KBR

IFLA WLIC 2023 ROTTERDAM

OCLC

For Whom We Should Create the Bibliographic Data !

The Rise of Machine

By

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Brussels
18th Aug 2023

Agenda

- **Title**: For Whom We Should Create the Bibliographic Data: The Rise of Machine
- **Location**: KBR.
- **Duration:** 1 Days (10:10 pm - 10:35 am).
- **Speaker:** Moamen Elnasharty, PhD.
- **Audience:** Librarians, Knowledge Managers and Academic Staff.
- **Organizer:** IFLA WLIC 2023.

Outline

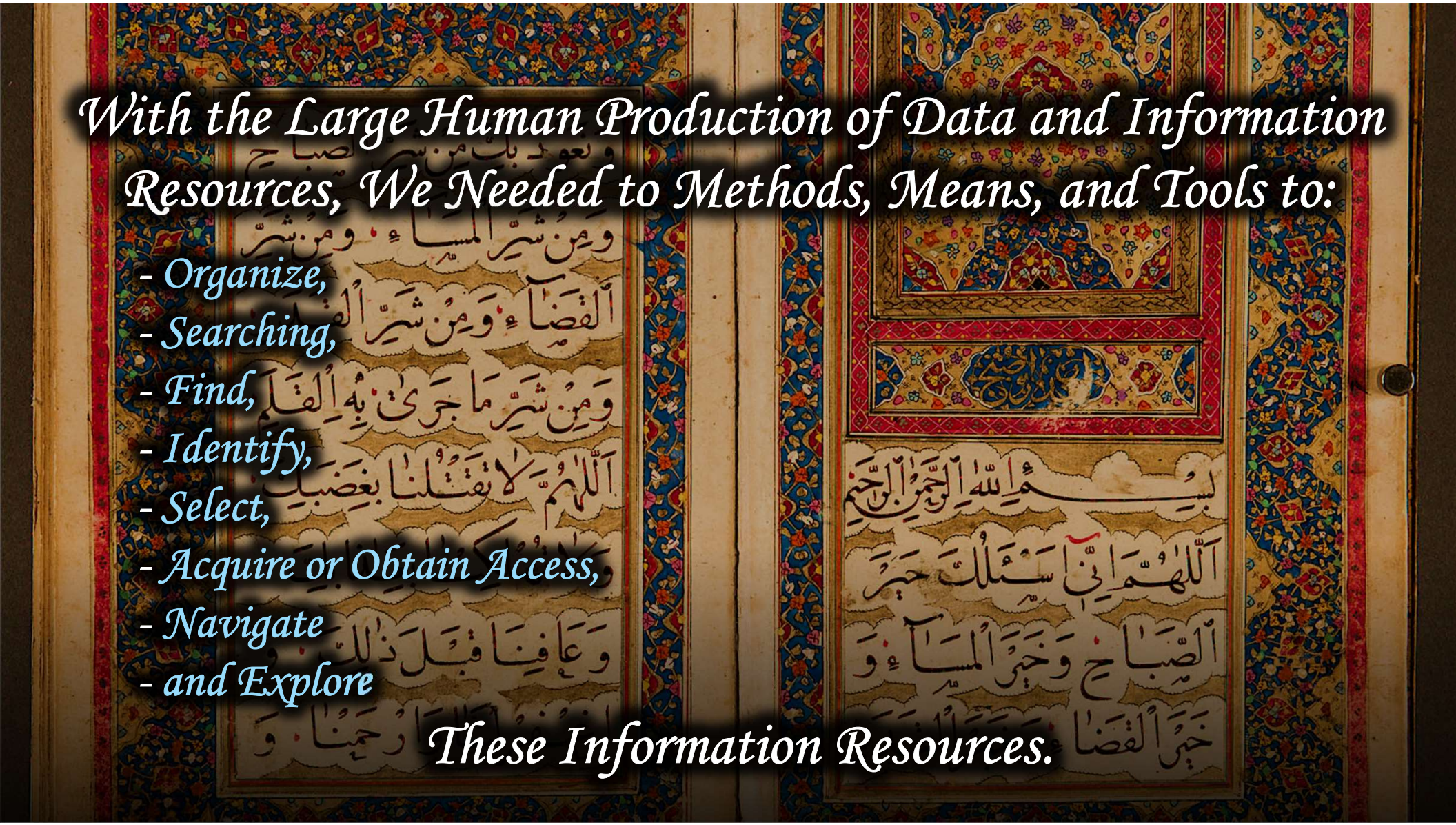
- ❑ Bibliographic Control.
- ❑ AI & Machine Learning.
- ❑ Generate AI Based on BC,

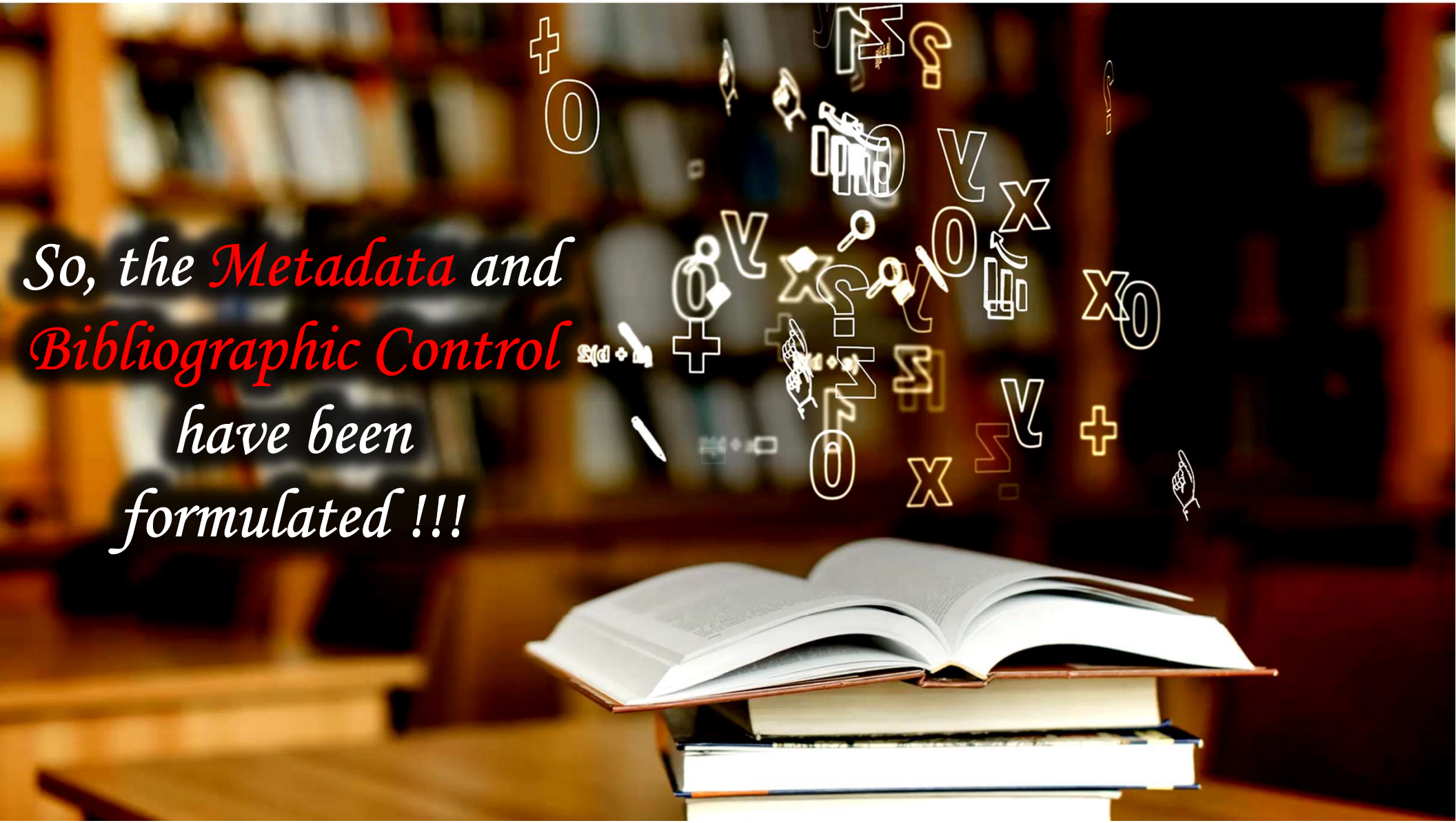
“… Let’s Start …”


So !!!
Where Data Comes From?


In the Past
The Human Being Was The Primary and The Only Source Of Data Production by:
Authorship, Discovery , Creativity , Extrapolation , Conclusion , Invention ...


The Products was
Manuscripts, Printed Books and Journals,
Audiovisual , Digital Resources !

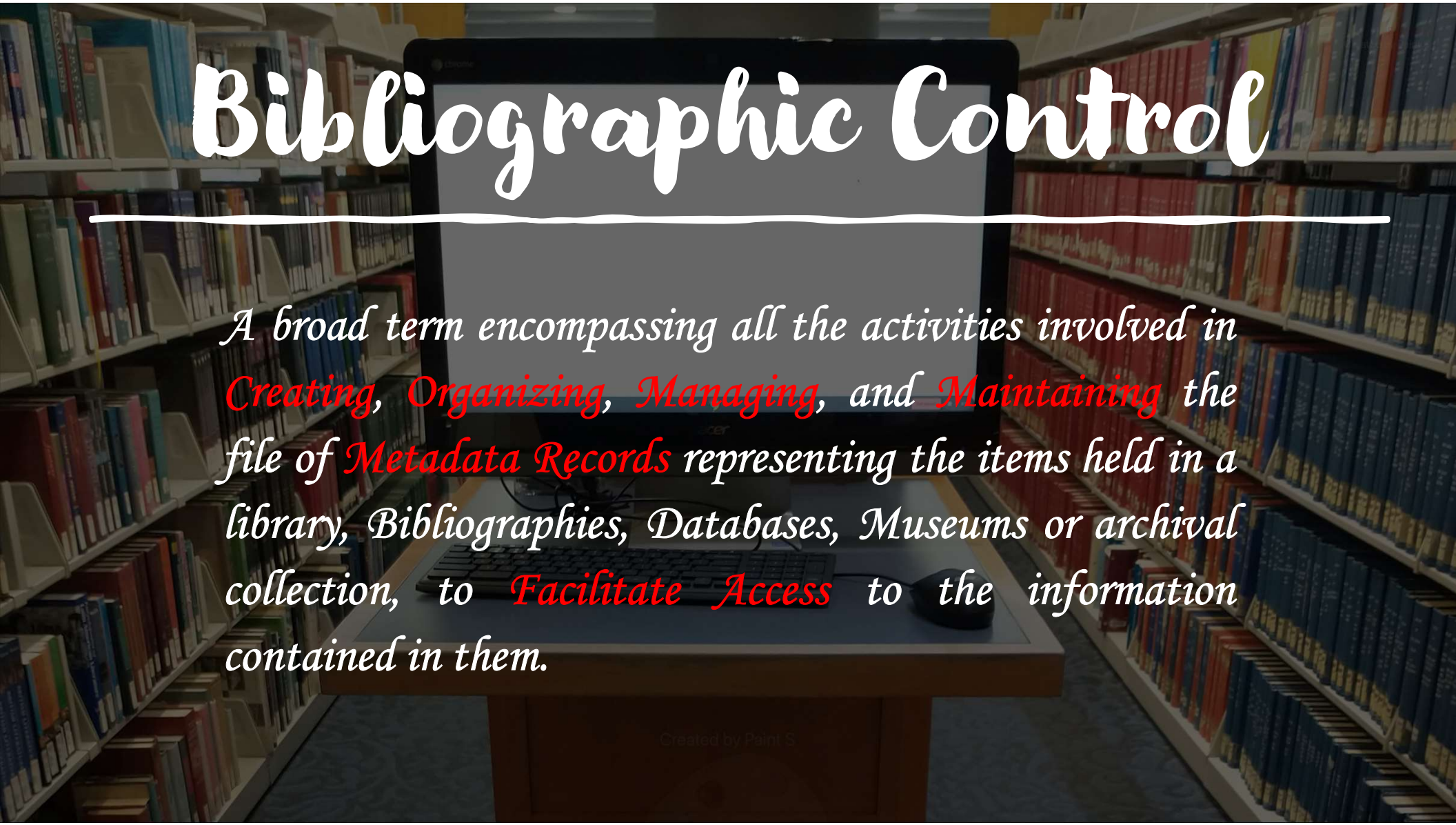

With the Large Human Production of Data and Information Resources, We Needed to Methods, Means, and Tools to:
- Organize,
- Searching,
- Find,
- Identify,
- Select,
- Acquire or Obtain Access,
- Navigate
- and Explore
These Information Resources.


So, the Metadata and
Bibliographic Control
have been
formulated !!!

Metadata

- *Metadata is basically data that describes Entites or Information Resources.*
- *It helps us understand the origin, structure, nature, and context of data.*
- *As a result, we can categorize, organize, and then easily retrieve information.*

https://dataedo.com/kb/data-glossary/what-is-metadata



Bibliographic Control

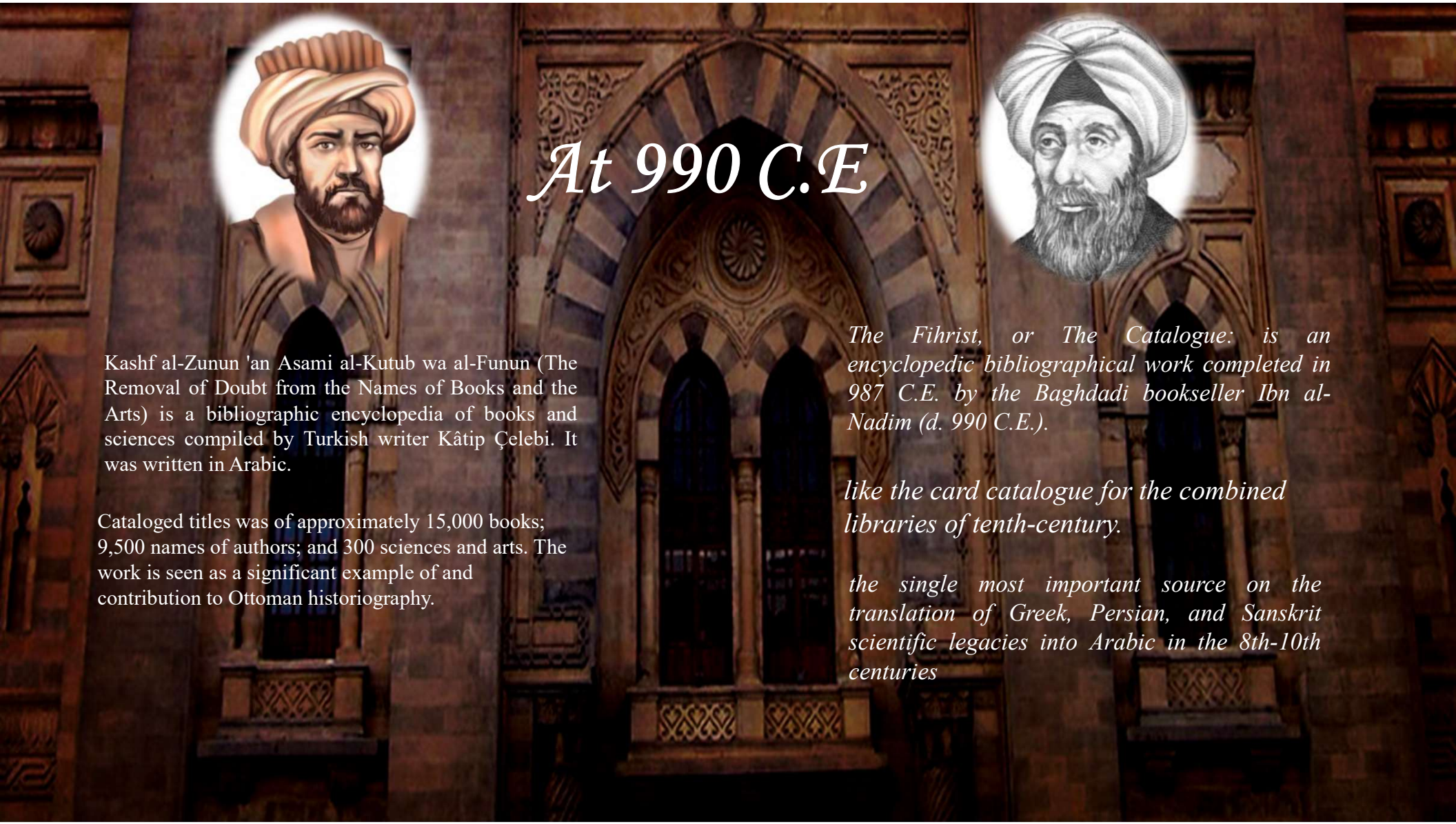
A broad term encompassing all the activities involved in Creating, Organizing, Managing, and Maintaining the file of Metadata Records representing the items held in a library, Bibliographies, Databases, Museums or archival collection, to Facilitate Access to the information contained in them.


BC History

The British Museum No: EA22878.

The first Bibliographic Record Backes to the Ancient Egyptian Civilization, Amenhotep III, The first Bibliographic Record Backes to the ancient Egyptian civilization, Amenhotep III, by hieroglyphic inscription, it had been about "the book of the moringa tree",

The Pinakes is a lost bibliographic work composed by Callimachus that is the first library catalog in the world; its contents were based upon the holdings of the Library of Alexandria during Callimachus' tenure there during the third century BCE.



At 990 C.E

Kashf al-Zunun 'an Asami al-Kutub wa al-Funun (The Removal of Doubt from the Names of Books and the Arts) is a bibliographic encyclopedia of books and sciences compiled by Turkish writer Kâtip Çelebi. It was written in Arabic.

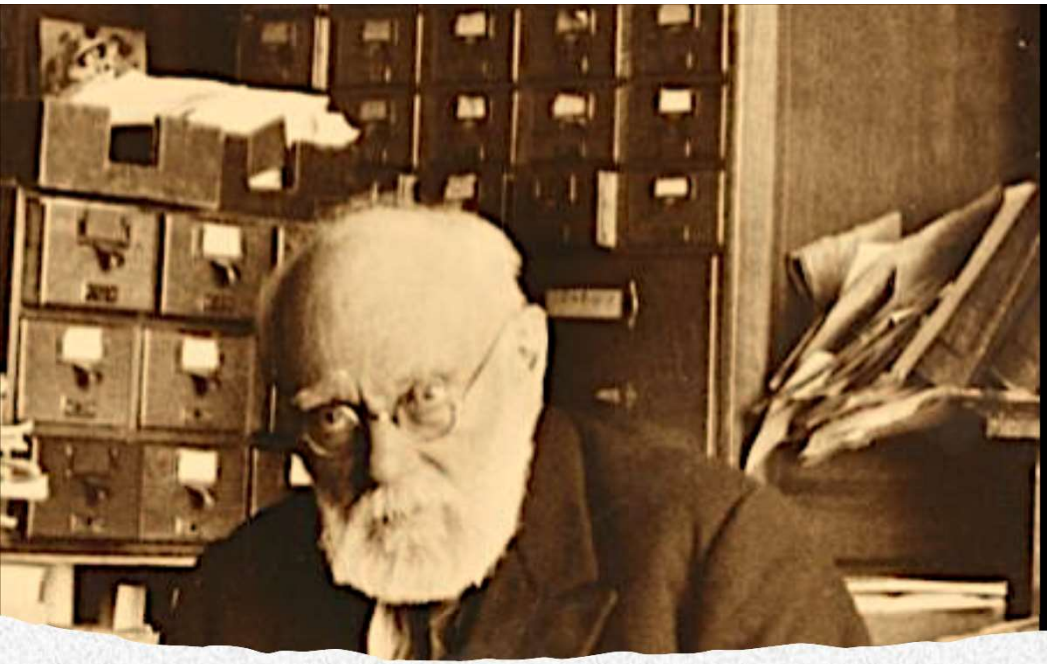
Cataloged titles was of approximately 15,000 books; 9,500 names of authors; and 300 sciences and arts. The work is seen as a significant example of and contribution to Ottoman historiography.

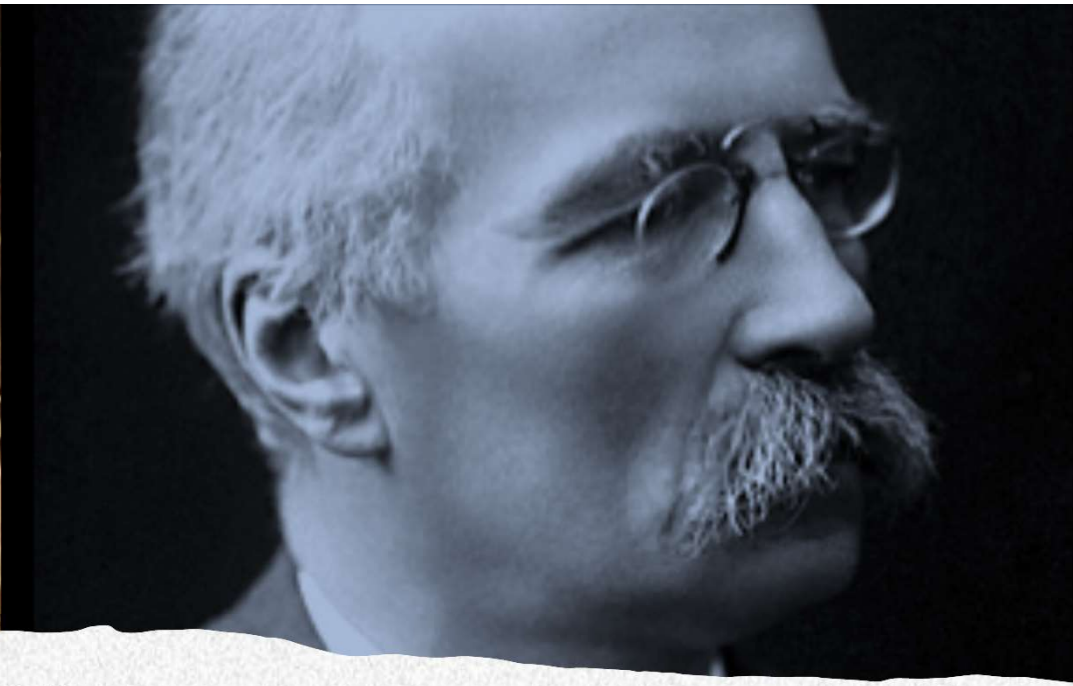
The Fihrist, or The Catalogue: is an encyclopedic bibliographical work completed in 987 C.E. by the Baghdadi bookseller Ibn al-Nadim (d. 990 C.E.).

like the card catalogue for the combined libraries of tenth-century.

the single most important source on the translation of Greek, Persian, and Sanskrit scientific legacies into Arabic in the 8th-10th centuries

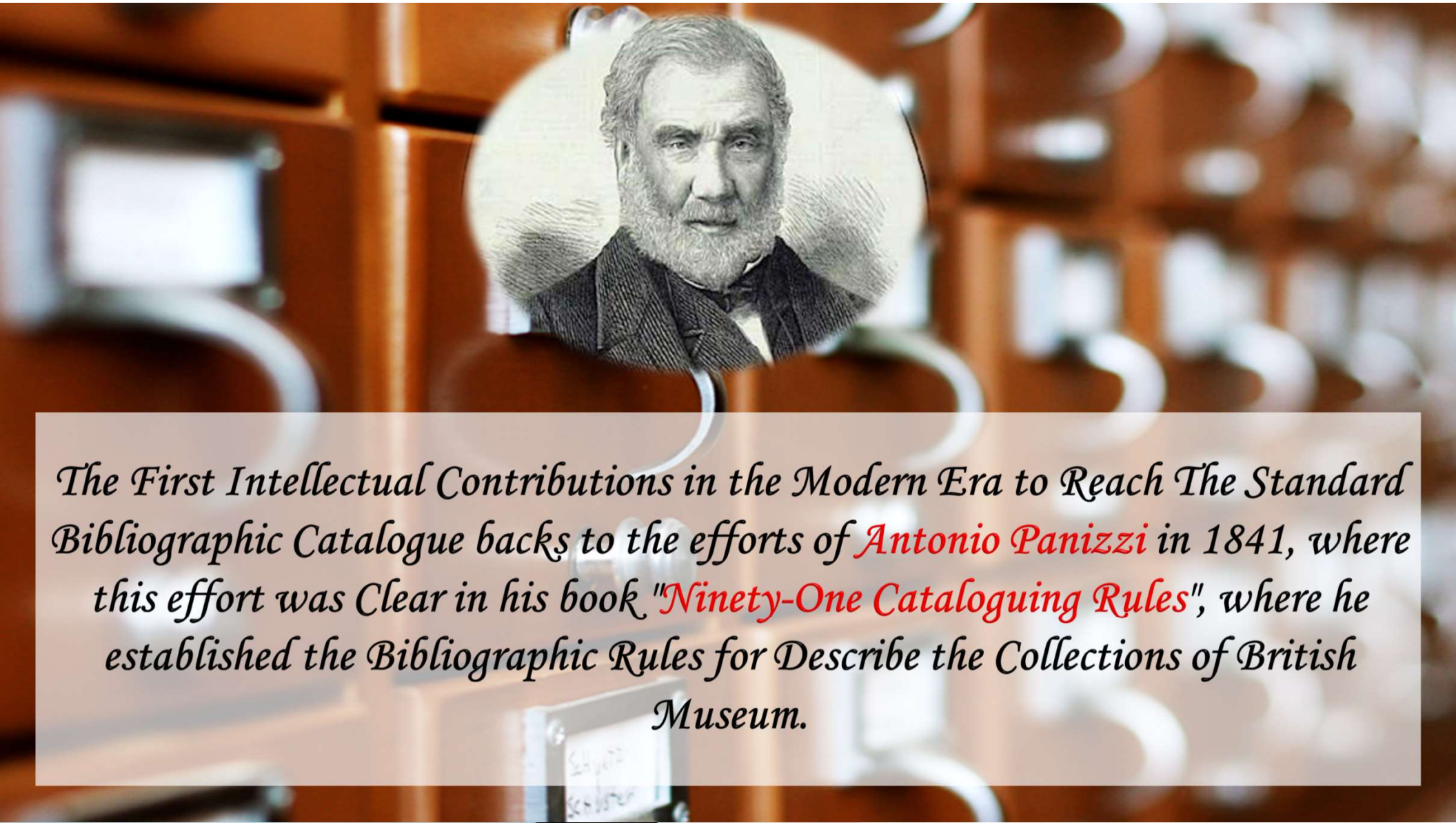
Conrad Gesner is known as the "father of bibliography". In 1545 he published Bibliotheca universalis (*Universal Bibliography 1545–1549*) (Twenty-one Books of Encyclopedias or Universal Divisions).



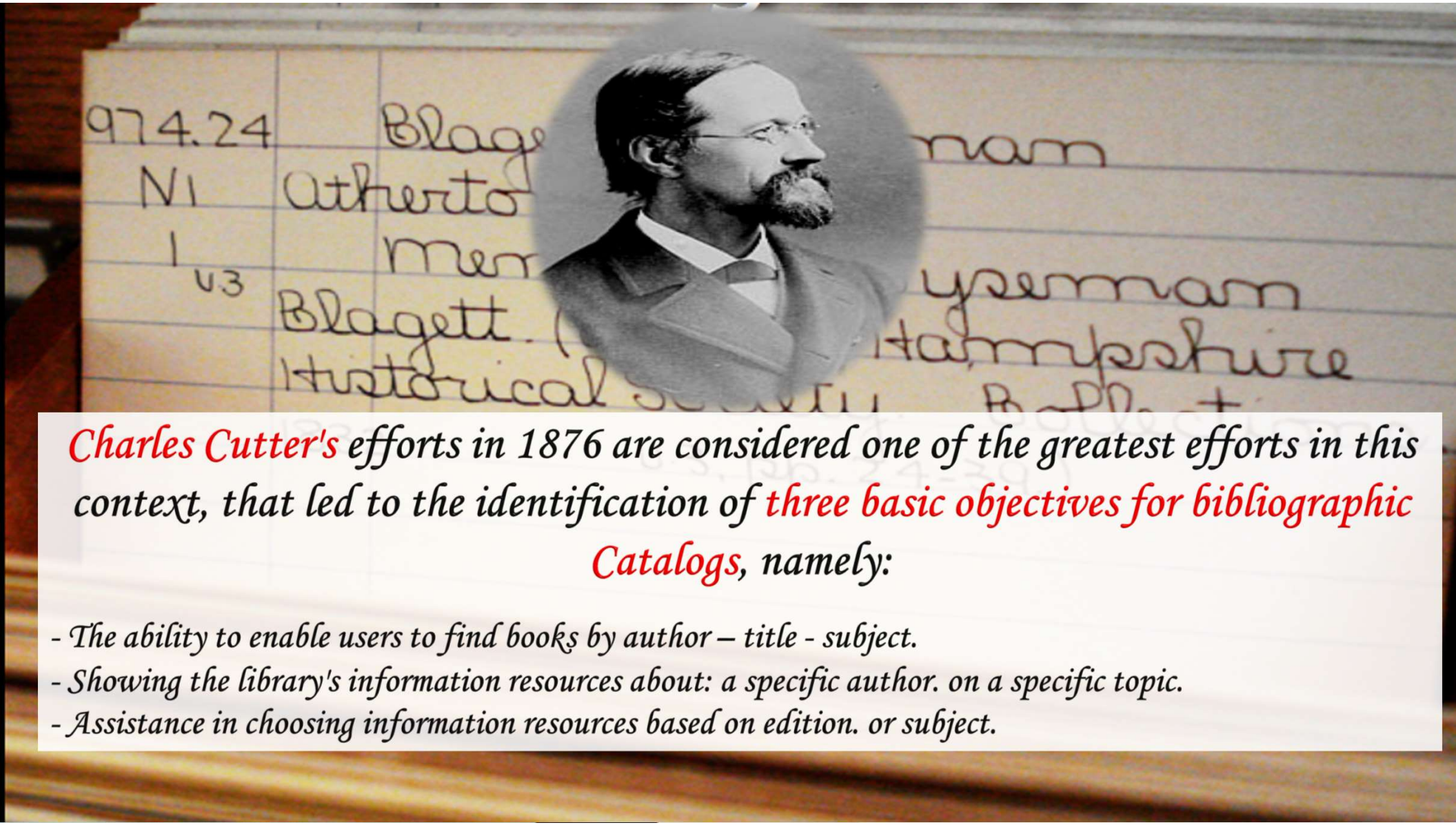


The Roles of Otlet & La Fontaine in Universal Bibliographic Vision

- Both played key roles in advancing the concept of universal bibliographic control through their works
  - The Universal Decimal Classification.
  - The Universal Bibliographic Repertory.
  - The Mundaneum: as a central repository for the world's information.
  - The World City or Cité Mondiale.

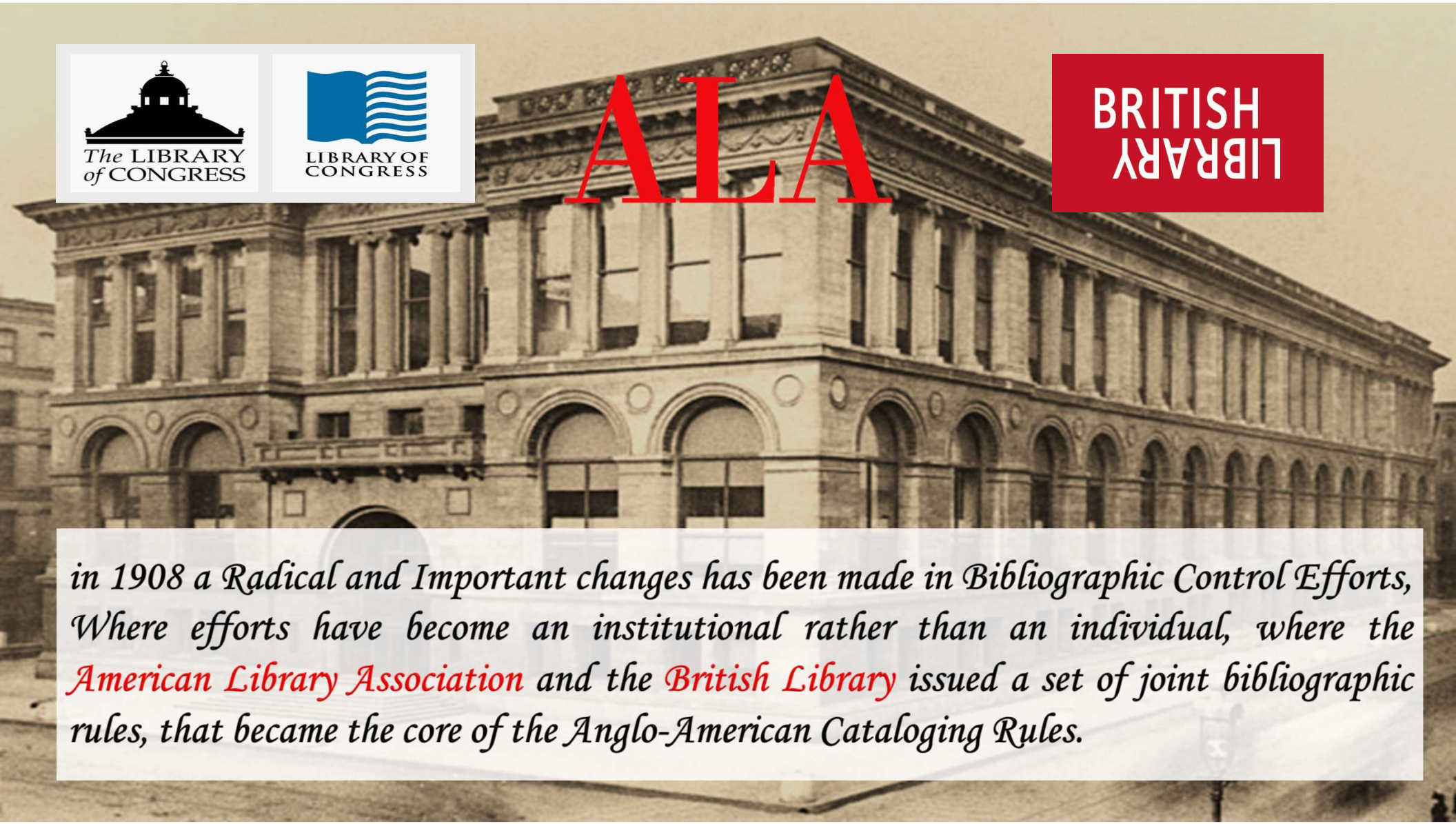


The First Intellectual Contributions in the Modern Era to Reach The Standard Bibliographic Catalogue backs to the efforts of Antonio Panizzi in 1841, where this effort was Clear in his book "Ninety-One Cataloguing Rules", where he established the Bibliographic Rules for Describe the Collections of British Museum.

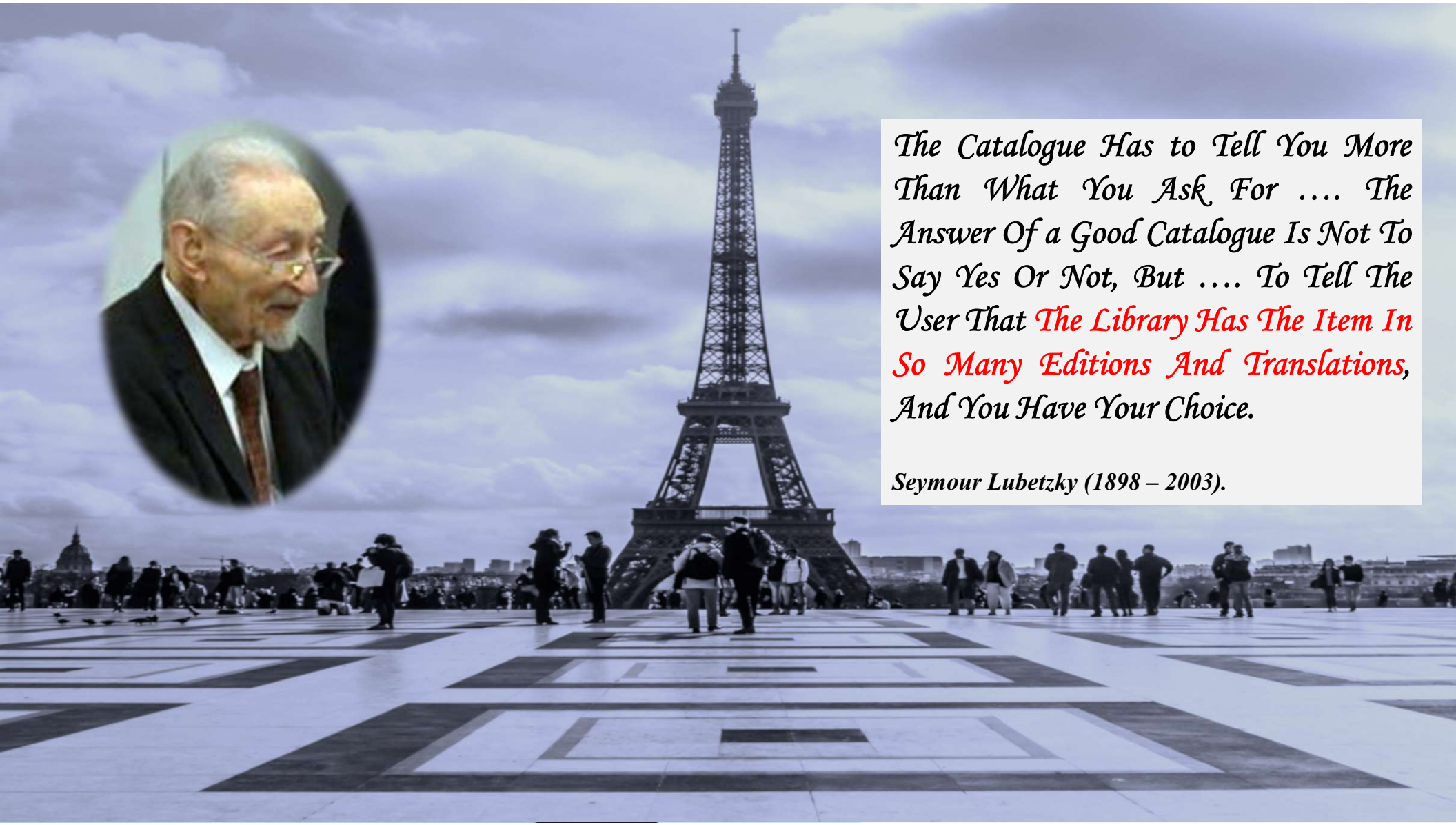


Charles Cutter's efforts in 1876 are considered one of the greatest efforts in this context, that led to the identification of three basic objectives for bibliographic Catalogs, namely:

- *The ability to enable users to find books by author – title - subject.*
- *Showing the library's information resources about: a specific author. on a specific topic.*
- *Assistance in choosing information resources based on edition. or subject.*



in 1908 a Radical and Important changes has been made in Bibliographic Control Efforts, Where efforts have become an institutional rather than an individual, where the American Library Association and the British Library issued a set of joint bibliographic rules, that became the core of the Anglo-American Cataloging Rules.

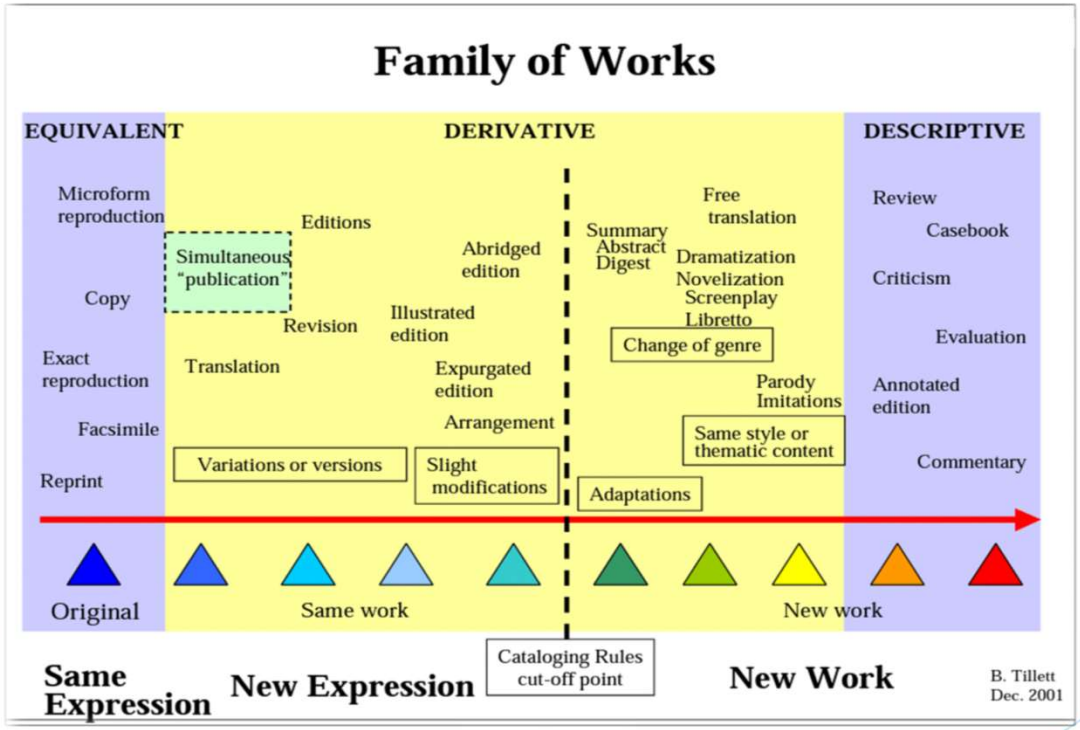


The Catalogue Has to Tell You More Than What You Ask For …. The Answer Of a Good Catalogue Is Not To Say Yes Or Not, But …. To Tell The User That The Library Has The Item In So Many Editions And Translations, And You Have Your Choice.

Seymour Lubetzky (1898 – 2003).


Henriette Avram, who developed the MARC format (Machine Readable Cataloging), that opened a new horizons for Data representation to Machine.

Tillett & Bibliographic Models



THE DAILY NEWS

www.dailynews.com THE WORLD'S FAVOURITE NEWSPAPER - Since 1879

عبقرية التأليف العربي، مؤلف يكشف عظمة المؤلفين العرب

Lorem Ipsum In libris graecis appetere mea. At vim odio lorem omnes, pri id iuvaret partiendo. Vivendo menandri et sed. Lorem volumus blandit cu has.Sit cu alia porro fuisset.

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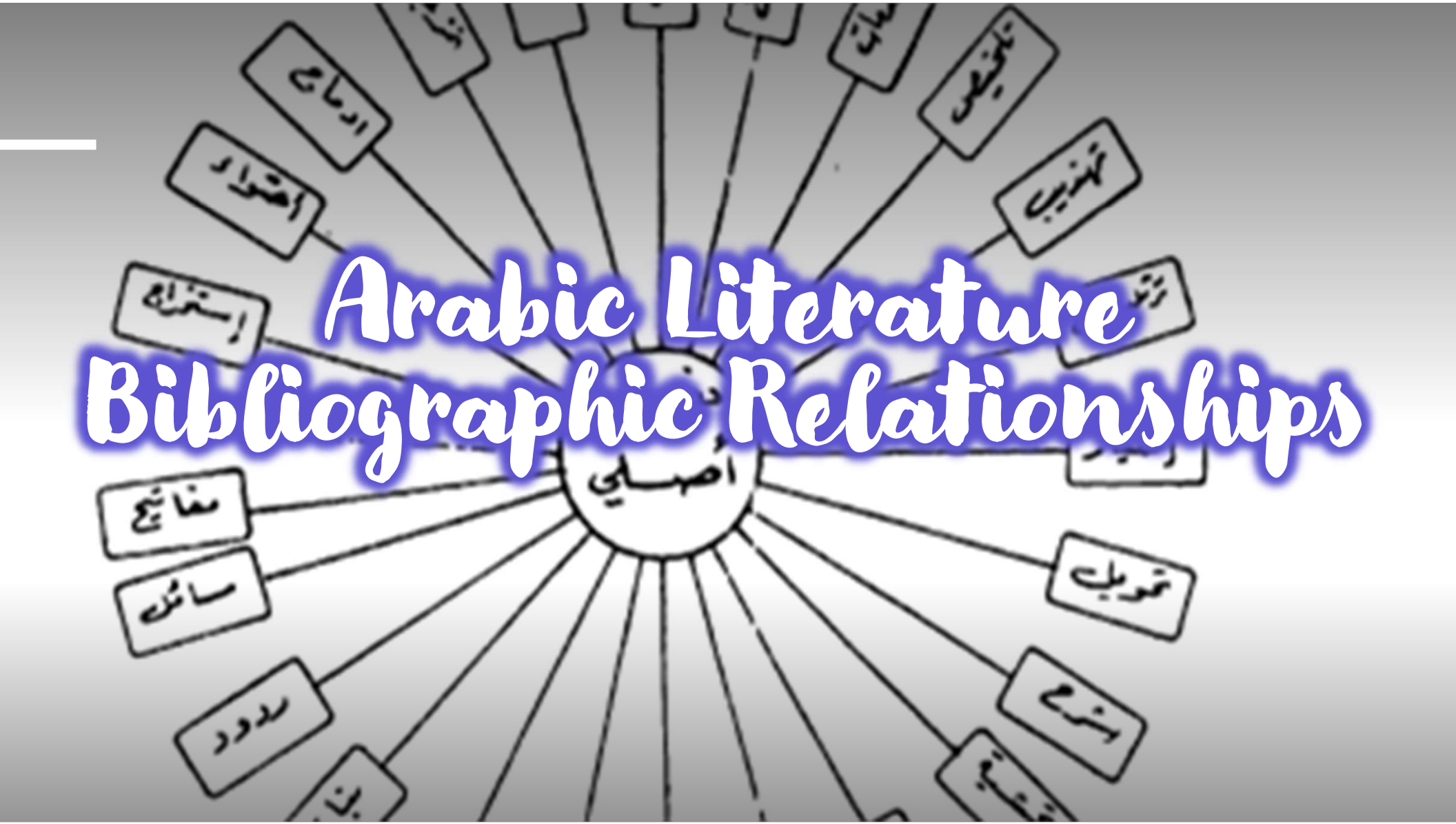
ARAFAT'S EFFORTS

Bibliographic Control Based on Relationships


Arabic Literature
Bibliographic Relationships
أصلي
مفاتيح
مسائل
ردود
تحويل
شرح
تهذيب
تلخيص
استدراك
استواء
ادماج

We are IFLA

IFLA WLIC 2023

ROTTERDAM

IFLA.org

IFLA was established in 1927 at Edinburgh, Scotland. In 1971, the Head Quarter was shifted at Netherland, the Hague.z

IFLA is a Non-Governmental, Not-For-Profit, an International Organization.

IFLA- provides, Information Specialists to the World, with a forum for exchange Ideas,

IFLA Promoting International Co-Operation, Research, and development in all fields of library and its services

#WeAreIFLA

IFLA & Universal Bibliographic Control

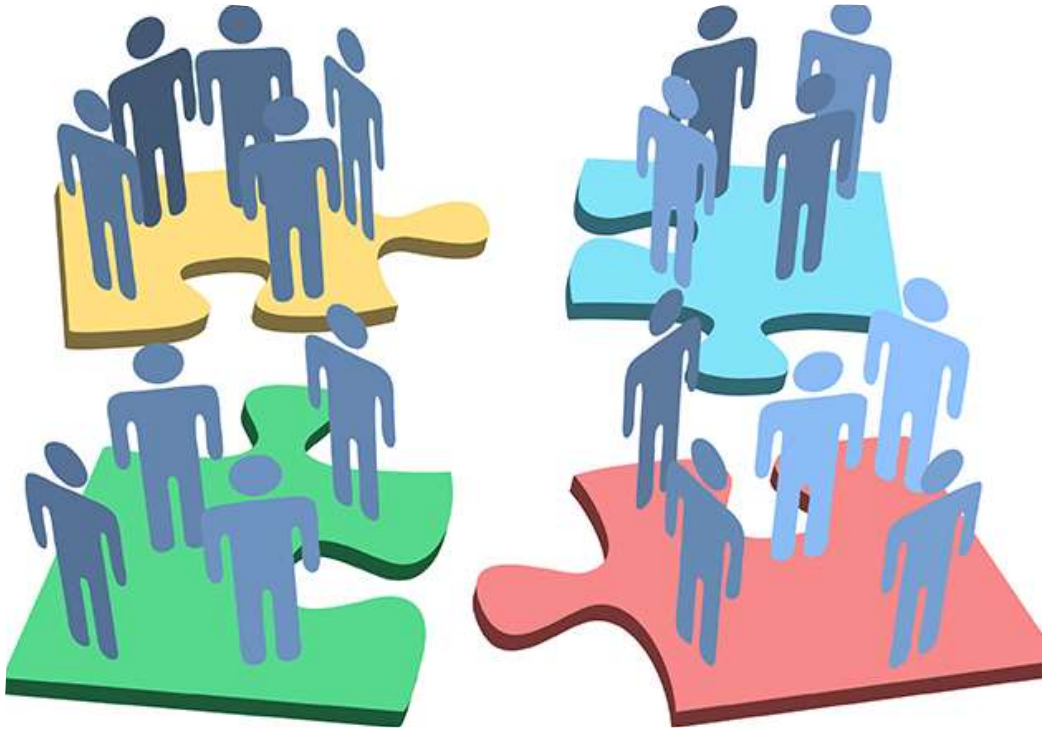
Universal Bibliographic Control (UBC) *is a concept has been* ***Coined*** *by* ***Herman Liebaers*** *(the president of IFLA).*

According to the UBC "… Any Document would only be cataloged once in its country of origin, and that record would then be available for the use of any library in the world…"

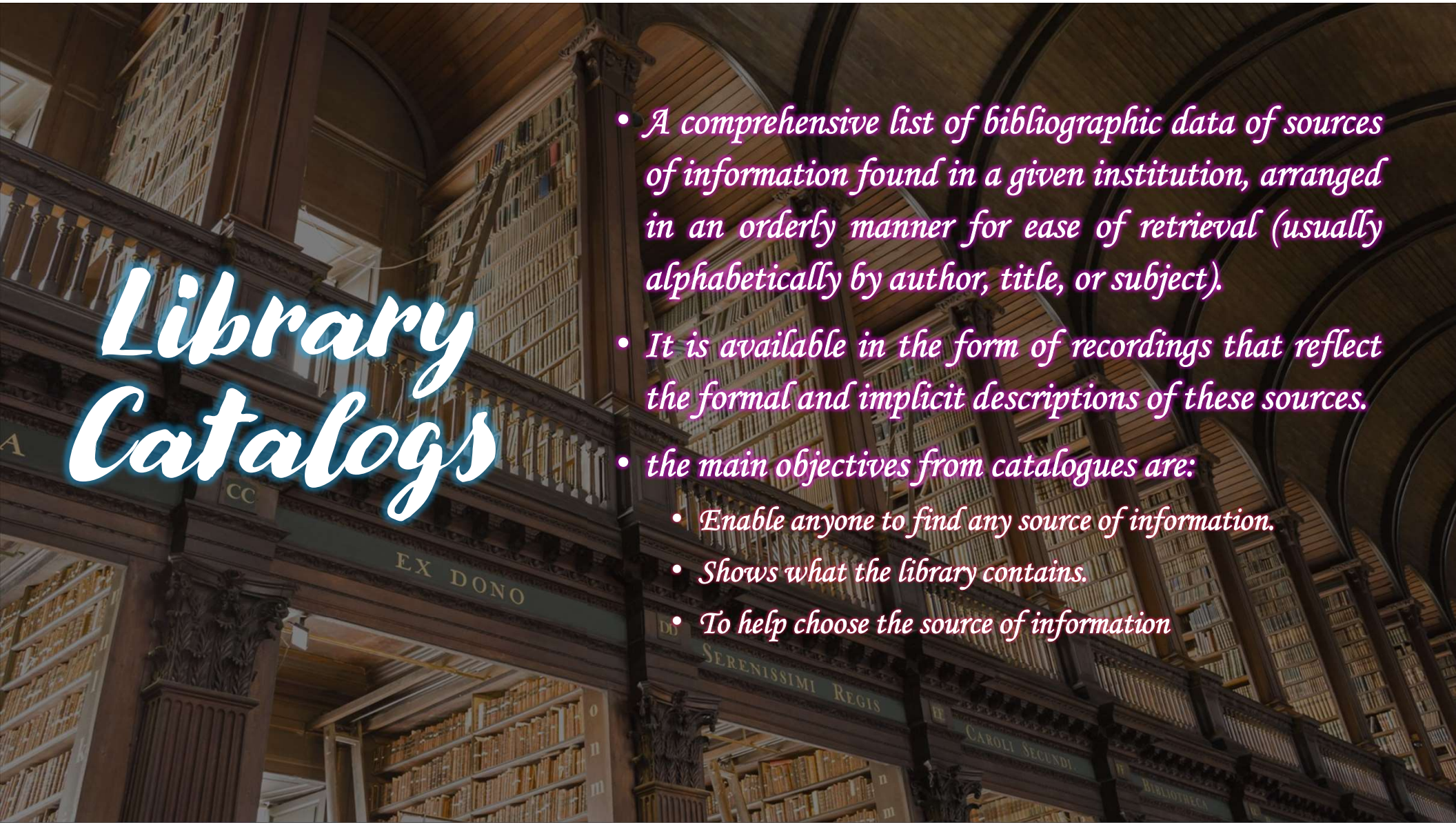
In the currently era, IFLA has played a central role, stimulating ***National Bibliographic Agencies*** *to promote standards and collaborations that go beyond the national sphere, leading to multicenter and even more cooperative bibliographic control.*

Universal Bibliographic Control

- **The Aim of UBC is Promotion of a worldwide system for the control and exchange of bibliographic information.**
- **Requirements of UBS are Need an Authoritative Organization-UNESCO, NBA- Create the Authoritative, Produce and Distribute the records in a standard physical form.**

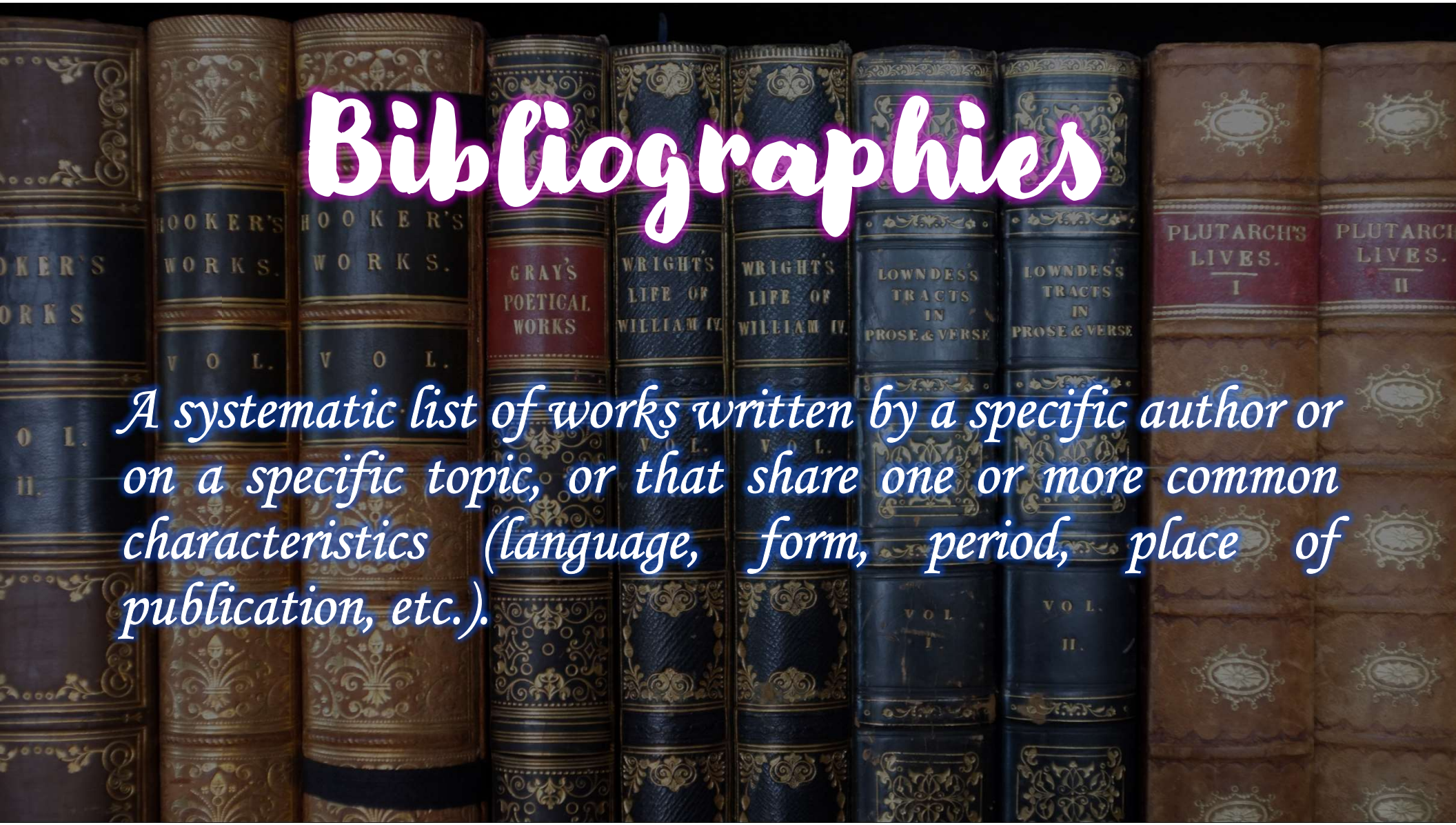



Bibliographic Control
Tools



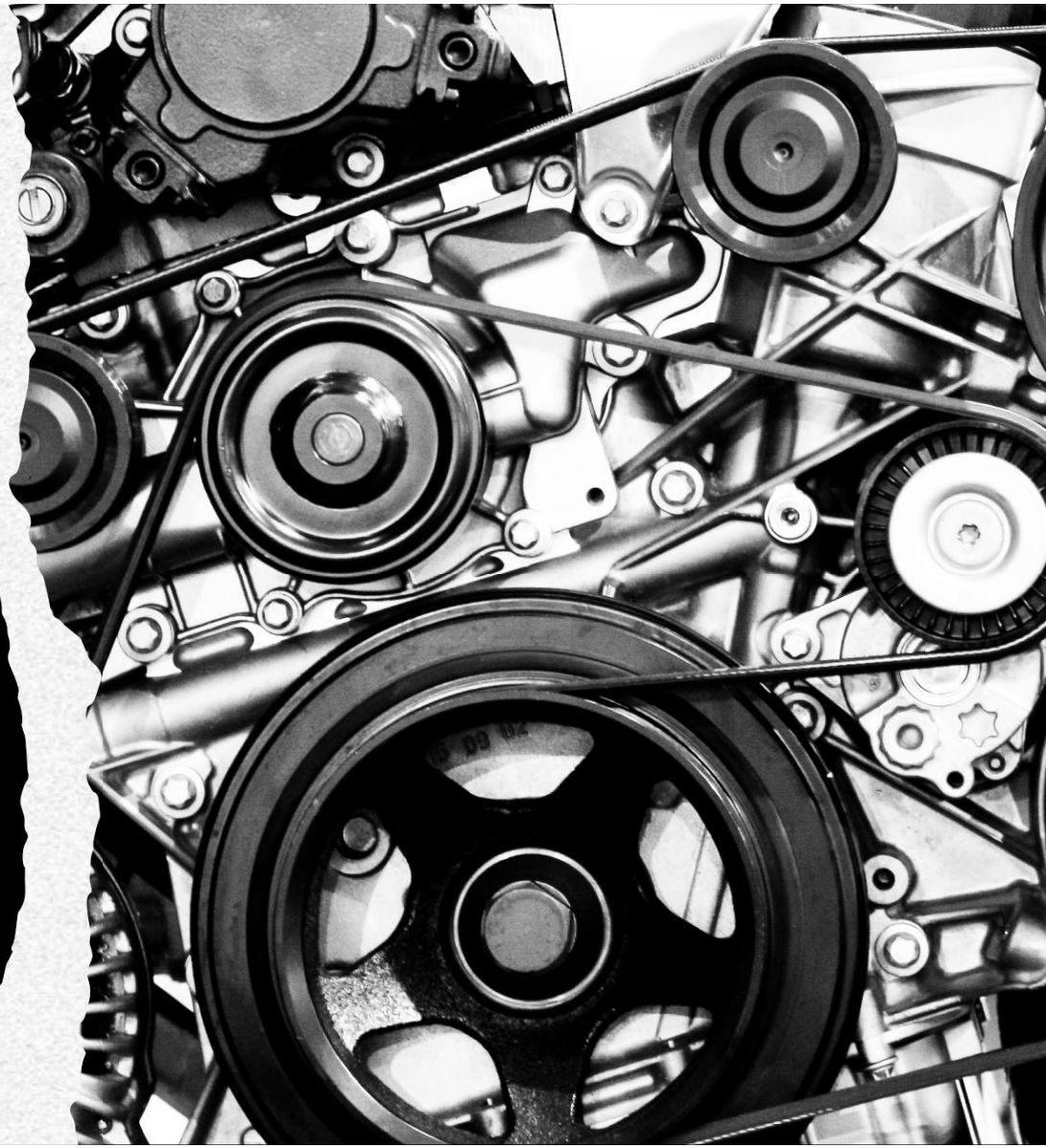
Library Catalogs

- A comprehensive list of bibliographic data of sources of information found in a given institution, arranged in an orderly manner for ease of retrieval (usually alphabetically by author, title, or subject).
- It is available in the form of recordings that reflect the formal and implicit descriptions of these sources.
- the main objectives from catalogues are:
  - Enable anyone to find any source of information.
  - Shows what the library contains.
  - To help choose the source of information

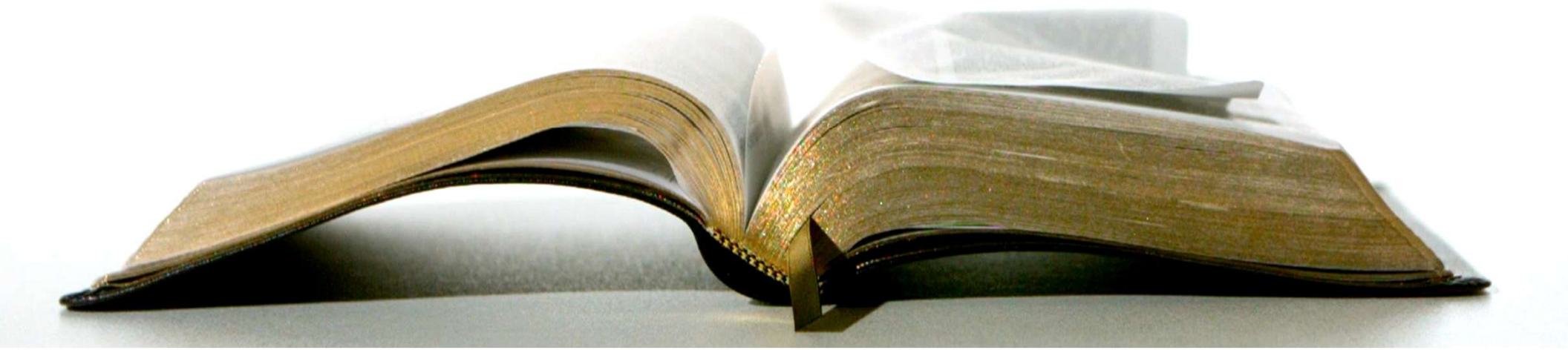

Bibliographies
A systematic list of works written by a specific author or on a specific topic, or that share one or more common characteristics (language, form, period, place of publication, etc.).

Search Engines

A search engine is a software program that helps people find the information they are looking for online using keywords or phrases. Search engines are able to return results quickly—even with millions of websites online—by scanning the Internet continuously and indexing every page they find.



How Can Create Bibliographic Control?




May be By Manual
FRAGILE
TORREY ARTIE and the PRINCESS
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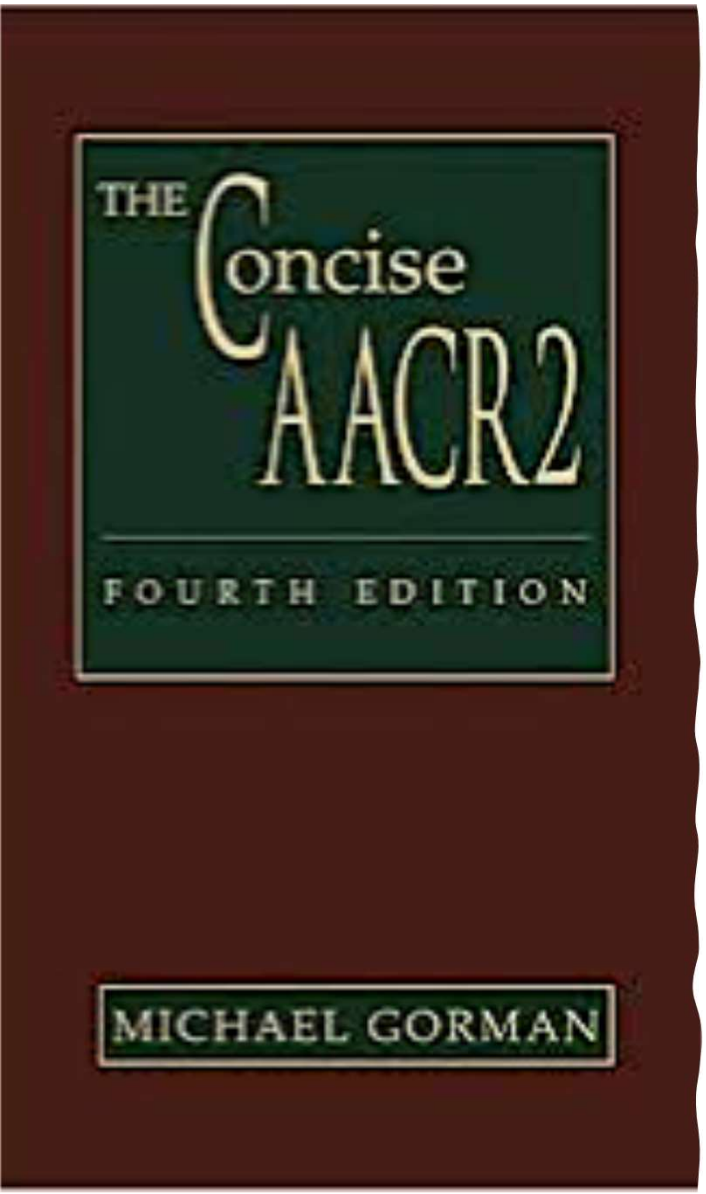
TORREY ARTIE and the PRINCESS



Title → Death penalty.

KF9725
.S74

Stevens, Leonard A

Death penalty : the case of life vs. death in the United States / by Leonard A. Stevens ; foreword by Michael Meltsner. — New York : Coward, McCann & Geoghegan, c1978.

159 p. ; 24 cm. — (Great constitutional issues)

Bibliography: p. 154-155.
Includes index.
ISBN 0-698-30701-1

Subject tracing → 1. Capital punishment—United States. 2. Furman, William Henry. I. Title.

KF9725.S74	345'.73'077	78-5880
		MARC
Library of Congress	78	


May be By Automation

RIDA

RESOURCE DESCRIPTION AND ACCESS

```
001      26132811
008      920608s1992    nyu       bf   001 0 eng
010      $a92021087
020      $a1555701205
040      $aDLC$cDLC$dAGL
049      $aHNKA
050  00  $aZ678.9$b.C58 1992
082  00  $a025/.00285$220
100  1   $aCohn, John M
245  10  $aPlanning for automation :$ba how-to-do it manual for
         librarians /$cJohn M. Cohn, Ann L. Kelsey, Keith Michael
         Fiels
260      $aNew York :$bNeal Schuman Publishers,$cc1992
300      $avi, 116 p. ;$c28 cm
440   0  $aHow-to-do it manuals for libraries ;$vno. 25
504      $aIncludes bibliographical references and index
650   0  $aLibraries$xAutomation$xManagement$xHandbooks, manuals, etc
650   0  $aLibrary planning$xHandbooks, manuals, etc
700  10  $aKelsey, Ann L
700  10  $aFiels, Keith Michael
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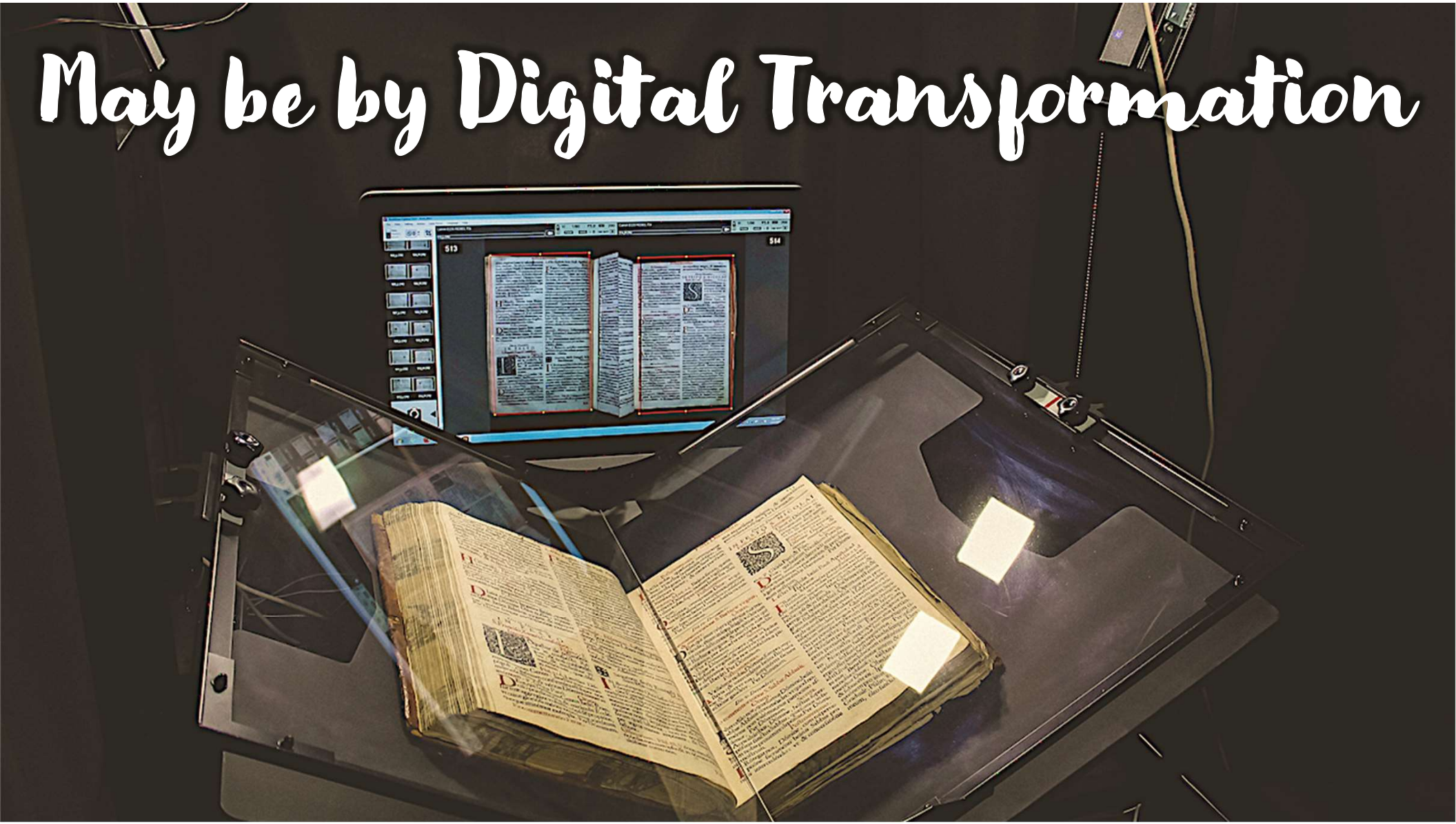
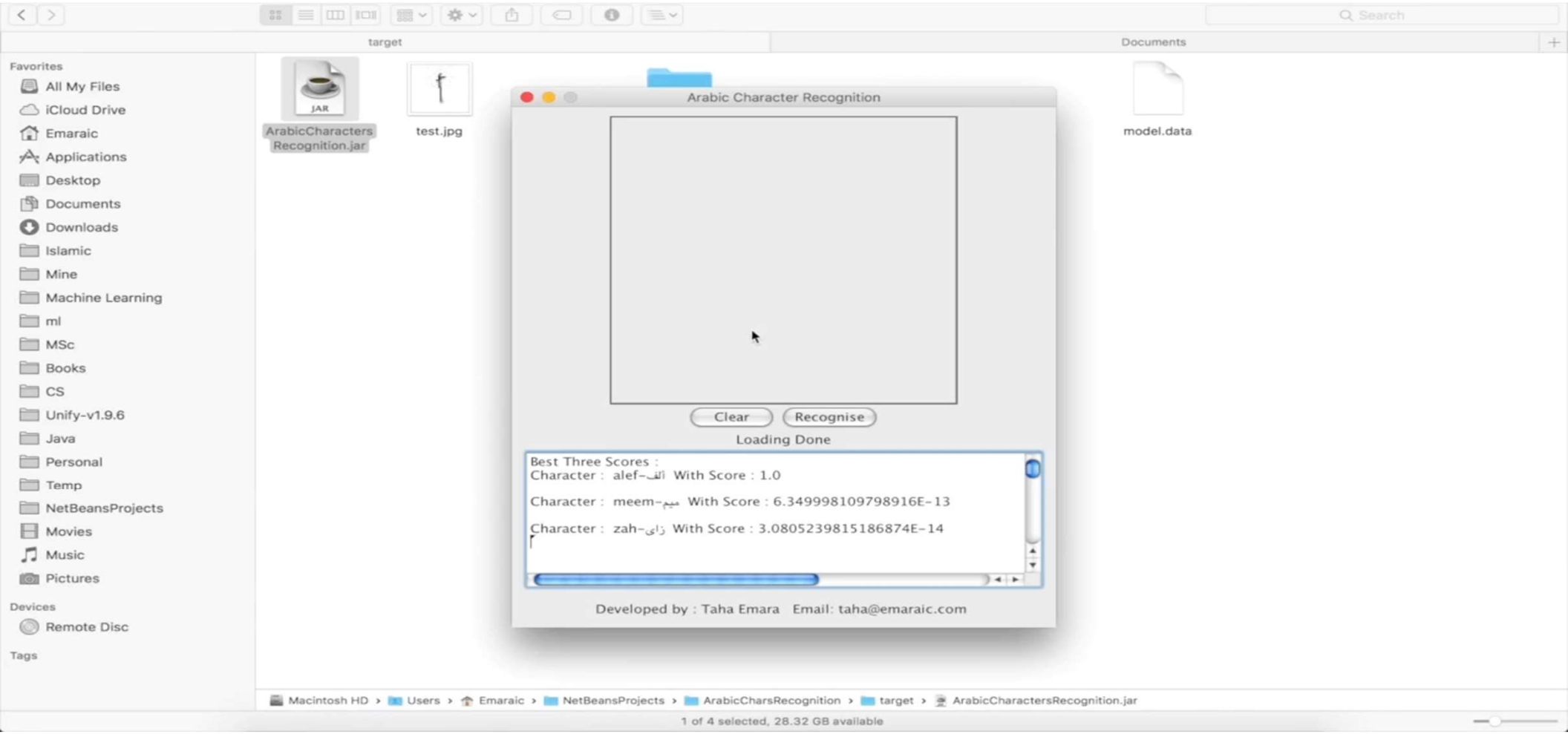
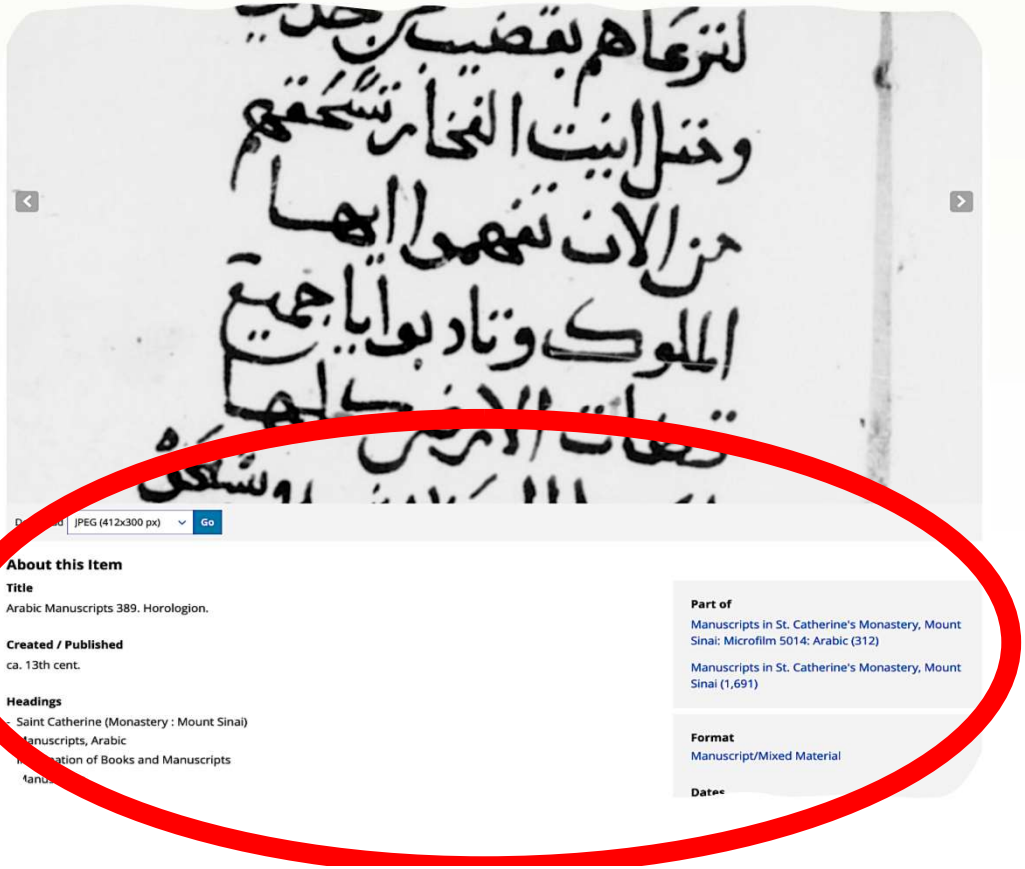
May be by Digital Transformation



Based on Text Analysis



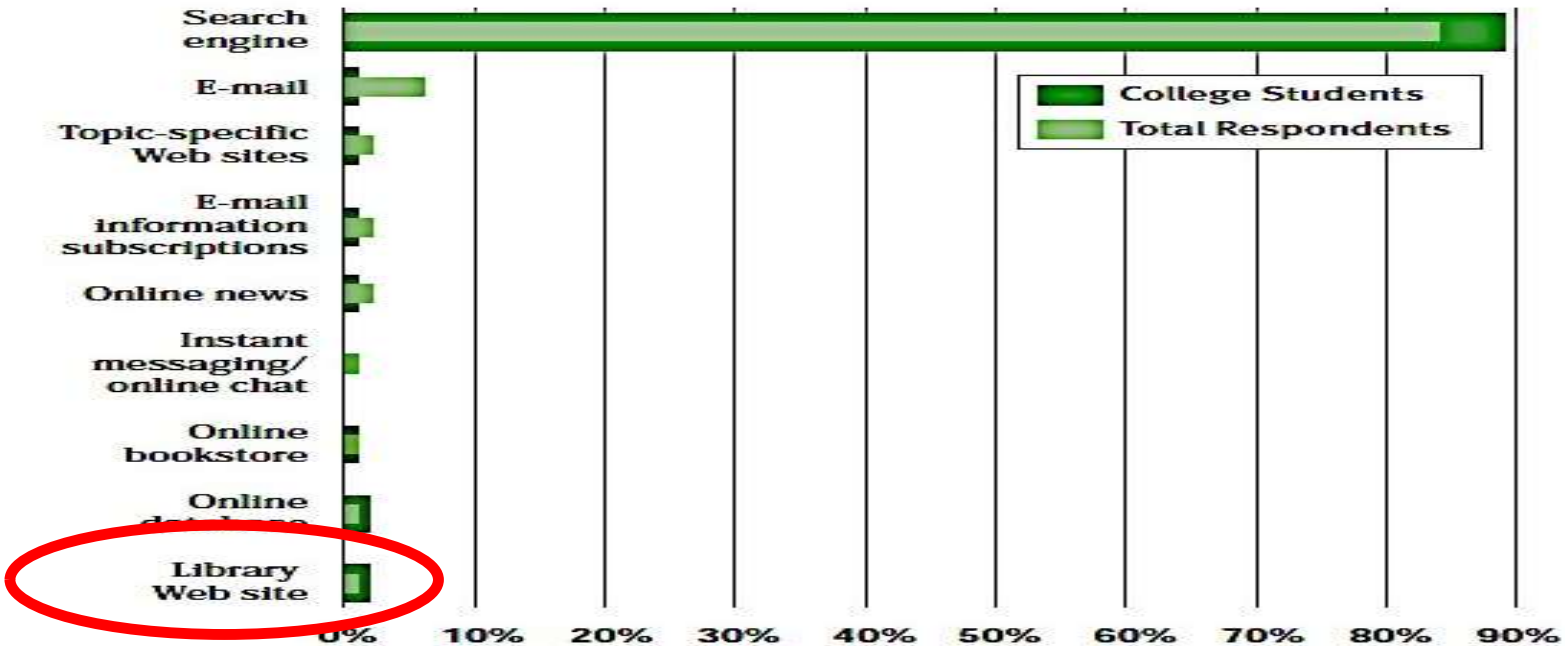
To be Result Like this !



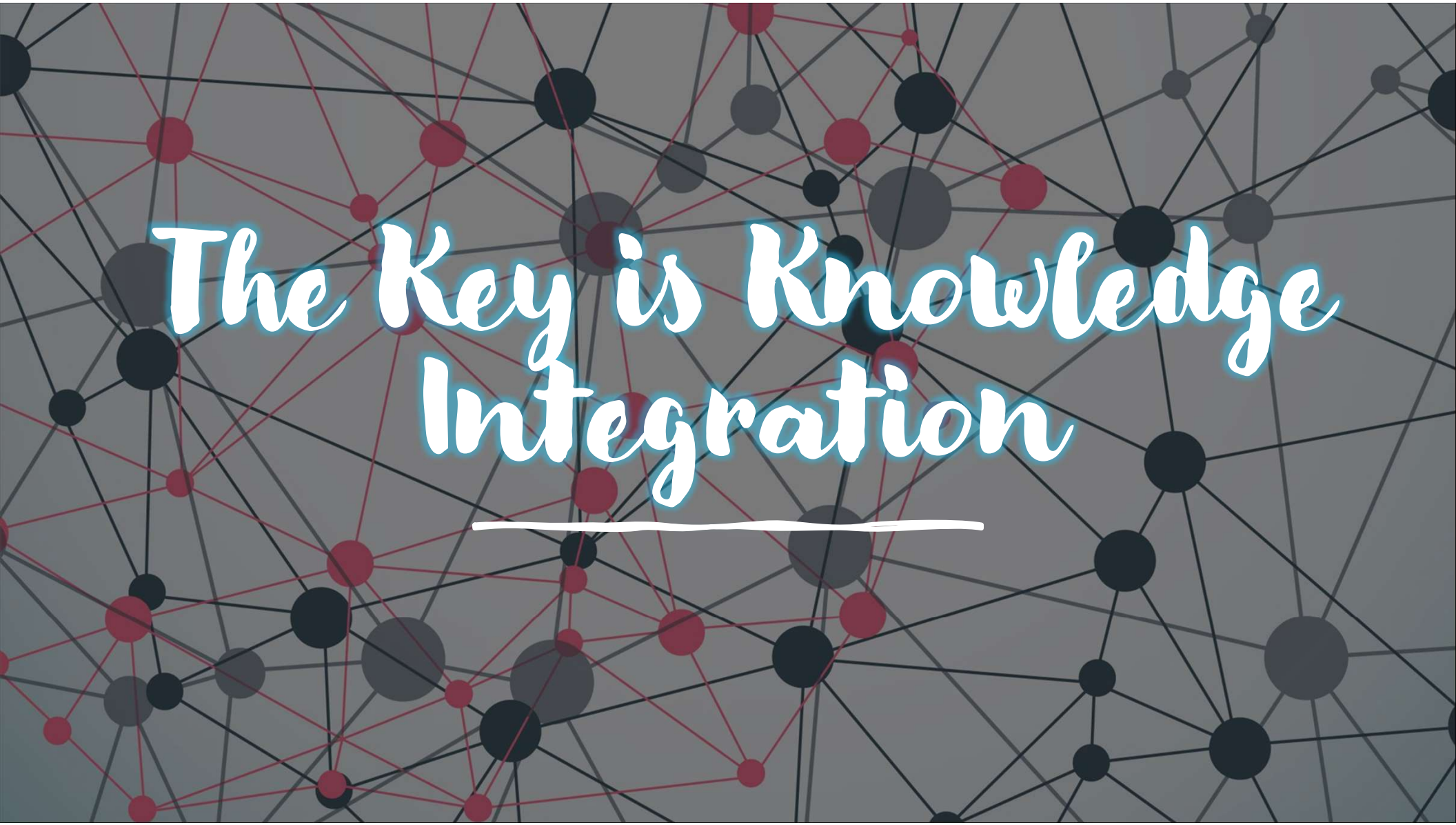

The Q:
Are BC Tools Meeting
Users Needs Currently?

The Current State of Bibliographic Control Tools

A survey conducted by the OCLC Network in 2010 about The usage of research tools in academic societies in Europe and USA revealed that library catalogs has a last rank between other research tools in conducting scientific research.



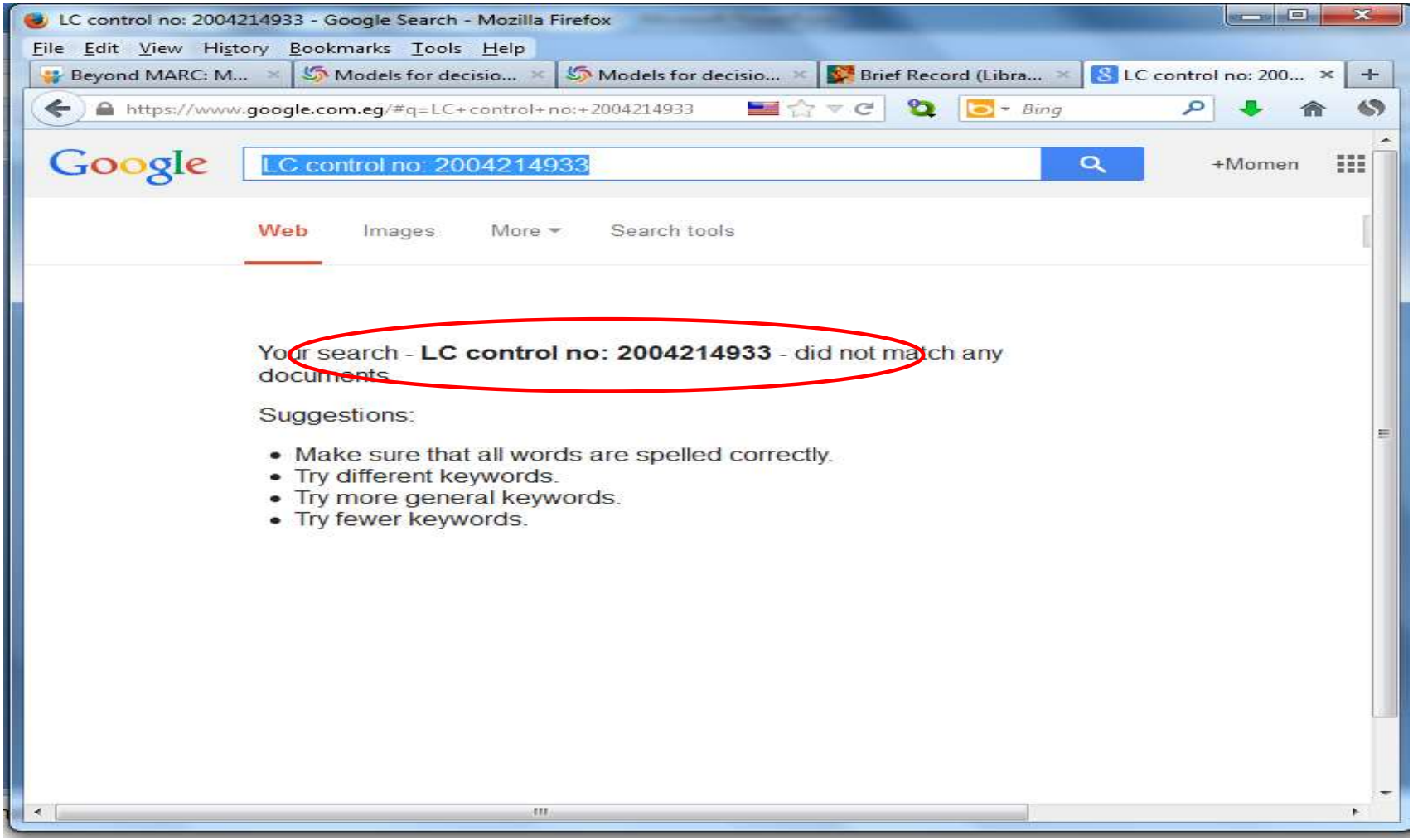

Why ?


The Key is Knowledge Integration

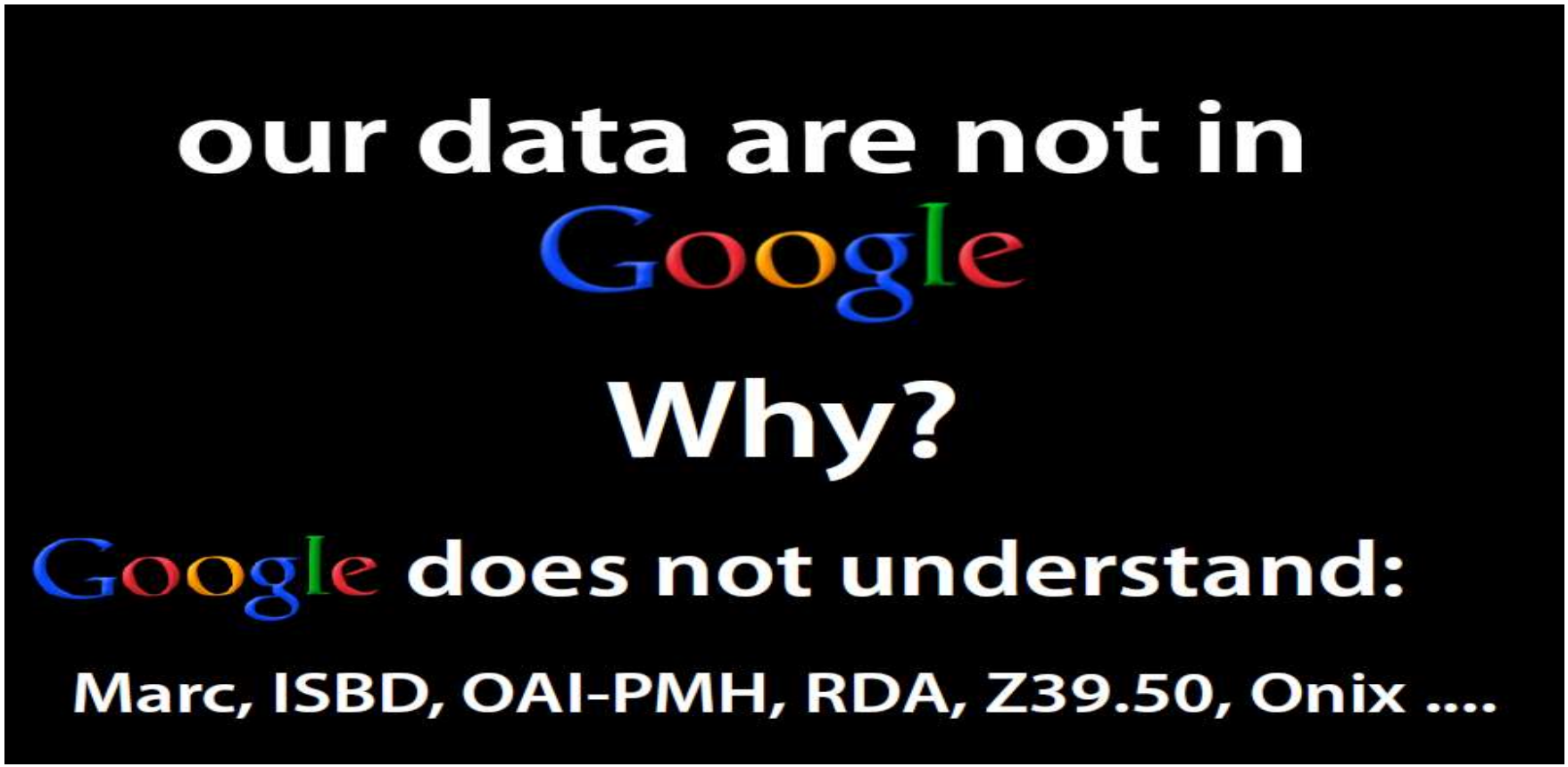
Bibliographic Control Tools Don't Integrate with others

Despite it is online

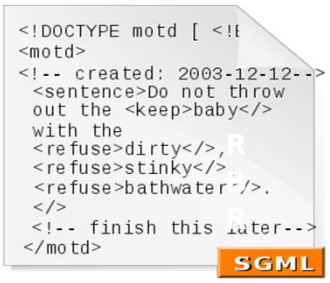
It Doesn't Be A Result In Search Engines Results



The Reasons Are:

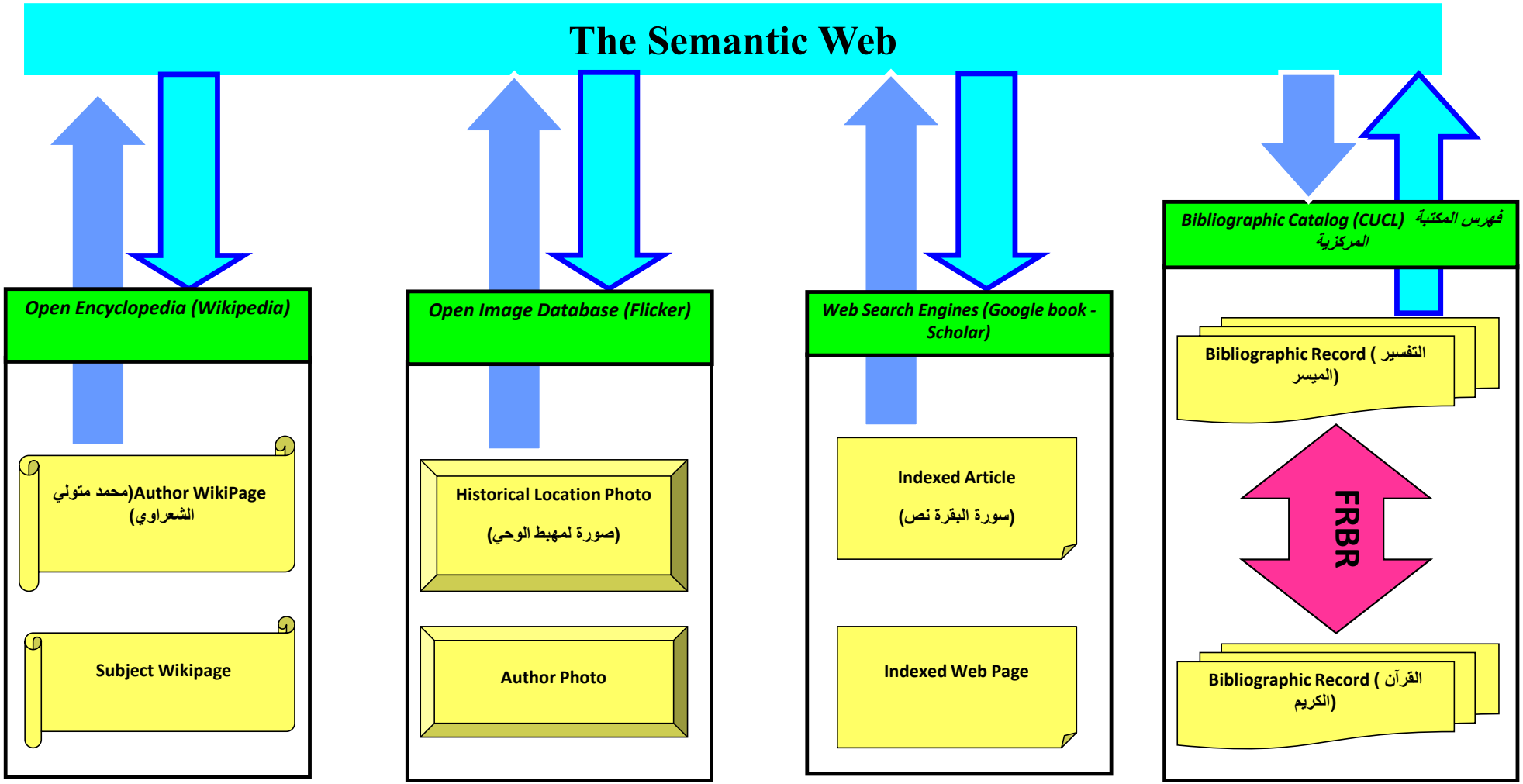


So, let's developing many Initiatives

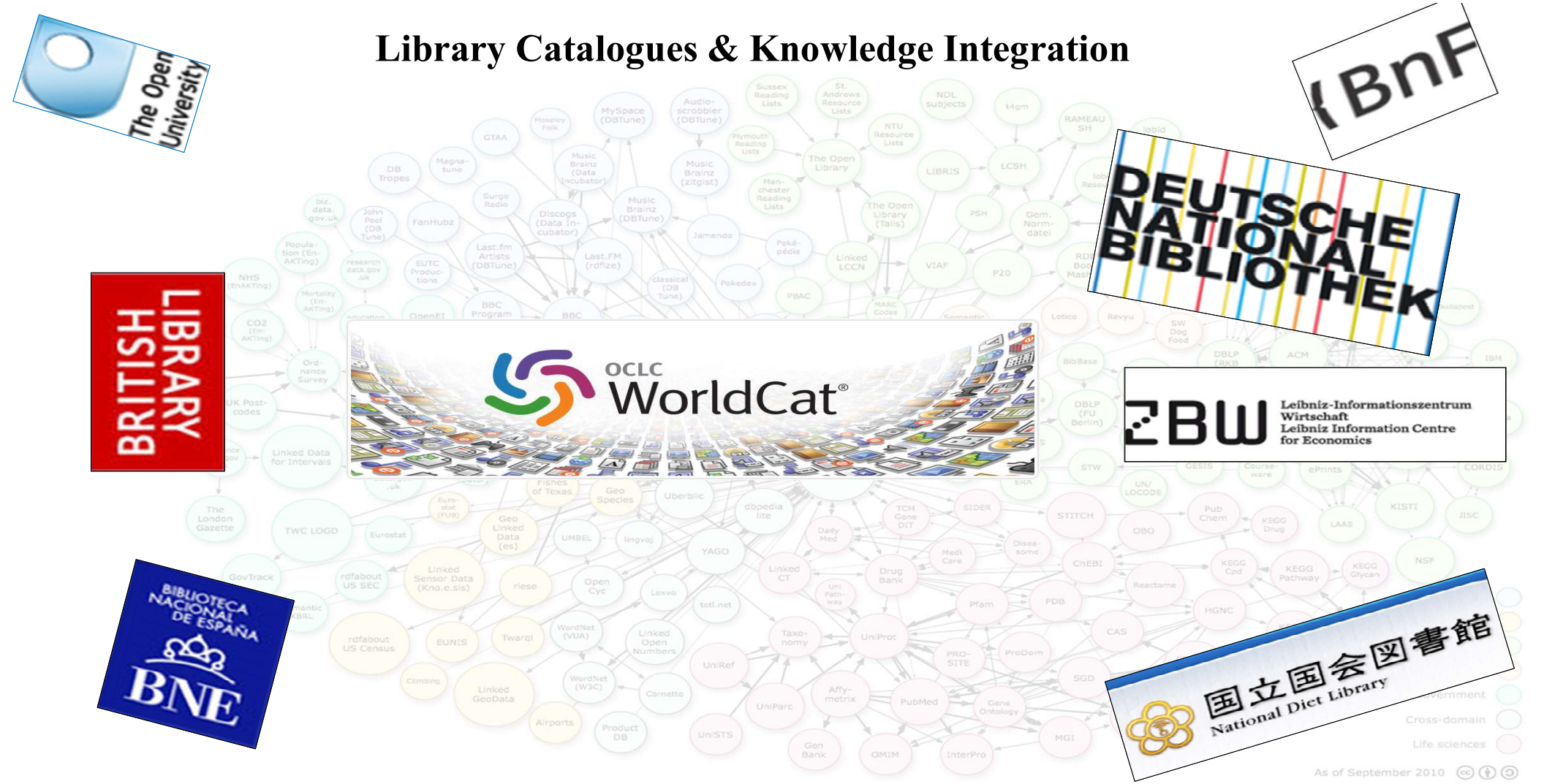


Linked data

Finally, we did it !!!



Library Catalogues & Knowledge Integration



BIBFRAME

In November 2012, the Library of Congress launched The Bibliographic Framework initiative,

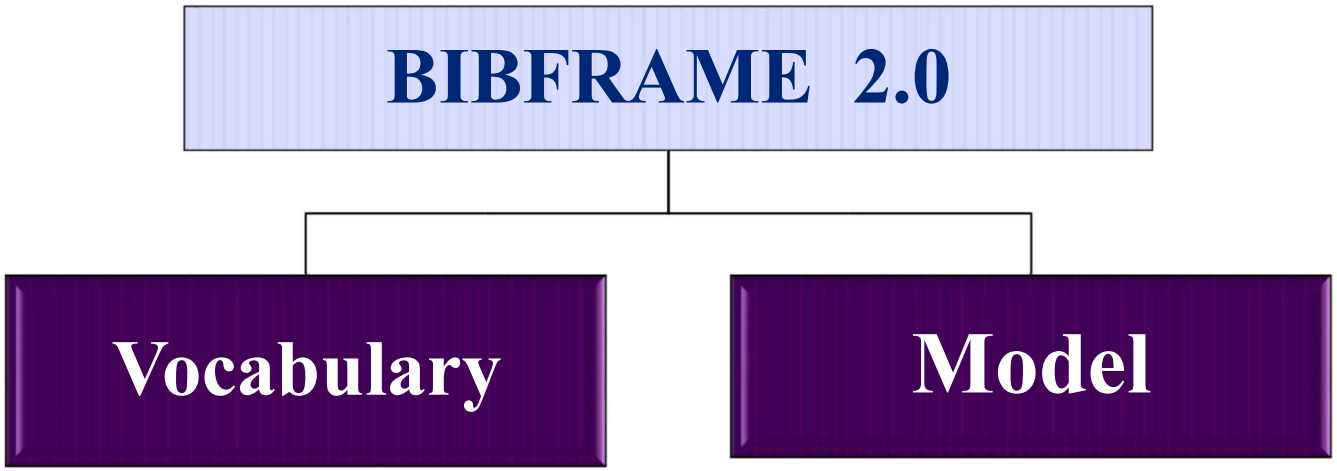
the goal is providing a complete and rich bibliographic description format that integrates indexes with other search tools on the Web.

Bibliographic Framework as a Web of Data:

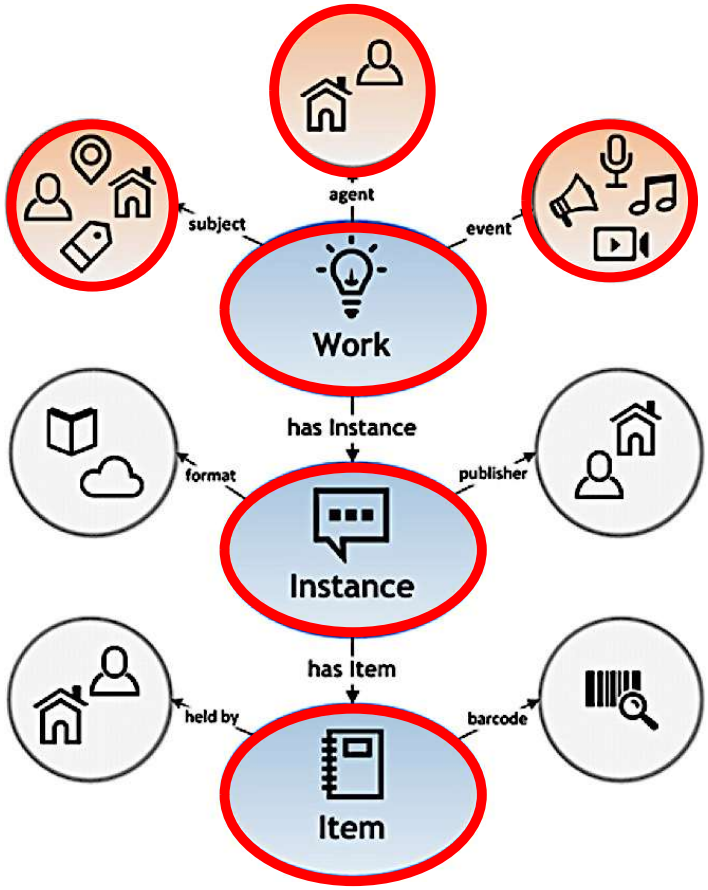
Linked Data Model and Supporting Services

Library of Congress
Washington, DC
November 21, 2012

BIBFRAME Architecture



Bibframe Model



العمل

الكيان

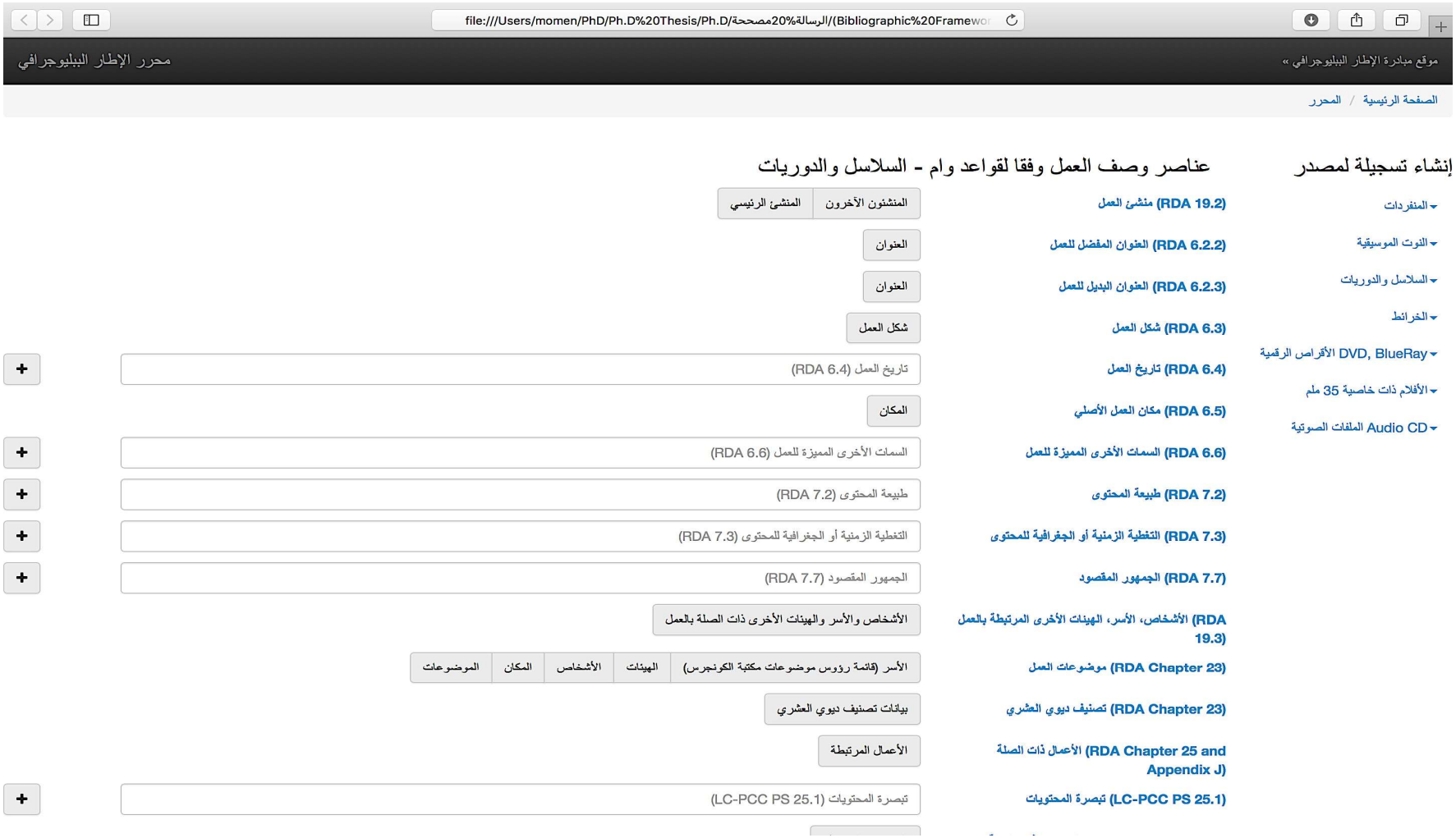
المفردة

الحدث

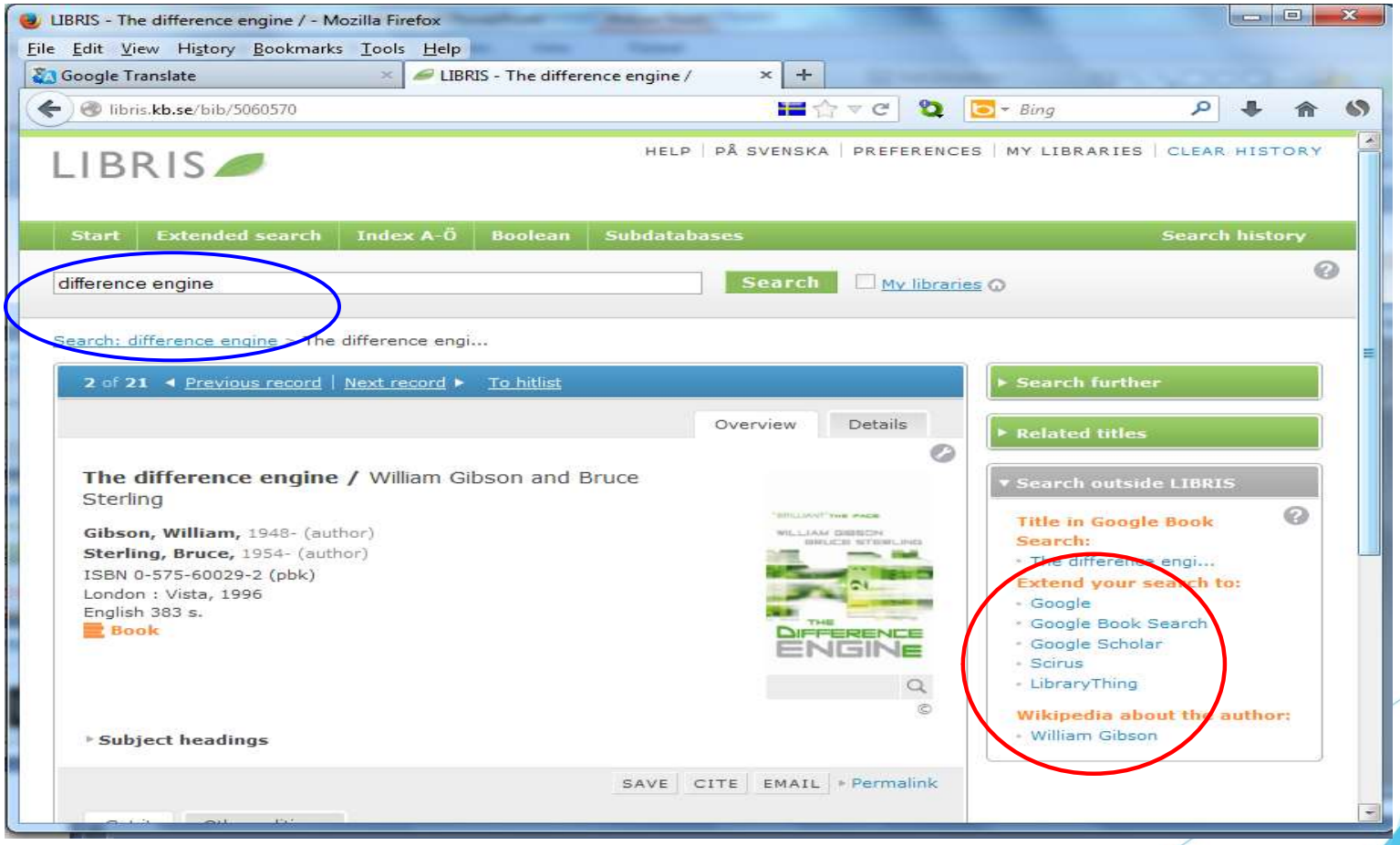
الموضوعات

الوكلاء

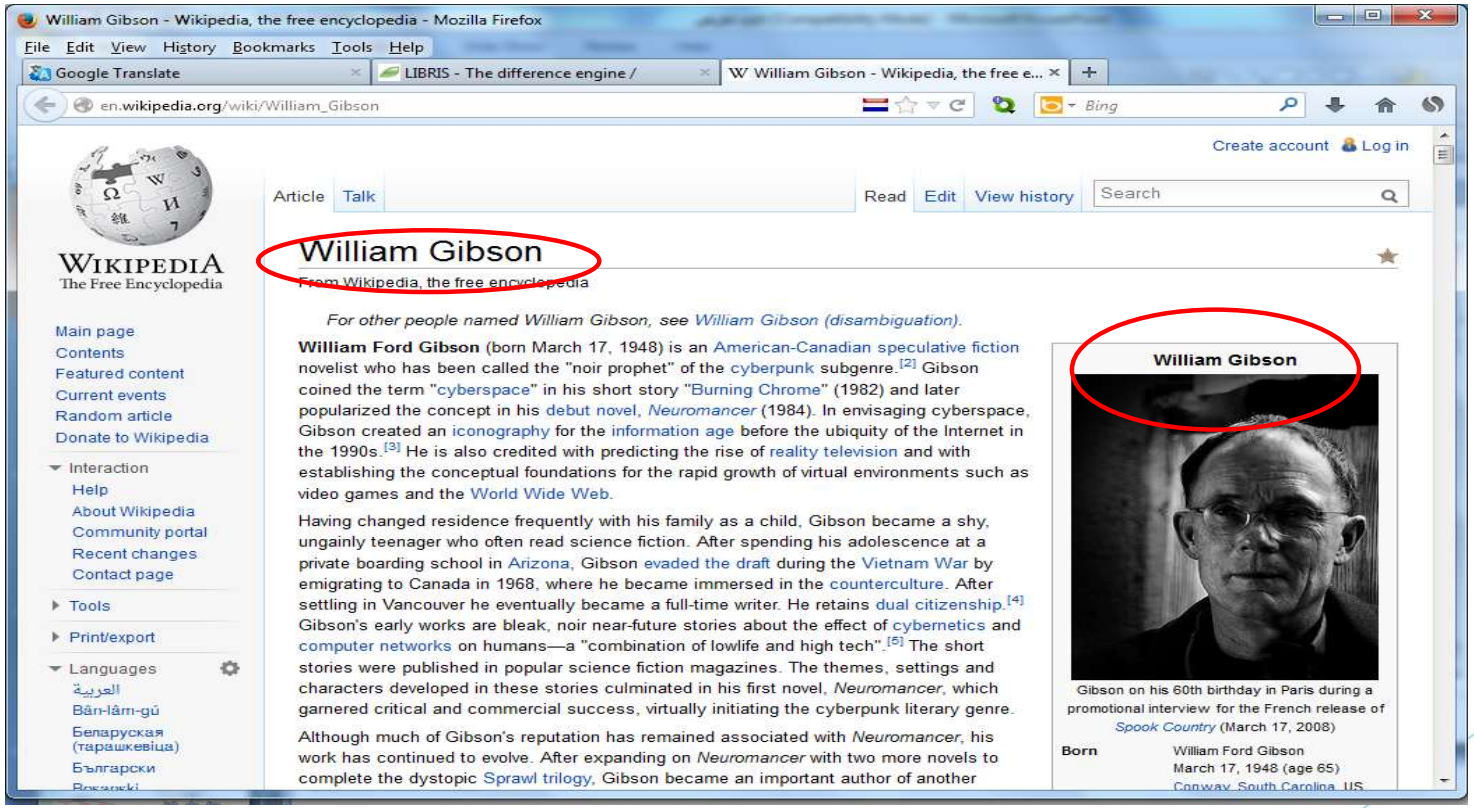
BIBFRAME Vocabulary



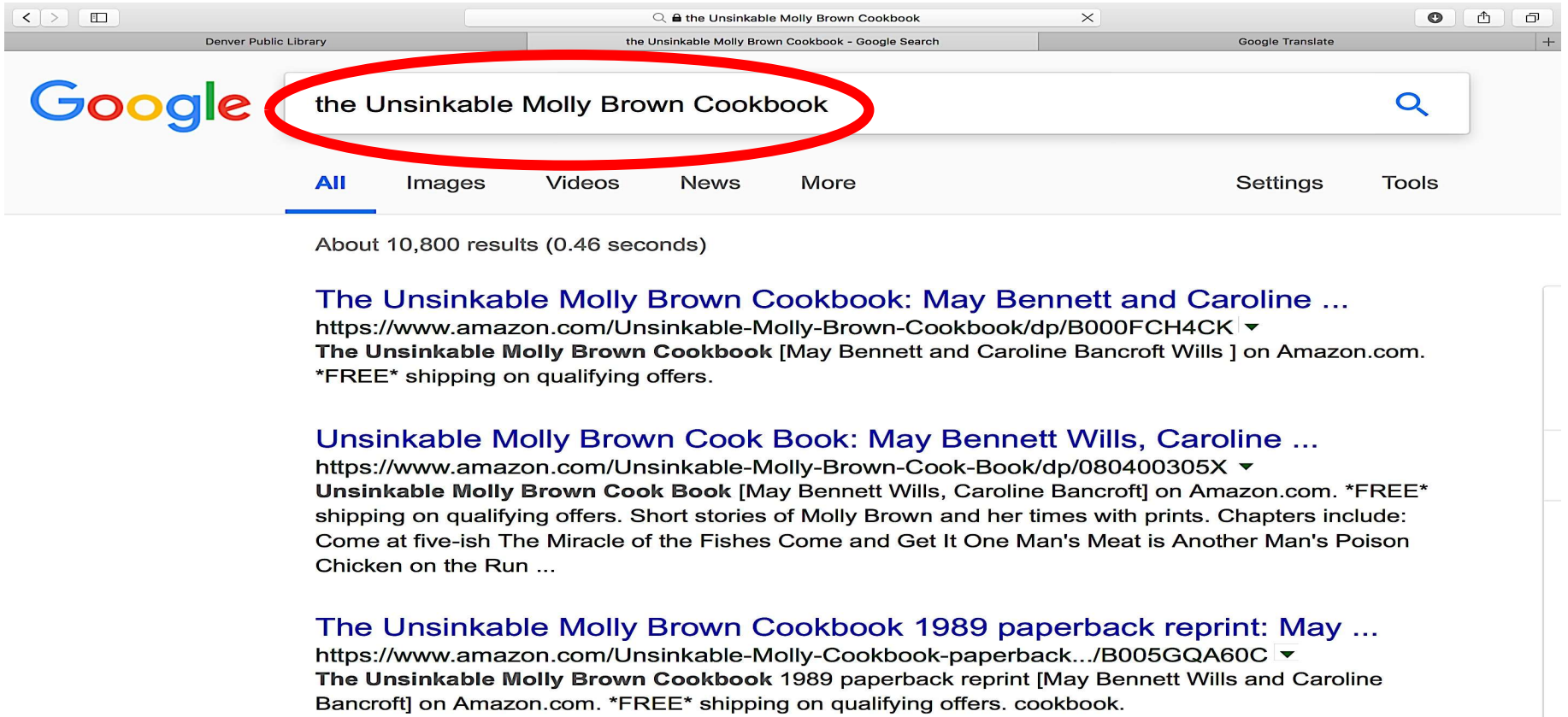
Now we have SW OPACS



The Semantic Web OPACs



Let's Try Again !!!



Let's Try Again !!!

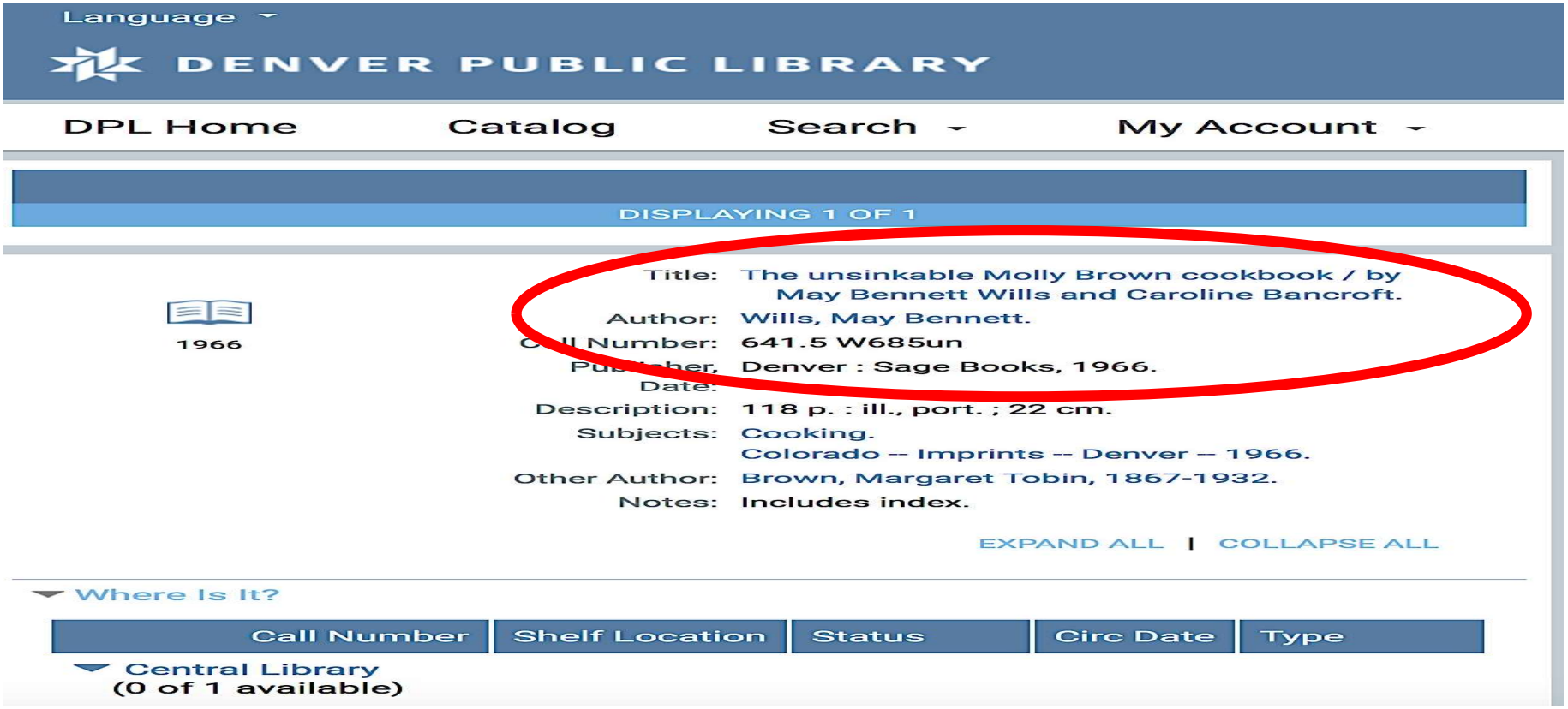
Edgewear,Rubbing,And Back Has Some StainingAll books shipped with trac.

The Unsinkable Molly Brown cookbook in SearchWorks catalog
https://searchworks.stanford.edu/view/9734480
The Unsinkable Molly Brown cookbook. Responsibility: by May Bennett Wills and Car
Imprint: Denver : Sage Books, [1966]; Physical description: 118 p. : ill., port. ; 22 cm.

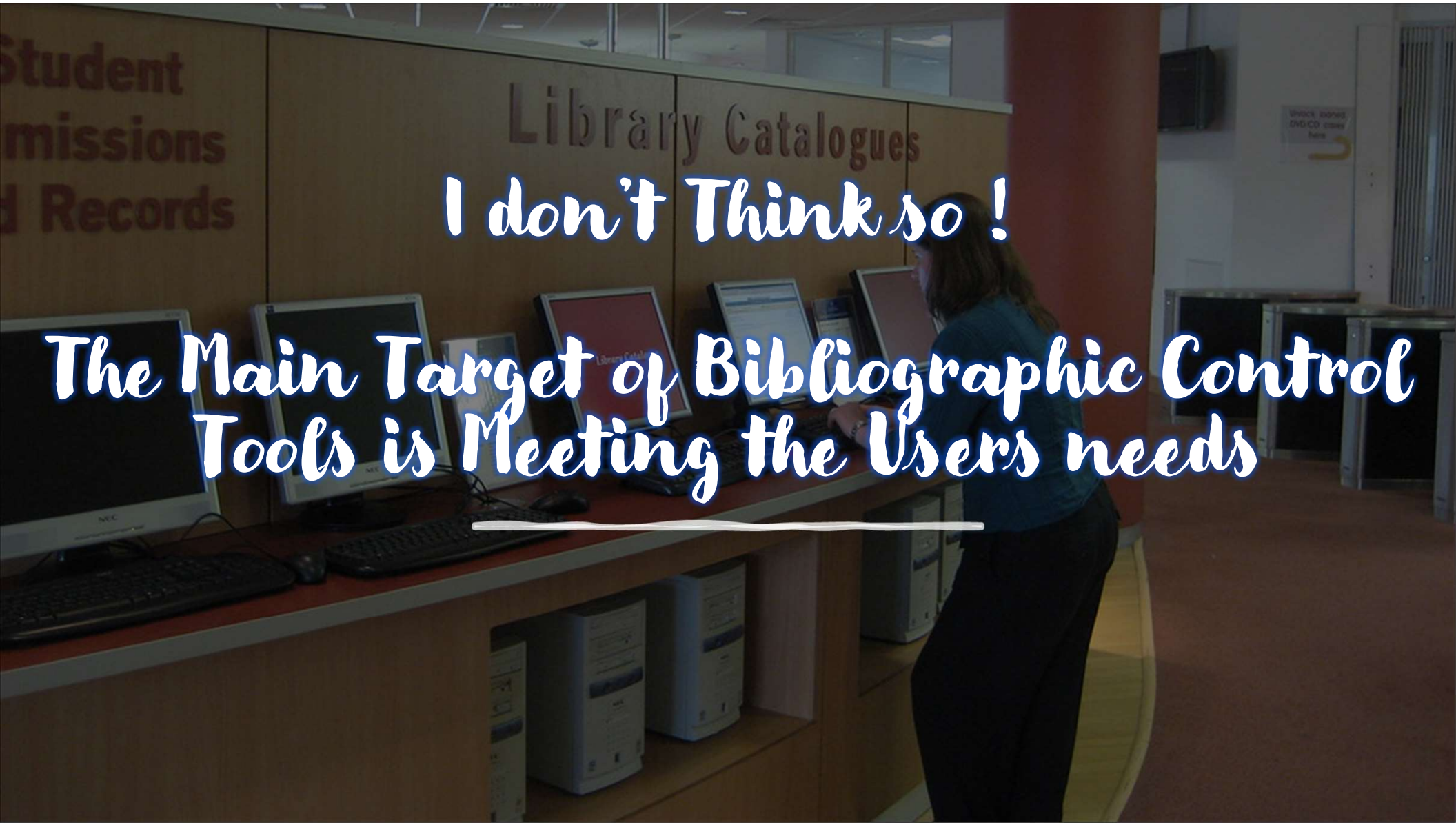
Denver Public Library Catalog
https://catalog.denverlibrary.org/search/title.aspx?cn=32231
The unsinkable Molly Brown cookbook / by May Bennett Wills and Caroline Bancroft.
May Bennett. Call Number: 641.5 W685un. Publisher, Date: Denver : Sage Books, 1966.
118 p. : ill., port. ; 22 cm. Subjects: Cooking. Colorado -- Imprints -- Denver -- 1966. Oth
Brown, Margaret Tobin ...

The Unsinkable Molly Brown cookbook / by May Bennett Wills a
nla.gov.au/anbd.bib-an658314
The Unsinkable Molly Brown cookbook / by May Bennett Wills and Caroline Bancroft.
May Bennett. Other Authors. Bancroft, Caroline, (joint author.) Brown, Margaret (Tobin).

Now We Have Smart OPACS



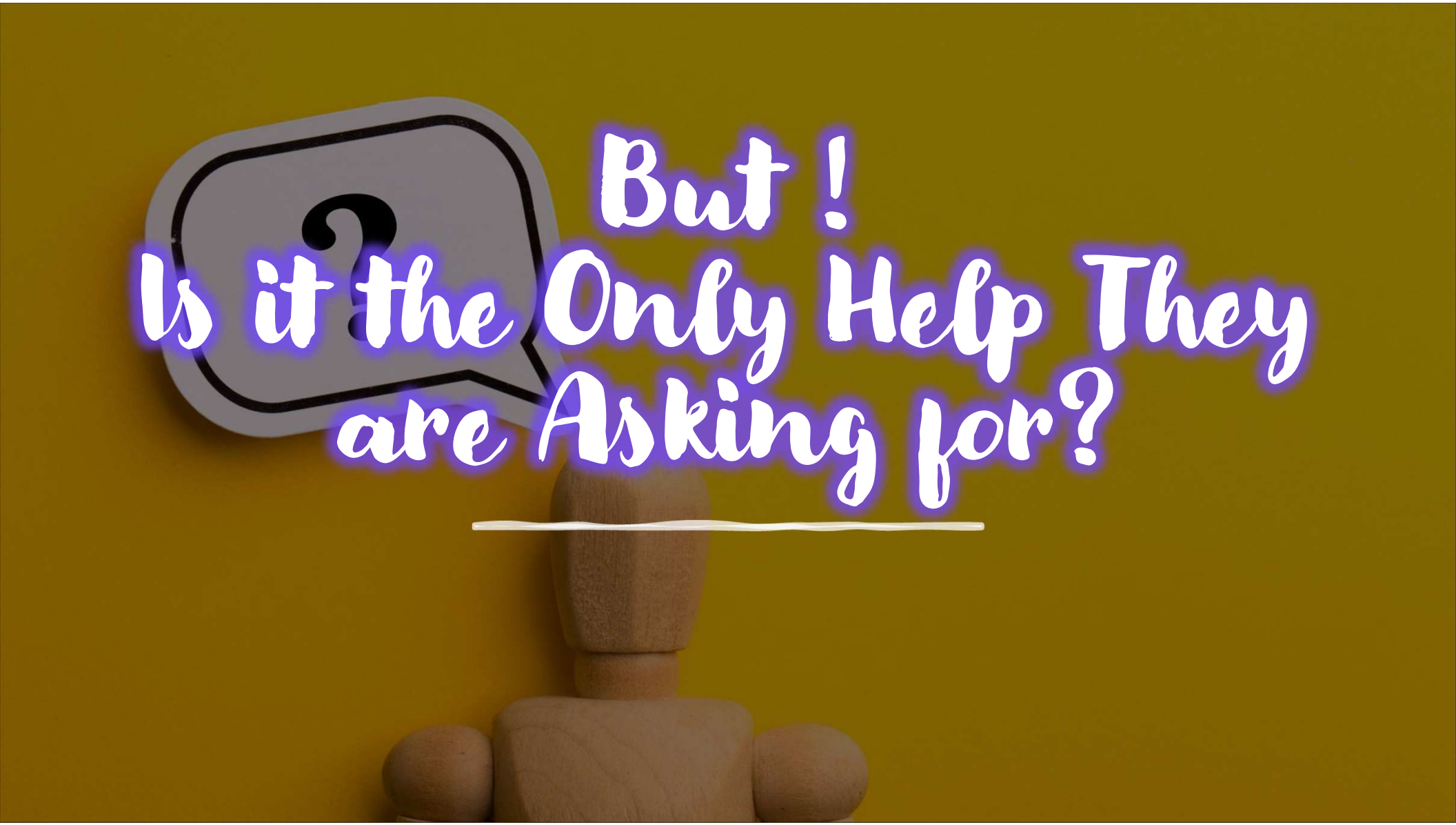

Now
OPACs Are Integrated !!
It was Finished?

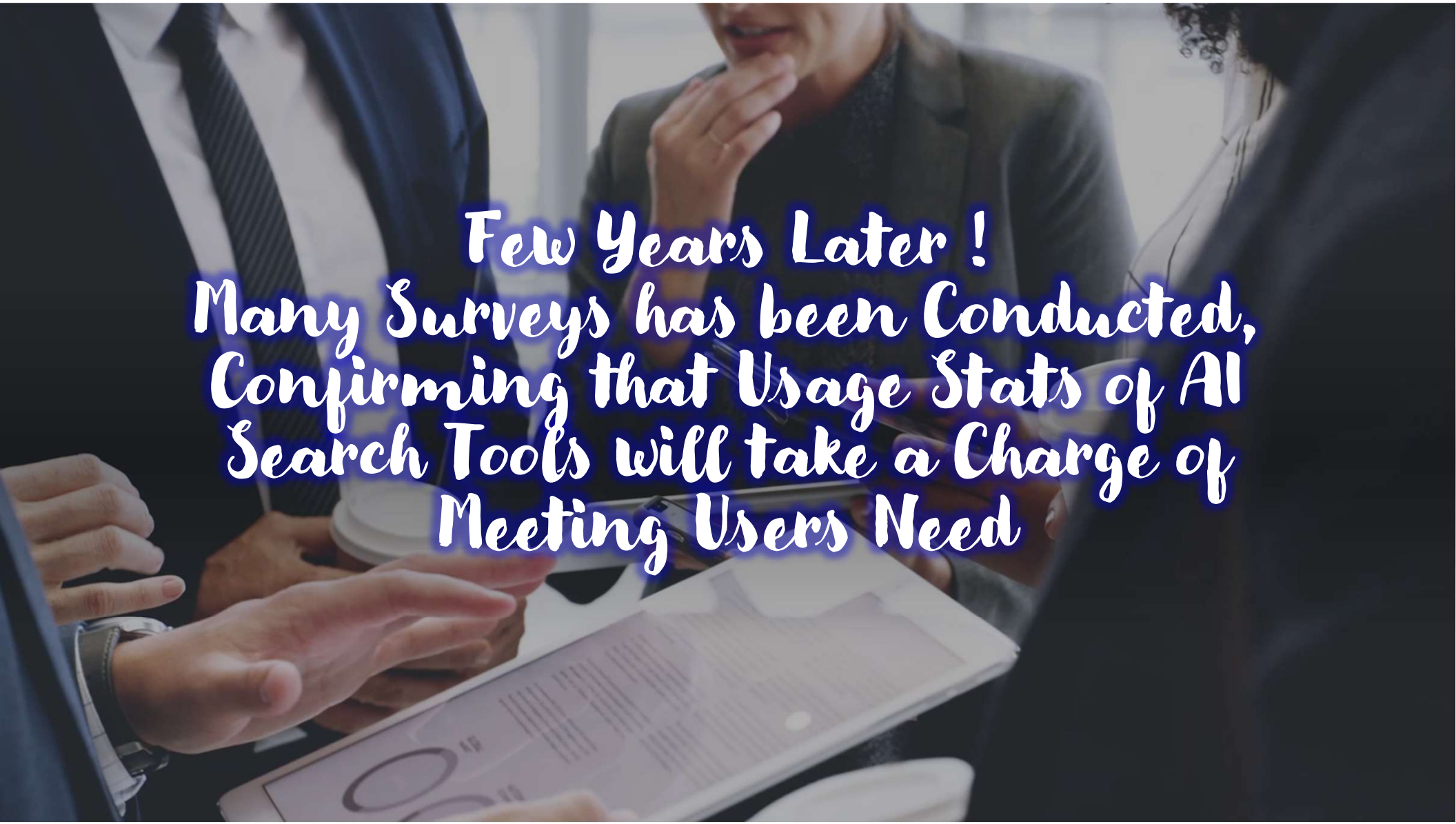


I don't Think so !

The Main Target of Bibliographic Control Tools is Meeting the Users needs

- *By helping Users to:*
  - *Searching,*
  - *Find,*
  - *Identify,*
  - *Select,*
  - *Acquire or Obtain Access,*
  - *Navigate*
  - *and Explore Information Resources*

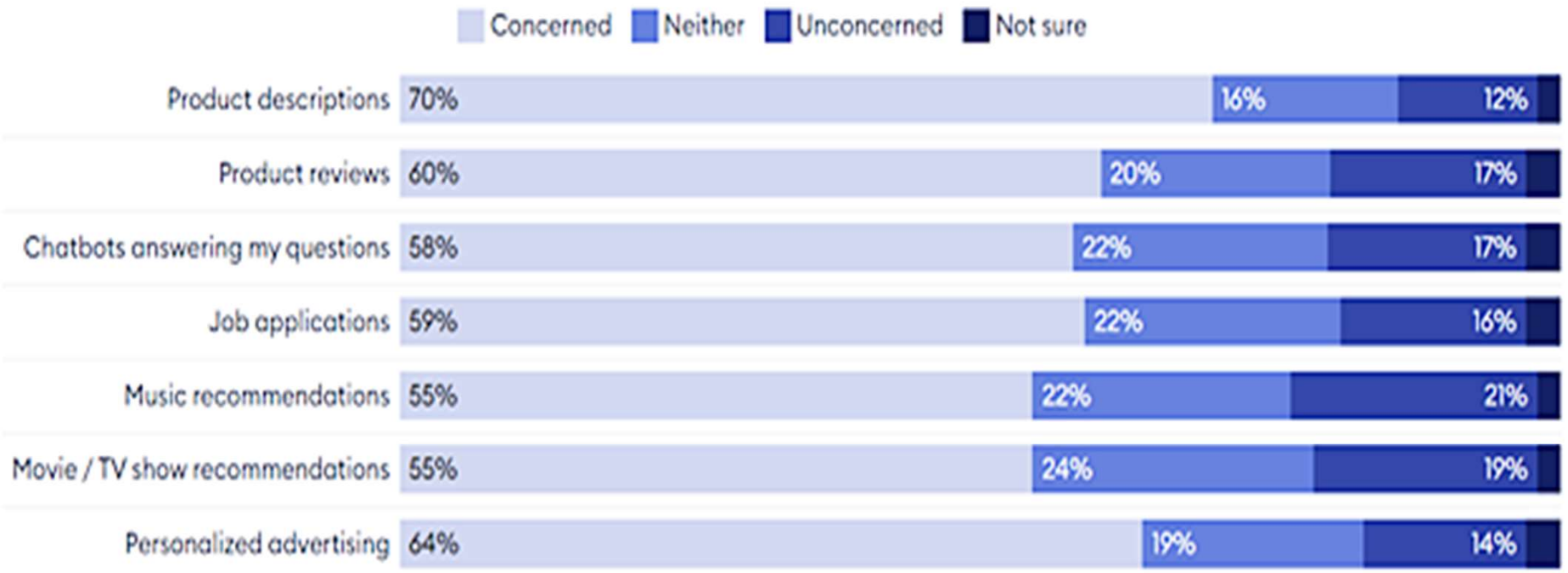

But !
Is it the Only Help They
are Asking for?


Few Years Later !
Many Surveys has been Conducted,
Confirming that Usage Stats of AI
Search Tools will take a Charge of
Meeting Users Need

Users going to AI Search Tools Stats

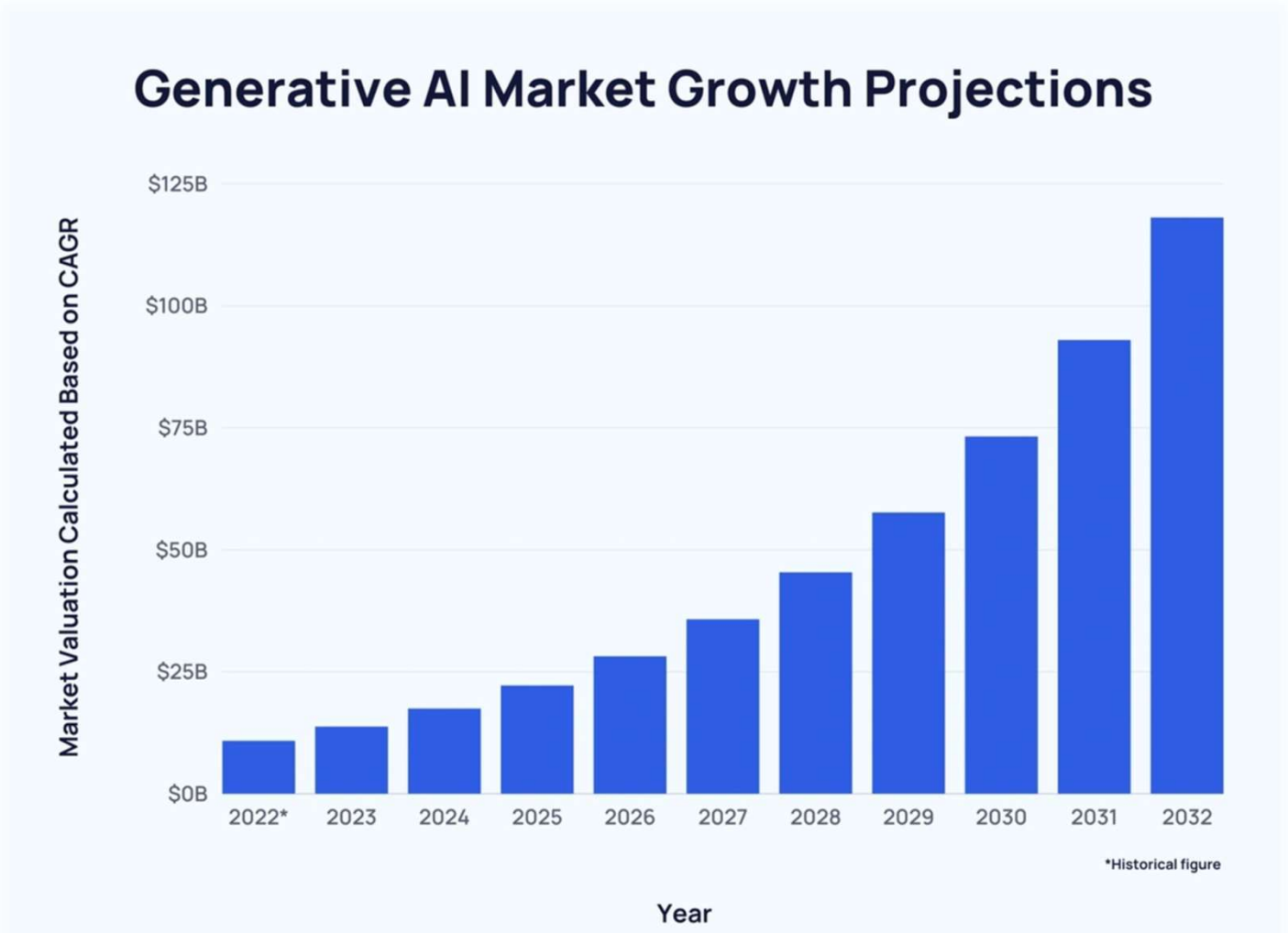
- 37% of people in advertising and marketing.
- 35% of people in technology.
- 30% of people in consulting.
- 19% of people in accounting.
- 15% of people in healthcare.

Types of Content Where Consumers are Concerned with Artificial Intelligence Being Used



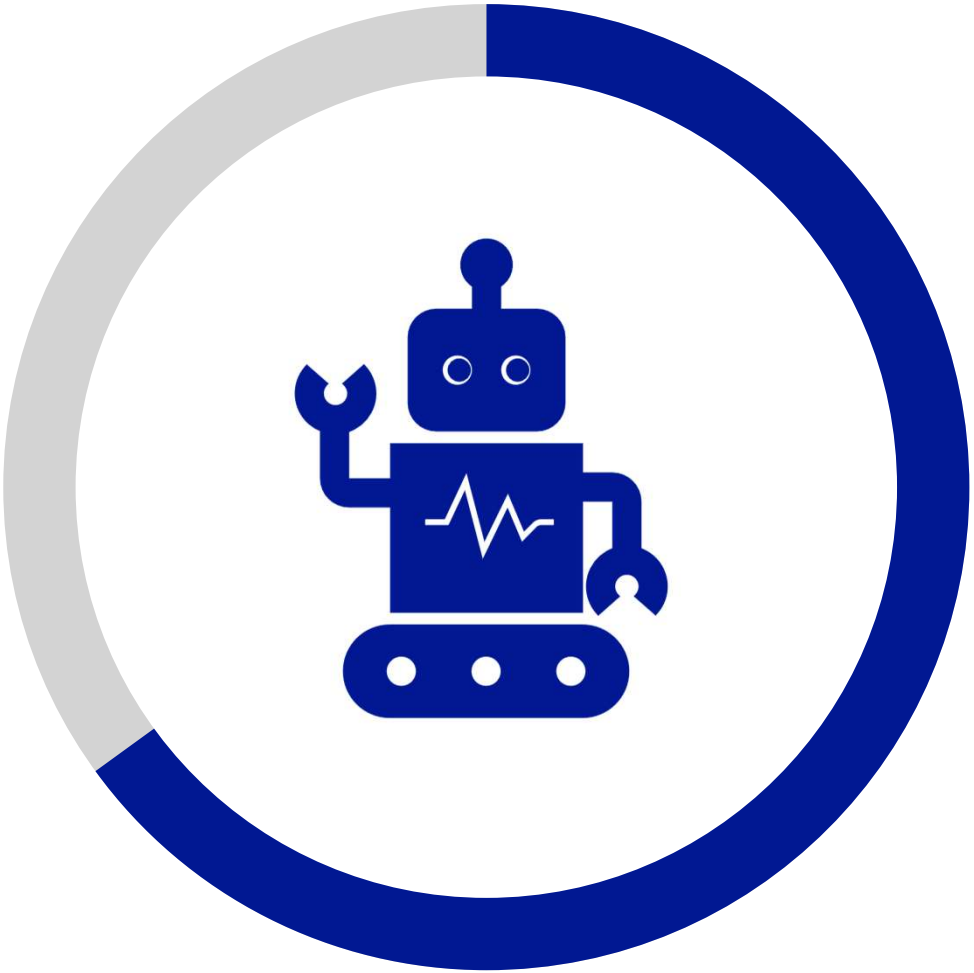
Source: Forbes Advisor • Embed

Forbes ADVISOR


Generative AI Market Growth Projections
Market Valuation Calculated Based on CAGR
$125B
$100B
$75B
$50B
$25B
$0B
2022*
2023
2024
2025
2026
2027
2028
2029
2030
2031
2032
*Historical figure
Year

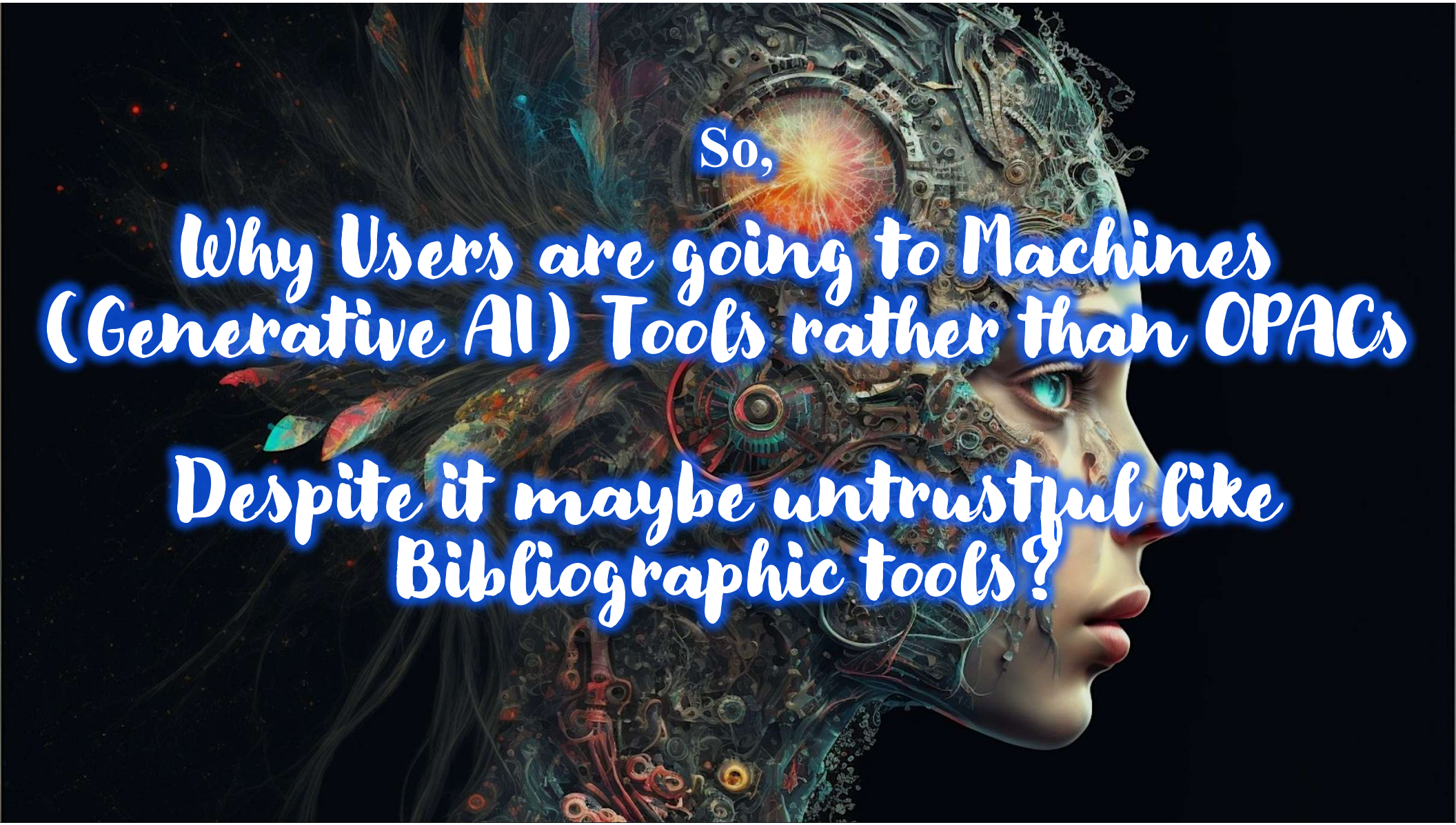
According to Forbes

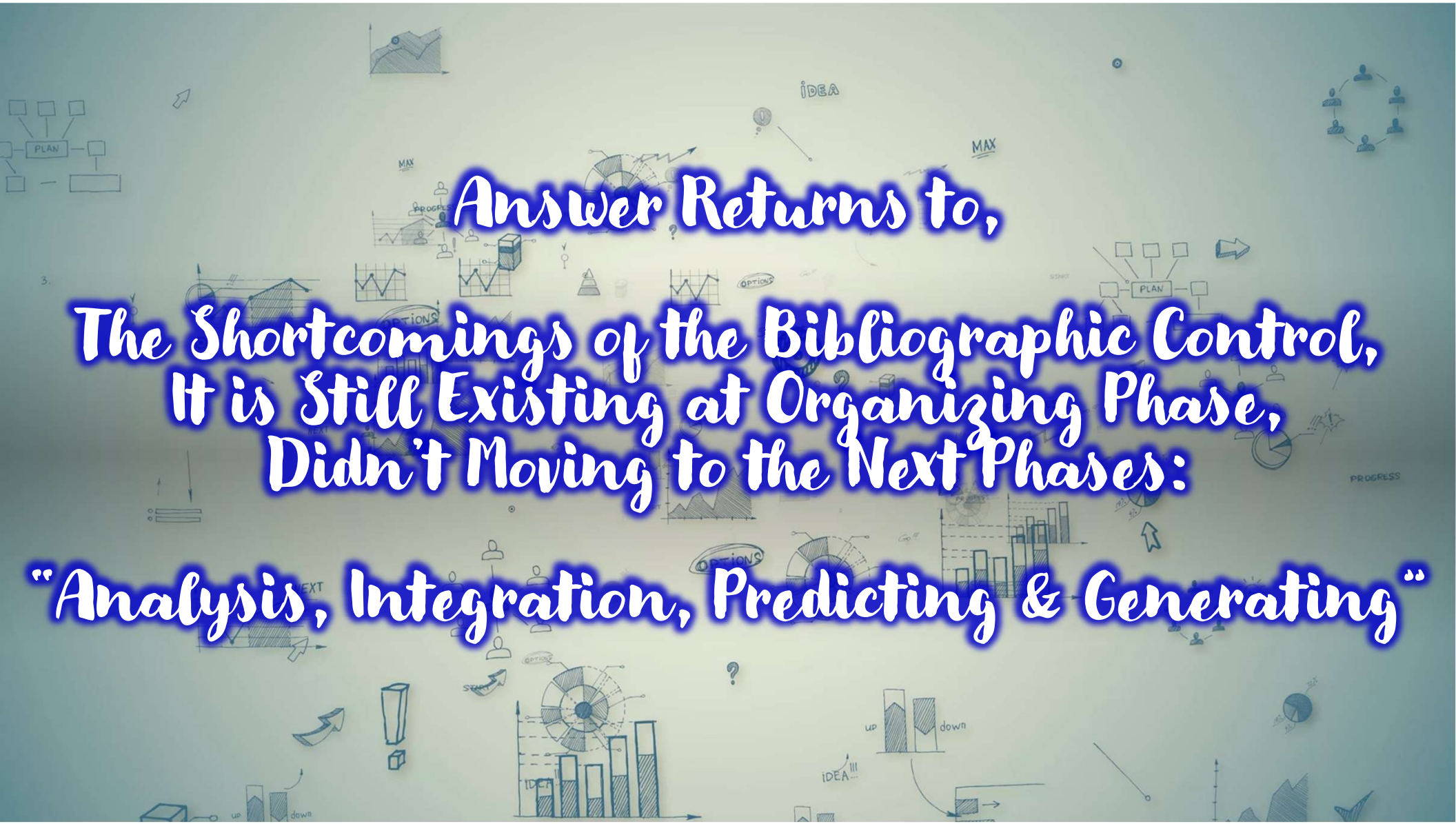
Despite having concerns about application of AI in various businesses and verticals, 65% of consumers have trust in the businesses which use AI technology.



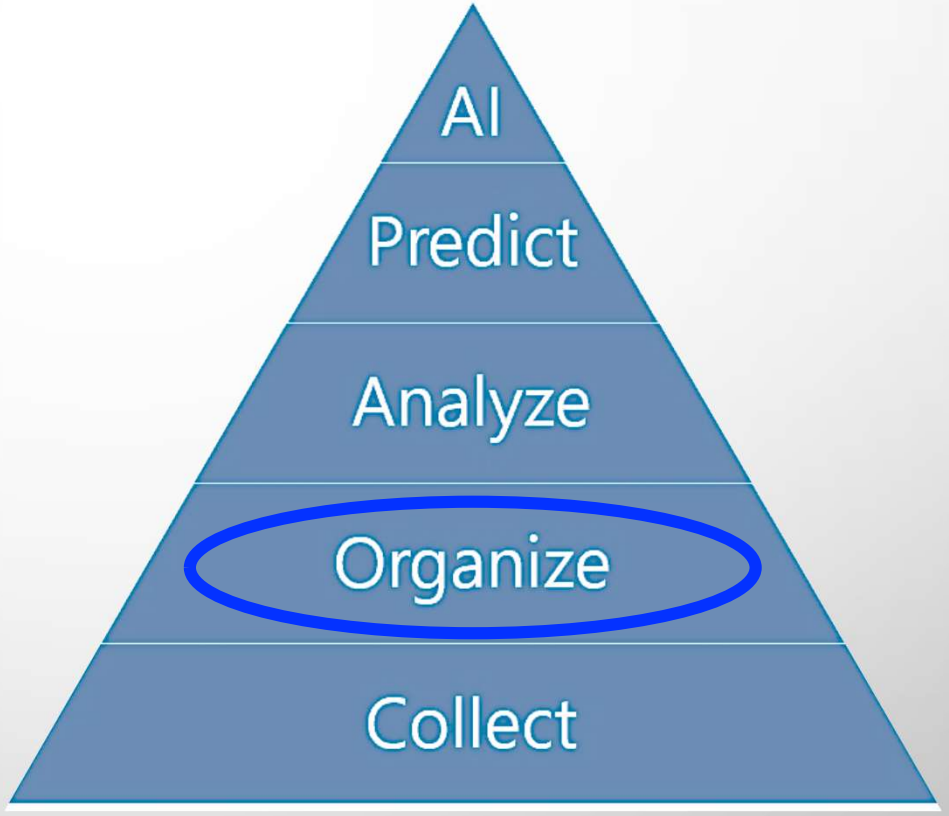
More than quarter of people in the UK (26%) Moving to use Generative AI Search Tools,

According to new findings from Deloitte's 2023 Digital Consumer Trends research


So,
Why Users are going to Machines (Generative AI) Tools rather than OPACs
Despite it maybe untrustful like Bibliographic tools?

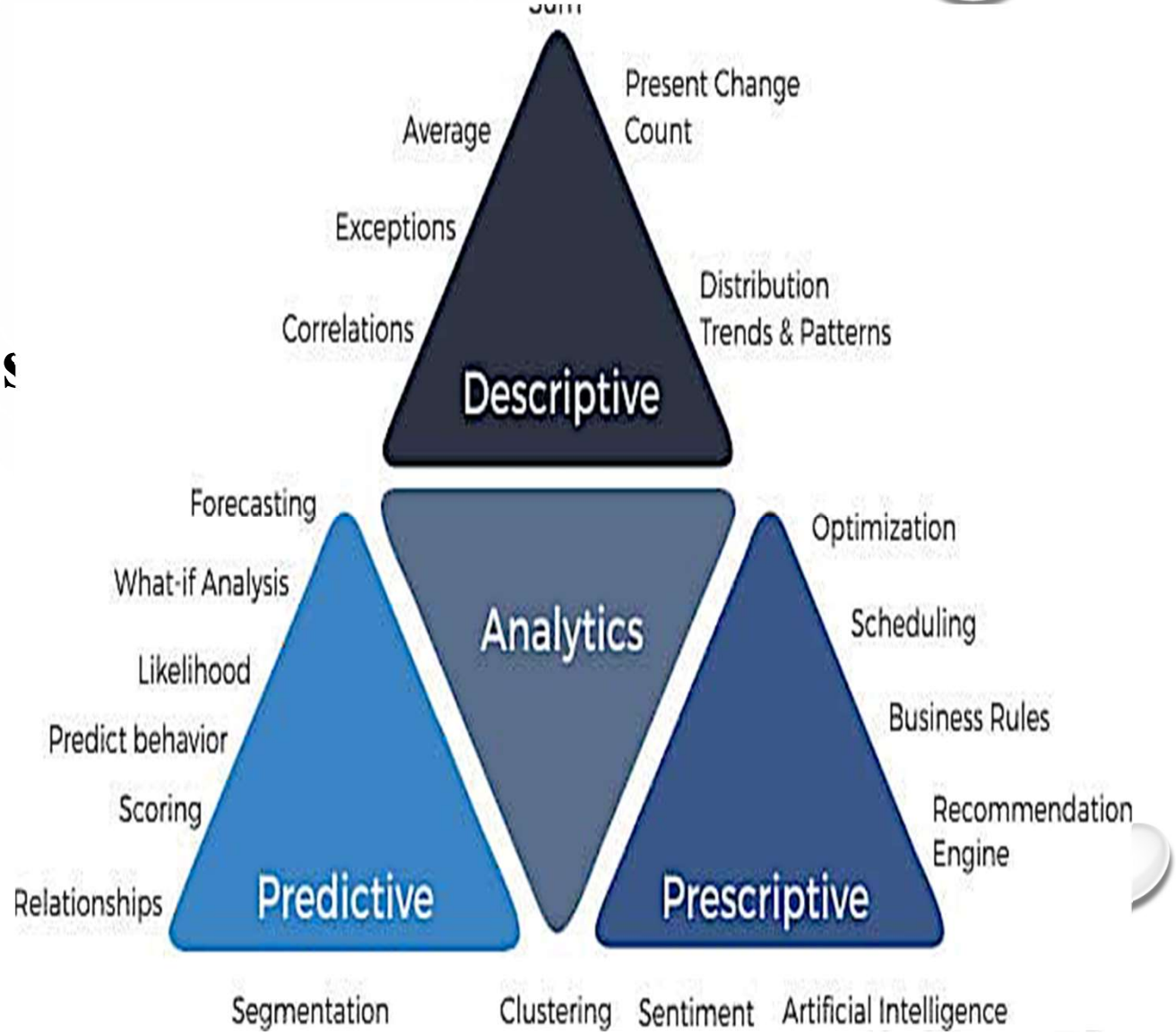

Answer Returns to,
The Shortcomings of the Bibliographic Control,
It is Still Existing at Organizing Phase,
Didn't Moving to the Next Phases:
"Analysis, Integration, Predicting & Generating"

THE BIBLIOGRAPHIC CONTROL FOCUS ON ORGANIZING PHASE



Where it Should Moving to next phases

“Analysis’
“Prediction”
&
“Generating”



To Meet Currently Users Needs Which Are Be ...

Descriptive Needs → "What has happened in the present and past?"

Diagnostic Needs → "Why it Happened?"

Predictive Needs → "What could Happen in future?" (ML)

Prescriptive Needs → "What should be Done?" (Gen. AI)

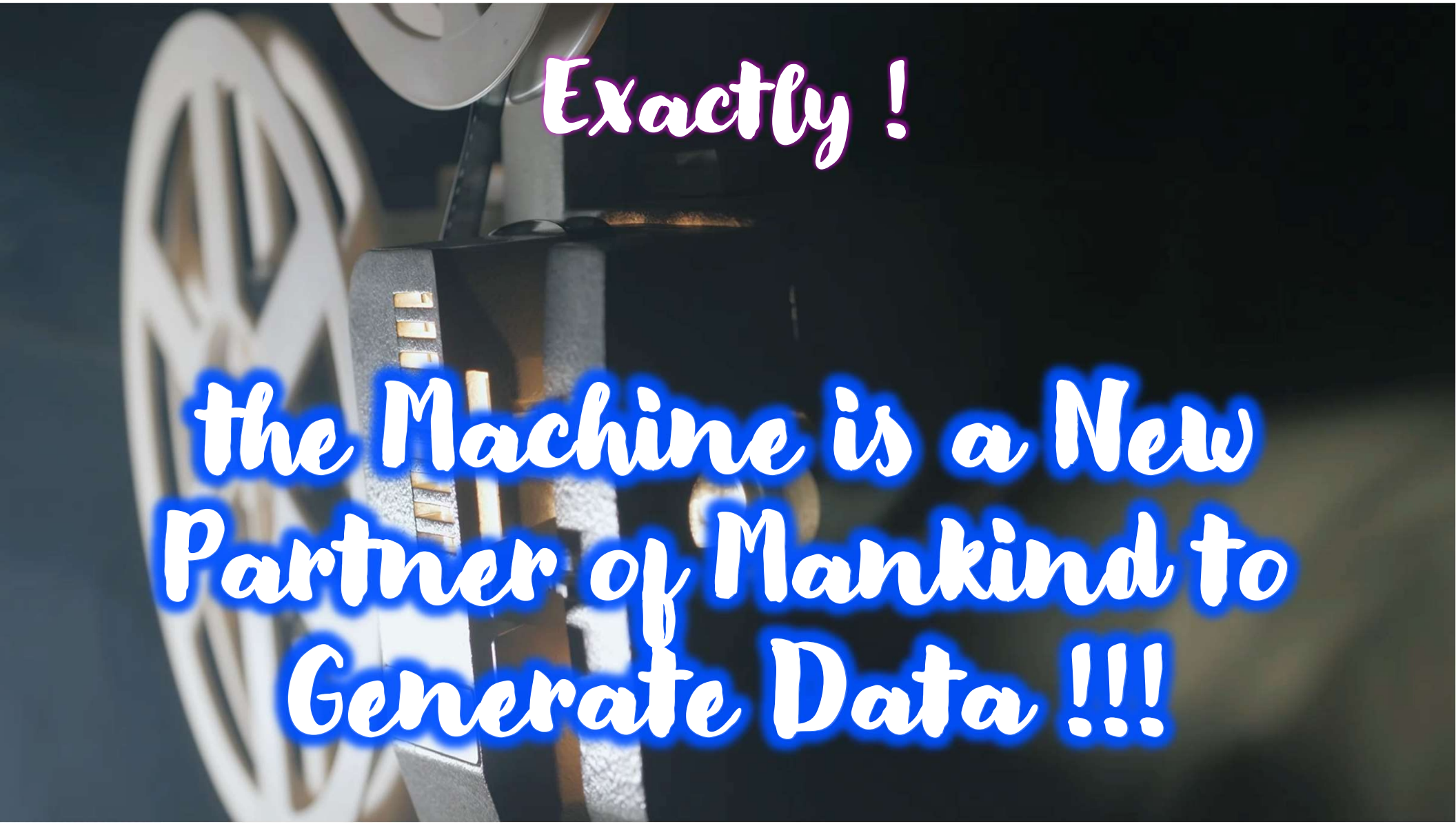

How Can Make UBC Meets Users Needs?
Or
Backing to the Main Question that has been Asked in IFLA WLIC 2014 !!!

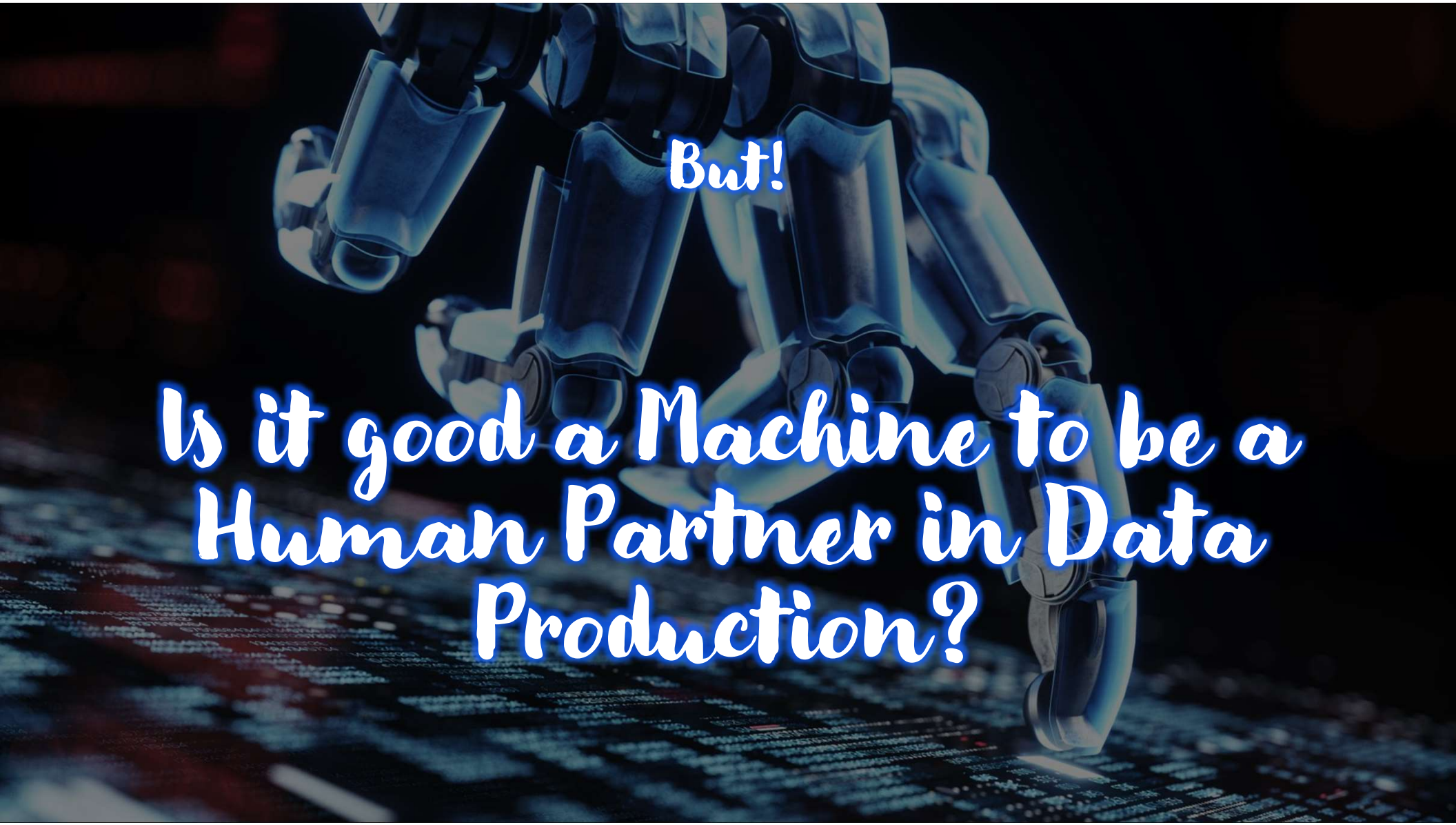
Did The Digital Tide Knock UBC Out?"


Let’s Exploring !!

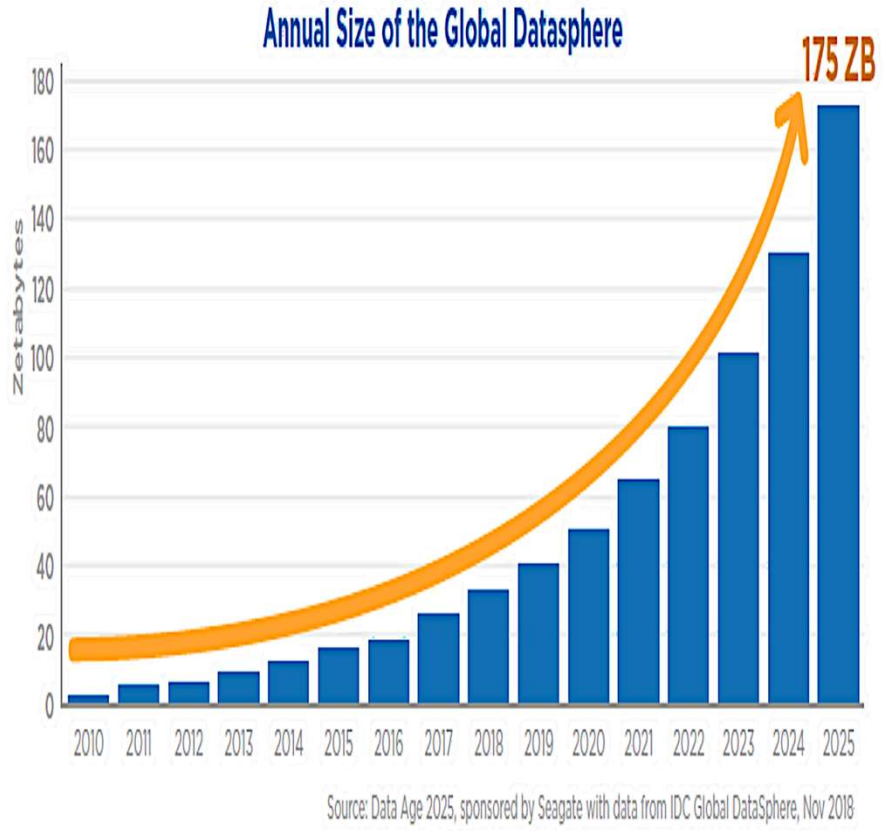

As We had Known Previously,
the Human being was
Responsible to Produce Data and
Control it ...


But
Is It Still as Before ?


Exactly !
the Machine is a New Partner of Mankind to Generate Data !!!


But!
Is it good a Machine to be a Human Partner in Data Production?

IDC Announcement



- *The International Data Corporation Annual Report (IDC) In 2011 Indicated, The Data Volume that Generated have Reached to 1021 Trillion Exabytes Of Data..*
- *The Data Volume has Doubled About 9 times than before,*
- *These Numbers can be considered as Alarm, and as Declaration to Great Phenomenon, that will be …..*


BIG DATA

So,

What is Big Data

What is Big Data

"… Refers to Data that is so Large, Fast , and Unstructured or Complex that it's Difficult or Impossible to Process Using Classic Methods (as Bibliographic Control) and Techniques …"

Size of Data

4,392,844,378
Internet Users in the world

1,728,794,416
Total number of Websites

241,920,112,418
Emails sent today

6,403,934,886
Google searches today

6,107,136
Blog posts written today

711,551,061
Tweets sent today

6,633,032,954
Videos viewed today
on YouTube

77,615,781
Photos uploaded today
on Instagram

131,459,538
Tumblr posts today

2,358,706,602
Facebook active users

762,388,249
Google+ active users

353,762,260
Twitter active users

How much…?

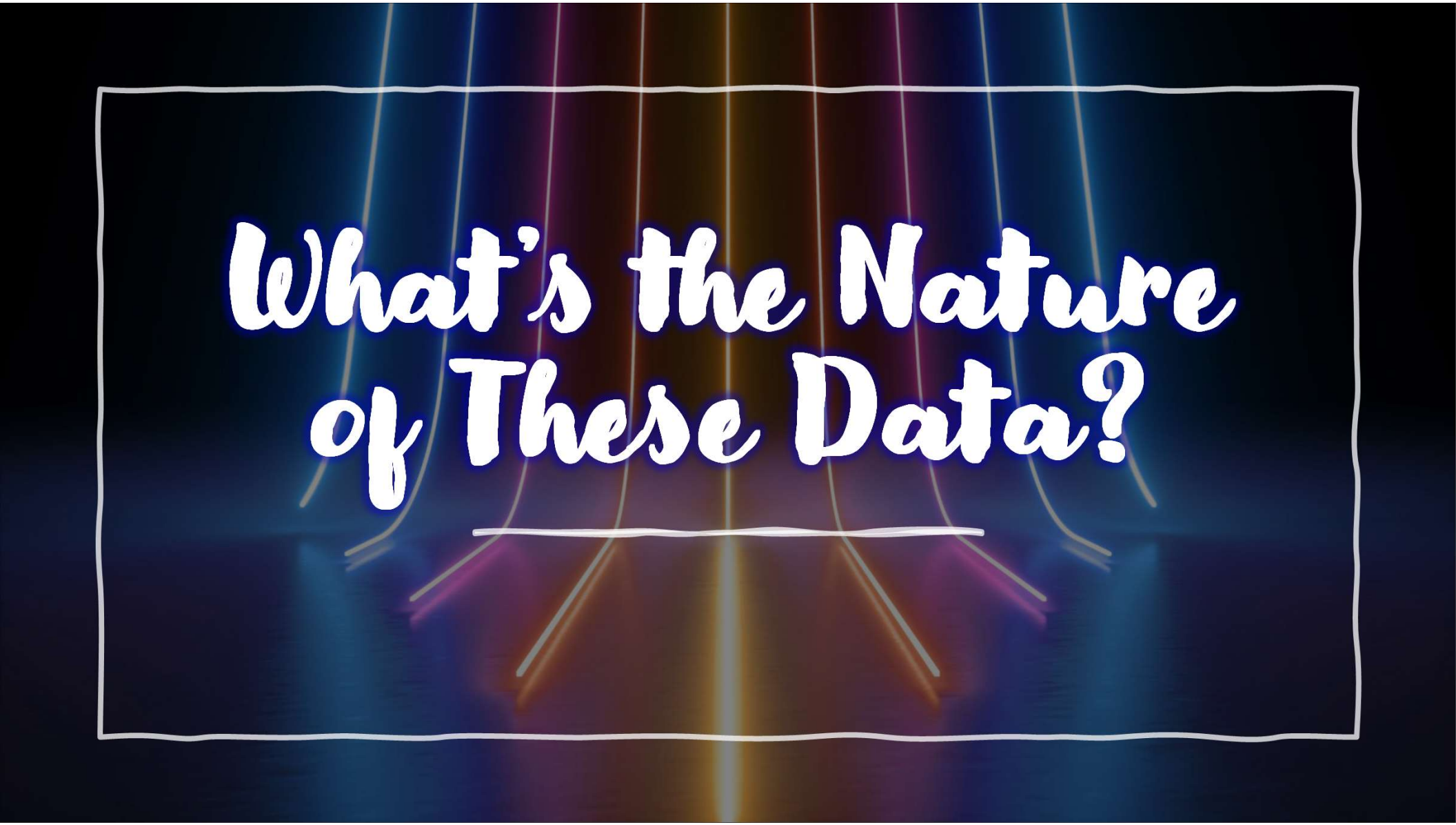

THE INTERNET IN 2023 EVERY MINUTE
22,831
visits to ChatGPT
241.2M
emails sent
18.8M
text messages sent
2.4M
Google searches
694,000
video hours viewed
347,222
tweets
3.47M
snaps created
10.4M
viewing minutes
11,035
fake accounts removed
6.3M
total Zoom meeting minutes
34,247
Slack messages
11,834
chats on Microsoft Teams
6.94M
emoji sent
3.02M
photos created with smartphones
271,309
IOS & Android app downloads
60
SECONDS
Created by: eDiscovery Today & LTMG

Big Data Features

VOLUME	VARIETY	VELOCITY	VERACITY	VALUE
The amount of data from myriad sources.	The types of data: structured, semi-structured, unstructured.	The speed at which big data is generated.	The degree to which big data can be trusted.	The business value of the data collected.






What's the Nature
of These Data?

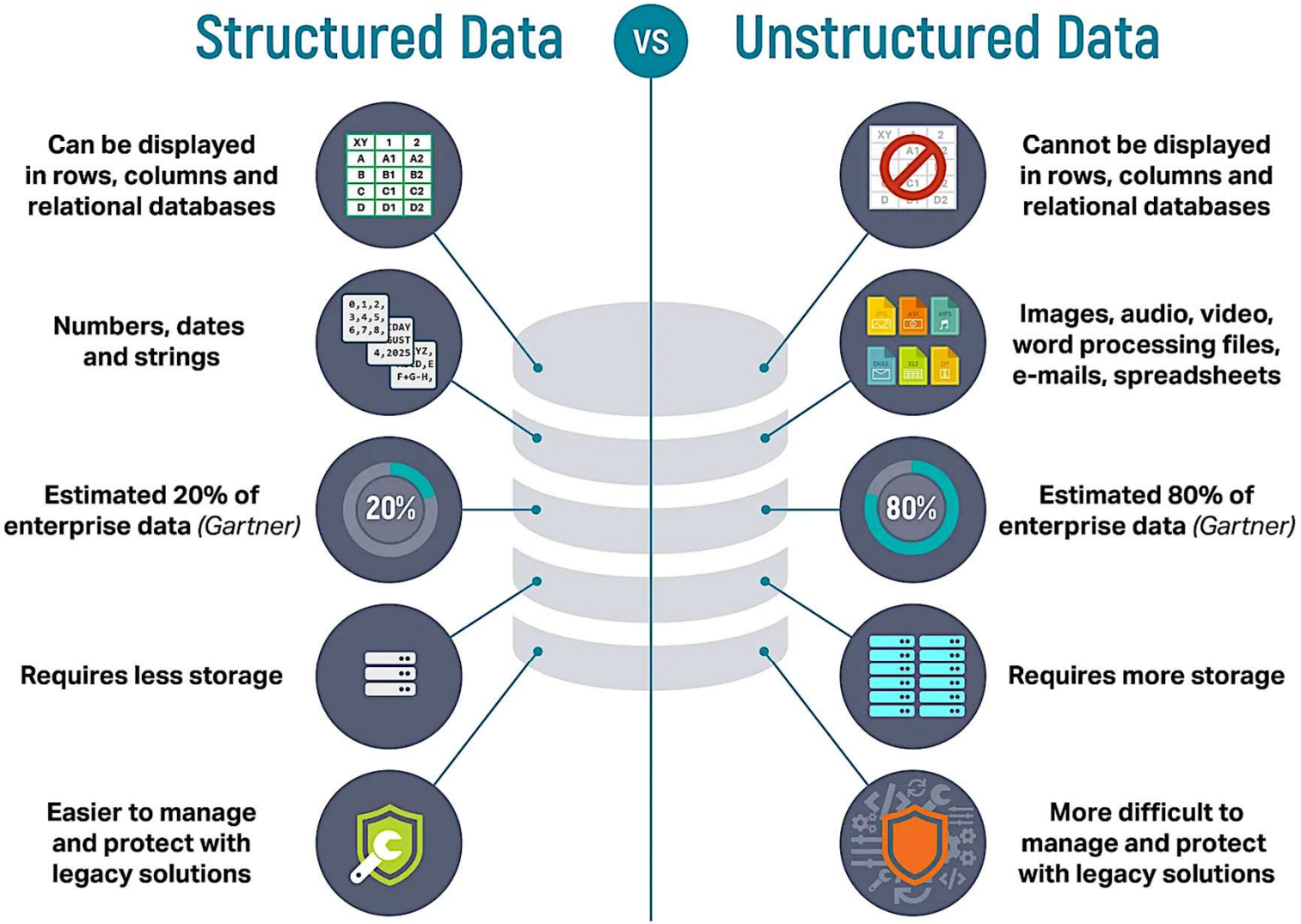

Unstructured
Data

Unstructured Data

- *Unstructured data refers to data that lacks a predefined structure or organized format.*

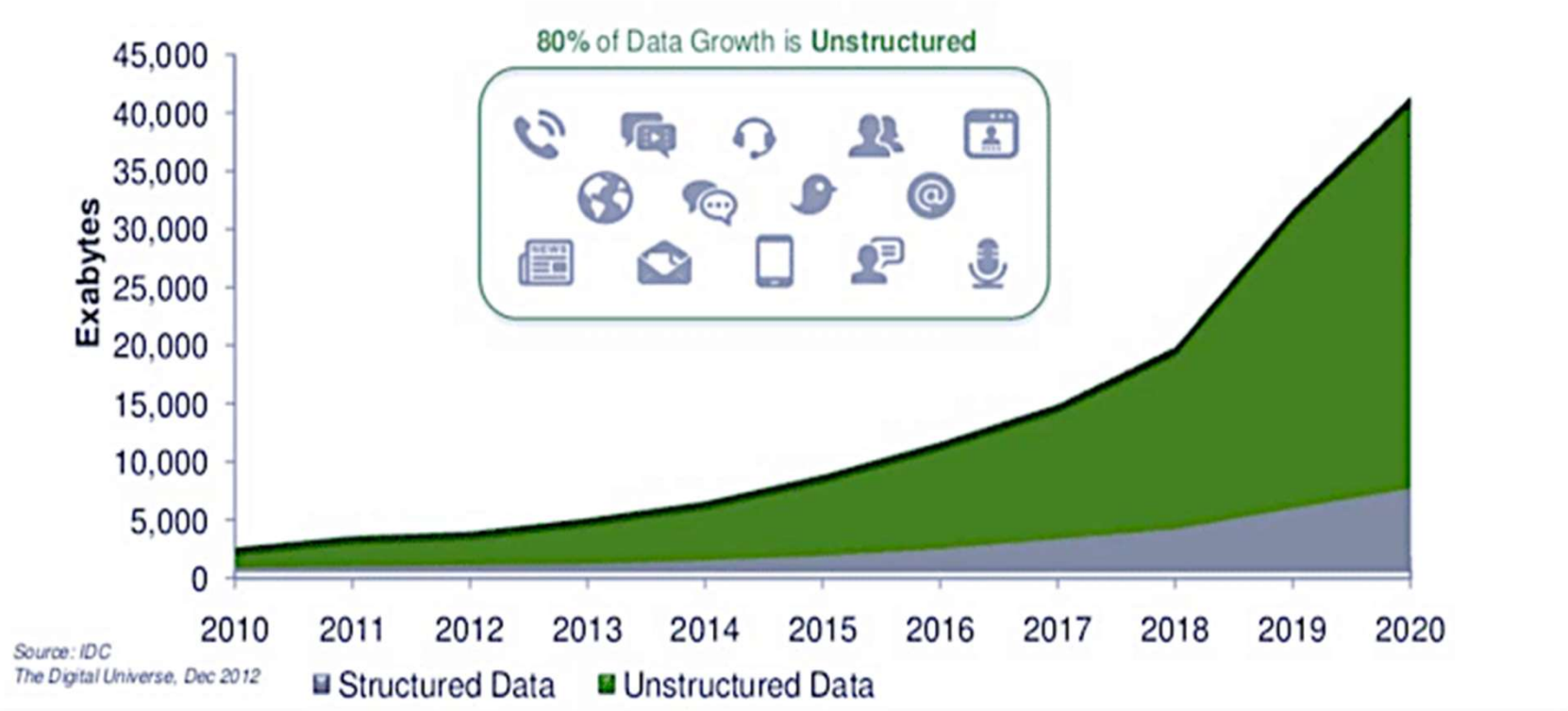
- *This type of data does not fit neatly into traditional rows and columns like structured data found in databases.*

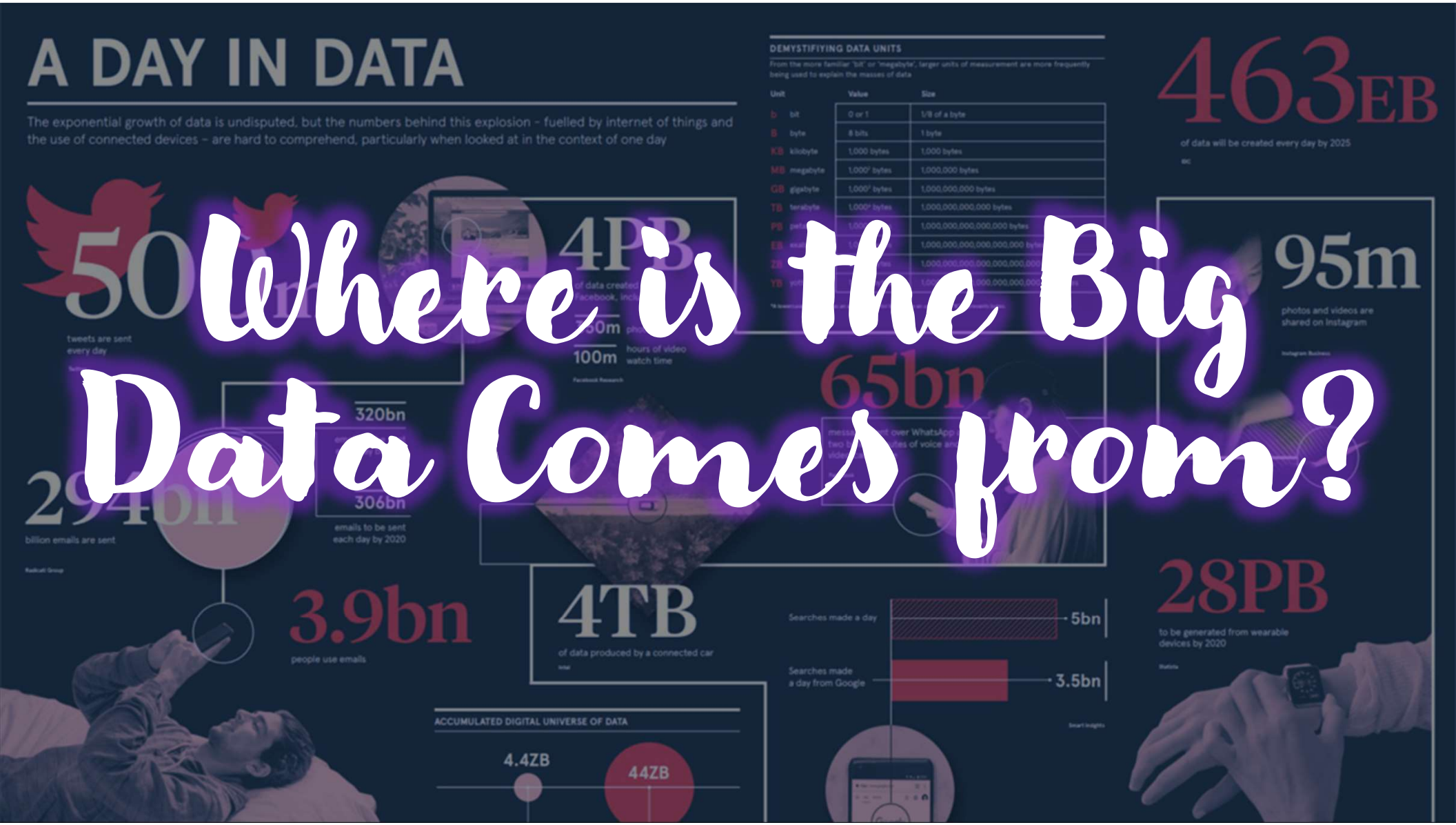
- *Unstructured data is typically more flexible in terms of content and format, making it challenging to manage and analyze using conventional data management tools and techniques.*


Structured Data
vs
Unstructured Data
Can be displayed in rows, columns and relational databases
Numbers, dates and strings
Estimated 20% of enterprise data (Gartner)
Requires less storage
Easier to manage and protect with legacy solutions
Cannot be displayed in rows, columns and relational databases
Images, audio, video, word processing files, e-mails, spreadsheets
Estimated 80% of enterprise data (Gartner)
Requires more storage
More difficult to manage and protect with legacy solutions
20%
80%

Unstructured Data Types

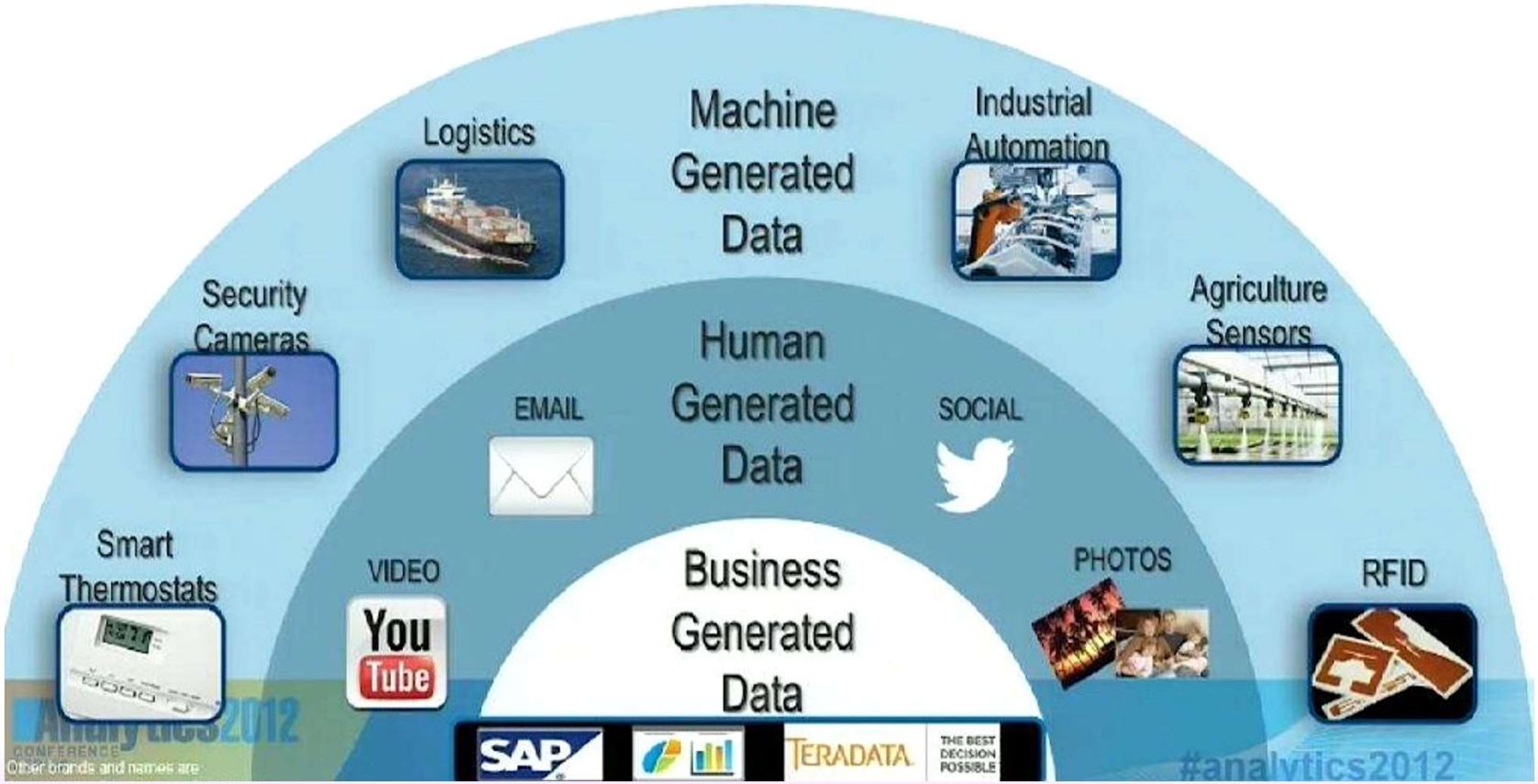
Unstructured Data Size





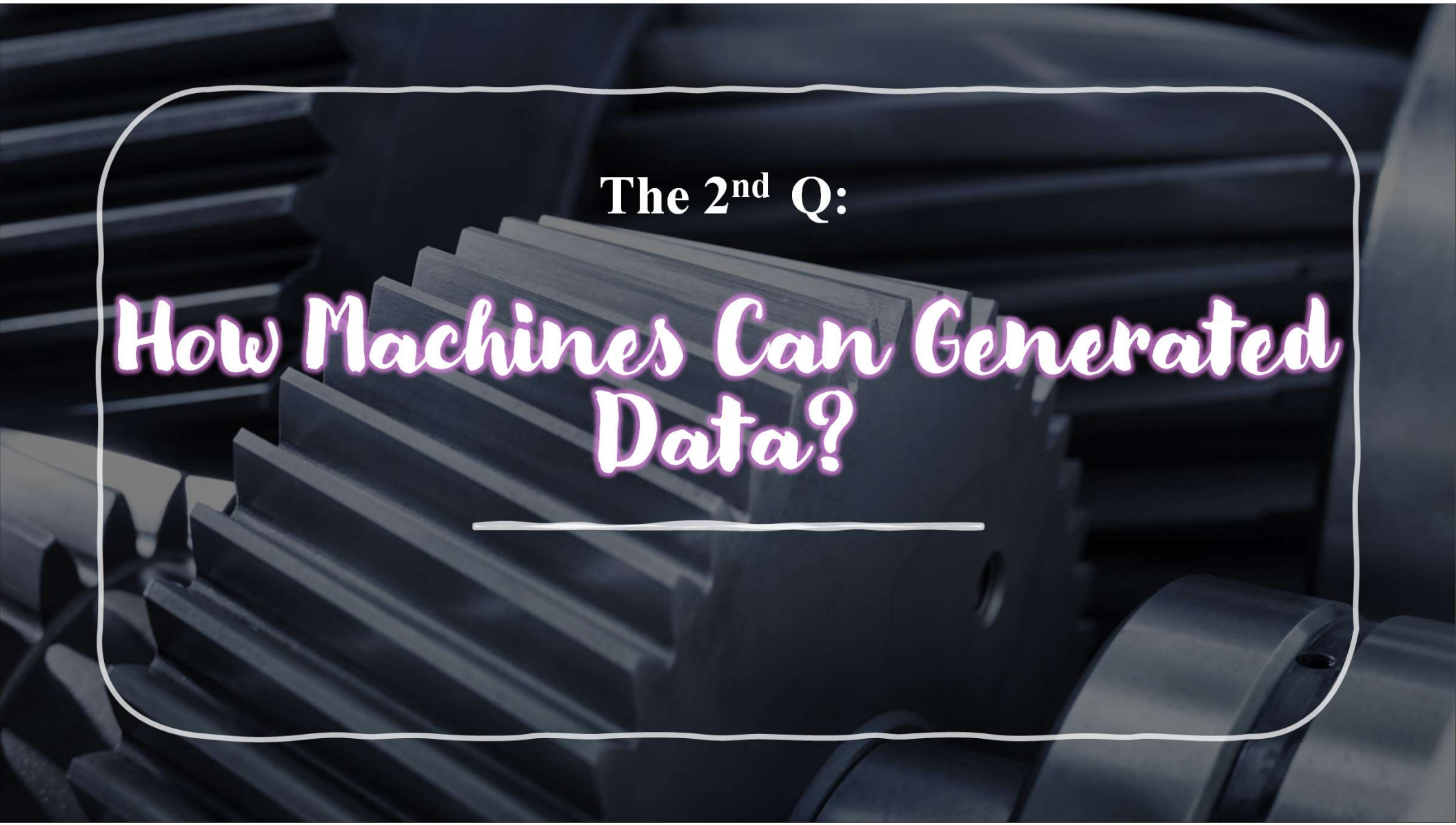
Where is the Big Data Comes from?

From Three Resources !!!



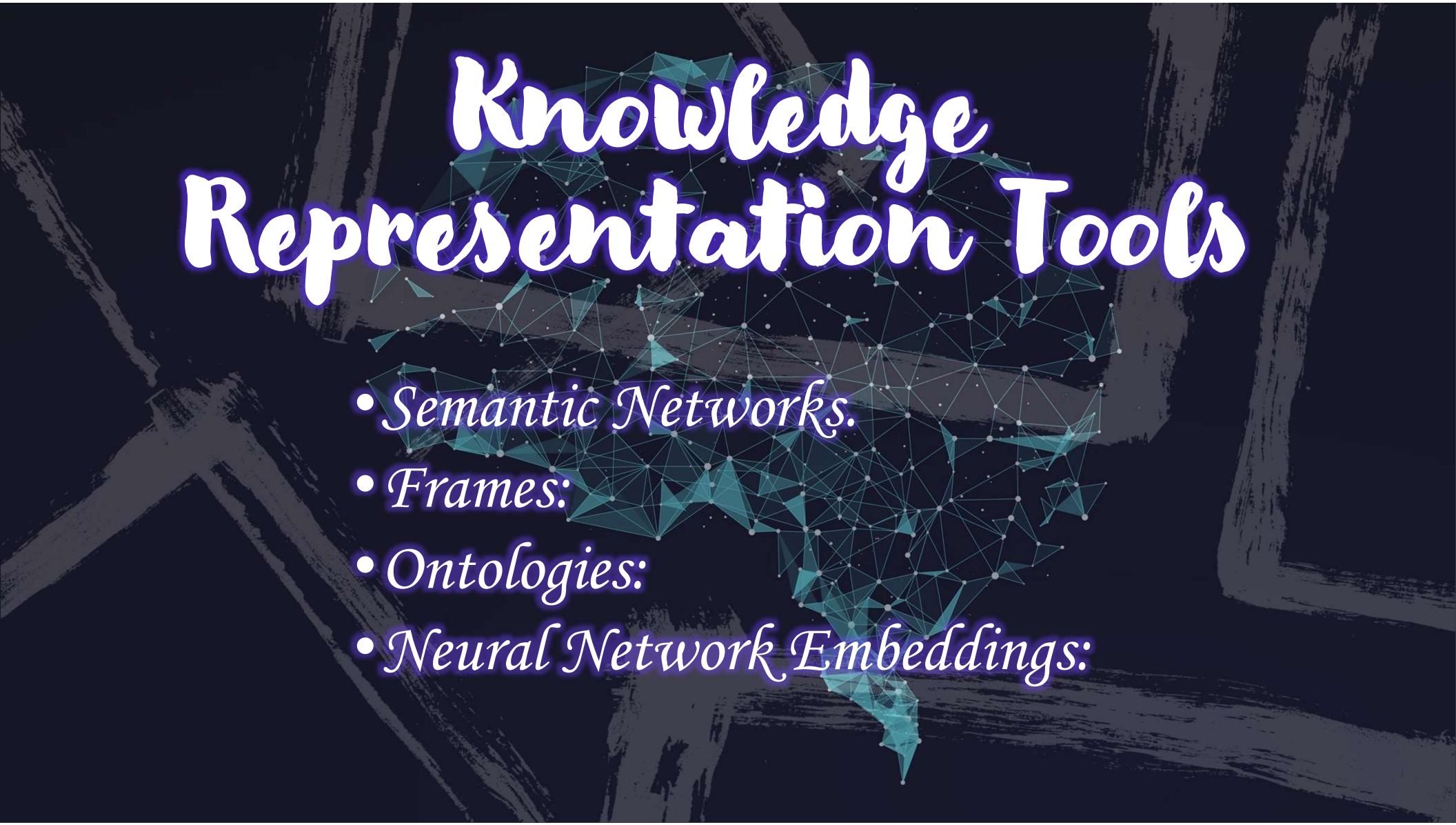
The Common Sources of Big Data:

- Social Media.
- IoT Devices.
- Online Transactions.
- Digital Media.
- Log Files.
- Sensor Networks.
- Genomic Data.
- Scientific Research.
- Government and Public Data.
- Text and Documents.
- Financial Data.
- Geospatial Data.


The 2nd Q:
How Machines Can Generated Data?


Based on Three phases
- Knowledge Representation.
- Knowledge Understanding.
- Knowledge Generation.


1 St phase:
Knowledge Representation
• Knowledge representation is a fundamental concept in artificial intelligence (AI).
• It refers to the process of capturing and structuring information in a way that can be understood, processed, and manipulated by computers or intelligent agents.
• The goal of knowledge representation is to create a formal system or framework that allows computers to reason, make inferences, and draw conclusions from the stored information.


Knowledge
Representation Tools
• Semantic Networks.
• Frames:
• Ontologies:
• Neural Network Embeddings:

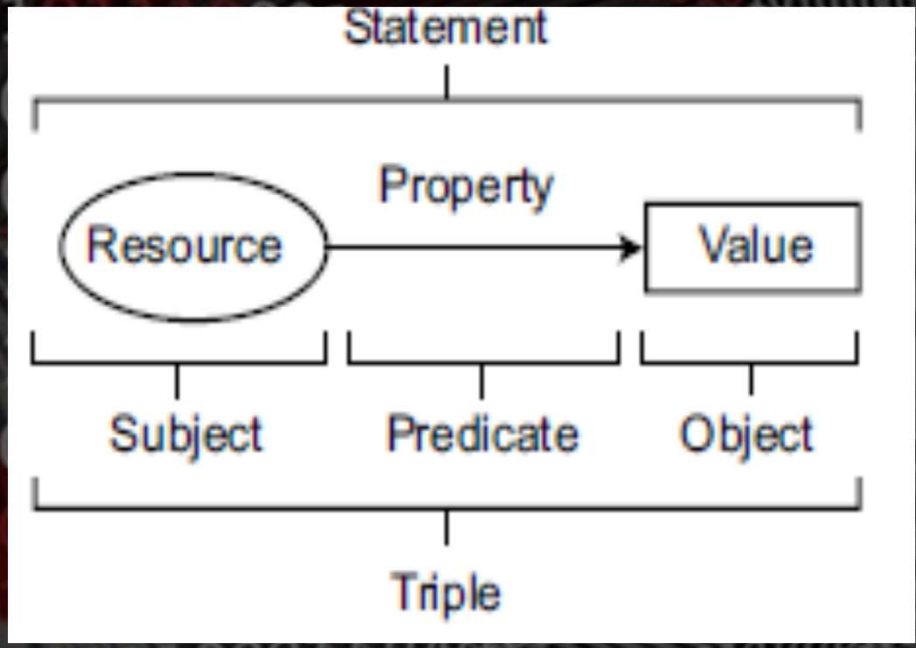
Semantic Networks

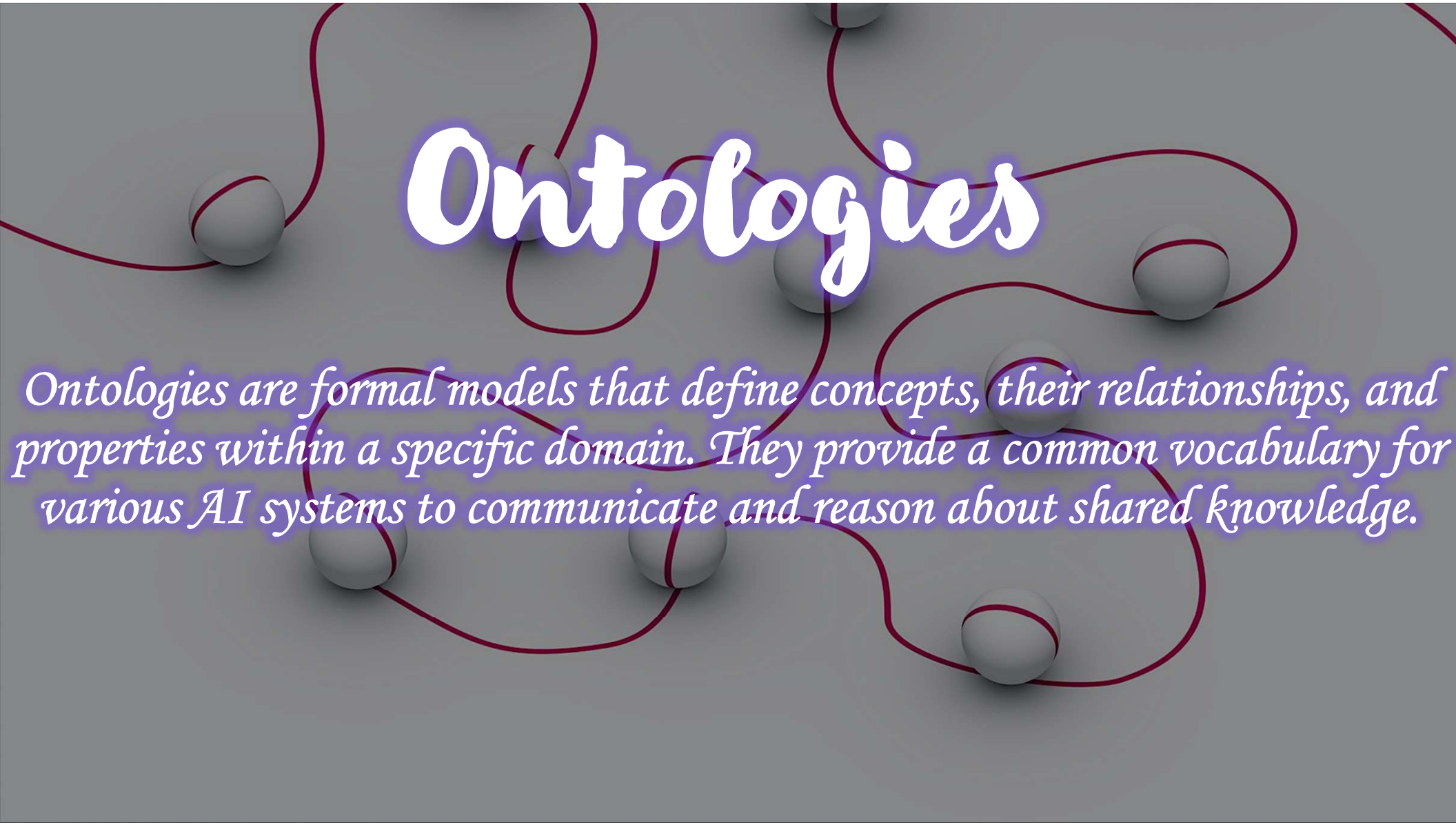
Semantic Networks: These represent knowledge as nodes (objects or concepts) connected by edges (relationships). They are easy to understand but can become complex for large knowledge bases.

Frames

Like (BIBFRAME – RDF)

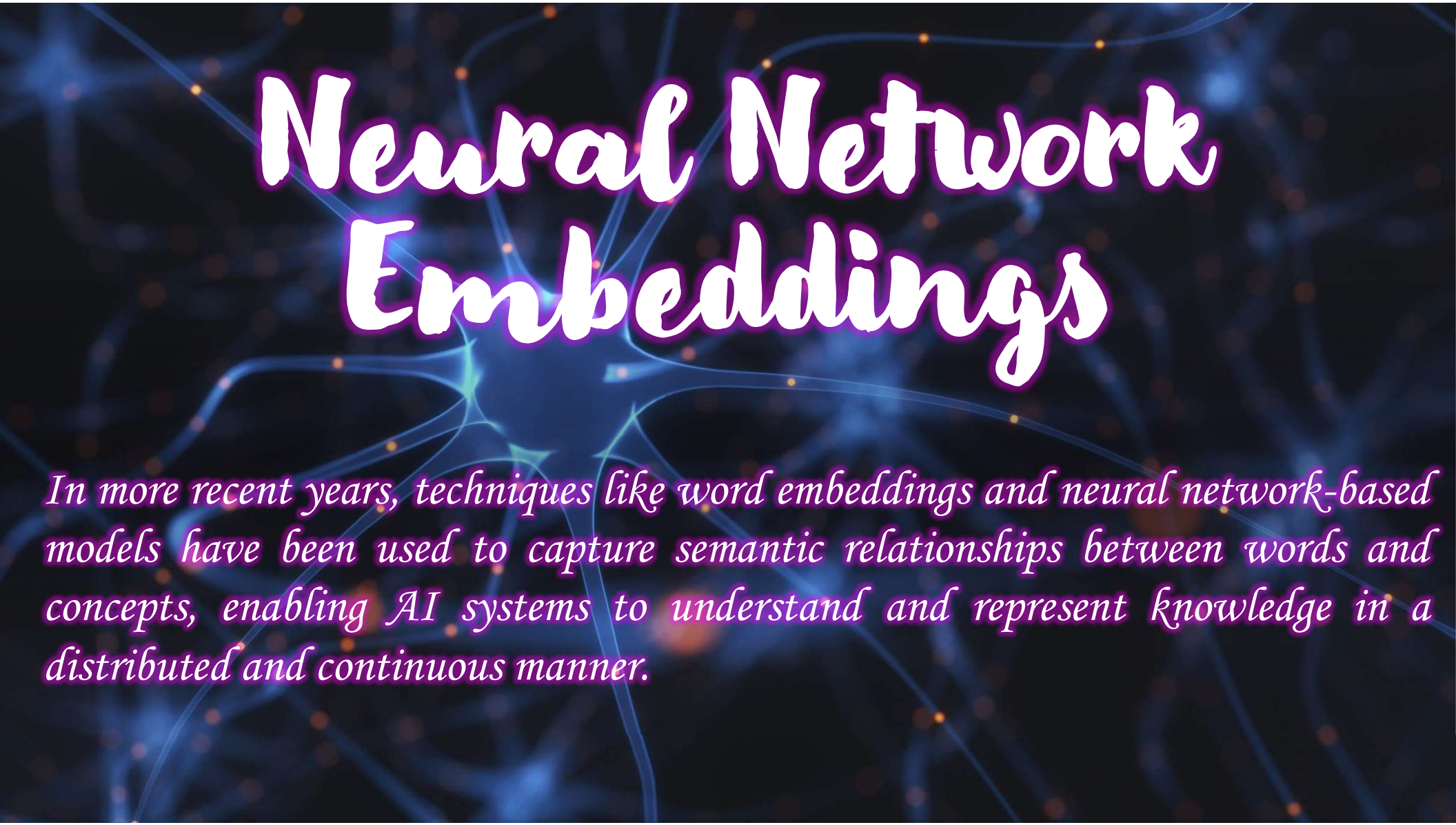
Frames organize knowledge into structured units, with attributes and slots that define properties and relationships of objects or concepts. They are used for representing structured information about objects or events.




Ontologies
Ontologies are formal models that define concepts, their relationships, and properties within a specific domain. They provide a common vocabulary for various AI systems to communicate and reason about shared knowledge.

Probabilistic Representations

In situations involving uncertainty, probabilistic models can be used to represent knowledge using probabilities and statistical methods.


Neural Network Embeddings
In more recent years, techniques like word embeddings and neural network-based models have been used to capture semantic relationships between words and concepts, enabling AI systems to understand and represent knowledge in a distributed and continuous manner.

2nd phase:

Knowledge Understanding !

Knowledge Understanding Is the Machines Ability to Comprehend and Make Sense of Information.

It is the process of extracting meaning from data and using that meaning to answer questions, solve problems, and make decisions.

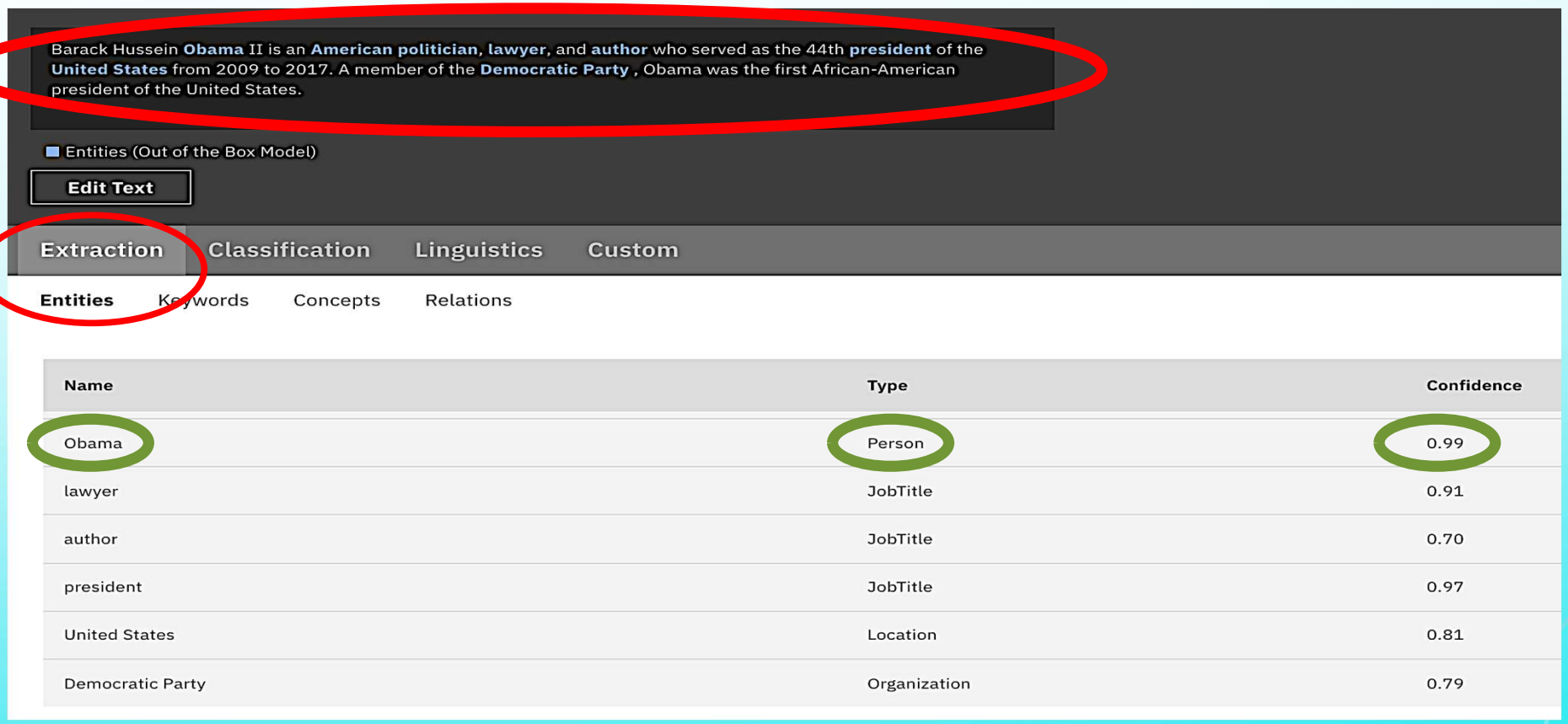
Knowledge Understanding

Knowledge understanding is a complex process that involves multiple cognitive skills, such as:

- **Machine Attention:** The ability to focus on relevant information and ignore irrelevant information.
- **Machine Memory:** The ability to store and retrieve information.
- **Comprehension:** The ability to understand the meaning of information.
- **Inference:** The ability to draw conclusions from information.
- **Evaluation:** The ability to assess the quality of information.

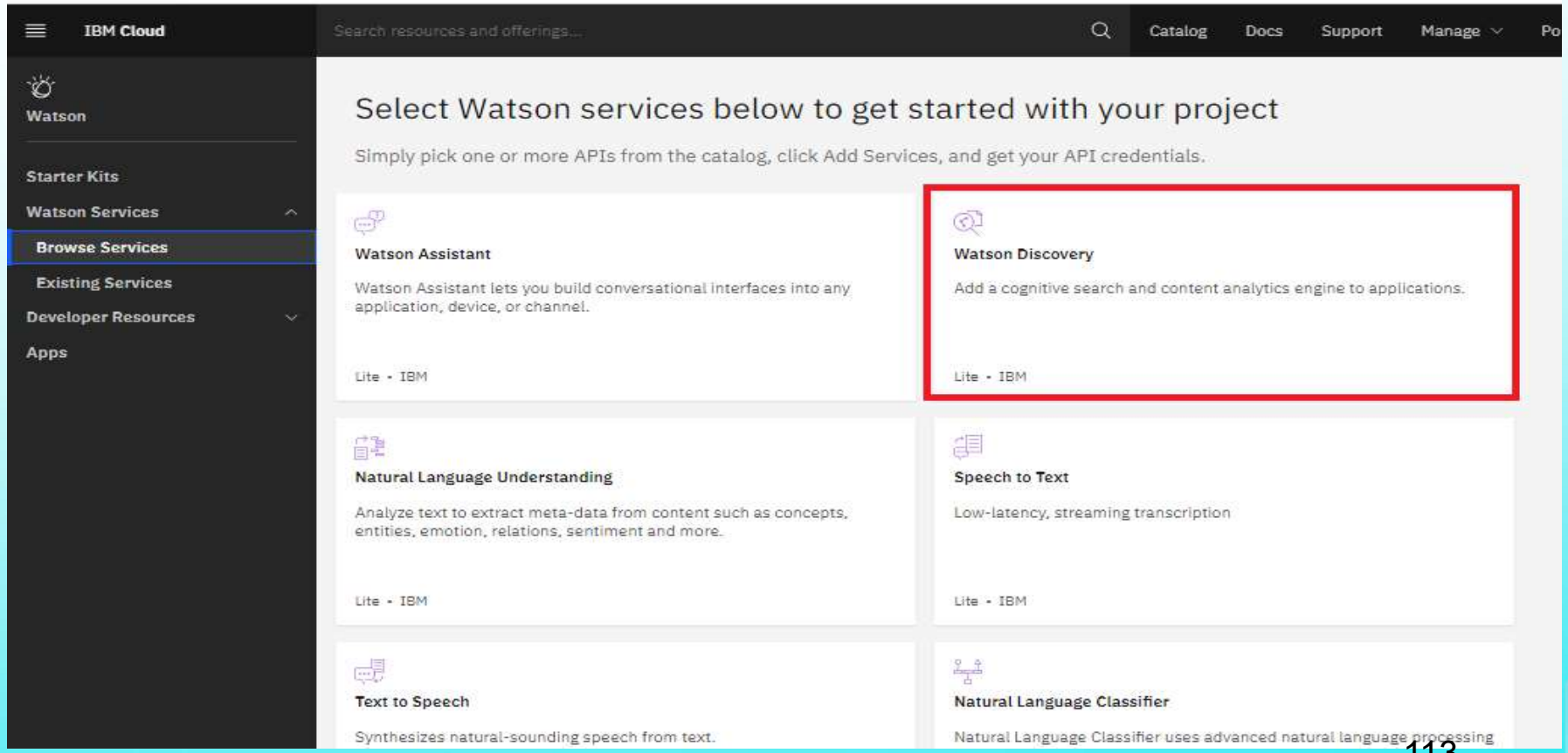
Let's Try

The Result !!!

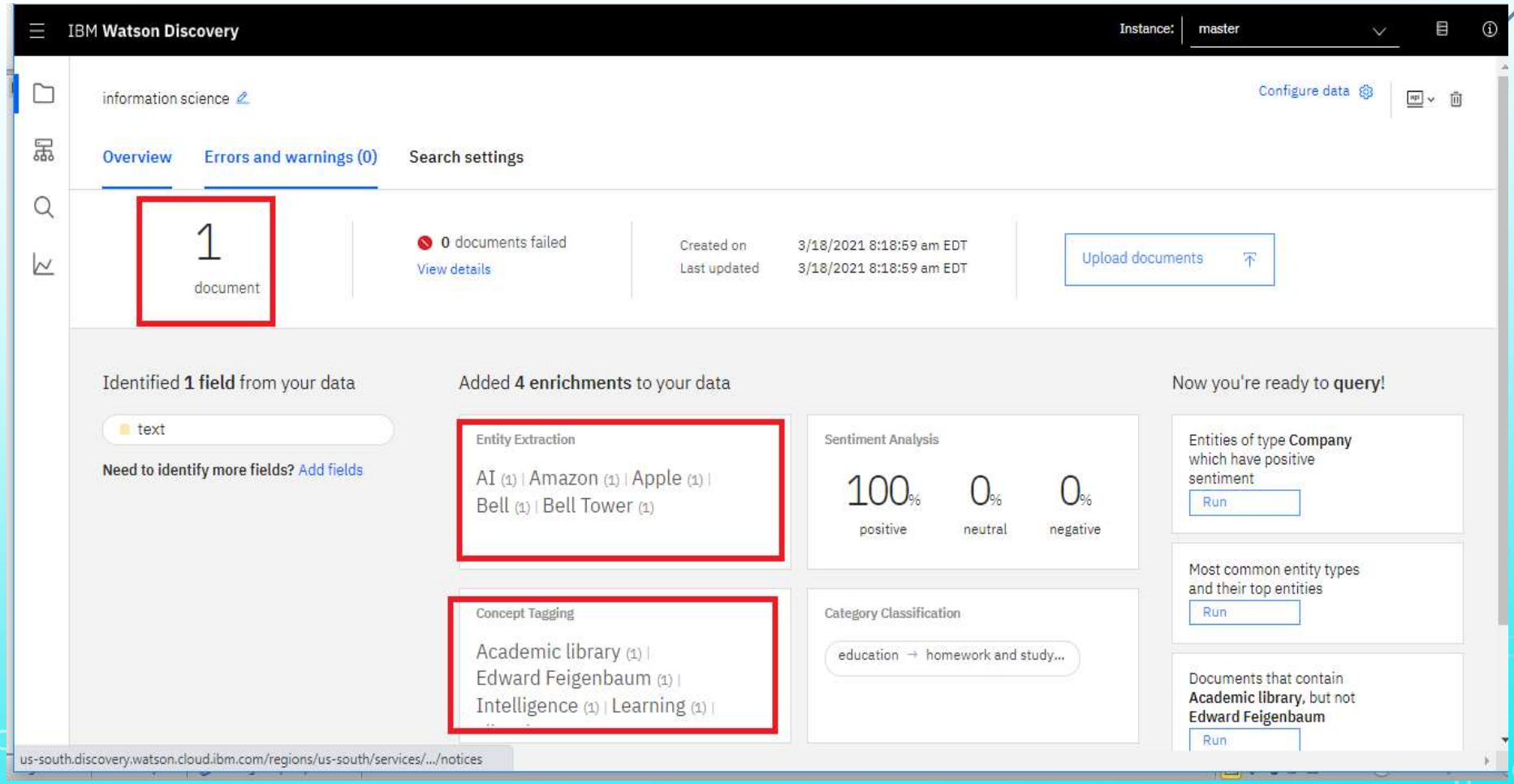


Name	Type	Confidence
Obama	Person	0.99
lawyer	JobTitle	0.91
author	JobTitle	0.70
president	JobTitle	0.97
United States	Location	0.81
Democratic Party	Organization	0.79

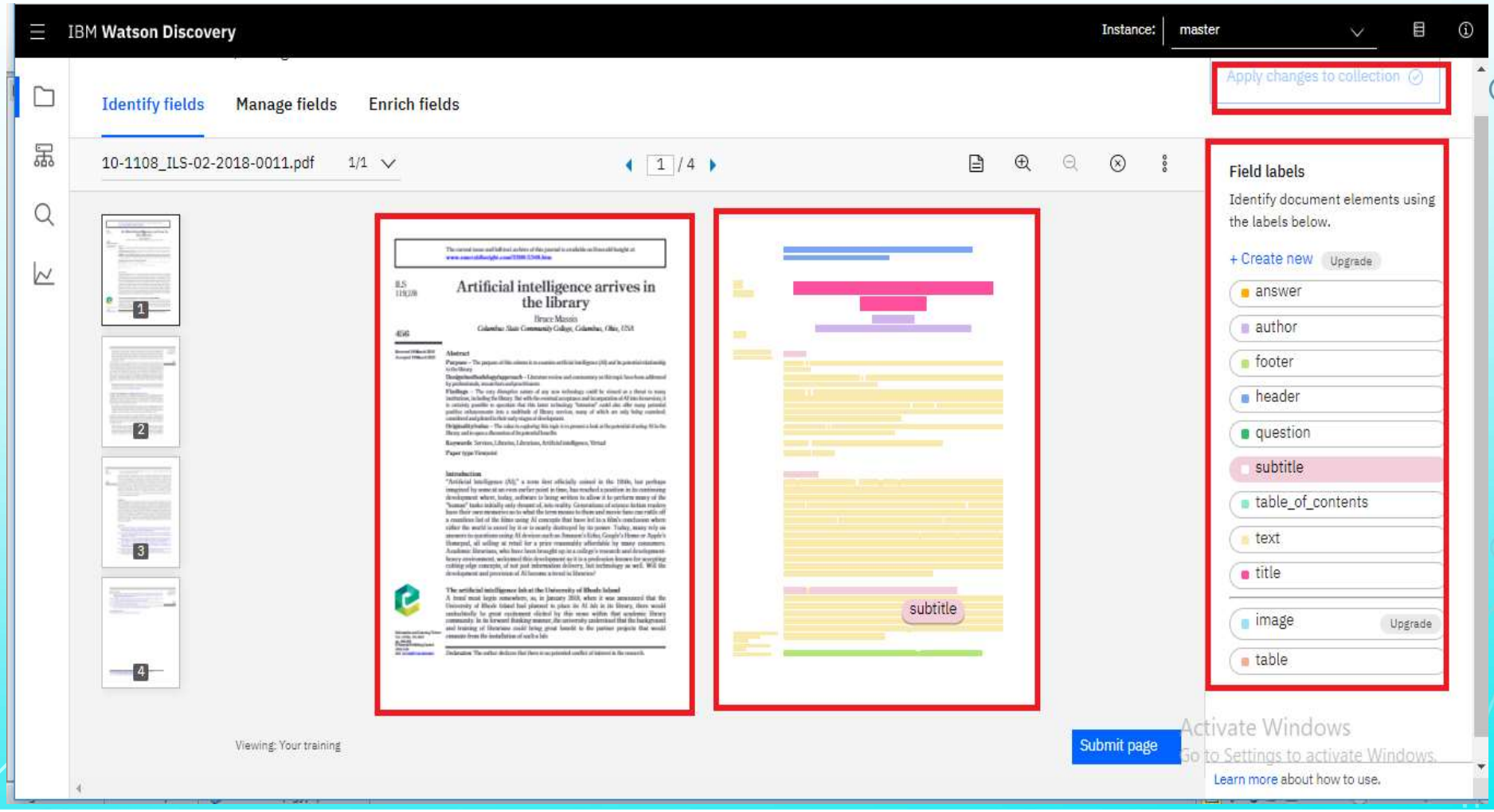
Based on Watson Discovery



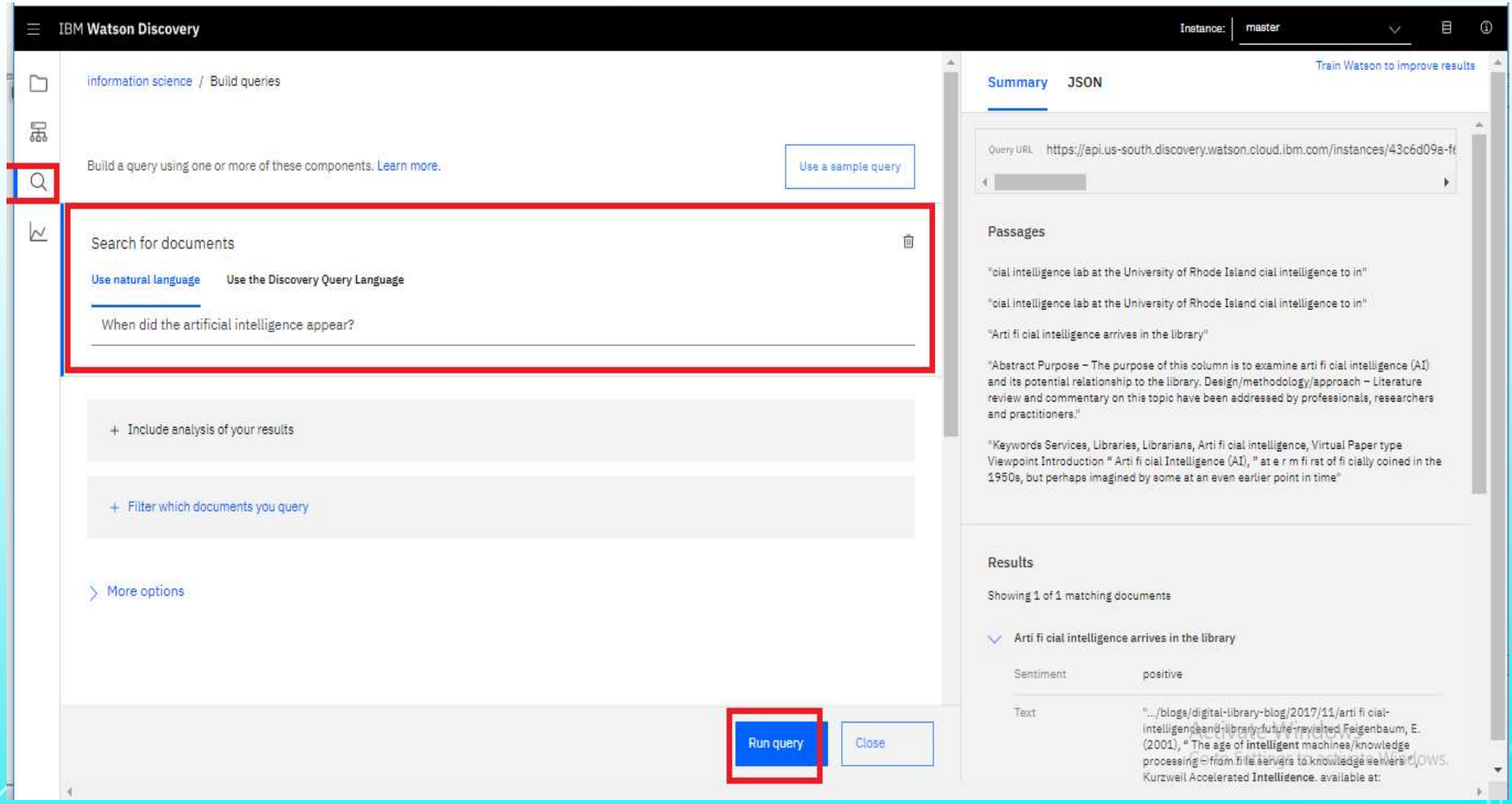
DETECTION !!!


IBM Watson Discovery
Instance: master
information science
Configure data
Overview
Errors and warnings (0)
Search settings
1
document
0 documents failed
View details
Created on 3/18/2021 8:18:59 am EDT
Last updated 3/18/2021 8:18:59 am EDT
Upload documents
Identified 1 field from your data
text
Need to identify more fields? Add fields
Added 4 enrichments to your data
Entity Extraction
AI (1) | Amazon (1) | Apple (1) |
Bell (1) | Bell Tower (1)
Sentiment Analysis
100% positive
0% neutral
0% negative
Concept Tagging
Academic library (1) |
Edward Feigenbaum (1) |
Intelligence (1) | Learning (1) |
Category Classification
education → homework and study...
Now you're ready to query!
Entities of type Company which have positive sentiment
Run
Most common entity types and their top entities
Run
Documents that contain Academic library, but not Edward Feigenbaum
Run
us-south.discovery.watson.cloud.ibm.com/regions/us-south/services/.../notices

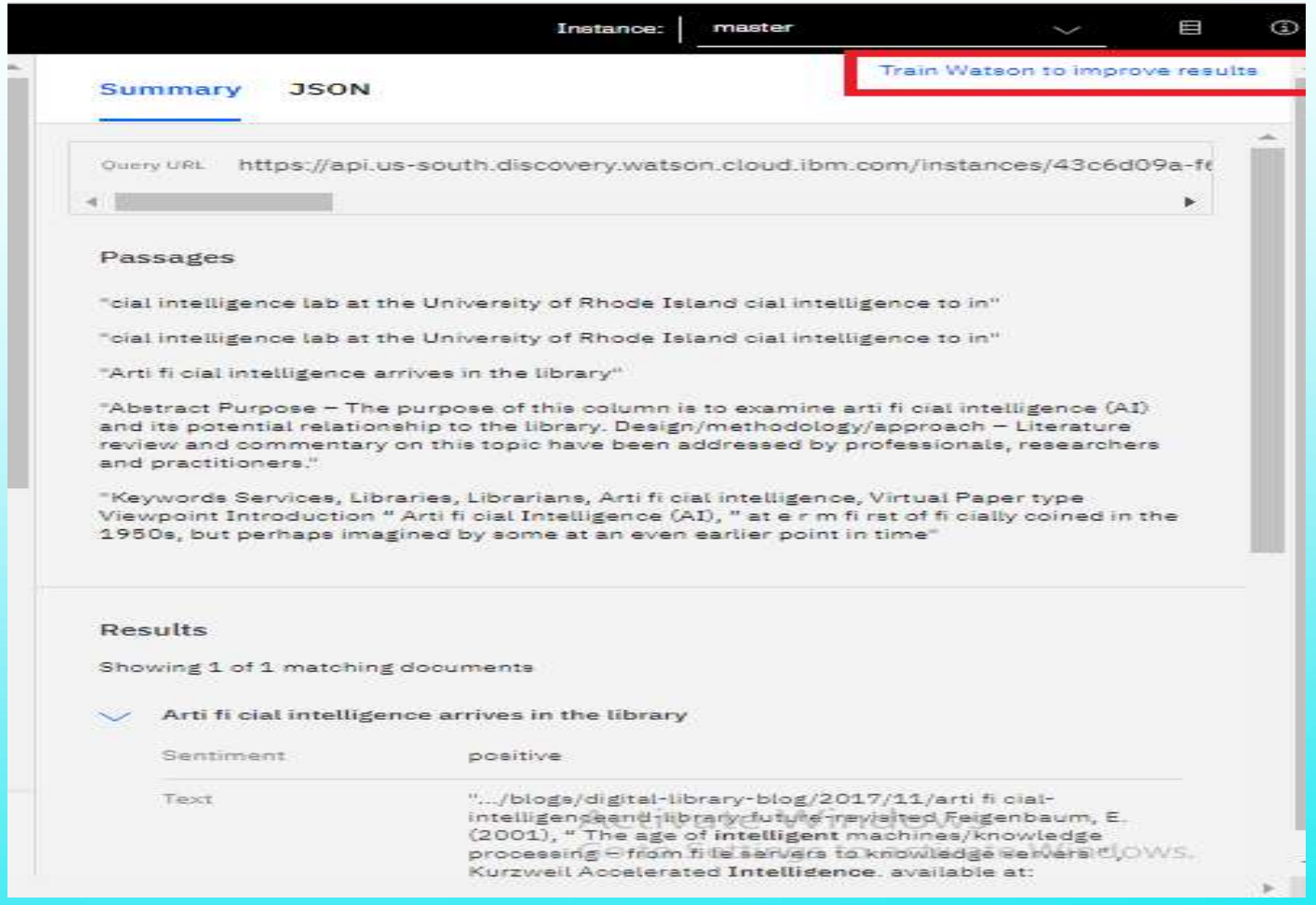
Understanding



TEST


IBM Watson Discovery
Instance: master
information science / Build queries
Build a query using one or more of these components. Learn more.
Use a sample query
Search for documents
Use natural language
Use the Discovery Query Language
When did the artificial intelligence appear?
+ Include analysis of your results
+ Filter which documents you query
More options
Run query
Close
Train Watson to improve results
Summary
JSON
Query URL https://api.us-south.discovery.watson.cloud.ibm.com/instances/43c6d09a-f
Passages
"cial intelligence lab at the University of Rhode Island cial intelligence to in"
"cial intelligence lab at the University of Rhode Island cial intelligence to in"
"Arti fi cial intelligence arrives in the library"
"Abstract Purpose – The purpose of this column is to examine arti fi cial intelligence (AI) and its potential relationship to the library. Design/methodology/approach – Literature review and commentary on this topic have been addressed by professionals, researchers and practitioners."
"Keywords Services, Libraries, Librarians, Arti fi cial intelligence, Virtual Paper type Viewpoint Introduction " Arti fi cial Intelligence (AI), " at e r m fi rst of fi cially coined in the 1950s, but perhaps imagined by some at an even earlier point in time"
Results
Showing 1 of 1 matching documents
Arti fi cial intelligence arrives in the library
Sentiment positive
Text ".../blogs/digital-library-blog/2017/11/arti fi cial-intelligenceand-library-future-revisited Feigenbaum, E. (2001), " The age of intelligent machines/knowledge processing – from fi le servers to knowledge servers ", Kurzweil Accelerated Intelligence. available at:

The Results !!!


Instance: master
Train Watson to improve results
Summary
JSON
Query URL https://api.us-south.discovery.watson.cloud.ibm.com/instances/43c6d09a-f
Passages
"cial intelligence lab at the University of Rhode Island cial intelligence to in"
"cial intelligence lab at the University of Rhode Island cial intelligence to in"
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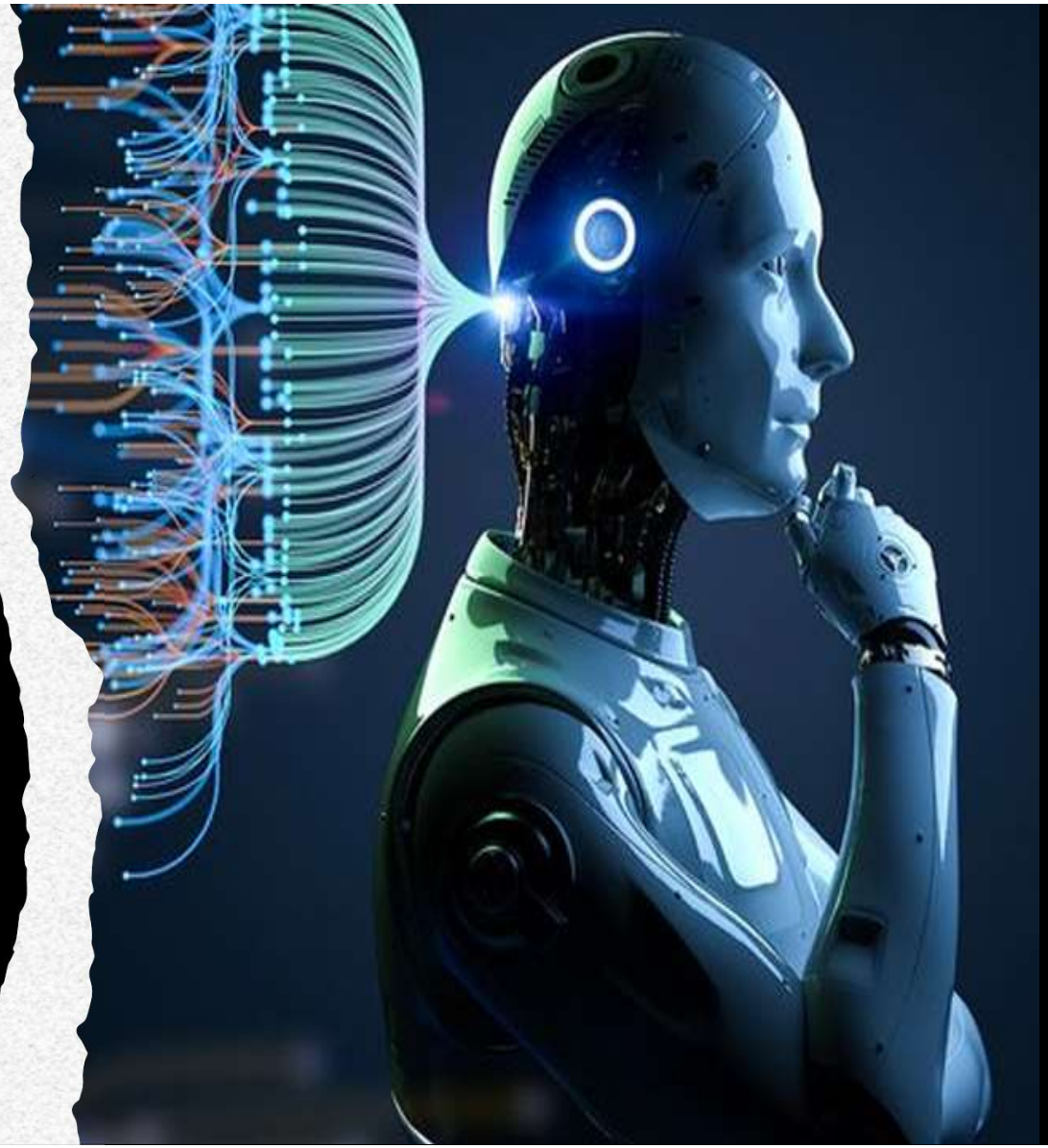
3rd phase:
Knowledge Generation !

Knowledge Generation

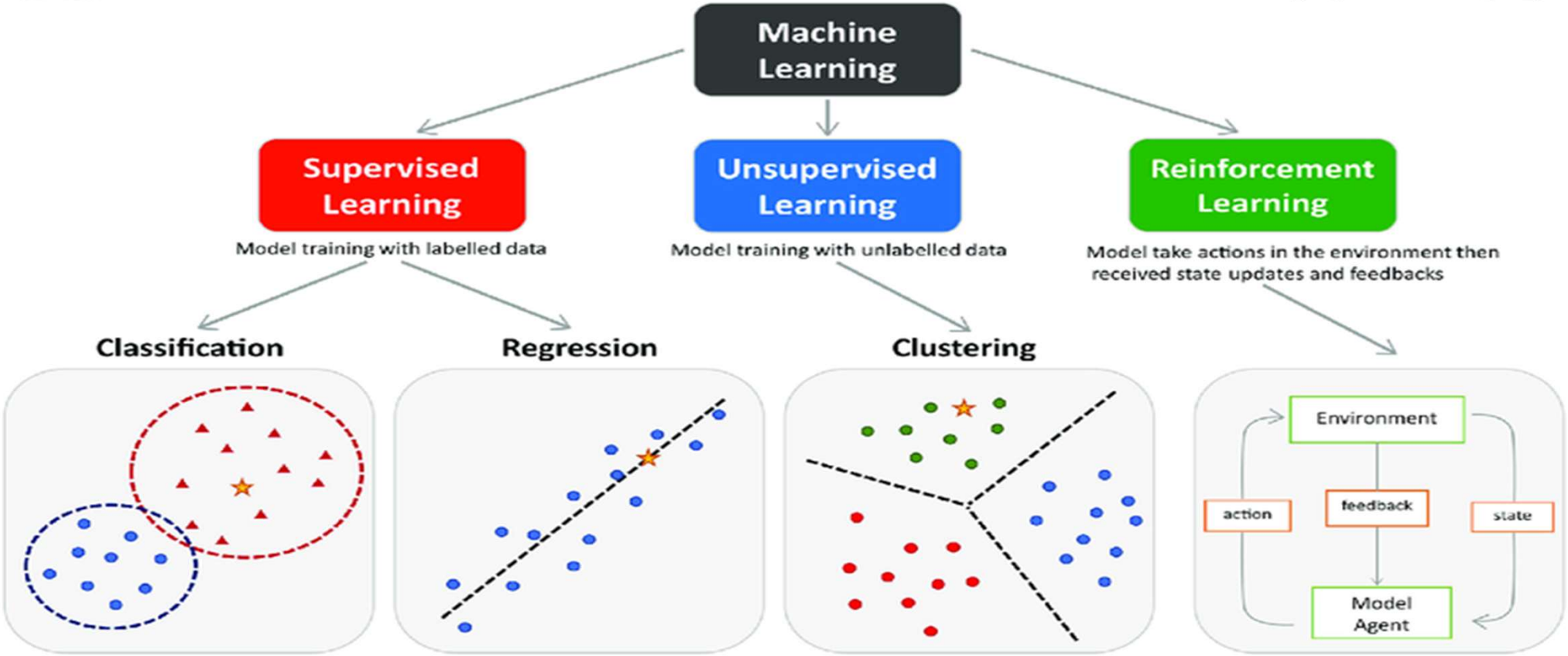
Generative knowledge is a type of artificial intelligence (AI) that can automatically create new knowledge from existing data.

How Generate Knowledge?

- There are several different ways to implement generative knowledge, including:
- Machine learning: Machine learning algorithms can be used to learn from existing data and generate new knowledge.
- Natural language processing: can be used to extract information from text and code, and then generate new knowledge in a human-readable format.
- Graph neural networks: can be used to model the relationships between different pieces of knowledge, and then generate new knowledge that is consistent with these relationships.

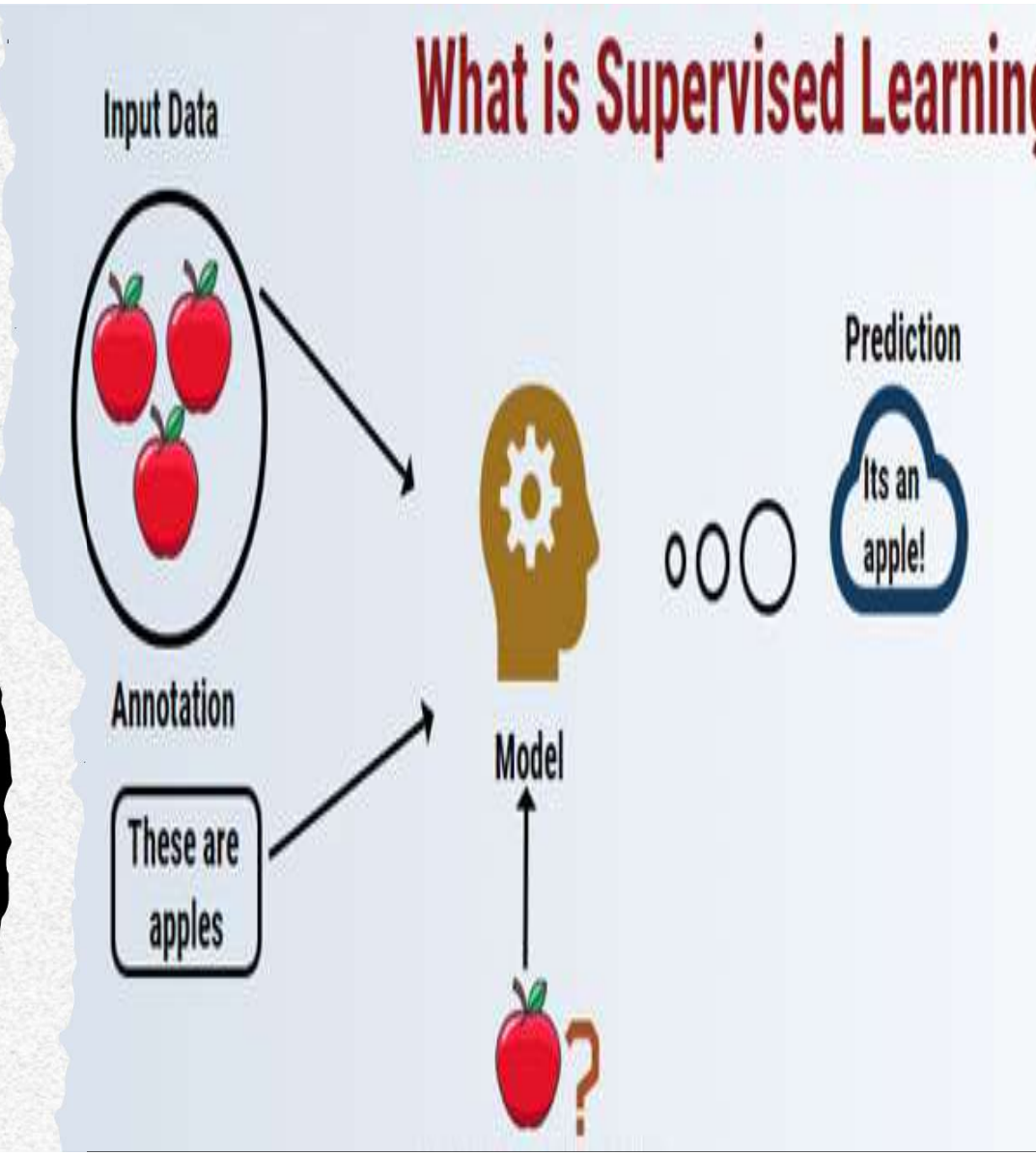


Machine Learning

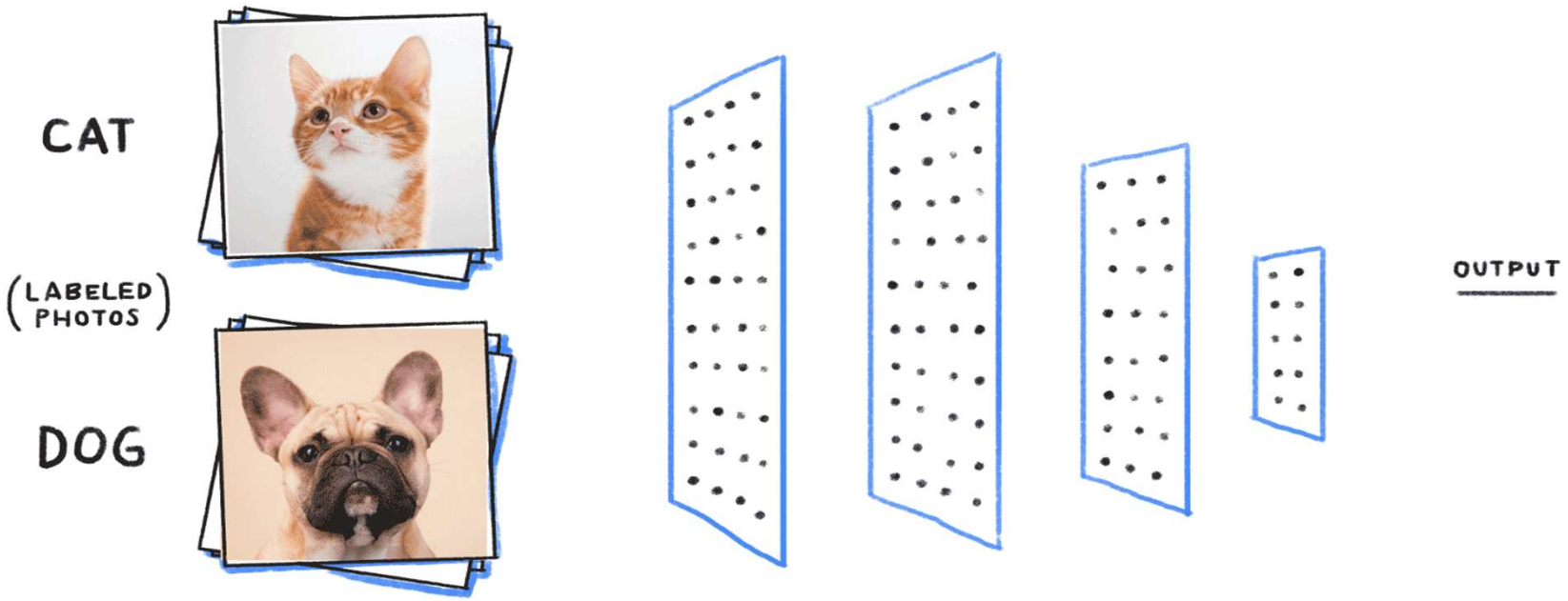


Supervised learning

In supervised learning, machine learning algorithms are trained on a set of labeled data. This data includes both the input data and the desired output data. The machine learning algorithm learns to map the input data to the desired output data. Once the machine learning algorithm has been trained, it can be used to generate new knowledge by predicting the output data for new input data.

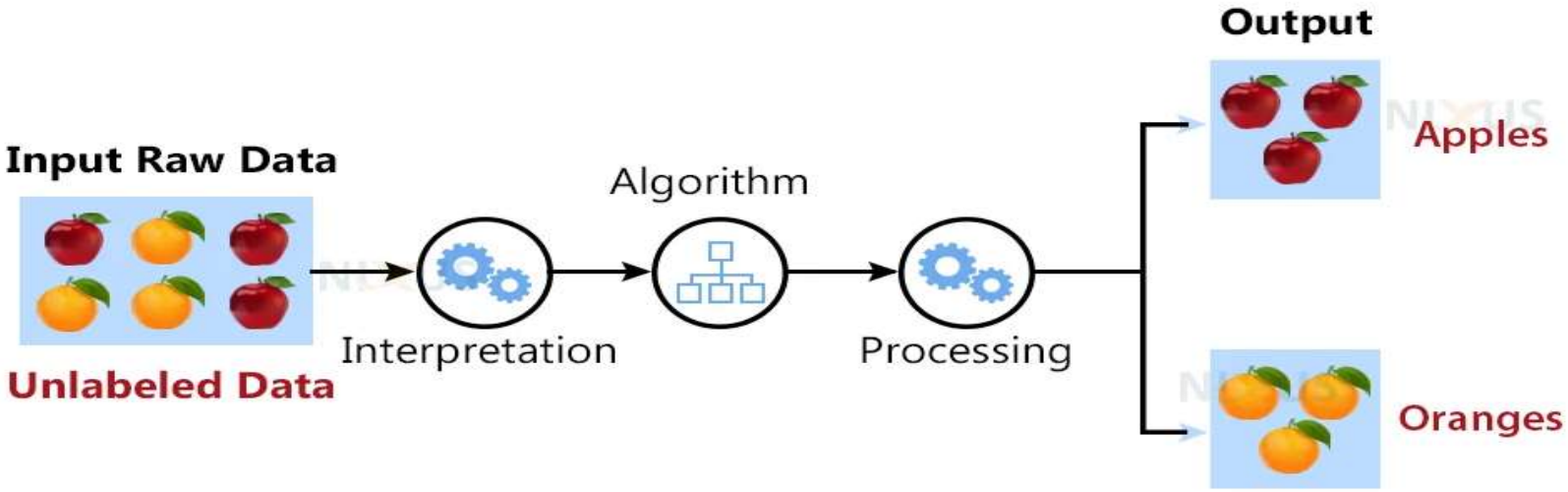


Machine Learneng Can generate Knowledge like This



Unsupervised Machine Learning

In unsupervised learning, machine learning algorithms are trained on a set of unlabeled data. This data does not include any desired output data. The machine learning algorithm learns to identify patterns in the data. Once the machine learning algorithm has been trained, it can be used to generate new knowledge by predicting the relationships between different pieces of data.



Ex: Unsupervised Machine Learning

1

Case Study – Book Cover Classification, Analysis, and Recognition

In this chapter, we will work on classifying an image cover into one of 30 categories. We will start by finding a publicly available book cover dataset, continue with analyzing the dataset, and then work on building a custom classifier using a combination of features extracted from a pretrained neural network and custom architecture. By the end of this chapter, you will also see how you can expose your solution to a REST web service.

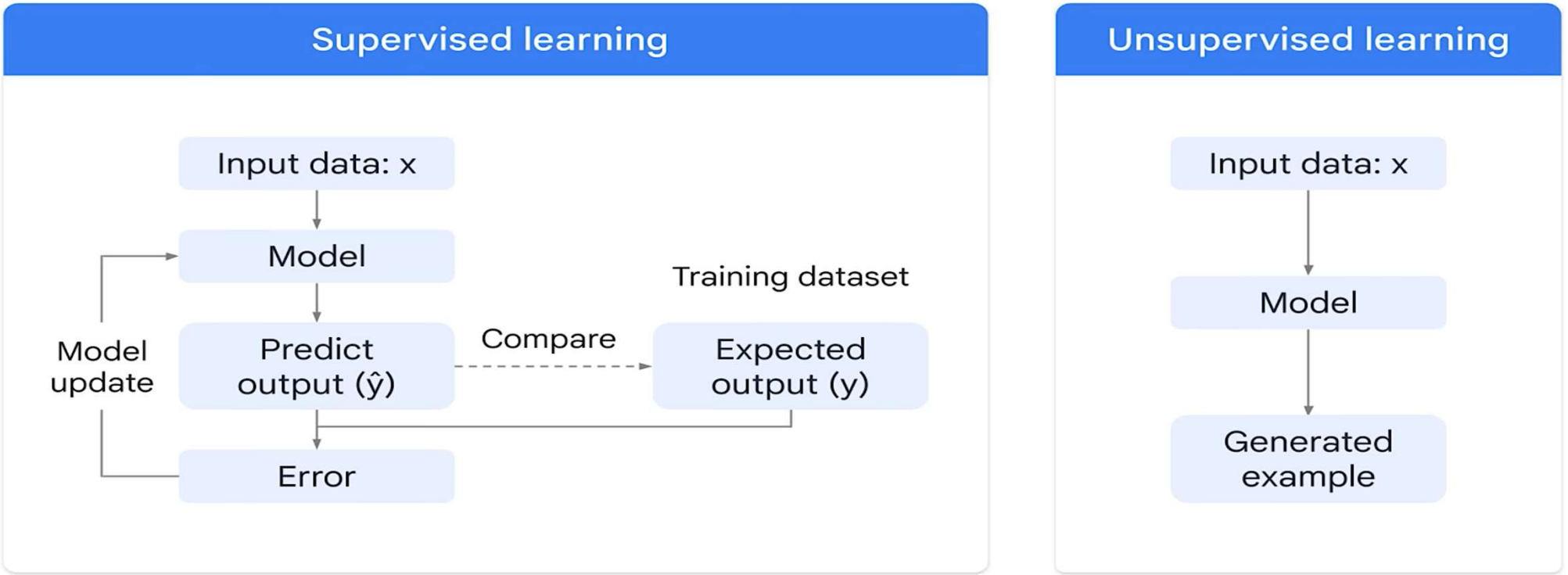
The code will first output shapes for the images that are being processed. As you can see, the shapes are fixed in height but are different in width:

```
(Any[(500, 381), (500, 333), (500, 324), (500, 360), (500, 339)]...)
```

Finally, you will see a preview of the images. The books are very different—from the **National Geographic** to **French Grammar**:

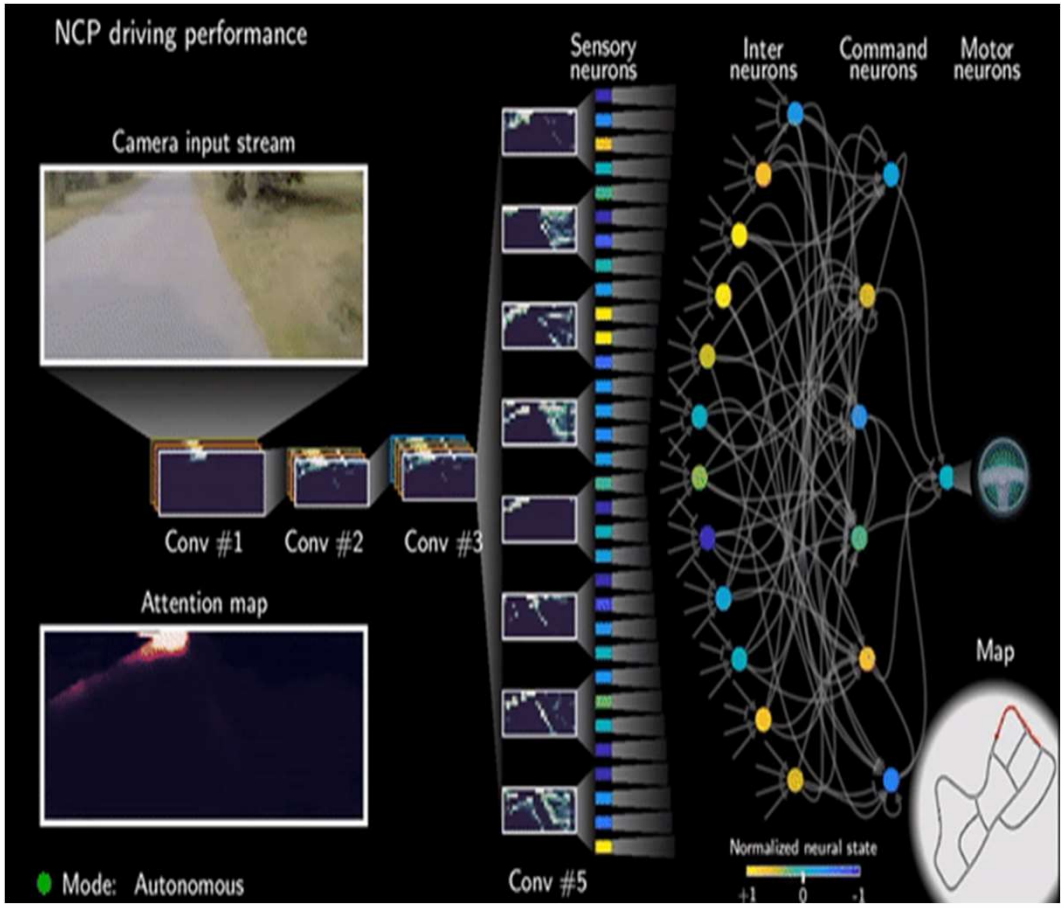
Now that we have our first understanding of the images dataset, we are ready to have a quick look at categories.

Differences between ML Sup & Unsup



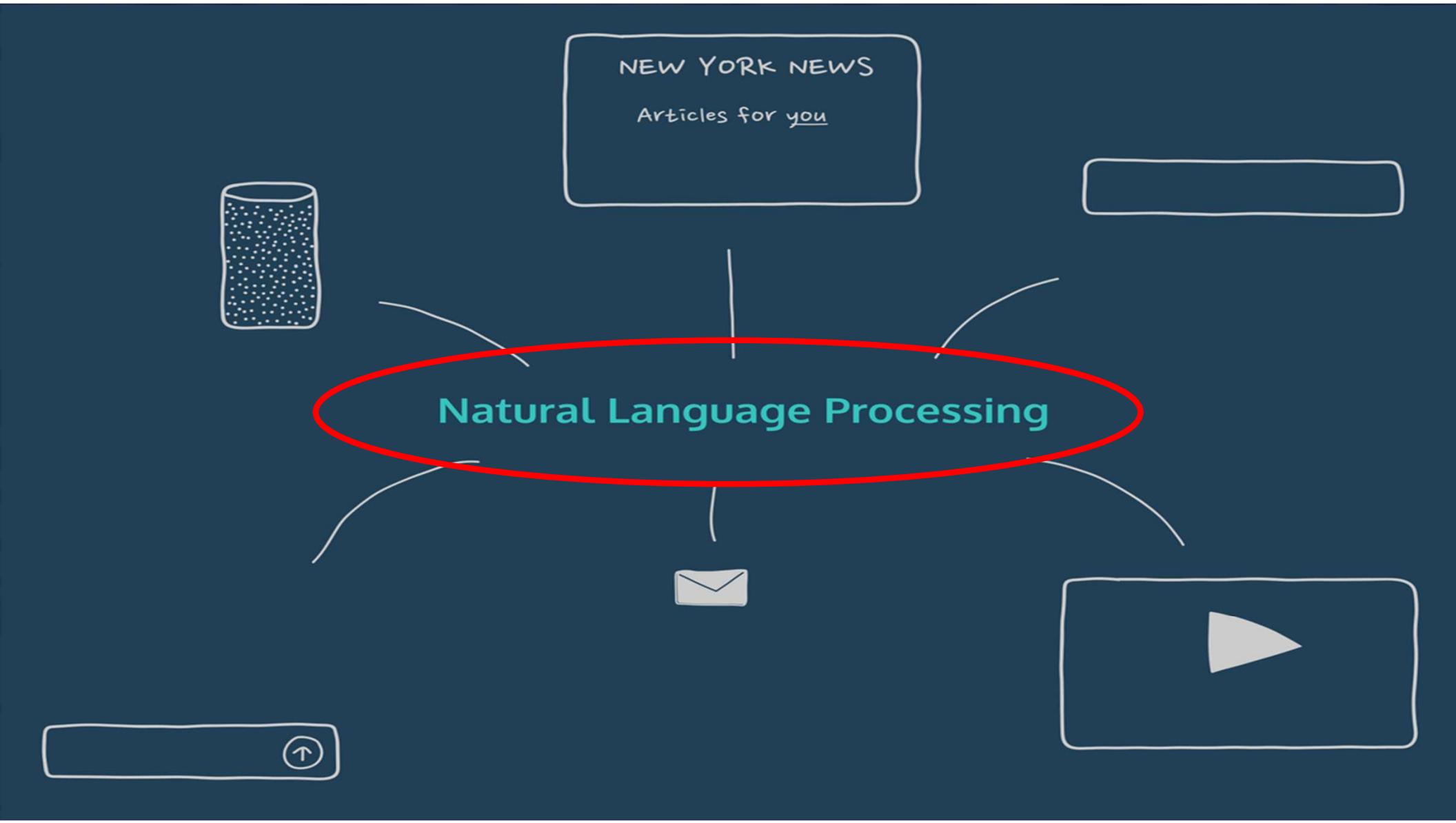
Reinforcement learning

In reinforcement learning, machine learning algorithms are trained to take actions in an environment in order to maximize a reward. The machine learning algorithm learns to associate certain actions with certain rewards. Once the machine learning algorithm has been trained, it can be used to generate new knowledge by exploring the environment and finding new ways to maximize the reward.

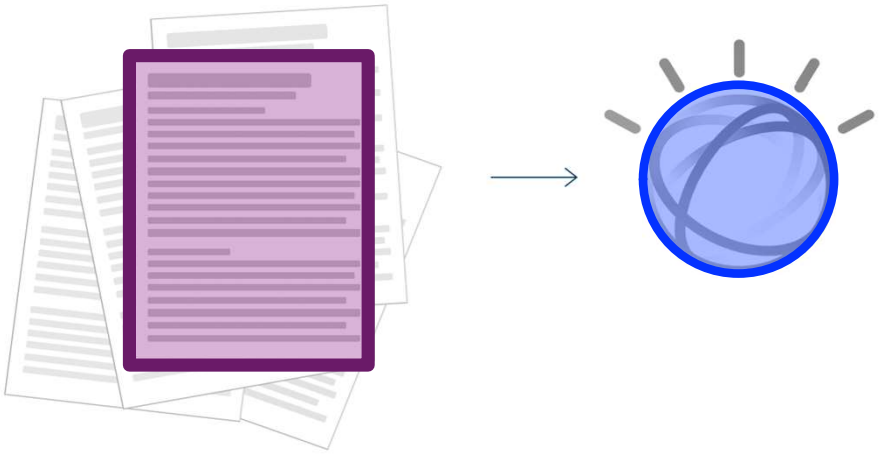


NLP

Natural language processing (NLP) is a branch of computer science and artificial intelligence that deals with the interaction between computers and human (natural) languages. It is concerned with the understanding, interpretation, and generation of human language.


NEW YORK NEWS
Articles for you
Natural Language Processing

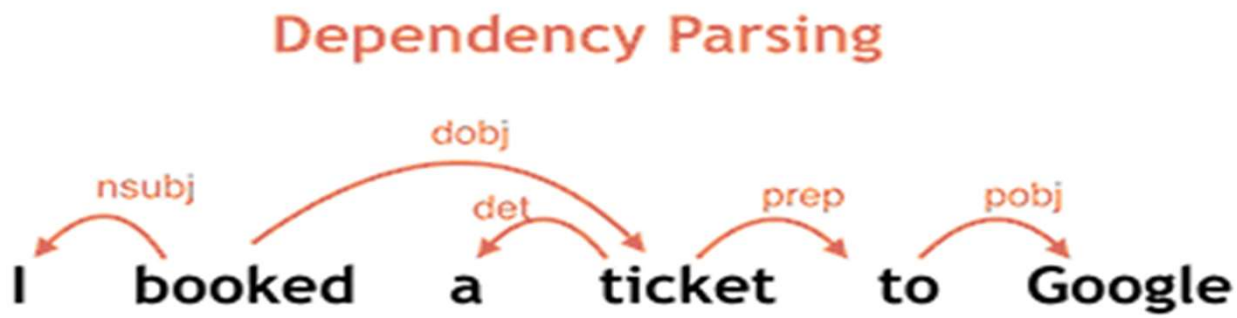
NLP for Documents



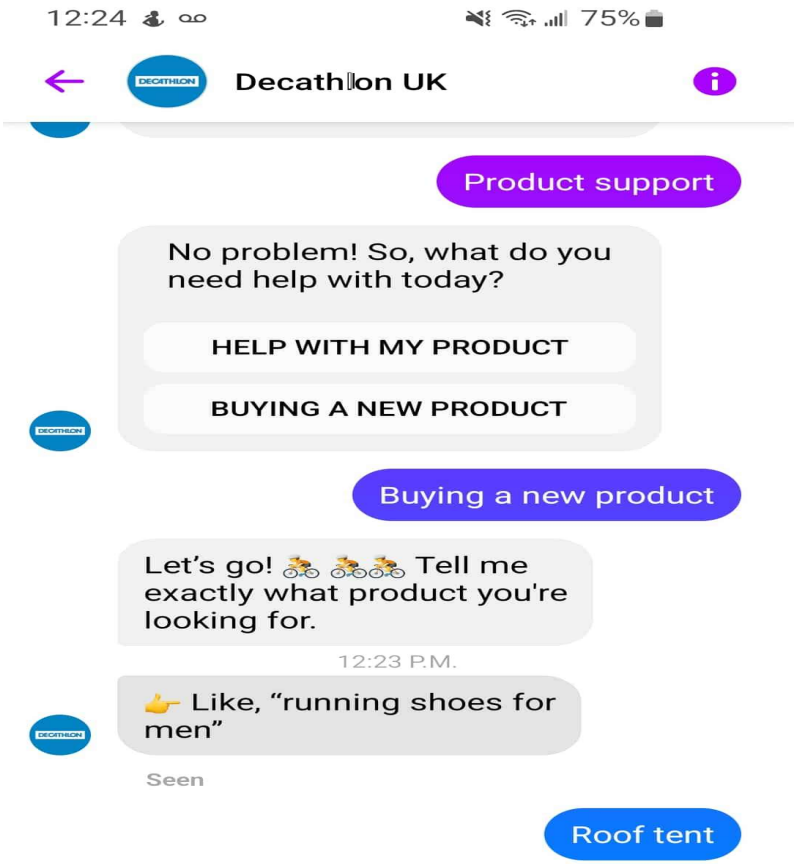
By Extracting:

- **Entites.**
- **Keywords.**
- **Concepts.**
- **Other LS.**

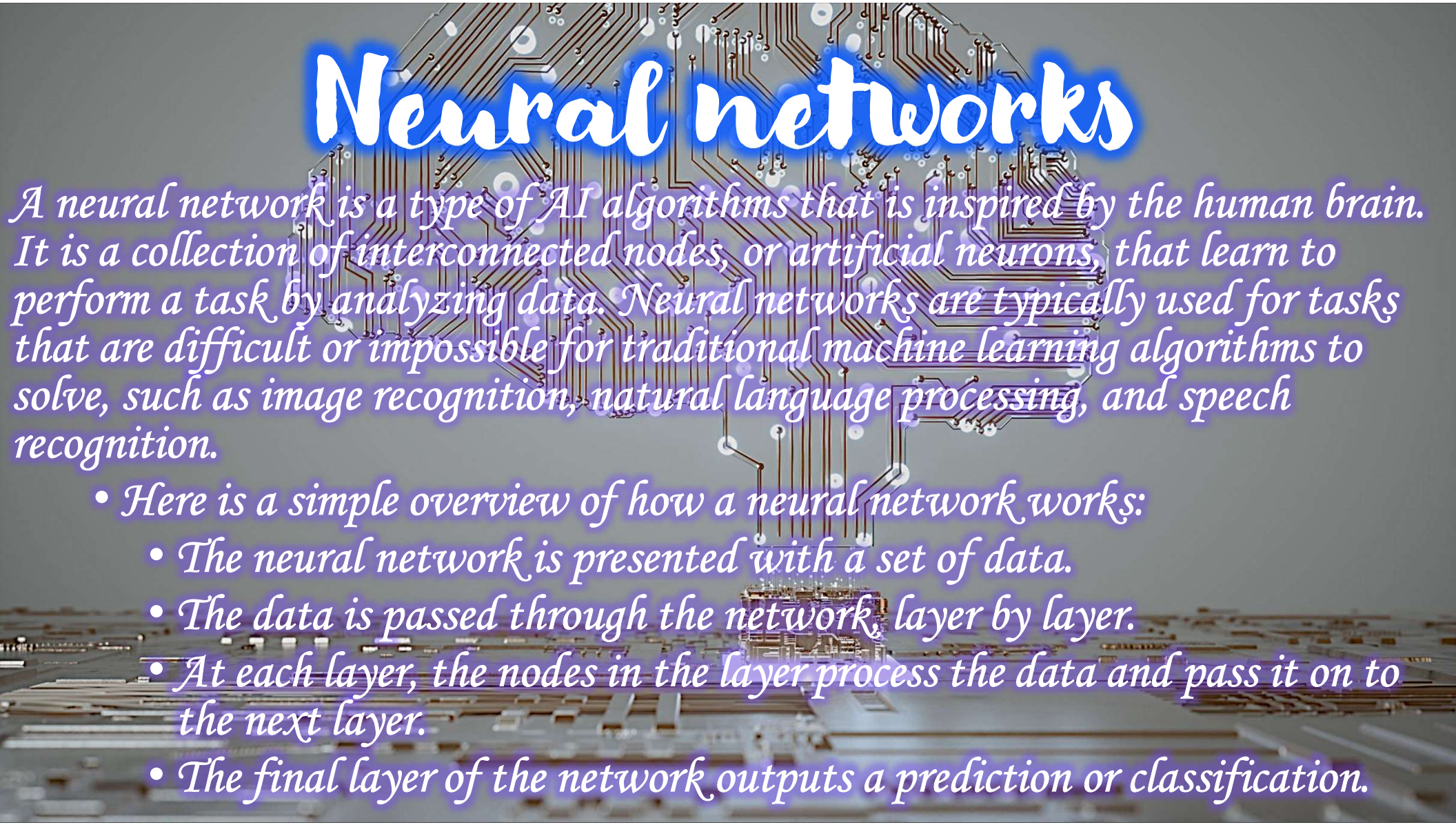
NLP for Resouces Indexing



The Results will be Like This



Neural Networks

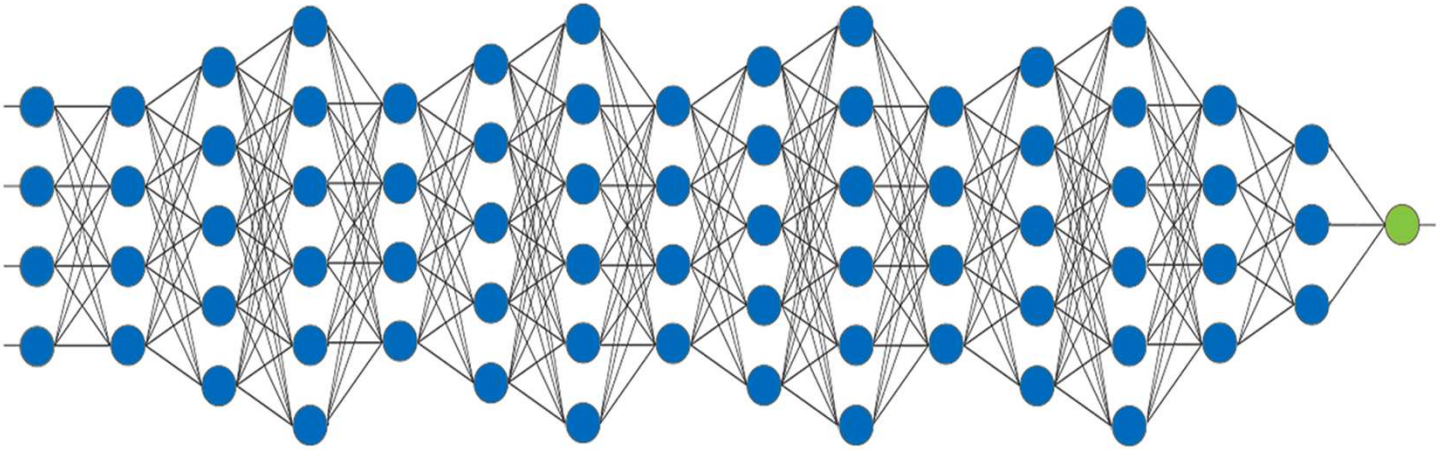


Neural networks

A neural network is a type of AI algorithms that is inspired by the human brain. It is a collection of interconnected nodes, or artificial neurons, that learn to perform a task by analyzing data. Neural networks are typically used for tasks that are difficult or impossible for traditional machine learning algorithms to solve, such as image recognition, natural language processing, and speech recognition.

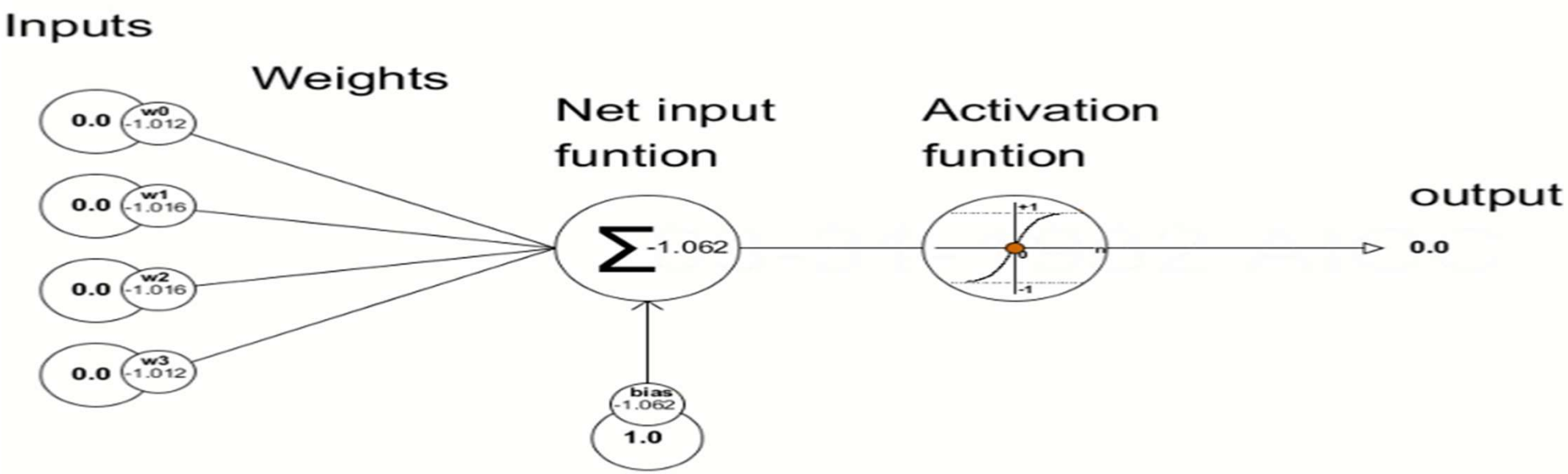
- Here is a simple overview of how a neural network works:
  - The neural network is presented with a set of data.
  - The data is passed through the network, layer by layer.
  - At each layer, the nodes in the layer process the data and pass it on to the next layer.
  - The final layer of the network outputs a prediction or classification.

Multiple Hidden Layers

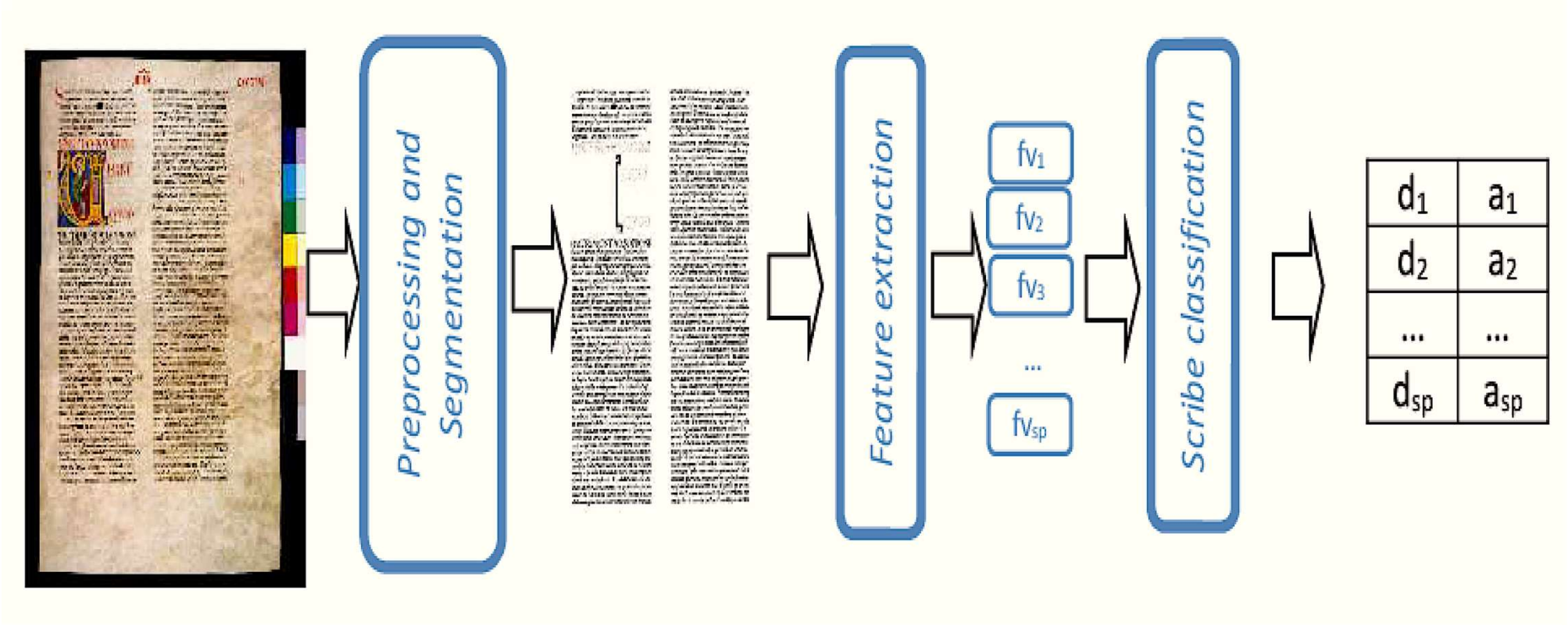


What's Going on Inside It?

To Make an Artificial Neural Network, We Need to Use the Most Universal Language Mathematics.

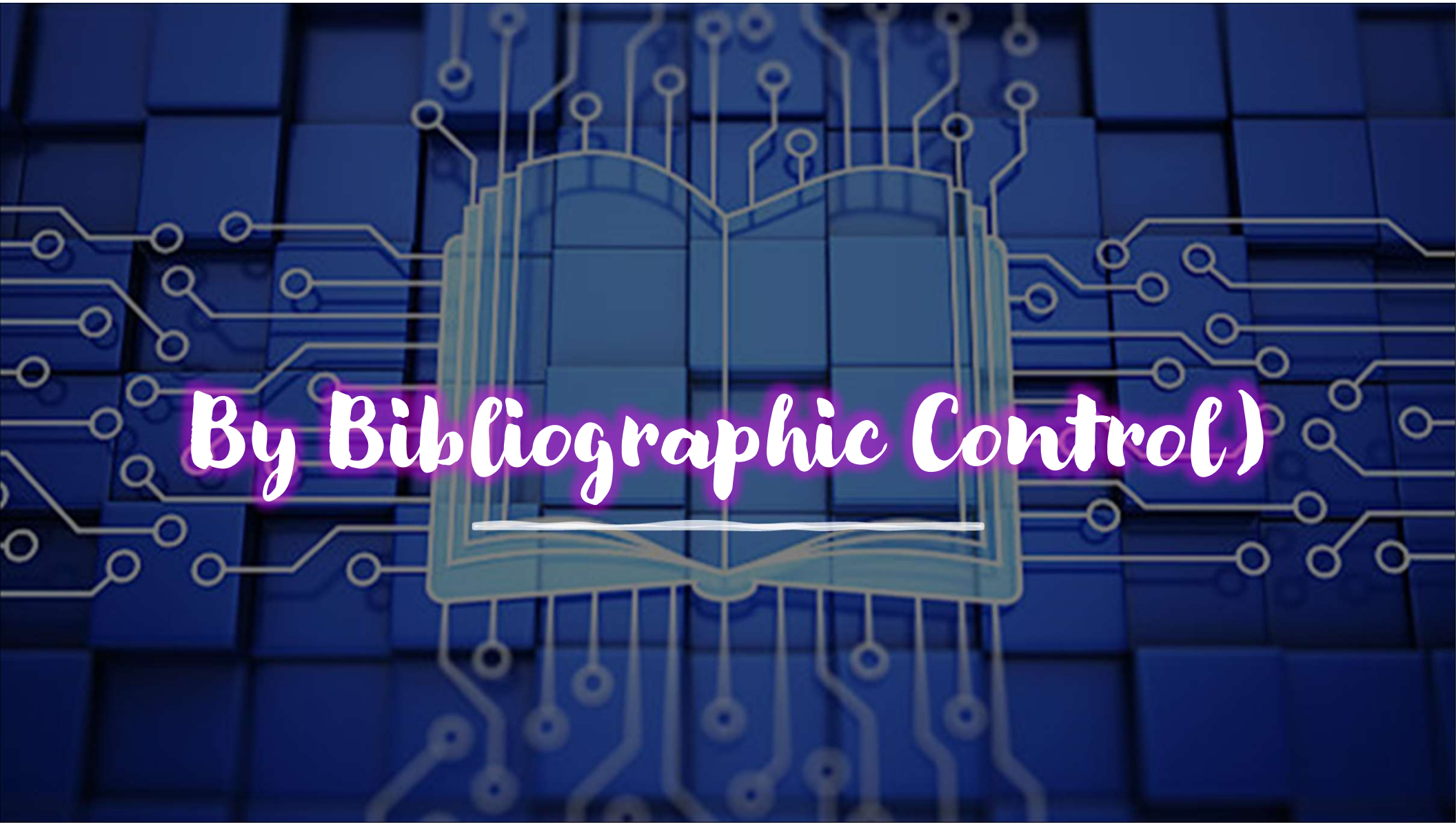


By Convolution Neural Networks




After all these ,
How Can Control These Generated Data?
11010
10101010


Or
Backing to the Main Question that has been Asked in IFLA WLIC 2014 !!!


By Bibliographic Control)

Did The Digital Tide Knock UBC Out?"

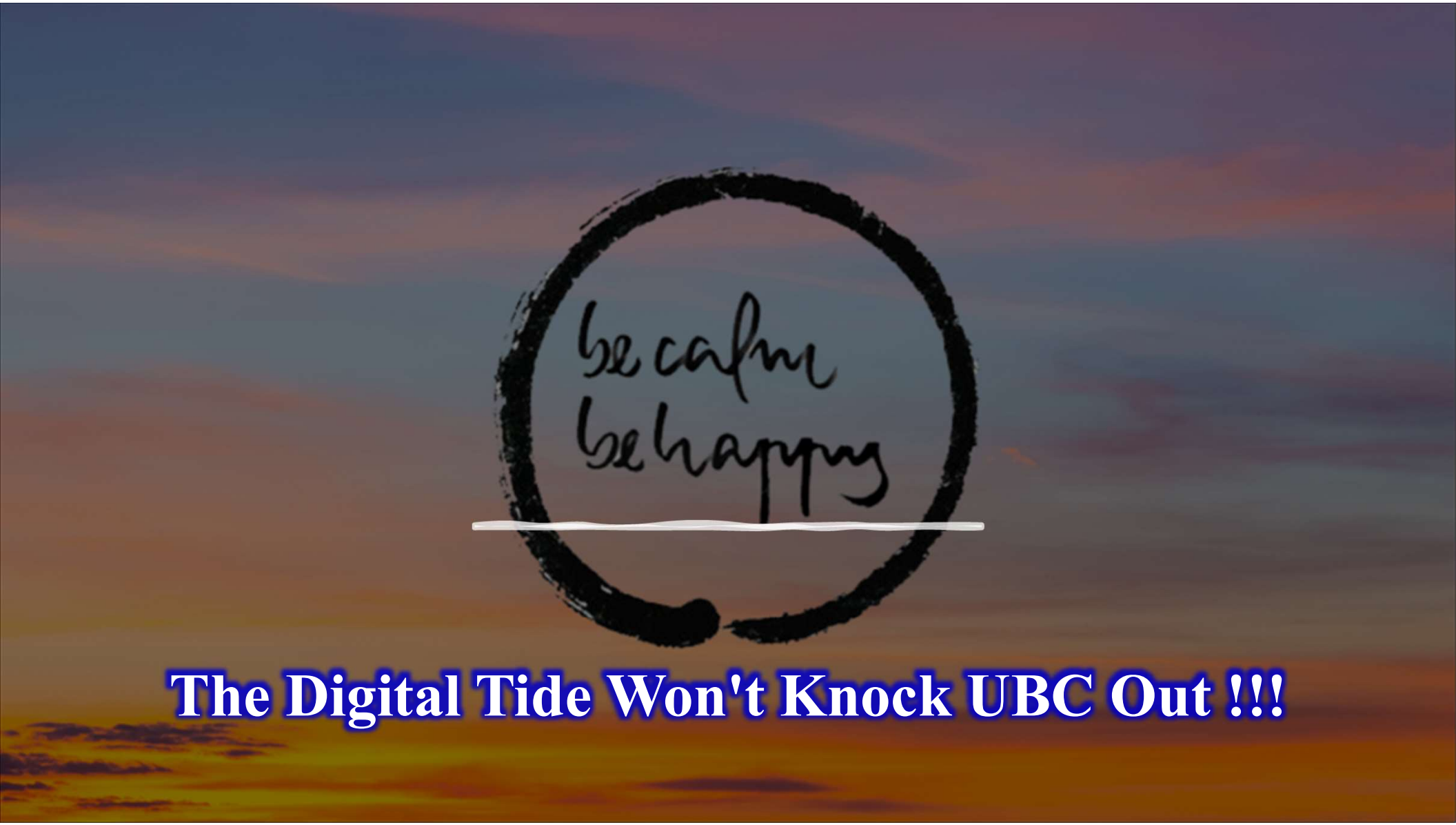

Metadata Management Tools Market Size, By Region, 2017 - 2029
(USD Billion)
6.26
2017
2018
2019
2020
2021
2022
2023
2024
2025
2026
2027
2028
2029
North America
Europe
Asia Pacific
Latin America
Middle East & Africa
Source: Polaris Market Research Analysis

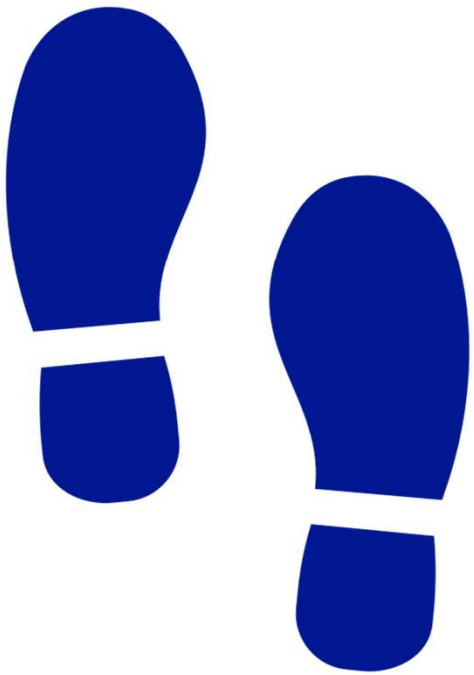
Bibliographic Control Still and will be Remains

- *Bibliographic control can play a role in generative AI in several ways:*
  - *It can help to identify and select relevant information resources. Generative AI systems need access to a large corpus of text in order to generate new text that is both coherent and meaningful. Bibliographic control can help to identify and select relevant information resources, such as books, articles, and websites.*
  - *It can help to describe and organize information resources. Bibliographic control systems provide a standardized way to describe information resources, such as their title, author, publication date, and subject matter. This can be helpful for generative AI systems to understand the content of information resources and to generate new text that is consistent with the style and tone of the resources.*
  - *It can help to track and manage information resources. Bibliographic control systems can help to track and manage information resources, such as their current location, ownership, and circulation status. This can be helpful for generative AI systems to ensure that they are using the most up-to-date information resources and to prevent plagiarism.*

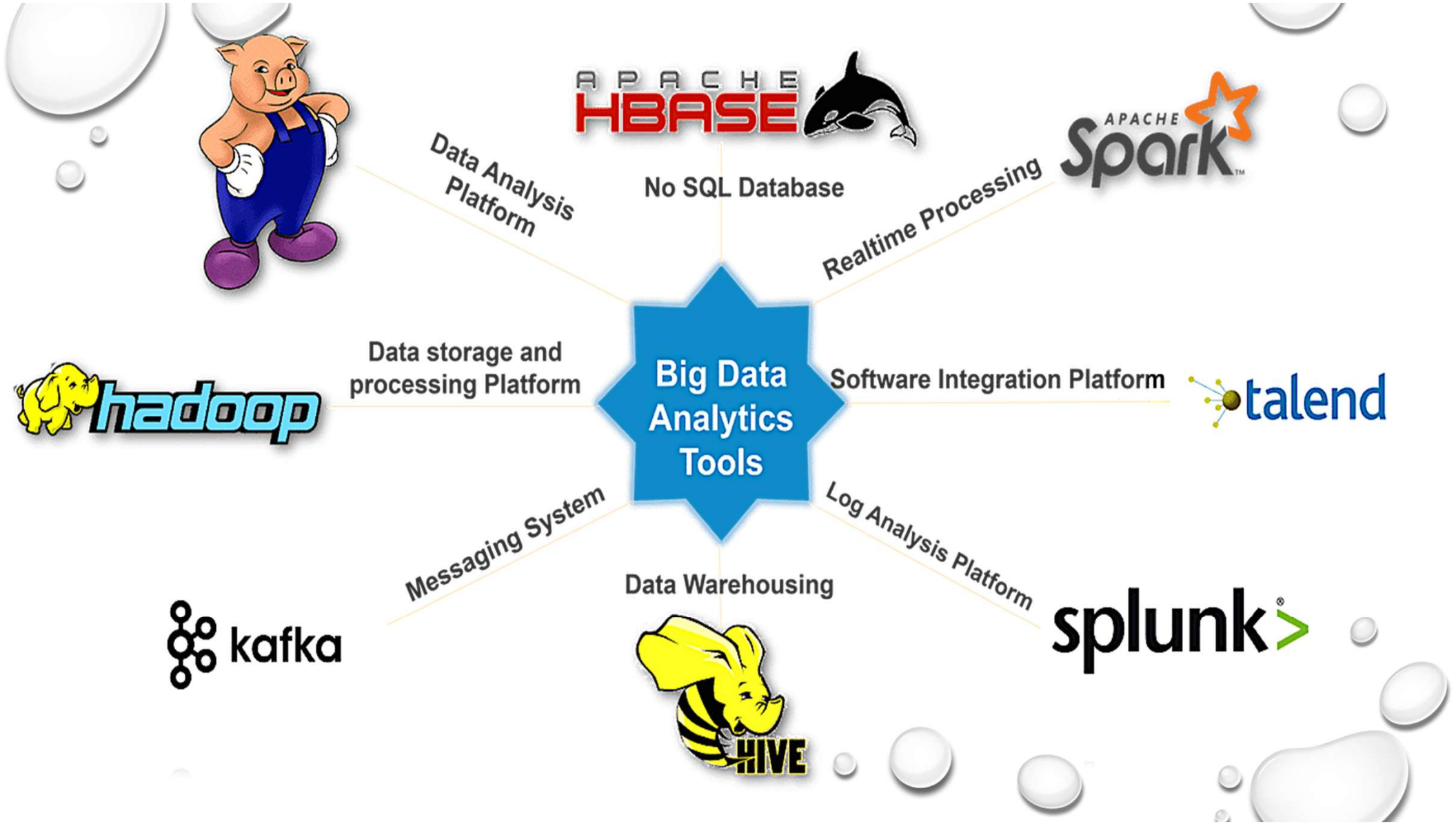
Bibliographic Control Still and will be Remains

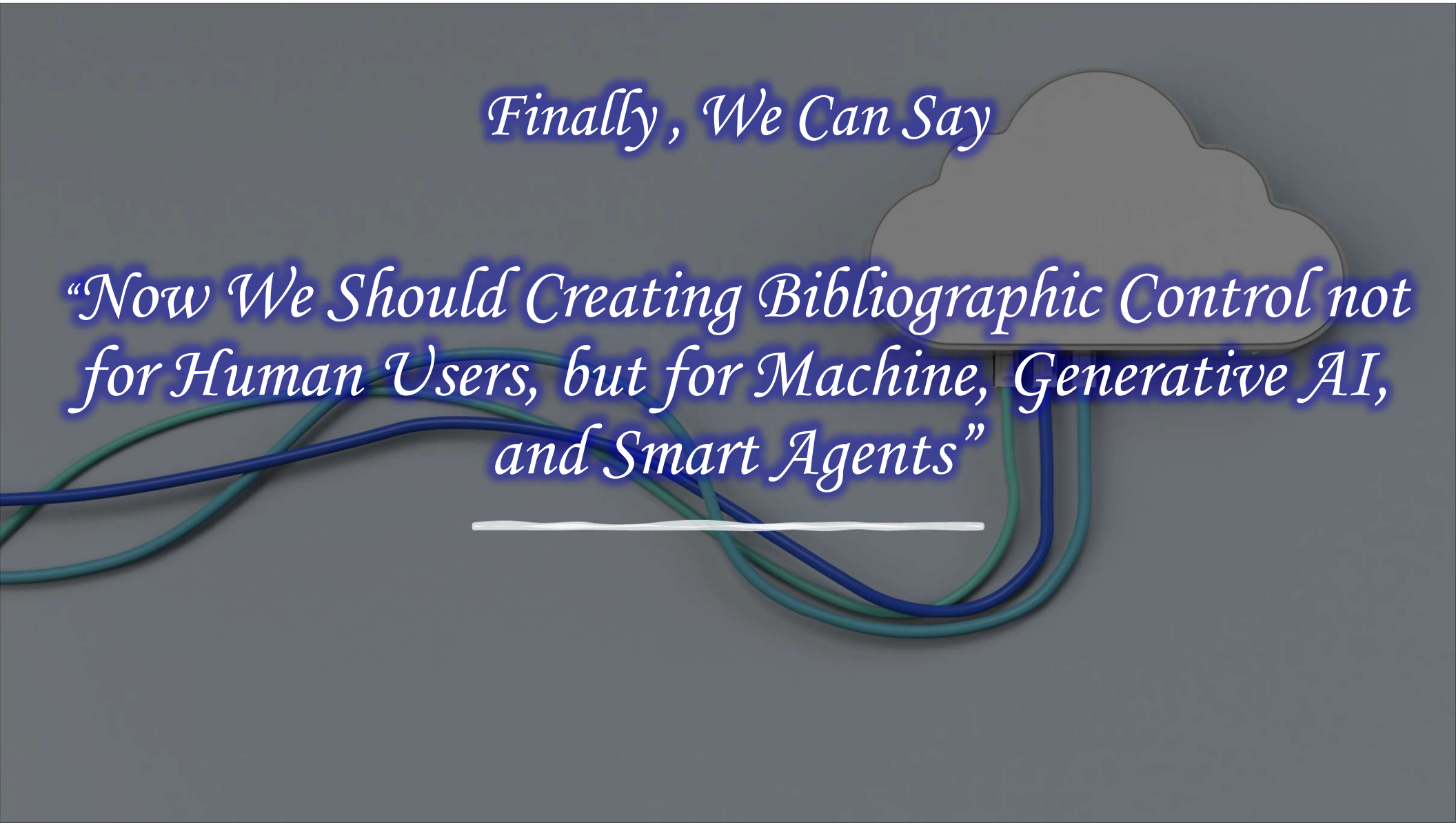
- *Here are some specific examples of how bibliographic control can be used in generative AI:*
- *A generative AI system could be used to write a news article about a recent scientific discovery.*
- *The system could use bibliographic control to identify and select relevant scientific papers that have been published on the discovery.*
- *The system could then use the information from these papers to generate a new article that is both accurate and informative.*
- *A generative AI system could be used to create a new poem.*
- *The system could use bibliographic control to identify and select relevant poems from different cultures and time periods.*
- *The system could then use the information from these poems to generate a new poem that is both creative and original.*
- *A generative AI system could be used to write a new business proposal. The system could use bibliographic control to identify and select relevant business reports and case studies.*
- *The system could then use the information from these resources to generate a new proposal that is both persuasive and feasible.*


be calm
be happy
The Digital Tide Won't Knock UBC Out !!!



But!!!
To Achieve that we need review our Bibliographic Tools to to include the following:


Big Data Analytics Tools
Data Analysis Platform
No SQL Database
Realtime Processing
Data storage and processing Platform
Software Integration Platform
Messaging System
Data Warehousing
Log Analysis Platform
APACHE HBASE
APACHE Spark
hadoop
talend
kafka
HIVE
splunk>

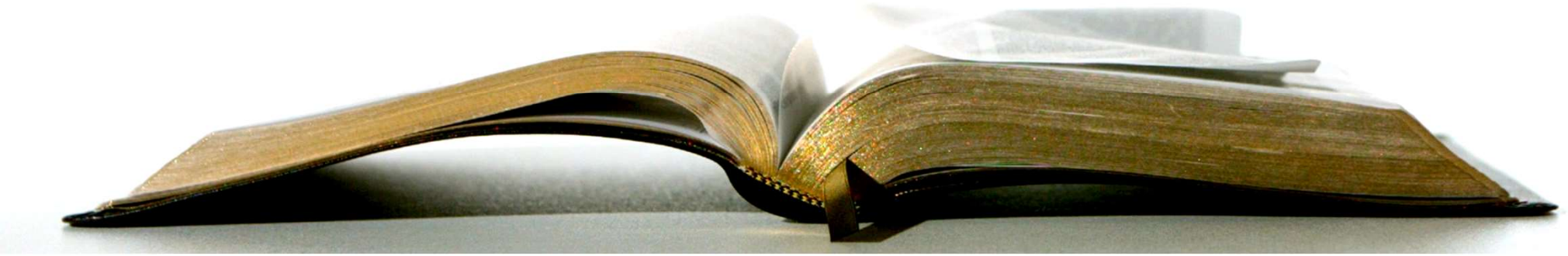

Finally , We Can Say
“Now We Should Creating Bibliographic Control not for Human Users, but for Machine, Generative AI, and Smart Agents”

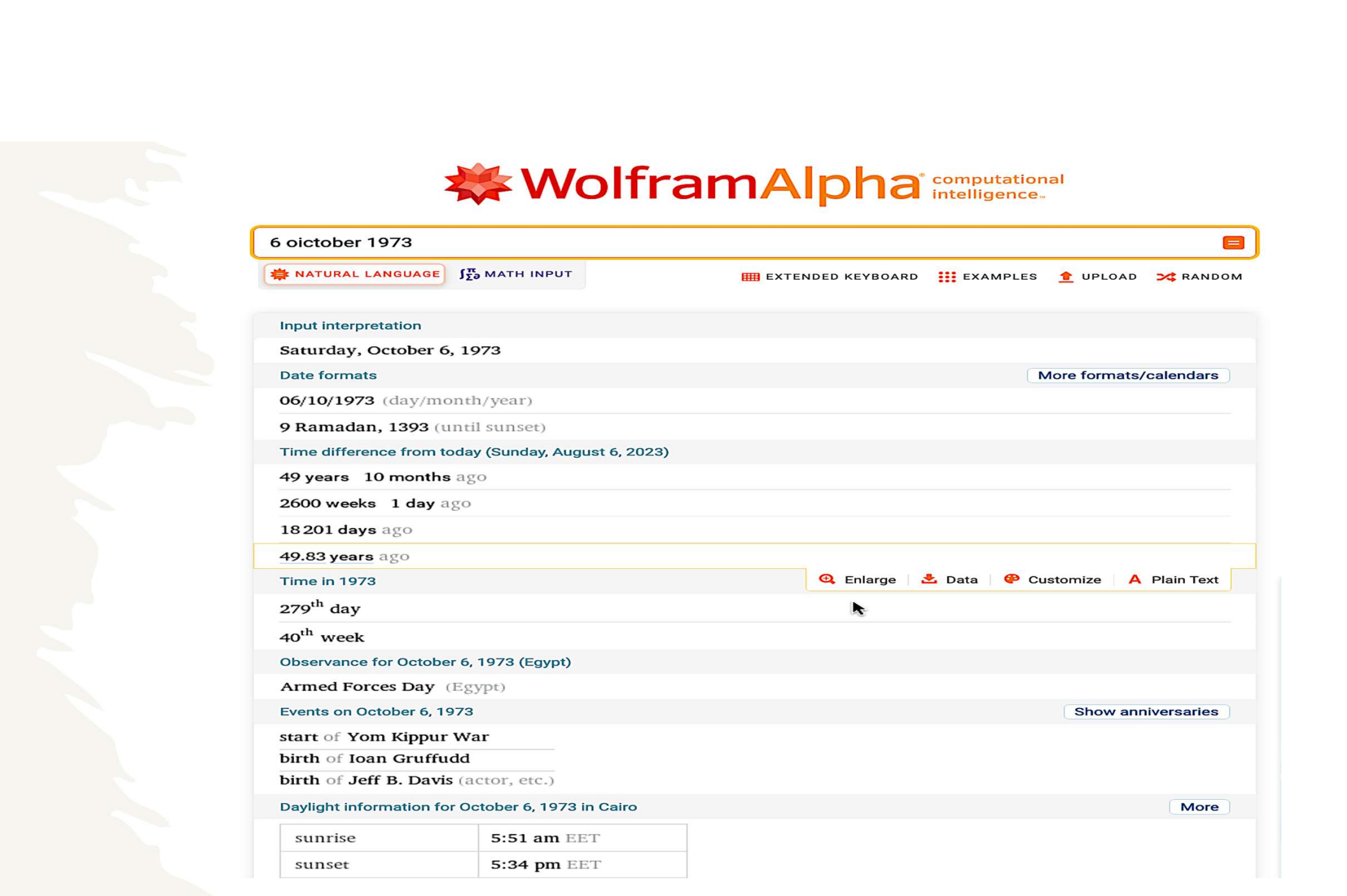

Based on Bibliographic Control, the
Generative AI Will Do …

Entities Extracting

In the 2010 World Cup of Soccer, the team from the Netherlands distinguished themselves well, losing to Spain 1-0 in the Final. Early in the second half, Dutch striker Arjen Robben almost changed the tide of the game on a breakaway, only to have the ball deflected by Spanish keeper, Iker Casillas. Near the end of regulation time, winger Andres Iniesta scored, winning Spain the World Cup.

Name	Position	Country
Arjen Robben	Striker	Netherlands
Iker Casillas	Goalkeeper	Spain
Andres Iniesta	Winger	Spain

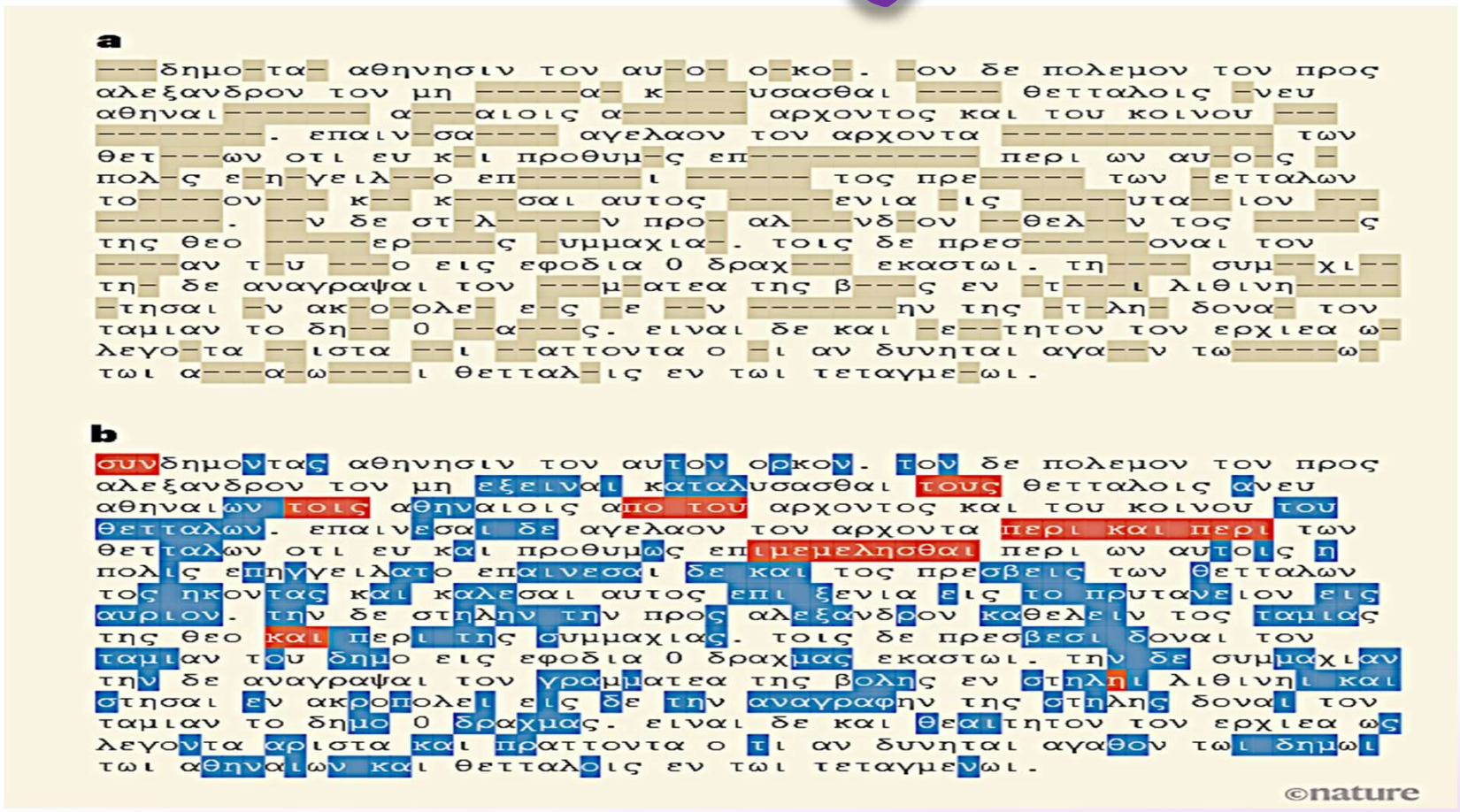



WolframAlpha computational intelligence
6 oictober 1973
NATURAL LANGUAGE
MATH INPUT
EXTENDED KEYBOARD
EXAMPLES
UPLOAD
RANDOM
Input interpretation
Saturday, October 6, 1973
Date formats
More formats/calendars
06/10/1973 (day/month/year)
9 Ramadan, 1393 (until sunset)
Time difference from today (Sunday, August 6, 2023)
49 years 10 months ago
2600 weeks 1 day ago
18 201 days ago
49.83 years ago
Time in 1973
Enlarge
Data
Customize
Plain Text
279th day
40th week
Observance for October 6, 1973 (Egypt)
Armed Forces Day (Egypt)
Events on October 6, 1973
Show anniversaries
start of Yom Kippur War
birth of Ioan Gruffudd
birth of Jeff B. Davis (actor, etc.)
Daylight information for October 6, 1973 in Cairo
More
sunrise
5:51 am EET
sunset
5:34 pm EET

Smart OCR

Image Restorations

Fill Missing Parts



Detecting Text, Images...etc


Generate by Metadata

Generate Images Doesn't Exist based on Metadata.

Untitled2.ipynb

File Edit View Insert Runtime Tools Help All changes saved

+ Code + Text

```
import torch
# Initialize a prompt
prompt =" a Library"
# Pass the prompt in the pipe line
pipe(prompt).images[0]
```

100% 50/50 [29:48<00:00, 34.92s/it]

5s

Untitled2.ipynb

File Edit View Insert Runtime Tools Help

+ Code + Text

```
!pip install --upgrade huggingface_hub
```

```
[17] from huggingface_hub import notebook_login
     notebook_login()
```

Token is valid (permission: read).

Your token has been saved in your configured git credential helpers (store).

Your token has been saved to /root/.cache/huggingface/token

Login successful

```
[18] !pip install -qq -U diffusers transformers
```

```
[20] from diffusers import StableDiffusionPipeline
     pipe = StableDiffusionPipeline.from_pretrained('runwayml/stable-diffusion-v1-5')
```

Downloading (…)ain/model_index.json: 100% 541/541 [00:00<00:00, 8.52kB/s]

Downloading (…)rocessor_config.json: 100% 342/342 [00:00<00:00, 2.96kB/s]

Fetching 15 files: 100% 15/15 [01:07<00:00, 5.32s/it]

Downloading (…)_checker/config.json: 100% 4.72k/4.72k [00:00<00:00, 41.0kB/s]

Downloading (…)_encoder/config.json: 100% 617/617 [00:00<00:00, 7.91kB/s]

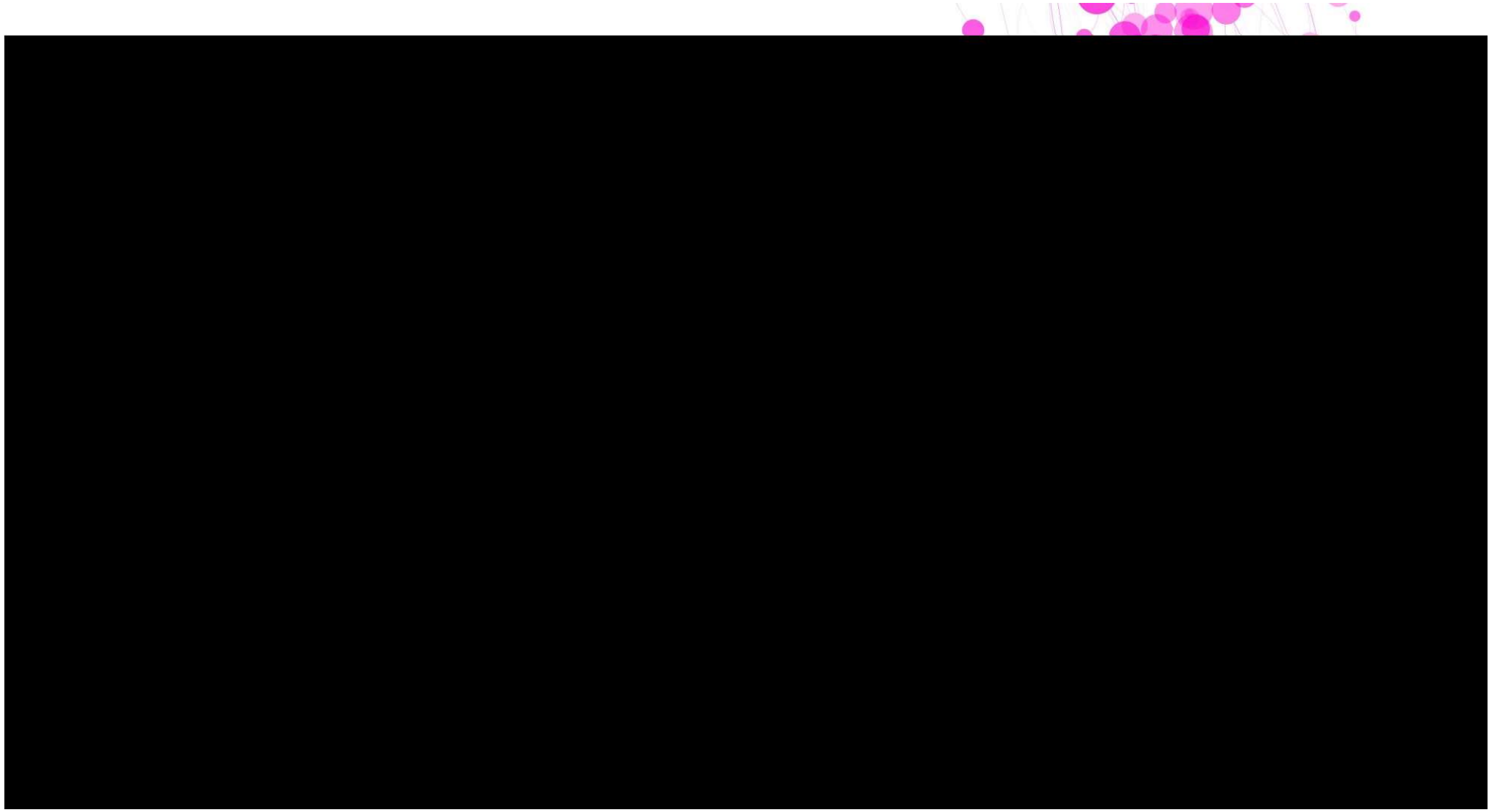
Downloading (…)cheduler_config.json: 100% 308/308 [00:00<00:00, 2.41kB/s]

Downloading (…)tokenizer/merges.txt: 100% 525k/525k [00:00<00:00, 2.52MB/s]

Downloading (…)7f0/unet/config.json: 100% 743/743 [00:00<00:00, 4.98kB/s]

Downloading (…)okenizer_config.json: 100% 806/806 [00:00<00:00, 4.31kB/s]

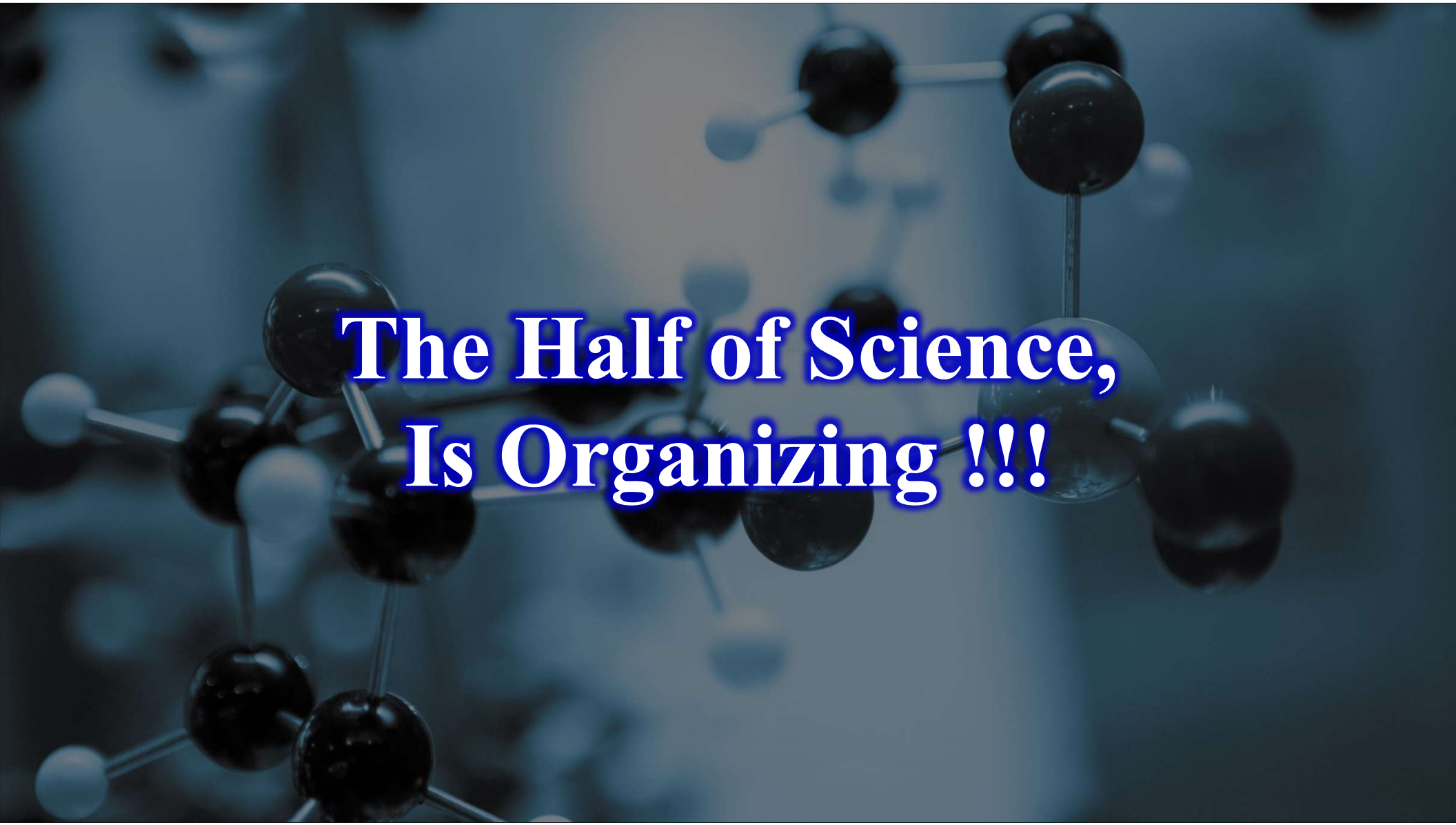
Executing (7s) <cell line: 5> > decorate_context() > __call__() > _call_impl() > forward() > _call_impl() > forward() > _call_impl() > forward() > _call_impl() > forward() > _ca



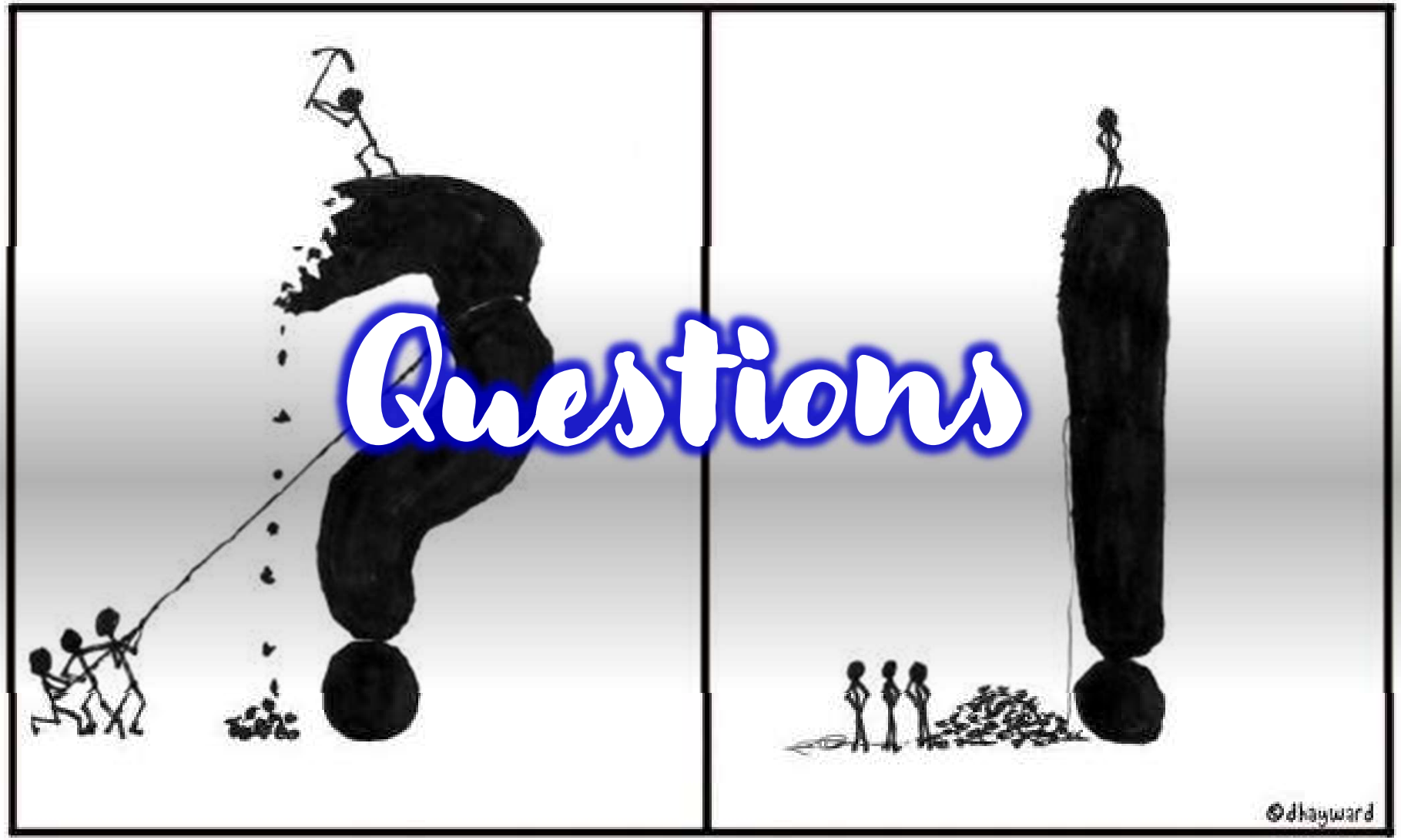
So, We Have Opportunity; Interruption Makes to..

The Final Advice


The Faster We Adapt,
The Faster We Escape
Extinction


The Half of Science,
Is Organizing !!!


Thank you for
Listening


Questions
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