Are digital humanities projects sustainable?

A proposed service model for a DH infrastructure

CNI MEMBERSHIP MEETING: FALL 2018

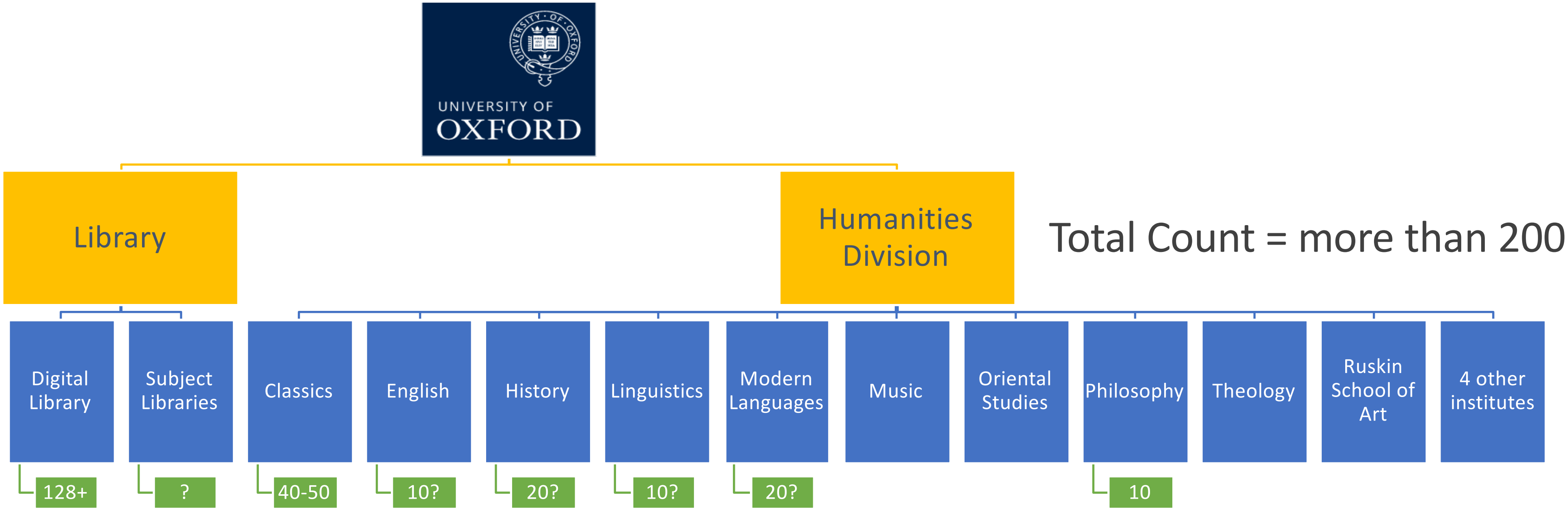
MONDAY 10 DECEMBER 2018 2:30-3:15PM

CHRISTINE MADSEN & MEGAN HURST

ATHENAEUM21

The Problem

A proliferation of DH projects, tucked away in more than 18 departments



Total Count = more than 200

Our Remit

How to create a sustainable infrastructure for DH

What is the *"minimum viable service"* for a digital humanities infrastructure that would be used by a *maximum* number of digital humanities researchers?

In other words, what is the minimum functionality required to persuade researchers to use a *centralized, supported, and sustainable* digital infrastructure, rather than create something themselves, or use commercially-available tools.

The Research:
Interviews + User Needs Analysis

- Interviewed 31 people from the Humanities and Social Sciences, representing 25 projects
- Reviewed all their available projects for documented user experience and user needs

The Research: Functional Analysis

For ~40 projects we:

- Approached each online project as an end-user
- Verified the functional requirements
- Double-checked the proposed “minimum viable service” against each project

The Findings: 4 Areas

1. What do DH researchers have? What are their research data?
2. What do people want to do with the data they have?
3. What are the functional requirements for *sustaining* these projects?
4. What are some of the functional *solutions?*

What do people in DH study?
What are their ***research data***?

In order of frequency:

1. Metadata (descriptions of things)
2. Text (full, transcribed text of things)
3. Images
4. Audio
5. Video
6. Software (but very little)

What do people in DH study?
What are their ***research data***?

In order of frequency:

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2. Text (full, transcribed text of things)
3. Images
4. Audio
5. Video
6. Software (but very little)

Good news! This is largely not a software preservation problem!

Findings

1. There is a limited number of research data types

What do people <**mostly**> want to do with their research data?

1. **Search and find**
2. **‘Publish’ online** (make available in a browser, via a stable, permanent URL)
3. **Compare versions**
4. Download
5. Listen / watch
6. Transcribe
7. Analyze
8. Run software

What do people <**increasingly**> want to do with their research data?

1. Search and find
2. ‘Publish’ online (make available in a browser, via a stable, permanent URL)
3. Compare versions
4. Download
5. Listen / watch
6. Transcribe
7. Analyze
8. Run software

- **Map**
- **Visualize**
- **Machine learning**
- **Visual search**

Findings

1. There is a limited number of research data types
2. There is a limited number of required functionalities

So, what is the problem?

WHAT ARE THE CHALLENGES ASSOCIATED WITH DH PROJECTS?

First things first

WHAT DO WE MEAN WHEN WE SAY SUSTAINABILITY?

Glossary: What are the issues here?

PASSIVE

archive (noun) - 1. A collection of historical documents or records providing information about a place, institution, or group of people.
1.2A complete record of the data in part or all of a computer system, stored on an **infrequently used medium**.
archive (verb) - 1. To place or store (something) in an archive.
1.1 Computing Transfer (data) to **a less frequently used storage medium** such as magnetic tape.

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PASSIVE

preservation (noun) - The **action** of preserving something.

ACTIVE

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preservation (noun) - The **action** of preserving something.	ACTIVE
sustainability (noun) – 1. The ability to be **maintained at a certain rate or level.** **sustain (verb)** – 3. Cause to continue for an extended period or **without interruption.**	ON-GOING

Can a data repository be the answer for sustainability?

No. repositories are

- …archives
- "…is not for the storage of data that is **still in use** by research projects."
- …requires 'packaging' the data in a way that prevents **granular** access

Sustainability requires access **without interruption**.

- Maintaining a level of access to the data intended by the researcher

It is a good idea to archive the data from these projects, but that will not sustain them.

Requirements for Sustainability

Sustainability requires understanding at least three things:

- What is essential to sustain
- What should not – or need not be – sustained
- What is unique about these projects?

What is Unique About these Projects?

- Bringing together a collection and/or a corpus for the first time
- Providing new forms of access to that content by making it electronic and searchable

To be clear:

- The content / collections / corpora are not *usually* unique
- The software is not *usually* unique

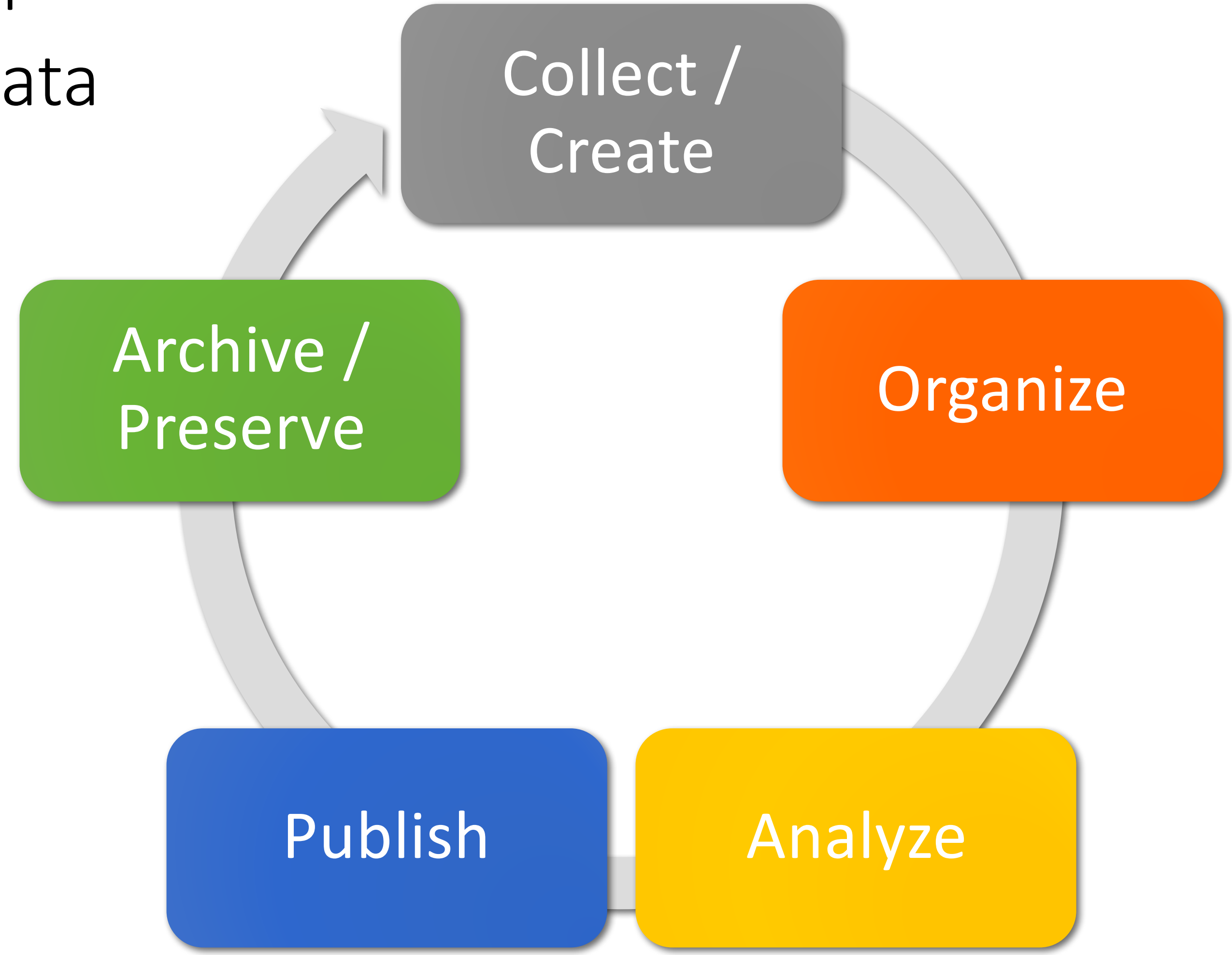
But

- The methods of access provide the opportunity for new scholarly opportunities

DH Workflows: A Deep Dive

THERE ARE MORE WORKFLOWS THAN WE THINK

“Traditional” Research Data Workflow



Collect / Create

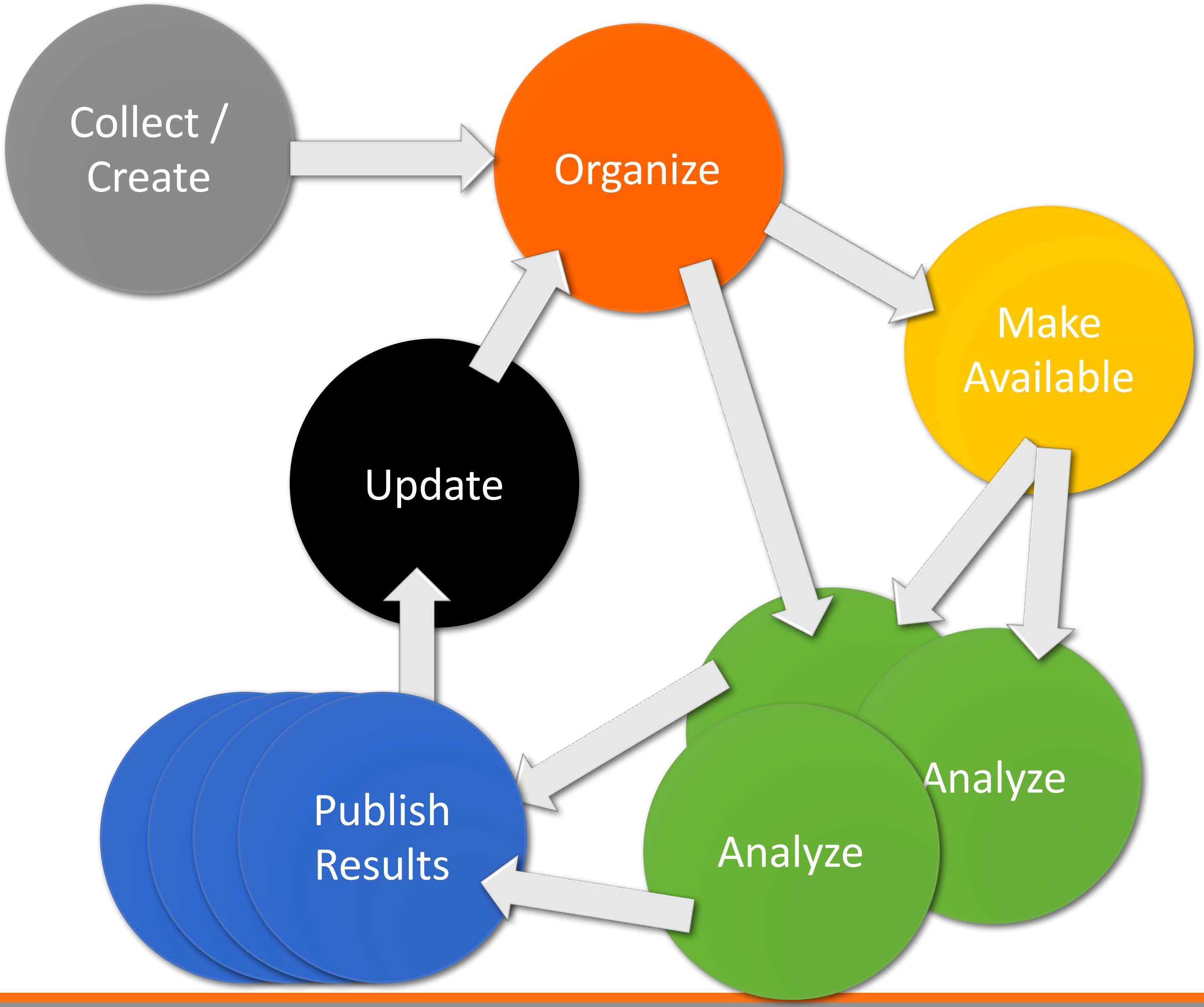
Organize

Analyze

Publish

Archive / Preserve

The Reality of the Data Workflow



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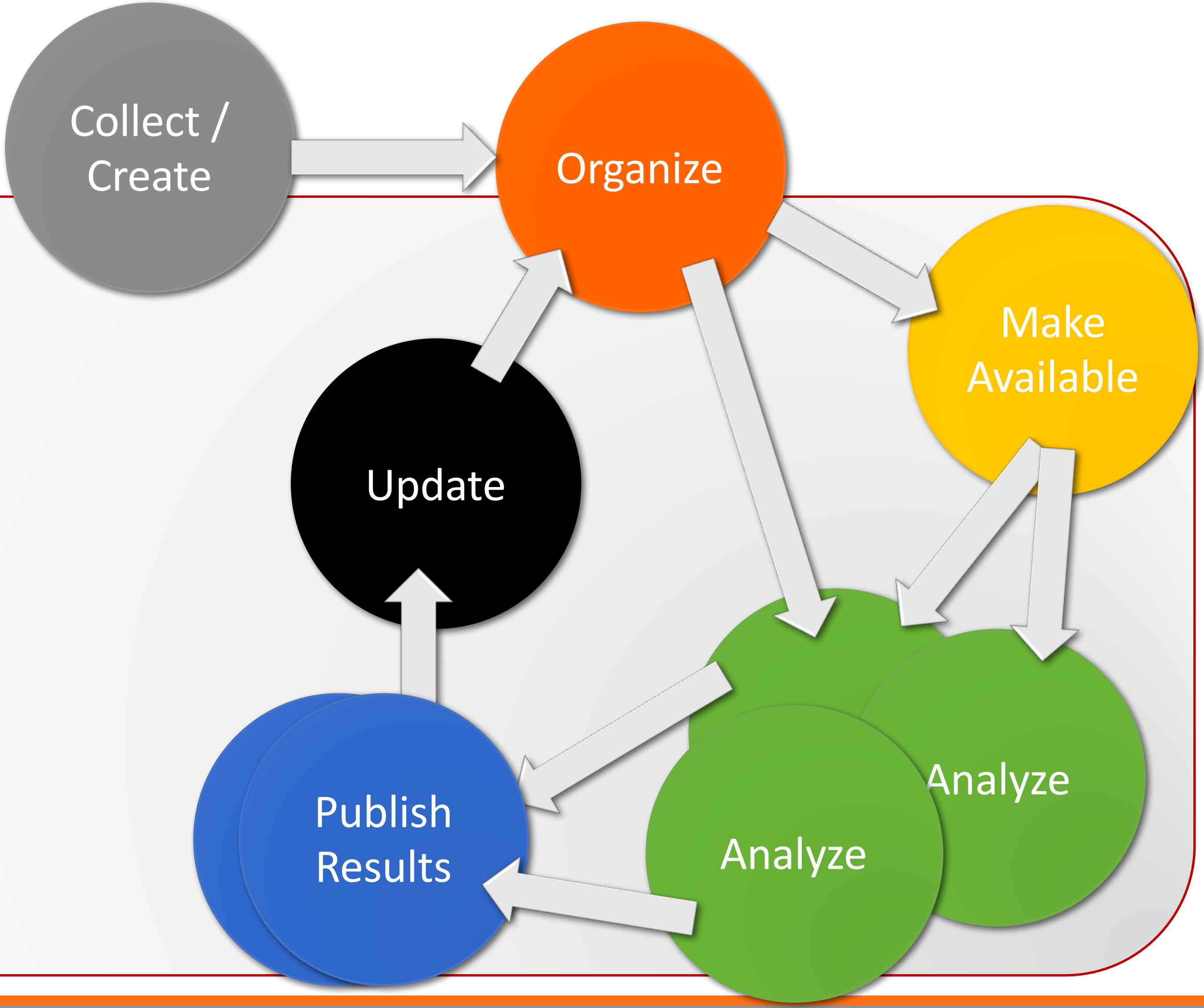
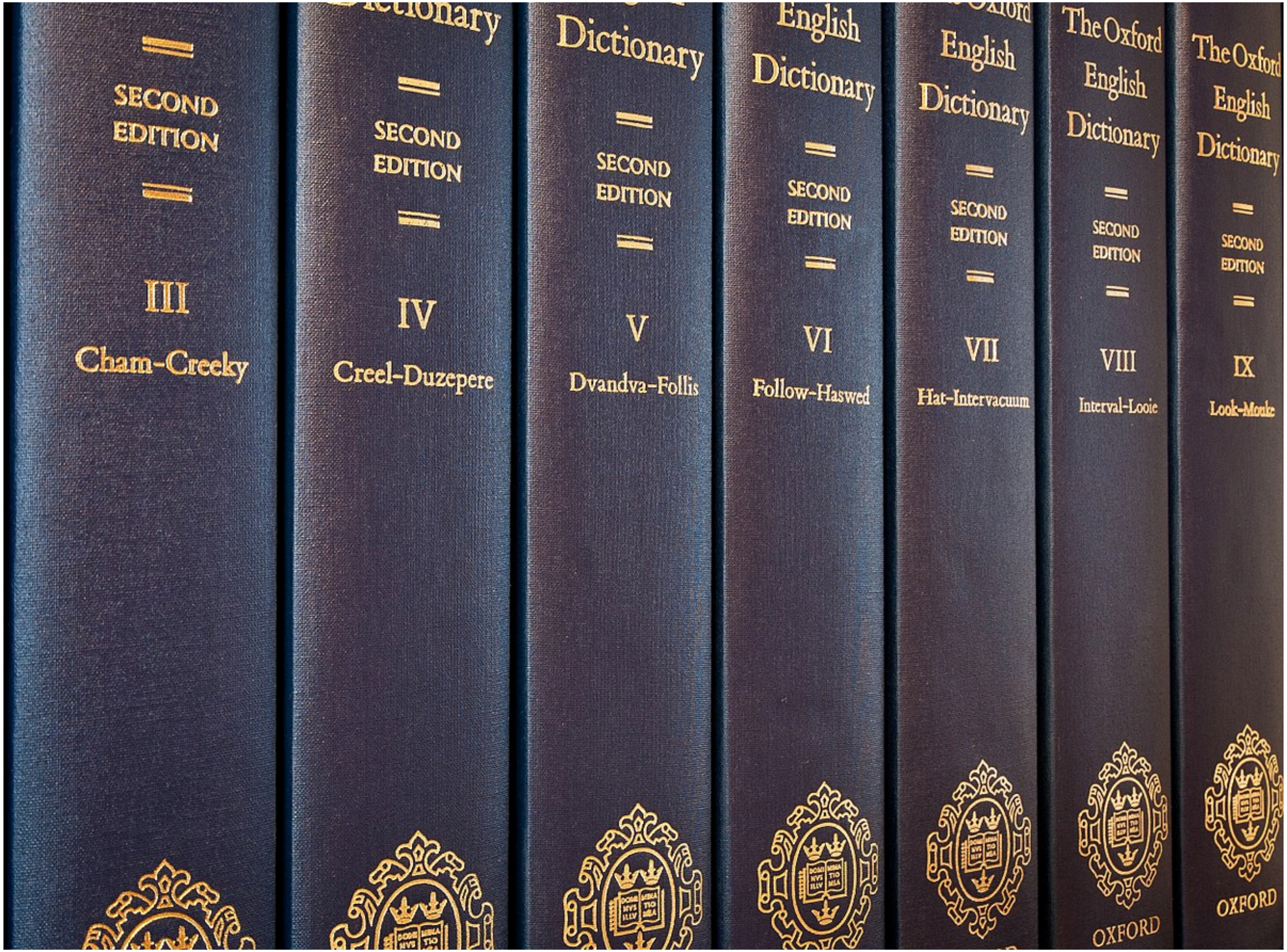


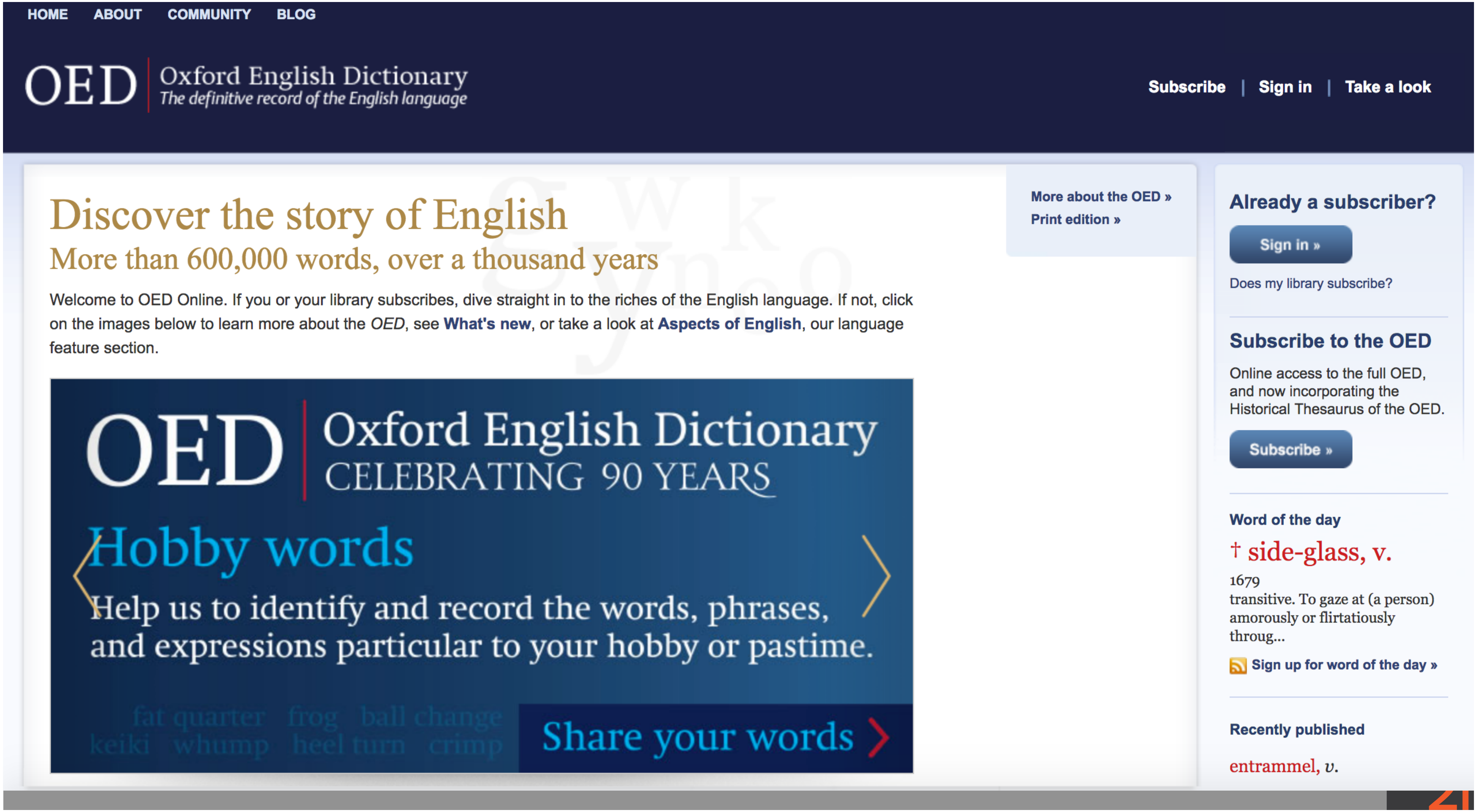
This process could take 10-100 years

The Reality of Data Lifecycles in DH

- The ‘research data’ being created is not just data, it is corpora, collections, and reference works.
- Think of it more like a dictionary than ‘traditional’ research data
  - Aggregations of granular data
  - Long-term activity
  - Data is ‘shared’ and made public much earlier in the workflow than in the traditional workflow diagrams
  - Multiple research projects using the data at the same time in different ways
  - New research leads to corrections, additions, and updates to the data (as well as ‘publications’)
- Not unique to DH – think Human Genome project or longitudinal, multi-generational medical studies

An Analogy : The Oxford English Dictionary





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Word of the day

† side-glass, v.

1679
transitive. To gaze at (a person) amorously or flirtatiously throug...

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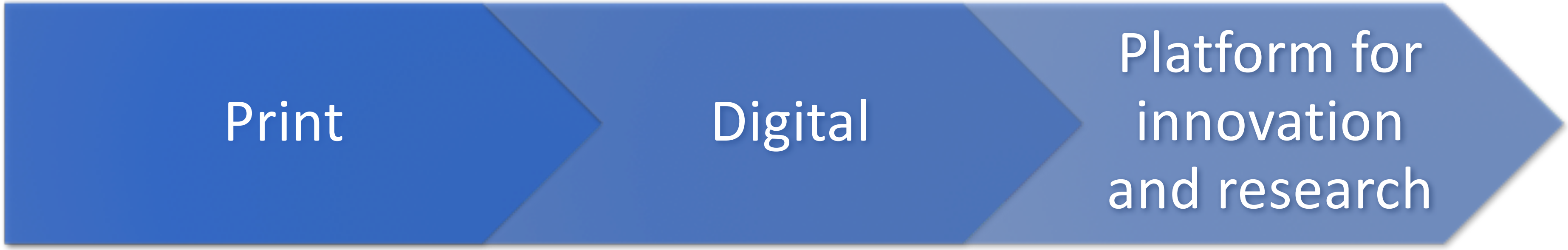
entrammel, *v.*

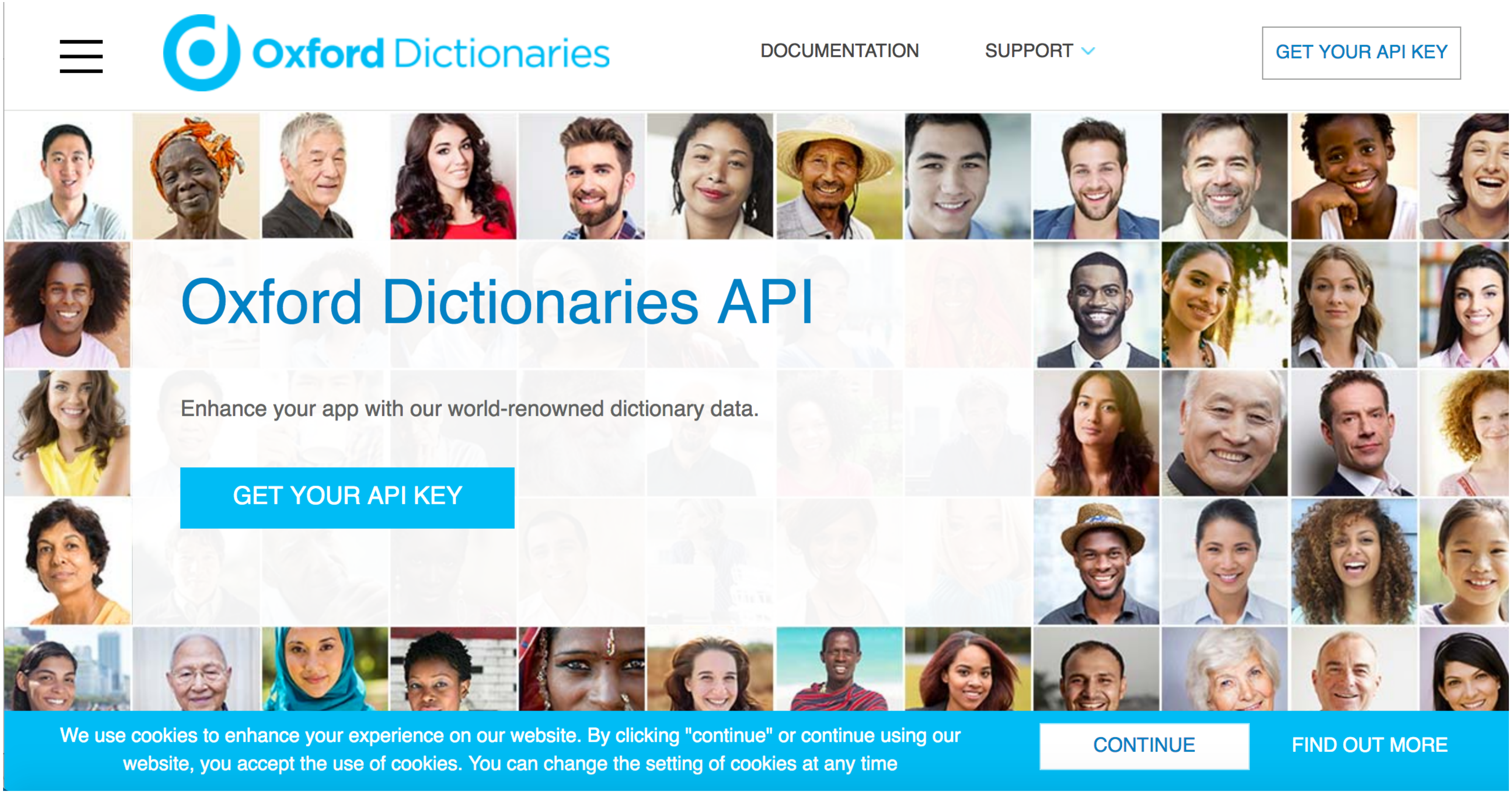


Print

Digital

Platform for innovation and research

You don’t archive the OED when you are ‘done’, you expose it for research and analysis. That is how you sustain it.



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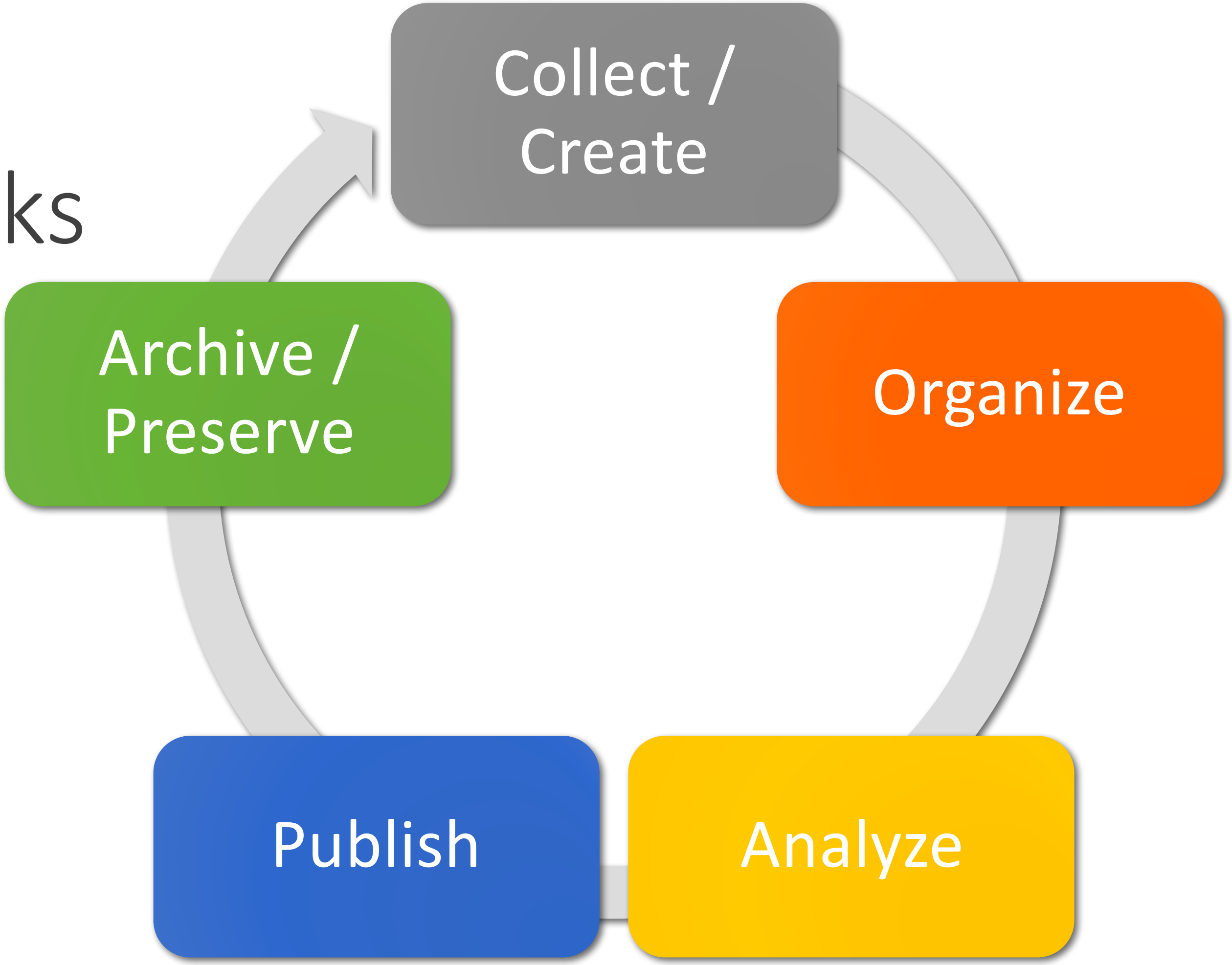
This is not how the OED Works



Collect / Create

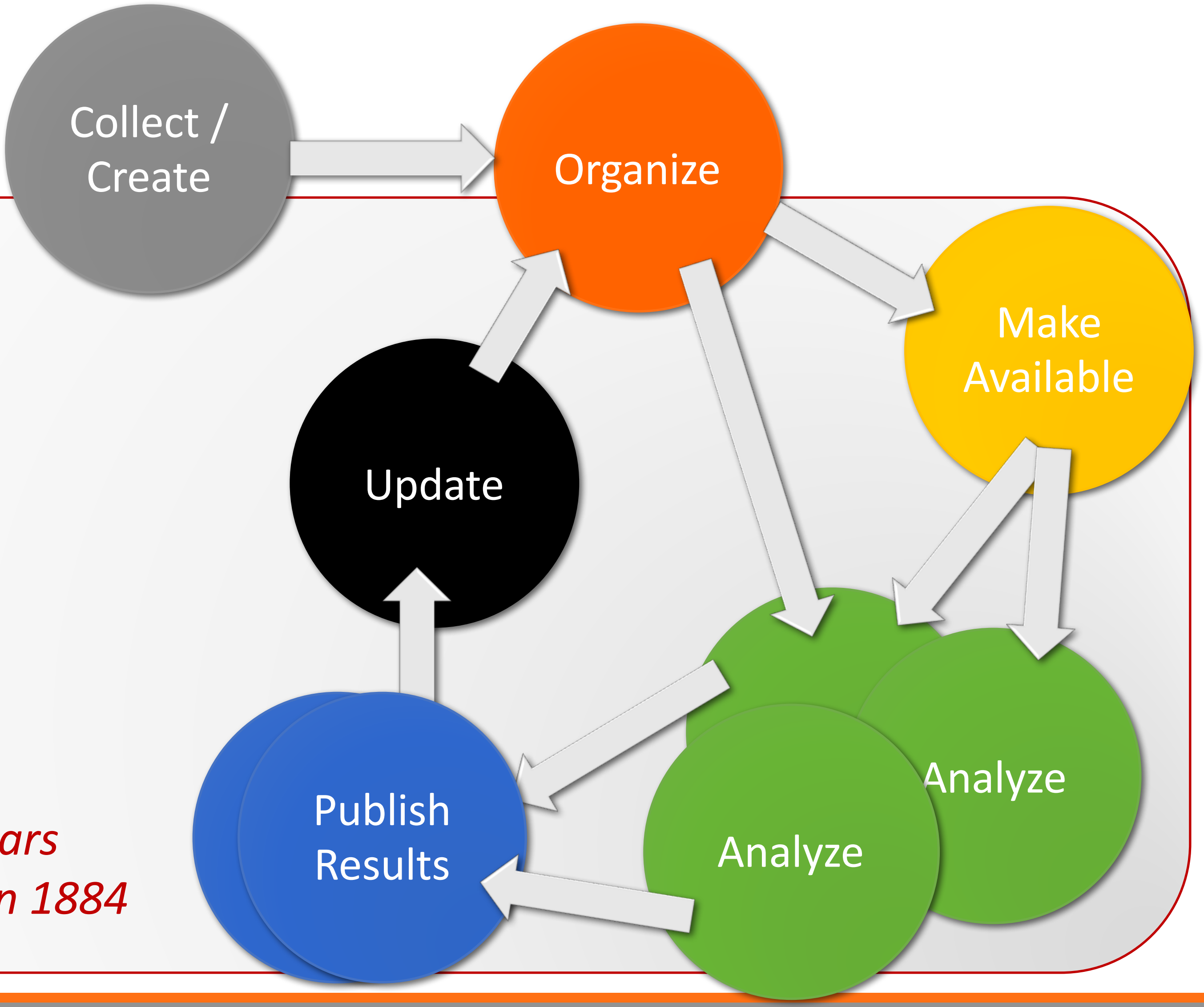
Organize

Analyze

Publish

Archive / Preserve

This is how the OED works



This has taken 100+ years
First fascicle released in 1884

Changing the language

Rather than talk about ‘research data’ we should talk about DH projects as producing corpora and reference collections

Findings

1. There is a limited number of research data types
2. There is a limited number of required functionalities
3. Sustainability requires sustained, granular access

E.g. ‘maintained at a certain rate or level’ (from the definition)

What Each Project Needs: Infrastructure

- A way to create metadata (that is, to describe things)
- A place to put ‘data’ (text, images, video, audio)
- An index that allows end-users to search and find things
- Ways to render these objects in a browser with stable/ permanent URLs so they can be cited
- A place to engage and innovate – that is, to do more experimental things like image matching, visualization, etc.
- A way to update the data

What Each Project Needs: People

- People to help translate functional requirements into technical requirements
- People to maintain, manage, update the software and storage
- Expertise in hardware, software, data and metadata standards
- People to sustain the collections and data and to migrate formats when needed
- Support for fundraising
- Expertise in outreach

What is needed to sustain these projects in aggregate?

1. People
2. Storage
3. Software
4. People

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People to help ‘translate’ functional requirements into technical requirements

People to maintain and update the software

What is needed to sustain these projects in aggregate?

1. People
2. Storage
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Infrastructure that allows continued (long-term), item-level access to these collections and corpora. (Also includes **people** to help manage/preserve)

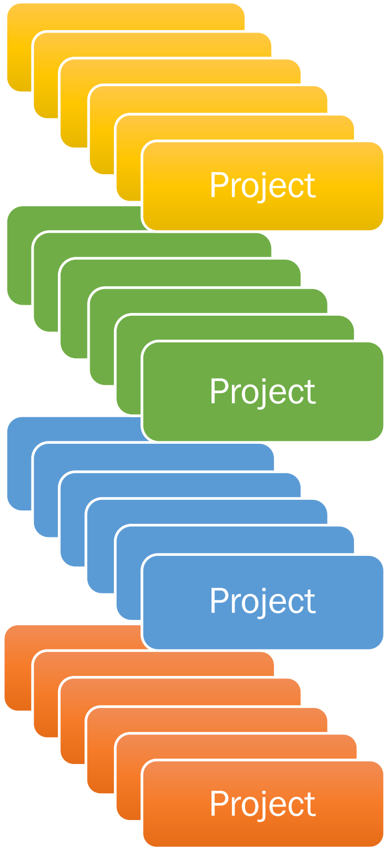
Findings

1. There is a limited number of research data types
2. There is a limited number of required functionalities
3. Sustainability requires sustained, granular access
4. Sustainability requires a mix of technology and people

Findings

1. There is a limited number of research data types
2. There is a limited number of required functionalities
3. Sustainability requires sustained, granular access
4. Sustainability requires a mix of technology and people
5. There is no, single, out-of-the-box solution to meet all these needs

Option 1: Provide Storage and People for Each Project



1. Give projects storage
2. Hire a team of people to look after them

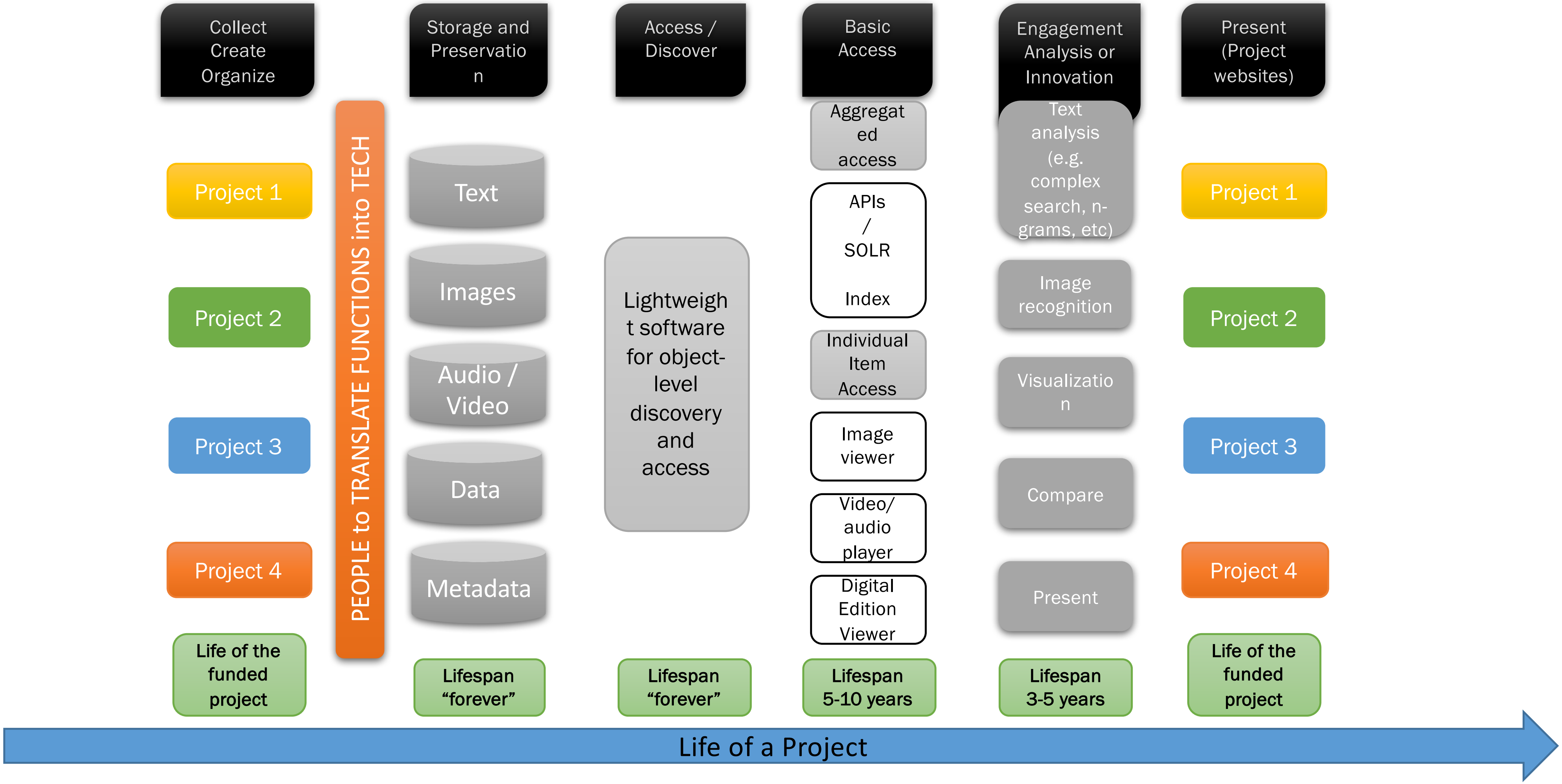
Pros

- Each project has full autonomy
- Funders like to give money for something 'new'

Cons

- Not scalable
- Who hires/manages the people?
- Doesn't solve the long-term problem because eventually people will no longer have funding or project knowledge – then what?

Option 2: Provide Sustainable 'Service Layers'



Collect Create Organize

Project 1

Project 2

Project 3

Project 4

Life of the funded project

PEOPLE to TRANSLATE FUNCTIONS into TECH

Storage and Preservation

Text

Images

Audio / Video

Data

Metadata

Lifespan "forever"

Access / Discover

Lightweight software for object-level discovery and access

Lifespan "forever"

Basic Access

Aggregated access

APIs / SOLR Index

Individual Item Access

Image viewer

Video/ audio player

Digital Edition Viewer

Lifespan 5-10 years

Engagement Analysis or Innovation

Text analysis (e.g. complex search, n-grams, etc)

Image recognition

Visualization

Compare

Present

Lifespan 3-5 years

Present (Project websites)

Project 1

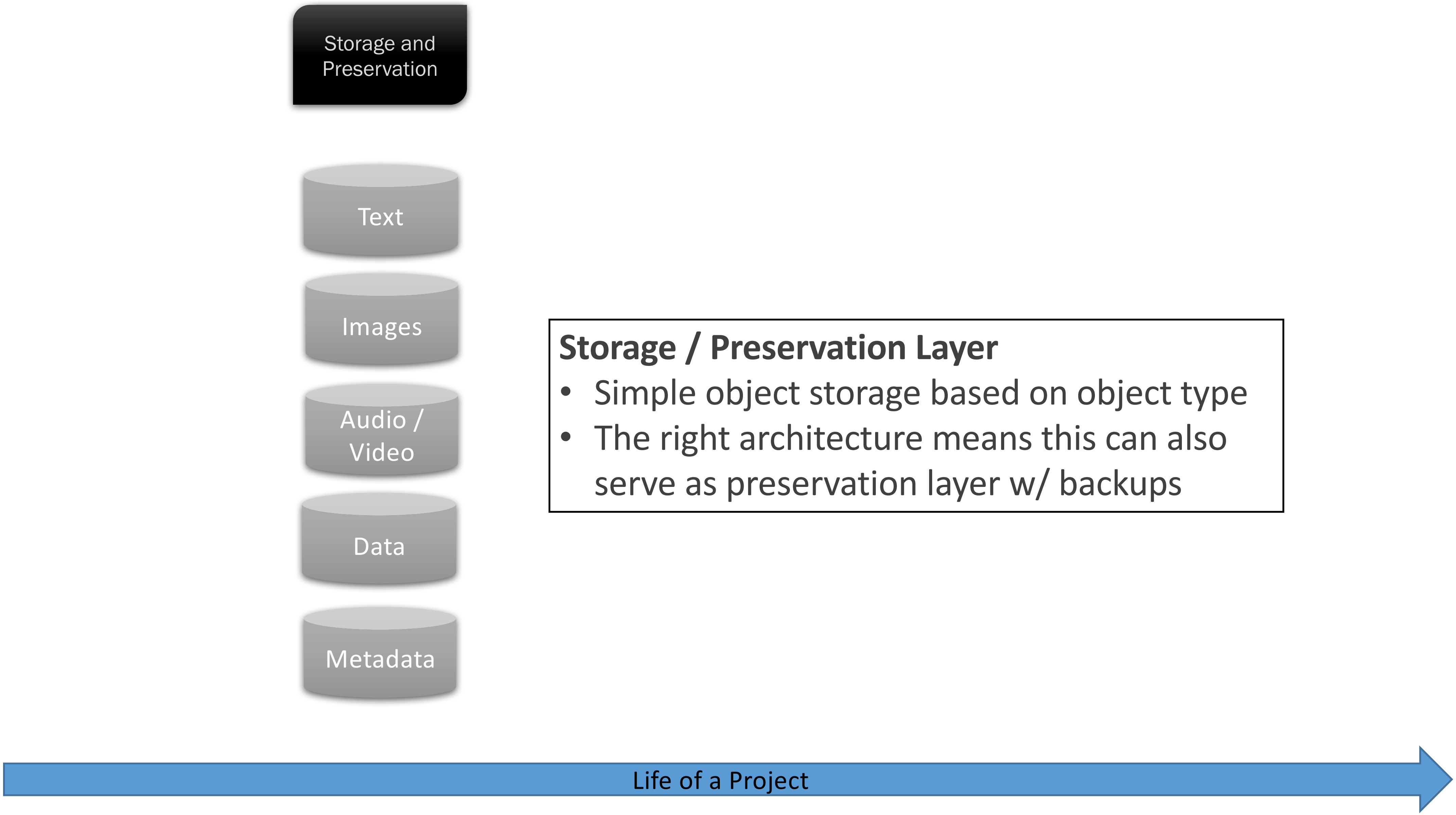
Project 2

Project 3

Project 4

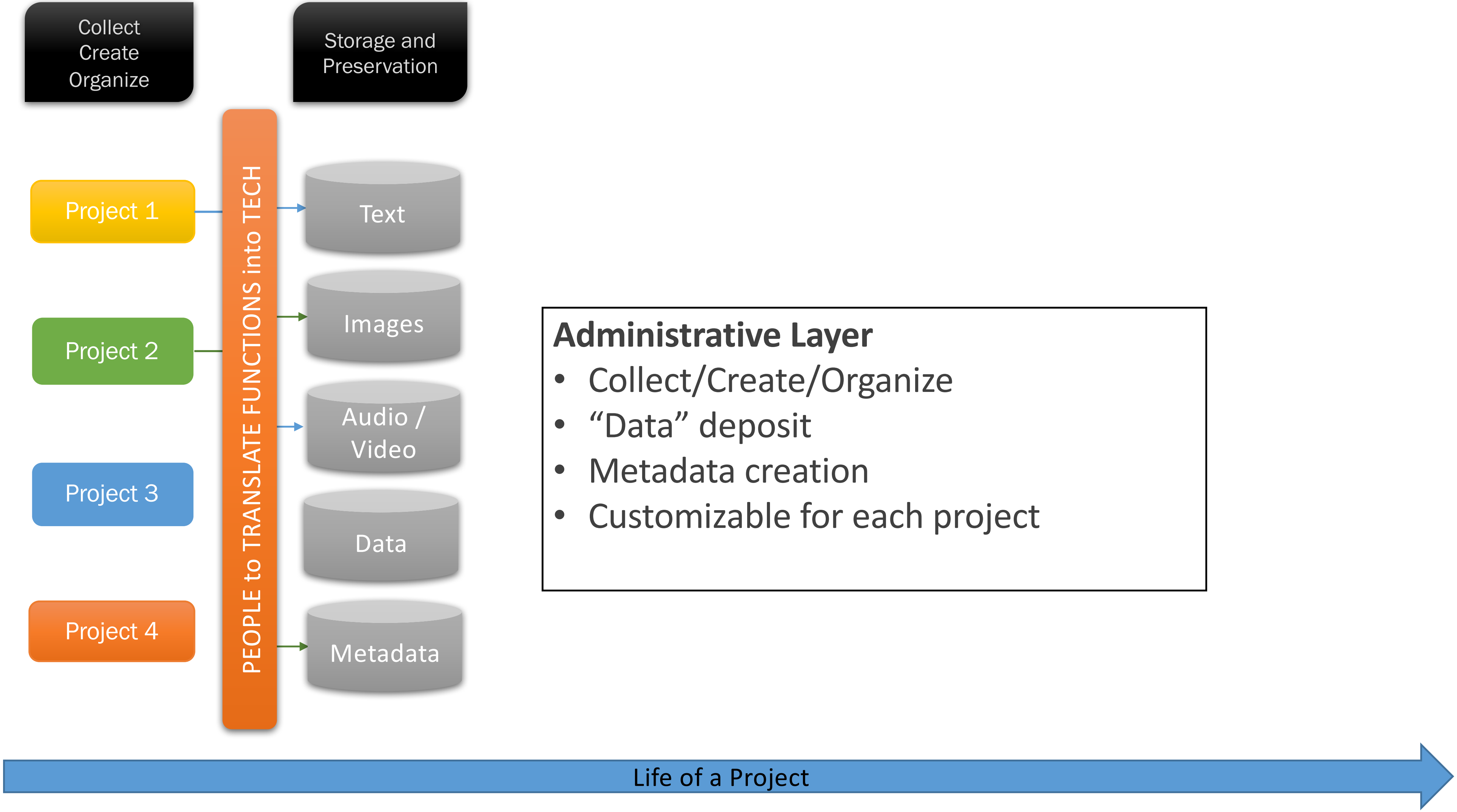
Life of the funded project

Life of a Project



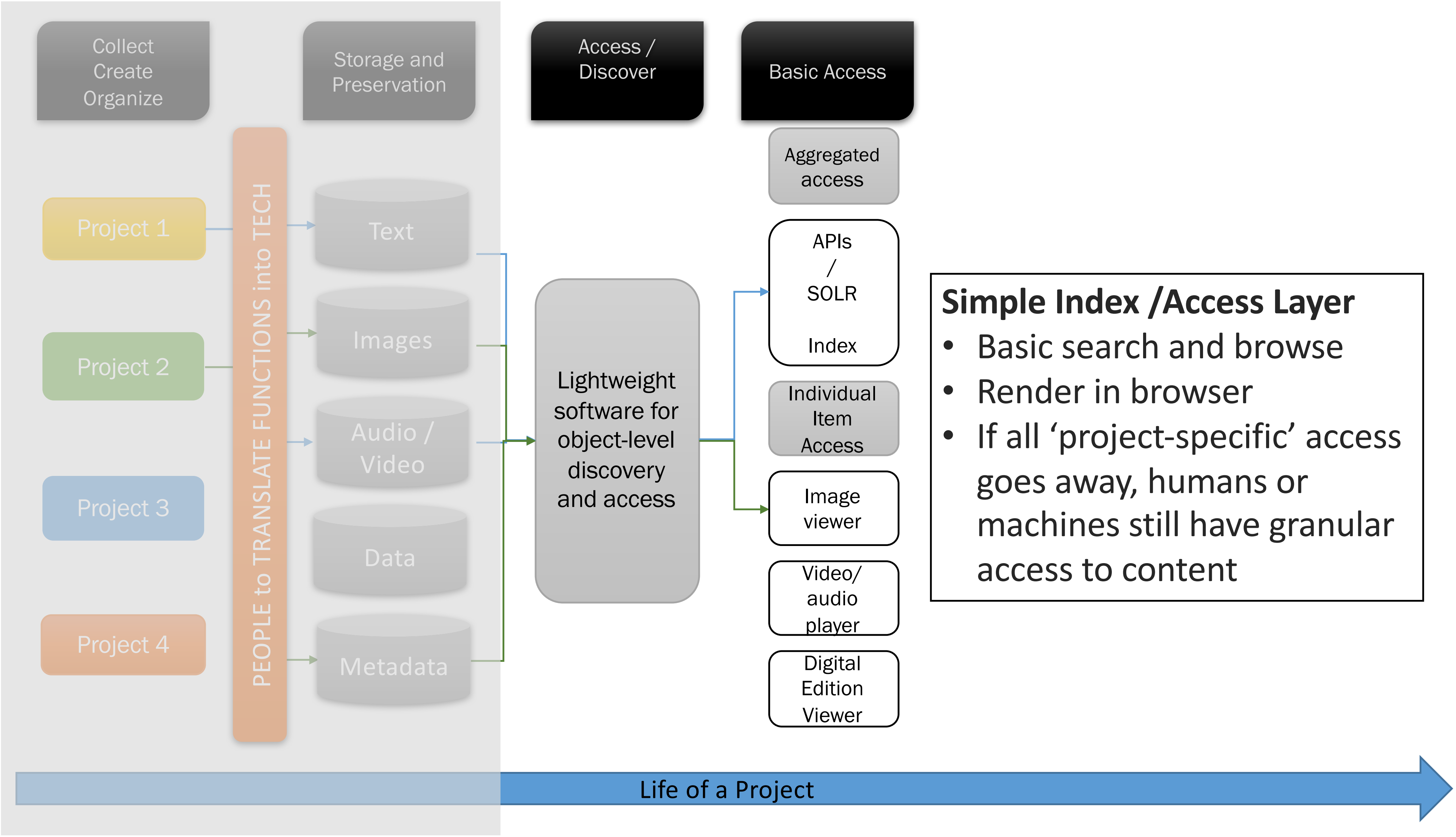
Storage / Preservation Layer

- Simple object storage based on object type
- The right architecture means this can also serve as preservation layer w/ backups



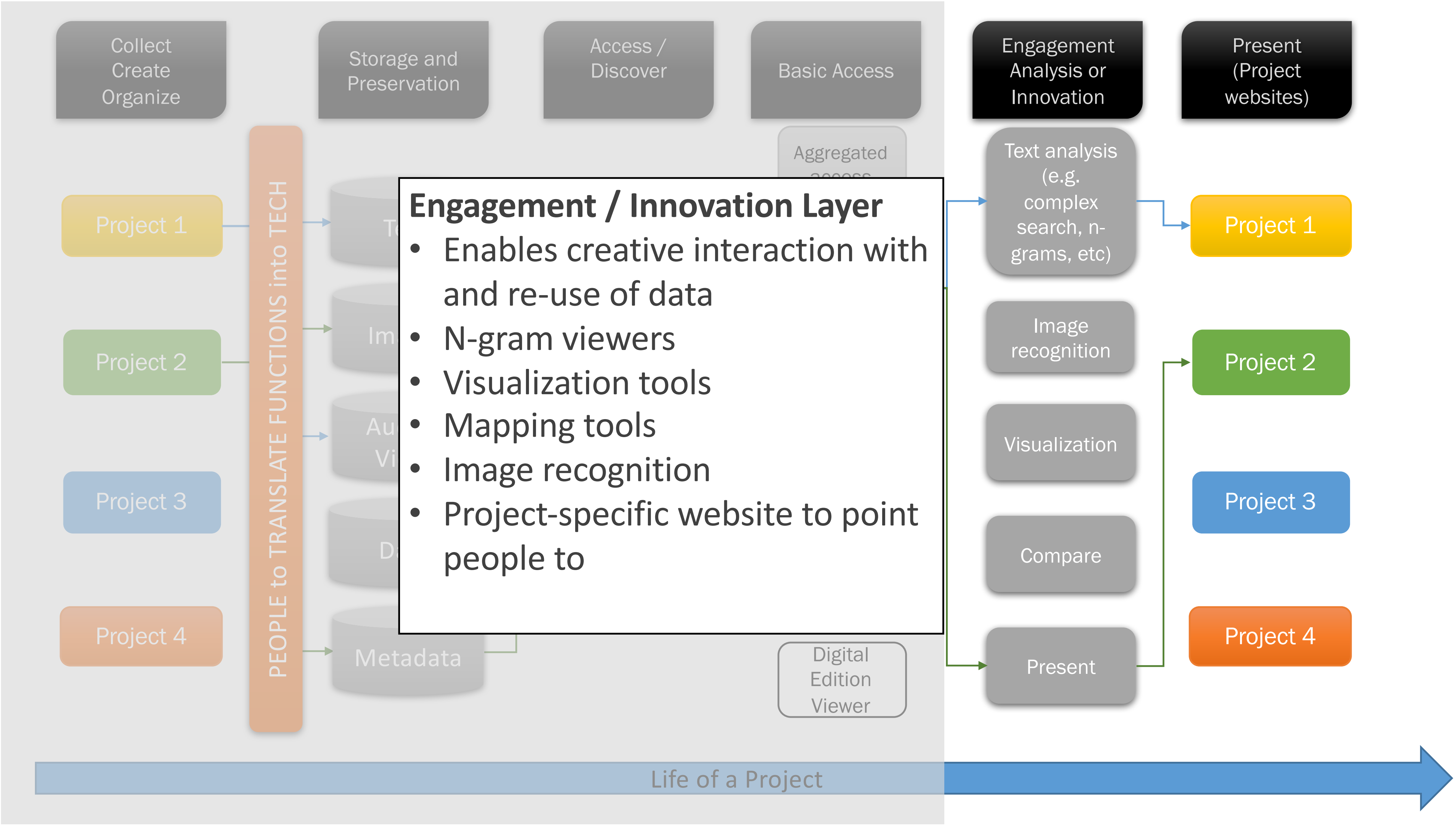
Administrative Layer

- Collect/Create/Organize
- “Data” deposit
- Metadata creation
- Customizable for each project



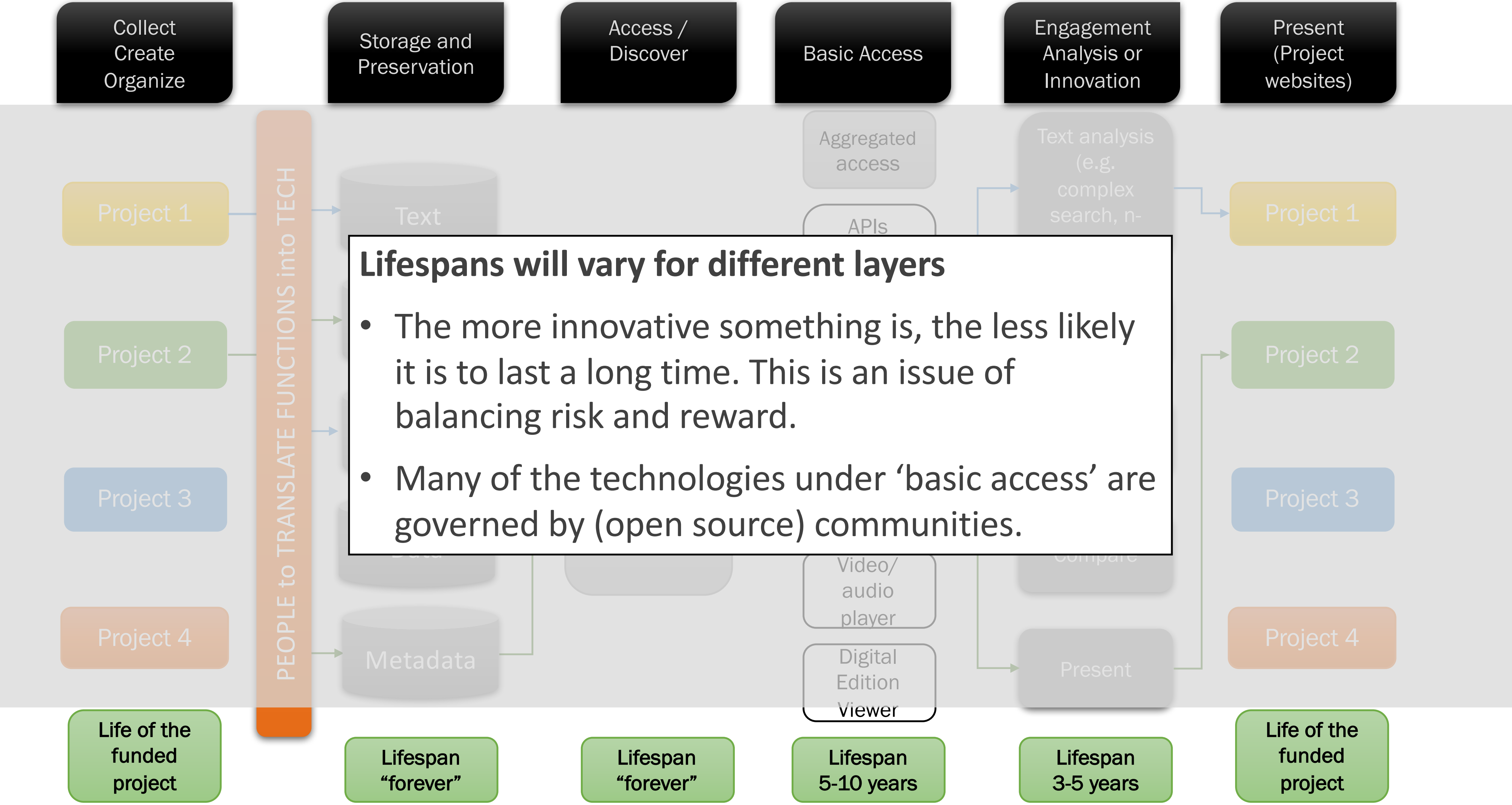
Simple Index /Access Layer

- Basic search and browse
- Render in browser
- If all ‘project-specific’ access goes away, humans or machines still have granular access to content



Engagement / Innovation Layer

- Enables creative interaction with and re-use of data
- N-gram viewers
- Visualization tools
- Mapping tools
- Image recognition
- Project-specific website to point people to



Collect Create Organize

Storage and Preservation

Access / Discover

Basic Access

Engagement Analysis or Innovation

Present (Project websites)

Lifespans will vary for different layers

- The more innovative something is, the less likely it is to last a long time. This is an issue of balancing risk and reward.
- Many of the technologies under ‘basic access’ are governed by (open source) communities.

Life of the funded project

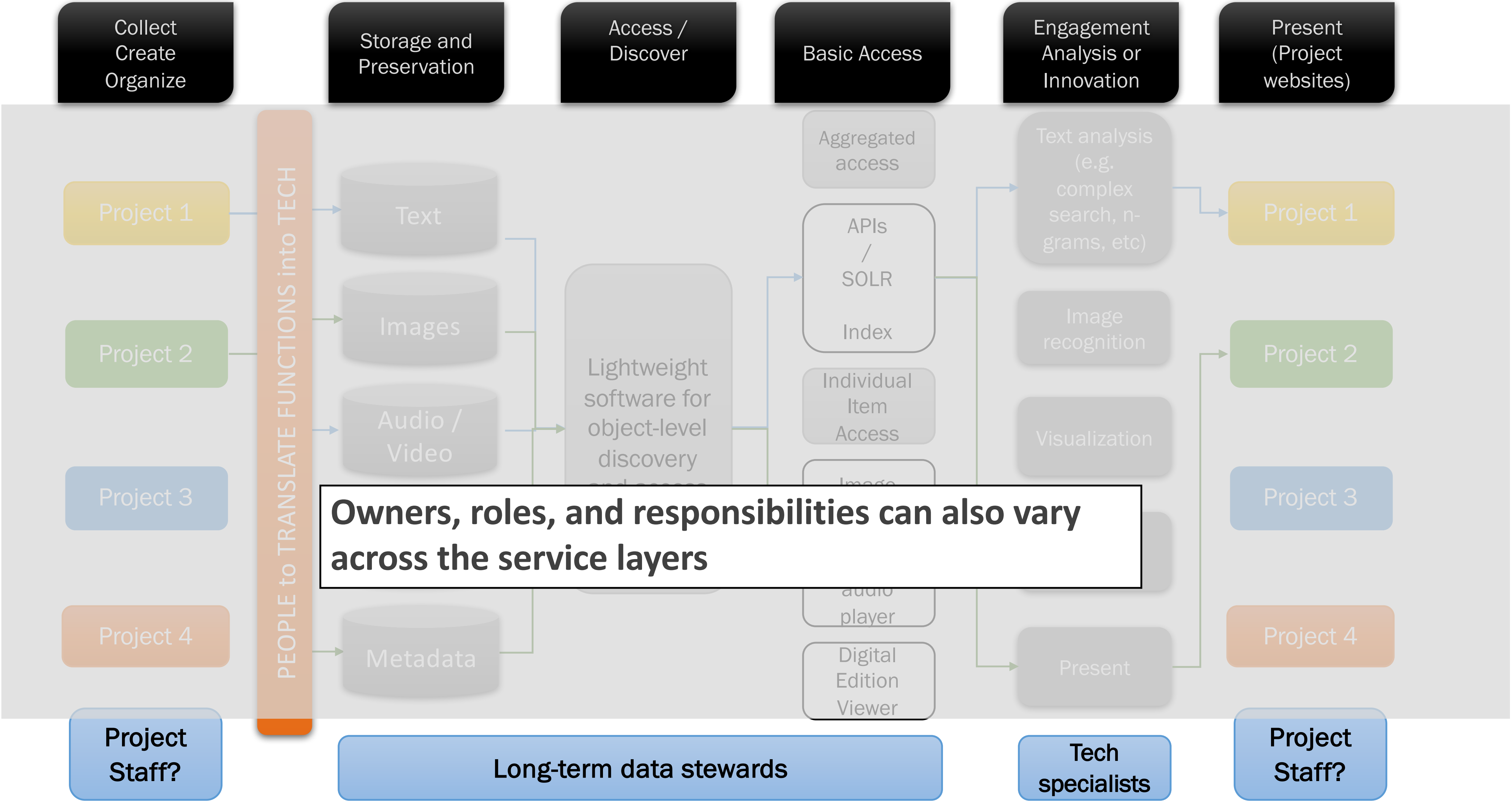
Lifespan “forever”

Lifespan “forever”

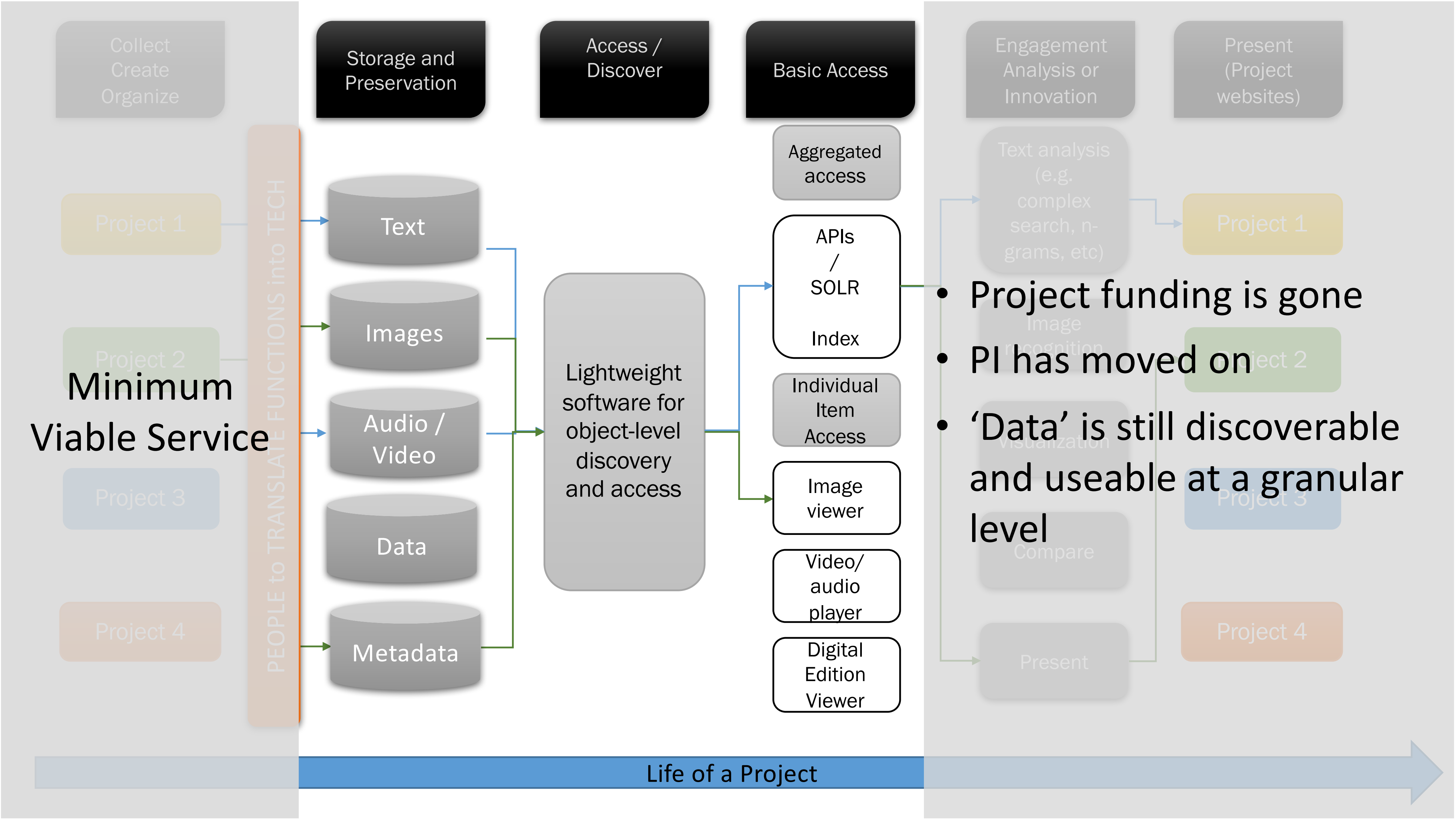
Lifespan 5-10 years

Lifespan 3-5 years

Life of the funded project

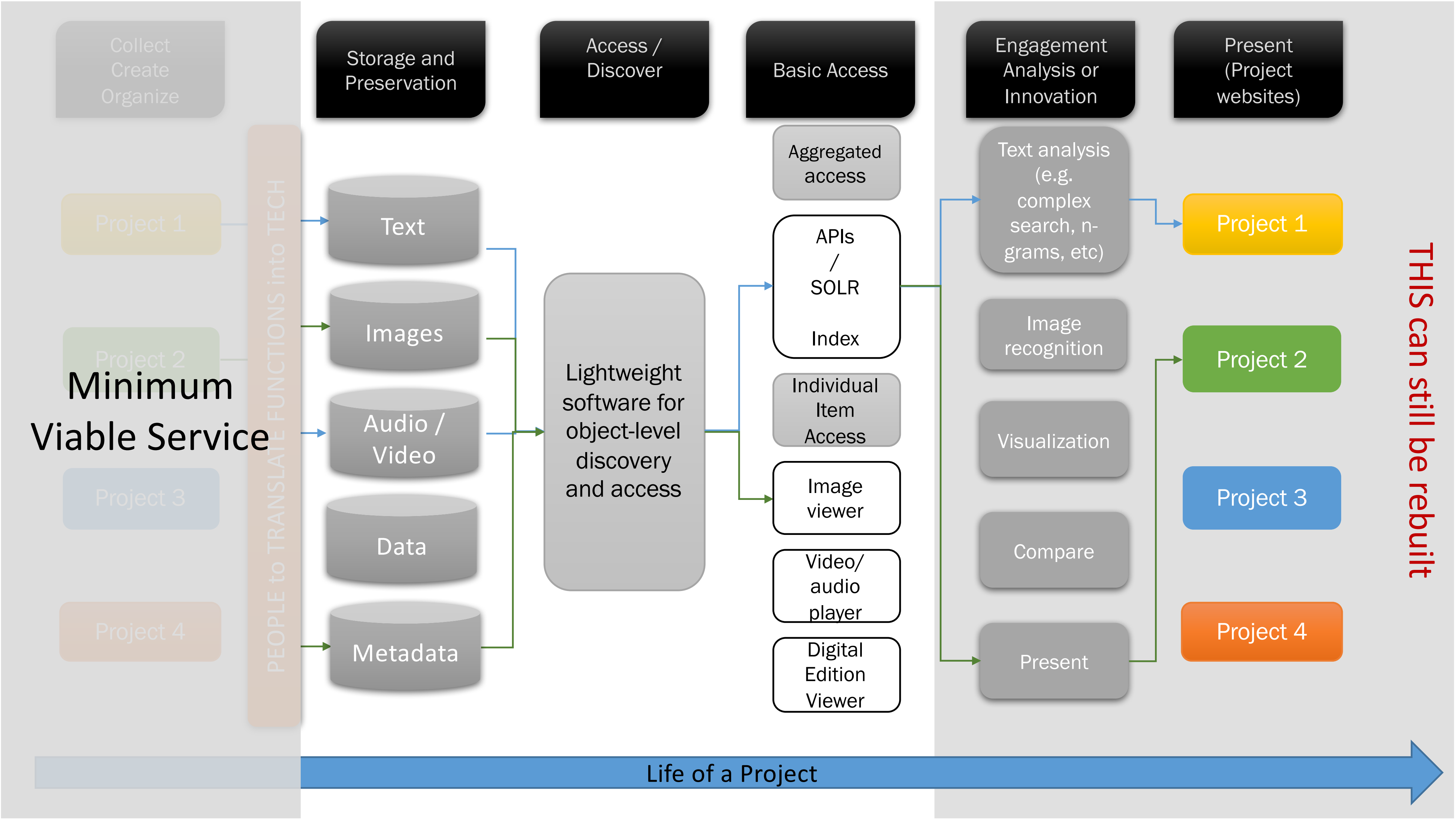


Owners, roles, and responsibilities can also vary across the service layers



Minimum Viable Service

- Project funding is gone
- PI has moved on
- ‘Data’ is still discoverable and useable at a granular level



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Present (Project websites)

Project 1

Project 2

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Project 4

PEOPLE to TRANSLATE FUNCTIONS into TECH

Minimum Viable Service

Text

Images

Audio / Video

Data

Metadata

Lightweight software for object-level discovery and access

Aggregated access

APIs / SOLR Index

Individual Item Access

Image viewer

Video/ audio player

Digital Edition Viewer

Text analysis (e.g. complex search, n-grams, etc)

Image recognition

Visualization

Compare

Present

Project 1

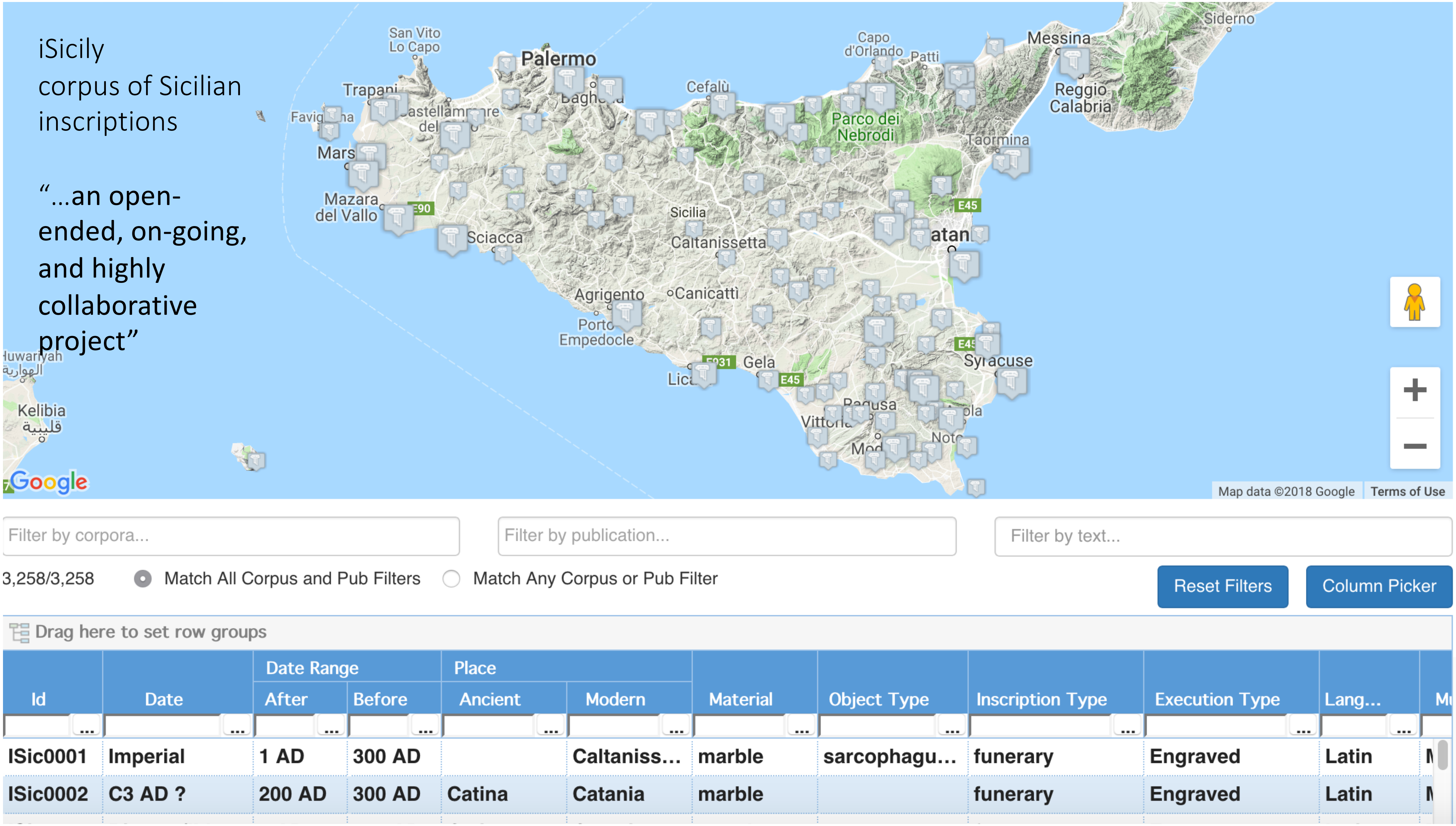
Project 2

Project 3

Project 4

THIS can still be rebuilt

Life of a Project



iSicily
corpus of Sicilian inscriptions

"…an open-ended, on-going, and highly collaborative project"

Filter by corpora...

Filter by publication...

Filter by text...

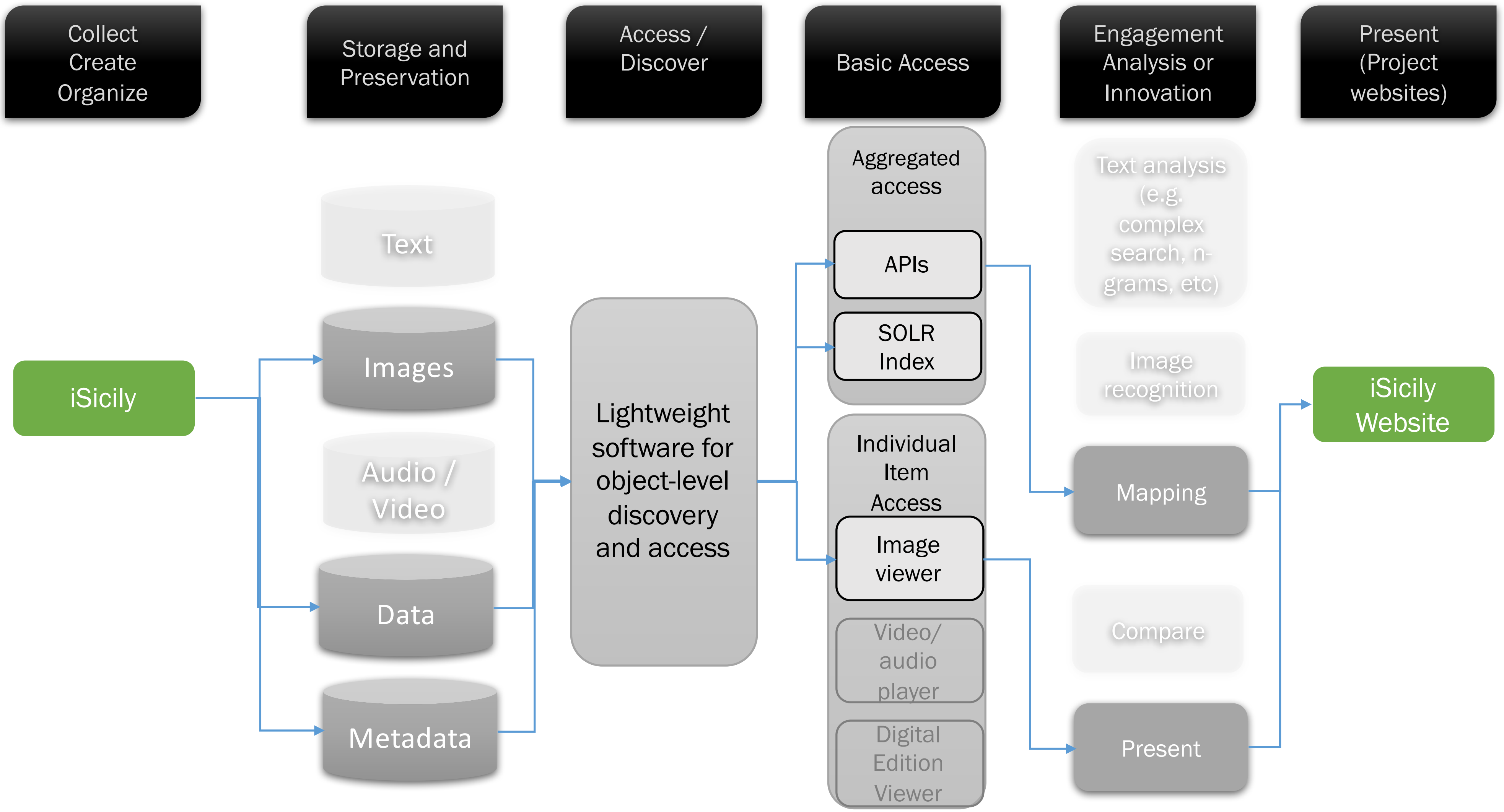
3,258/3,258 ● Match All Corpus and Pub Filters ○ Match Any Corpus or Pub Filter

Reset Filters

Column Picker

Drag here to set row groups

Id	Date	Date Range		Place		Material	Object Type	Inscription Type	Execution Type	Lang...	M
		After	Before	Ancient	Modern						
ISic0001	Imperial	1 AD	300 AD		Caltaniss...	marble	sarcophagu...	funerary	Engraved	Latin	M
ISic0002	C3 AD ?	200 AD	300 AD	Catina	Catania	marble		funerary	Engraved	Latin	M



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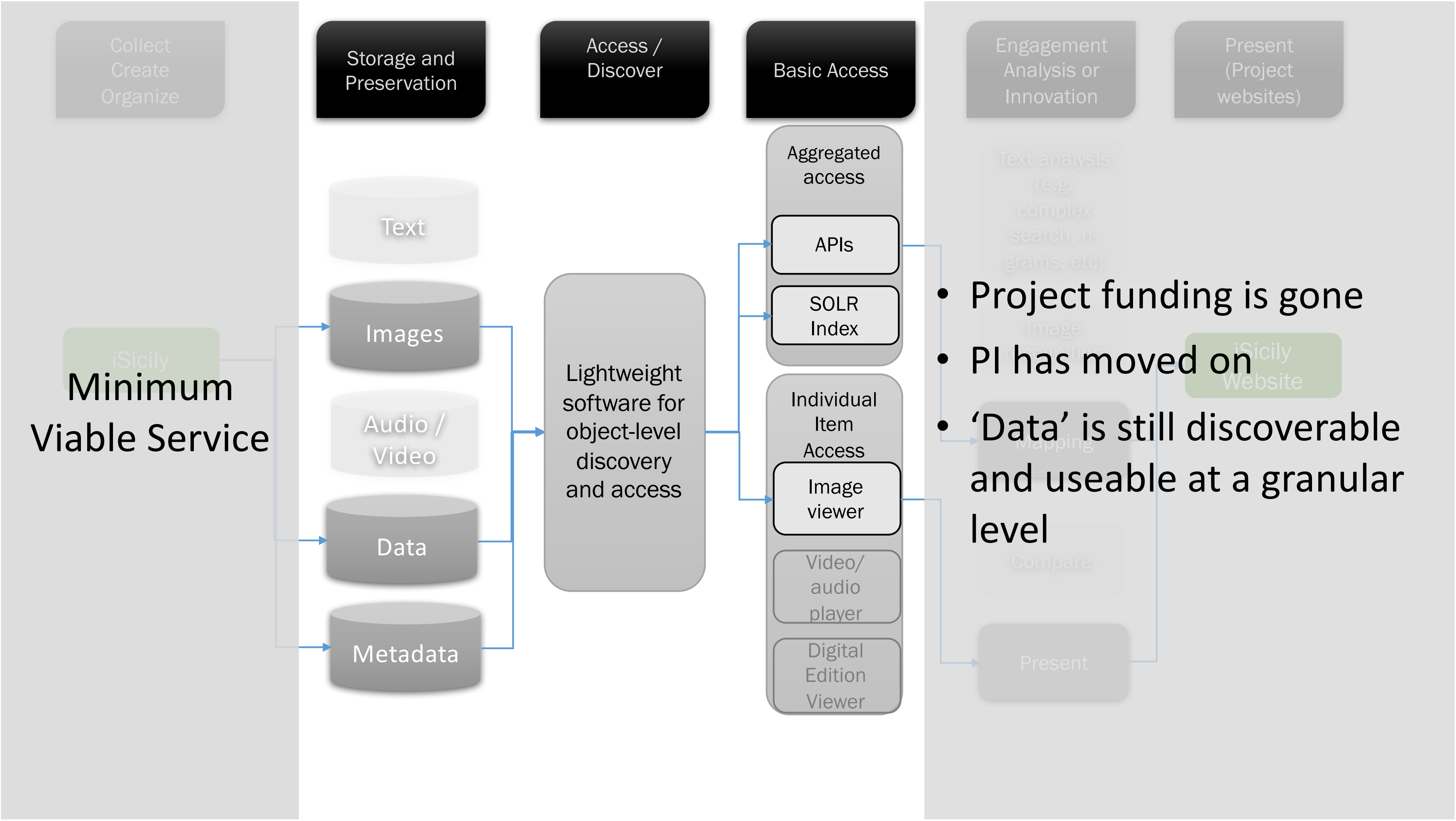

Minimum Viable Service

- Project funding is gone
- PI has moved on
- ‘Data’ is still discoverable and useable at a granular level

Benefits

- Provides a minimum viable service
- Allows autonomy where it is needed
- Allows for different layers to have different lifespans and different owners

Risks

1. **The Funders**: Current funding models and funders specifically encourage technological innovation.
2. **The Perception**: Some projects may always insist that they cannot use a shared infrastructure due to their uniqueness.
3. **The Reality**: This modular, service-layer approach (or variations of it) may not easily accommodate the migration of ***all*** existing projects. With enough money all things are possible, but this may not be financially worthwhile.

Questions? Comments?

Do you have a similar approach? Let's discuss.

madsen@athenaeum21.com

@mccarthymadsen

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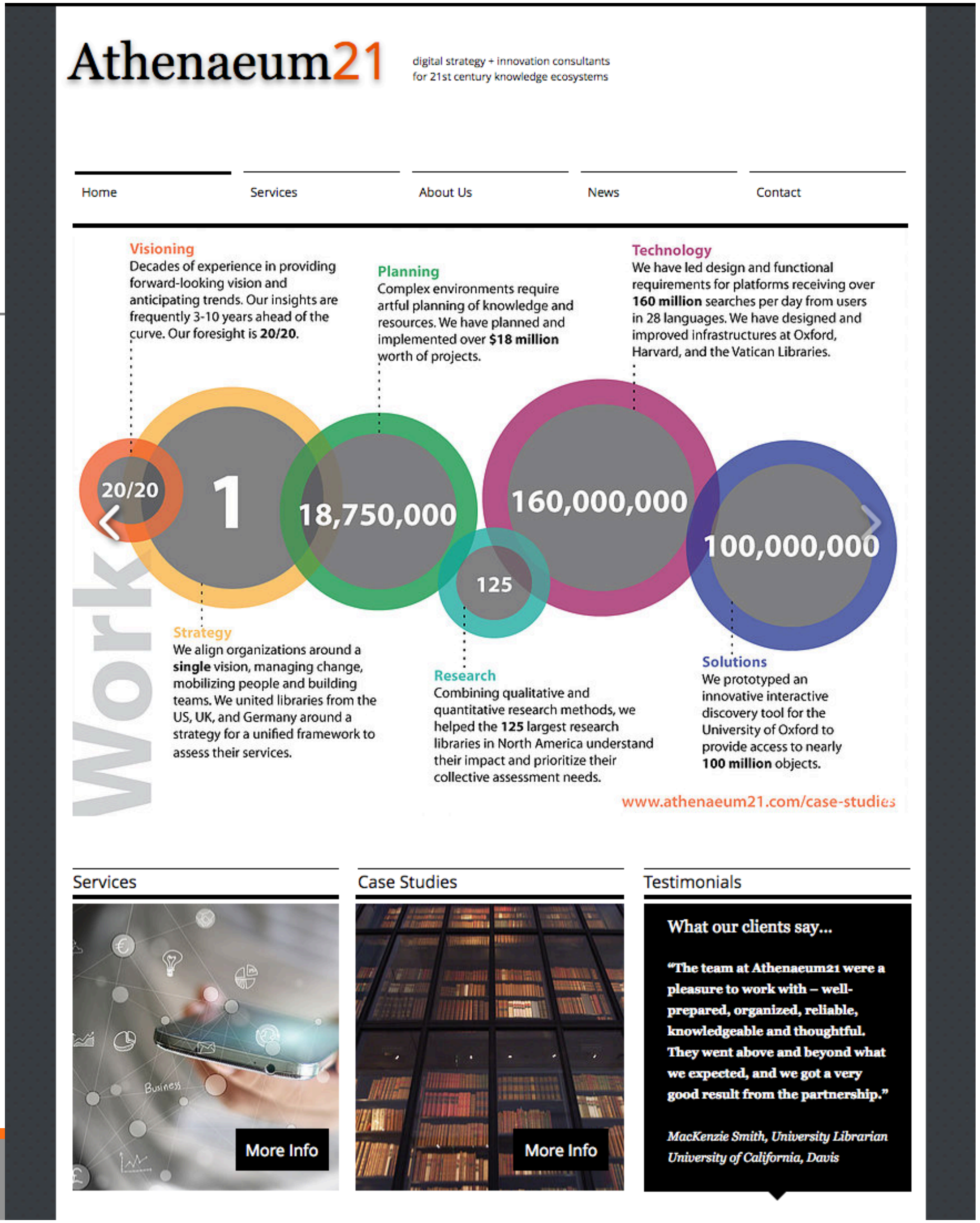

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We align organizations around a **single** vision, managing change, mobilizing people and building teams. We united libraries from the US, UK, and Germany around a strategy for a unified framework to assess their services.

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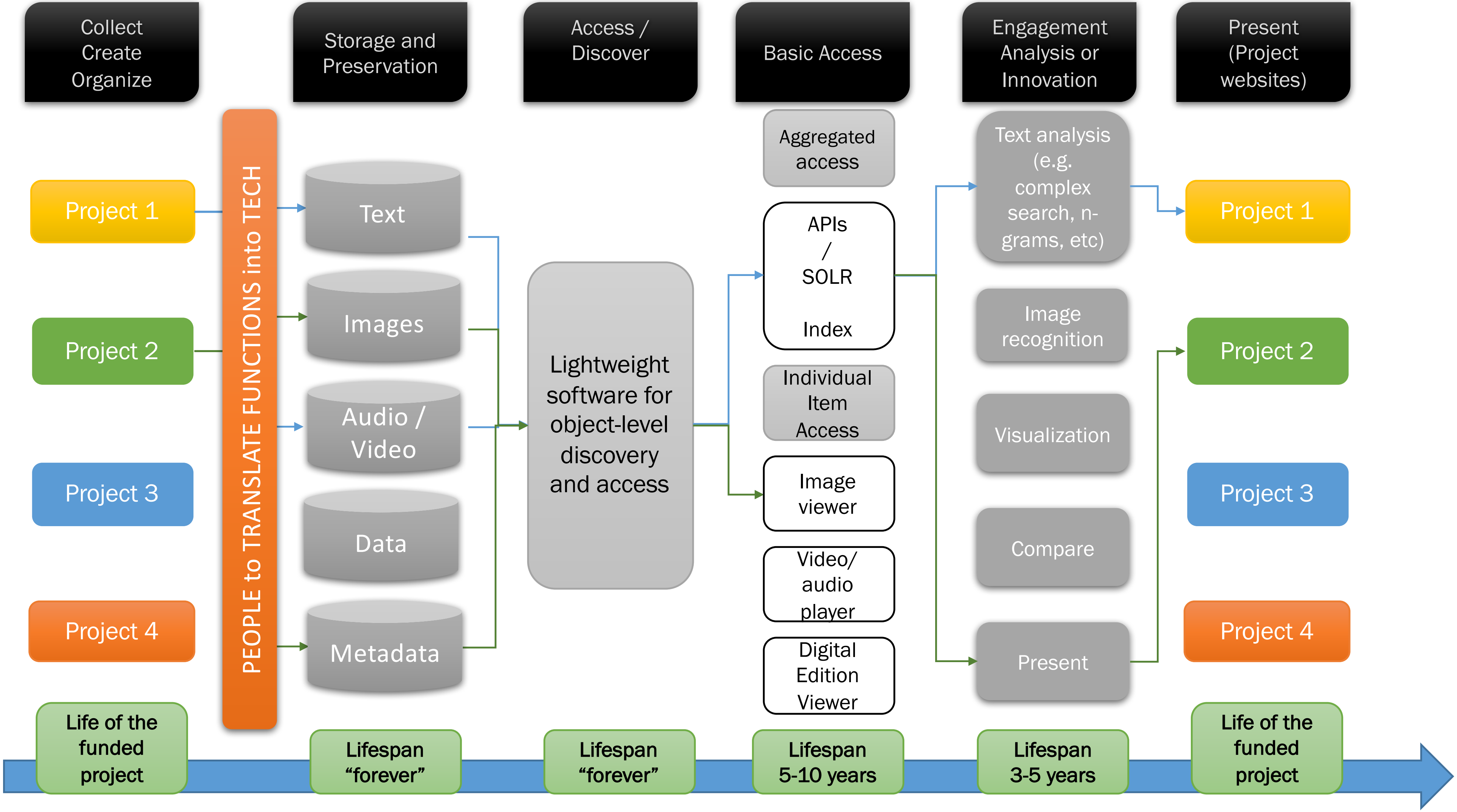
University of California, Davis



Collect Create Organize

Project 1

Project 2

Project 3

Project 4

Life of the funded project

PEOPLE to TRANSLATE FUNCTIONS into TECH

Storage and Preservation

Text

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Lifespan "forever"

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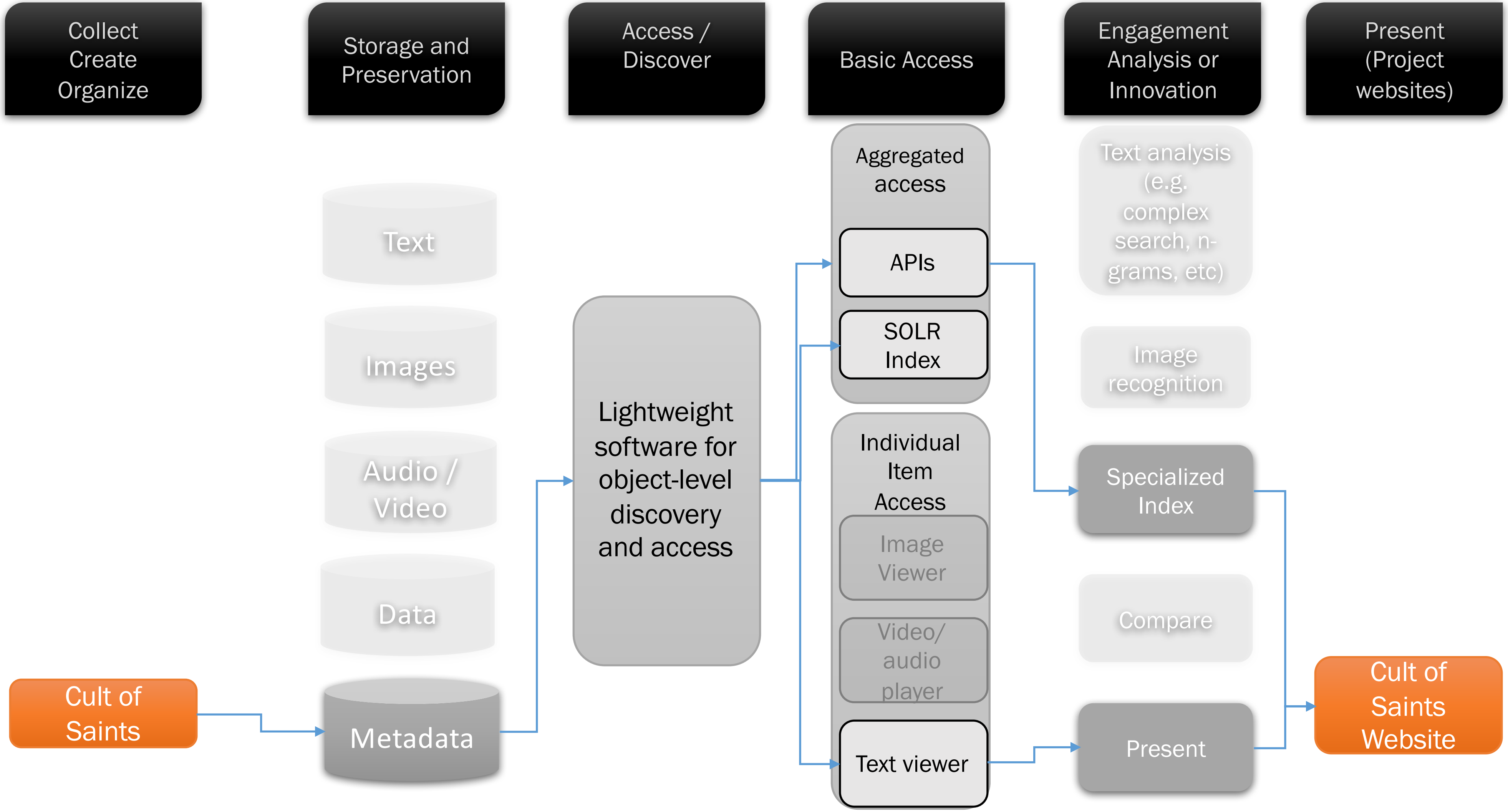

Collect Create Organize

Storage and Preservation

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Present (Project websites)

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Audio / Video

Data

Metadata

Cult of Saints

Lightweight software for object-level discovery and access

Aggregated access

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Image Viewer

Video/ audio player

Text viewer

Text analysis (e.g. complex search, n-grams, etc)

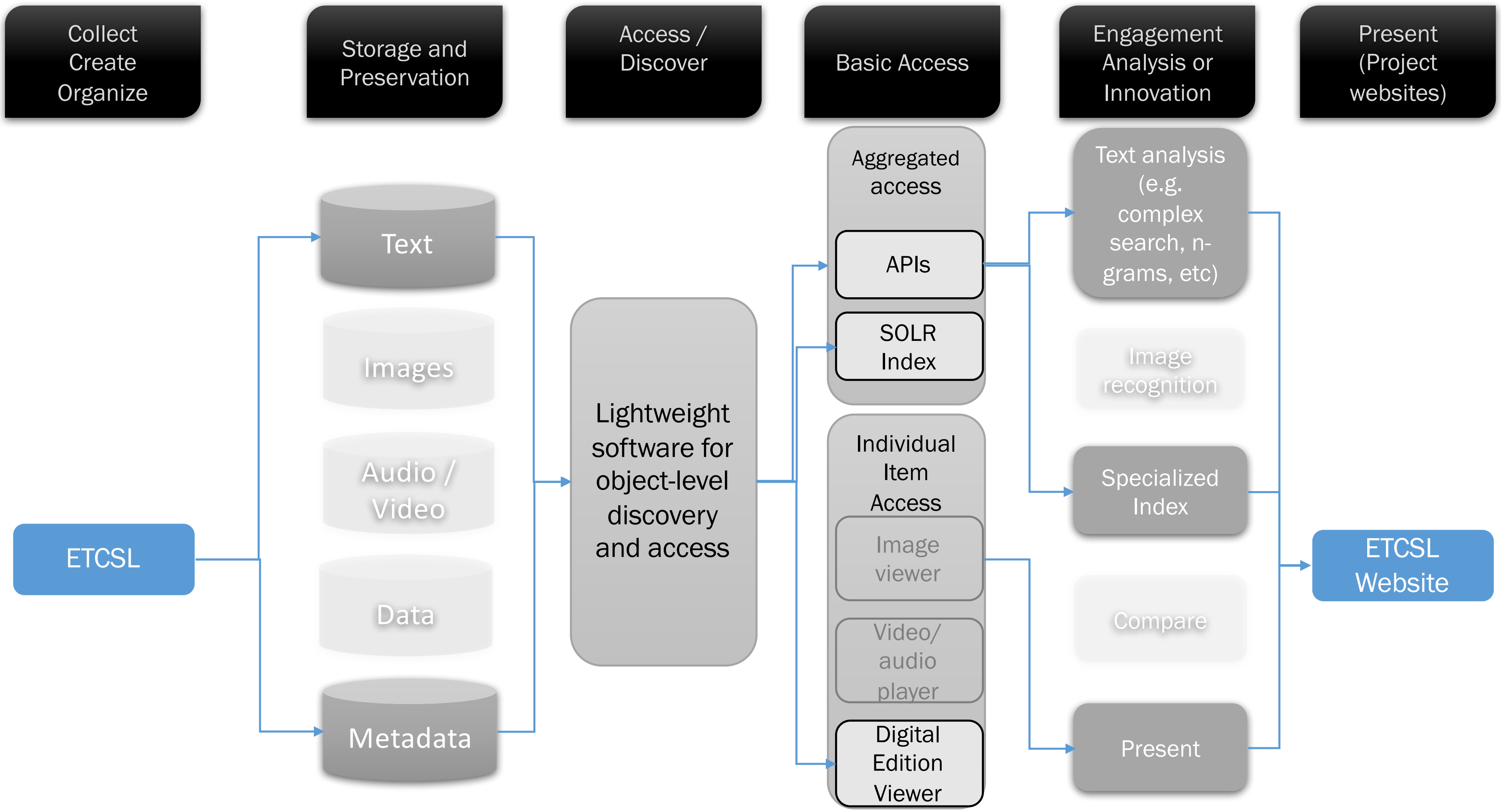
Image recognition

Specialized Index

Compare

Present

Cult of Saints Website



Collect Create Organize

Storage and Preservation

Access / Discover

Basic Access

Engagement Analysis or Innovation

Present (Project websites)

ETCSL

Text

Images

Audio / Video

Data

Metadata

Lightweight software for object-level discovery and access

Aggregated access

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Image viewer

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Digital Edition Viewer

Text analysis (e.g. complex search, n-grams, etc)

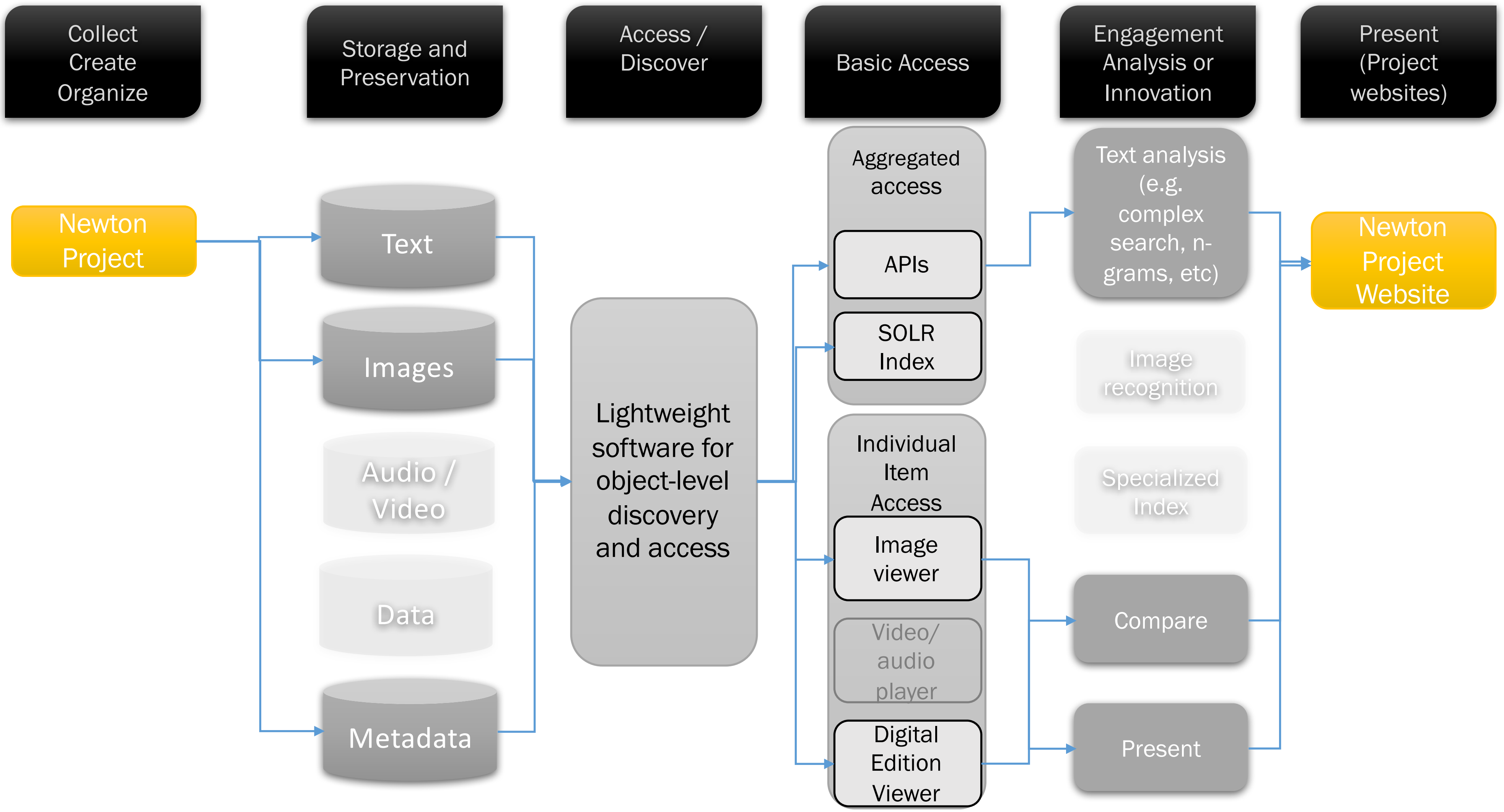
Image recognition

Specialized Index

Compare

Present

ETCSL Website



Collect Create Organize

Storage and Preservation

Access / Discover

Basic Access

Engagement Analysis or Innovation

Present (Project websites)

Newton Project

Text

Images

Audio / Video

Data

Metadata

Lightweight software for object-level discovery and access

Aggregated access

APIs

SOLR Index

Individual Item Access

Image viewer

Video/ audio player

Digital Edition Viewer

Text analysis (e.g. complex search, n-grams, etc)

Image recognition

Specialized Index

Compare

Present

Newton Project Website

Benefits

- Provides a minimum viable service
- Allows autonomy where it is needed
- Allows for different layers to have different lifespans and different owners

Risks

1. **The Funders**: Current funding models and funders specifically encourage technological innovation.
2. **The Perception**: Some projects may always insist that they cannot use a shared infrastructure due to their uniqueness.
3. **The Reality**: This modular, service-layer approach (or variations of it) may not easily accommodate the migration of ***all*** existing projects. With enough money all things are possible, but this may not be financially worthwhile.

Questions? Comments?

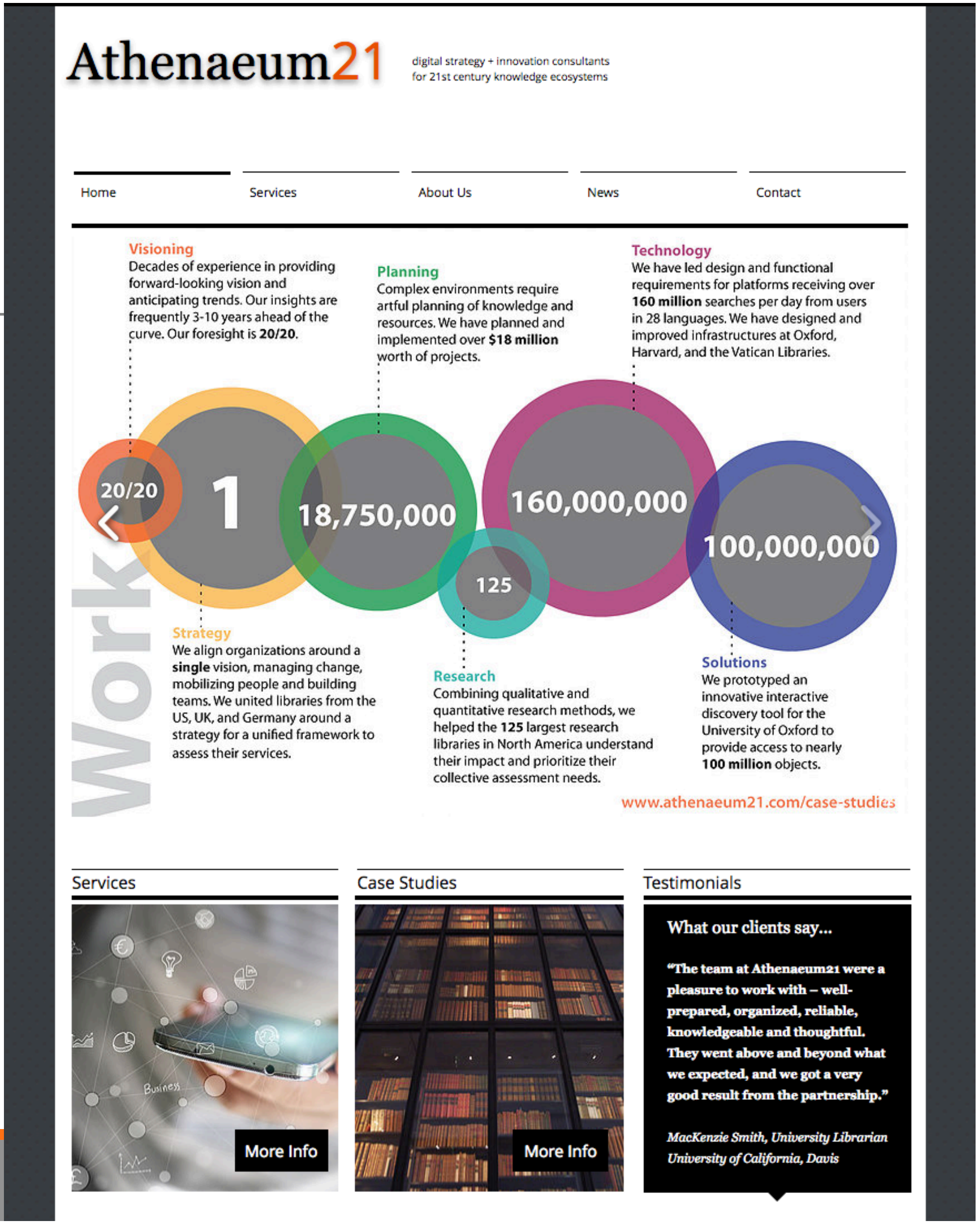
Do you have a similar approach?
Let’s discuss.

madsen@athenaeum21.com

@mccarthymadsen

Athenaeum21 Consulting

www.athenaeum21.com



Visioning
Decades of experience in providing forward-looking vision and anticipating trends. Our insights are frequently 3-10 years ahead of the curve. Our foresight is **20/20.**

Planning
Complex environments require artful planning of knowledge and resources. We have planned and implemented over **$18 million** worth of projects.

Technology
We have led design and functional requirements for platforms receiving over **160 million** searches per day from users in 28 languages. We have designed and improved infrastructures at Oxford, Harvard, and the Vatican Libraries.

Strategy
We align organizations around a **single** vision, managing change, mobilizing people and building teams. We united libraries from the US, UK, and Germany around a strategy for a unified framework to assess their services.

Research
Combining qualitative and quantitative research methods, we helped the **125** largest research libraries in North America understand their impact and prioritize their collective assessment needs.

Solutions
We prototyped an innovative interactive discovery tool for the University of Oxford to provide access to nearly **100 million** objects.

www.athenaeum21.com/case-studies

What our clients say...

“The team at Athenaeum21 were a pleasure to work with – well-prepared, organized, reliable, knowledgeable and thoughtful. They went above and beyond what we expected, and we got a very good result from the partnership.”

MacKenzie Smith, University Librarian
University of California, Davis