

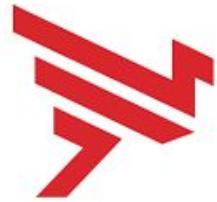
# Open Banking

## A Developer's Perspective



Uli Hitzel  
API Evangelist  
Axway

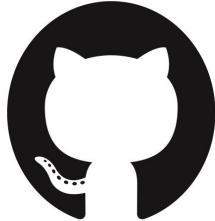




# Developer Advocate



/in/uhitzel



/u1i/slides



IBM





## cosmicrenaissance

1,257 posts

194 followers

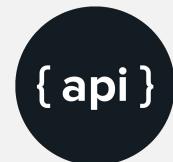
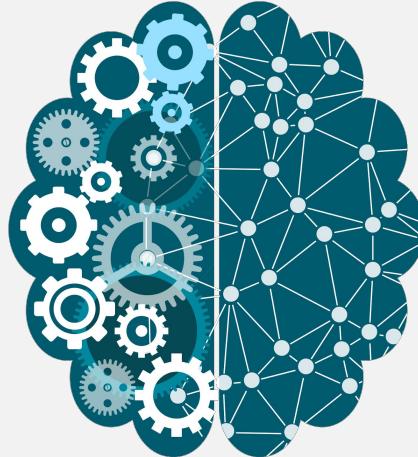
615 following

Just some guy, really.

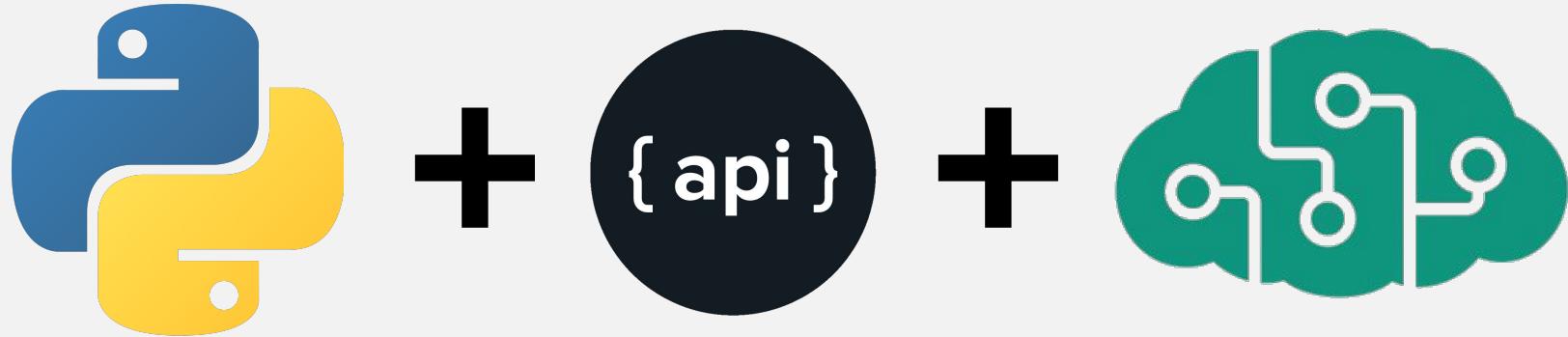
+65

City life, scenery, food.

Camera: Samsung Galaxy S7/S9

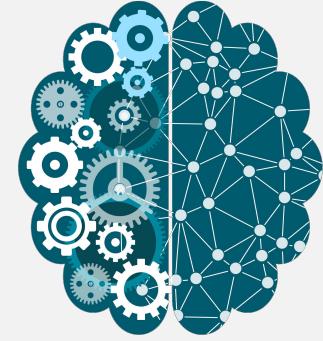






Microsoft

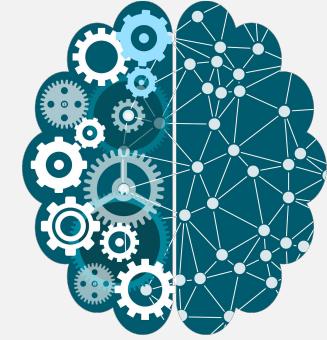
Cognitive Services



**Text:** "a close up of a pizza"

**Confidence:** 0.9246481371443355

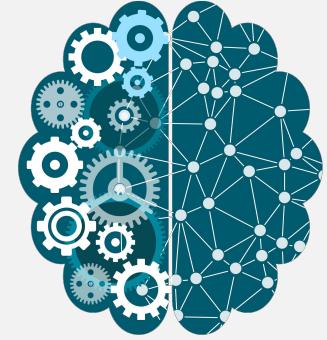
**Tags:** "pizza" "food" "table" "sitting" "cheese" "plate" "top" "piece" "slice" "toppings" "close" "eaten" "sauce" "covered" "wooden" "large" "pepperoni" "white" "pan"



**Text:** "a cup of coffee"

**Confidence:** 0.8527612488821656

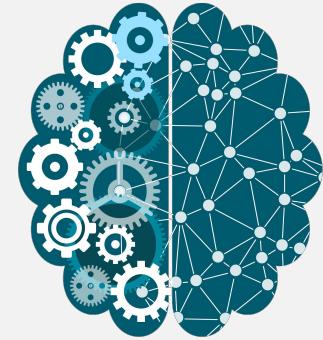
**Tags:** "cup" "table" "coffee" "food" "sitting" "drink" "plate" "sandwich" "breakfast"  
"spoon" "glass" "close" "donut" "hot" "white" "phone" "soup"



**Text:** "a wooden table next to a window"

**Confidence:** 0.8365439206950018

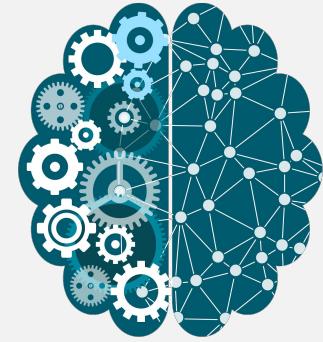
**Tags:** "table" "indoor" "window" "room" "sitting" "chair" "small" "desk" "wooden" "laptop" "lit" "top" "light" "counter" "computer" "living" "kitchen"



**Text:** "a sunset over the ocean"

**Confidence:** 0.8065587199349568

**Tags:** "outdoor" "water" "beach" "sunset" "ocean" "sun" "man" "pier" "track"  
"board" "top" "large" "red" "standing" "surfing" "walking" "boat" "holding" "flying"



**Text:** "a bunch of bananas"

**Confidence:** 0.37608016747604295

**Tags:** "animal" "covered" "sitting" "old" "side" "large" "water" "lot" "many" "top"  
"table" "bunch" "street" "fire" "bird" "snow" "parking" "group" "river" "ocean" "field"

# Agenda

1 – Open Banking – Evolution & Roadmap

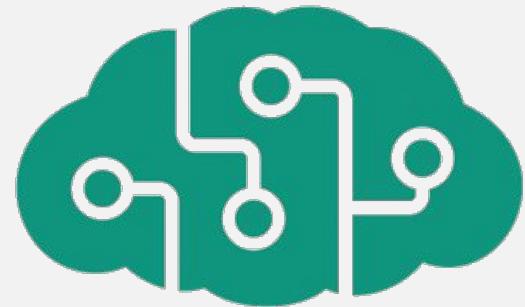
2 – Challenges & Roadblocks

3 – Building Great APIs:  
Developer Experience & Innovation



# You've just seen a great Example

- API abstracts something really complex
- Quick Results
- Easy to use → More Users → More Sample Data → AI learns → Better Product



 Microsoft

Cognitive Services

A portrait of a man with voluminous, dark, curly hair and black-rimmed glasses. He is wearing a brown zip-up jacket over a plaid shirt and tie. He is looking directly at the camera with a slight smile.

# Developers



# Two Worlds

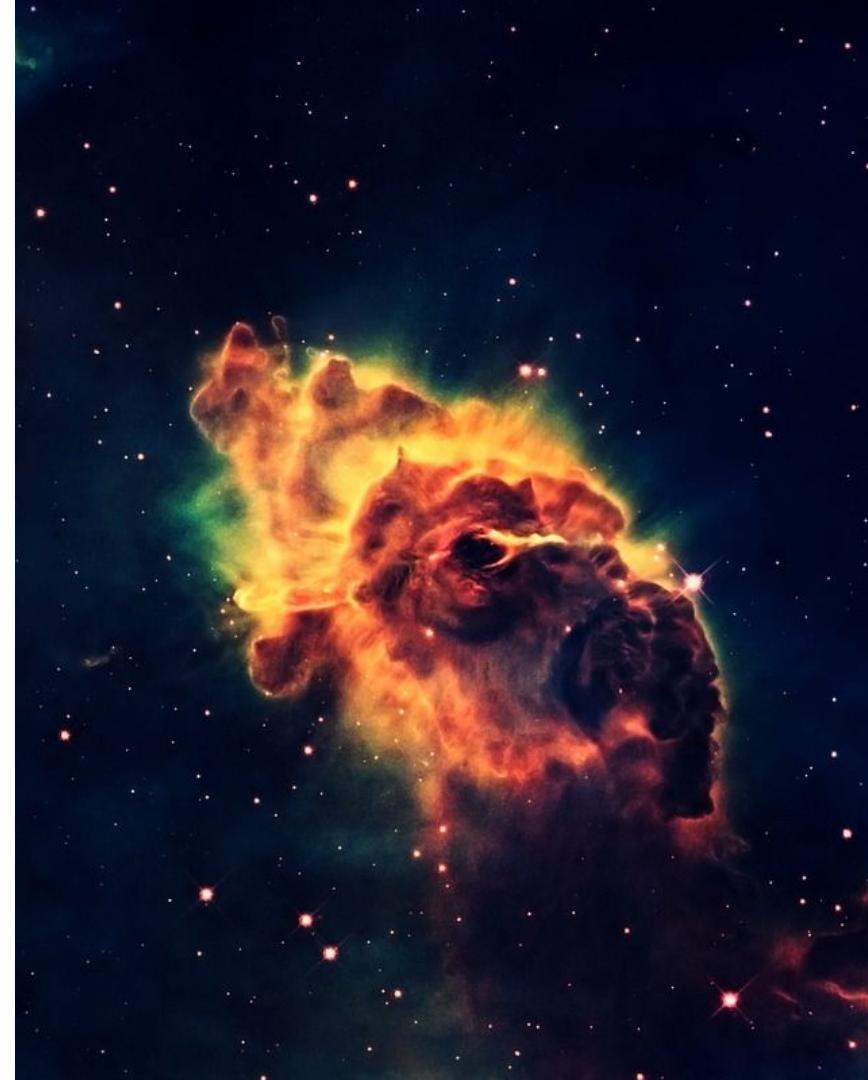
- Open Banking: Initiated by Regulators
- FinTech: Consume APIs & Create New Offerings

→ **Offer & Consume Financial Services in a new Way**

# The Big Bang

- October 2015: PSD2 (EU)
- Allow using 3rd parties to manage finances
- Banks obligated to allow access

→ **Innovation, Protect Consumers & Payments**





# Open Banking Ltd.

- 2016: Large UK Banks required to allow access to licensed startups
- Payments is only the start
- Define Phases
- Phase 1:
  - Accounts
  - Payment Initiation
  - Transaction History

# Worldwide Adoption

- Hong Kong: Identical Model
- Singapore: Collaborative Approach
- Australia: Recommendations instead of Directives





## 200+ APIs available

More than 200 APIs to support your business and your customers' needs



Deposits



Fund Transfers



Loans



Parties



Rewards



Reference Data

[View All](#)

# 'Hello World' in 5 Minutes

- Instant Access
- Sandbox
- Examples, Tutorials & Documentation



# Challenges & Roadblocks

- Access to Resources: The Cloud sets Expectations
- Interface Design & Documentation
- Quick Prototyping
- Plausible Mock Services & Data





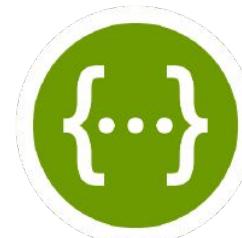
# Takeaways

- Start with the Interface
- Divide & Conquer
- Use Mock Tools!



# Design First

- What can I do?
- What do I get?
- Data Models
- Authentication
- License



```
1 swagger: "2.0"
2 info:
3   description: "This is a sample server for Swagger. Find out more about Swagger at [http://swagger.io] or on [irc.freenode.net, #swagger]. Within this sample, you can use the api key authorization filters."
4 version: "1.0.0"
5 title: "Swagger Petstore"
6 termsOfService: "http://swagger.io/terms/"
7 contact:
8   email: "apiteam@swagger.io"
9 license:
10   name: "Apache 2.0"
11   url: "http://www.apache.org/licenses/LICENSE-2.0.html"
12 host: "petstore.swagger.io"
13 basePath: "/v2"
14 tags:
15   - name: "pet"
16     description: "Everything about your pet"
17     externalDocs:
18       description: "Find out more"
19       url: "http://swagger.io"
20   - name: "store"
21     description: "Access to Petstore operations"
22   - name: "user"
23     description: "Operations about users"
24     externalDocs:
25       description: "Find out more about users"
26       url: "http://swagger.io"
```

# Divide & Conquer

2

## Use

- API Portal
- Swagger/OAS
- API Keys
- OAuth
- HTTP
- JSON
- Sandbox

## Manage

- Access Control
- Security
- Quotas
- Transformation
- Service Catalog
- Self Service
- Analytics

## Build





YOISHO  
偽の会社

SOAP & REST  
Webservices / APIs  
for a fictional  
japanese bank. Easy  
to run docker  
images that expose  
endpoints you can  
use for demos and  
testing.

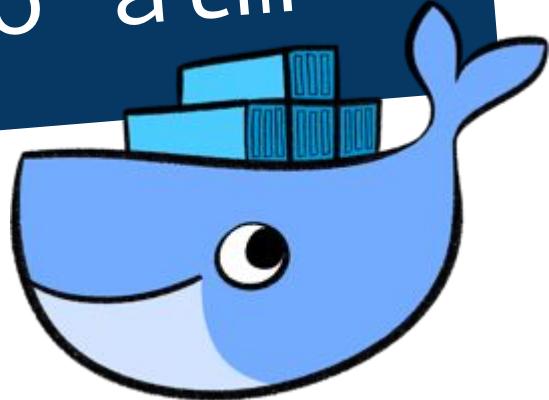


[View On GitHub](#)

# Use Mock Tools

3

```
Terminal
docker run -d -P
ulih/yoisho-atm
```



# Open Banking - Live Endpoints

Webservices and REST APIs that expose bank related data services with dynamic content, use them for testing and demos. Available over [HTTP](#) and [HTTPS](#)



[Full Documentation](#)

## ATM

Full CRUDL REST interface (Create, Read, Update, Delete, List), /v1 and /v2 endpoints with respective Swagger specs

[API Version 1 - Swagger](#)

[API Version 1 - Swagger Editor](#)

[API Version 2 - Swagger](#)

[API Version 2 - Swagger Editor](#)

[Sample Request](#)

## Currency Exchange

REST/JSON, 1 parameter. Response is different each time.

[Swagger](#)

[Swagger Editor](#)

[Sample Request](#)

## Assets (SOAP)

Bank Assets & Debt- SOAP/XML, 2 methods, dynamic output.

[WSDL](#)

# Open Banking - Live Endpoints



Webservices and REST APIs that expose bank related data services with dynamic content, use them for testing and demos. Available over [HTTP](#) and [HTTPS](#)

[Full Documentation](#)

## Fixed Deposit

Calculator - REST/JSON, 2 parameters, semantic error handling, complex output

[Swagger](#)

[Swagger Editor](#)

[Sample Request](#)

## Investment

/v1 and /v2 endpoints with respective Swagger specs.  
Static responses.

[API Version 1 - Swagger](#)

[API Version 1 - Swagger Editor](#)

[API Version 2 - Swagger](#)

[Swagger Editor](#)

[API Version 2 - Sample Request](#)

## Stock Quote

Returns the stock price. Data updates once every minute, it's also sending additional Cache-Control headers.

[Swagger](#)

[Swagger Editor](#)

[Sample Request](#)

# ATM Locations 2.0

[ Base URL: backend.yoisho.dob.jp/banking/v2 ]

<https://backend.yoisho.dob.jp/banking/v2/swagger>

List of ATM locations for Yoisho Banking Corporation

**PUT**    `/atm/{id}` Update ATM Location

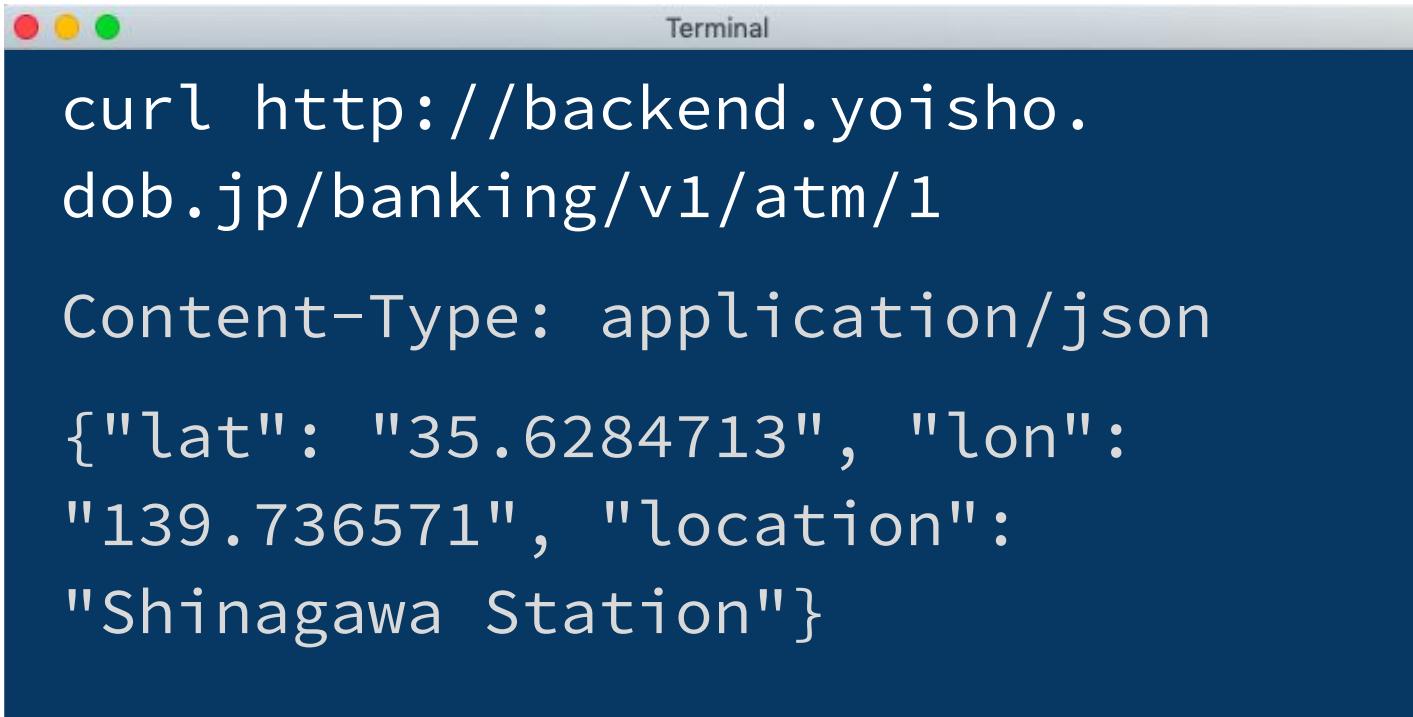
**DELETE**    `/atm/{id}` Delete ATM Location

**GET**    `/atm/{id}` Get ATM Location

**POST**    `/atm` Create ATM Location

**GET**    `/atm` List Atm locations

# ATM Example: cURL

A screenshot of a Mac OS X Terminal window titled "Terminal". The window has the standard red, yellow, and green close buttons at the top left. The terminal itself is dark blue with white text. It displays a cURL command and its JSON payload. The command is: "curl http://backend.yoisho.dob.jp/banking/v1/atm/1". Below it is the JSON payload: "Content-Type: application/json" followed by a large brace-enclosed JSON object with keys "lat", "lon", and "location" and their corresponding values.

```
curl http://backend.yoisho.dob.jp/banking/v1/atm/1
Content-Type: application/json
{"lat": "35.6284713", "lon": "139.736571", "location": "Shinagawa Station"}
```

## Projects

- ▼ Bank Assets
- ▼ Application
  - ▼ bank\_assets
    - Request 1
  - ▶ bank\_debt



# SoapUI

The screenshot shows the SoapUI application window. The title bar reads "Request 1". The toolbar includes standard icons for running, stopping, and saving. The URL field contains "http://backend.yoisho.dob.jp/soap".

The left pane displays the XML structure of the outgoing request:

```
<soapenv:Envelope xmlns:soape>
  <soapenv:Header/>
  <soapenv:Body>
    <yois:bank_assets/>
  </soapenv:Body>
</soapenv:Envelope>
```

The right pane displays the XML structure of the incoming response:

```
<ksoap11env:Envelope xmlns:ksoap11env="http://schemas.xmlsoap.org/soap/envelope">
  <ksoap11env:Body>
    <tns:bank_assetsResponse>
      <tns:bank_assetsResult>
        <tns:string>9948380</tns:string>
      </tns:bank_assetsResult>
    </tns:bank_assetsResponse>
  </ksoap11env:Body>
</ksoap11env:Envelope>
```

# Get Started

- **Use:** Postman, Swagger, Stoplight
- **Experiment:** Use Uli's Open Banking APIs
- **Join & Share:** Participate at Meetups & Get Involved



/u1i/yoisho

