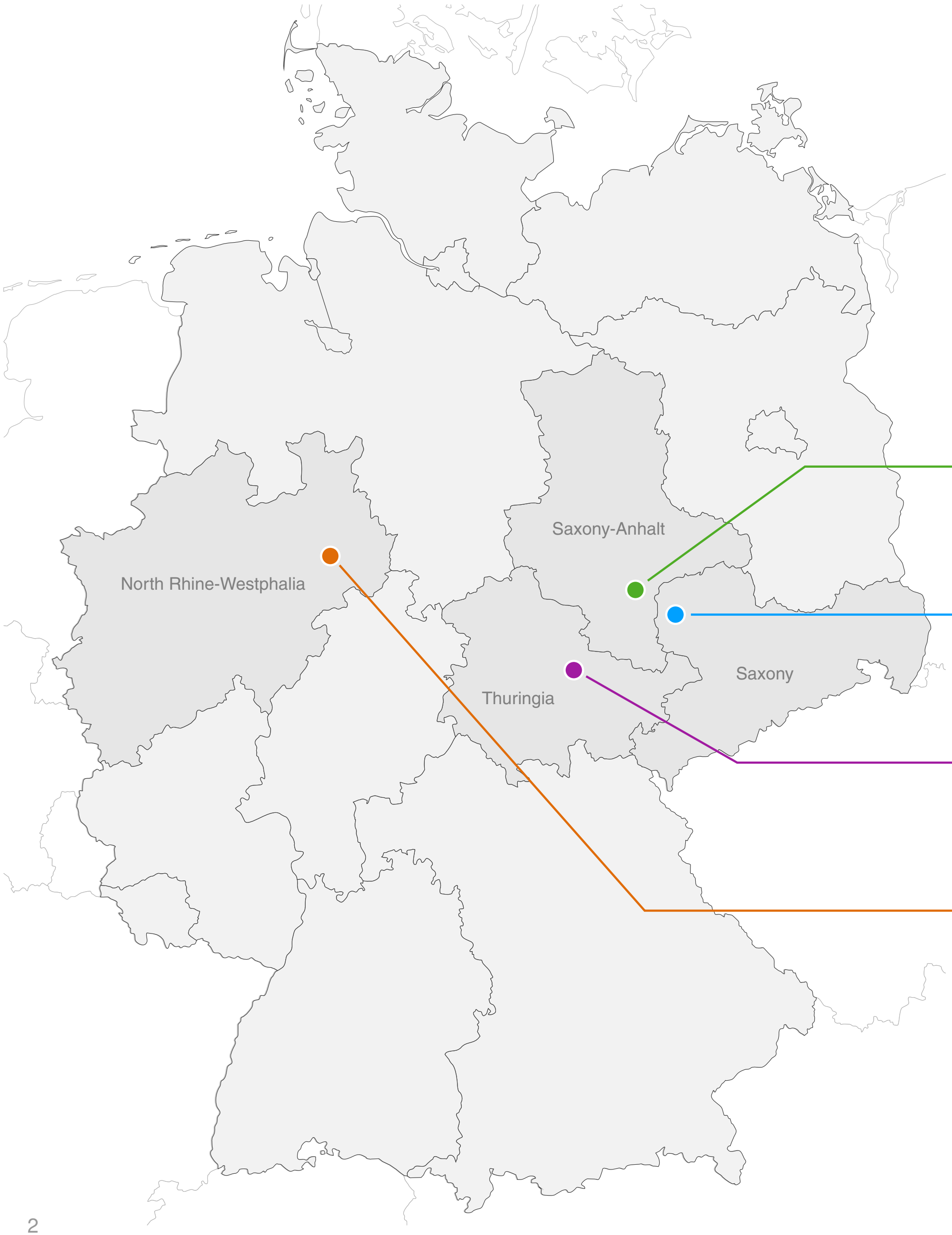
Towards an Open Web Index

Lessons from the Past

Michael Völske
Bauhaus-Universität Weimar
webis.de

Second International Open Search Symposium · Geneva · October 13, 2020



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Open Web Search

Open Web Search

Challenges

Independence

Scale

User data

Market penetration

Funding

Transparency

Open Web Search

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The Search Market in 2020

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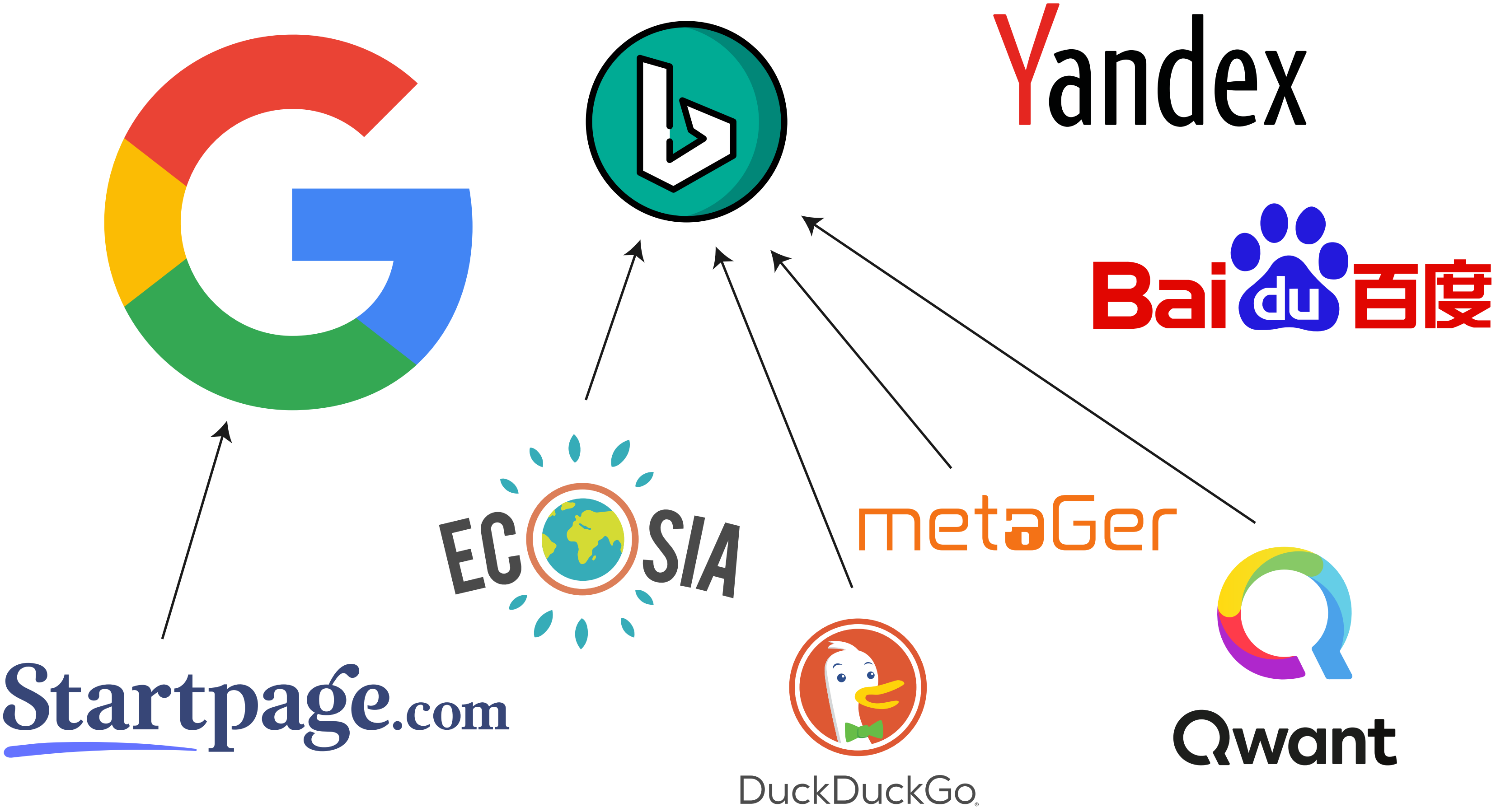
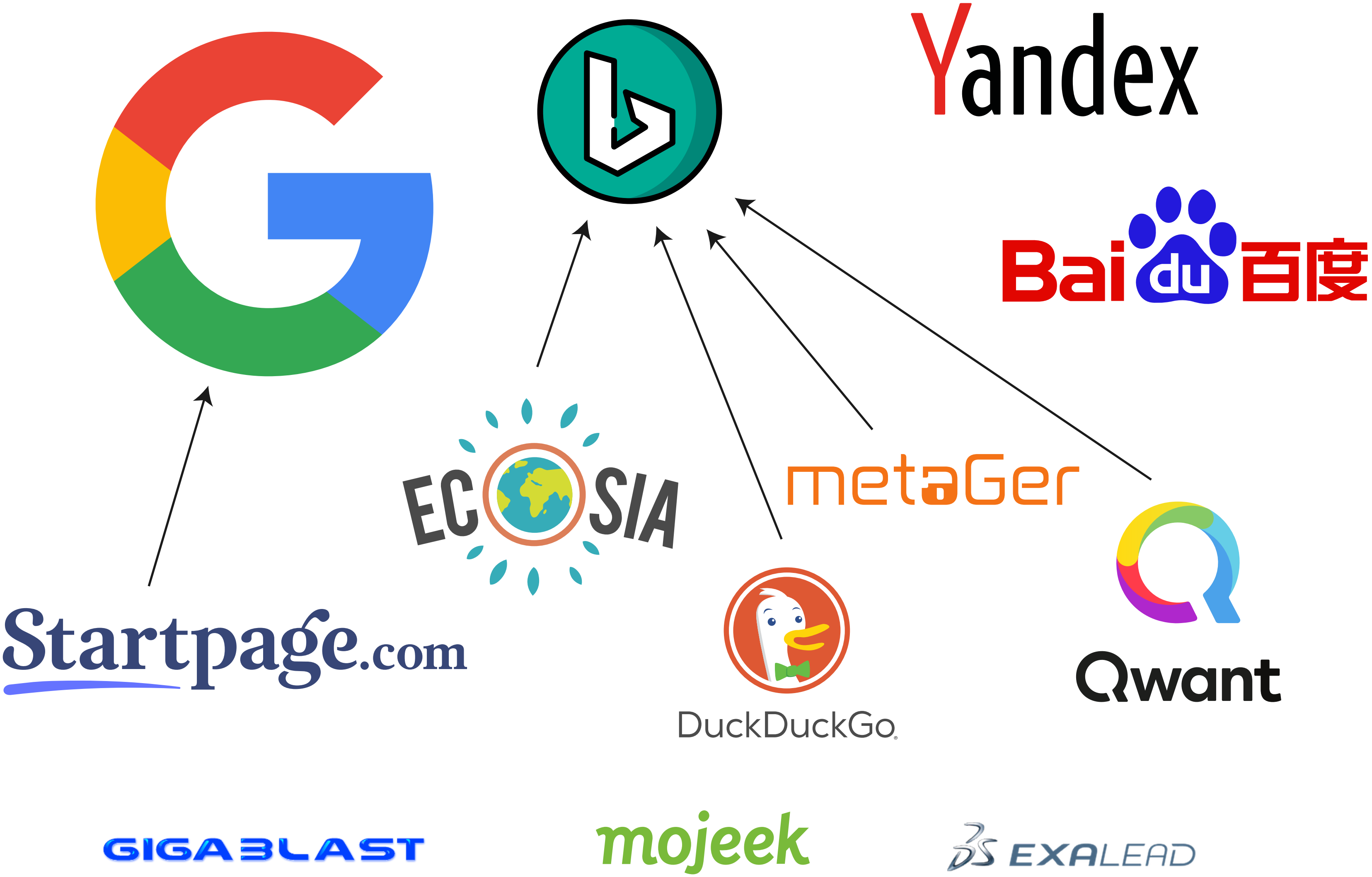


Independence

The Search Market in 2020



Scale

The Global Datasphere

The Global Datasphere

“A measure of all new data captured, created, and replicated in a single year.”

[IDC, 2018]

“. . . images and videos on mobile phones uploaded to YouTube, digital movies populating the pixels of our high-definition TVs, security footage at airports and major events such as the Olympic Games, subatomic collisions recorded by the Large Hadron Collider at CERN, banking data swiped in an ATM, transponders recording highway tolls, voice calls zipping through digital phone lines, texting as a widespread means of communications, . . . ”

[IDC, 2012]

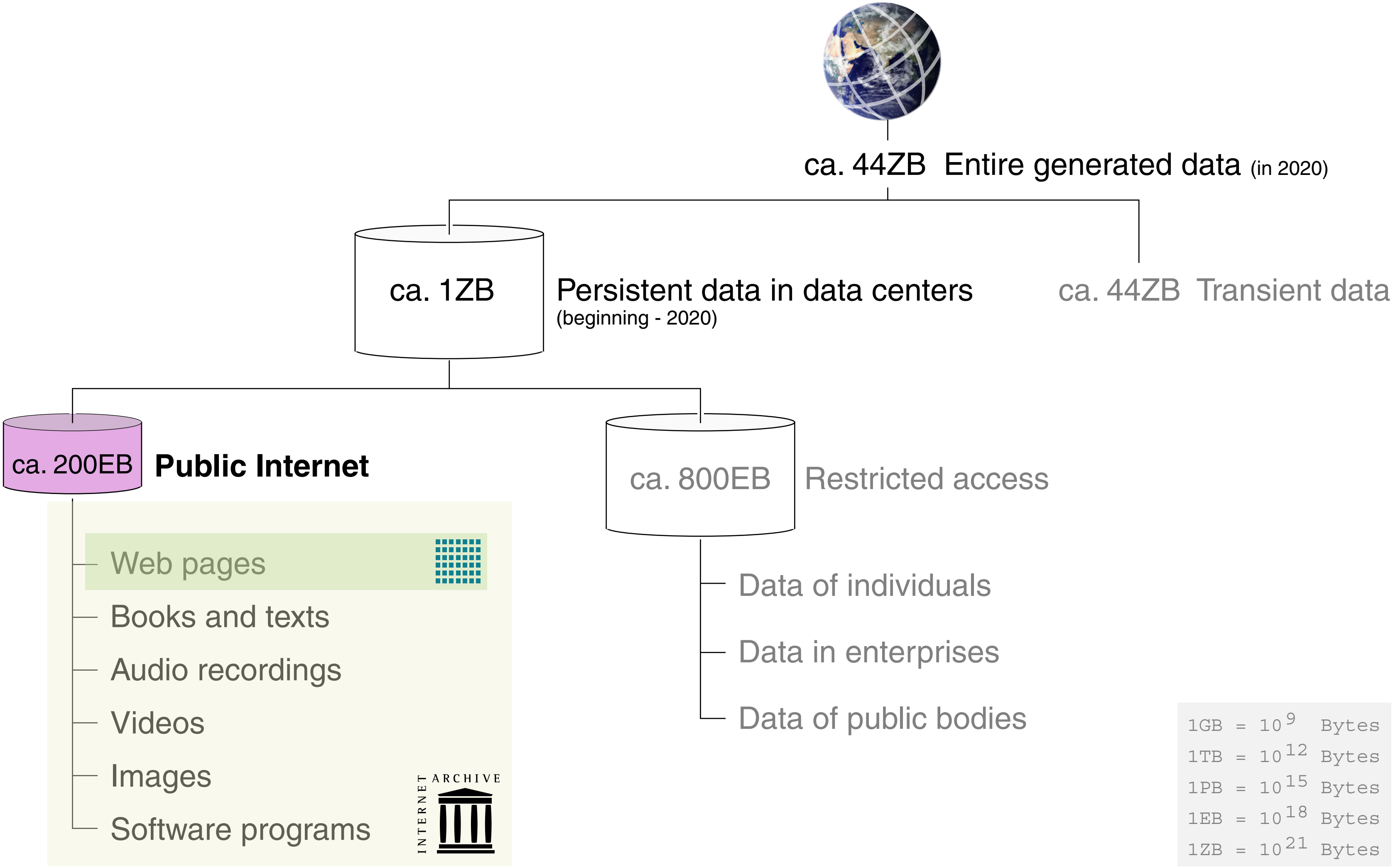
The Global Datasphere

- ca. 44ZB Entire generated data (in 2020)
  - ca. 1ZB Persistent data in data centers (beginning - 2020)
    - ca. 200EB **Public Internet**
      - Web pages
      - Books and texts
      - Audio recordings
      - Videos
      - Images
      - Software programs
    - ca. 800EB Restricted access
      - Data of individuals
      - Data in enterprises
      - Data of public bodies
  - ca. 44ZB Transient data

1GB	=	10^9	Bytes
1TB	=	10^{12}	Bytes
1PB	=	10^{15}	Bytes
1EB	=	10^{18}	Bytes
1ZB	=	10^{21}	Bytes

Basis: IDC (2014-20) • Seagate (2018-20) • Cisco Systems (2018) • Statista (2020) • Domo Inc. (2018-20)

The Global Datasphere



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INTERNET ARCHIVE

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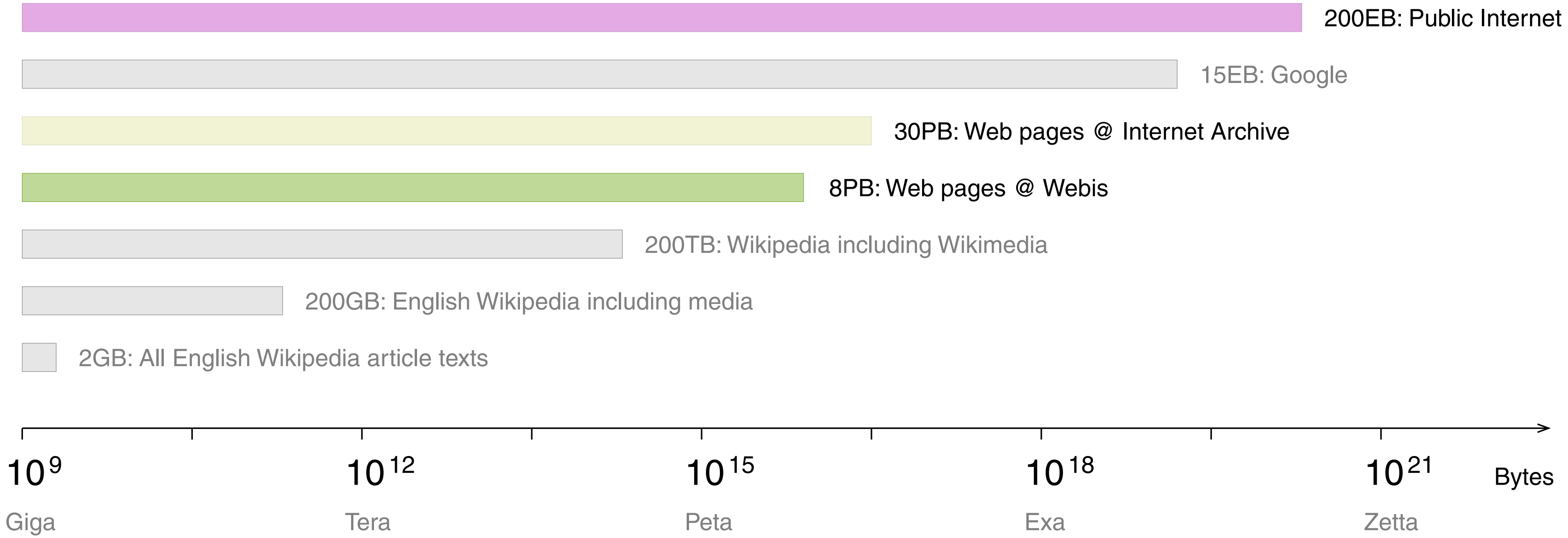
The Global Datasphere

Relating Data Source Sizes



The Global Datasphere

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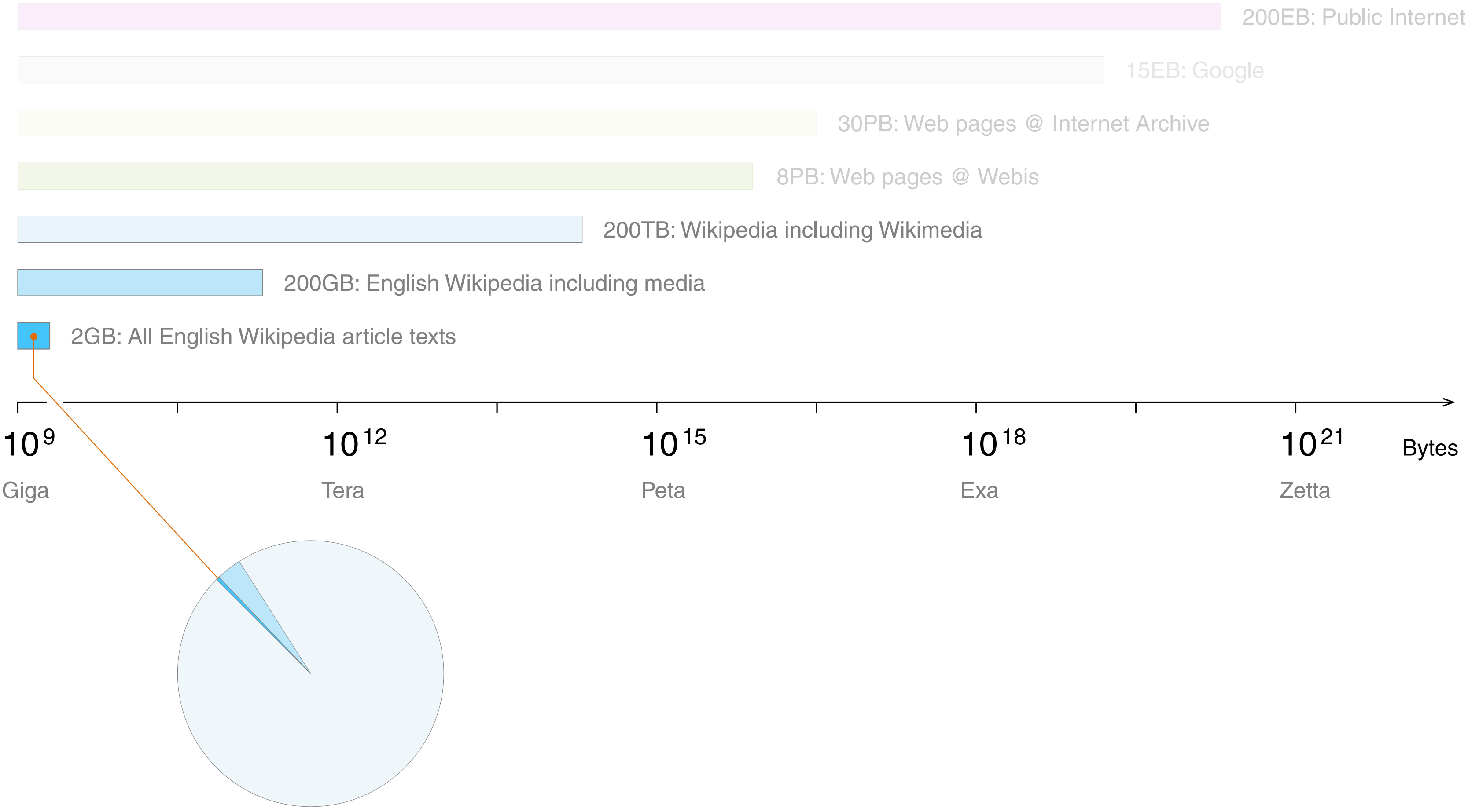
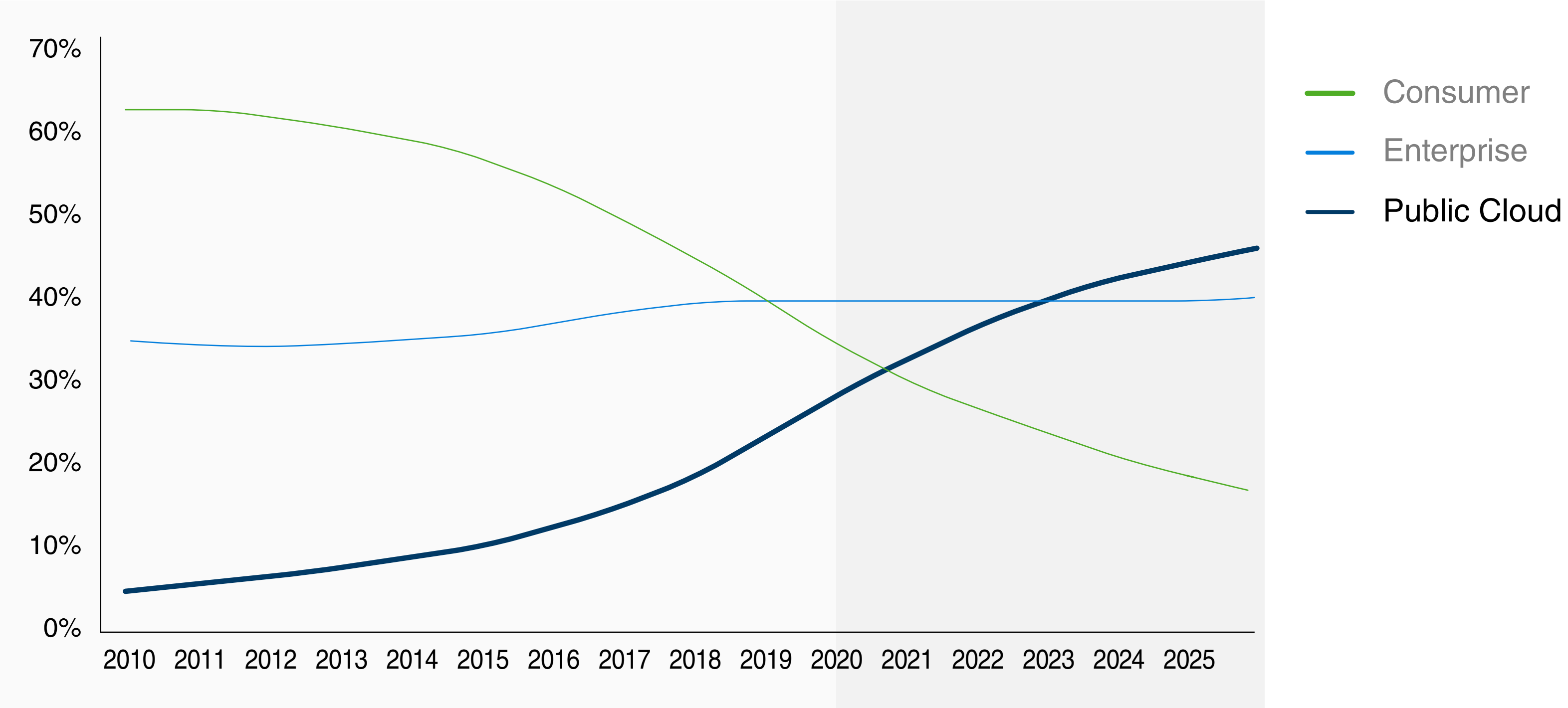


The Global Datasphere

Where is the Data Stored?



Basis: Data Age 2025, sponsored by Seagate with data from IDC Global DataSphere, May 2020.

The Global Datasphere

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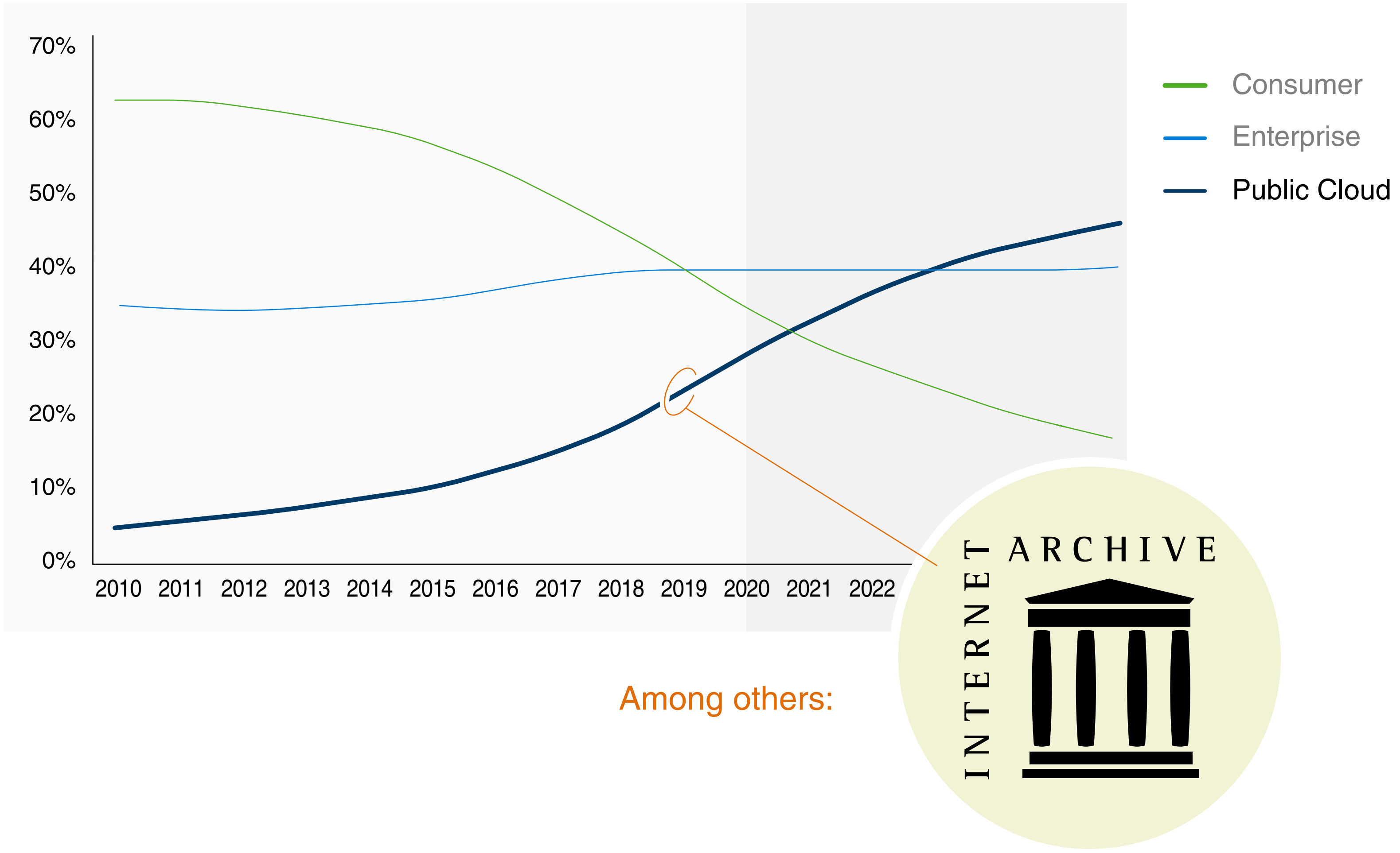


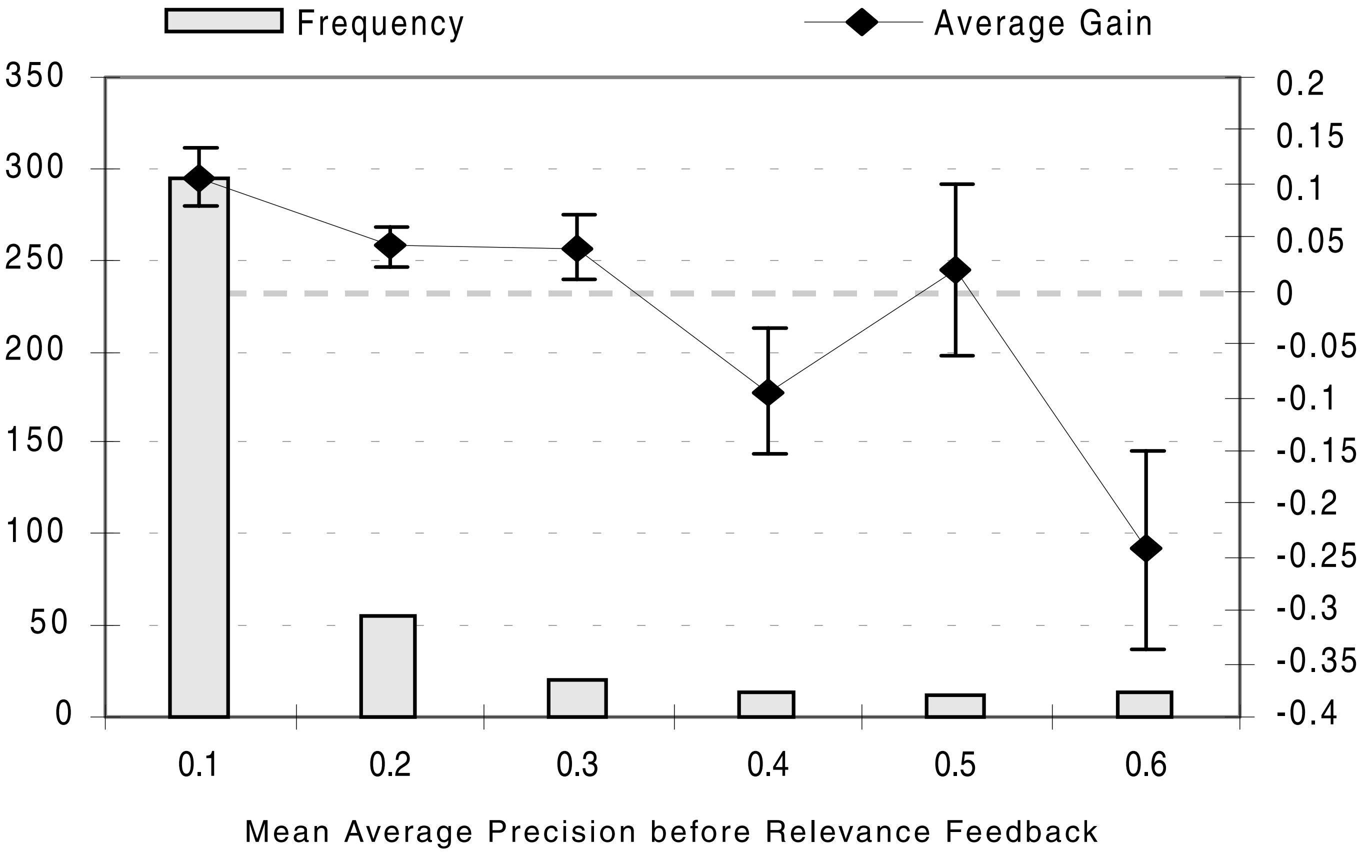
Among others:

Basis: Data Age 2025, sponsored by Seagate with data from IDC Global DataSphere, May 2020.

User Data

User Data

Benefits of Implicit Relevance Feedback



Basis: Agichtein et al., Improving Web Search Ranking by Incorporating User Behavior Information, SIGIR (2006)

User Data

Risks: Record Linkage

Timestamp	UID	URL
2020-10-13 14:06	A1234	sportsnews.com/sports/
2020-10-13 14:07	A1234	news.com/myaccount/solso
2020-10-13 14:07	A1234	ecommerce.com/receipt_id=1234054
2020-10-13 14:08	A1234	sportsnews.com/sports
2020-10-13 14:06	B5678	sportsnews.com/sports
2020-10-13 14:07	B5678	sportsnews.com/sports

Basis: `https://0x65.dev/blog` • Human Web—Collecting Data in a Socially Responsible Manner (2019)

User Data

Risks: Record Linkage

Domain	Unique Visitors
sportsnews.com	2
news.com	1
ecommerce.com	1

Timestamp	UID	URL
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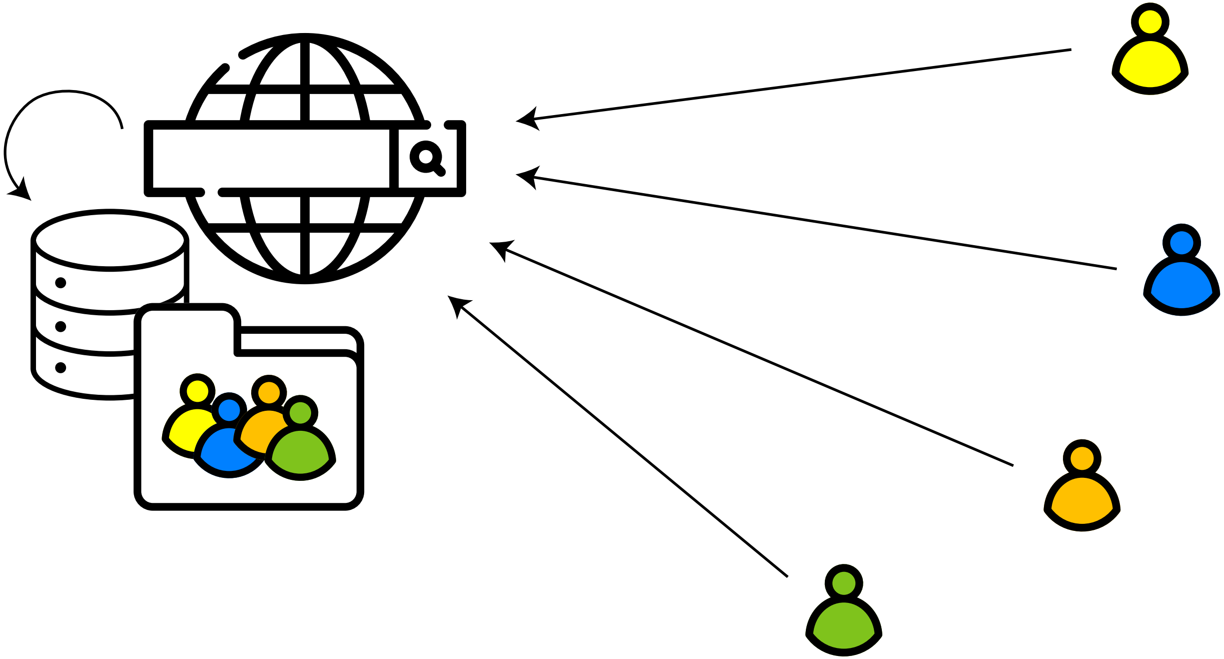
User Data

Traditional Data Collection



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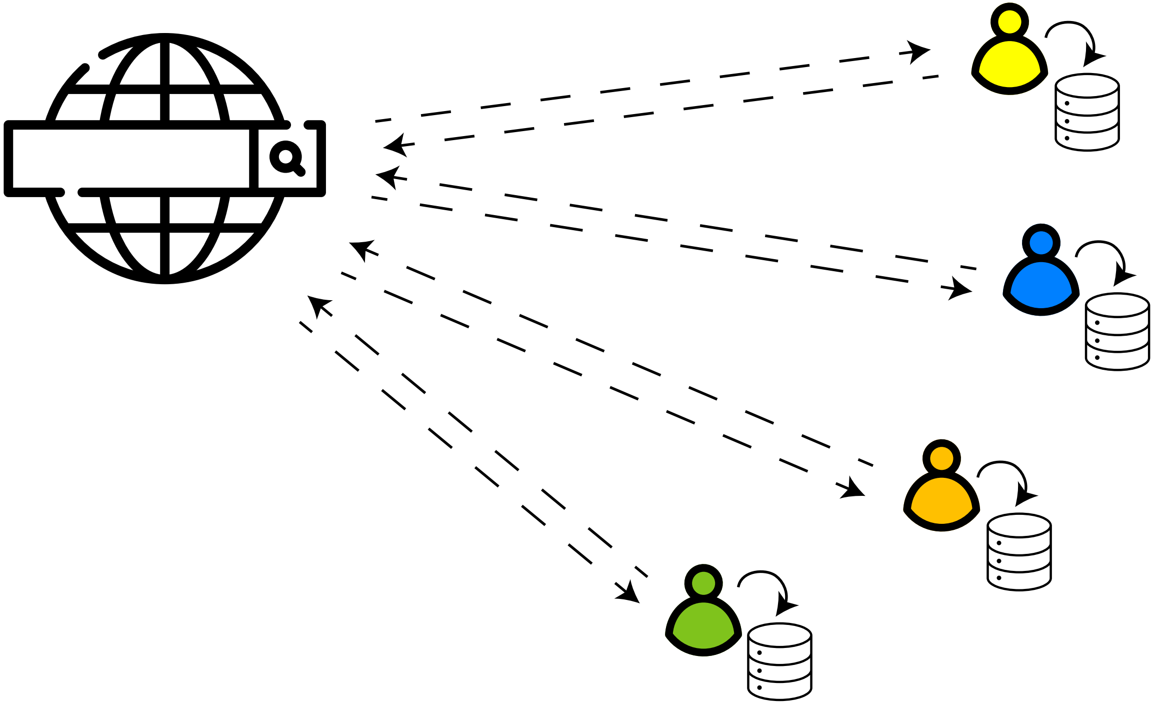
User Data

Privacy-preserving Data Collection

CLIQZ [2015 – 2020]

Human Web & Human Proxy Network



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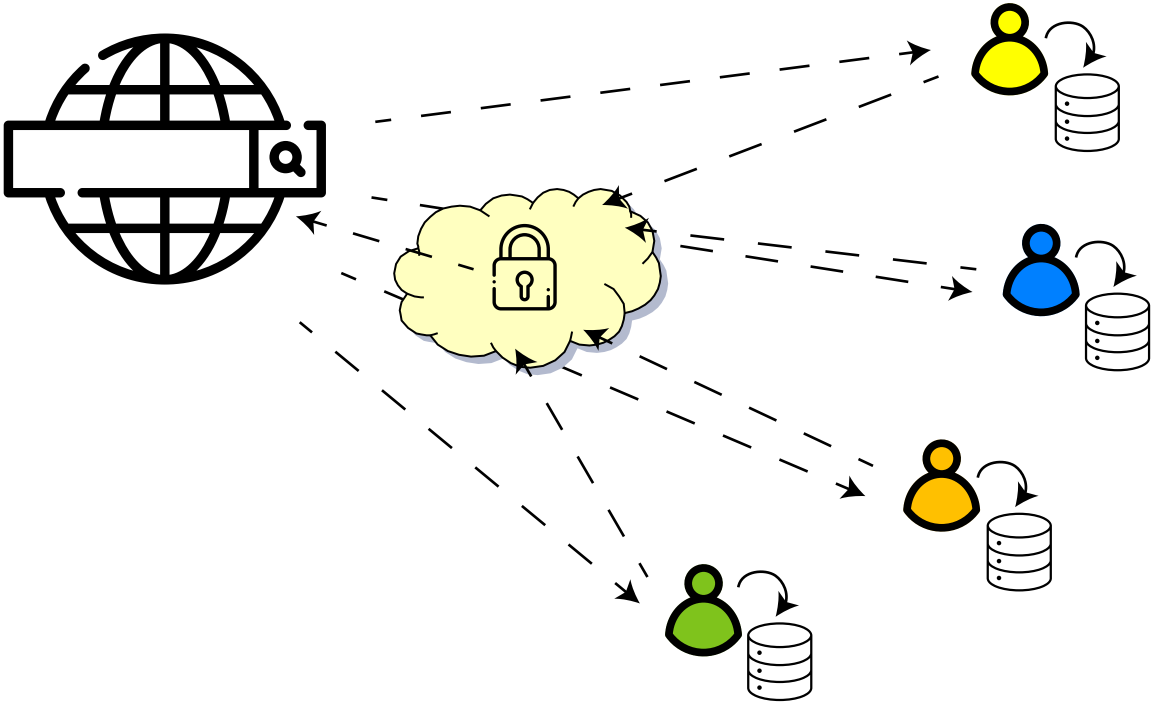

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◉

Summary

Independence

Scale

User data

Market penetration

Funding

Transparency

Challenges

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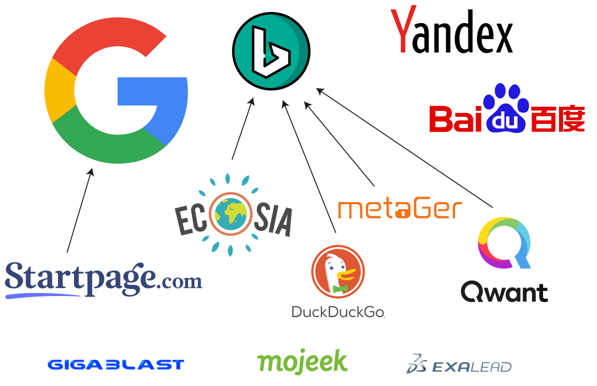

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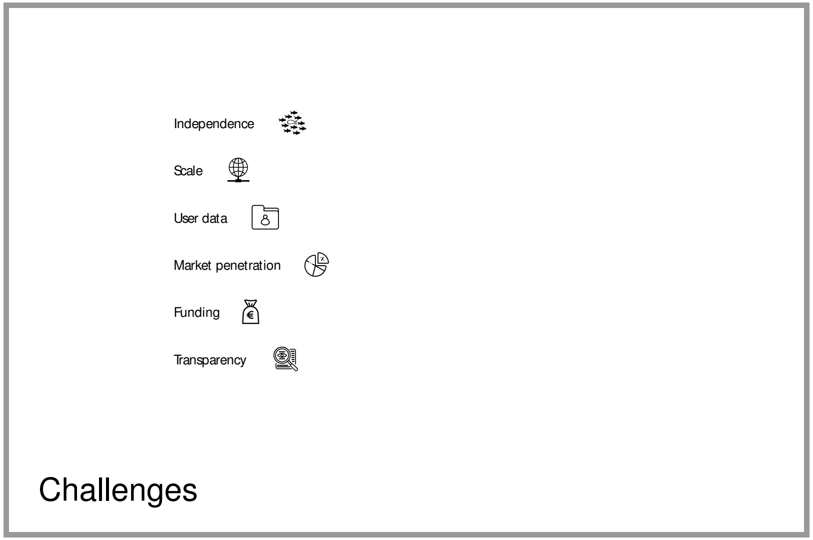

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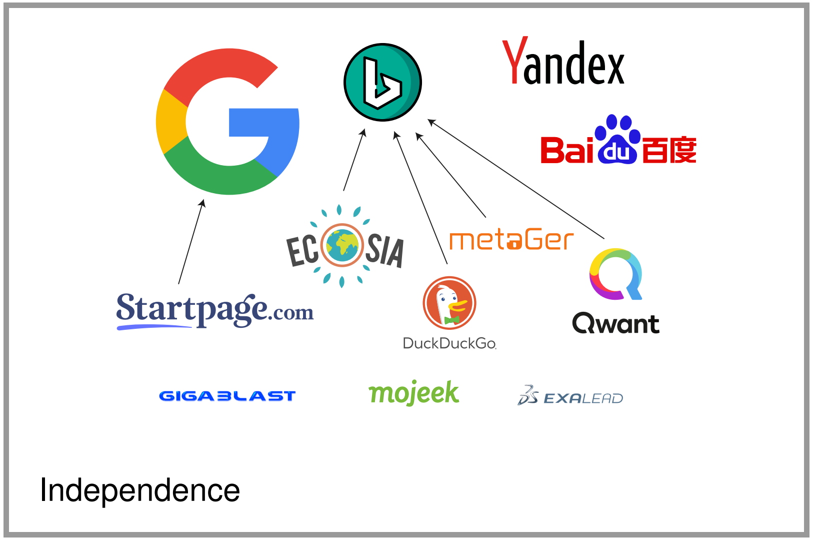

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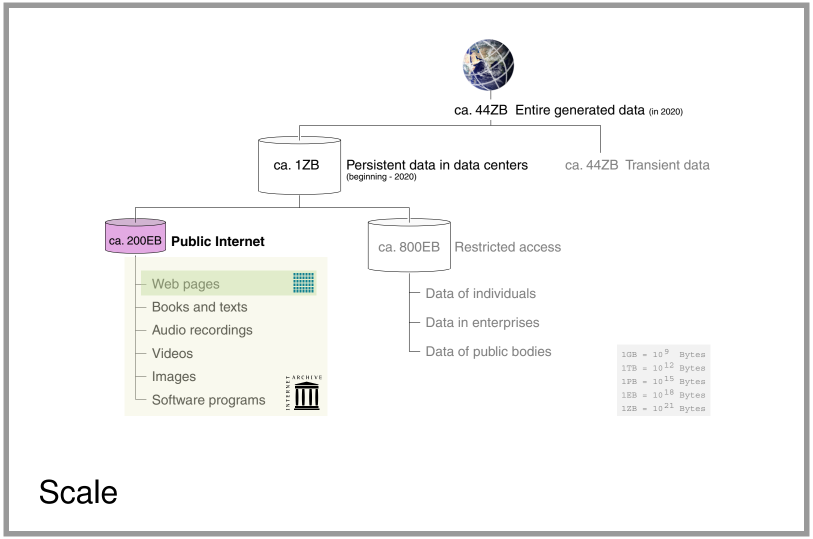

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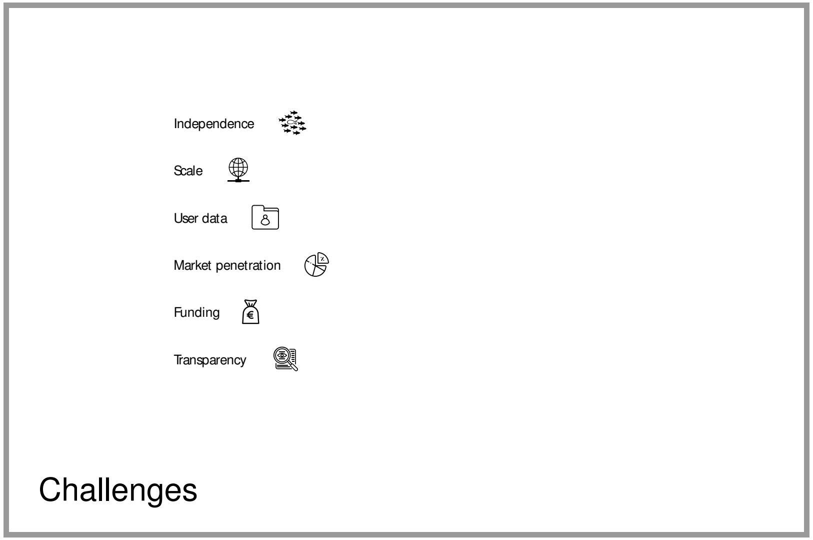

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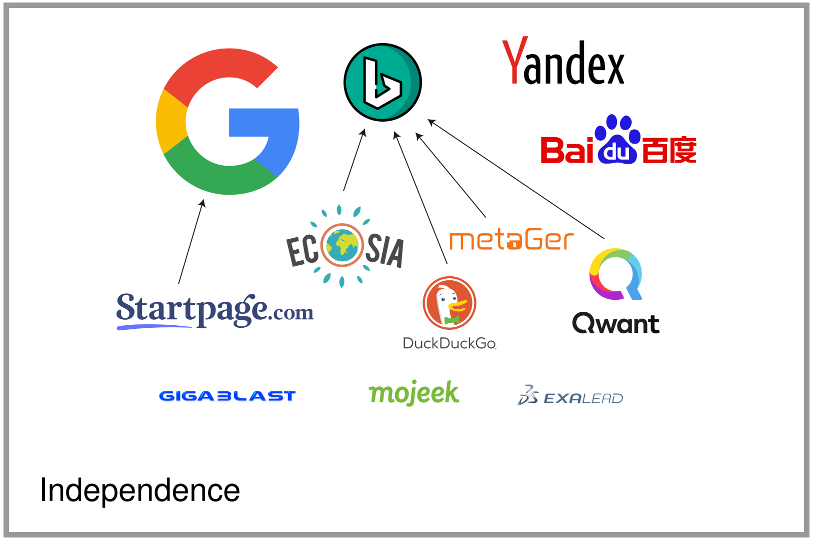

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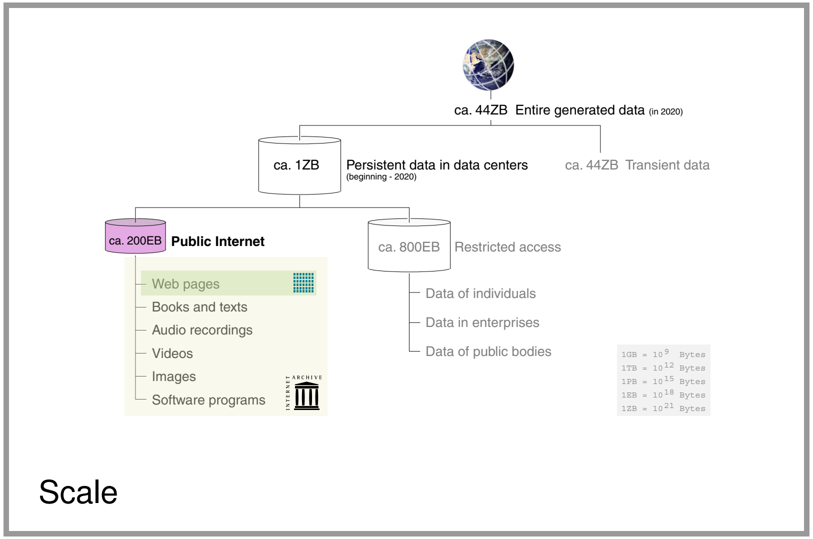

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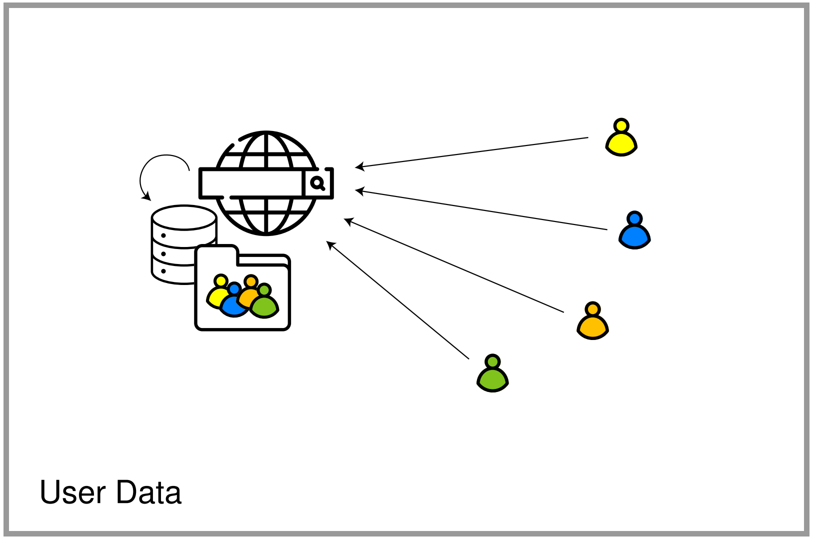

User Data

Thank You!

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