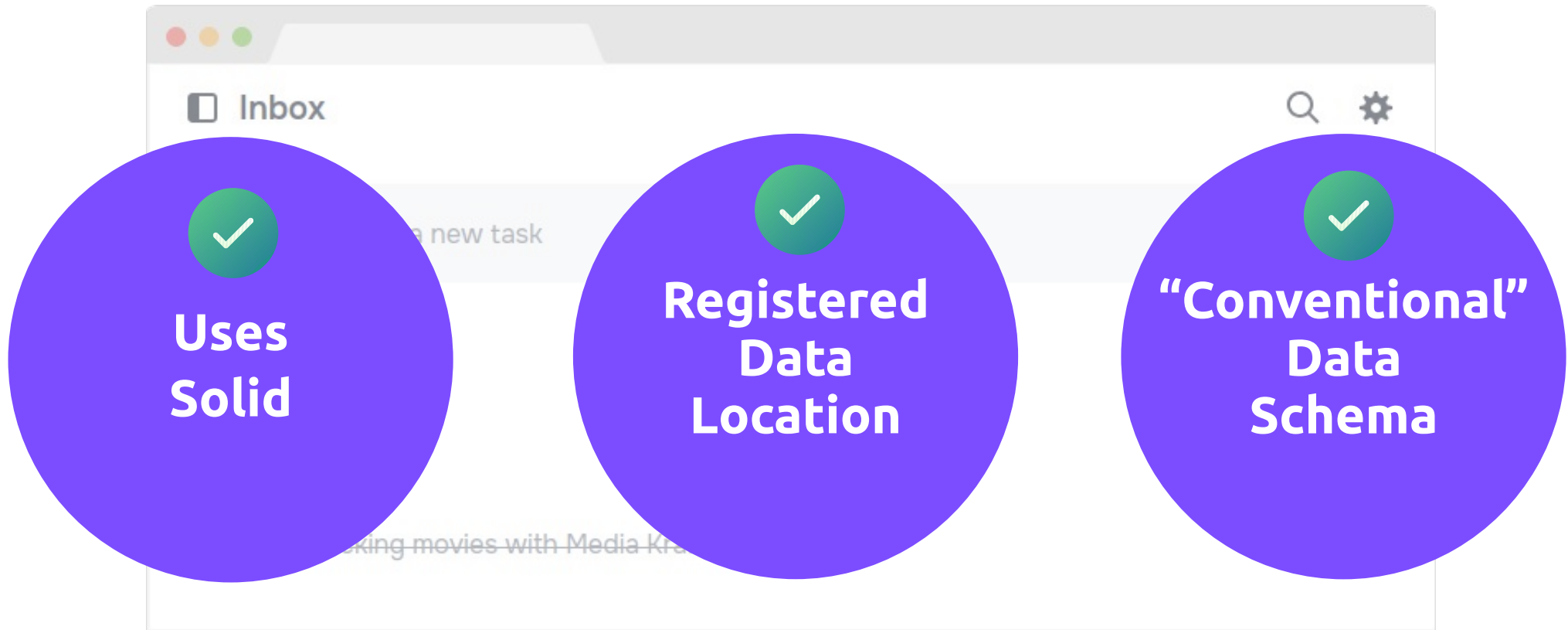


**“Conventional”
Data
Schema**

```
@prefix schema: <https://schema.org/> .  
@prefix ical: <http://www.w3.org/2002/12/cal/ical#> .  
@prefix xml: <http://www.w3.org/2001/XMLSchema#> .  
  
<#it>  
  a schema:Action, ical:Vtodo ;  
  schema:name "Start tracking my movies with Media Kraken" ;  
  ical:summary "Start tracking my movies with Media Kraken" ;  
  ical:completed "2018-12-25T00:00:00Z"^^xml:dateTime.
```

Intentional interoperability

Focus v2



Intentional interoperability



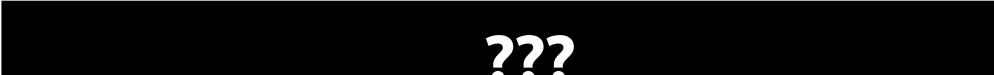
Self-describing Data
+
Solid Protocol

VS



Facebook API

Cooperative interoperability

- Level 1: Obfuscated interoperability
- Level 2: Intentional interoperability
- Level 3: Lens-based interoperability
- Level 4:  ???

Lens-based interoperability



Alice



Bob

Lens-based interoperability

Alice's Task Manager

```
@prefix schema: <https://schema.org/> .  
@prefix xml: <http://www.w3.org/2001/XMLSchema#> .  
  
<#it>  
  a schema:Task ,  
  schema:name "Go shopping" ,  
  schema:actionStatus  
    schema:CompletedActionStatus .
```

Bob's Task Manager

```
@prefix ical: <http://www.w3.org/2002/12/cal/ical#> .  
@prefix xml: <http://www.w3.org/2001/XMLSchema#> .  
  
<#it>  
  a ical:Vtodo ;  
  ical:summary "Go shopping" ;  
  ical:completed  
    "2018-12-25T00:00:00Z"^^xml:dateTime .
```

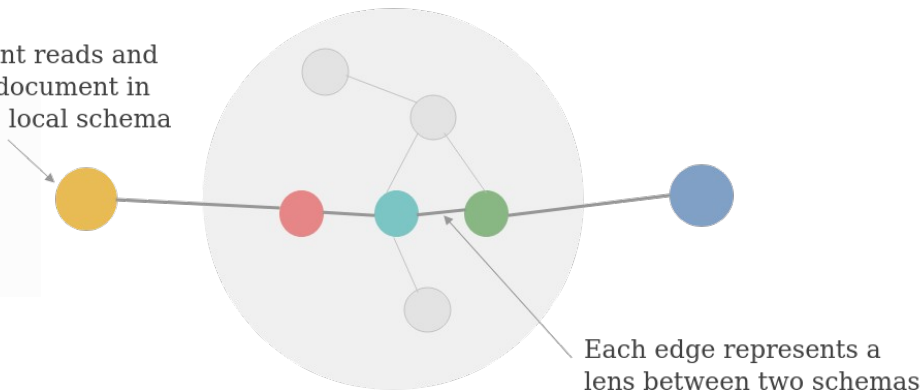
Lens-based interoperability

Project Cambria

Translate your data with lenses

inkandswitch.com/cambria/

Each client reads and writes a document in its native local schema



Shaping Linked Data apps

Decentralized apps will need a lot of flexibility, which they will gain through data shapes.

ruben.verborgh.org/blog/2019/06/17/shaping-linked-data-apps/

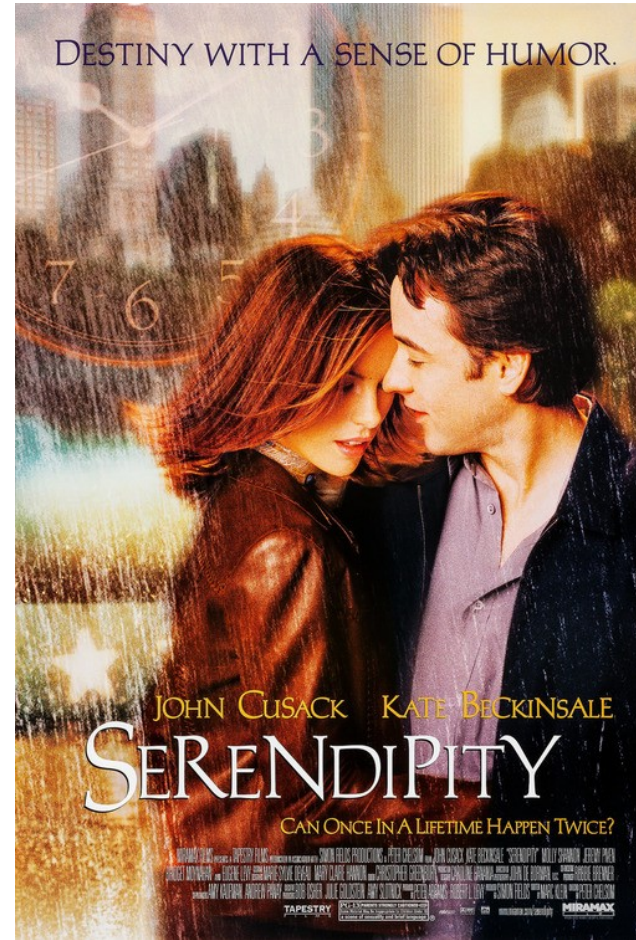
Cooperative interoperability

- Level 1: Obfuscated interoperability
- Level 2: Intentional interoperability
- Level 3: Lens-based interoperability
- Level 4: *Interoperable Serendipity* ✨

Serendipity?



Not that one...



Interoperable Serendipity

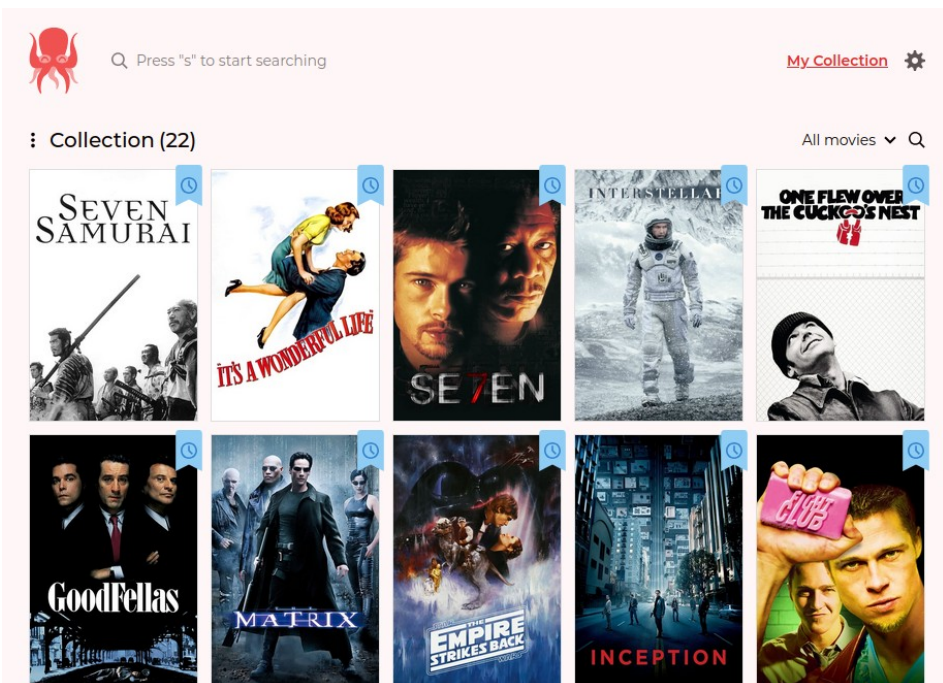
“Interoperable Serendipity happens when apps built by different developers work together without explicit coordination.”

— [Noel De Martin](#)

Interoperable Serendipity

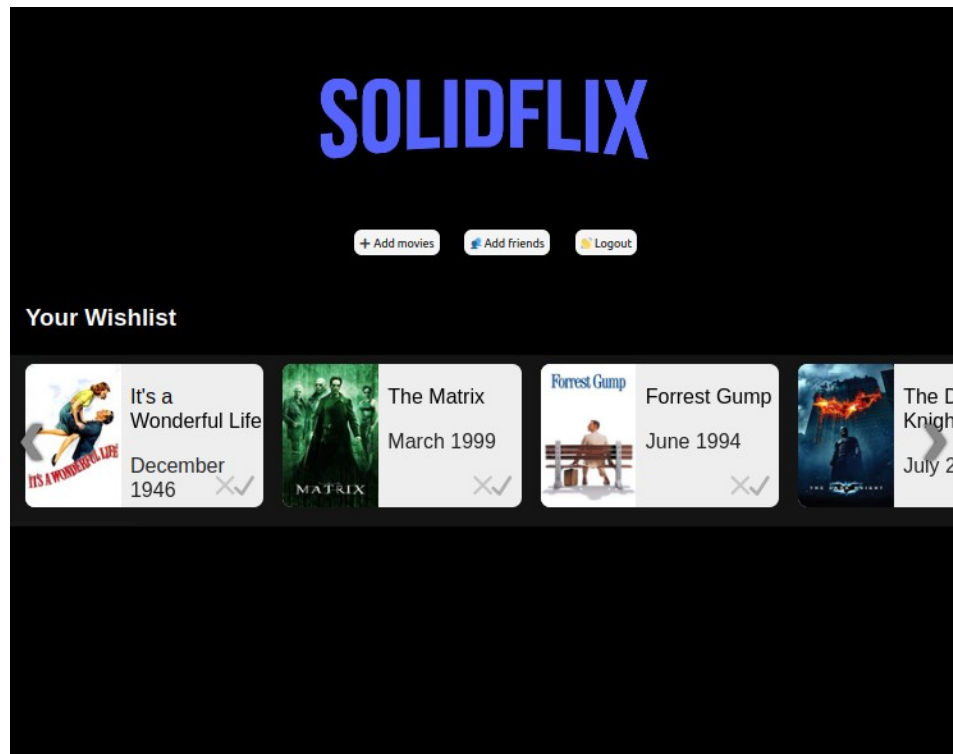
Media Kraken

(presented @ Solid World February 2021)



Solidflix

(presented @ Solid World December 2022)



Interoperable Serendipity

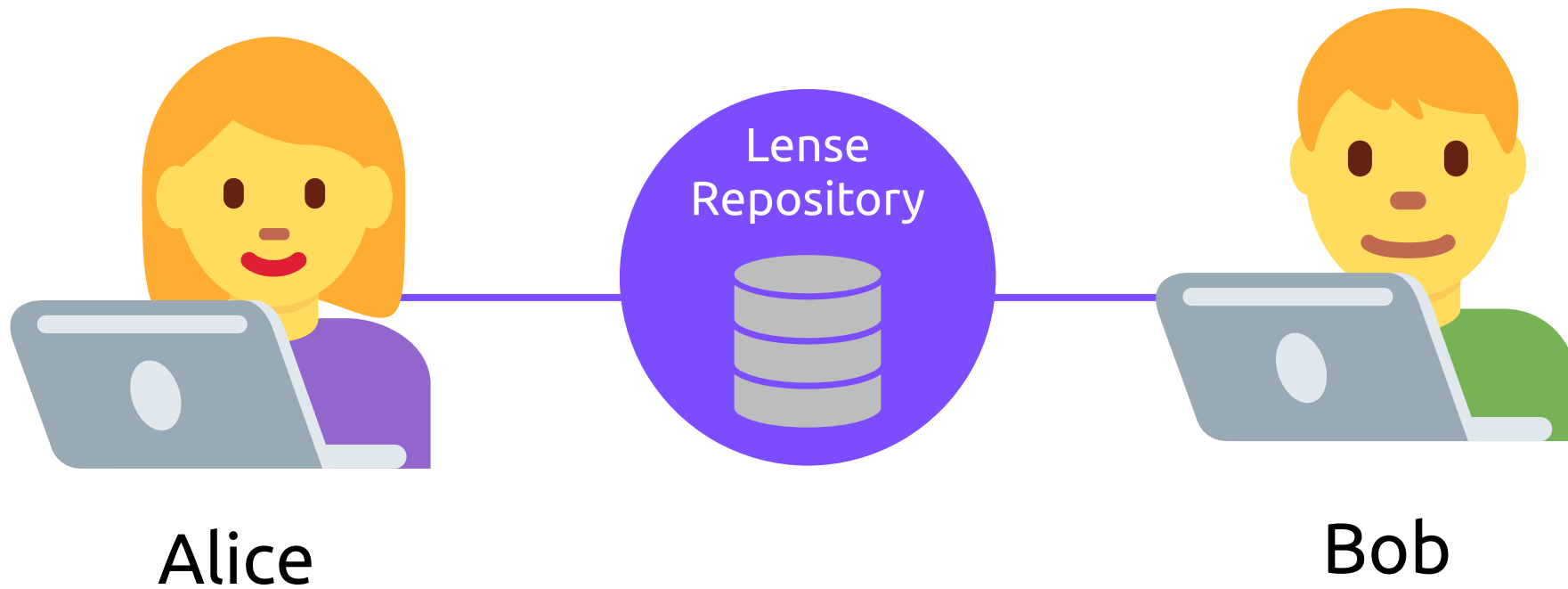


Alice

Bob

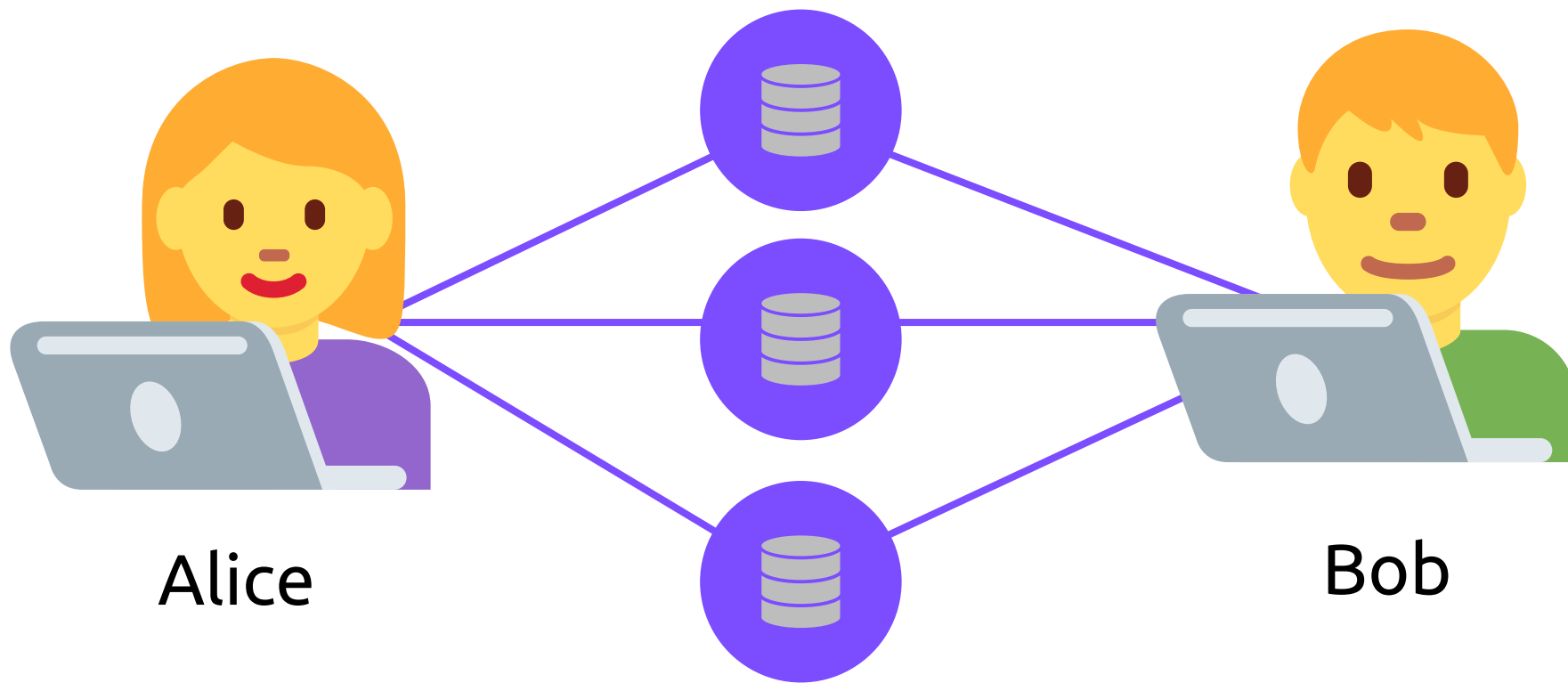
Interoperable Serendipity

Using lense repositories



Interoperable Serendipity

Using lense repositories



Alice

Bob

Interoperable Serendipity

Using lense repositories

- shaperepo.com
- pdsinterop.org/conventions
- github.com/solid/shapes
- ...

Join tomorrow's meeting about shape repo(s) (at 3pm UTC):
forum.solidproject.org/t/solid-stm-about-shape-repo-s

Interoperable Serendipity

Using browser extensions

 Inbox



Press "+" to add a new task

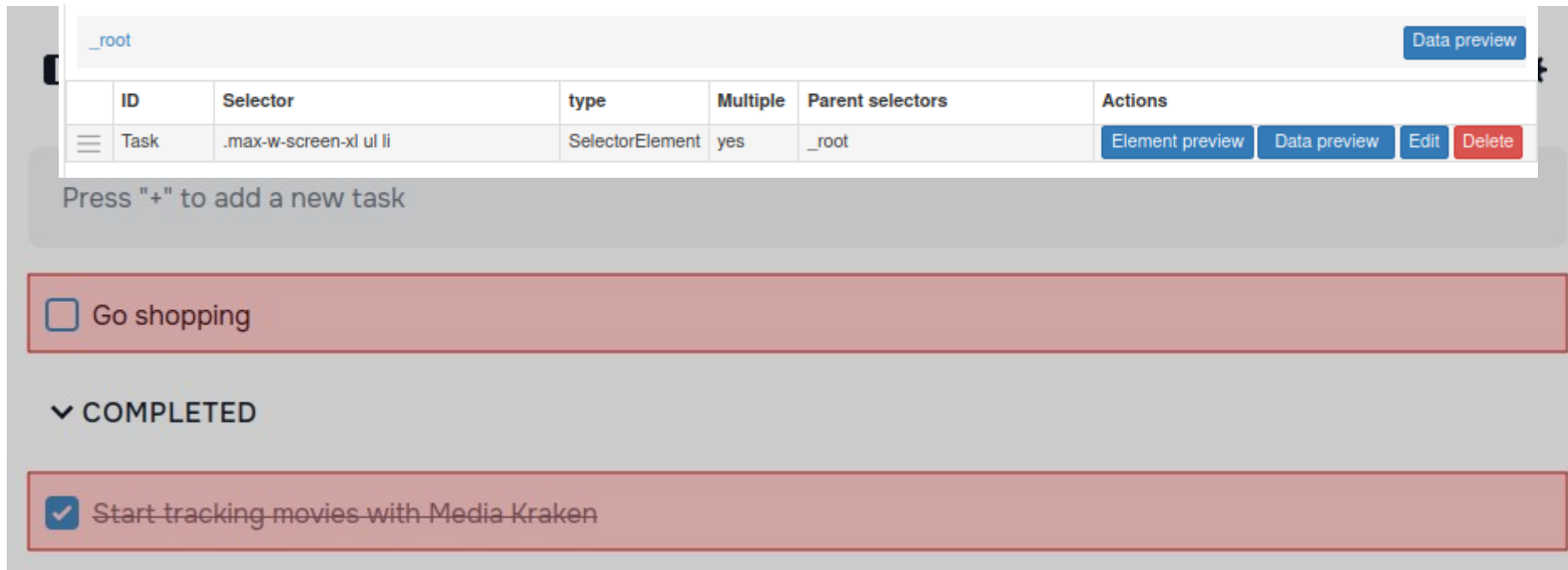
Go shopping

▼ COMPLETED

Start tracking movies with Media Kraken

Interoperable Serendipity

Using browser extensions



The screenshot shows a browser extension interface. At the top, there is a search bar containing the text "_root" and a "Data preview" button. Below this is a table with the following columns: ID, Selector, type, Multiple, Parent selectors, and Actions. The table contains one row with the following data: ID: Task, Selector: .max-w-screen-xl ul li, type: SelectorElement, Multiple: yes, Parent selectors: _root, and Actions: Element preview, Data preview, Edit, Delete. Below the table, there is a prompt: "Press '+' to add a new task". Underneath this prompt is a list of tasks. The first task is "Go shopping" with an unchecked checkbox. Below it is a section header "COMPLETED" with a downward arrow. Underneath this section header is a task "Start tracking movies with Media Kraken" with a checked checkbox. The tasks are highlighted with a red border.

ID	Selector	type	Multiple	Parent selectors	Actions
Task	.max-w-screen-xl ul li	SelectorElement	yes	_root	Element preview Data preview Edit Delete

Press "+" to add a new task

- Go shopping
- ▼ COMPLETED
 - Start tracking movies with Media Kraken

Interoperable Serendipity

Using browser extensions

The screenshot displays a browser extension interface. At the top, there is a breadcrumb navigation path: `_root / Task`. To the right of this path is a blue button labeled "Data preview". Below the breadcrumb is a table with the following columns: ID, Selector, type, Multiple, Parent selectors, and Actions.

ID	Selector	type	Multiple	Parent selectors	Actions
name	<code>.whitespace-pre</code>	SelectorText	no	Task	Element preview Data preview Edit Delete
Completed	<code>input[type="checkbox"]</code>	SelectorElementAttribute	no	Task	Element preview Data preview Edit Delete

Below the table, there is a task list. The first task is "Go shopping", which is currently unchecked. The second task is "Start tracking movies with Media Kraken", which is checked. A "COMPLETED" section header is visible above the second task.

Interoperable Serendipity

Using browser extensions

Data Preview



name	Completed
Go shopping	null
Start tracking movies with Media Kraken	

Try yourself at webscraper.io

Interoperable Serendipity

Using AI

Task from Alice's app



Task from Bob's app



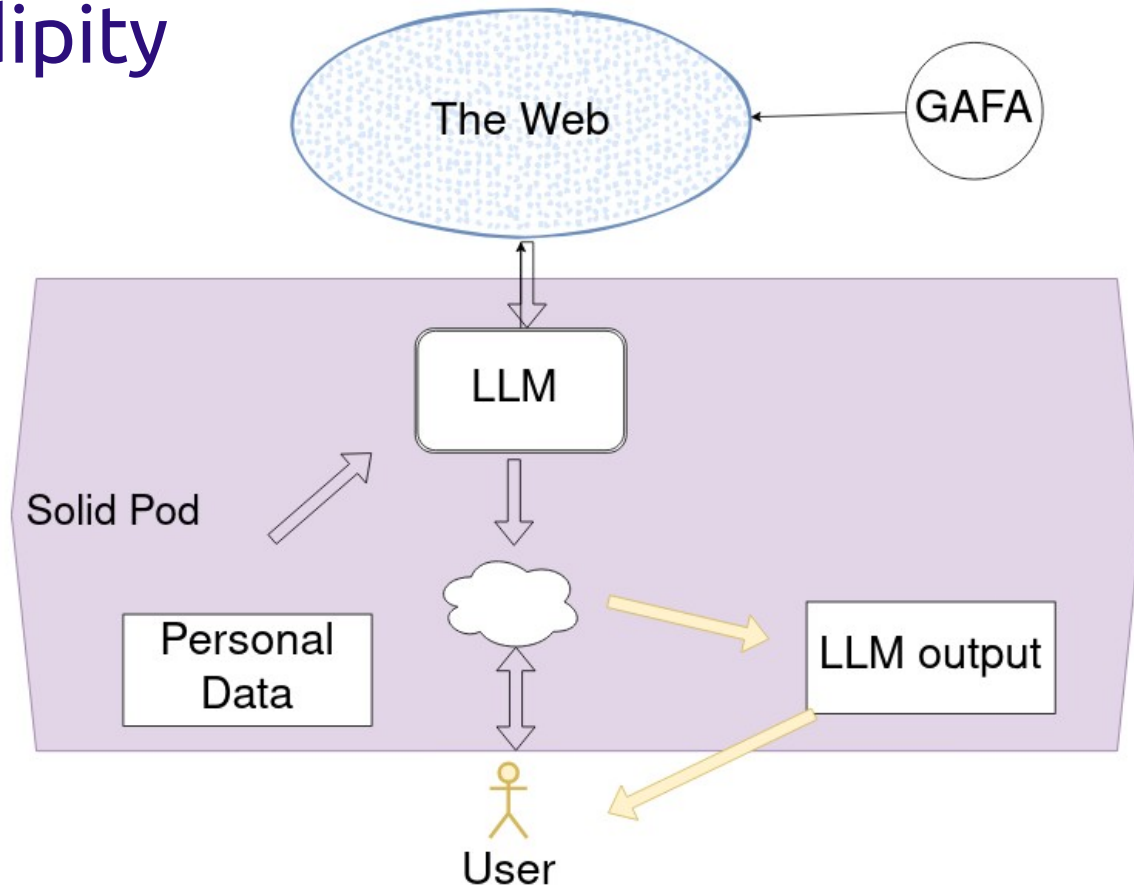
Charlie
AI

Lense in your POD



Interoperable Serendipity

Using AI



See:

- [Charlie works for Bob](#)
- [Tim Berners-Lee @ WeAreDevelopers World Congress 2023](#)

Interoperable Serendipity

- Using lense repositories
- Using browser extensions
- Using AI
- ...



Interoperable Serendipity ✨

Further reading

- [Interoperable Serendipity](#) (original blog post)
- [What Technology Wants](#)
- [Skeuomorphic Software](#)
- [A Vision for Personal Knowledge Graphs](#) by Angelo Veltens
- [Adversarial Interoperability](#) by Seth Godin
- [Interoperability: Fix the Internet, Not the Tech Companies](#) by Cory Doctorow
- [Project Cambria: Translate your data with lenses](#) by Ink & Switch
- [Shaping Linked Data apps](#) by Ruben Verborgh
- [Charlie works for Bob](#) by Tim Berners-Lee

See you online!



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- noeldemartin.com/now
- aerogel.js.org

You can also find me on the fediverse,
Bluesky, Twitter/X, etc.