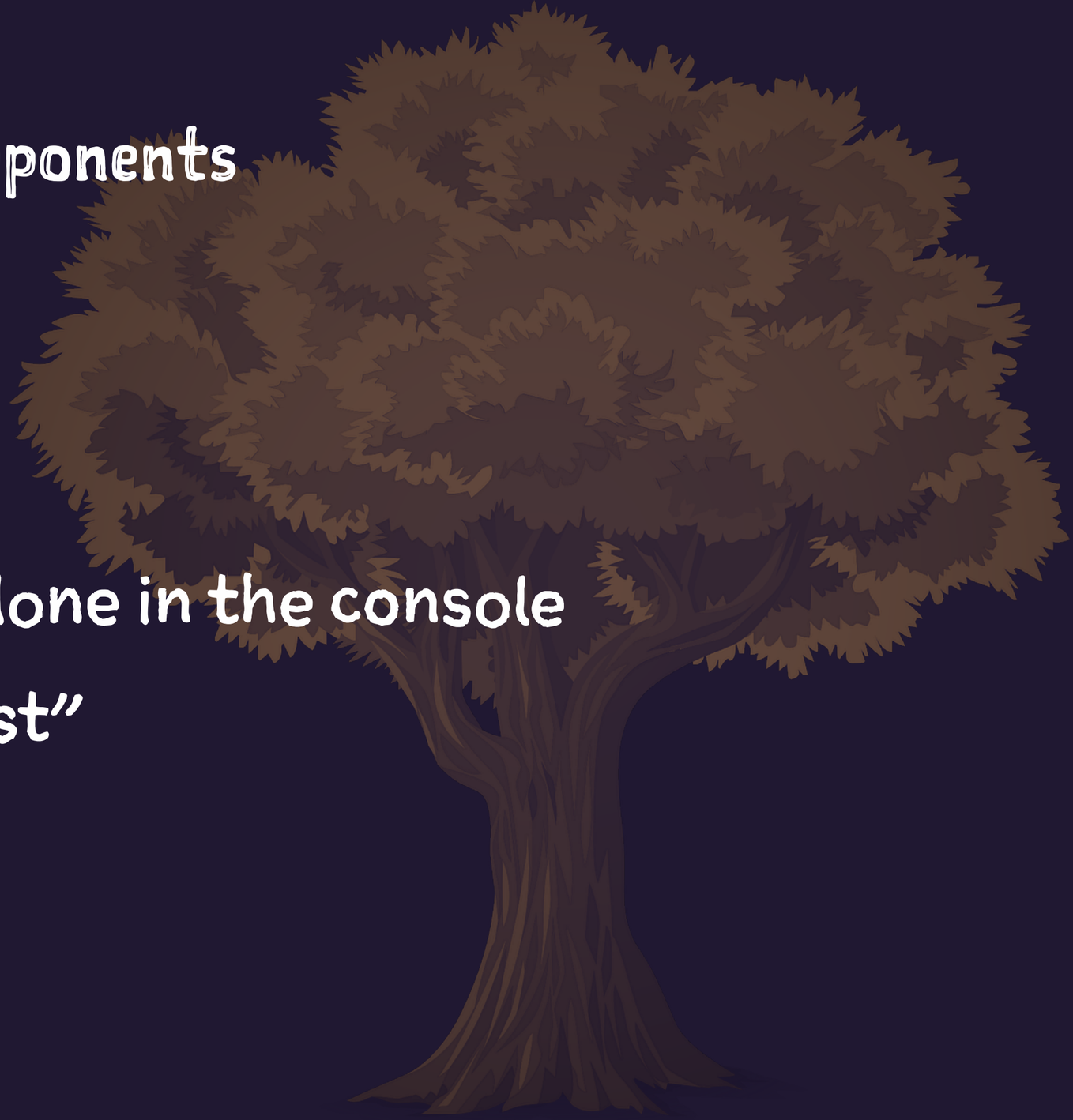
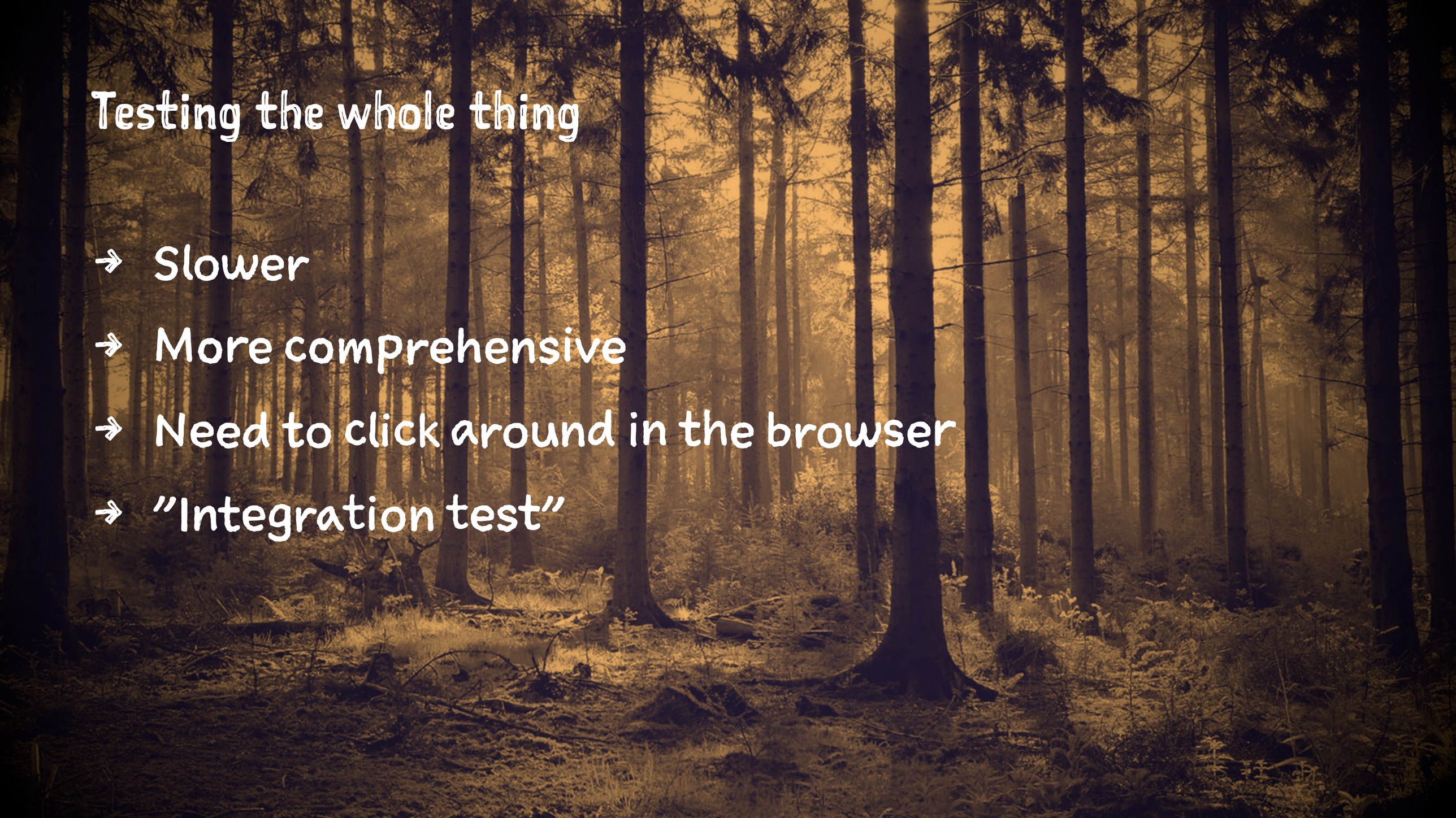
Why do we test?


Two approaches

Testing Components



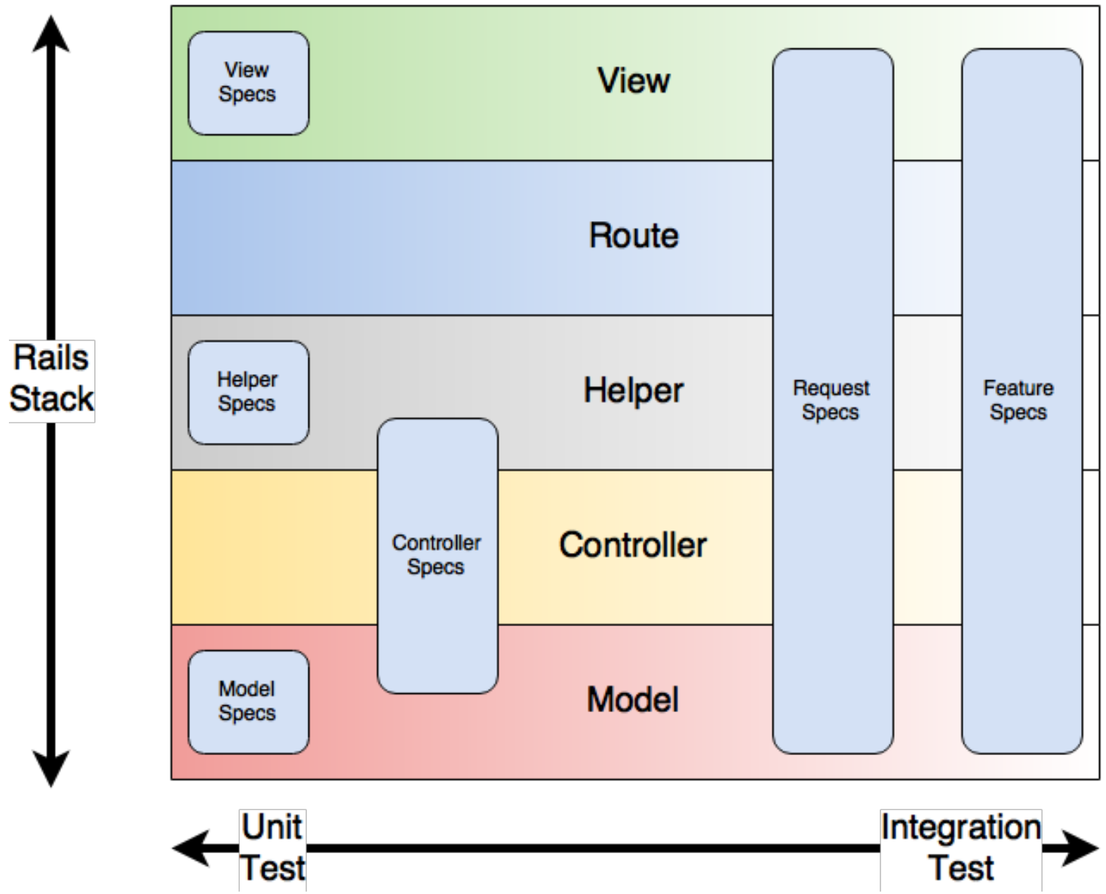
- Fast
- Simple
- Can be done in the console
- "Unit test"



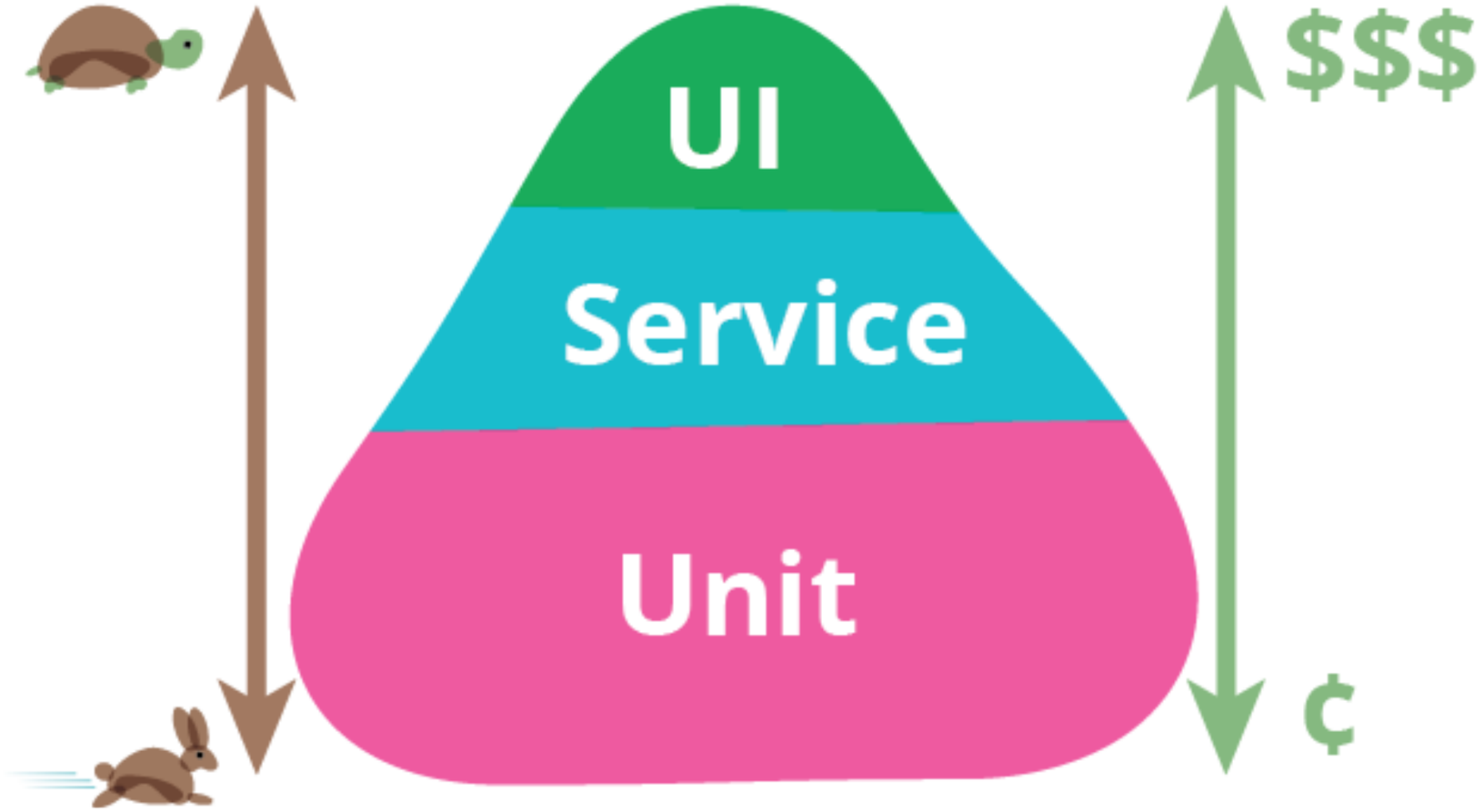
Testing the whole thing

- Slower
- More comprehensive
- Need to click around in the browser
- "Integration test"

Rails test types



Testing pyramid

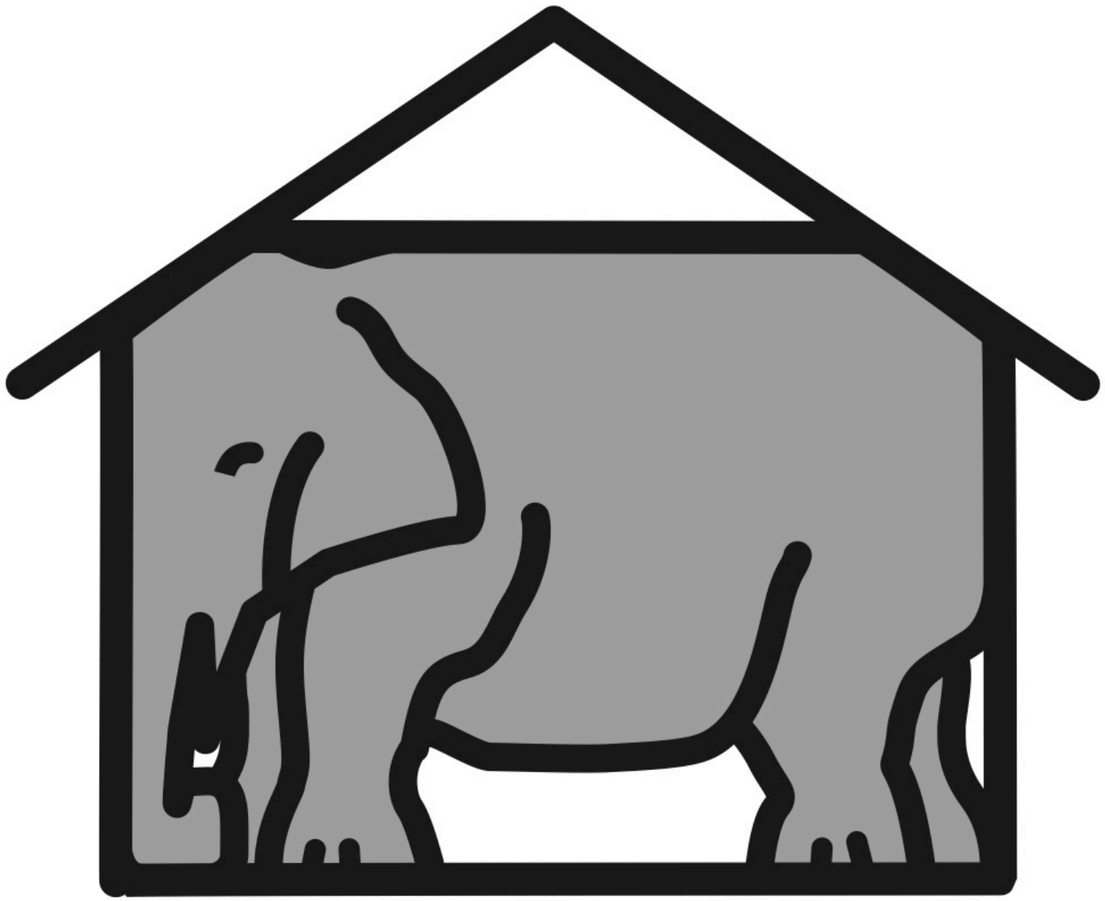


Testing in isolation


easy

No dependencies

```
it "does something" do
  formatter = Formatter.new

  formatted_text = formatter.format("foo")

  expect(formatted_text).to eq "FOO"
end
```

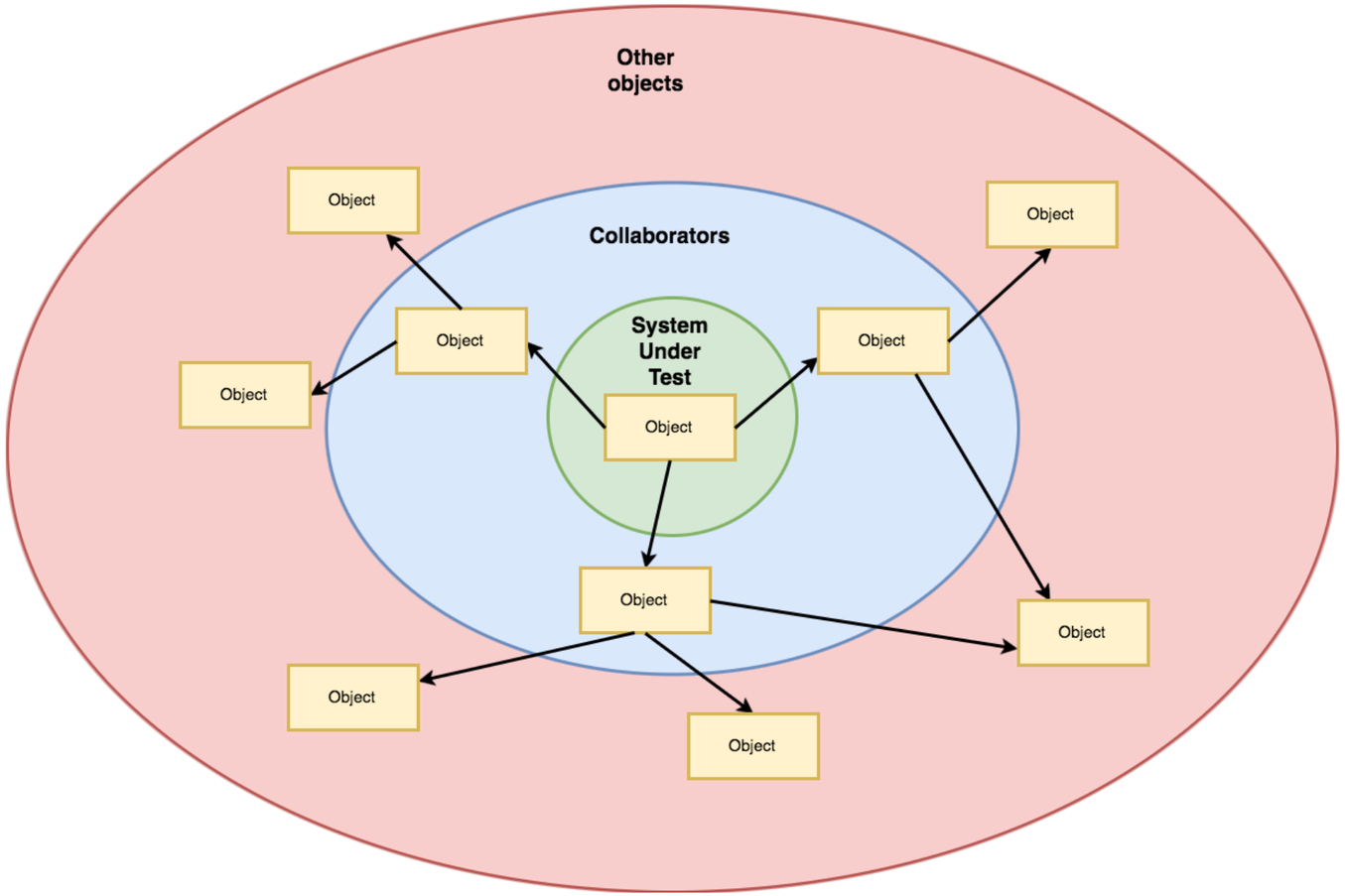


ELEPHANT
IN THE ROOM


Public-Private Partnerships

Test the what, not the how

Object graphs



Introducing a collaborator

```
class Formatter
  def format_name(user)
    "#{user.first_name} #{user.last_name}"
  end
end
```


duck typing

Duck typing

```
class User < ActiveRecord::Base
 validates :first_name, presence: true
 validates :last_name, presence: true
end
```

Duck typing

```
class Guest
  def first_name
    "First"
  end

  def last_name
    "Last"
  end
end
```

Duck typing

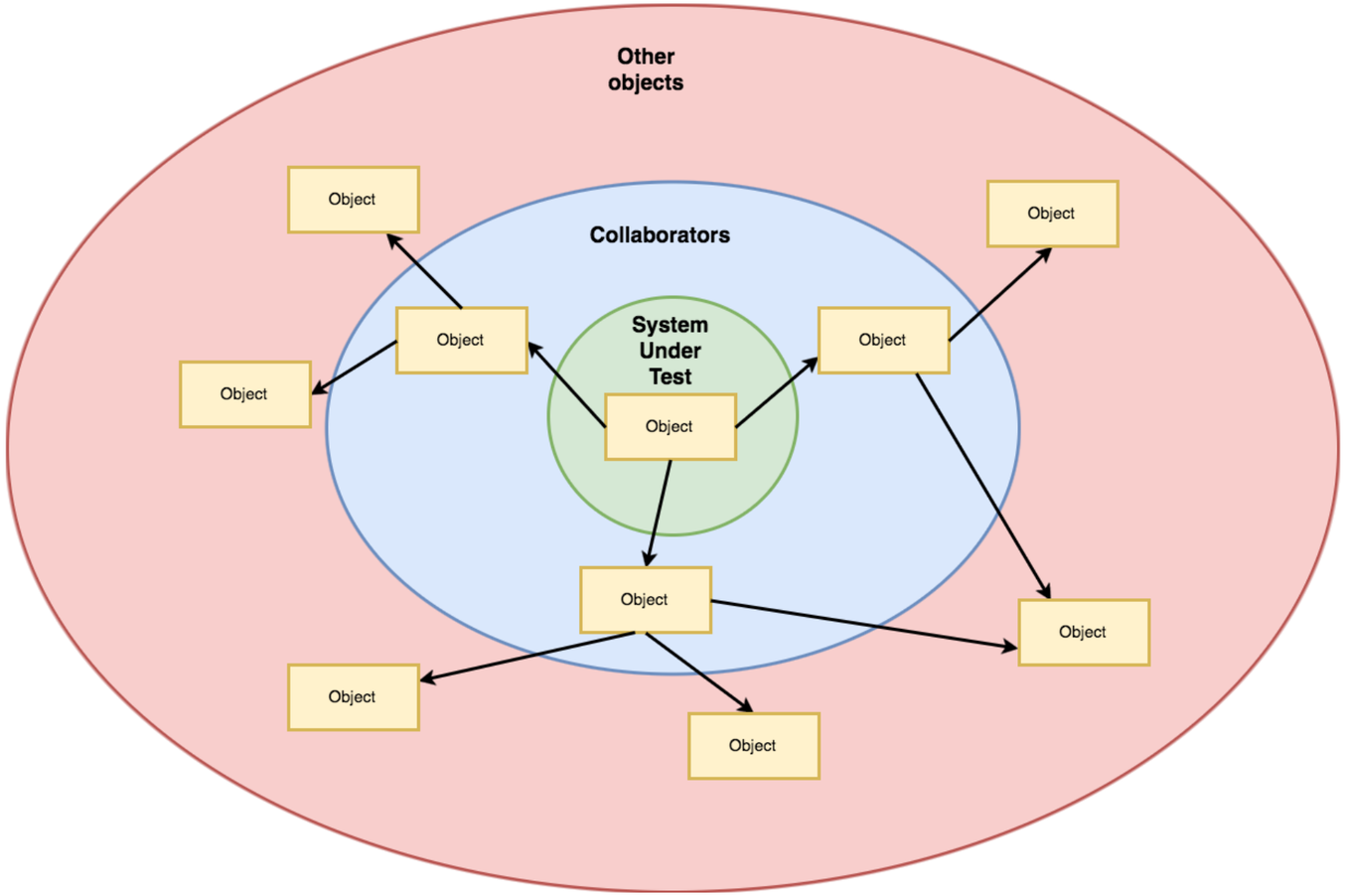
```
Duck = Struct.new(:first_name, :last_name)
```

Test doubles

```
it "formats a user's name" do
  formatter = Formatter.new
  user = double(first_name: "Joël", last_name: "Quenneville")

  formatted_text = formatter.format_name(user)

  expect(formatted_text).to eq "Joël Quenneville"
end
```


Dependency injection

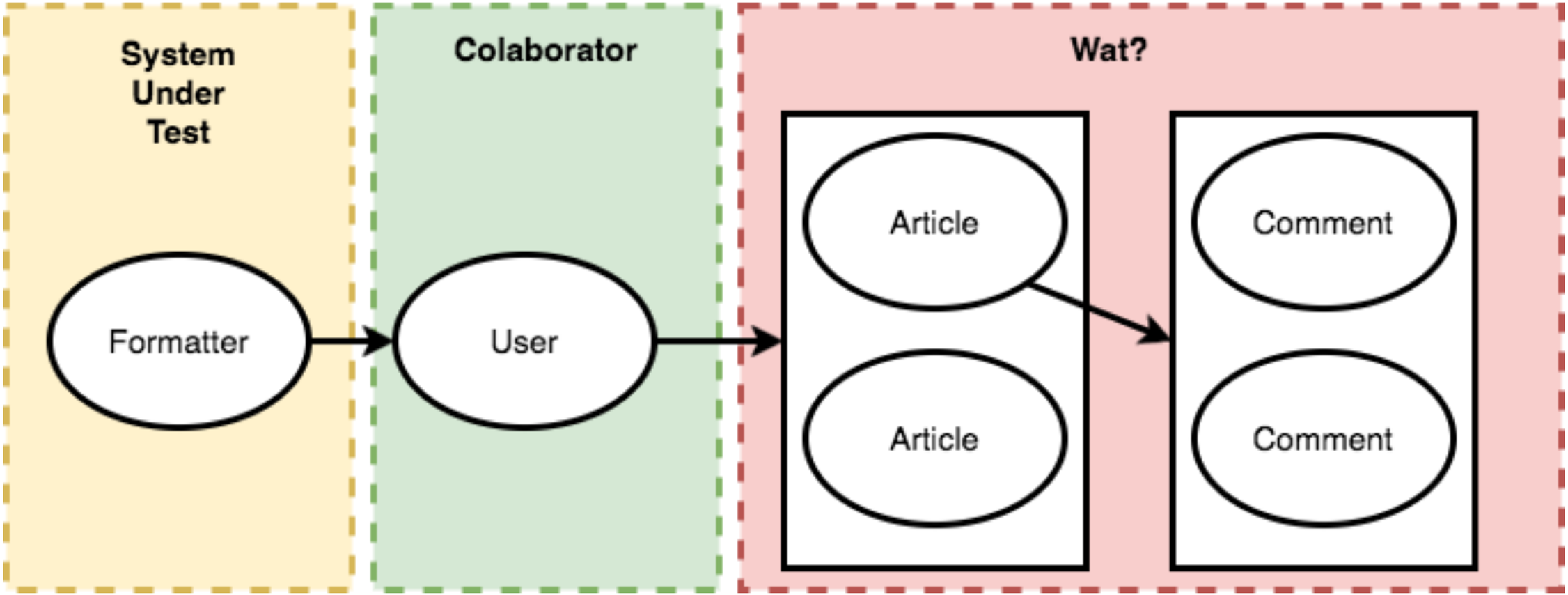
Remember this object graph?



Collaborators of collaborators

```
class Formatter
  def comment_blurb(user)
    "Most recent comment:\n #{user.articles.comments.most_recent}"
  end
end
```

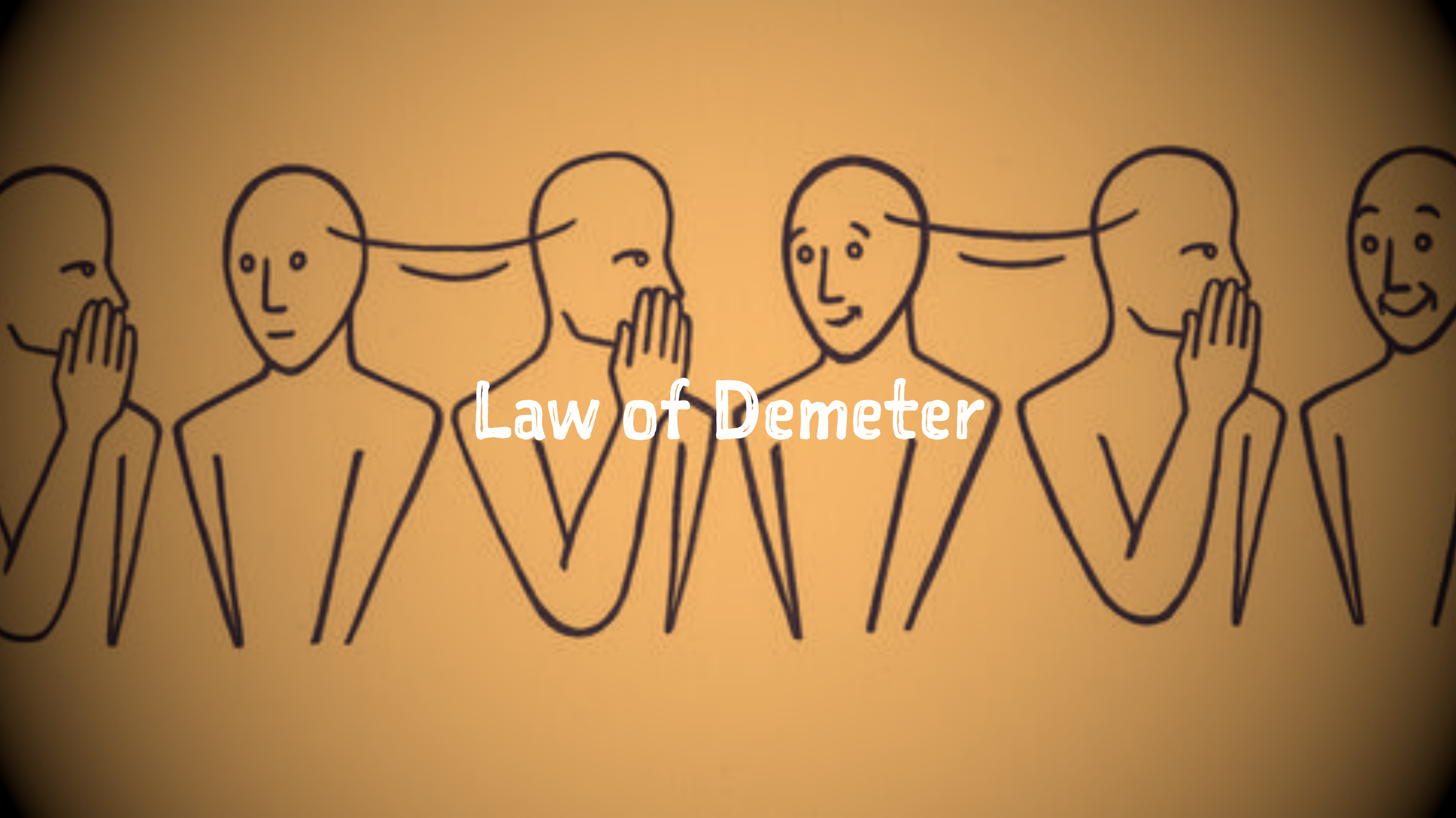
Graphical representation



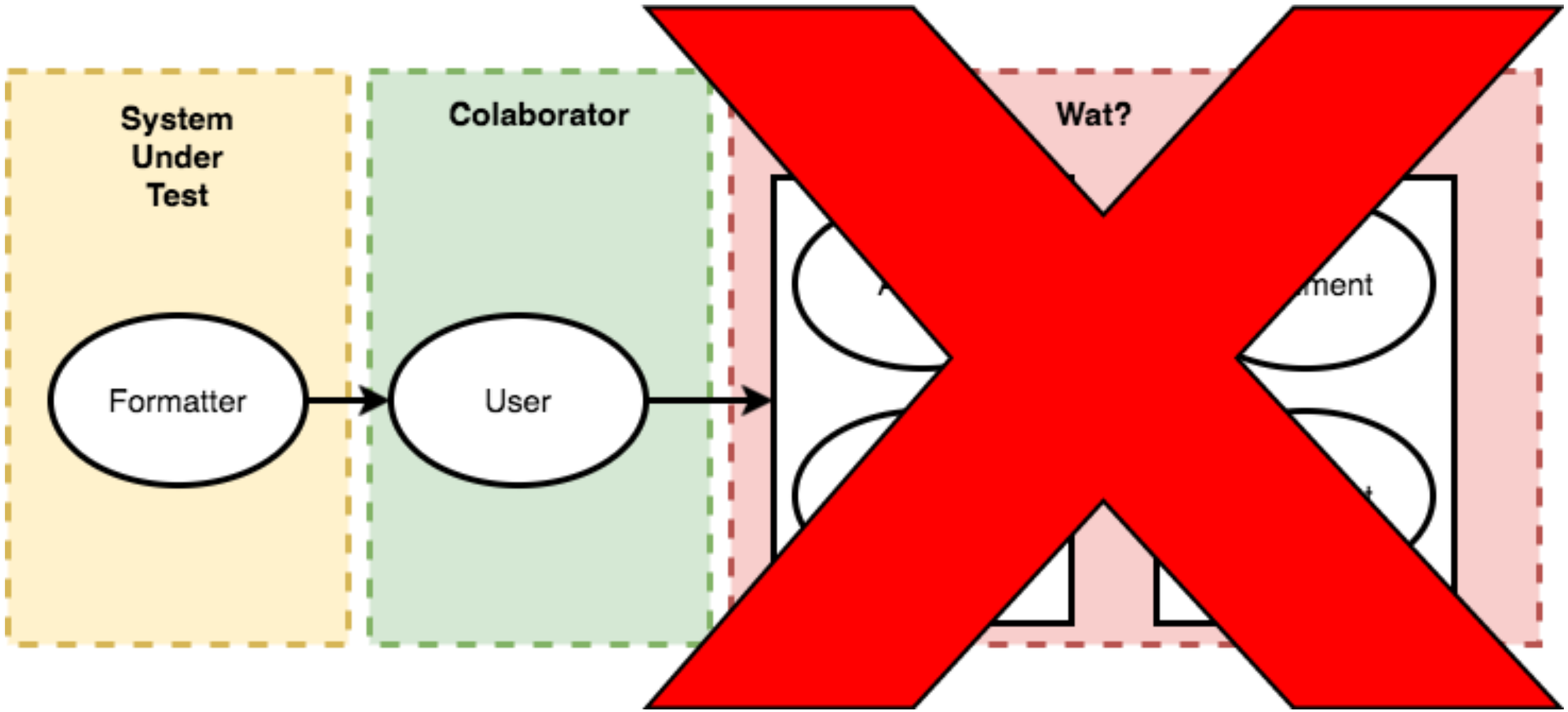
Test

```
it "shows a blurb with most recent comment" do
  formatter = Formatter.new
  comment = double(body: "great post!")
  article = double(comments: [comment])
  user = double(articles: [article])

  formatted_text = formatter.comment_blurb(user)

  expect(formatted_text).to eq "Most recent comment:\n - great post!"
end
```


Test pain often points to architecture smells


Law of Demeter

Desired result



Simpler Test...

```
it "formats a user's name with their latest comment" do
  formatter = Formatter.new
  user = double(most_recent_comment: "great_post")

  formatted_text = formatter.comment_blurb(user)

  expect(formatted_text).to eq "Most recent comment: \n - great post!"
end
```

... leads to simpler code

```
class Formatter
  def comment_blurb(user)
    "Most recent comment:\n #{user.most_recent_comment}"
  end
end
```


Something harder

There are two types of methods...

```ruby
# query
def format(user)
  "#{user.first_name} #{user.last_name}"
end

# command
def save(data)
  HTTParty.post(ENDPOINT, data)
end
```

Stubbing

```
it "posts to the API" do
  allow(HTTParty).to recieve(:post)
  data = double
  user = User.new

  user.save(data)

  expect(HTTParty).to have_recieved(:post).with(User::ENDPOINT, data)
end
```

Temptation...

```
class Sasquatch
  def to_s
    "#{full_name} - Sasquatch"
  end
end
```


JACK LINK'S
BEEF JERKY
MESSIN' WITH
SASQUATCH
JACK LINK'S
ORIGINAL
BEEF
JERKY

stubbing the system under test

```
it "renders a textual representation of the user" do
  sasquatch = Sasquatch.new
  allow(sasquatch).to recieve(:full_name).and_return("First Last")

  expect(sasquatch.to_s).to eq "First Last - Sasquatch"
end
```

The know it all

```
class KnowItAll
  def do_a_thing
    # a lot of stuff
  end

  def do_another_thing
    do_a_thing
    # do some more stuff
  end
end
```

Extract Class

```
class AnotherThing
  def do_another_thing(know_it_all)
    know_it_all.do_a_thing
    # do some more stuff
  end
end
```

Single Responsibility

Prefer composition to inheritance

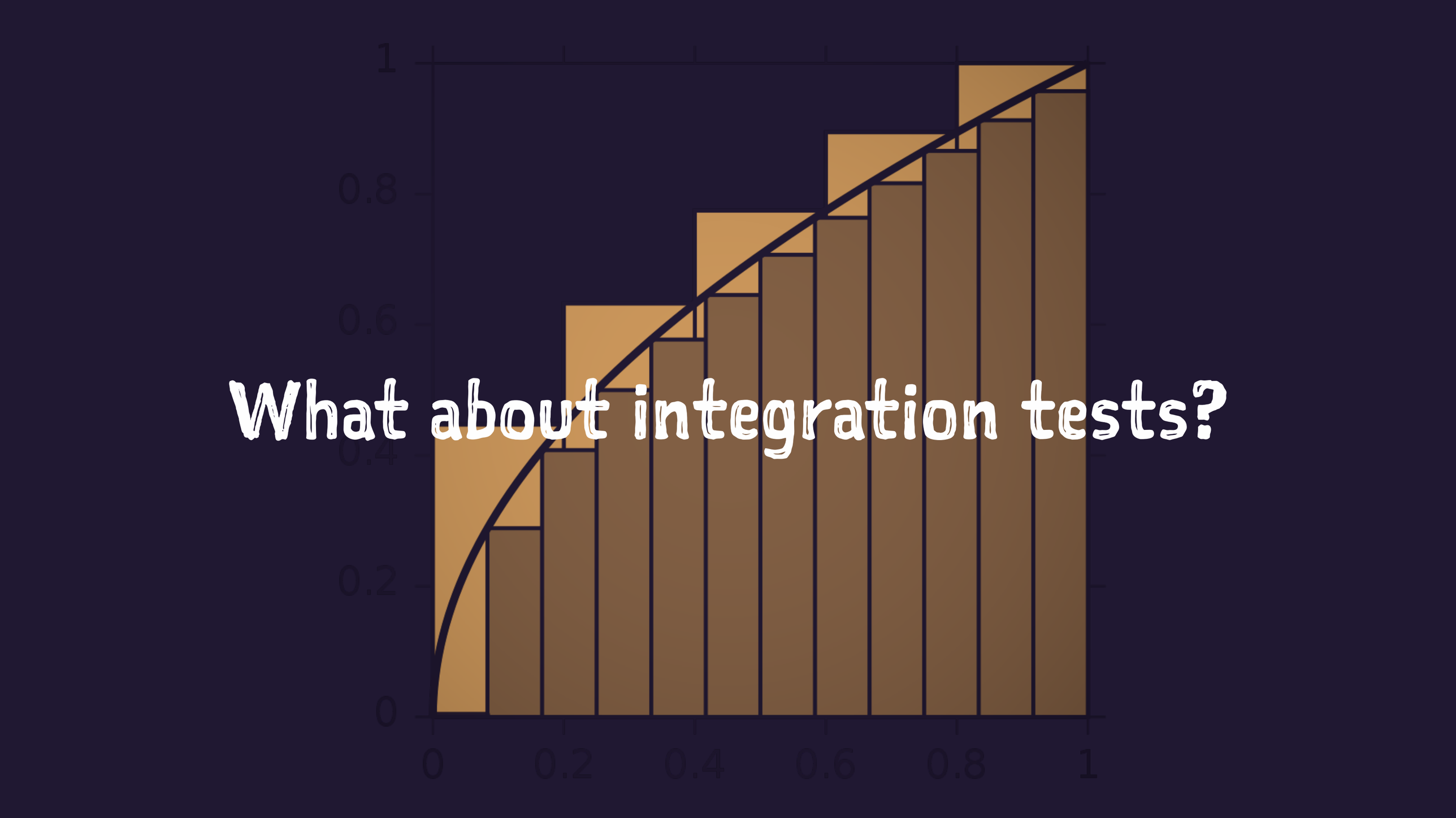
Command/Query separation (not!)

```
class User
  def self.create(data)
    response = HTTParty.post(data)
    if response.success?
      new(response.body)
    else
      false
    end
  end
end
```

Working with your framework

Principles of testing

- Isolate your subject
- Don't mess with the subject
- If you feel pain, maybe rethink your implementation



What about integration tests?

Stubbing the system under test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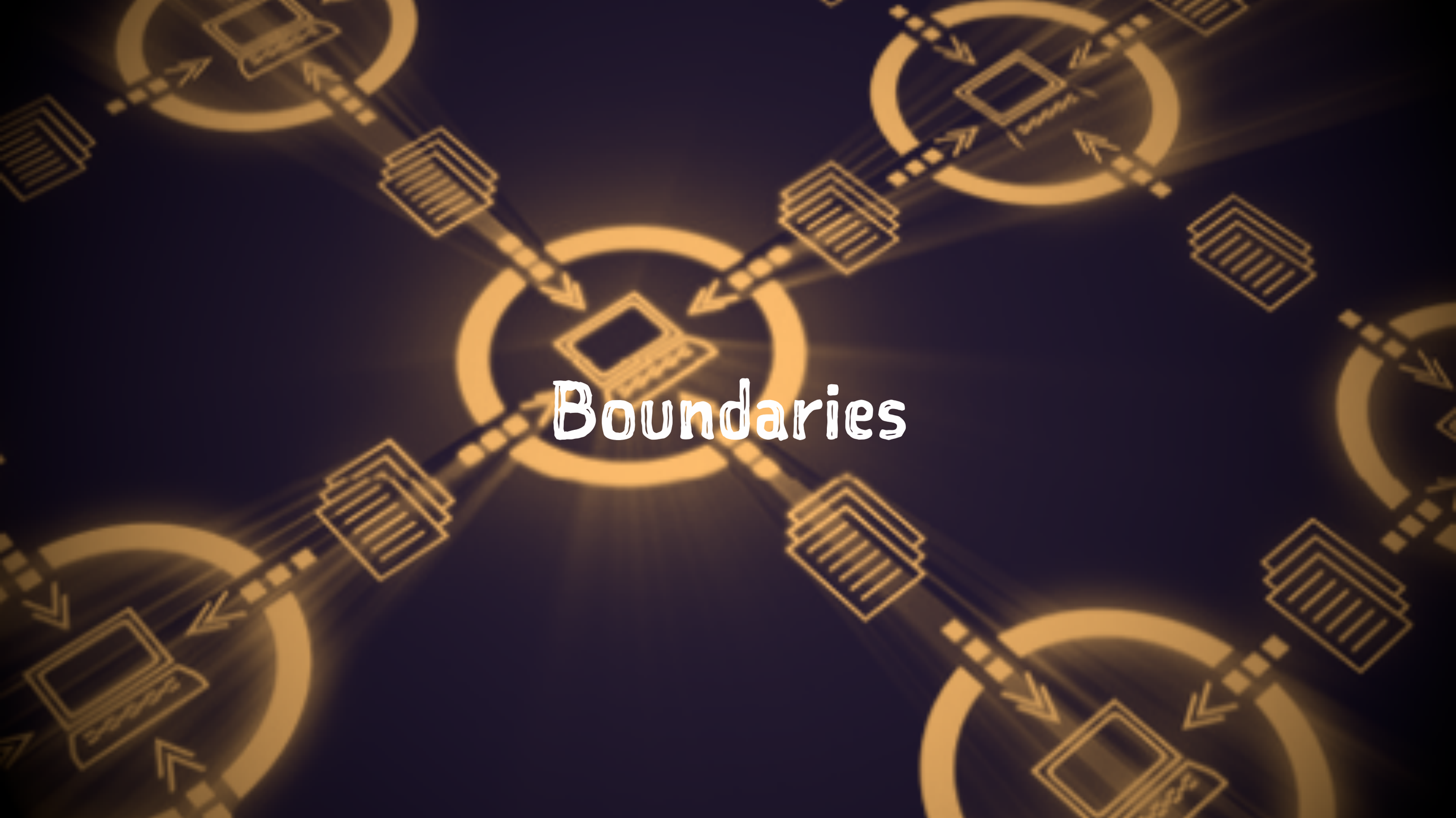
SASQUATCH
JACK LINK'S
ORIGINAL
BEEF
JERKY


Boundaries

Principles of testing

- Isolate your subject
- Don't mess with the subject
- If you feel pain, maybe rethink your implementation

Questions?

Slides:

http://github.com/JoelQ/testing-in-isolation