

Harnessing  
BDD & Example Mapping  
for effective API delivery  
#apidays

# I'm Frank Kilcommins

- › Principal API Technical Evangelist @ SmartBear
- › Developer and Architect ( ❤️ APIs & Developer Experience)
- › Governance Board member on OpenAPI Initiative (OAI)
- › Contributor on Workflows Specification

## › Connect:

`/* insert embarrassing photo here */`



@fkilcommins



@frank-kilcommins



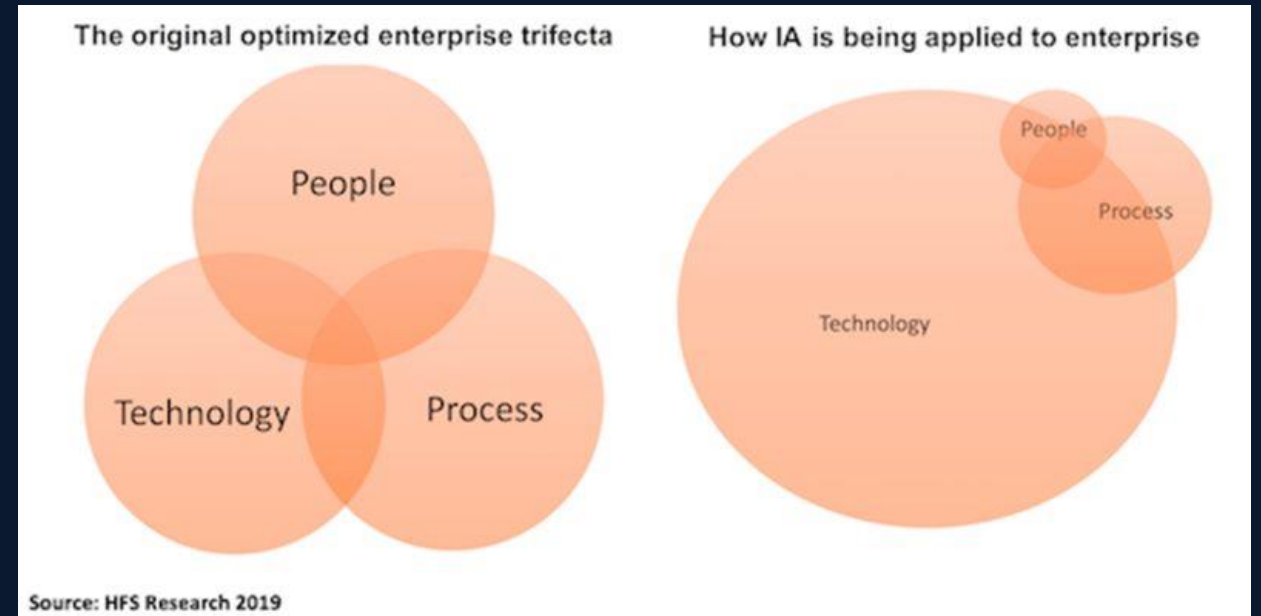
frank.kilcommins@smartbear.com

# Talk Track

- › Why APIs Fail - The People Problem
- › Leveraging BDD & API Specifications for API delivery
- › Takeaways
- › Q&A

# The People Problem...

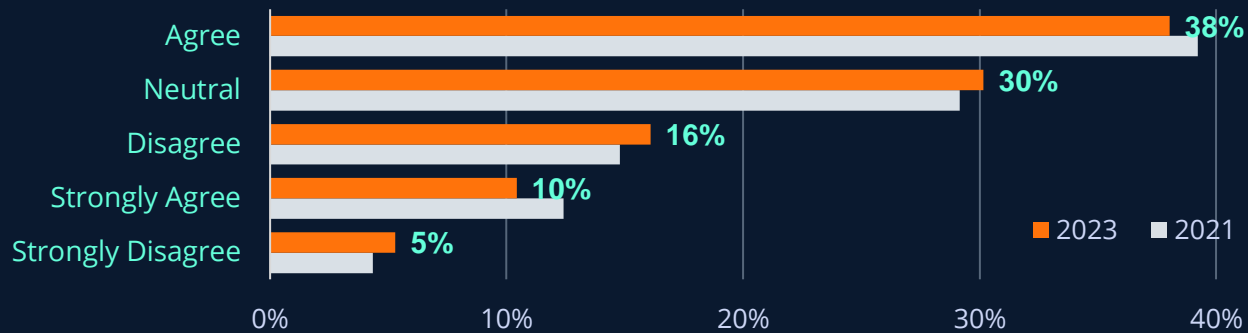
## › Organizational challenges



Technology focus dominates rather than people and process.  
(This graphic reflects Integrated Automation but is also true for APIs)

# Alignment Gap

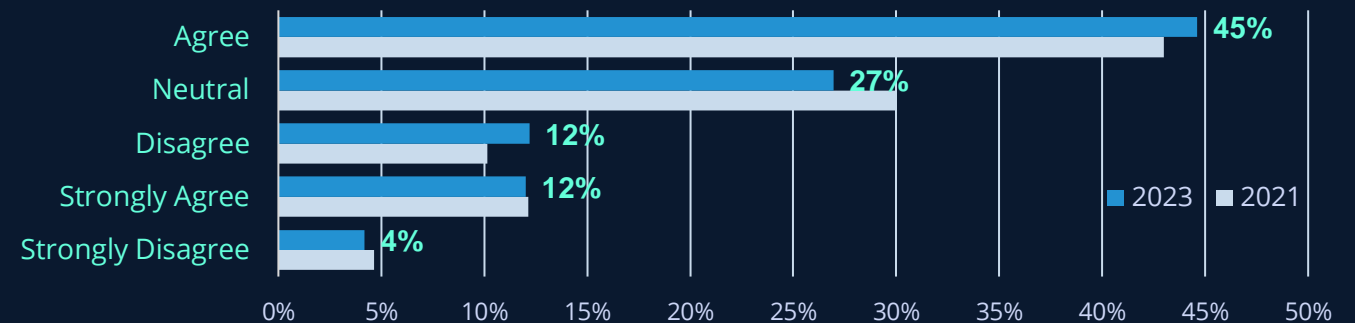
Our APIs are well documented for our consumers



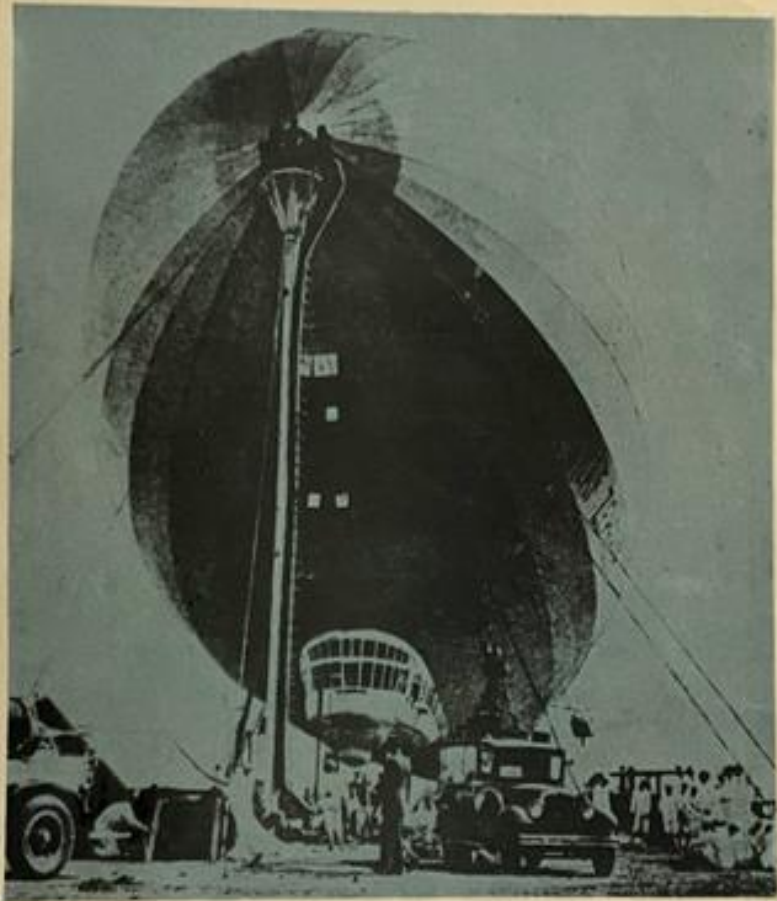
› Only 48% are confident their APIs are well documented and explain value for consumers

› ~43% unsure their processes will deliver appropriate developer experience (DX)

Our organization has good processes in place to ensure APIs can be efficiently consumed



# LED ZEPPELIN



**GOOD TIMES, BAD TIMES**  
**COMMUNICATION BREAKDOWN**  
**DAZED AND CONFUSED**



Playlist for the  
modern API program

./BDD for API Delivery

# BDD for API Delivery

Business Rules

# Where are the API requirements?



Business Rules

Acceptance Criteria

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Acceptance Criteria

# Where are the API requirements?

Test Plan

Business Rules

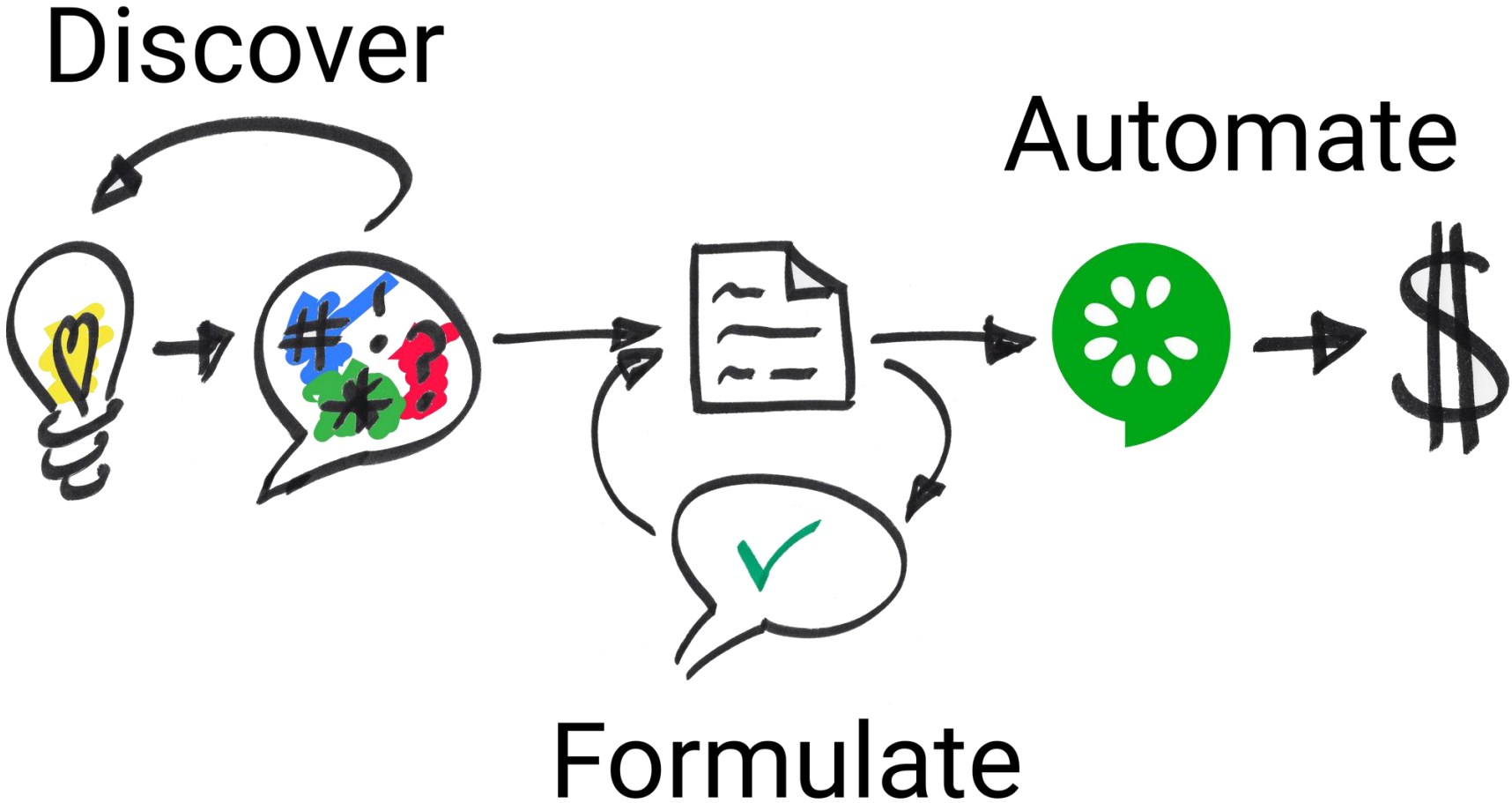
Acceptance Criteria

# Where are the API requirements?

Test Plan

Napkins to Code with  
annotations

# BDD for API Delivery



./API Specifications

# API Specifications

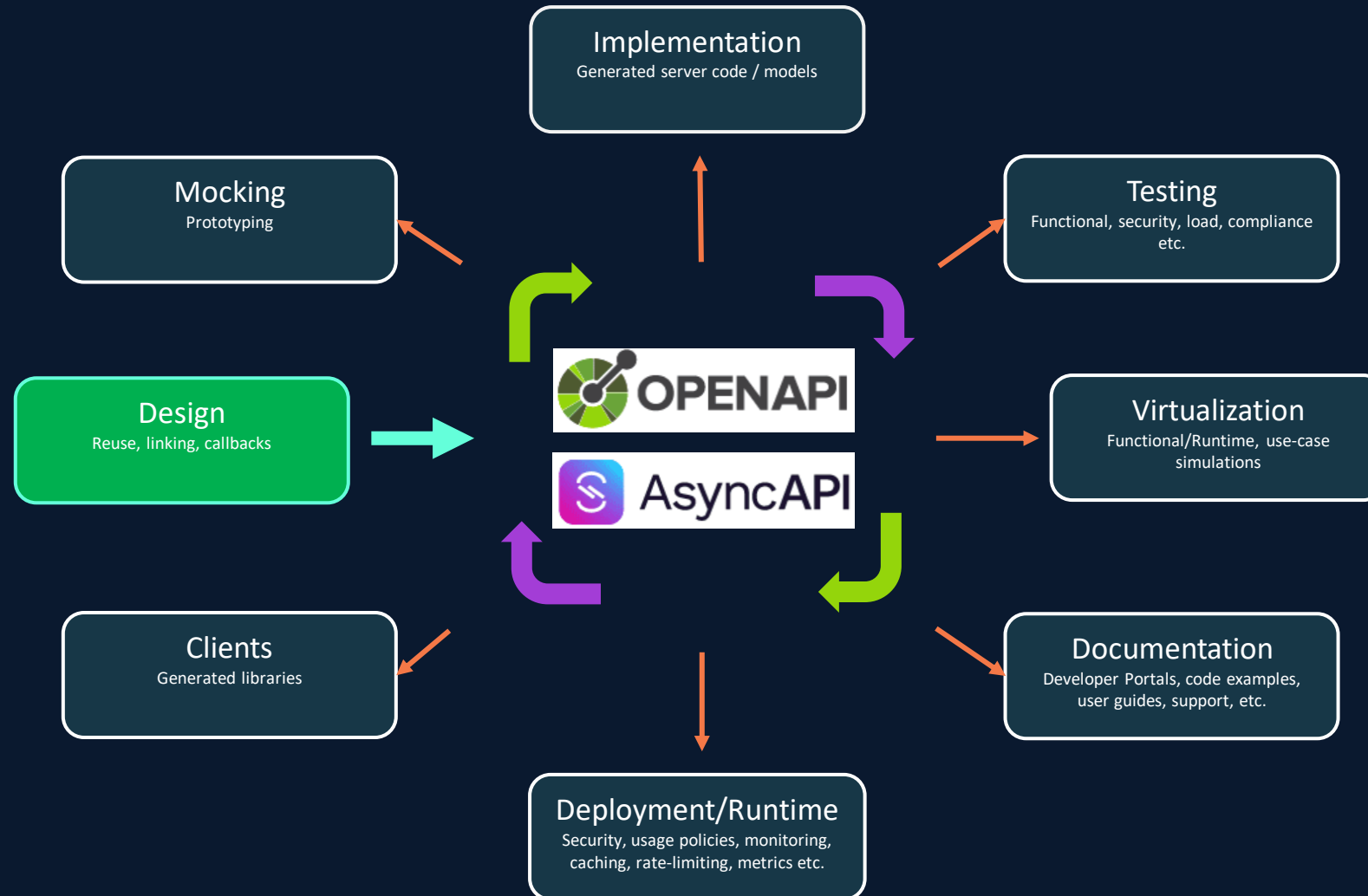
# Popular API related Specifications



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WSDL | WADL | RAML | API Blueprint

# Let Specifications Drive the API Lifecycle





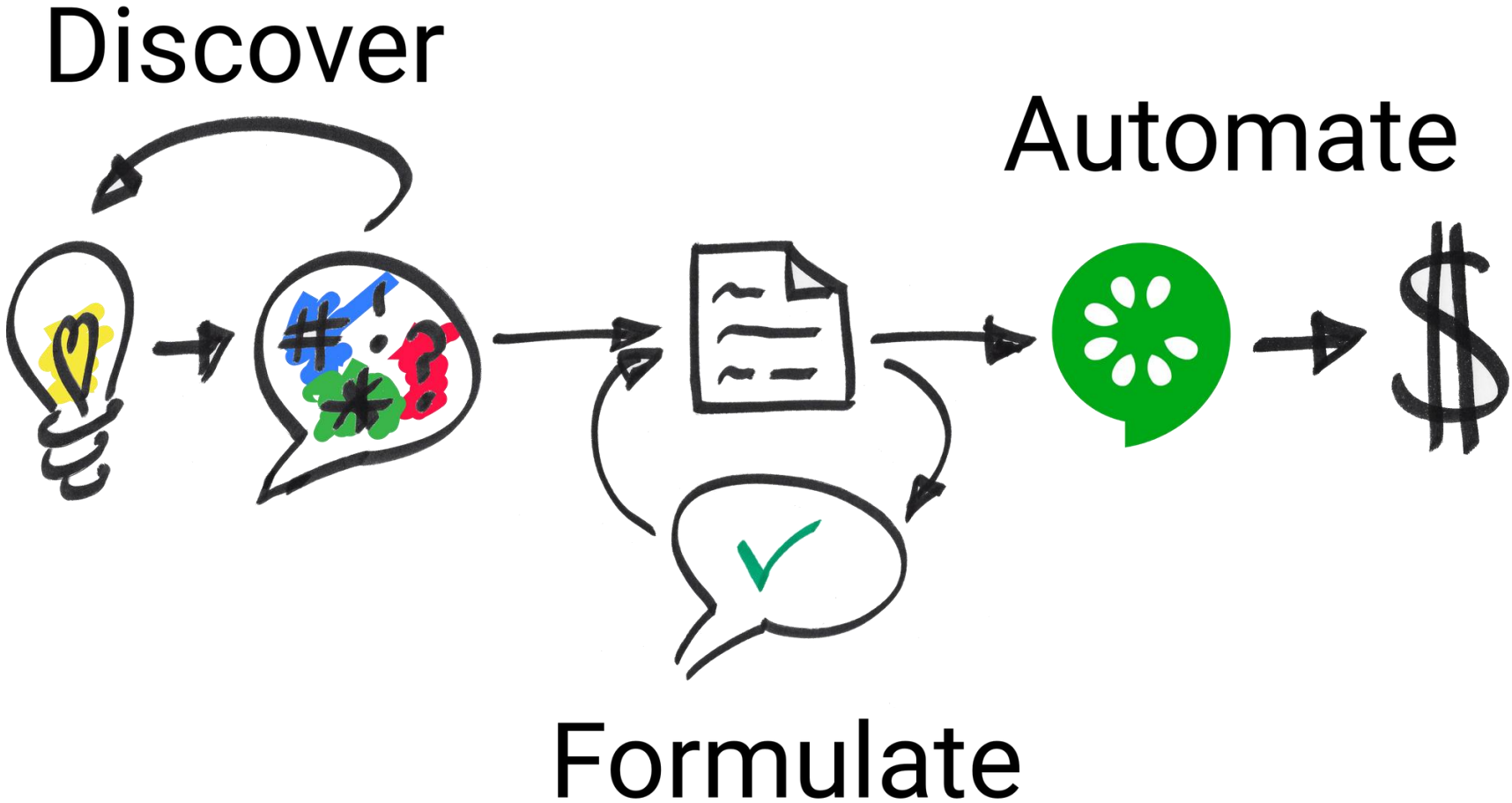
*"Good specifications will always improve programmer productivity far better than any programming tool or technique."*

- Milt Bryce



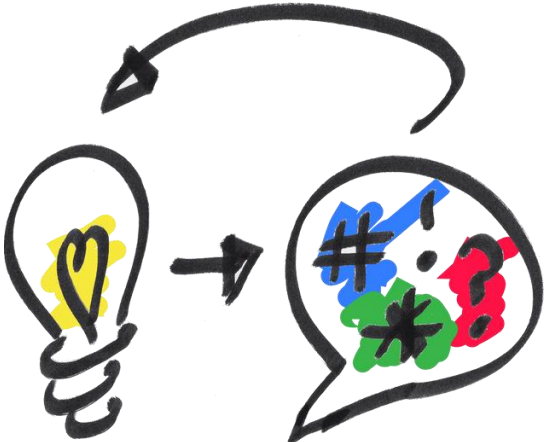


# BDD for API Delivery



# BDD for API Delivery

Discover



OPENAPI

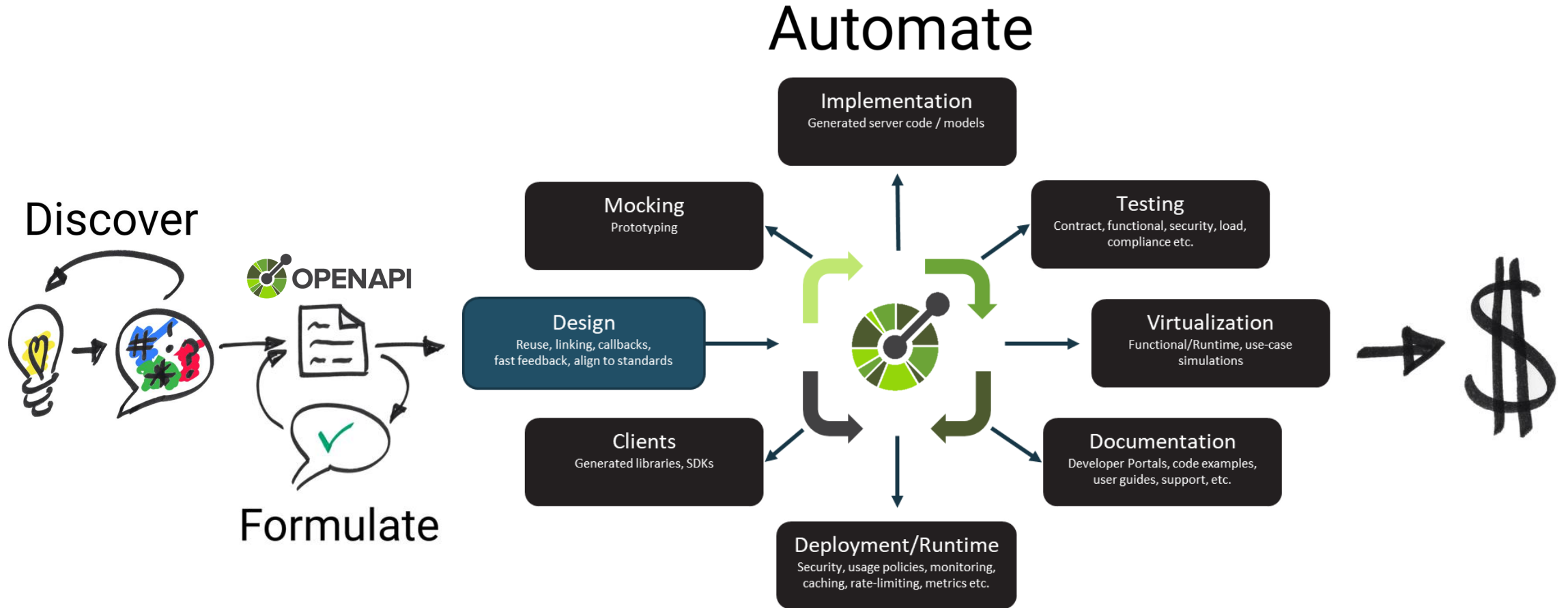


Automate



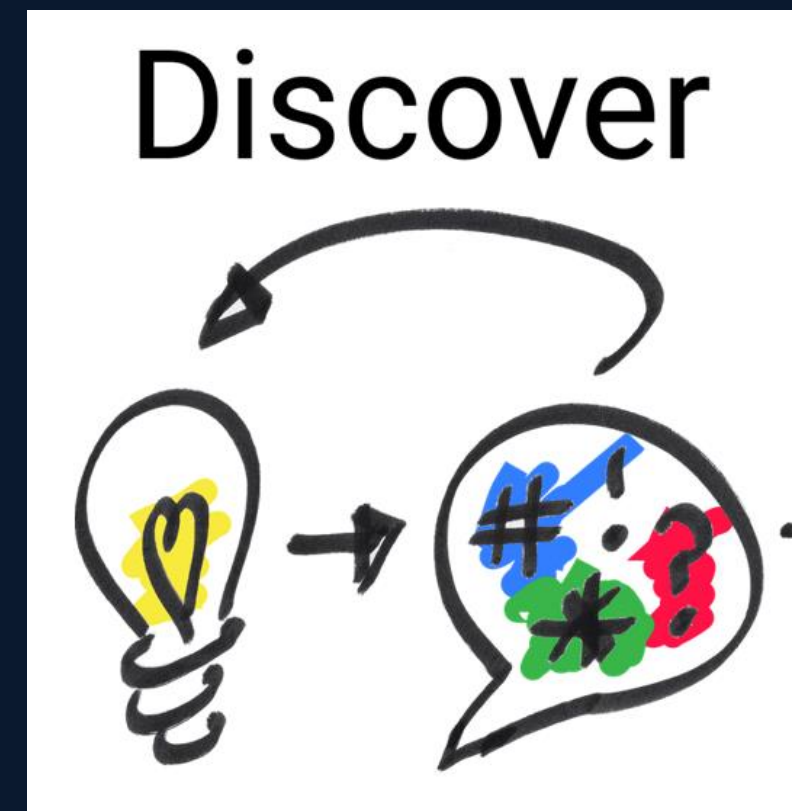
Formulate

# BDD for API Delivery



# Example Mapping for Deliberate Discovery

- › Effectively explore and refine detailed acceptance criteria so that:
  - › **Agreed the scope**
  - › **Identified** as much **uncertainty** as possible
  - › **Agreed** on the **readiness** for design/development
  - › Identified **concrete examples**



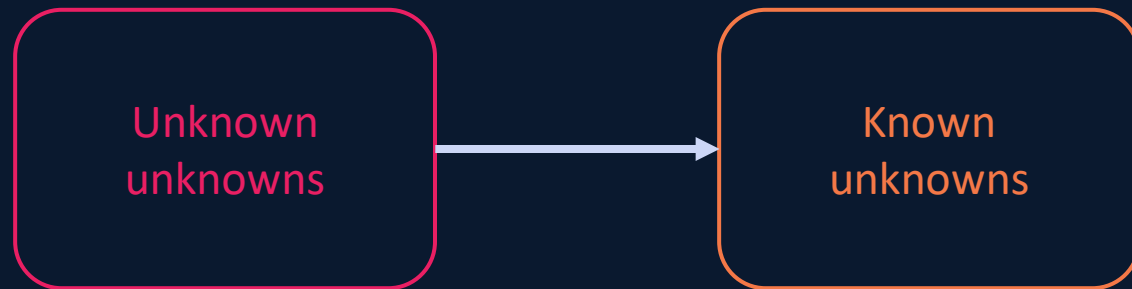
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Unknown  
unknowns

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USER STORY

RULE

RULE

RULE

QUESTION?

-

ASSUMPTION

EXAMPLE

EXAMPLE

EXAMPLE

EXAMPLE

EXAMPLE

EXAMPLE

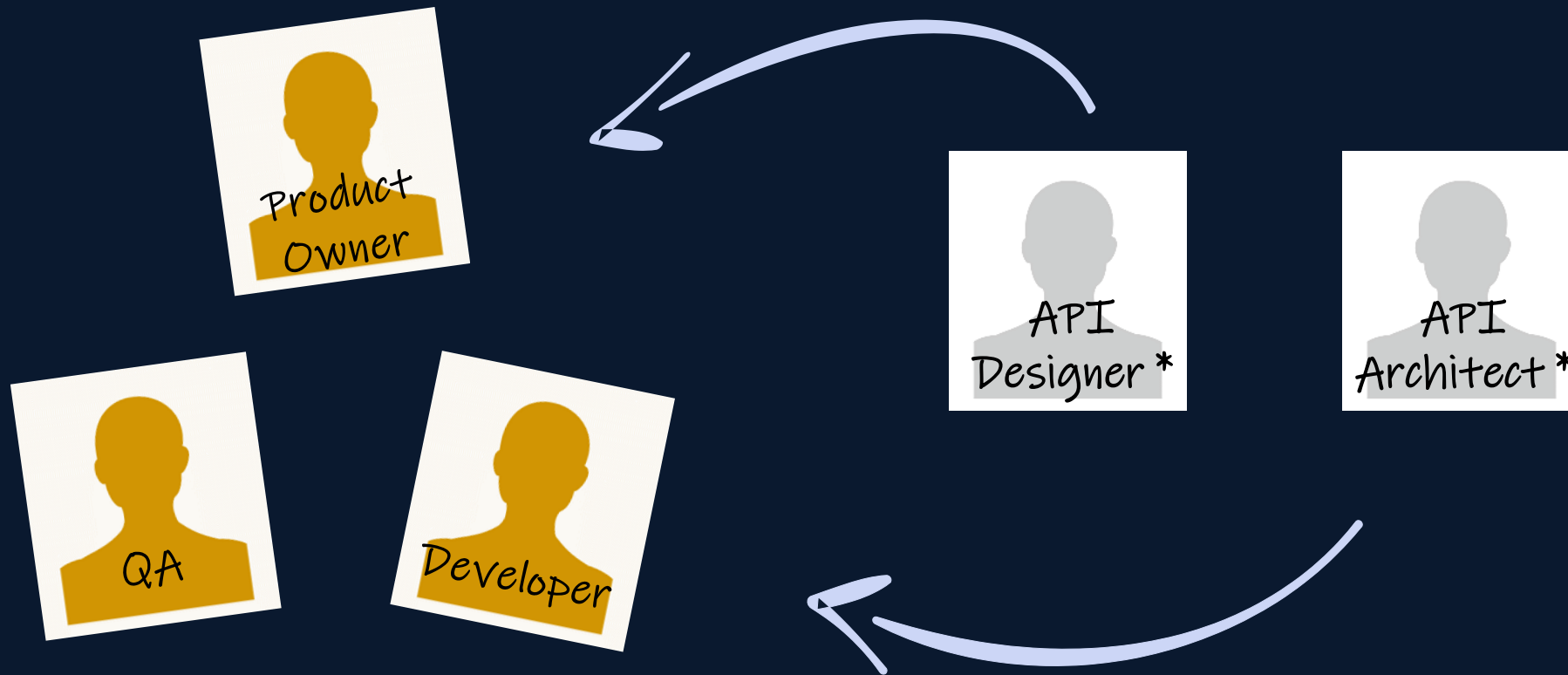


# Who should participate?



The traditional 3 Amigos

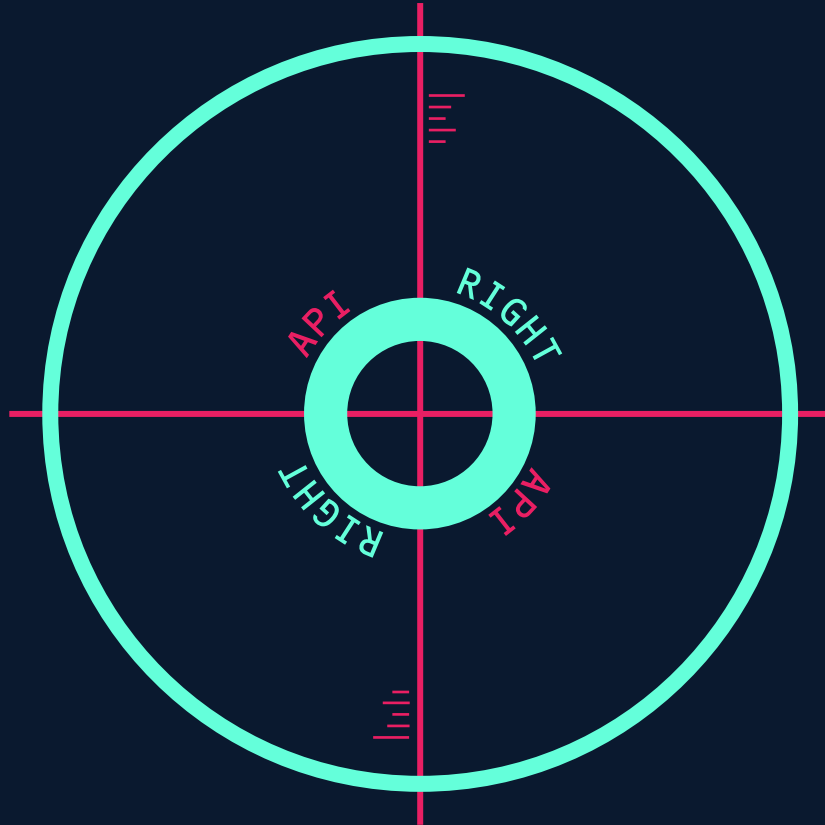
# Who should participate?



The traditional 3 Amigos

Enhanced with API specific SMEs  
\* dedicated or floating from a C4E

# Practical API Governance



- › Are we building the right API?
- › Are we building the API right?

## Creating a Pet Adoption Service



### **Problem:**

We're overwhelmed by the number of pets being abandoned at our pet store.

### **Solution:**

Following research and evaluation, we've decided to create the ability to search for and adopt pets that we catalog.

We'll offer the service via our website but also with a wider eco-system of shelters, charities, and pet orphanages.



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## SEARCH FOR PETS

CALLING THE SEARCH  
PETS RESOURCE  
RETURNS ALL  
AVAILABLE PETS

PETS CAN BE FILTERED  
BY STATUS, CATEGORY,  
LOCATION, & BREED

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JANE CALLS THE SEARCH  
PETS RESOURCE  
=> ALL DETAILS OF  
AVAILABLE PETS ARE  
RETURNED


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A PET SUMMARY SHOULD  
HAVE: NAME, ID, STATUS,  
CATEGORY, BREED,  
LOCATION

JANE CALLS THE SEARCH  
PETS RESOURCE  
=> ALL SUMMARY  
DETAILS OF AVAILABLE  
PETS ARE RETURNED





## SEARCH FOR PETS

CALLING THE SEARCH PETS RESOURCE RETURNS ALL AVAILABLE PETS

PETS CAN BE FILTERED BY STATUS, CATEGORY, LOCATION, & BREED

A PET SUMMARY SHOULD HAVE: NAME, ID, STATUS, CATEGORY, BREED, LOCATION

SEARCHING PETS MUST SUPPORT PAGINATION (PAGED RESULTS & PARAMETERS)



JANE CALLS THE SEARCH PETS RESOURCE  
=> ALL **PAGED** SUMMARY DETAILS OF AVAILABLE PETS ARE RETURNED



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JANE CALLS THE SEARCH PETS RESOURCE  
=> ALL PAGED SUMMARY DETAILS OF AVAILABLE PETS ARE RETURNED

JANE SEARCHES FOR ADOPTED STATUS PETS  
=> PAGED SUMMARY OF ADOPTED PETS RETURNED

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=> PAGED SUMMARY OF ADOPTED PETS RETURNED

JANE SEARCHES FOR PETS LOCATED IN GALWAY  
=> PAGED SUMMARY OF GALWAY LOCATED PETS RETURNED

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=> PAGED SUMMARY OF ADOPTED PETS RETURNED

JANE SEARCHES FOR PETS LOCATED IN GALWAY  
=> PAGED SUMMARY OF GALWAY LOCATED PETS RETURNED

JANE SEARCHES CATS  
=> PAGED SUMMARY OF CATS REGARDLESS OF LOCATION, STATUS, OR BREED RETURNED

## SEARCH FOR PETS

CALLING THE SEARCH PETS RESOURCE RETURNS ALL AVAILABLE PETS

PETS CAN BE FILTERED BY STATUS, CATEGORY, LOCATION, & BREED

A PET SUMMARY SHOULD HAVE: NAME, ID, STATUS, CATEGORY, BREED, LOCATION

SEARCHING PETS MUST SUPPORT PAGINATION (PAGED RESULTS & PARAMETERS)



WHEN CRITERIA DOES NOT MATCH A PET RETURN EMPTY RESPONSE (NOT ERROR)



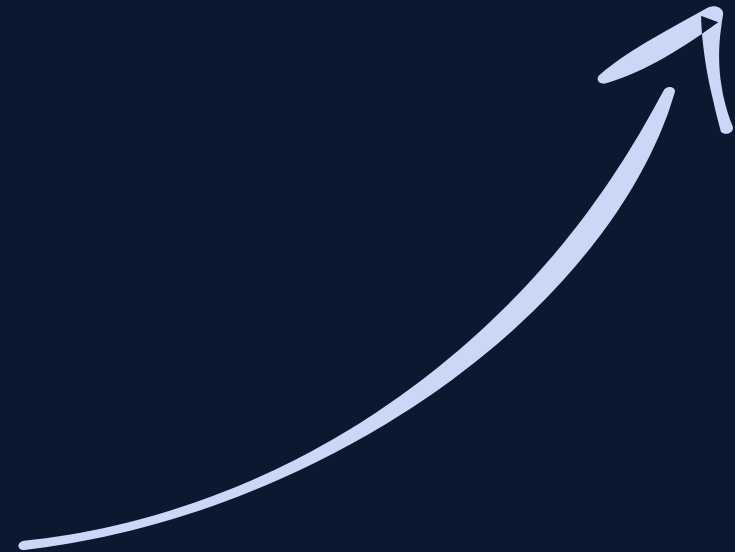
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JANE SEARCHES FOR BOXER BREED CATS  
=> AN EMPTY RESPONSE IS RETURNED



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CALLING THE SEARCH PETS RESOURCE RETURNS ALL AVAILABLE PETS

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SEARCHING PETS MUST SUPPORT PAGINATION (PAGED RESULTS & PARAMETERS)



WHEN CRITERIA DOES NOT MATCH A PET RETURN EMPTY RESPONSE (NOT ERROR)



JANE CALLS THE SEARCH PETS RESOURCE  
=> ALL PAGED SUMMARY DETAILS OF AVAILABLE PETS ARE RETURNED

JANE SEARCHES FOR ADOPTED STATUS PETS  
=> PAGED SUMMARY OF ADOPTED PETS RETURNED

JANE SEARCHES FOR PETS LOCATED IN GALWAY  
=> PAGED SUMMARY OF GALWAY LOCATED PETS RETURNED

JOE SEARCHES 1 PAGE OF PETS WITH 10 PER PAGE  
\* PAGE PARAMS VALIDATED  
=> A PAGED RESULT CONTAINING 10 PETS WITH LINKS TO NEXT/SELF/PREVIOUS PAGES RETURNED

JANE SEARCHES CATS  
=> PAGED SUMMARY OF CATS REGARDLESS OF LOCATION, STATUS, OR BREED RETURNED

JANE SEARCHES FOR BOXER BREED CATS  
=> AN EMPTY RESPONSE IS RETURNED

# What does formulation look like?

Check out:

<https://www.youtube.com/watch?v=L8HjnzOmhV4>

# VIEW PET DETAILS

THE FULL PET DETAILS  
CAN BE RETURNED  
ONCE THE PETID IS  
KNOWN

JANE HAS THE PETID  
AND USES IT TO GET THE  
PET DETAILS  
=> FULL DETAILS ON THE  
PET RETURNED

JOE USES THE NAME OF A  
PET TO GET THE DETAILS  
  
=> A BAD REQUEST  
RESPONSE IS RETURNED

JOE HAS A PETID BUT IT  
DOES NOT MATCH A  
RECORD IN OUR SYSTEM  
=> A NOT FOUND  
RESPONSE IS RETURNED

REQUEST PARAMETERS  
MUST MATCH THE  
EXPECTED TYPE OR  
PATTERN



VALID REQUESTS ON  
SINGULAR RESOURCE  
NOT MATCHING A  
RECORD MUST  
RETURN 404





AUTHENTICATED USERS  
CAN ADD NEW PETS  
FOR ADOPTION

## ADD A NEW PET

JANE HAS AN AUTH  
TOKEN AND SENDS A  
NEW PET RECORD  
\* REQUEST VALIDATED  
=> A SUCCESSFUL  
RESPONSE IS RETURN  
INCLUDING THE PET  
RESOURCE

JOE TRIES TO CREATE A  
PET BUT FORGETS HIS  
TOKEN  
=> A UNAUTHORIZED  
RESPONSE RETURNED

A NEW PET MUST HAVE  
AT LEAST NAME,  
CATEGORY, BREED, AND  
LOCATION SET

JOE SENDS A NEW PET  
RECORD WITH JUST  
NAME AND CATEGORY  
\* REQUEST VALIDATION  
FAILS  
=> A BAD REQUEST IS  
RETURNED

ALWAYS RETURN A HTTP  
201 RESPONSE FOR  
CREATED RESOURCES



JOE SENDS A NEW PET  
RECORD THAT MEETS  
VALIDATION RULES  
=> A HTTP 201  
RESPONSE IS CREATED  
WHICH ALSO CONTAINS  
THE PET RECORD

ALWAYS RETURN A  
LOCATION HTTP  
RESPONSE HEADER FOR  
CREATED  
RESOURCES



JOE SENDS A NEW PET  
RECORD THAT MEETS  
VALIDATION RULES  
=> THE RESPONSE  
CONTAINS A LOCATION  
HEADER WITH THE LINK  
TO THE GET /PETS/{ID}

ERROR RESPONSES MUST  
CONFORM TO  
RFC 7807



## ADOPT A PET

AVAILABLE PETS CAN  
BE ADOPTED BY  
REGISTERED USERS

JANE IS REGISTERED  
AND CHOSED TO  
ADOPT AN AVAILABLE  
PET

=> THE ADOPTION IS  
REGISTERED, THE PET  
STATUS IS UPDATED,  
AND A CONFIRMATION  
IS RETURNED TO JANE

SALLY IS UNREGISTERED  
AND TRIES TO ADOPT A  
PET

=> AN ERROR MESSAGE  
IS RETURNED TO SALLY  
AS SHE MUST BE  
REGISTERED

JOE TRIES TO ADOPT  
AN ADOPTED PET  
=> AN ERROR IS  
RETURNED WITH INFO  
THAT THE PET IS  
UNAVAILABLE FOR  
ADOPTION

JOE TRIES TO ADOPT  
AN UNKNOWN PET  
=> A 404 NOT FOUND  
ERROR IS RETURNED TO  
JOE

SHOULD A 401  
UNAUTHORISED OR 403  
FORBIDDEN STATUS BE  
RETURNED FOR  
UNREGISTERED?



## GET PET ADOPTIONS LIST

A REGISTERED USER CALLING THE SEARCH ADOPTIONS ALL RECORDED ADOPTIONS

ADOPTIONS CAN BE FILTERED BY STATUS, AND LOCATION

A ADOPTION CAN HAVE STATUS OF REQUESTED, PENDING, AVAILABLE, DENIED, APPROVED

UNKNOWN QUERY PARAMETERS SHOULD BE IGNORED

Known knows

SEARCHING PETS MUST SUPPORT PAGINATION (PAGED RESULTS & PARAMETERS)



WHEN CRITERIA DOES NOT MATCH A PET RETURN EMPTY RESPONSE (NOT ERROR)



JANE IS REGISTERED AND CALLS THE SEARCH ADOPTIONS RESOURCE => PAGED SUMMARY OF ADOPTIONS RETURNED

JANE SEARCHES FOR ADOPTIONS WITH PENDING STATUS => PAGED SUMMARY OF PENDING ADOPTIONS RETURNED

JOE SEARCHES FOR ADOPTIONS BUT OMITTS TOKEN => AN UNAUTHORIZED RESPONSE IS RETURNED

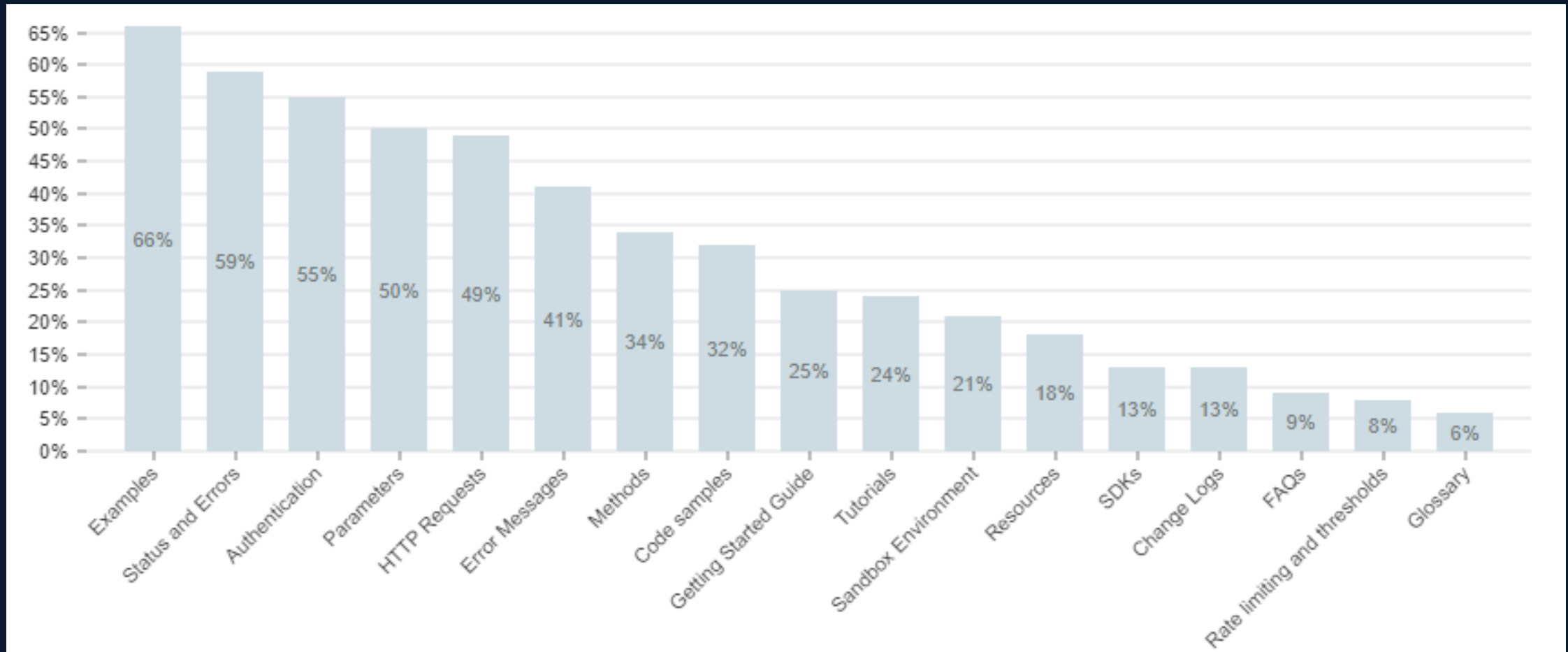
JOE SEARCHES FOR INACTIVE ADOPTIONS => AN ERROR IS RETURNED AS INVALID IS NOT AN ADOPTION STATUS

JOE SEARCHES FOR ADOPTIONS WITH A COLOUR=RED => A PAGED SUMMARY OF ADOPTIONS RETURNED

Can we do more with “Examples”?

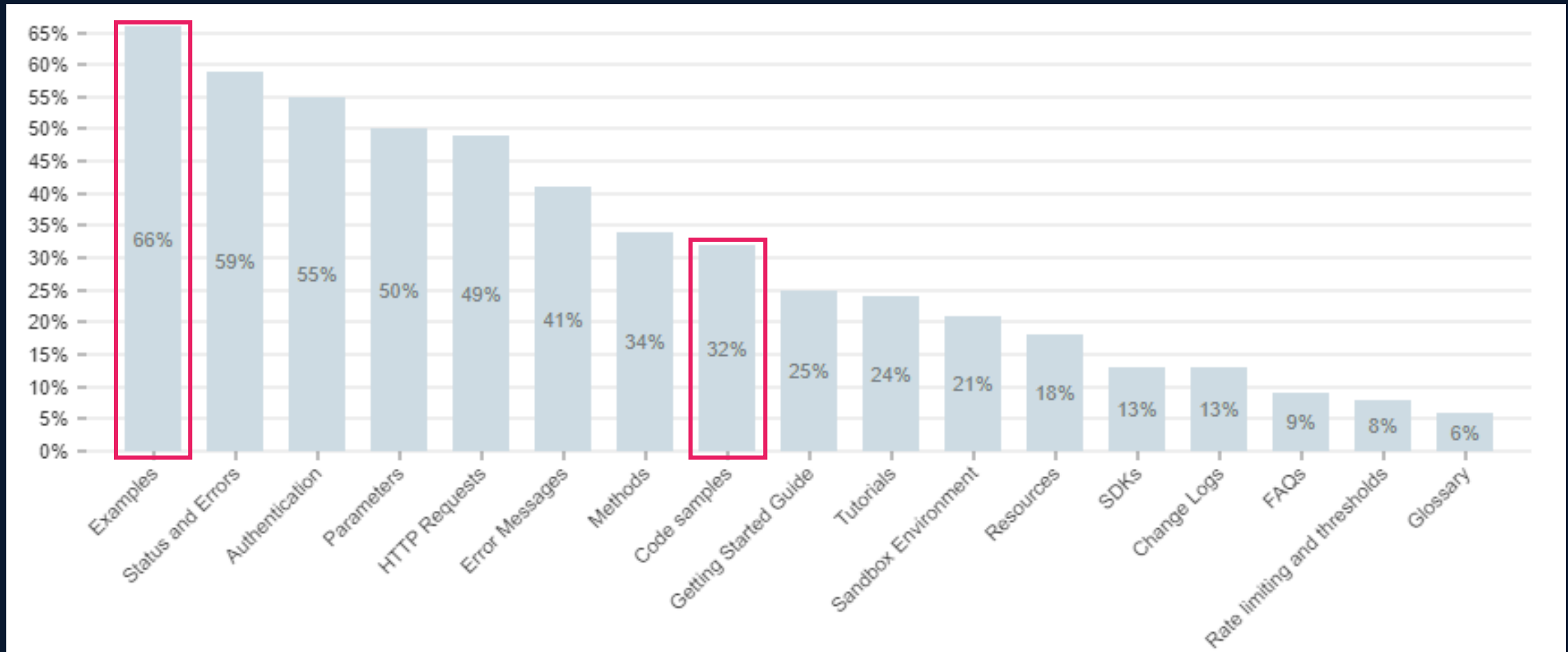
# Most Important API Documentation Features?

› Examples continue to be the best learning resource for consumers



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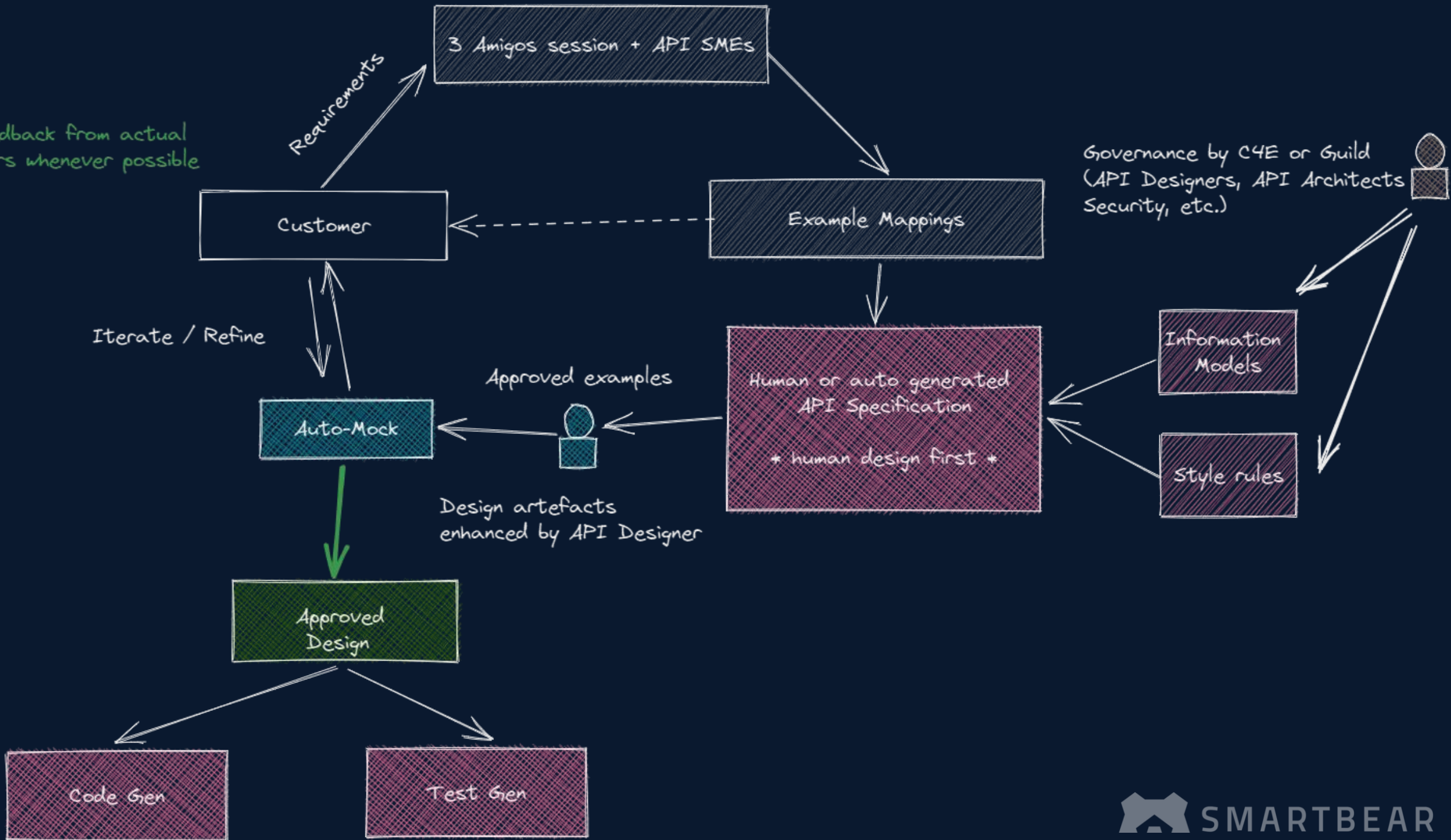


What does example-enriched  
formulation look like?

Check out:

<https://www.youtube.com/watch?v=L8HjnzOmhV4>

Get feedback from actual consumers whenever possible



Governance by C4E or Guild (API Designers, API Architects Security, etc.)

Approved examples

Design artefacts enhanced by API Designer

Iterate / Refine



# Summary

- › Focus on the **consumer** and the **behaviour** they need
- › Keep **people** at the center of API delivery
- › Human conversations & techniques like **example mapping** work
- › **Collaboration** is key to delivering good Developer Experience
  
- › Remember: Your **API** is a **promise**, let it tell its story!

# Thank You!

## Questions?

### › Connect:



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