Is It a Project or a Business? Perspectives on the Consideration of Sustainability

Michael Zentner

HUBzero Director

Science Gateways Community Institute Associate Director

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The Pain Point

Connecting expensive resources

to scientist authors that write codes to utilize & analyze them

to audiences that use those codes and instruments en masse

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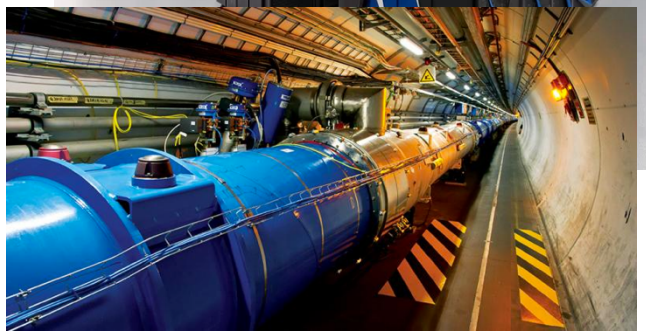
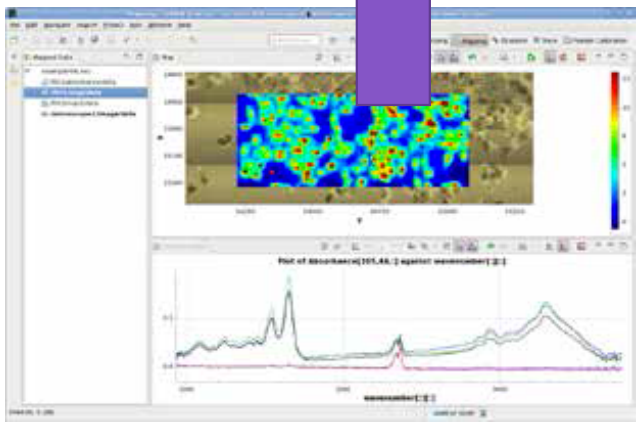
(expensive) Resources



Audience(s)

?



Software / Data Authors

The Solution:

A Science Gateway

A Science Gateway:

- Connects to supercomputers and/or instruments
- Allows scientists and engineers to share access to their software codes with…
- …large audiences who can run those codes on supercomputers and access those instruments with little to no effort.

- …AND
  - Facilitates publishing results
  - Allows for interactions / collaborations within the scientific community
  - Assists with reproducibility of results
  - Runs citizen science projects
  - etc…

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Functional Capabilities of the HUBzero Science Gateway Platform

Community
Interaction / Collaboration

Knowledge
Dissemination /
Publication

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Resource, Data, Analytics &
Application Sharing

Business vs Project in Mission

Virgin Galactic

We are a part of Sir Richard Branson's Virgin Group. With our sister companies, The Spaceship Company and Virgin Orbit, we are developing and operating a new generation of space vehicles to open space for everyone.

Our mission, to be the Spaceline for Earth, means we focus on using space for good while delivering an unparalleled customer experience.

We recognise that improving access to space is a fundamentally challenging ambition. We will achieve it only in a spirit of collaboration and with a recognition that we must continually learn and can always improve.

NASA Apollo

The national effort that enabled Astronaut Neil Armstrong to speak those words as he stepped onto the lunar surface fulfilled a dream as old as humanity. Project Apollo's goals went beyond landing Americans on the moon and returning them safely to Earth. They included:

- Establishing the technology to meet other national interests in space.
- Achieving preeminence in space for the United States.
- Carrying out a program of scientific exploration of the Moon.
- Developing human capability to work in the lunar environment.

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A repeatable, saleable product to satisfy customers

Discovery

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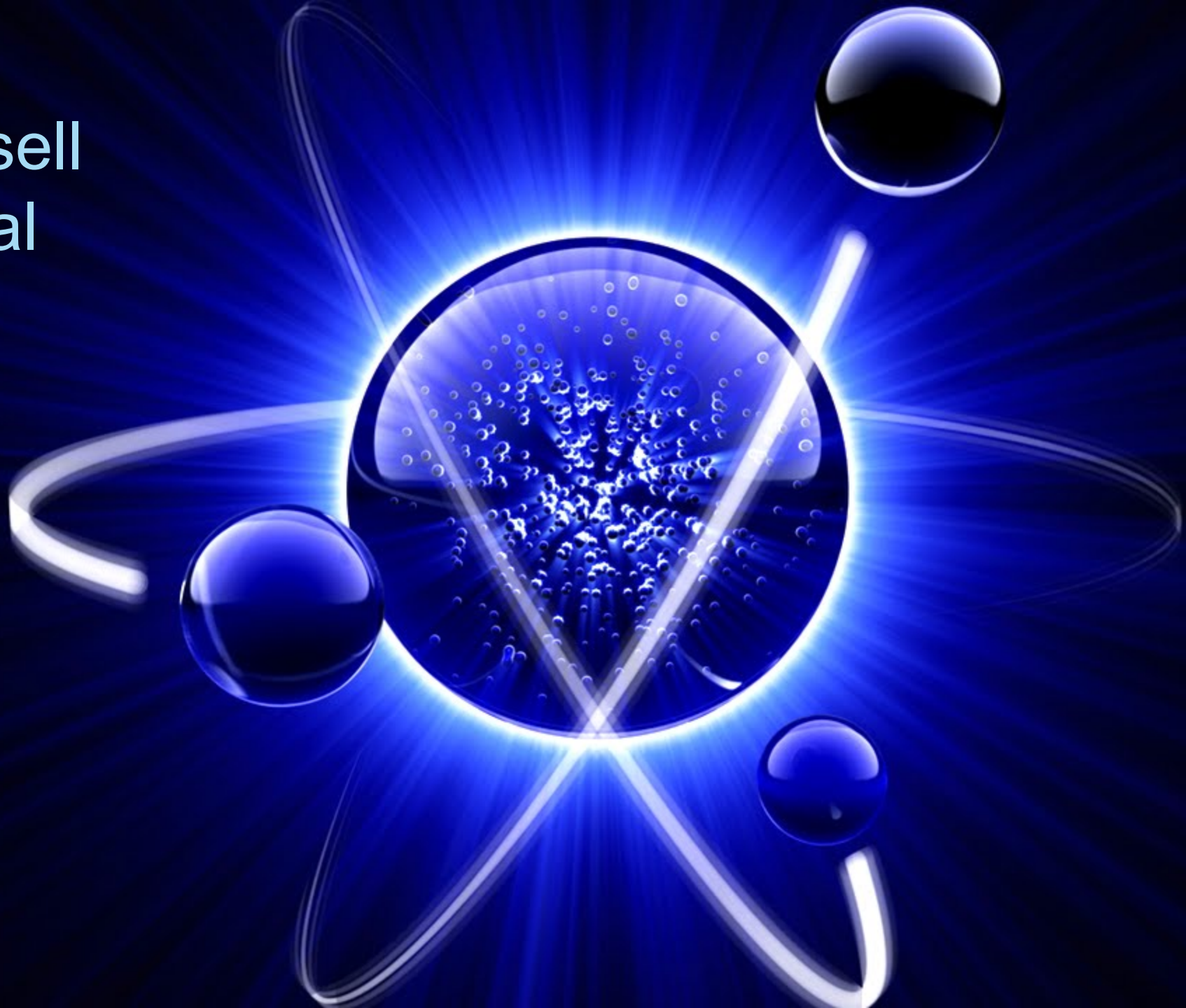
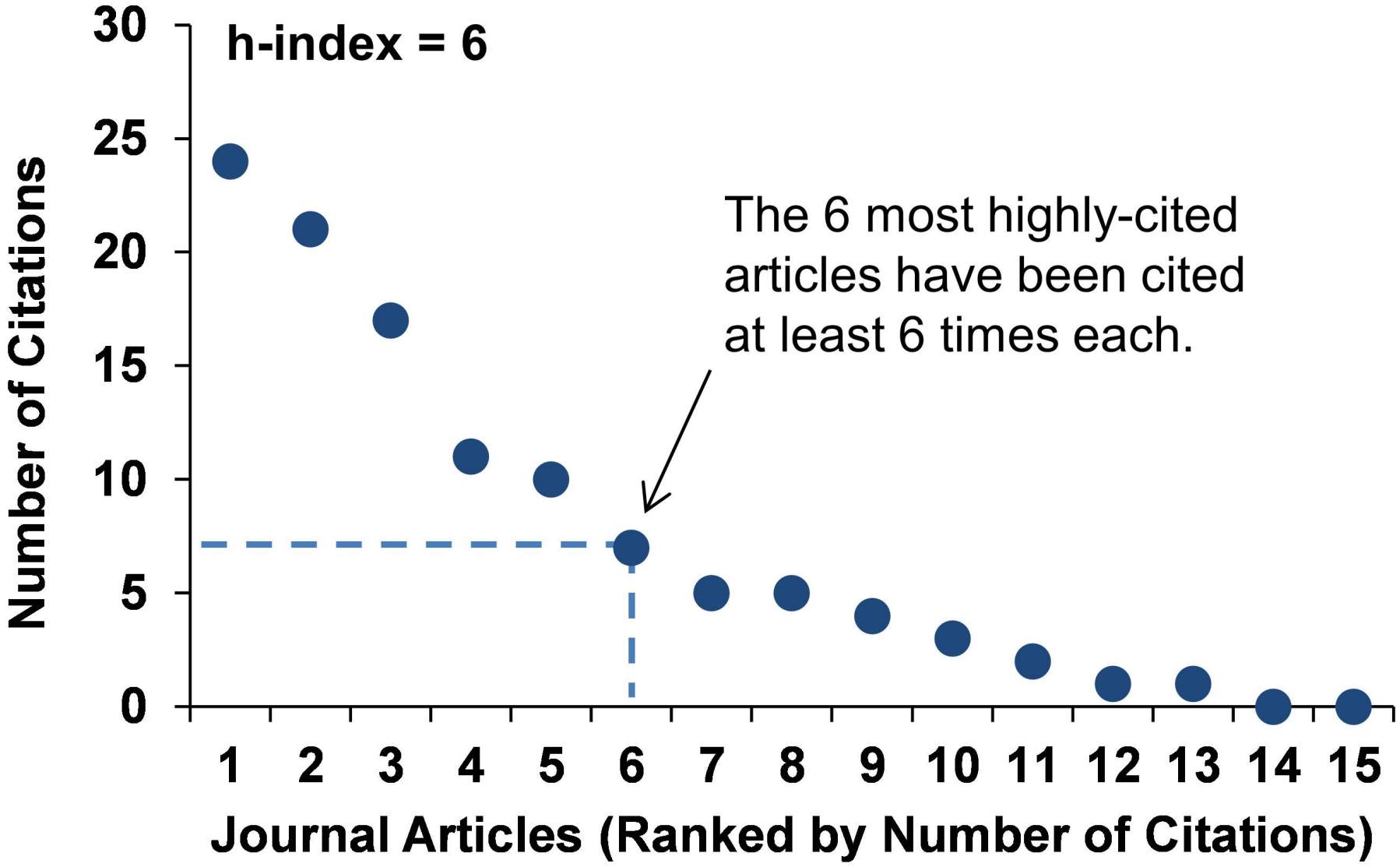
Discovery

How we sell a proposal



How our performance may have been evaluated...



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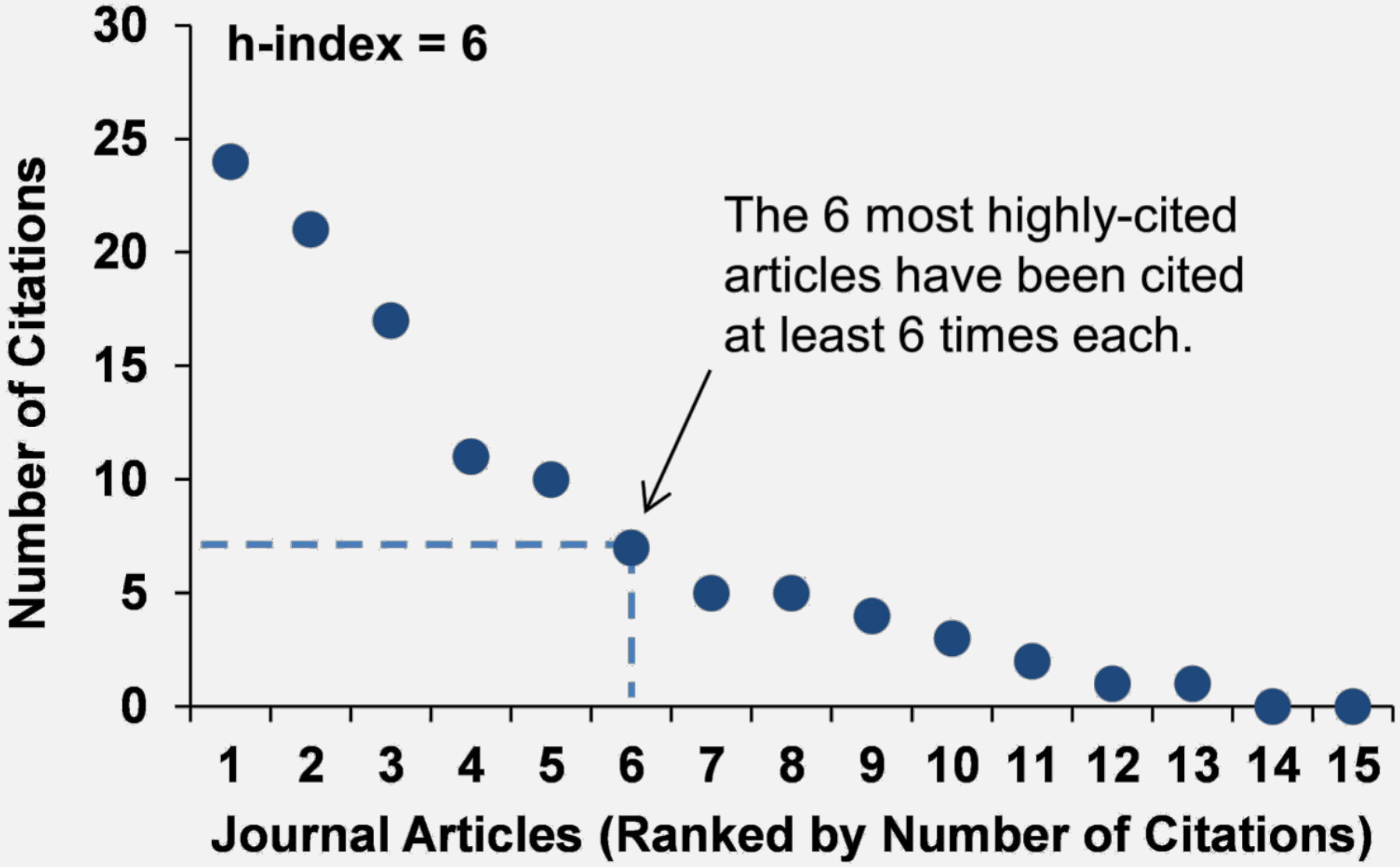
How our performance is increasingly being evaluated...



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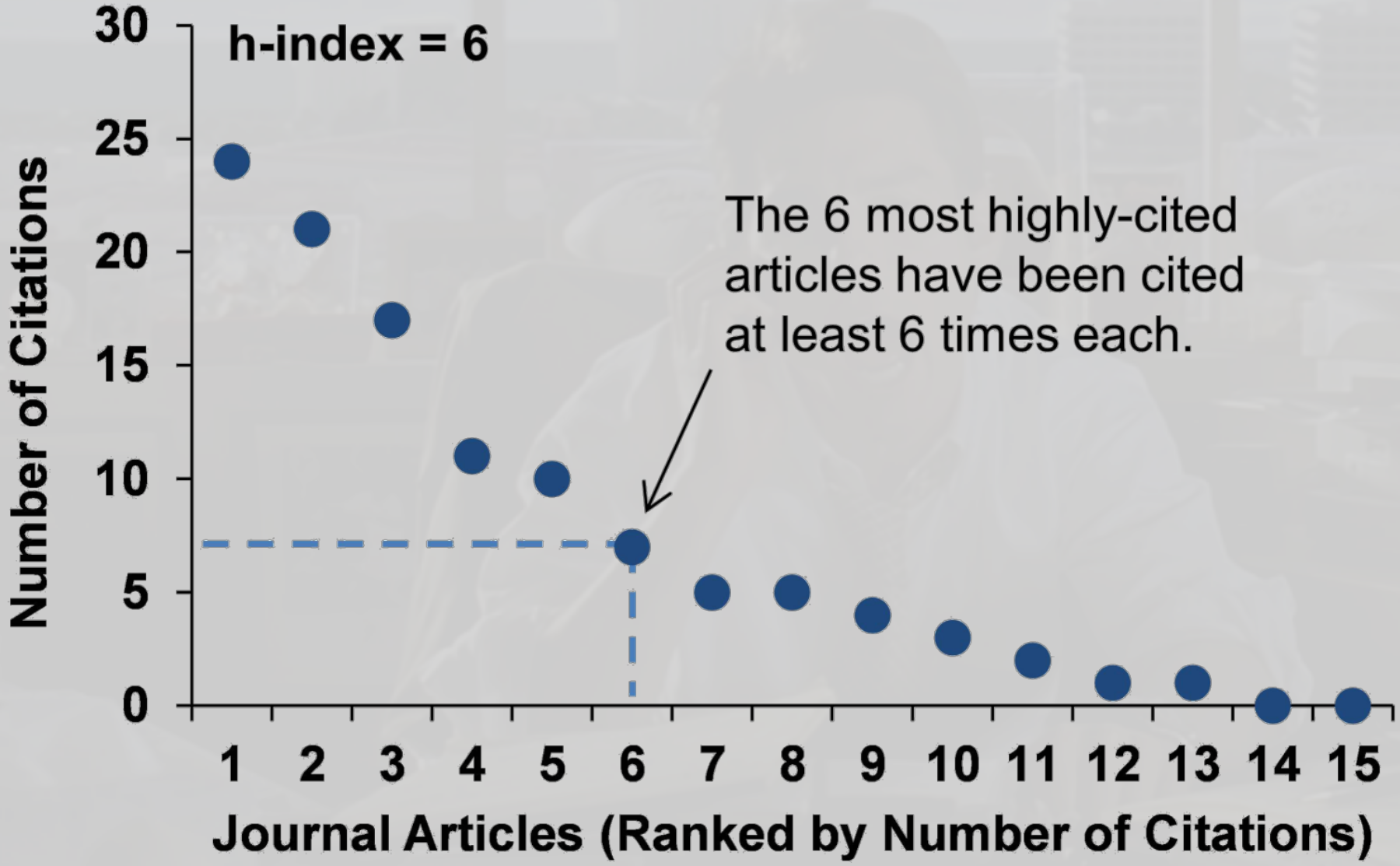

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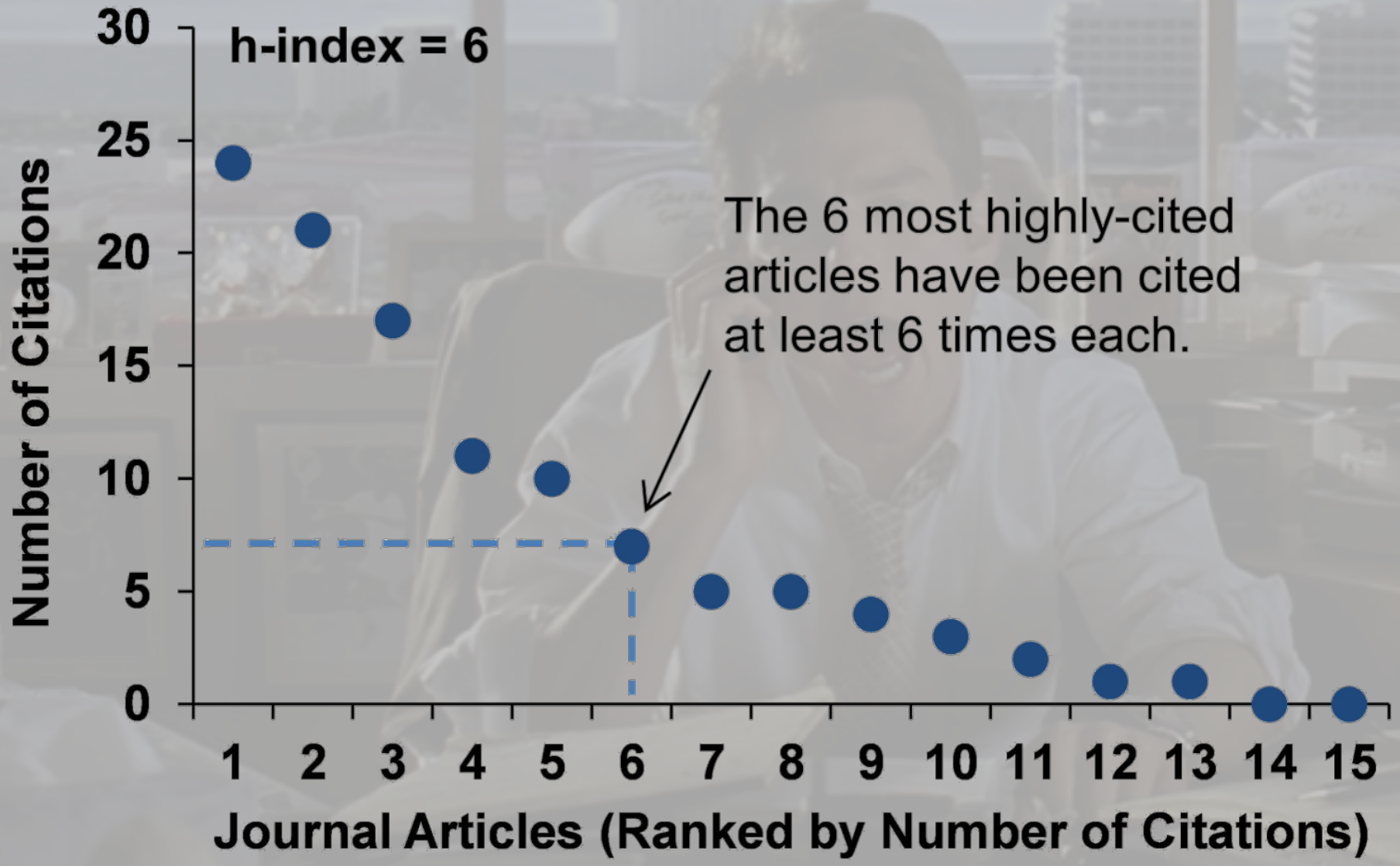

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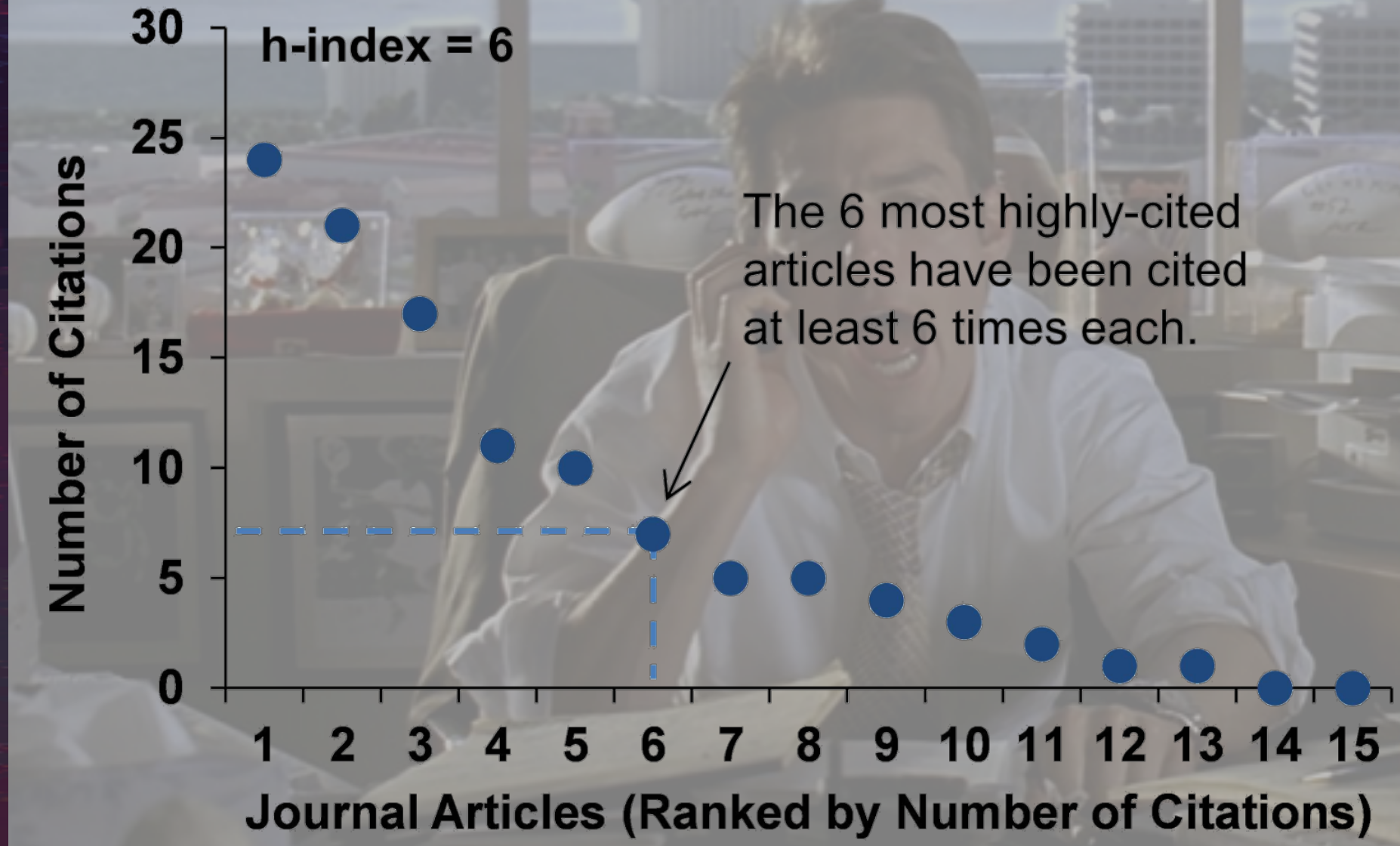

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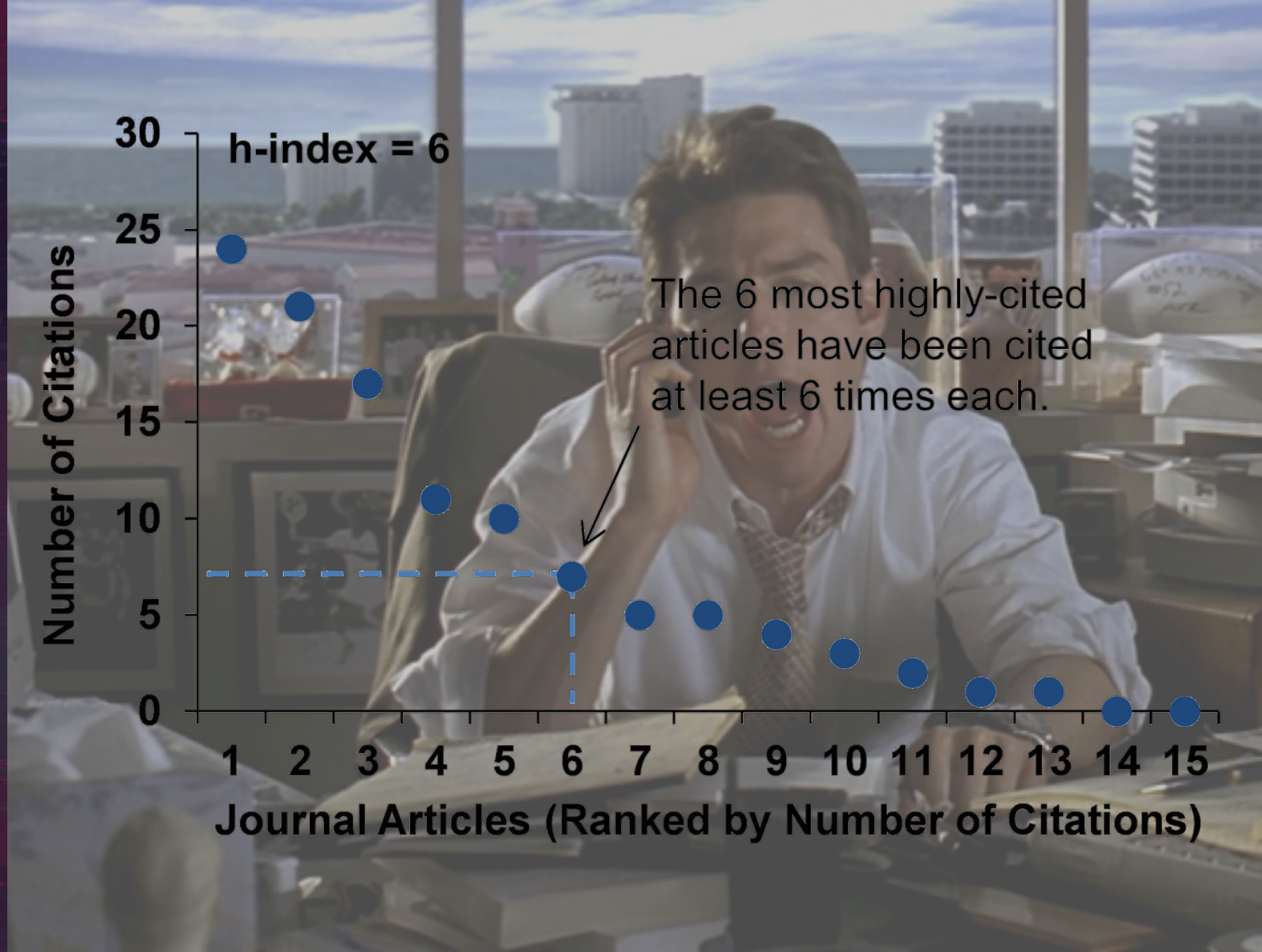

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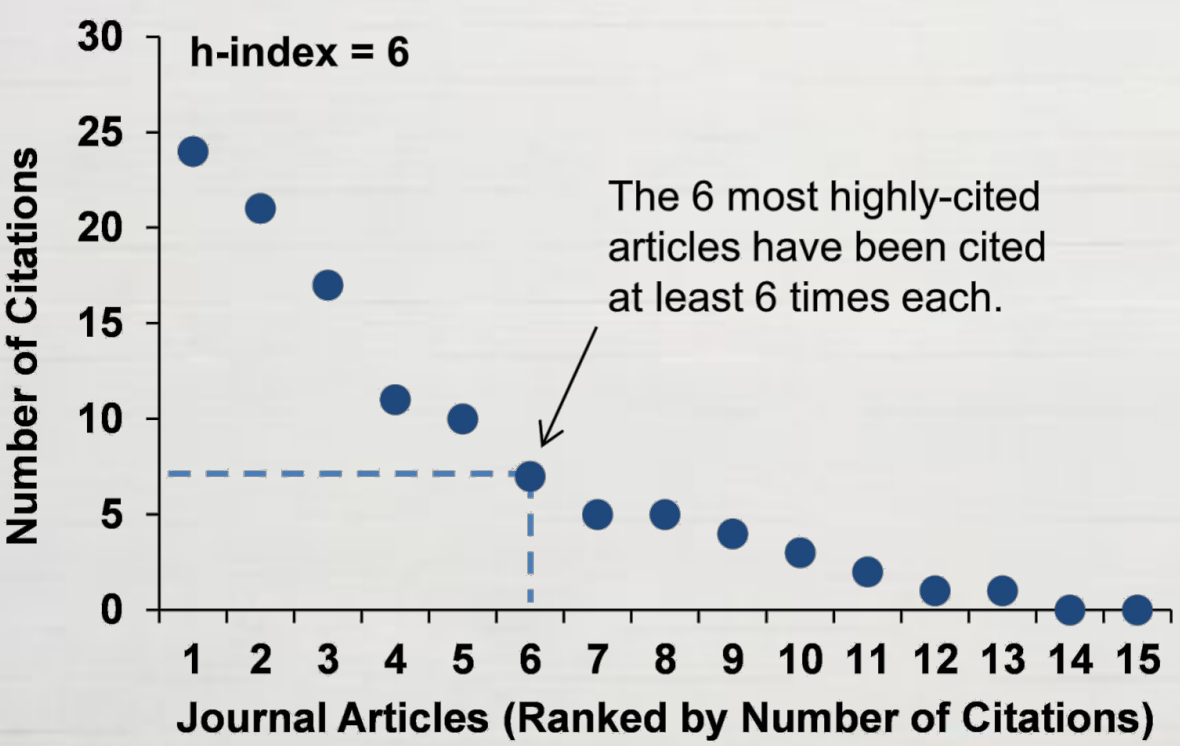
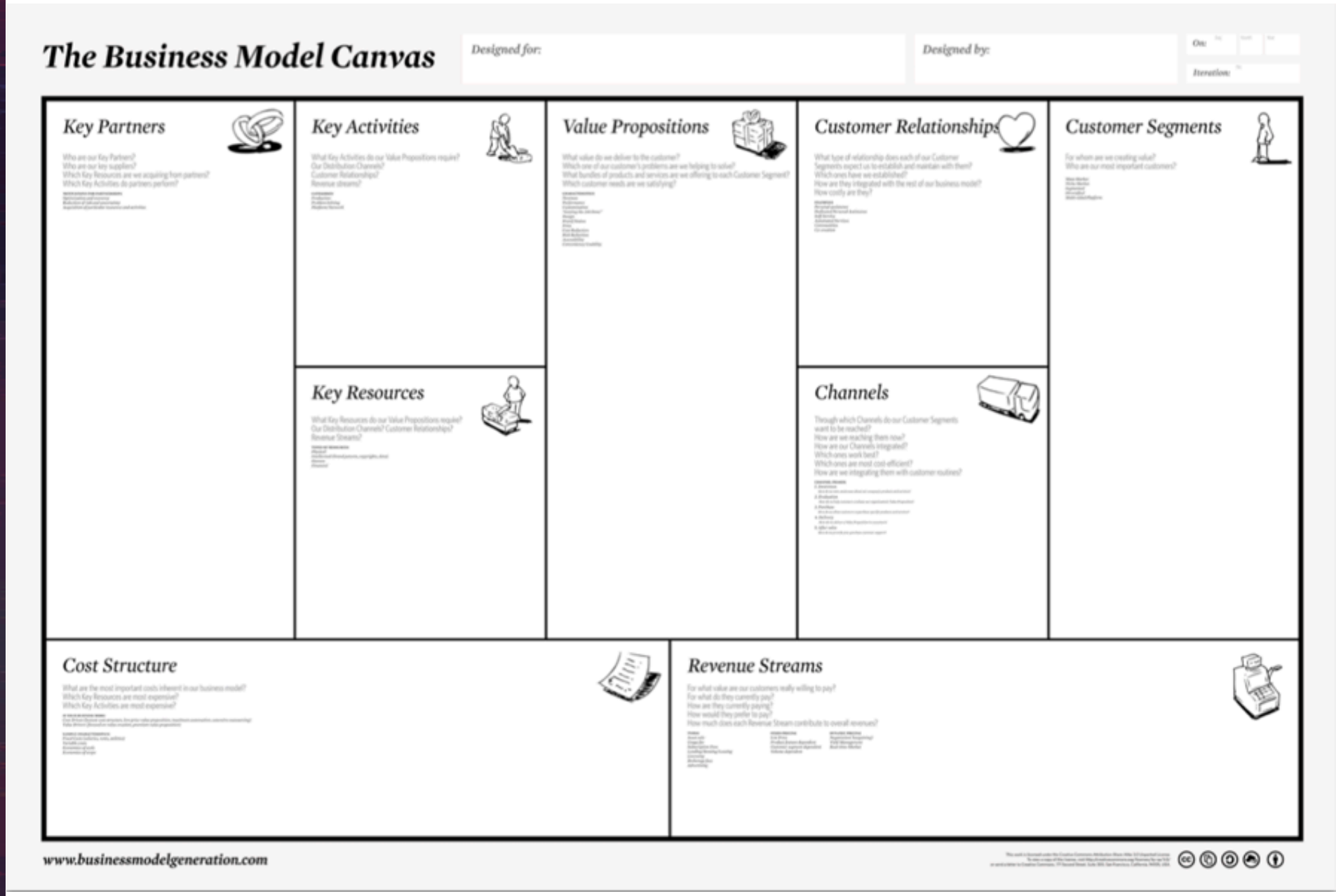


These things must be at odds right?

Not really...

...there is a unifying framework



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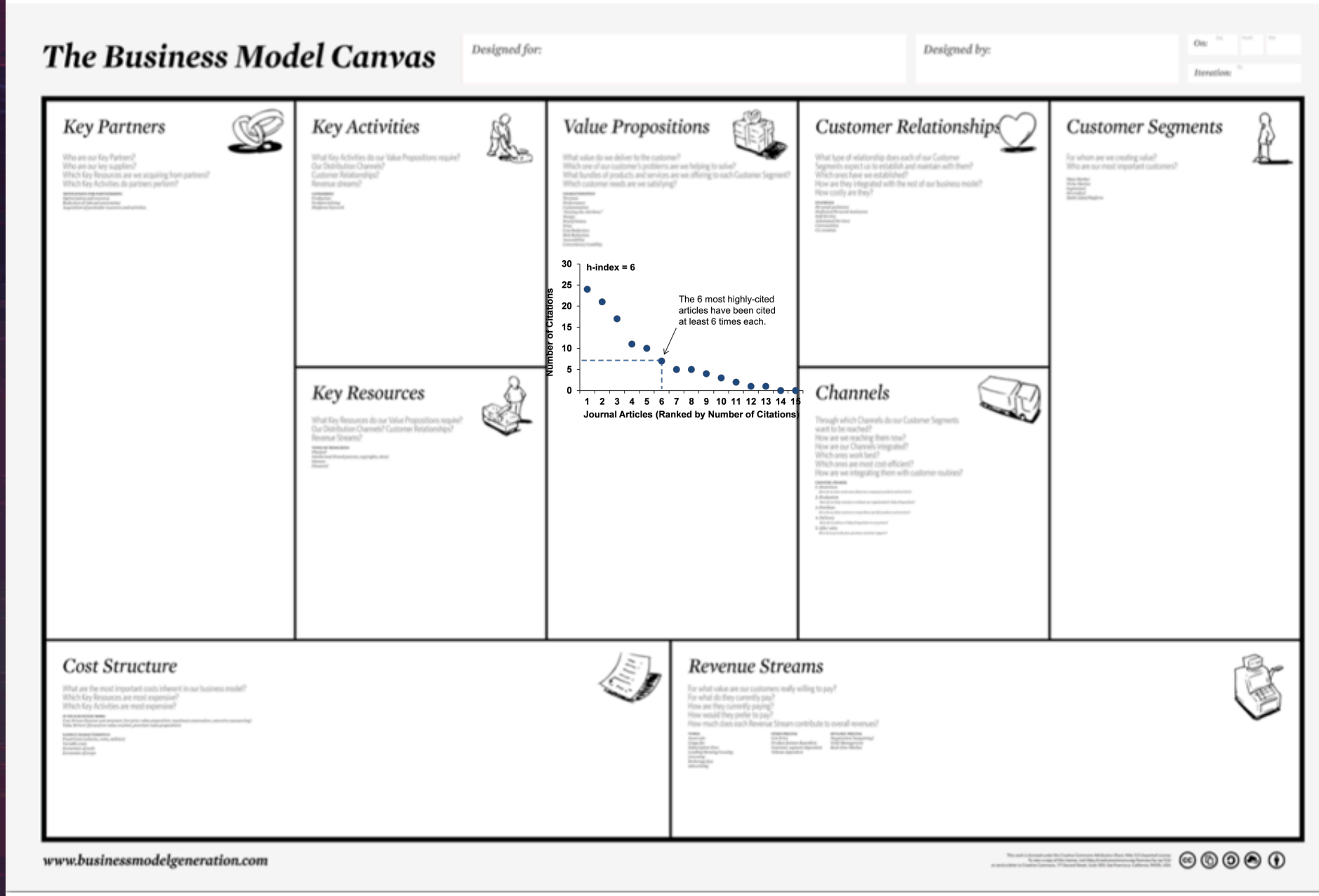

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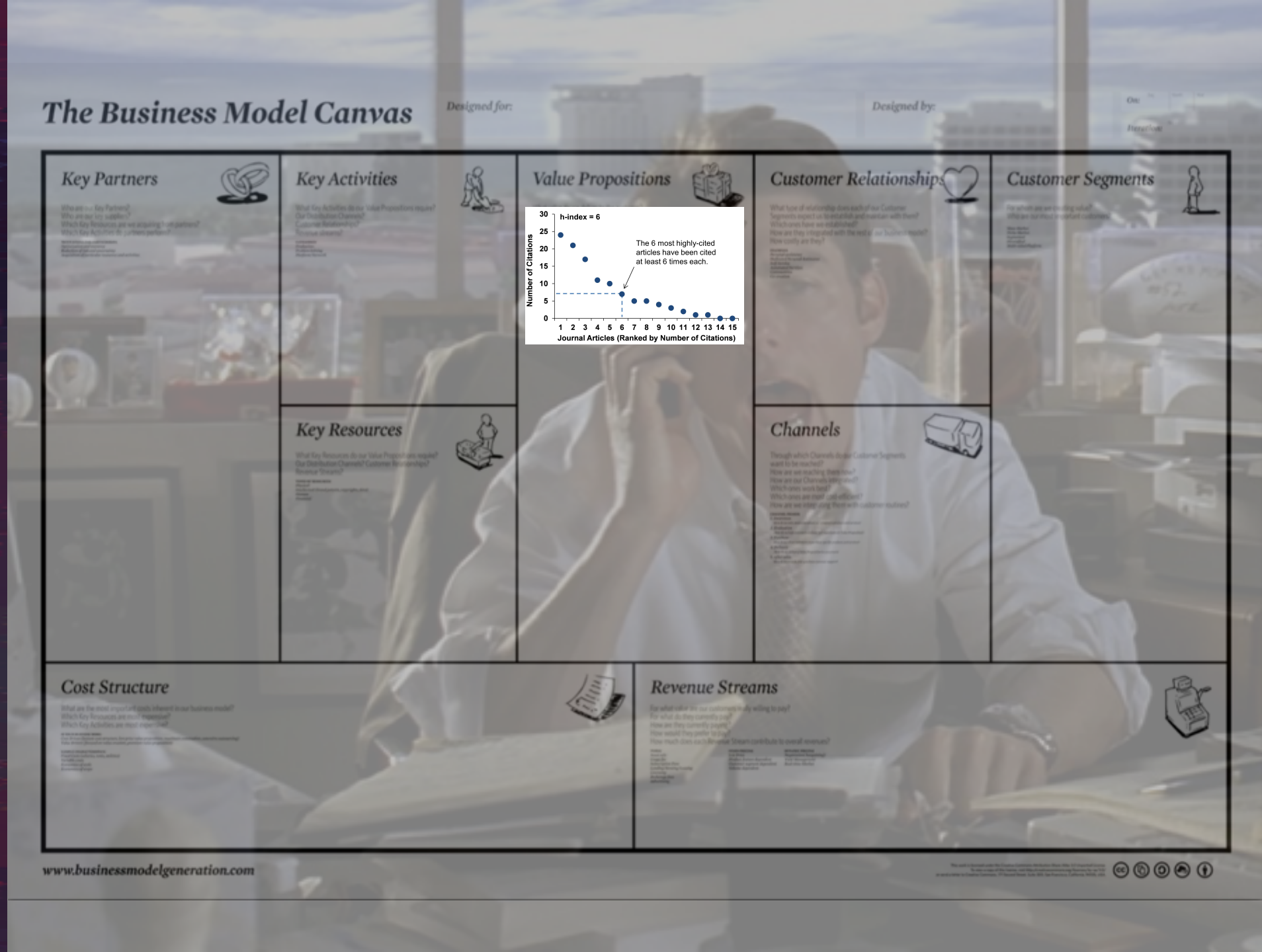

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Not really...

...there is a unifying framework

But how does a project fill it in?

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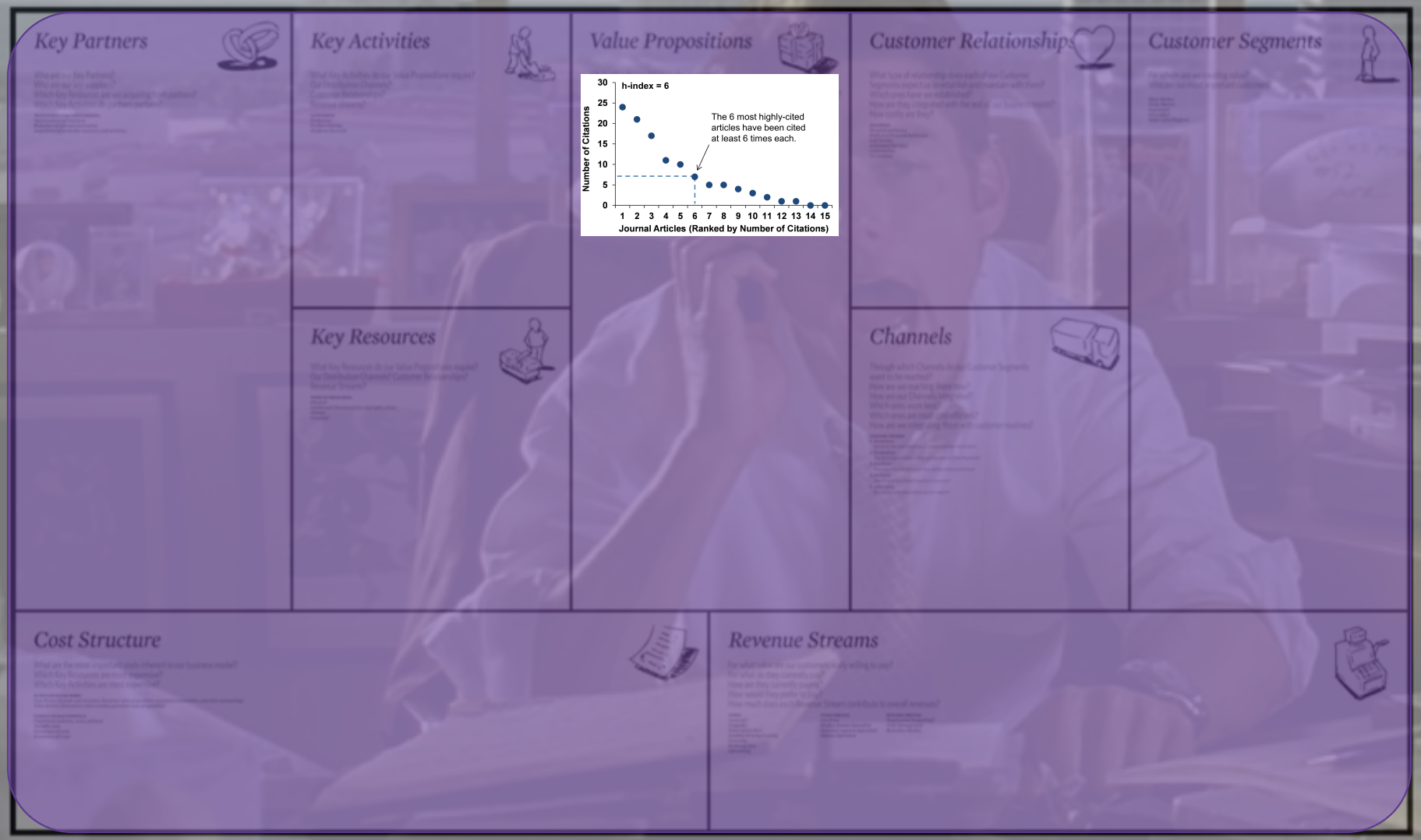

Not really...

...there is a unifying framework

But how does a project fill it in?

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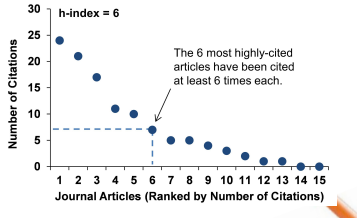
- Solicit business investment
- Gradually build it from grant to grant
- Align with another organization already doing it

Soliciting business investment



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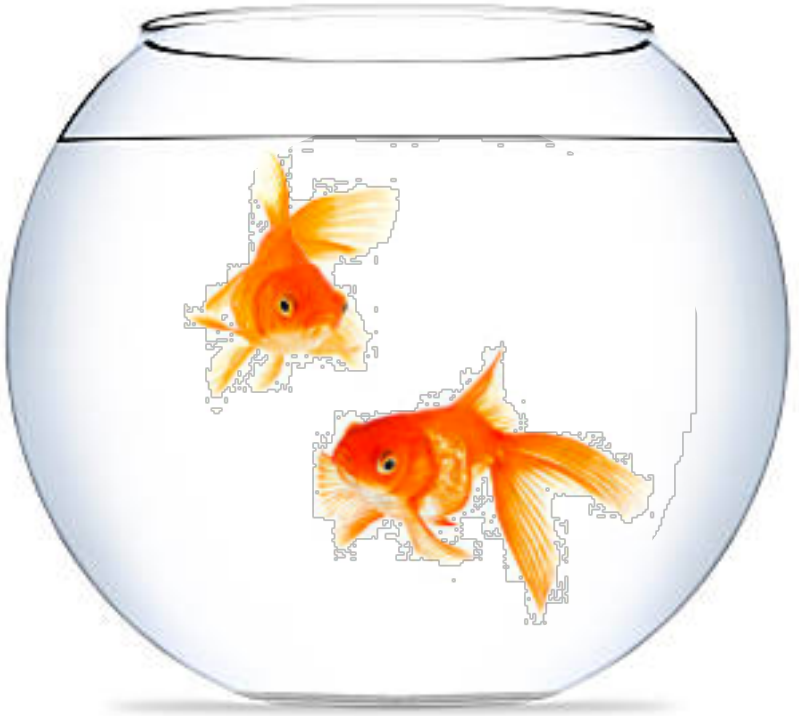
Grant to grant



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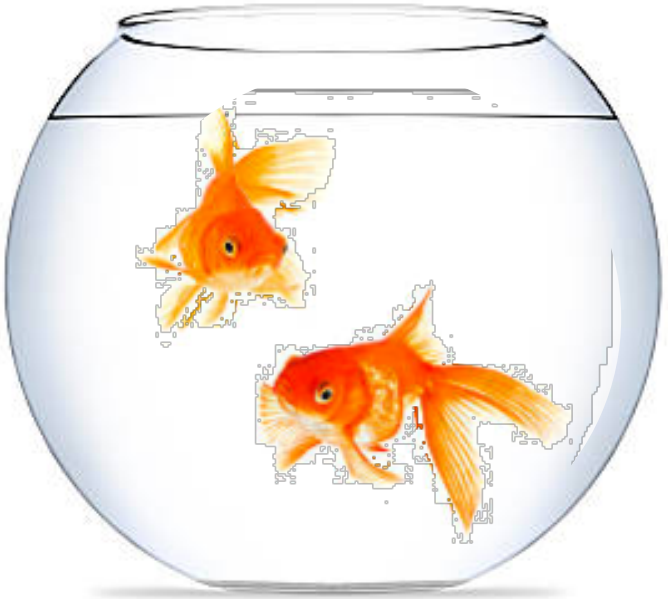
Grant to grant



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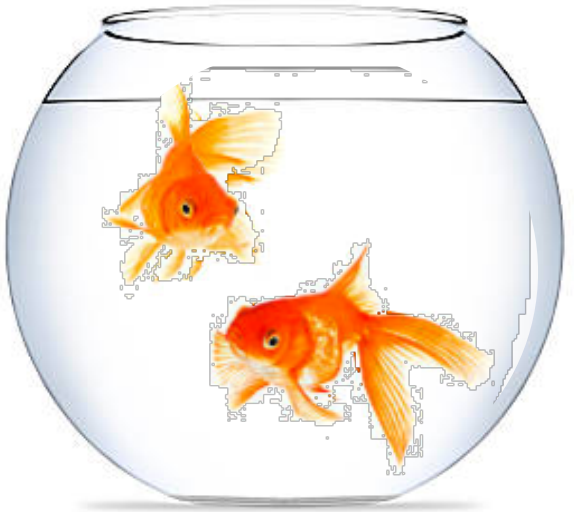

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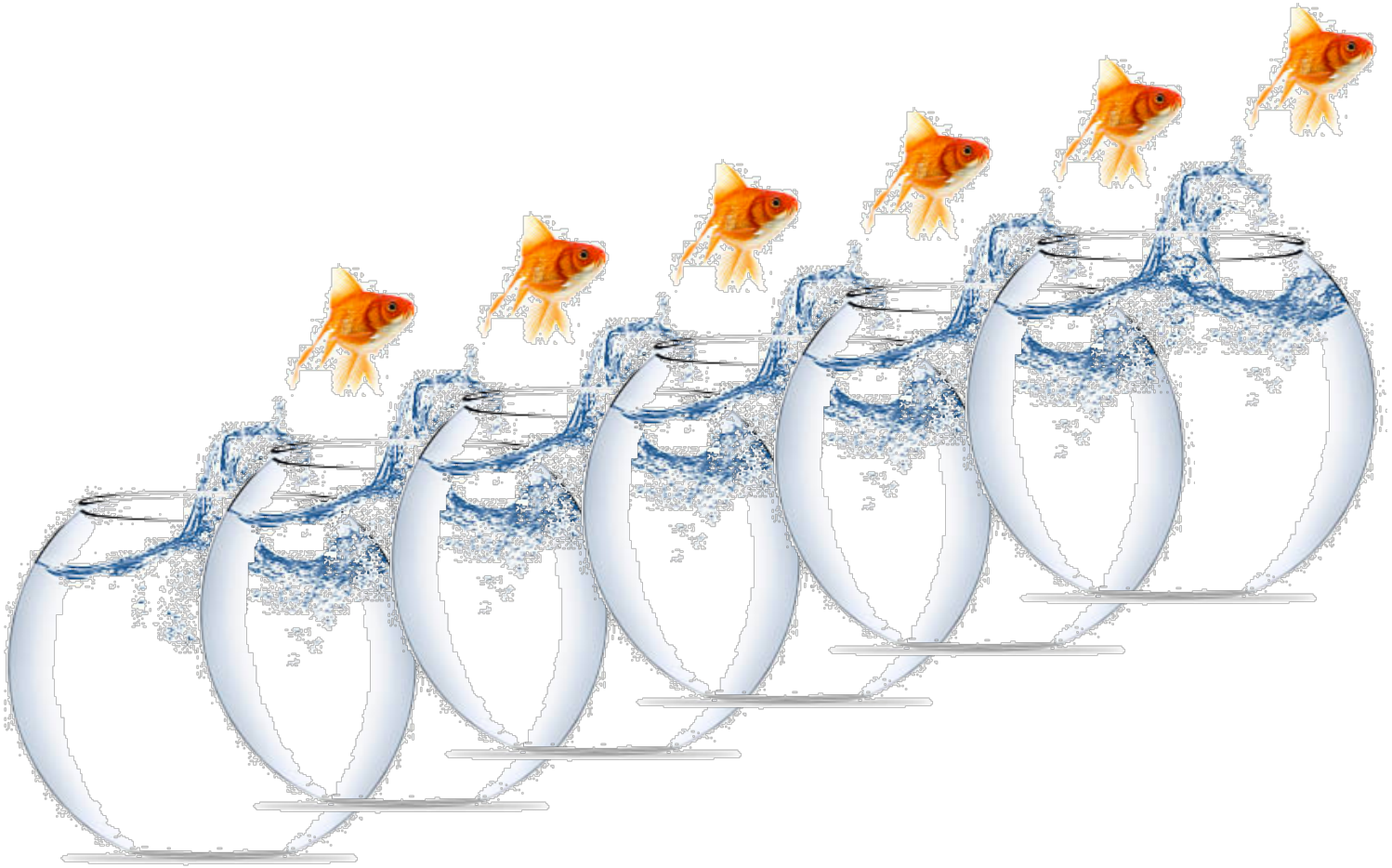

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Grant to grant

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Grant to grant

Great for innovation.
Terrible for continuity.
Worse for repeatable products.
As bad as can be for sustainability.

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In the beginning (1998)...

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Vertical Scaling

500+ Simulation Tools
6100+ Other Resources
3900+ Online Presentations
700+ Teaching Materials
35,000+ Students Reached

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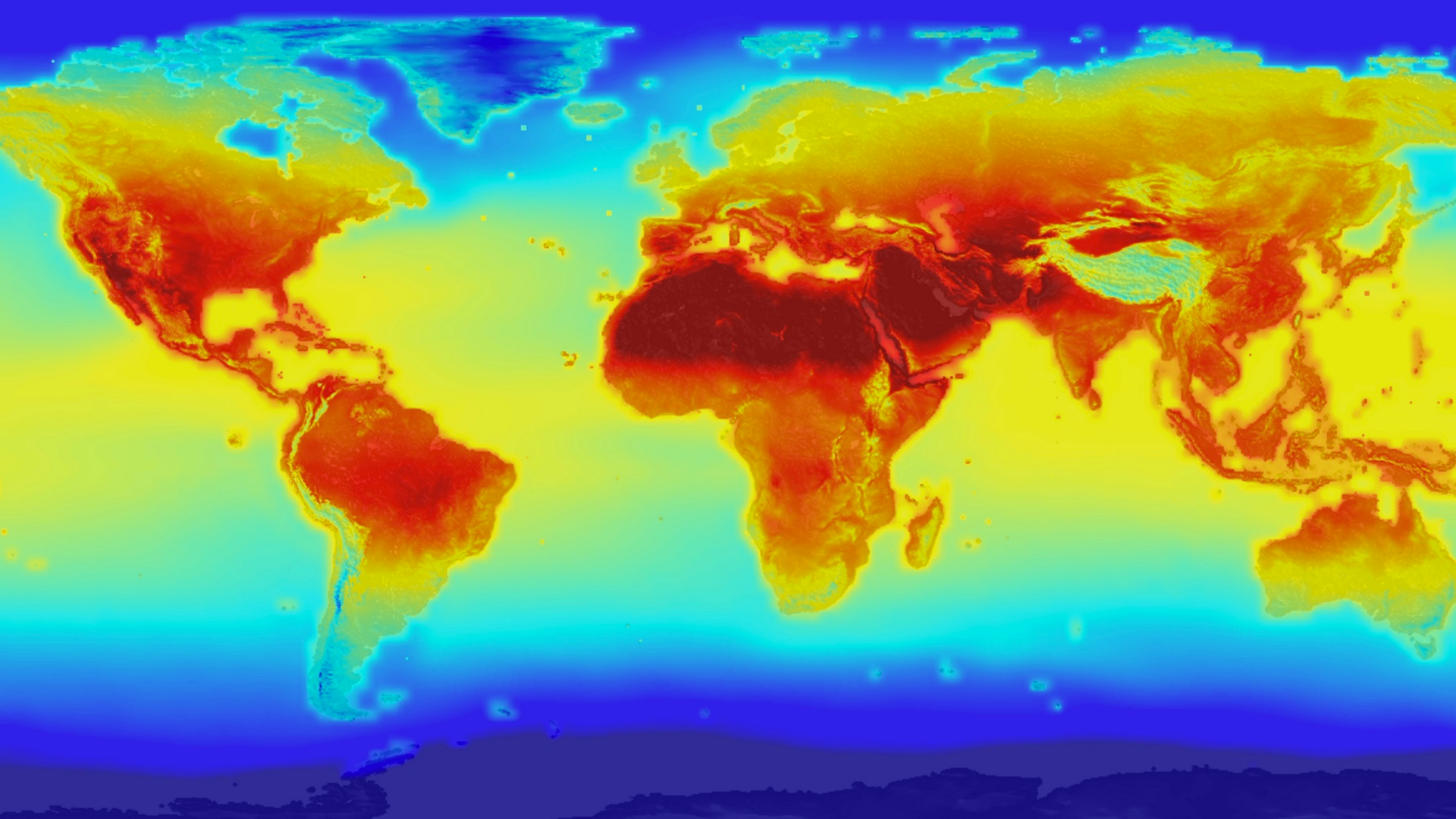
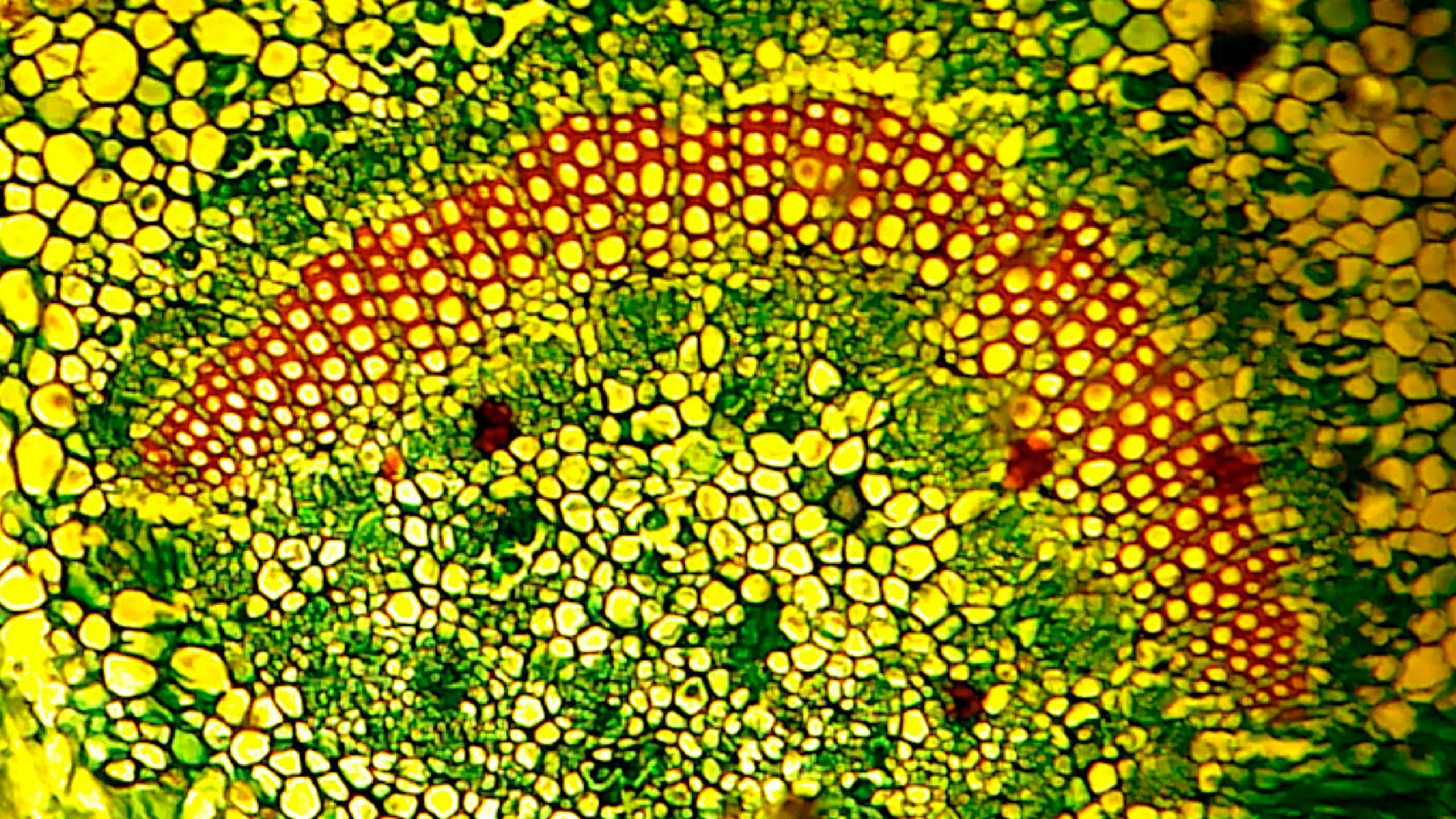
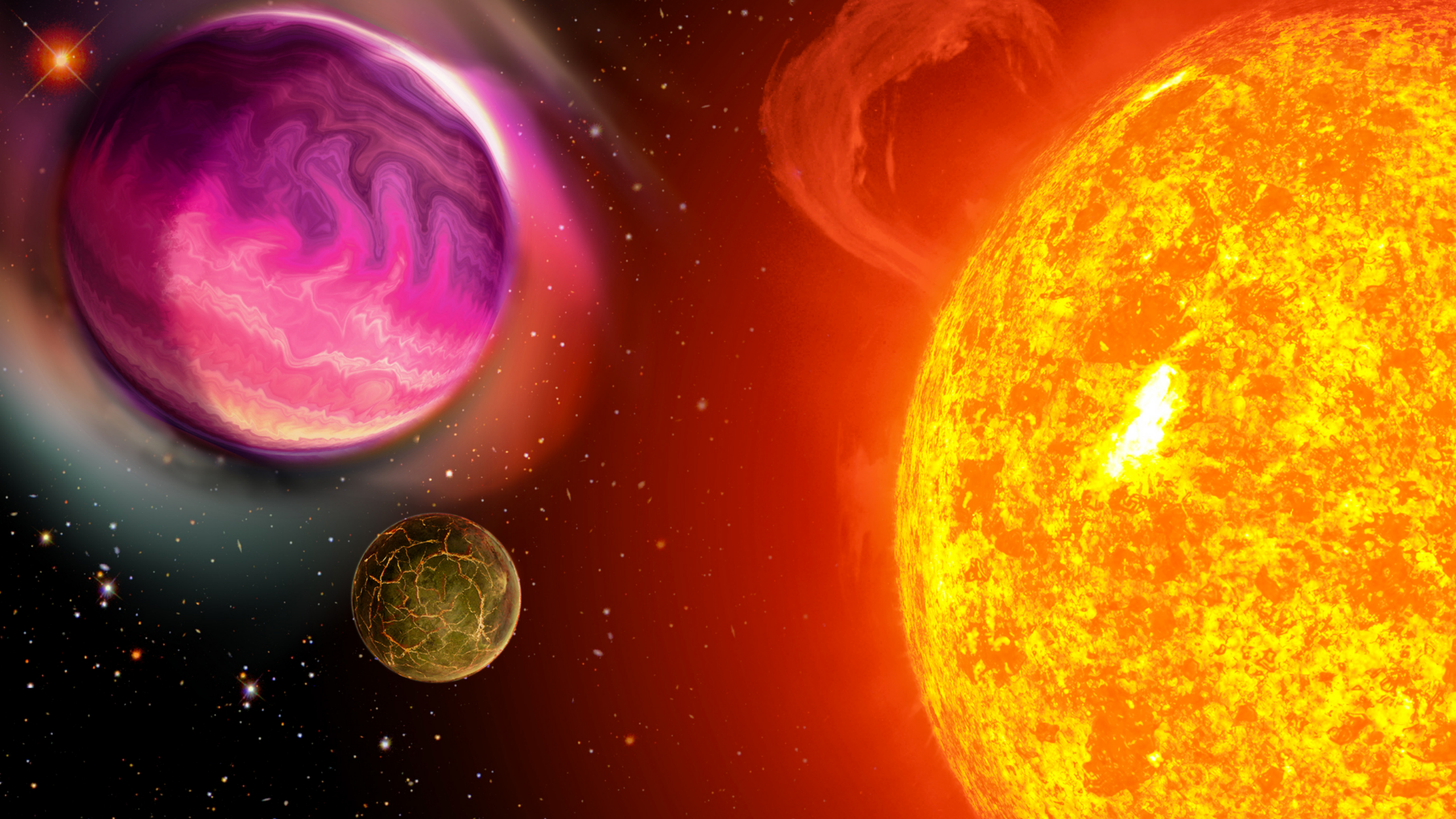




LinkedIn
foursquare
LIVEJOURNAL
vimeo
YouTube
Insta
facebook
my Blogger
twitter
flickr
Like



+60
LinkedIn
foursquare
LiVEJOURNAL
vimeo
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facebook
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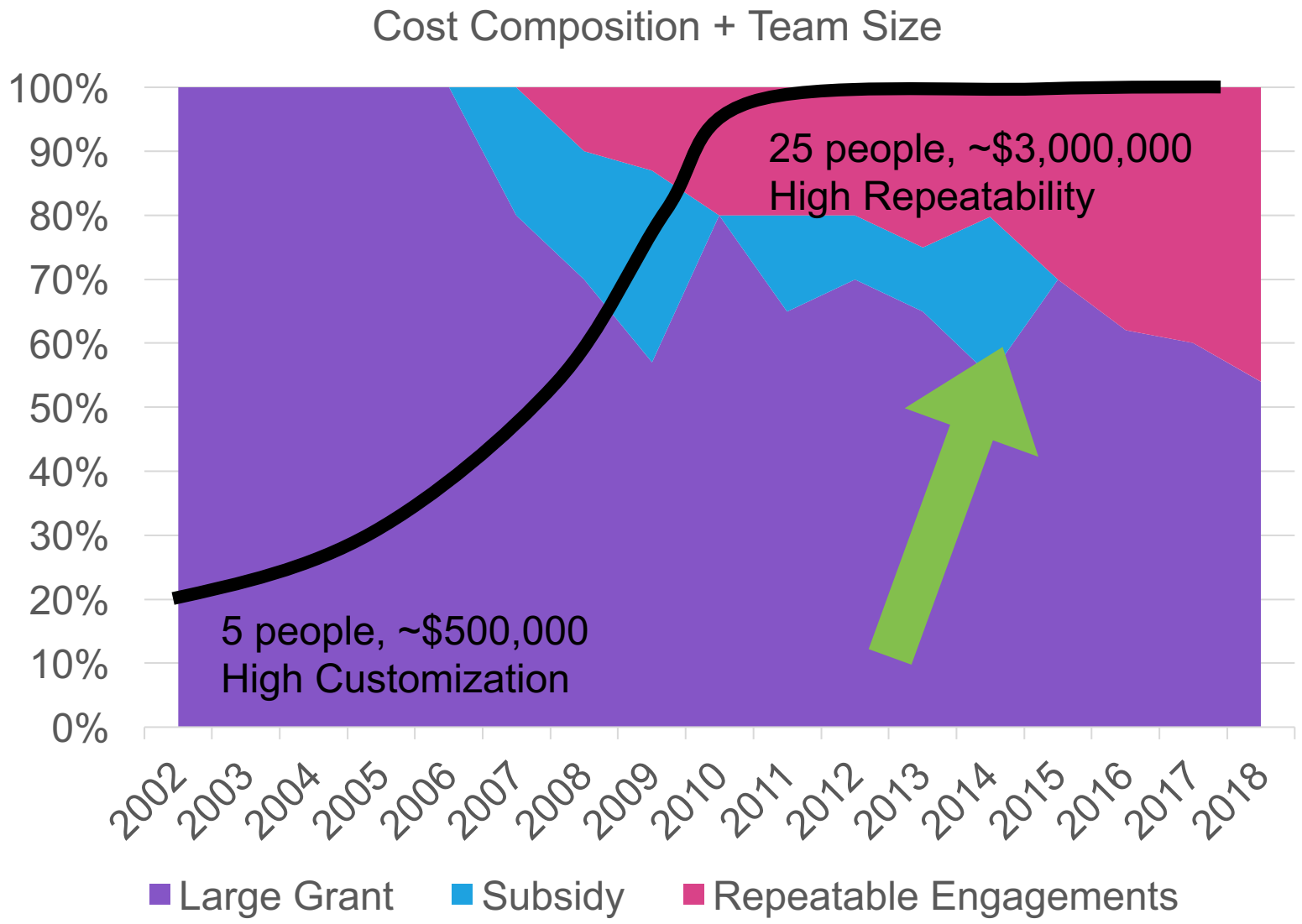
flickr
Like

Evolving Cost Composition



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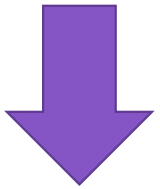
The Math Does Not Work

High Customization

- $500,000 Funding Requirement
- 1/8 Proposal Hit Rate
- $500,000 Average Proposal Size

== 8 Proposals Annually

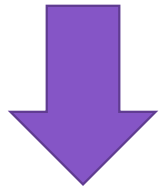


Continue doing highly novel work

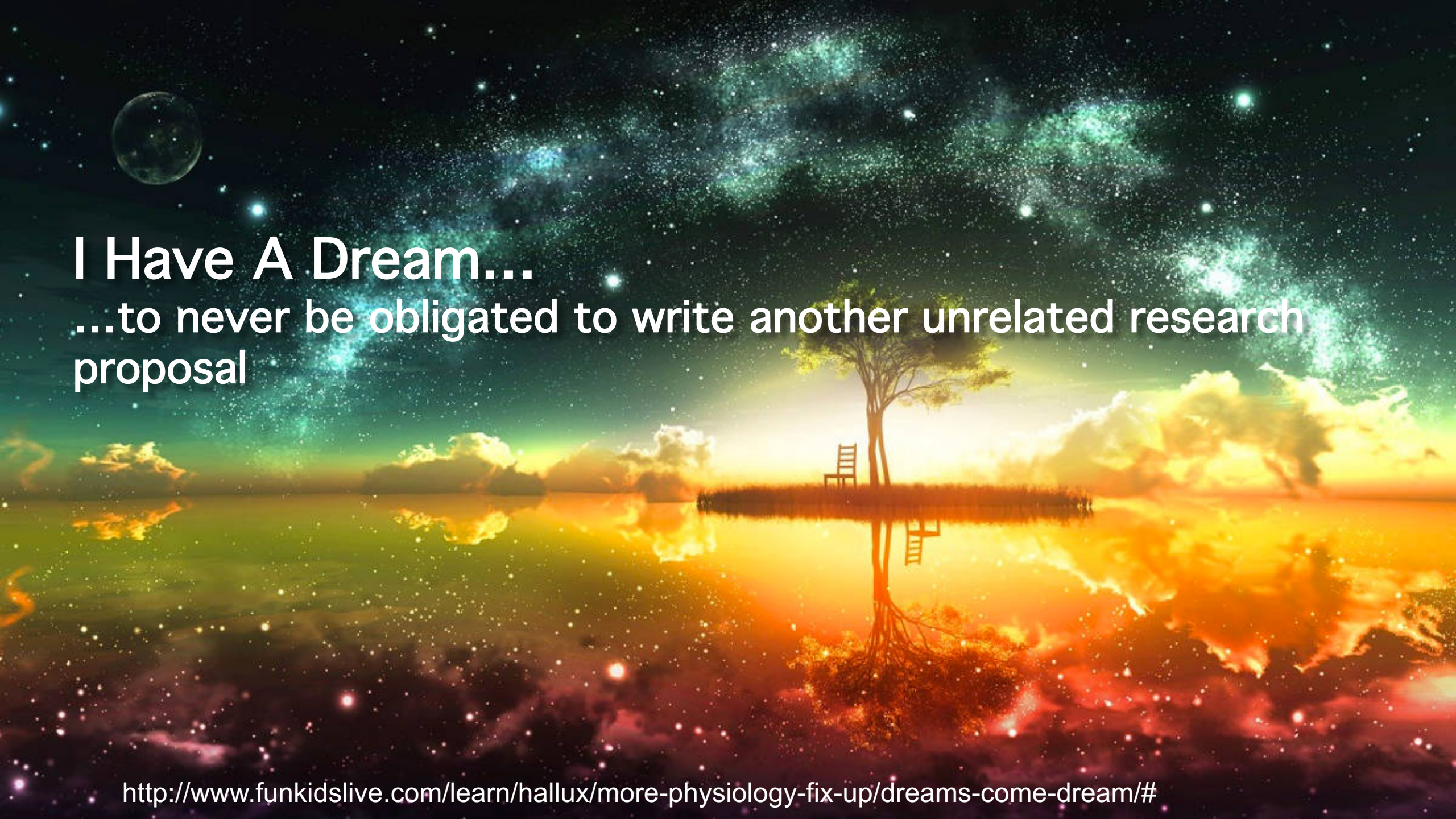
High Repeatability

- $3,000,000 Funding Requirement
- ?1/8? Proposal Hit Rate
- $500,000 Average Proposal Size

== ~~48 Proposals Annually~~

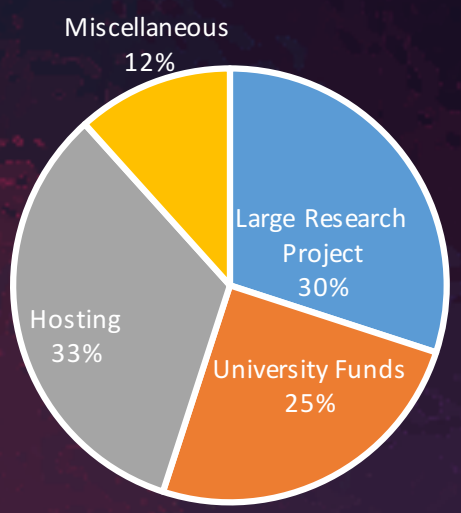


Continue delivering value from the work already done

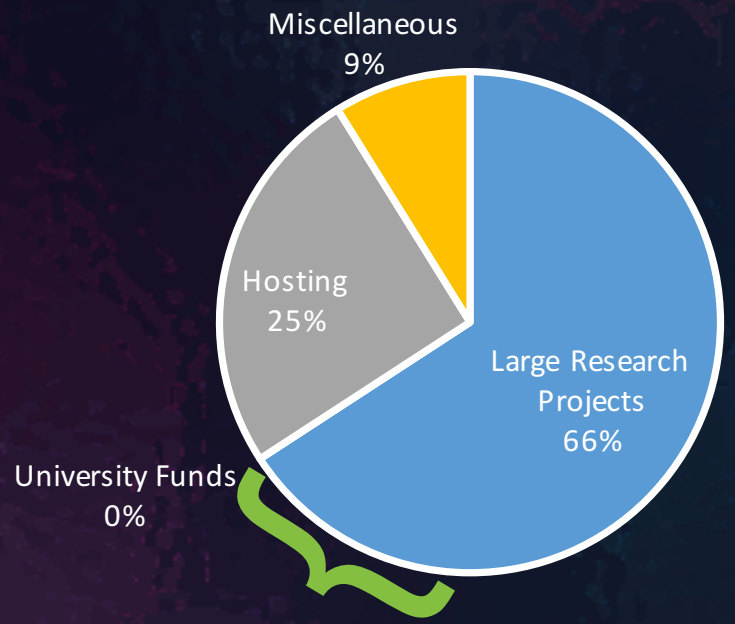

I Have A Dream...
...to never be obligated to write another unrelated research proposal
http://www.funkidslive.com/learn/hallux/more-physiology-fix-up/dreams-come-dream/#

Evolving Revenue Stream Composition
Phase I: Large Project Diversification

2014-2015



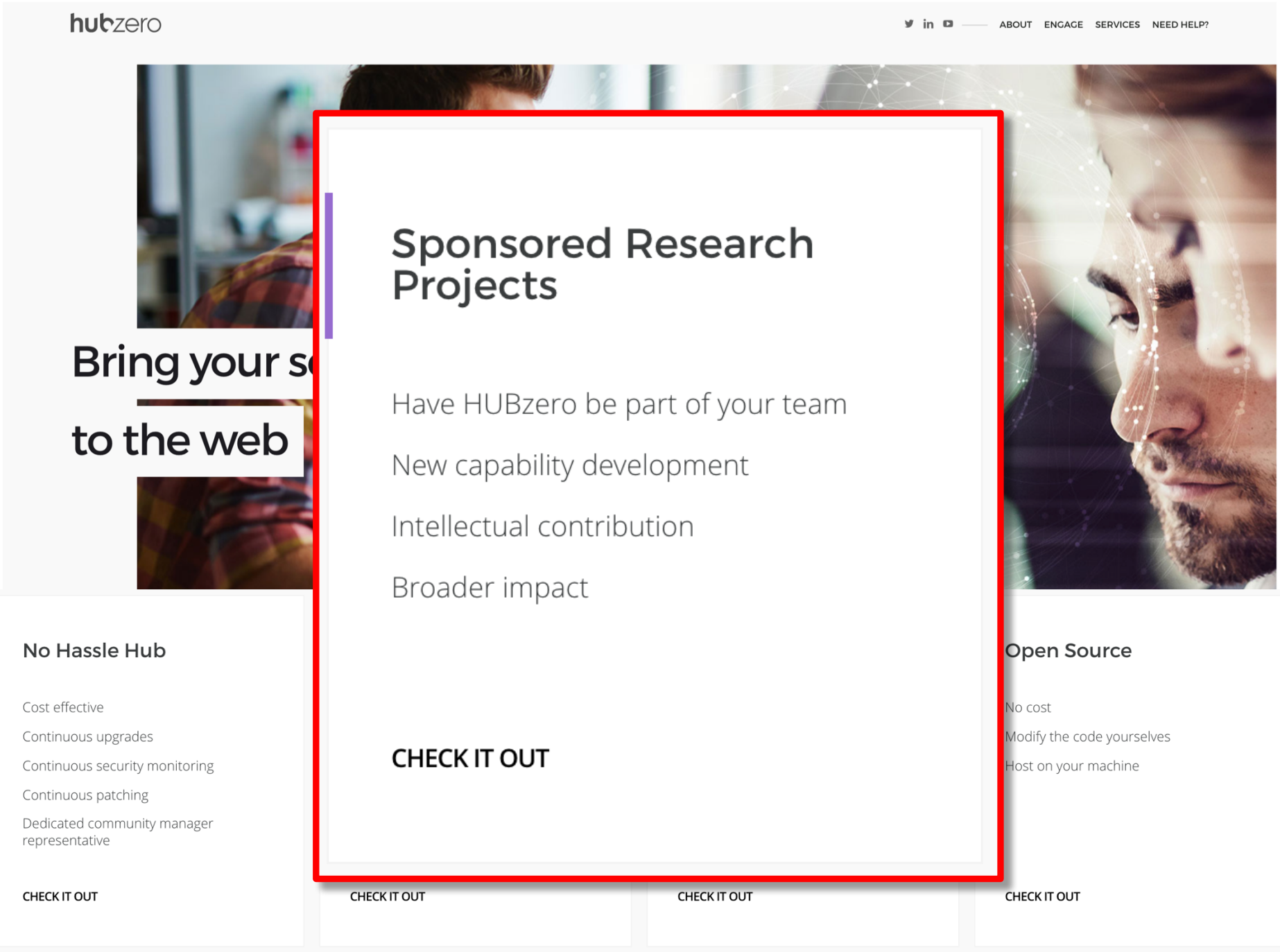
2015-2016



R&D based on what can be borrowed from these projects.

Business Model Components

Customization



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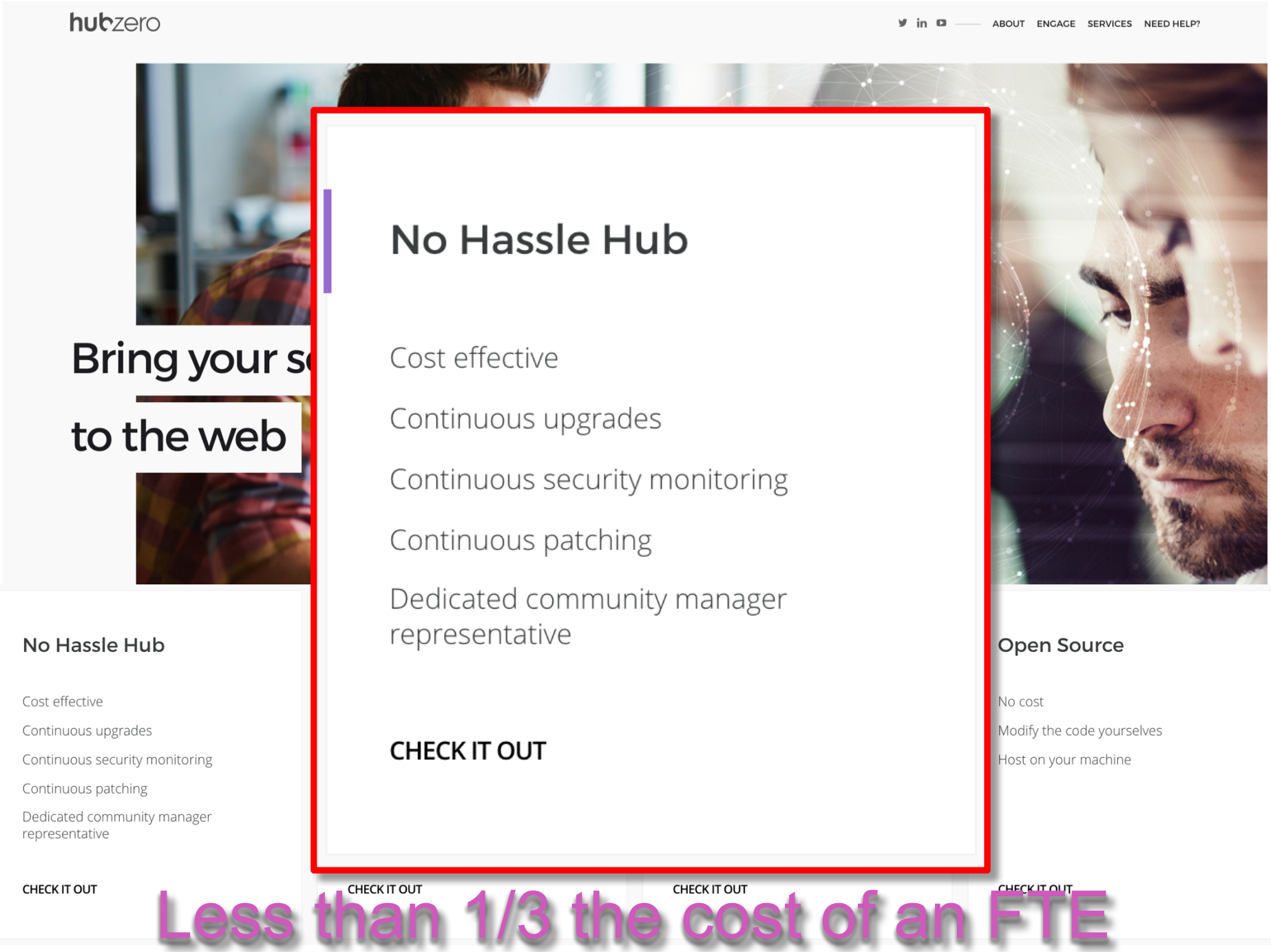
Business Model Components

Repeatability



Less than 1/3 the cost of an FTE

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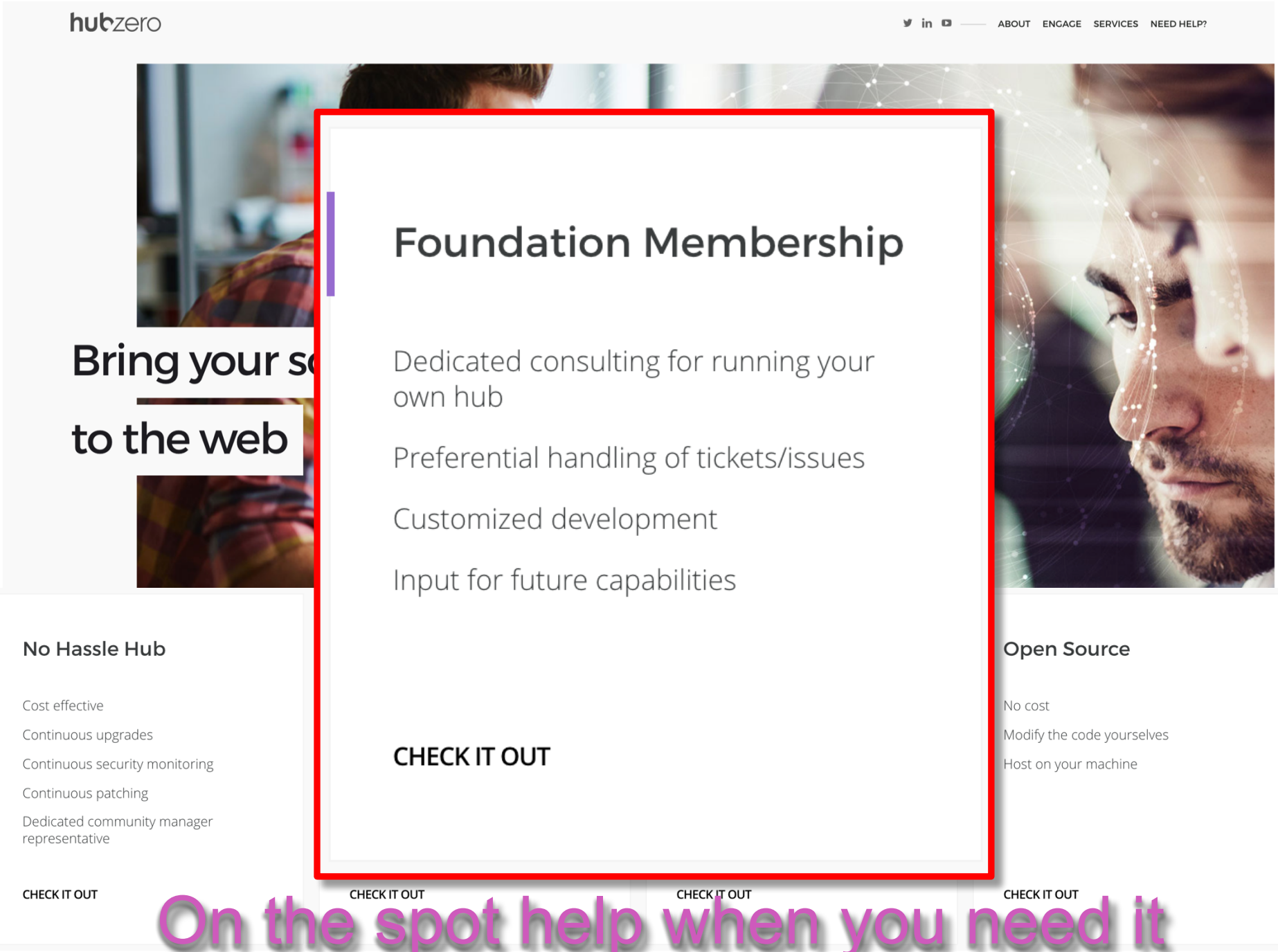
Business Model Components

Repeatability



On the spot help when you need it

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Business Model Components

Repeatability

(sysadmin is NOT free)

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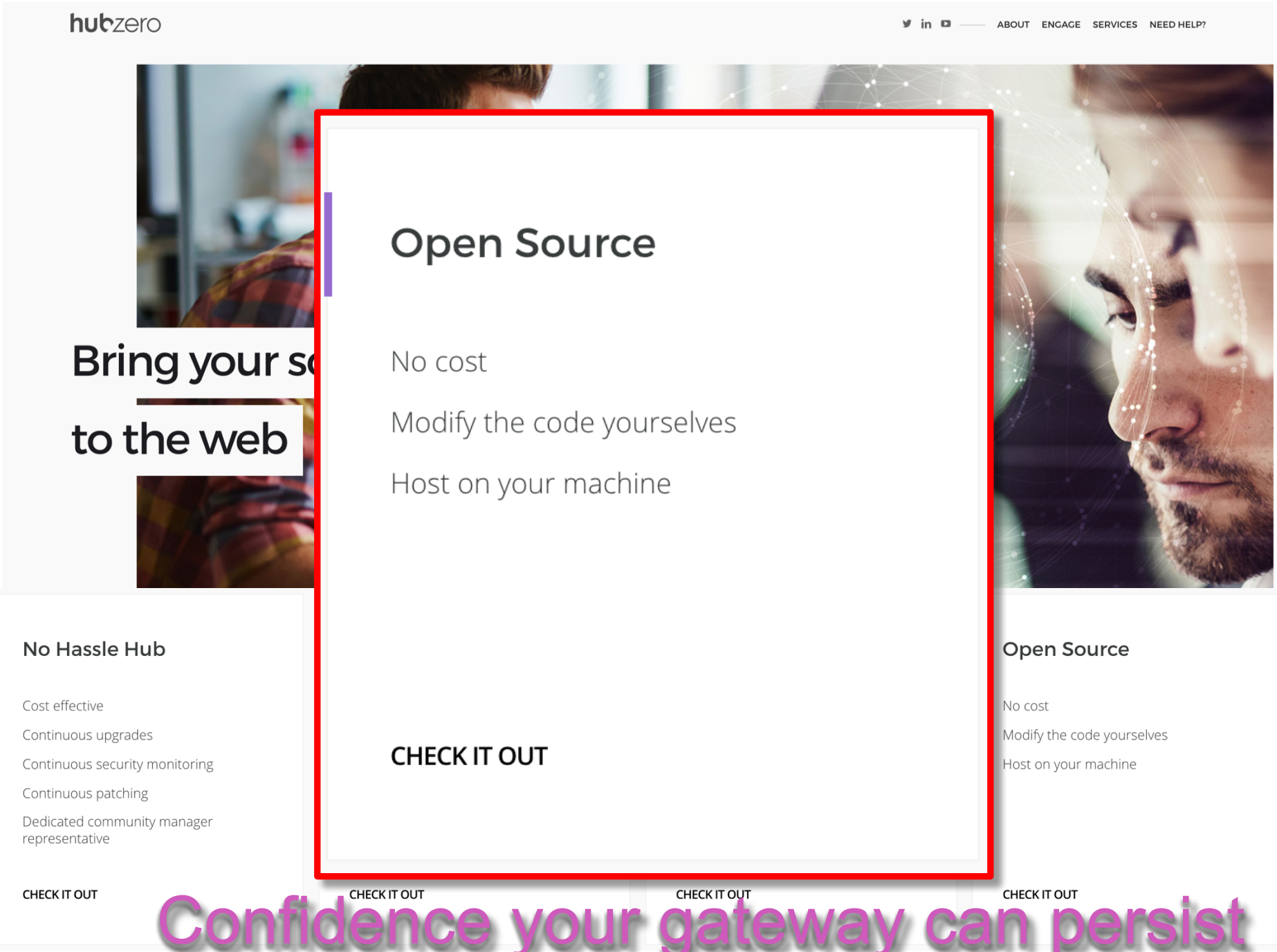
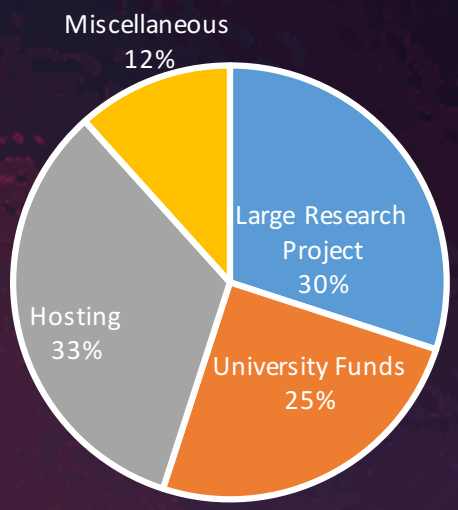


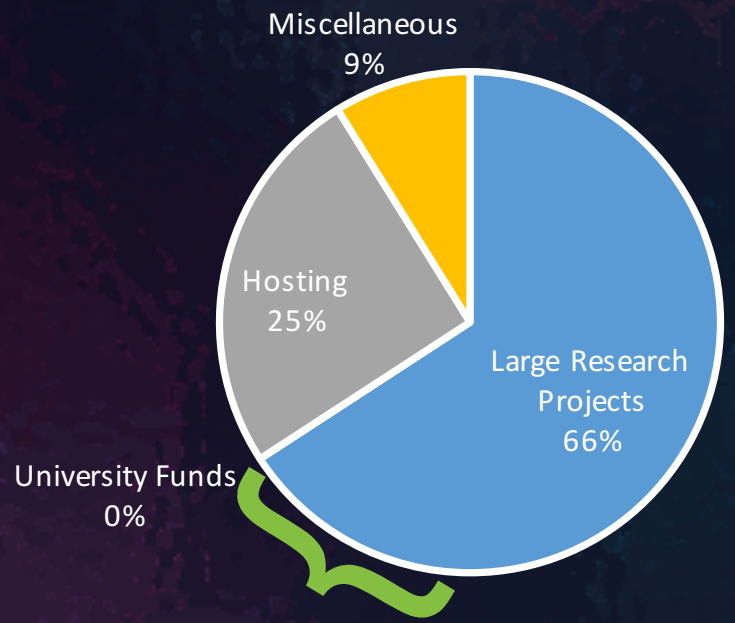
Confidence your gateway can persist

Evolving Revenue Stream Composition
Phases II & III: Repeatability & Reinvestment

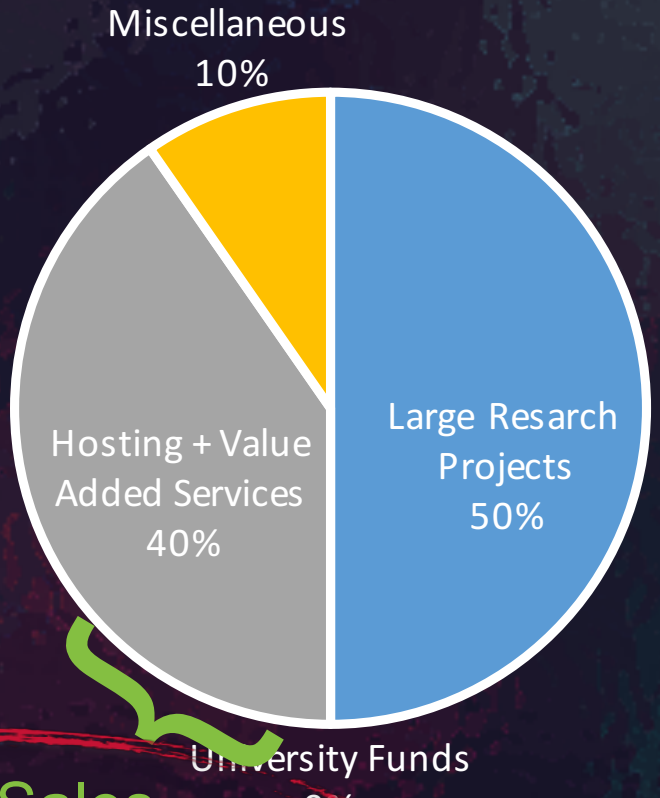
2014-2015



2015-2016



2017-2018

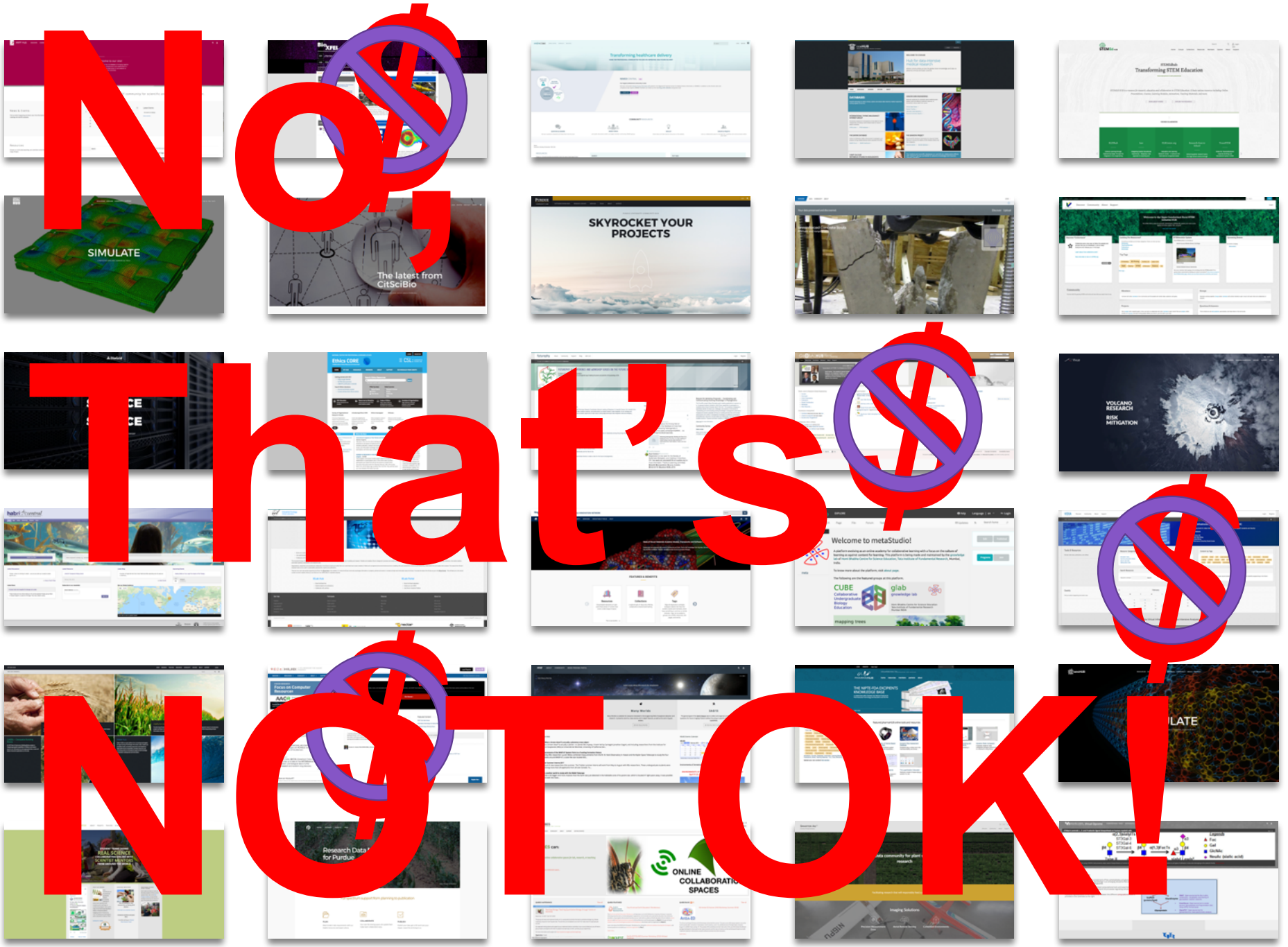


~~R&D based on what can be [illegible]ved from these projects.~~

R&D *AND* Sales based on true cost of operation.

Aligning with other organizations

End of Funding Should Not Mean End of Community



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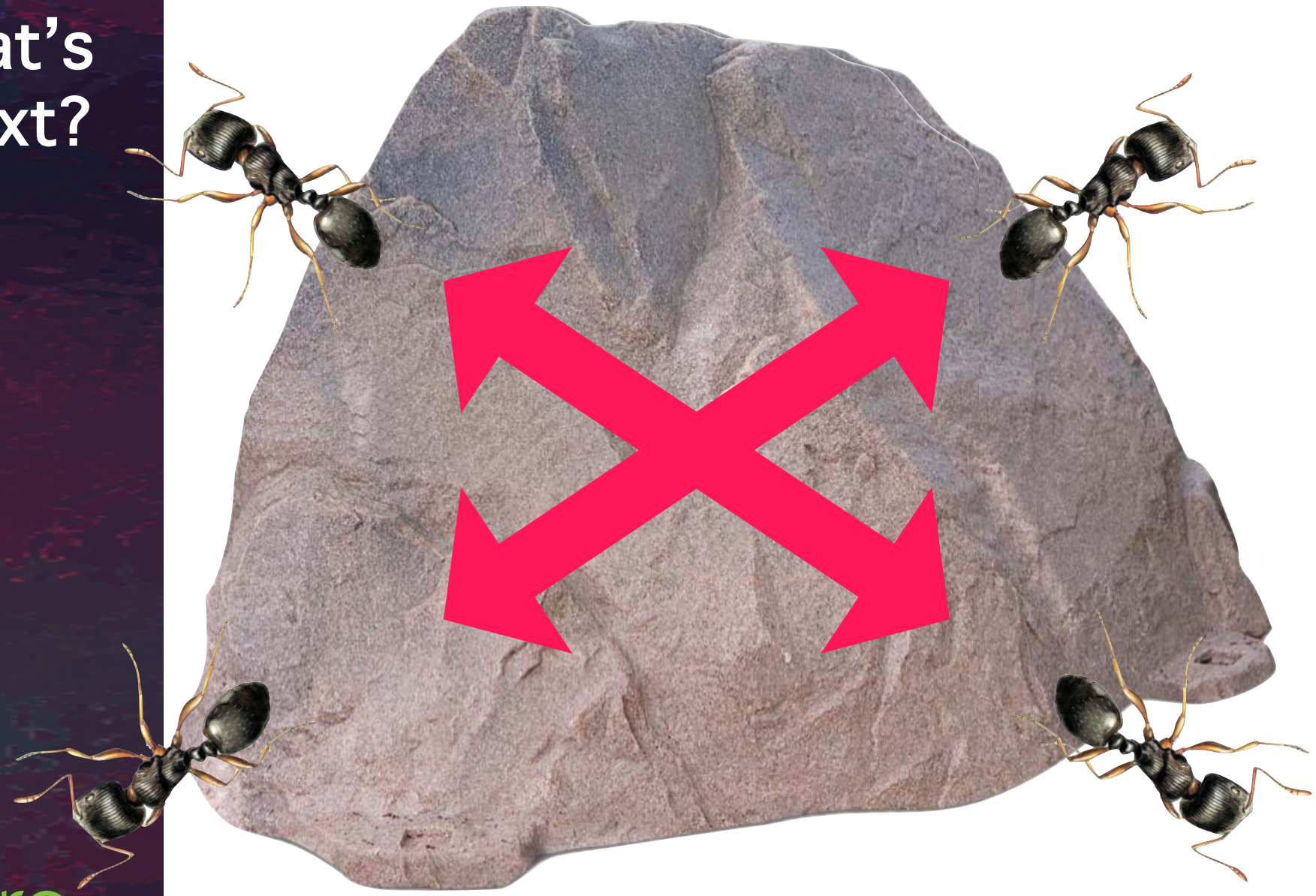
This will not
stand, man

What's Next?

Drawing by Wright

hubzero

What's Next?



Drawing by Wright

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What's Next?

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Aligning with other organizations

Solving Sustainability for our Clients

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OneSciencePlace

A new address for sustainability from the HUBzero Foundation

Aligning with other organizations

Solving Sustainability for our Clients

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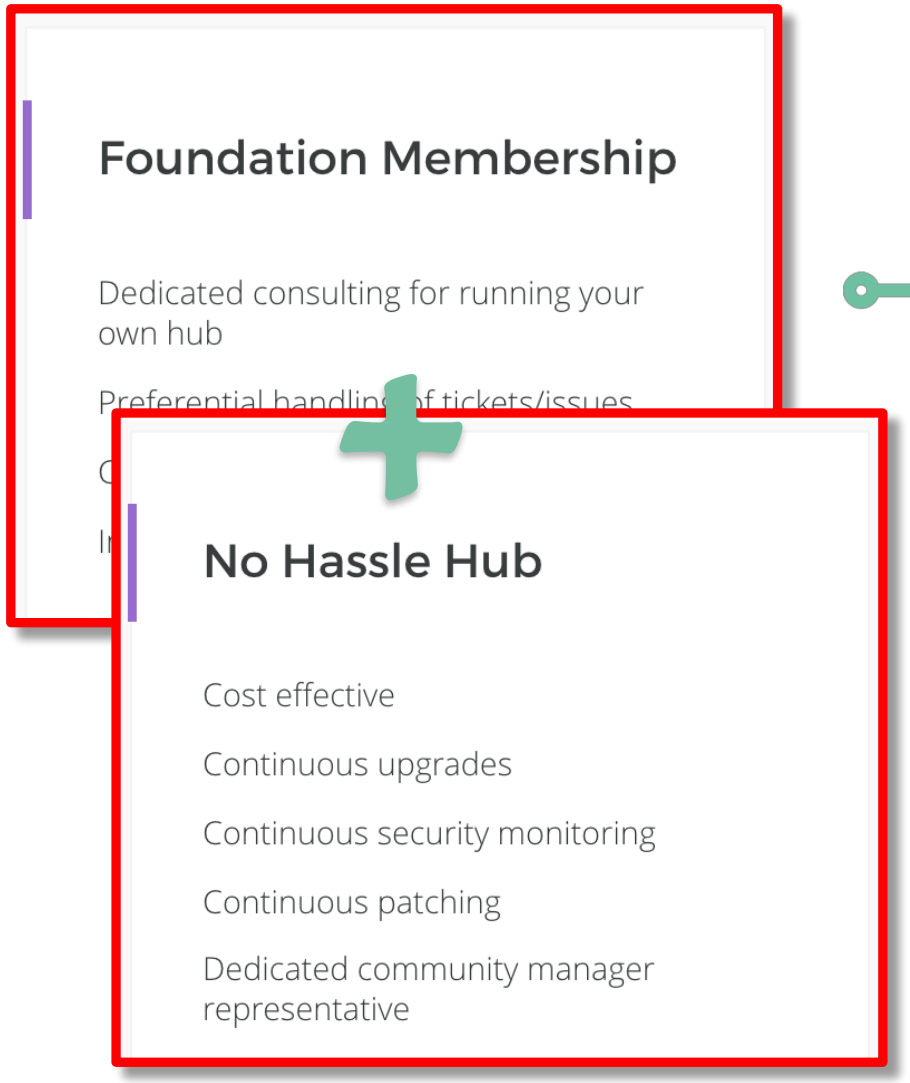


One Science Place

A community of science gateways living in **one big community, solving sustainability together**.

Grant +7 years minimum for starter hubs.

SGCI

Connecting people and resources to accelerate discovery by empowering the science gateway community

Science Gateways Community Institute

PI Nancy Wilkins-Diehr
San Diego Supercomputer Center
wilkinsn@sdsc.edu

co-PI Michael Zentner
Purdue University
mzentner@purdue.edu

sciencegateways.org

Award Number
ACI-1547611

NSF

A field of such platforms

GenApp

hubzero

SGCI

SGCI Science Gateways Community Institute

THE AGAVE PLATFORM

YOUR SCIENCE-AS-A-SERVICE API PLATFORM

Science Gateways Catalog

Save time — reuse gateway technologies or discover gateways and virtual research enviro
research, teaching, and learning

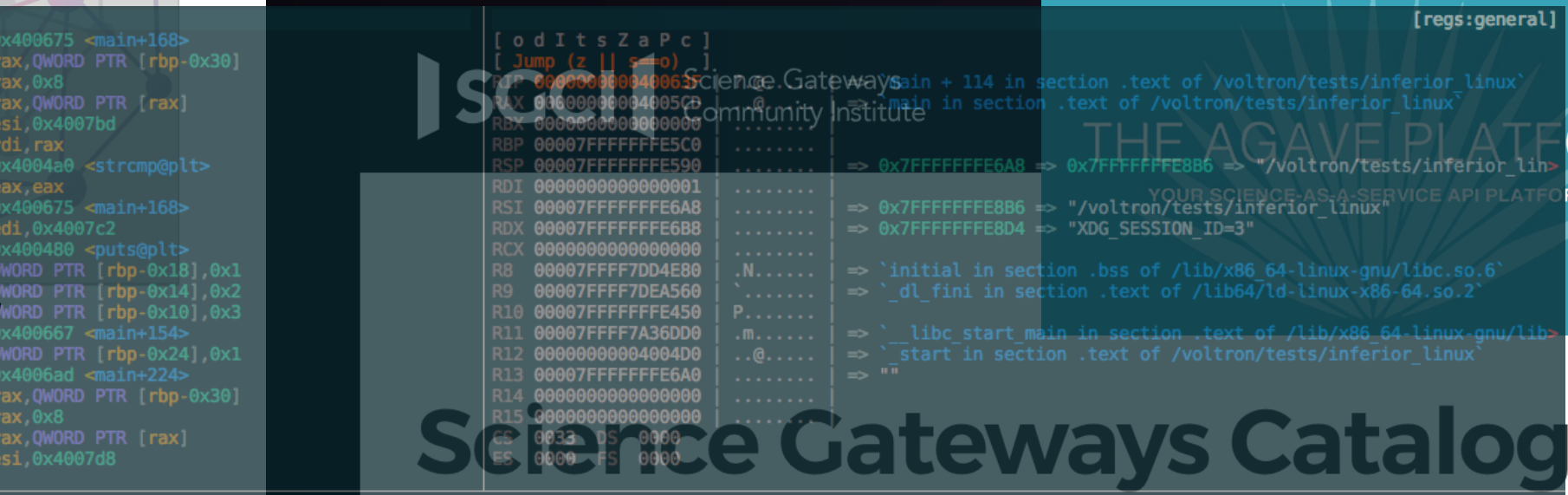
Total Entries: 449

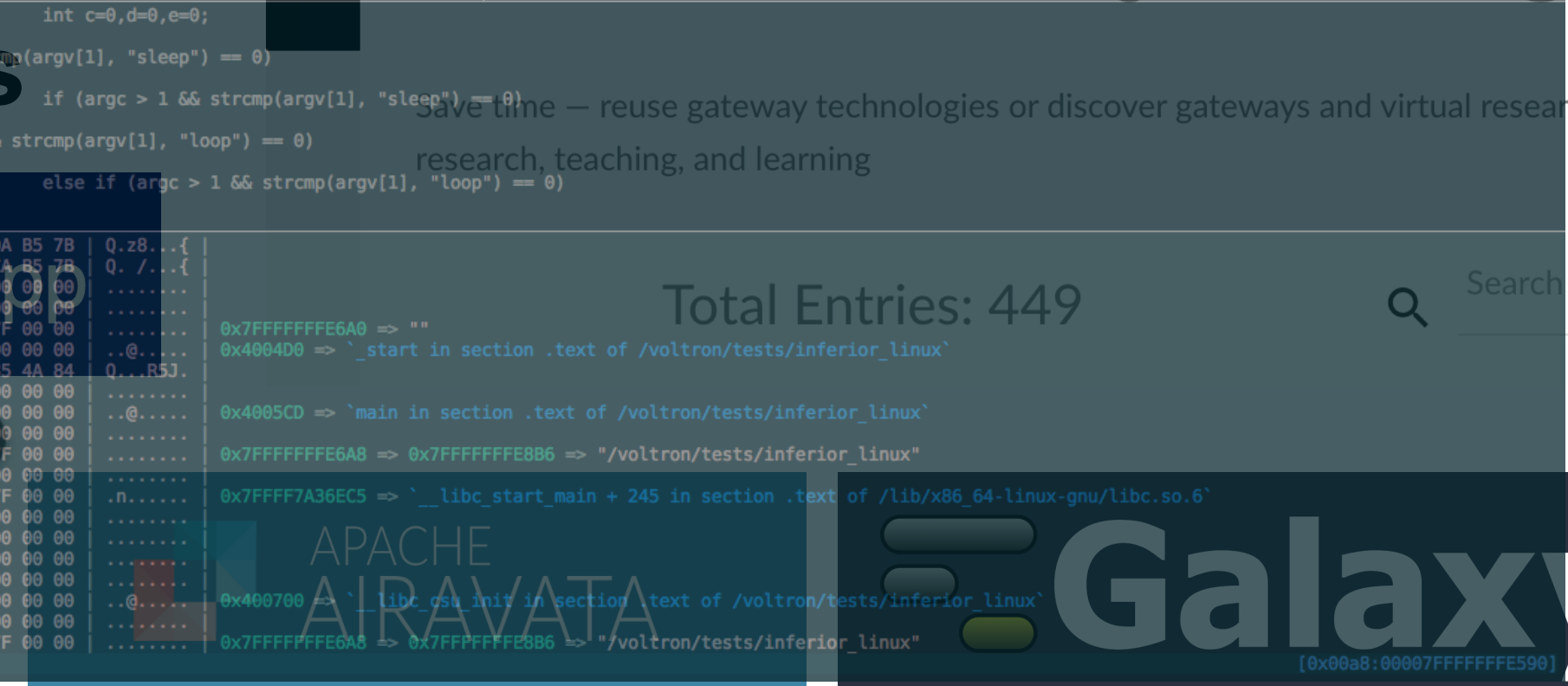
Search

APACHE AIRAVATA

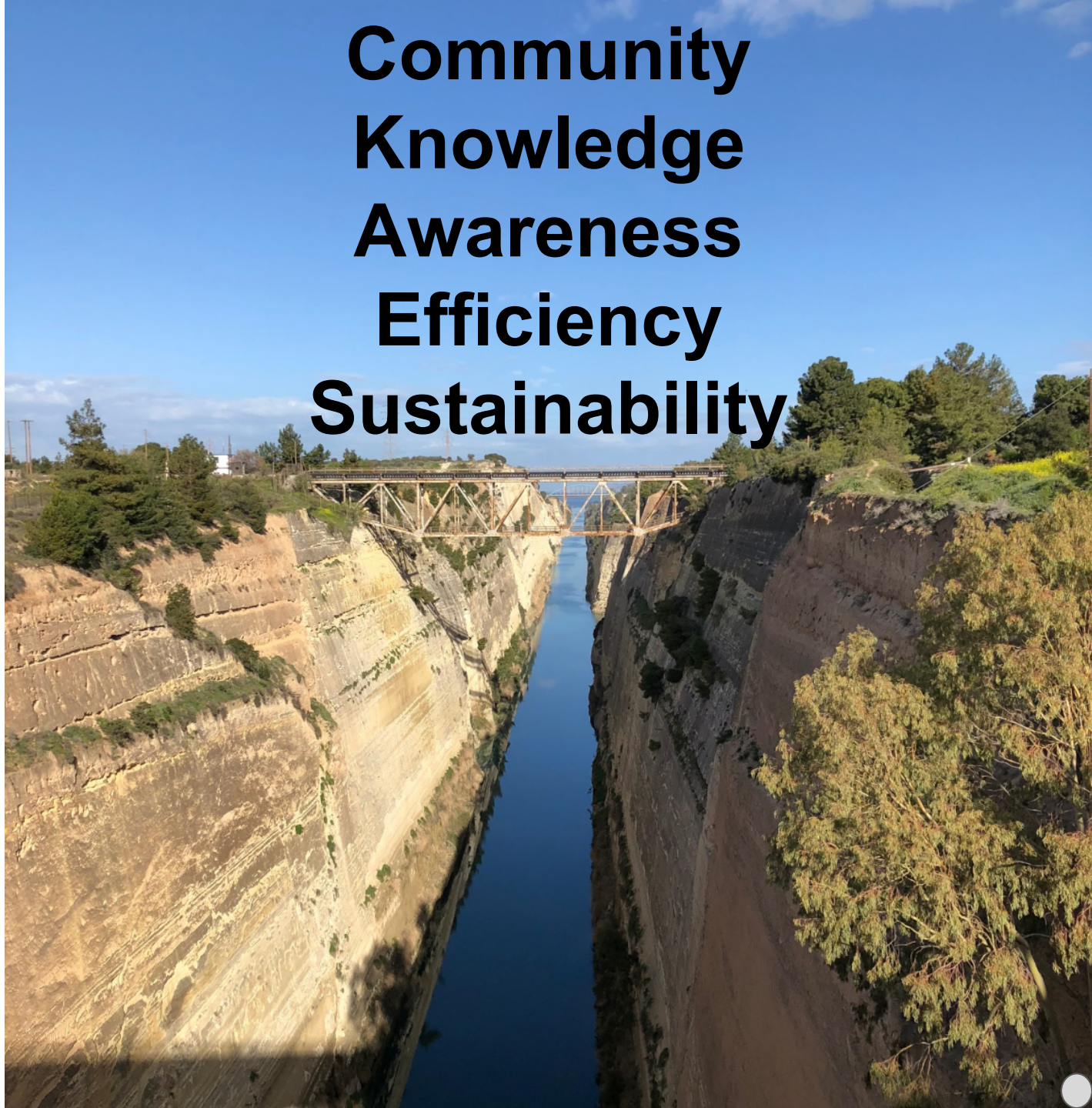
Galaxy

A field of such platforms





NSF formation of a $15M institute… to institutionalize best practices



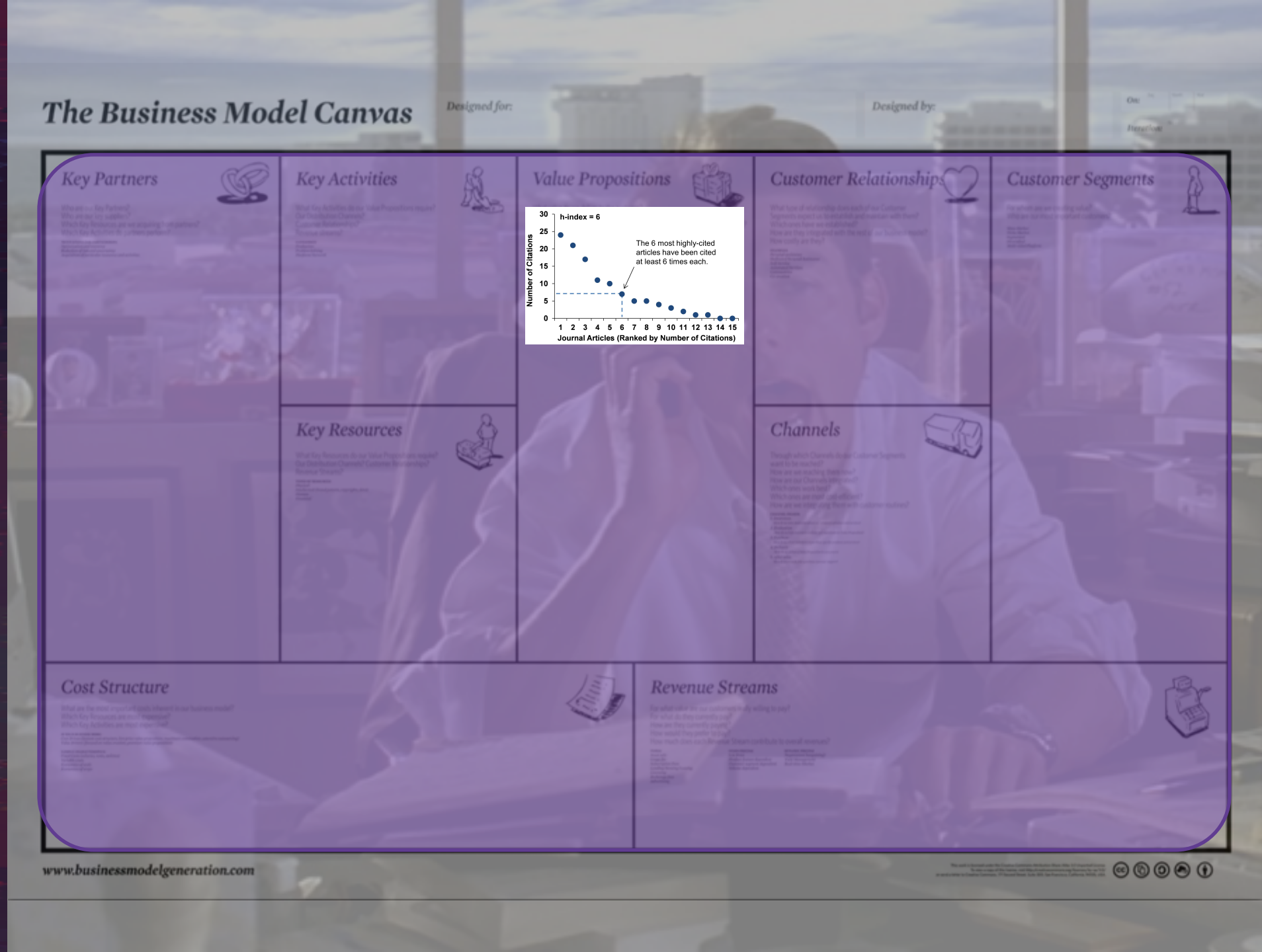
SGCI

Not really...

...there is a unifying framework

But how does a project fill it in?

hubzero



But how does a project fill it in?

- **Solicit business investment**
- Gradually build it from grant to grant
- **Align with another organization already doing it**

hubzero

http://www.funkidslive.com/learn/hallux/more-physiology-fix-up/dreams-come-dream/#