XRAY

Human-Centric Exploratory Testing

"Somewhere, something incredible is waiting to be known."
- Carl Sagan

Sérgio Freire

Solution Architect &
Testing Advocate

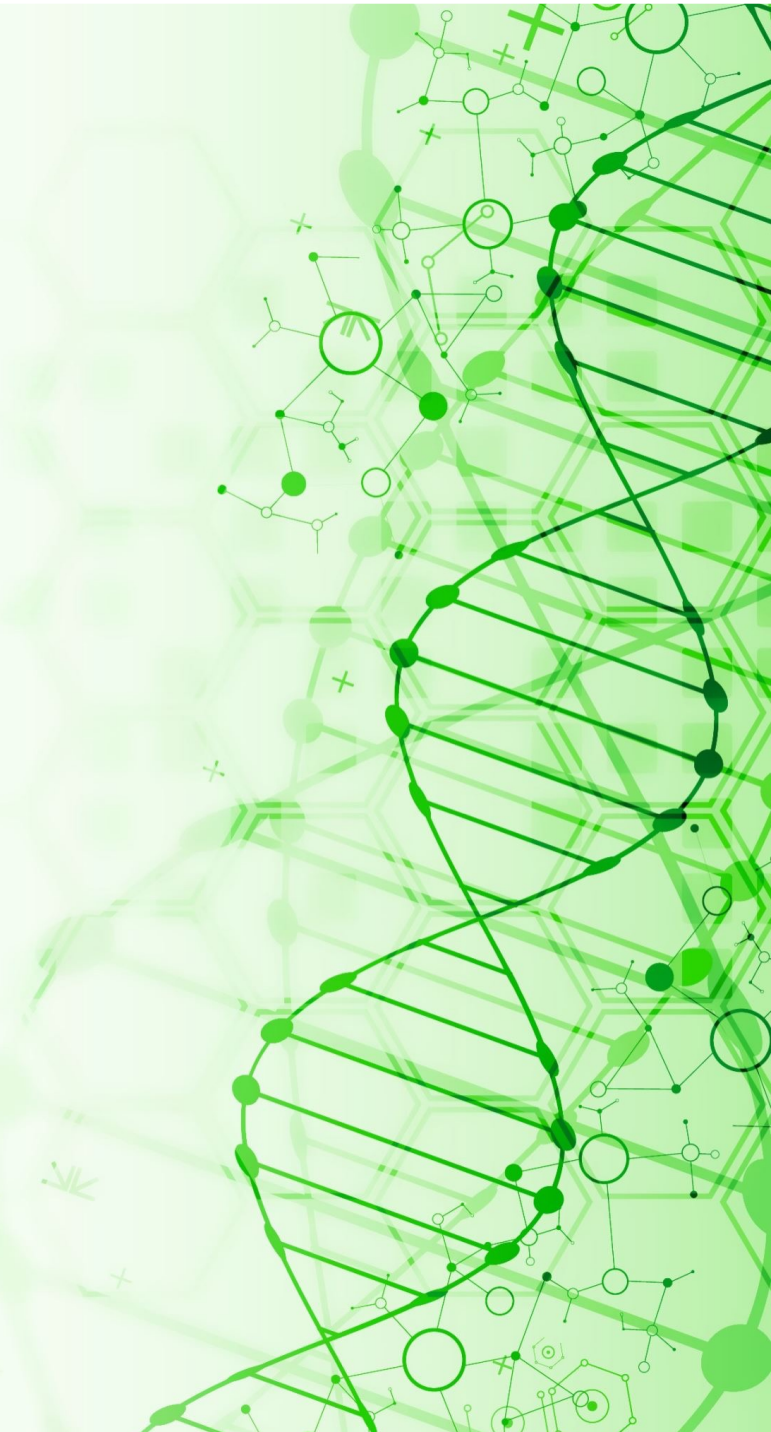
Xray

@darktelecom

Humans

- We expect different things
- On different moments
- Our hurry is different
- Our tolerance to friction is different
- Our background is different
- Our goals are also different

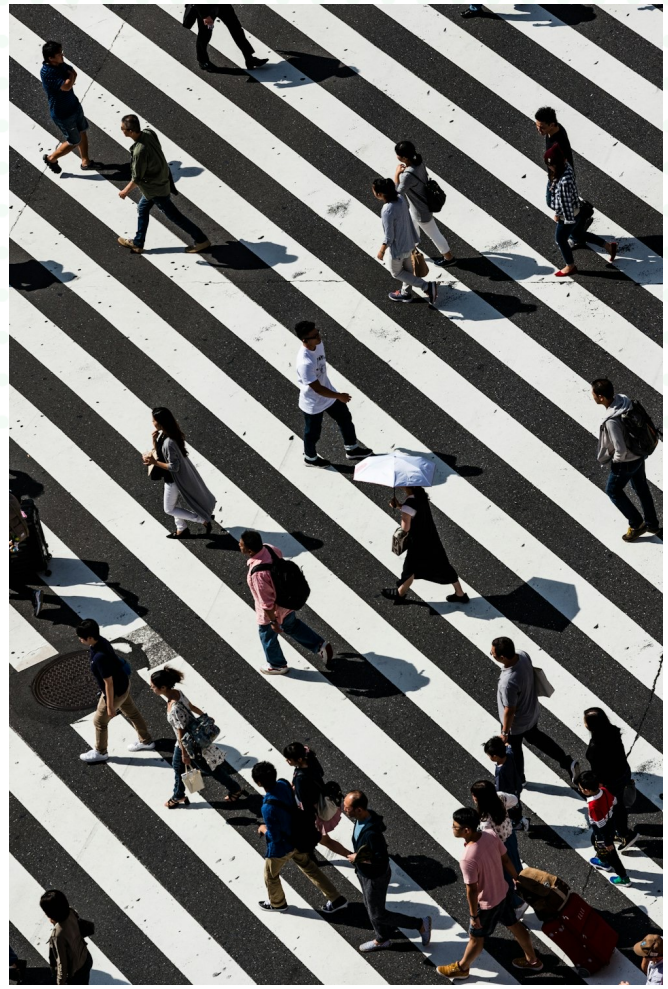
Quality is in the eye of the beholder.
We need to find what's relevant.



What makes humans unique?

How do we find information and how can it change depending on the user?

- Curiosity
- Learning
- Insatiable
- Emotional
- Smart
- Social
- Individual
- And more...



We dream, we dare, we uncover.

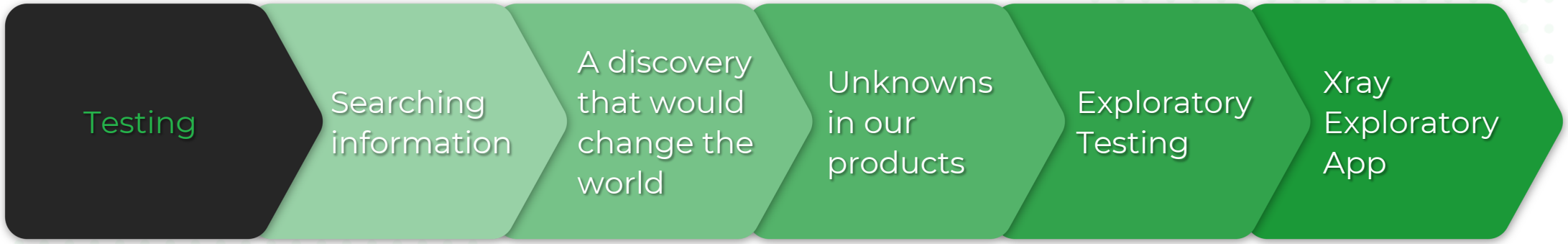
We don’t follow steps.

We walk unchartered territories.

We learn.

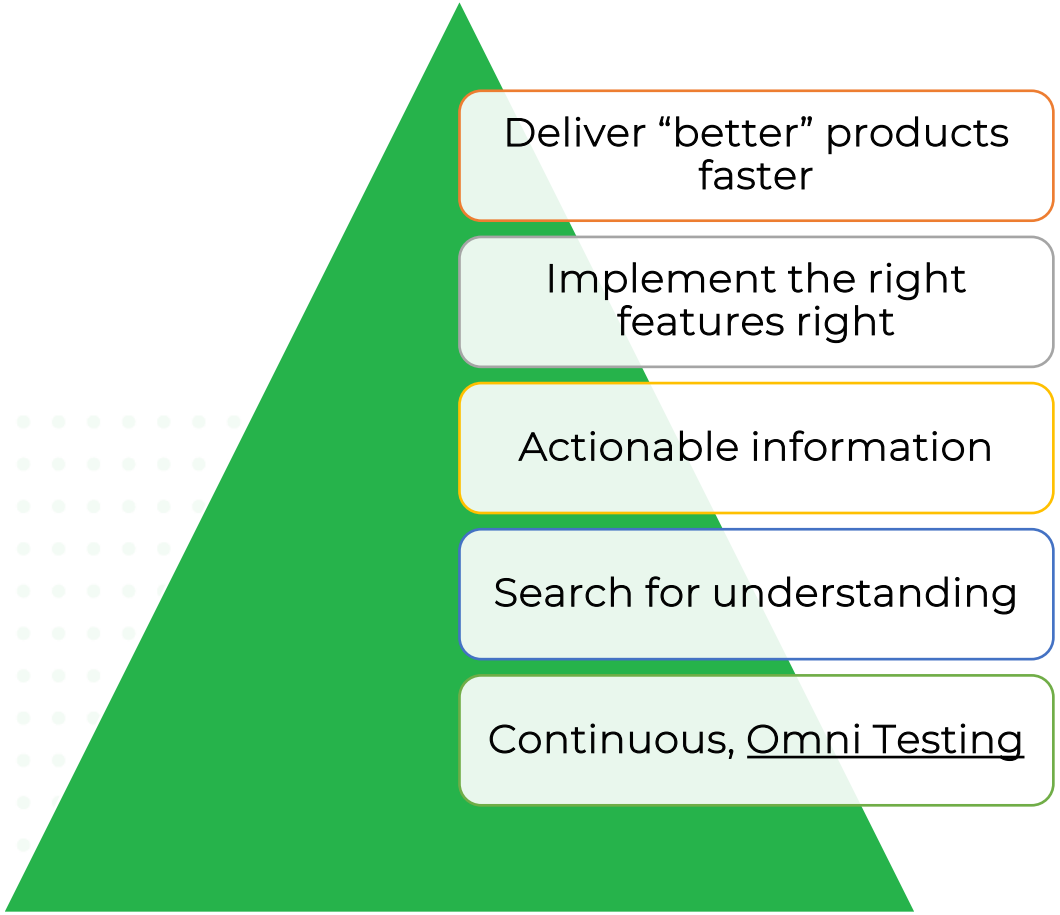
We go beyond.

Image from Unsplash.


Testing
Searching information
A discovery that would change the world
Unknowns in our products
Exploratory Testing
Xray Exploratory App


Product
MINOLTA
X-G-M

Does it meet demand? Does it taste well?



Testing: some definitions

*Testing is an empirical, technical **investigation** conducted to provide quality-related information about a software product to a stakeholder. - Cem Kaner*

Testing is the process of evaluating a product by learning about it through **exploration and experimentation**, which includes to some degree questioning, studying, modeling, observation, inference, etc. – *James Bach & Michael Bolton*

Testing is all about reducing risk. – *Janet Gregory*

*Investigation? **Discovery**? Examination? **Experimentation**? Analysis? Inspection? Research? – Dan Ashby*

*Testing is about finding new **information** - Rikard Edgren*

Testing, my definition

Testing is a **targeted** process of **challenging something (e.g. a product) and our understanding about it**, using a set of activities leveraged by specific human skills, assisted and augmented by tools.

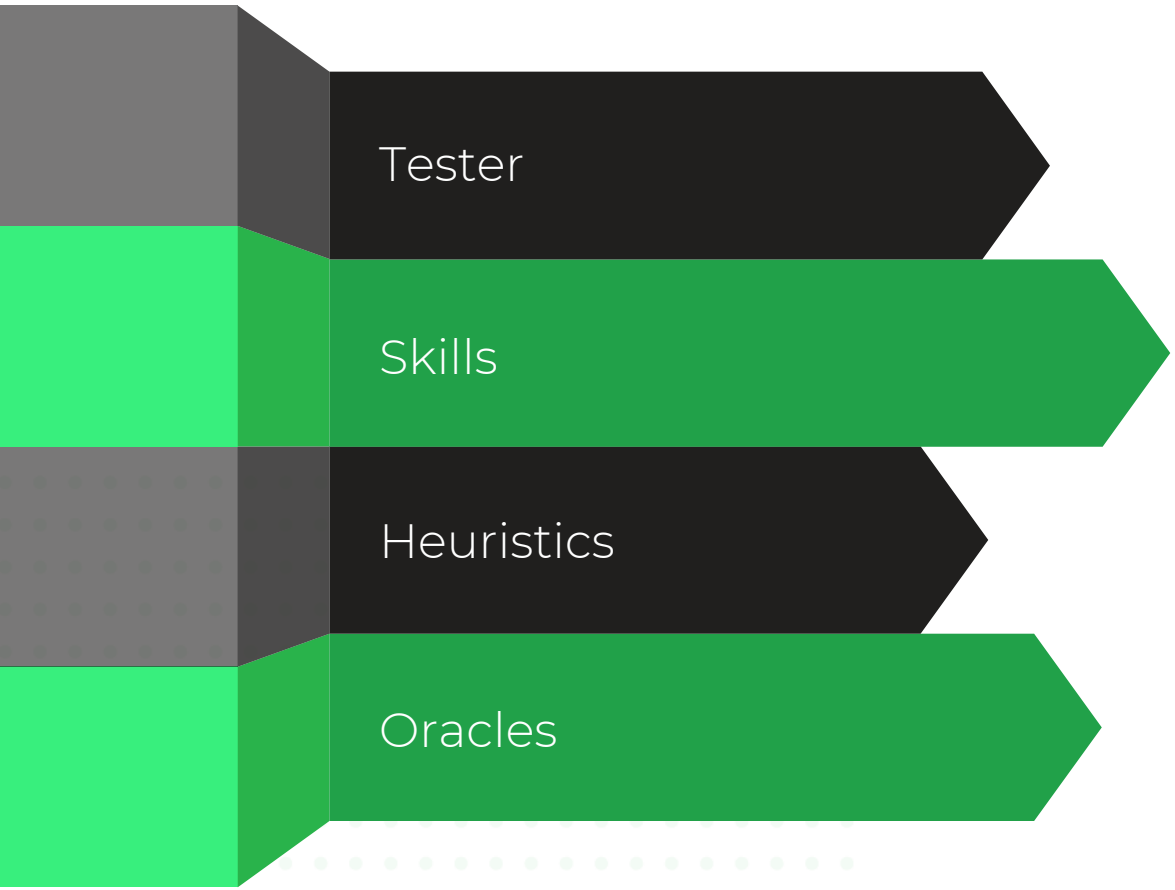
– *Sergio Freire et al*

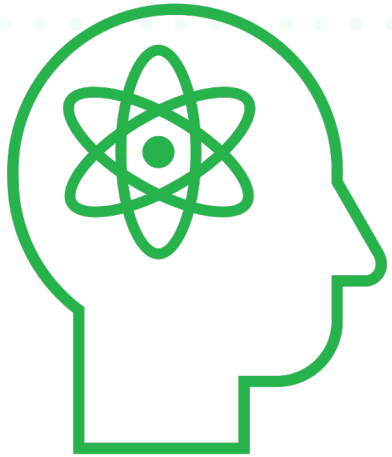
Testing outcome: information => quality assessment

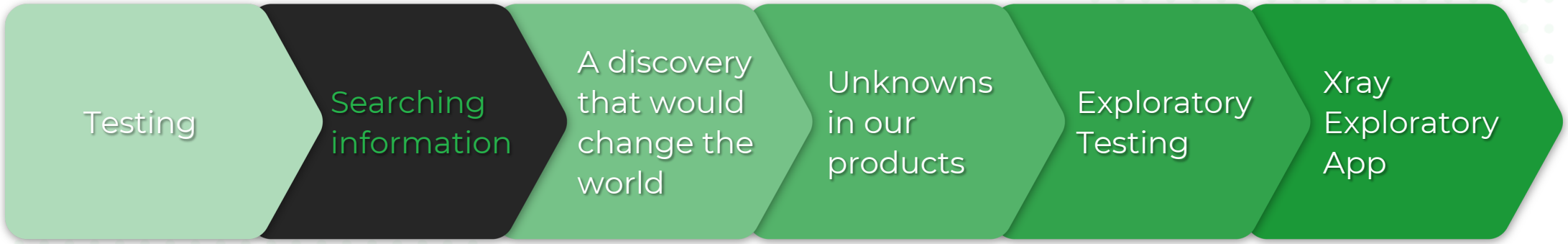
~~X~~ quality

Testing ultimate goal

How we test?



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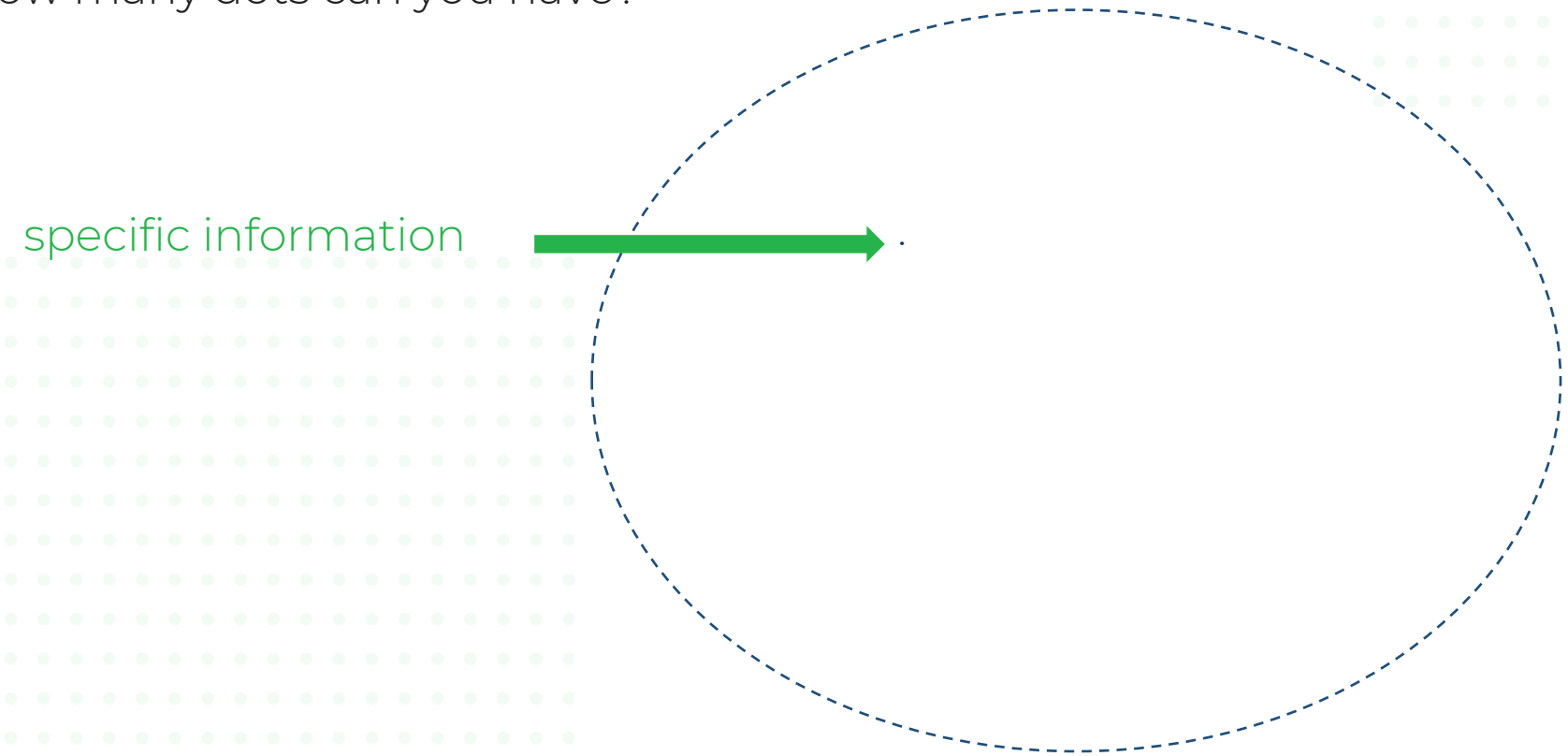
Our test target

Consider a dot as an information (e.g. a behaviour or a bug) about our test target.

How many dots can you have?



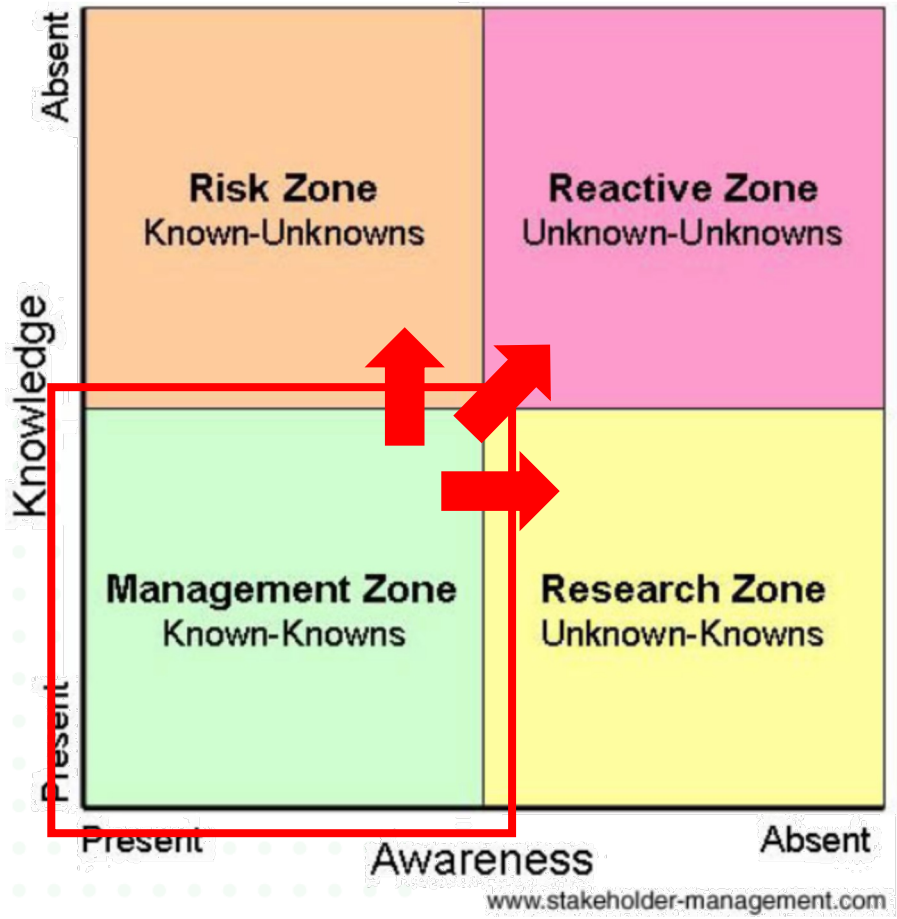
FACTS!

- It’s impossible to test everything!
- Resources (human, tools, time, $$$) are limited

The tester/team needs to make choices

Risks?

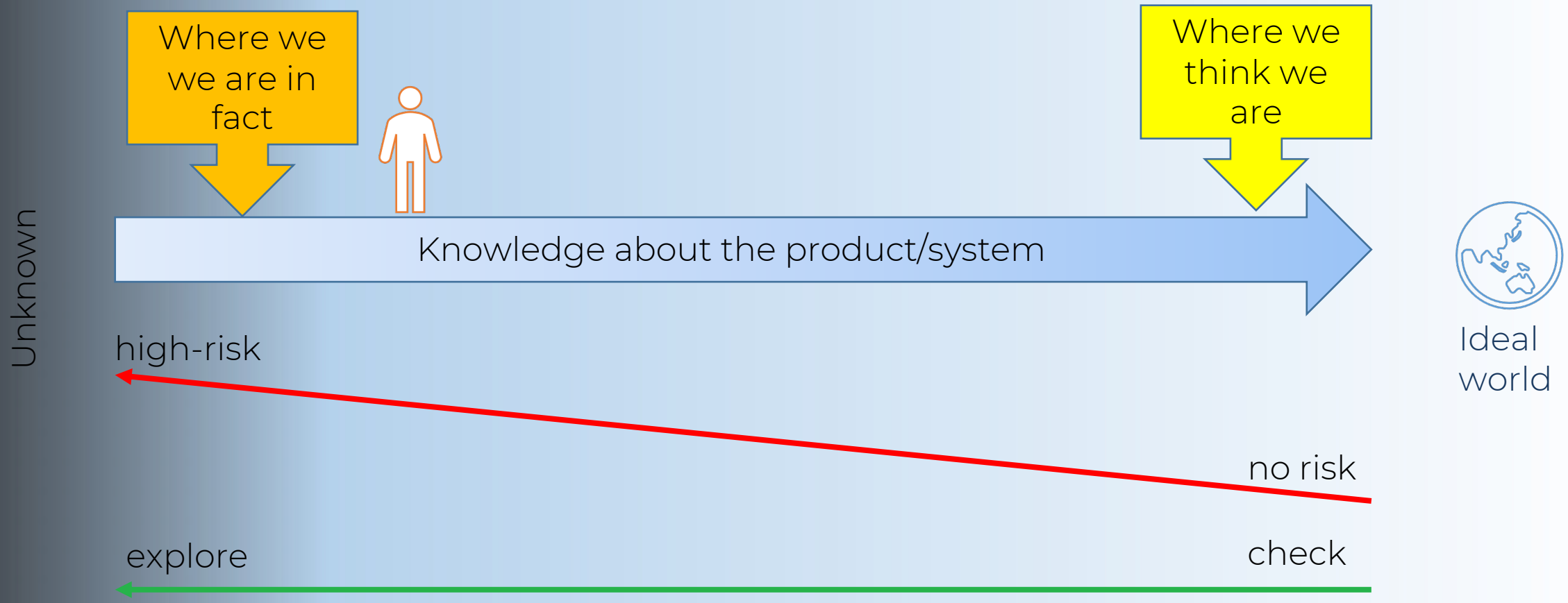
Risks



We want to address important risks but...

How can we identify and know more about unknown risks?

Risks and testing



Adapted from Callum Akehurst-Ryan


Experiment


Rim
Vera Rubin Ridge
Etive 2
Glen Etive 1
Probe


Observe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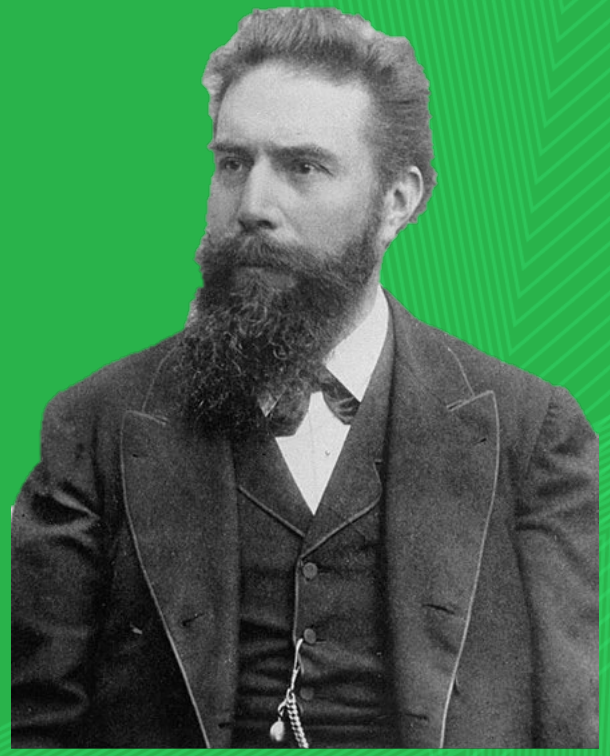
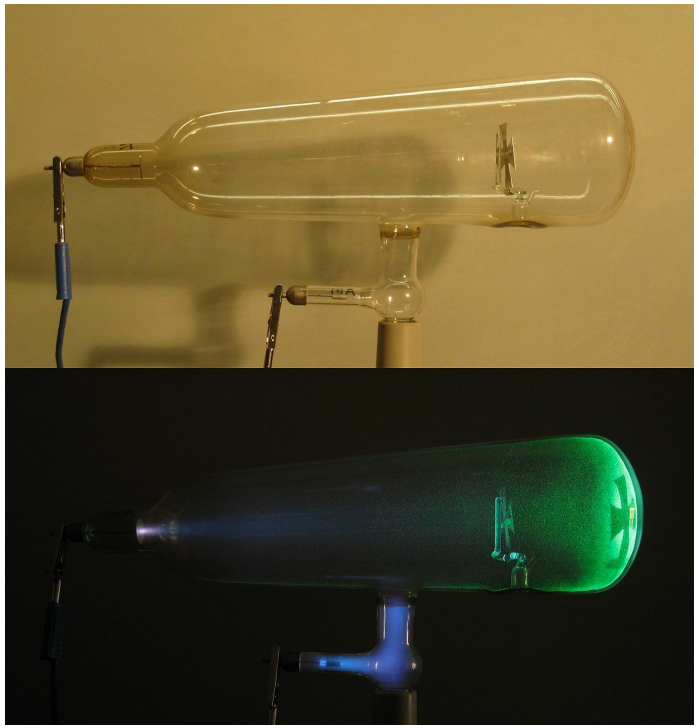


Wilhelm Röntgen

1895-11-08: Something was about to happen

By Leslie Ward - Published in "Vanity Fair", 21 May 1903



Meet the first X-ray of a human

- November 8th, 1895: X-rays discovery
- December 28th, 1895: report “"On a new kind of ray: A preliminary communication" ” published
- December 10th, 1901: 1st Nobel Prize in Physics

Print of Wilhelm Röntgen's first "medical" X-ray, of his wife's hand, taken on 22 December 1895

X-rays discovery: a matter of luck?!

Seneca: *“Luck is what happens when preparation meets opportunity.”*

serendipity

Louis Pasteur: *“In the fields of observation chance favours only the prepared mind”*

Explore the unknown with Exploratory Testing

The truth lake

Truth (infinite)

- all possible uses of our product in all possible scenarios
- every possible bug

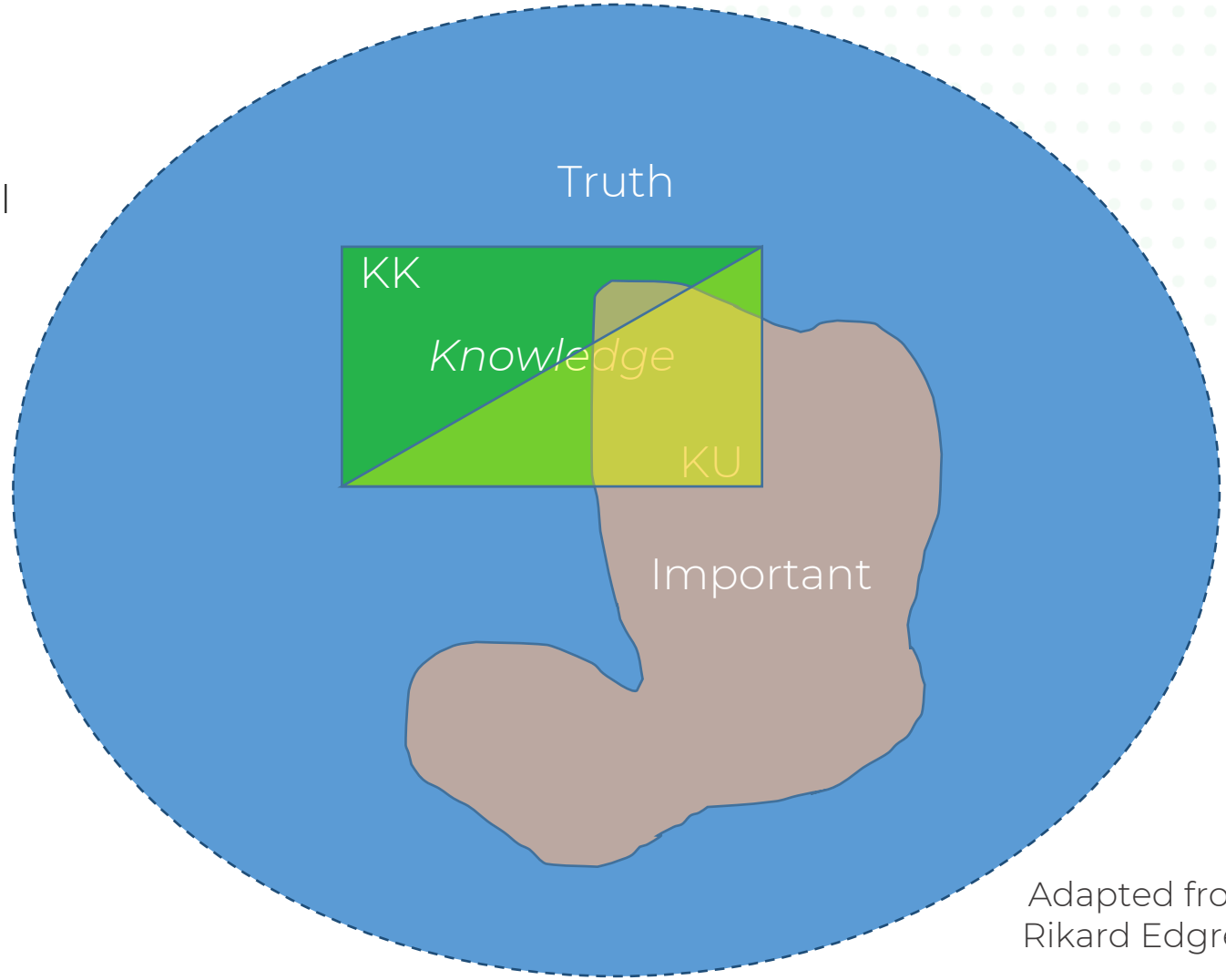
Knowledge

- KK+KU (known knowns, known unknowns)

Important

- risks we need to address

How to ensure we find many things around what's important?

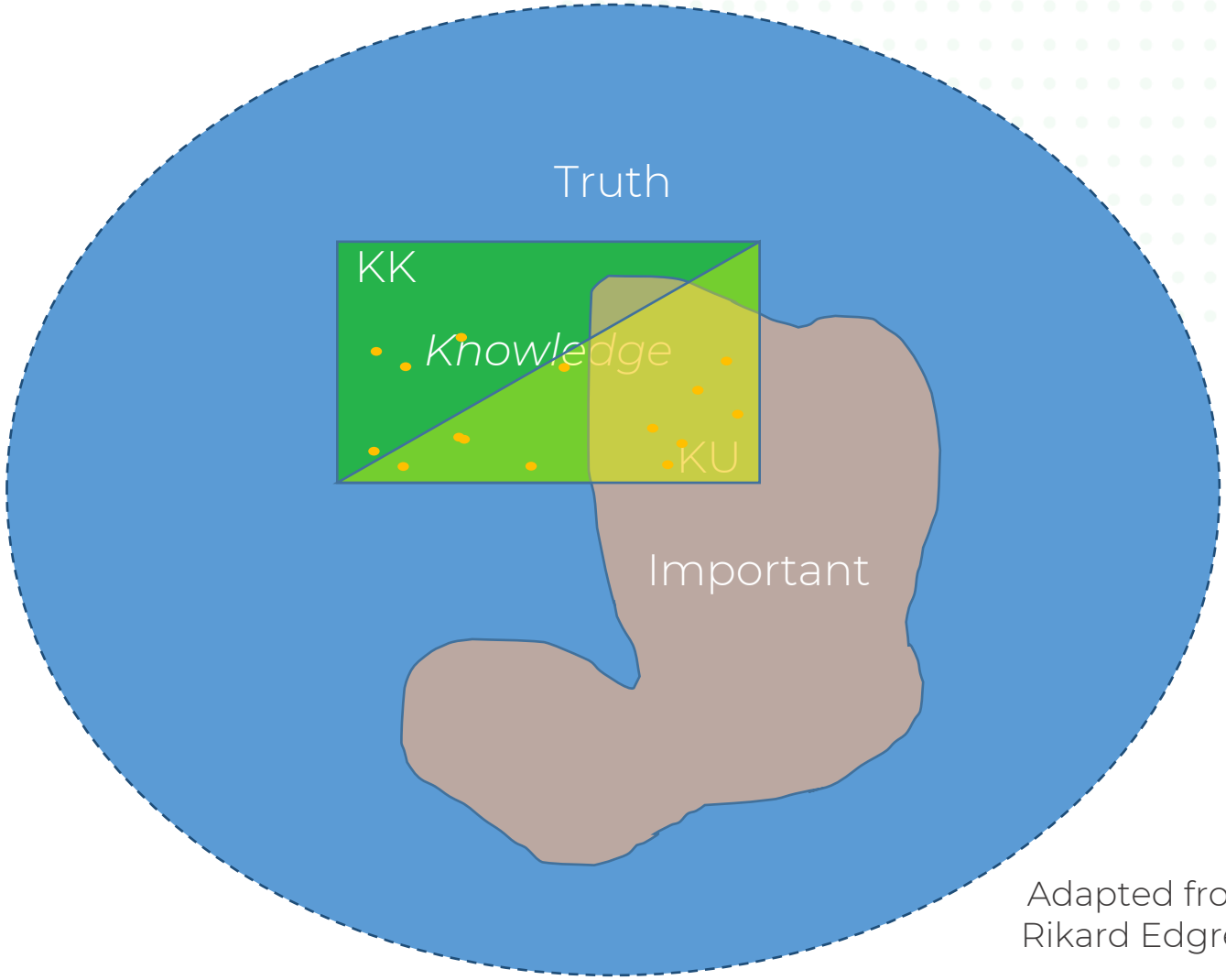


Adapted from Rikard Edgren

Focusing on (outdated) knowledge

Important issues will be missed.

- Scripts (actions/expected results) can only tackle knowledge and to a very limited point!
- More scripted tests won't increase knowledge

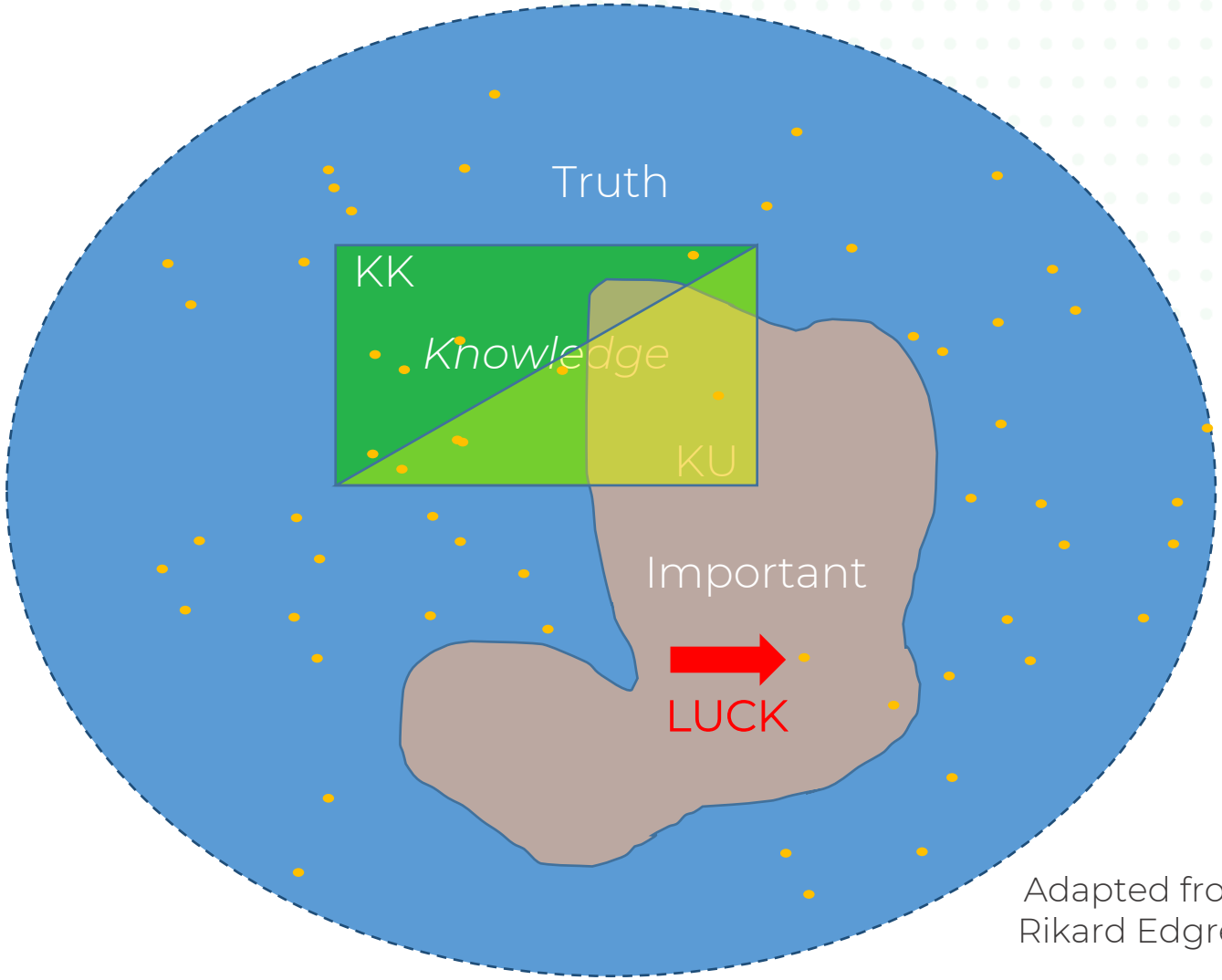


Adapted from Rikard Edgren

Challenge: How to go beyond knowledge?

Random testing?

We need to explore the unknown wisely.

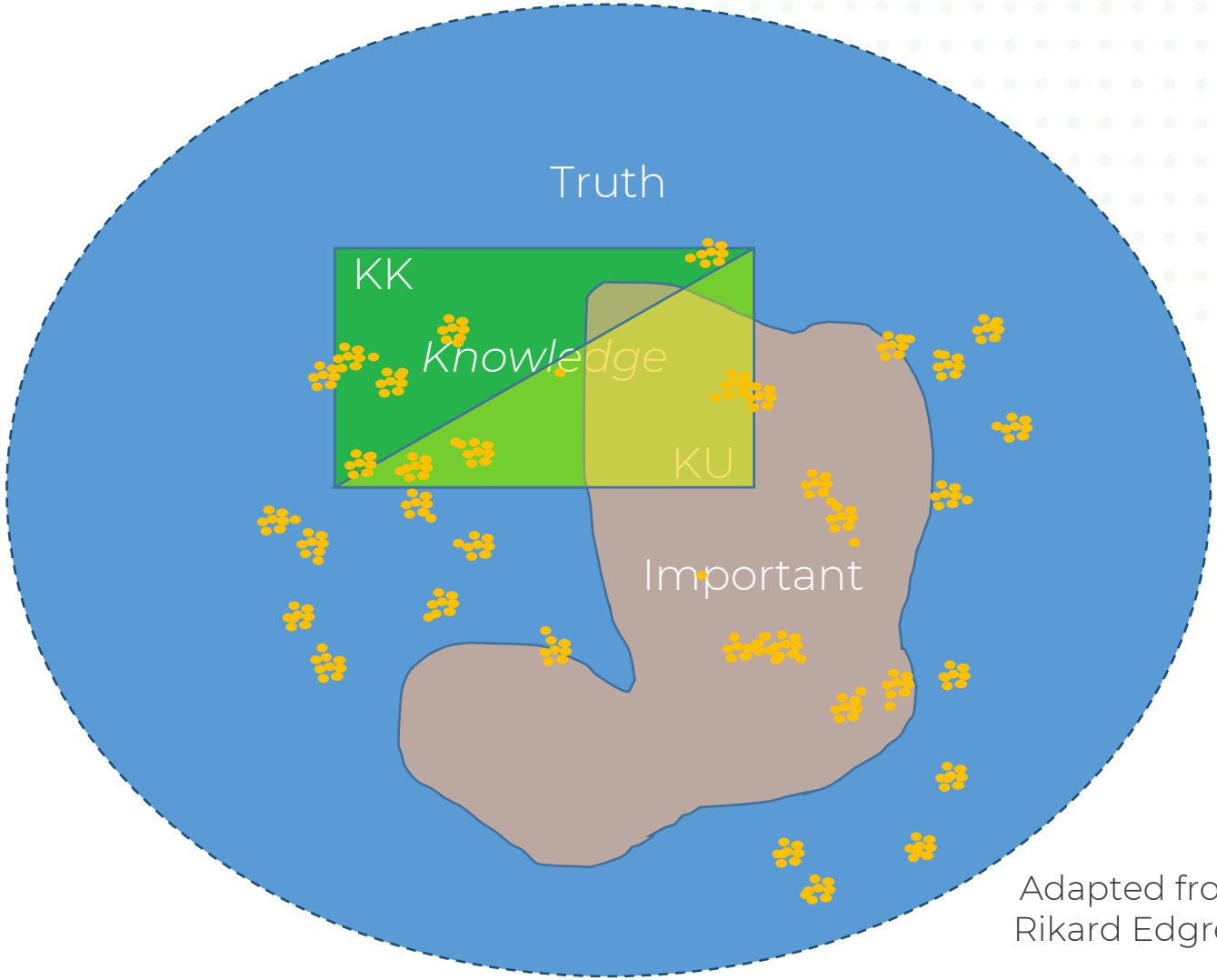


Adapted from
Rikard Edgren

Looking for important issues

Increasing probability of serendipity

- Prepare your knowledge backpack
- Prepare the environment
- Explore with curiosity, courage, observation and perseverance
- Iterate and keep learning



Adapted from
Rikard Edgren

Knowledge backpack as an uncovering tool

Product

- Customer needs
- Requirements/Specs
- Risks
- Architecture & frameworks used
- Team & project context
- Current product usage
- Support issues
- Build & deployment process
- Tooling
- APIs (internal & external)
- 3rd party services

Testing

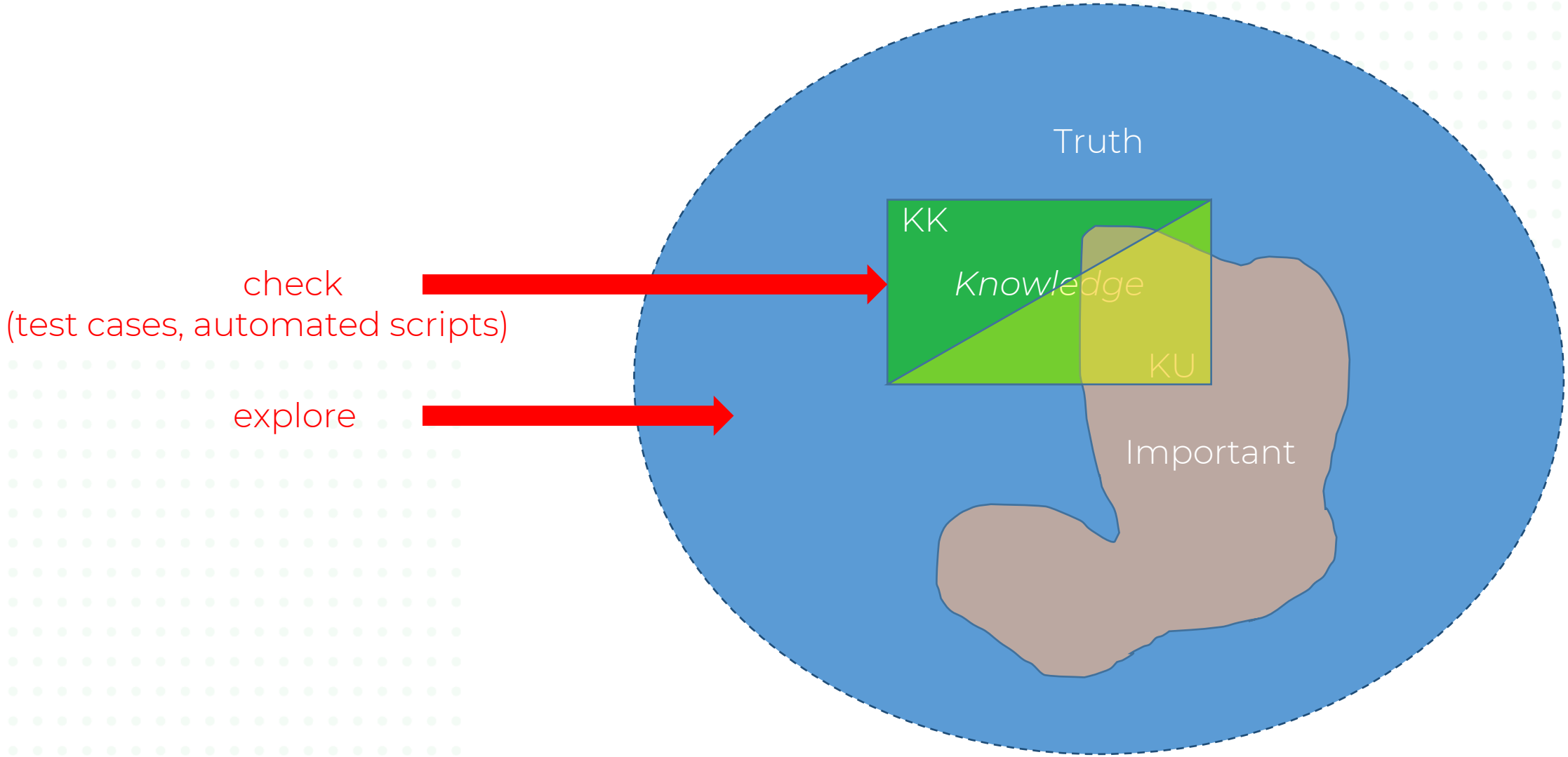
- Heuristics
- Oracles
- Testing techniques
- Quality attributes/criteria
- Test types
- Test levels
- Testing approaches/styles

Explore the product from multiple angles

Use **“diverse half-measures”**-- lots of different points of view, approaches, techniques, even if no one strategy is performed completely.

-- Cem Kaner, Black Box Software Testing

A simplified model to fit testing approaches



Exercise: Learning a topic by reading a book

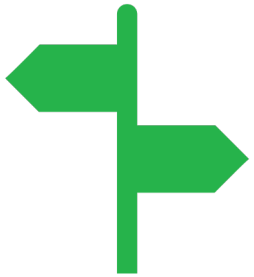
Let's think for a moment...

- Extent
- Freshness
- Bias
- Improving

Exercise: Porto → Lisbon using the highway

Let's think for a moment...

- Auto-pilot/Repeat
- Detours
- Missed interesting places

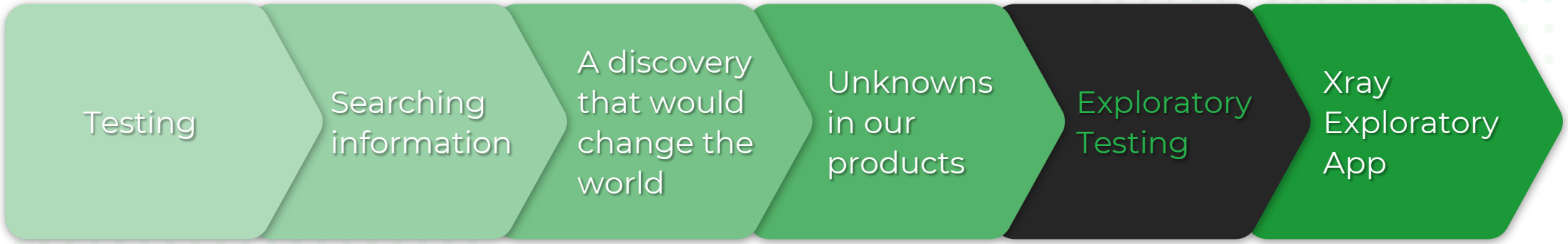


100% scripts are OK: what does it mean?

That those specific tests, executed exactly in that step order, in that context, produced the expected results. It can give a misleading sense of knowing all about the product

It doesn't tell you...

- About usefulness, relevance
- Much about risks, which are dynamic
- About the unknowns
- Uncovered gaps
- Original scripts intent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Example: Accounting system

Scripted testing

1 + 0 = 1	OK
1 + 2 = 3	OK

Exploratory testing

1 + 2 = 3	Ok, how about if we switch elements?
2 + 1 = 3	Seems ok. Hmmm Let's try subtract one of elements..
3 - 2 = X	Unsupported operation. Ups!

- Check with a script

verification

- Explore with intent

discoveries

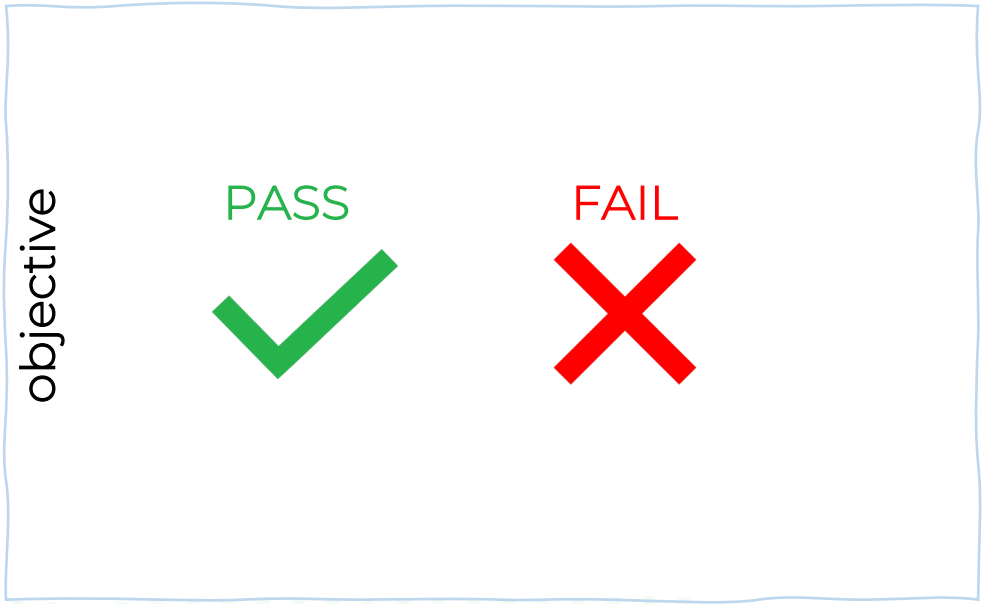
Differences in outcomes

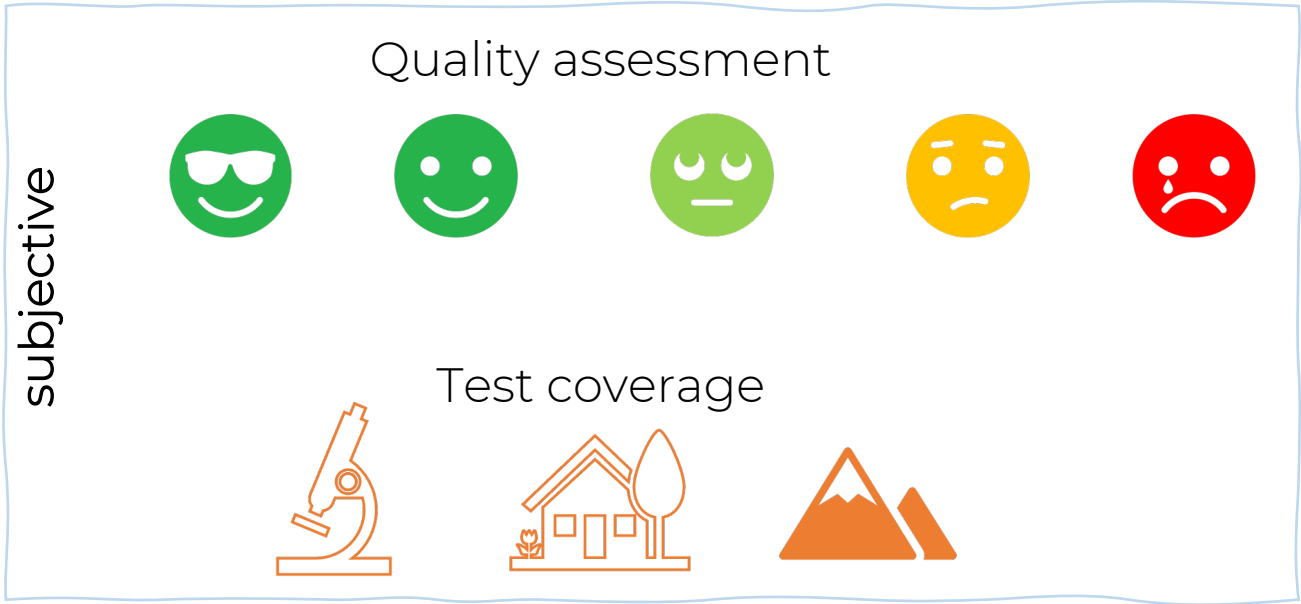
Scripted testing

- Have my expectations been met?

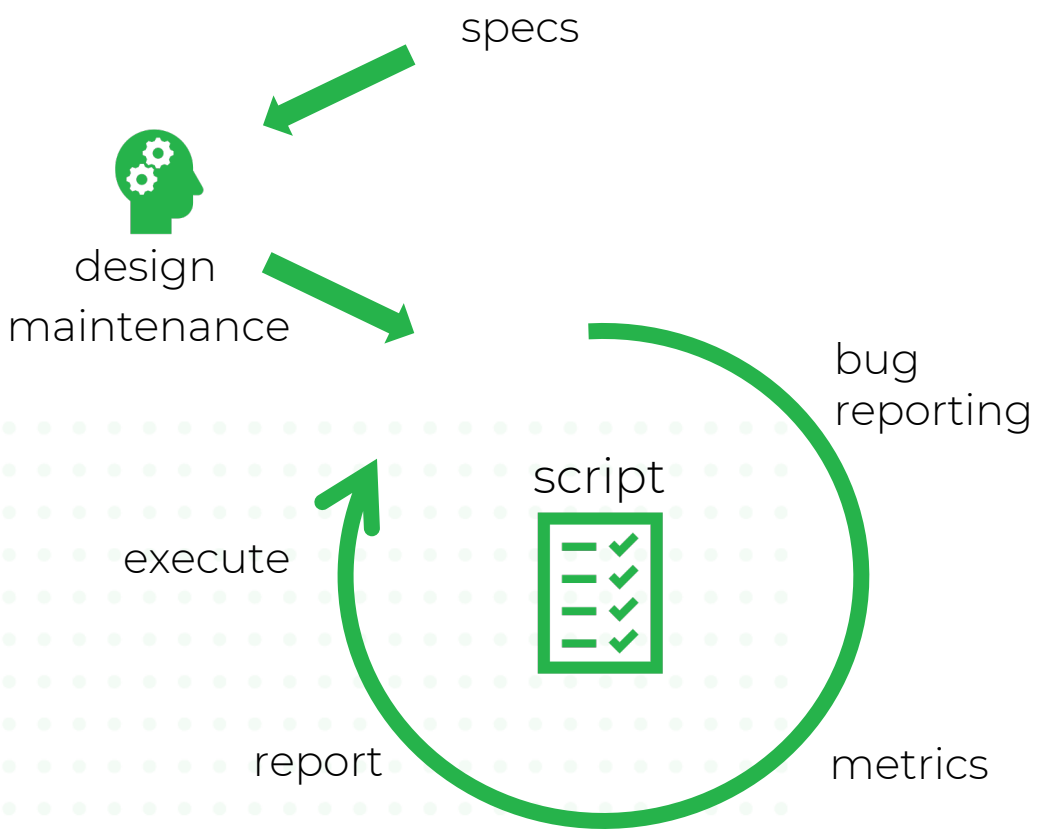
Exploratory testing

1. How confident am I about releasing it?
2. Did I have opportunity to look at details?

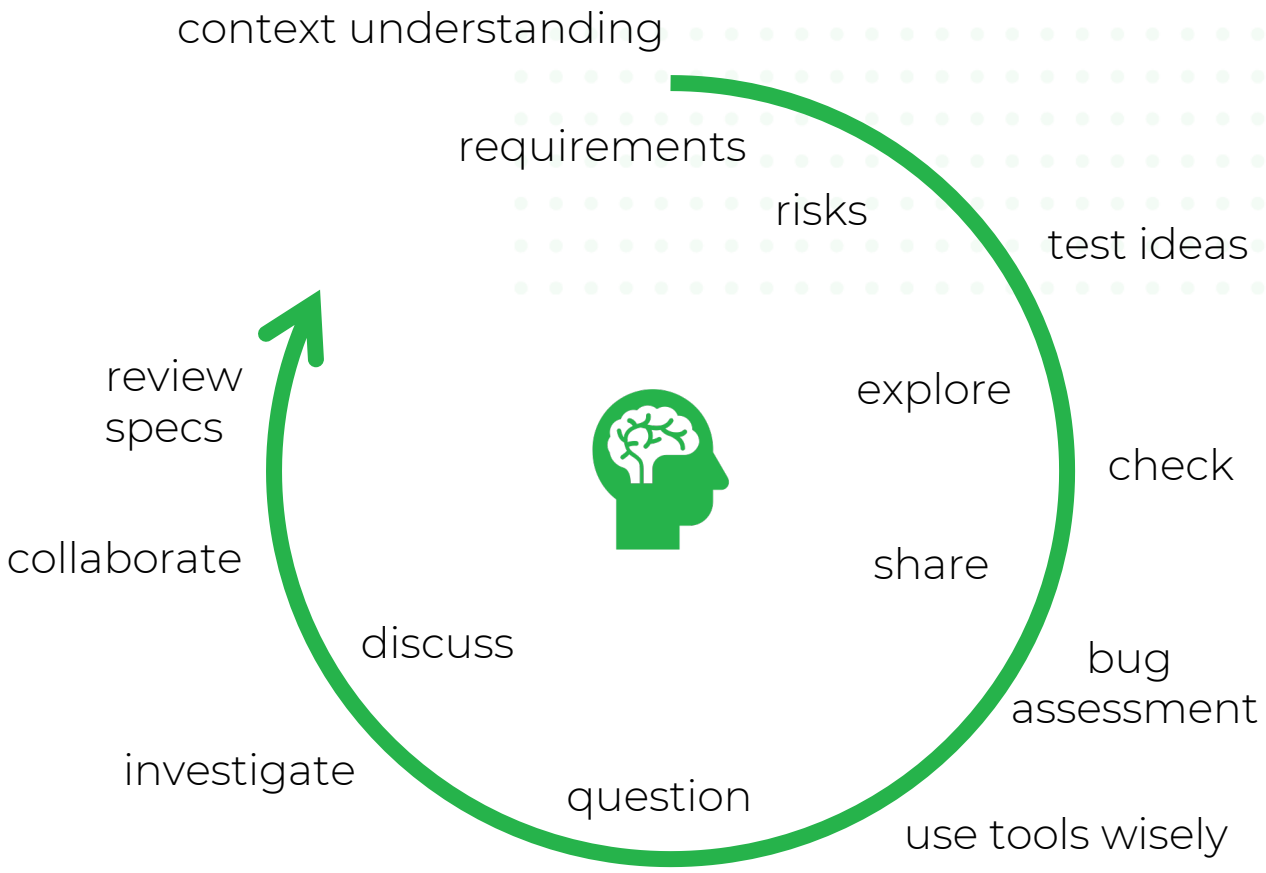




Where’s the tester? What’s important?



Scripted testing



Exploratory testing
(human-centric)

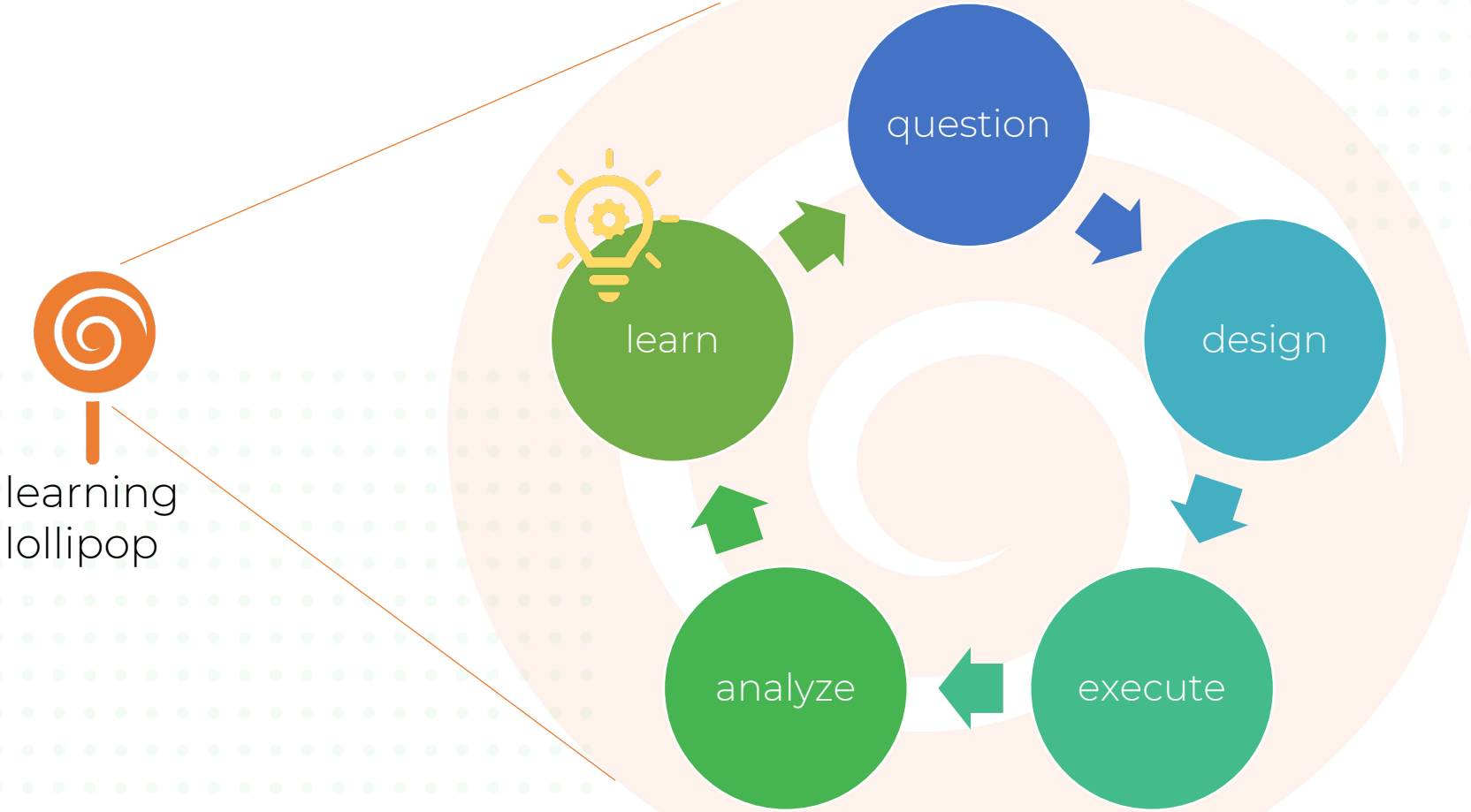
ET: definitions from the community

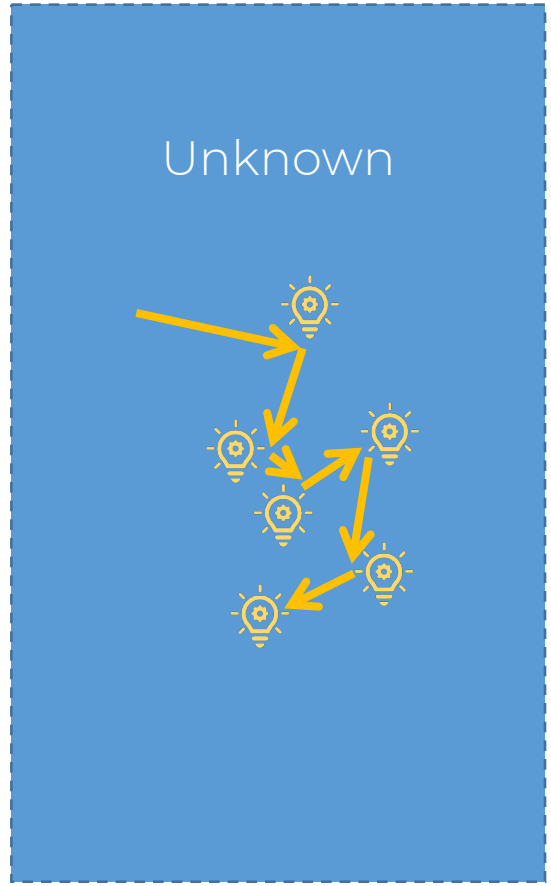
Exploratory testing is a systematic approach for discovering risks using rigorous analysis techniques coupled with testing heuristics - *Elisabeth Hendrickson*

Exploratory Testing is an approach to testing that centers the person doing testing by emphasizing intertwined test design and execution with continuous learning where next test is influenced by lessons on previous tests. - *Maaret Pyhäjärvi*

An approach to testing whereby the testers dynamically design and execute tests based on their knowledge, exploration of the test item and the results of previous tests. – *ISTQB glossary*

What happens during test execution





Based on previous work from Nancy Keln and Mark Winteringham

Skills in exploratory testing

- Learning
- Curiosity
- Analytical thinking
- Critical thinking
- Lateral thinking
- Observer
- Creativity
- Explorer
- Courageous
- Patience, Persistence and Perseverance
- Coding
- Note-taking

- Communication
- Empathy
- User advocate
- Organized
- Collaborative
- Tools
- ...

The charter

Explore <area, feature, risk>

with/using <resources, restrictions, heuristics, dependencies>

to discover <information>

Adapted from Maaret Pyhäjärvi, Elisabeth Hendrickson

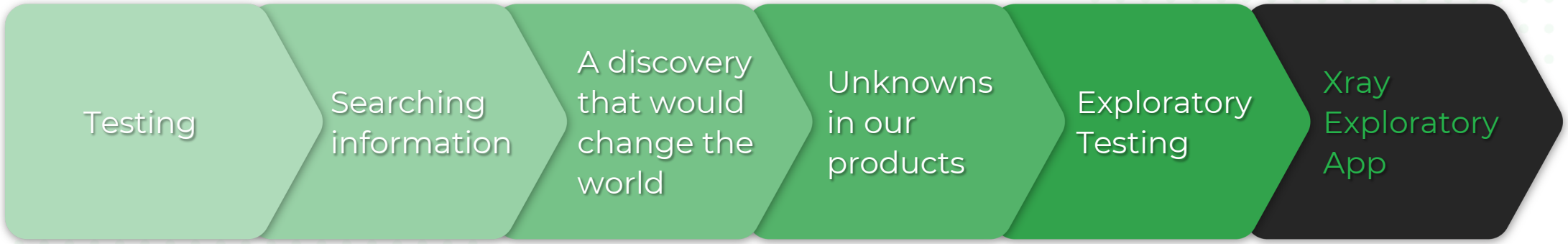
Explore the login page
Using Chrome and different screen sizes
To discover problems with usability

Benefits of Exploratory Testing

- Easy to jump in (no tough preparation)
- Learn anytime
- Better use of time
- Uncover unknowns
- Uncover gaps
- Assess important risks
- Always up-to-date

Tips for uncovering the unknown with ET

- Prepare as much as possible upfront
- Turn-off all distractions
- Be aware of possible, useful heuristics for that charter
- Focusing & defocusing
  - Focus for critical thinking
  - Defocus for creative thinking
- Move away from known parts (Iryna Suprun)
- Perform sessions with different testers, even around the same charter
- Pair
- Augment your testing using tools where appropriate (don’t be afraid of trying)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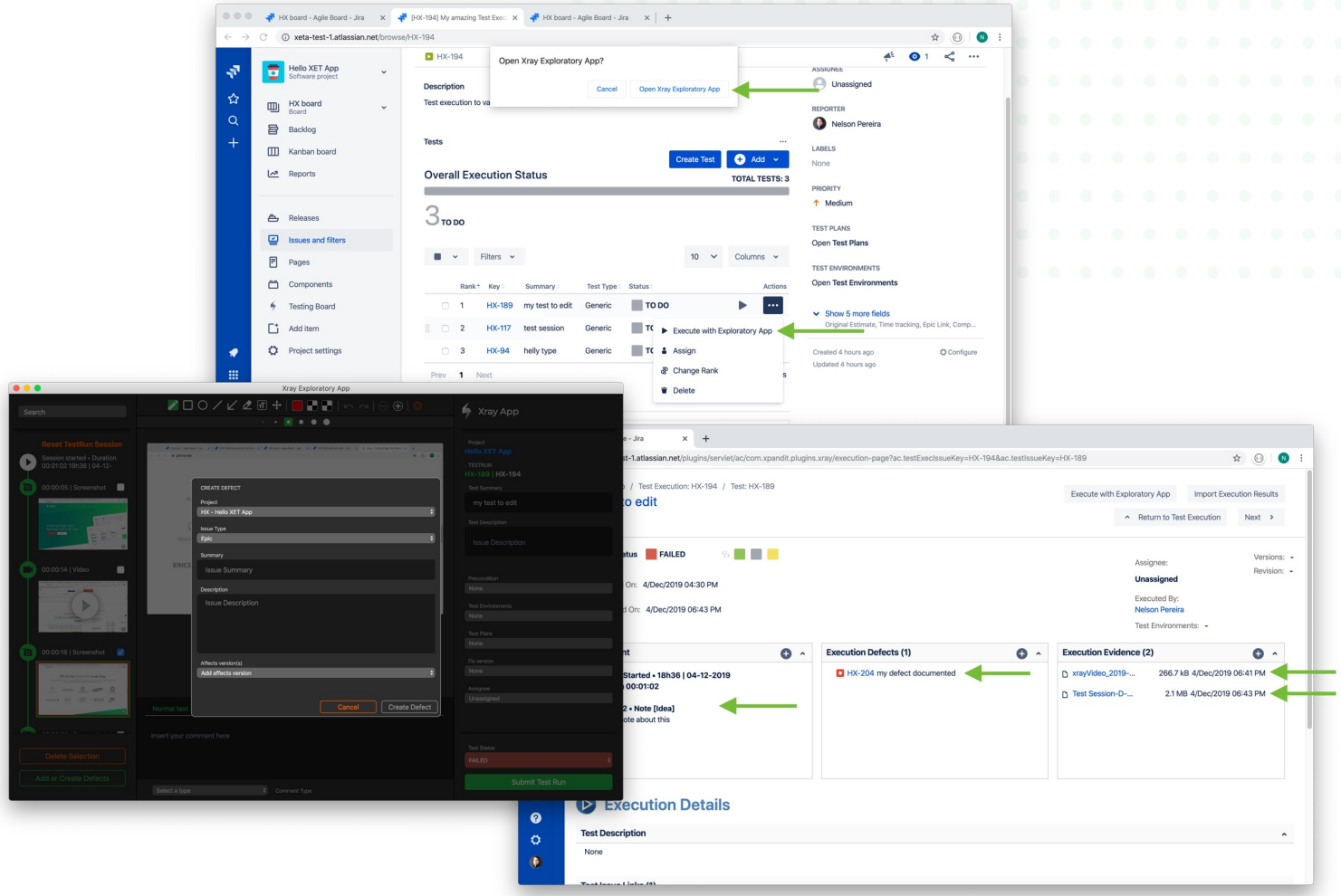
xr4y.io/explore

Your testing companion

- Session
  - Easy note taking (text, visual)
  - Control time
- Xray integration (optional)
  - Start sessions from Xray/Jira
  - Report bugs
- Cloud storage
- Share with other team members



DEMO

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Search for books, authors, etc...

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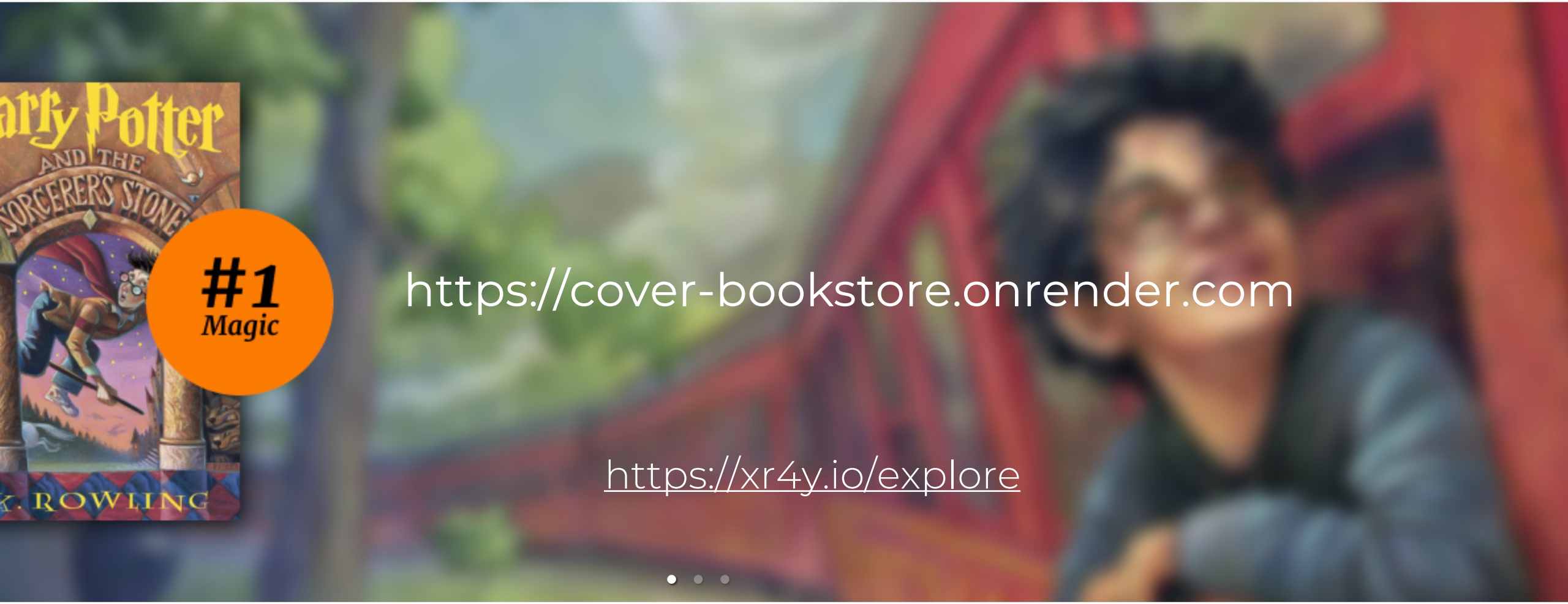
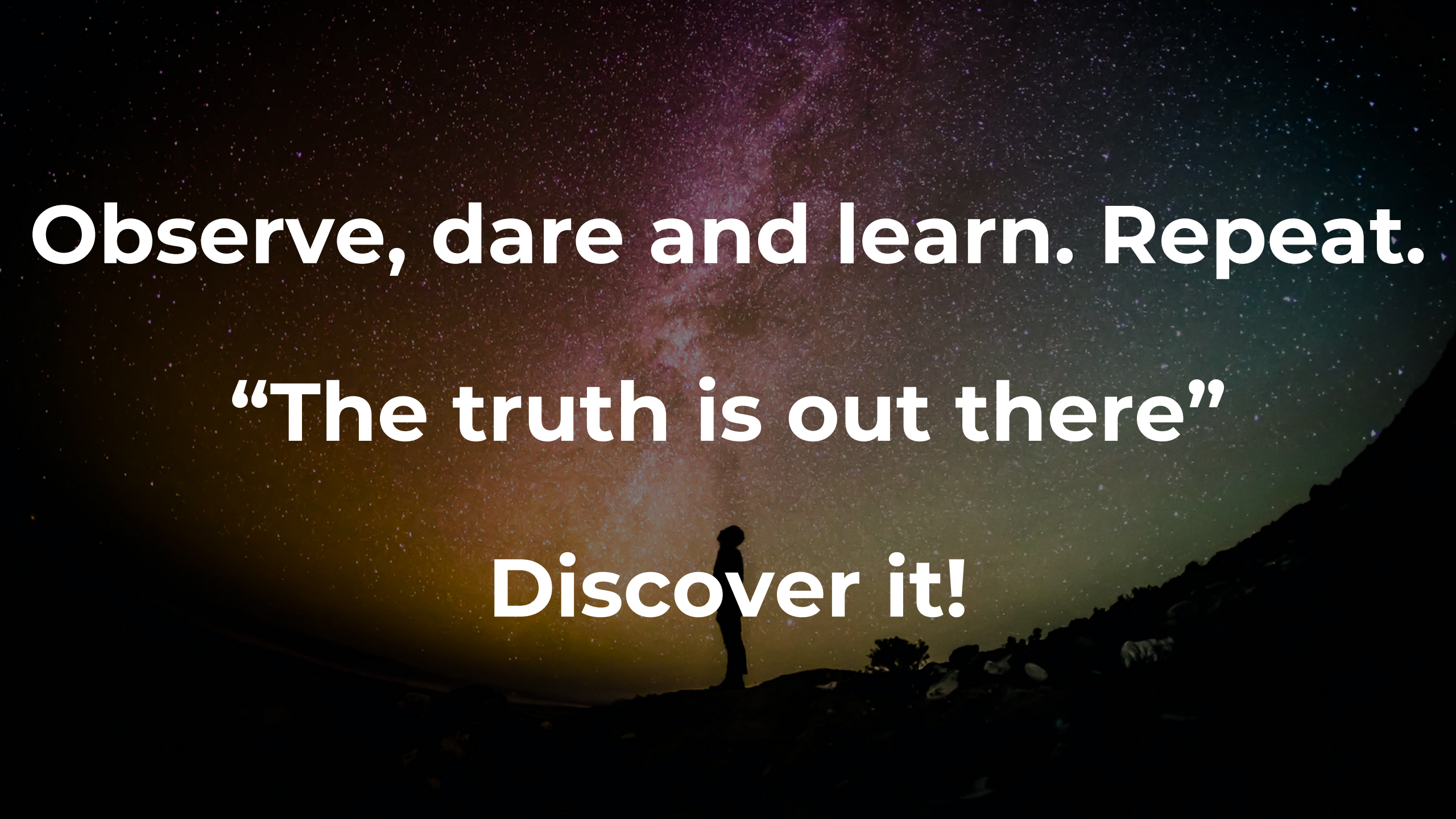
Children's History Horror Mystery Non-Fiction



Cover


Observe, dare and learn. Repeat.
“The truth is out there”
Discover it!

Thank you!

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