MIS 4596

Data Privacy

Class 4

Agenda

- Milestone Teams
- Online privacy
- Privacy and data protection by design
  - Data provenance and data lineage
  - Data lineage metadata and its processing
  - Audit of SCE’s enterprise information processing
  - Metadata processing enables data privacy by design
- Lab: Web Privacy and Anonymity

Milestone Teams

Full Name	Email Address	Team
Bartolome, AJ Delfin	tuj60206@temple.edu	1
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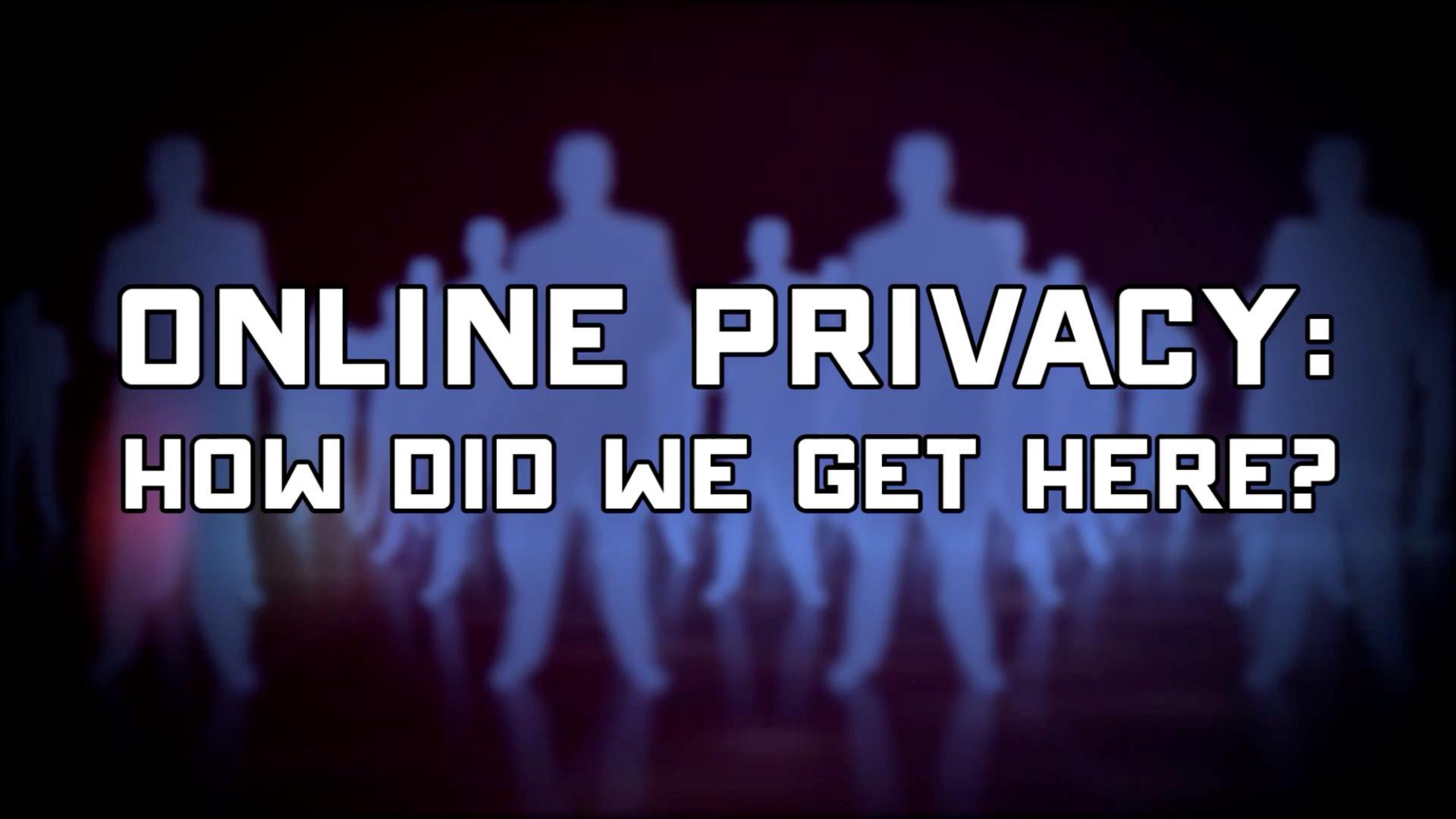

ONLINE PRIVACY:
HOW DID WE GET HERE?

California Consumer Privacy Act (CCPA, 2018)
&
California Privacy Rights Act (CPRA, 2020)

California voters approve Prop. 24, ushering in new rules for online privacy

CORONAVIRUS AND PANDEMIC ›

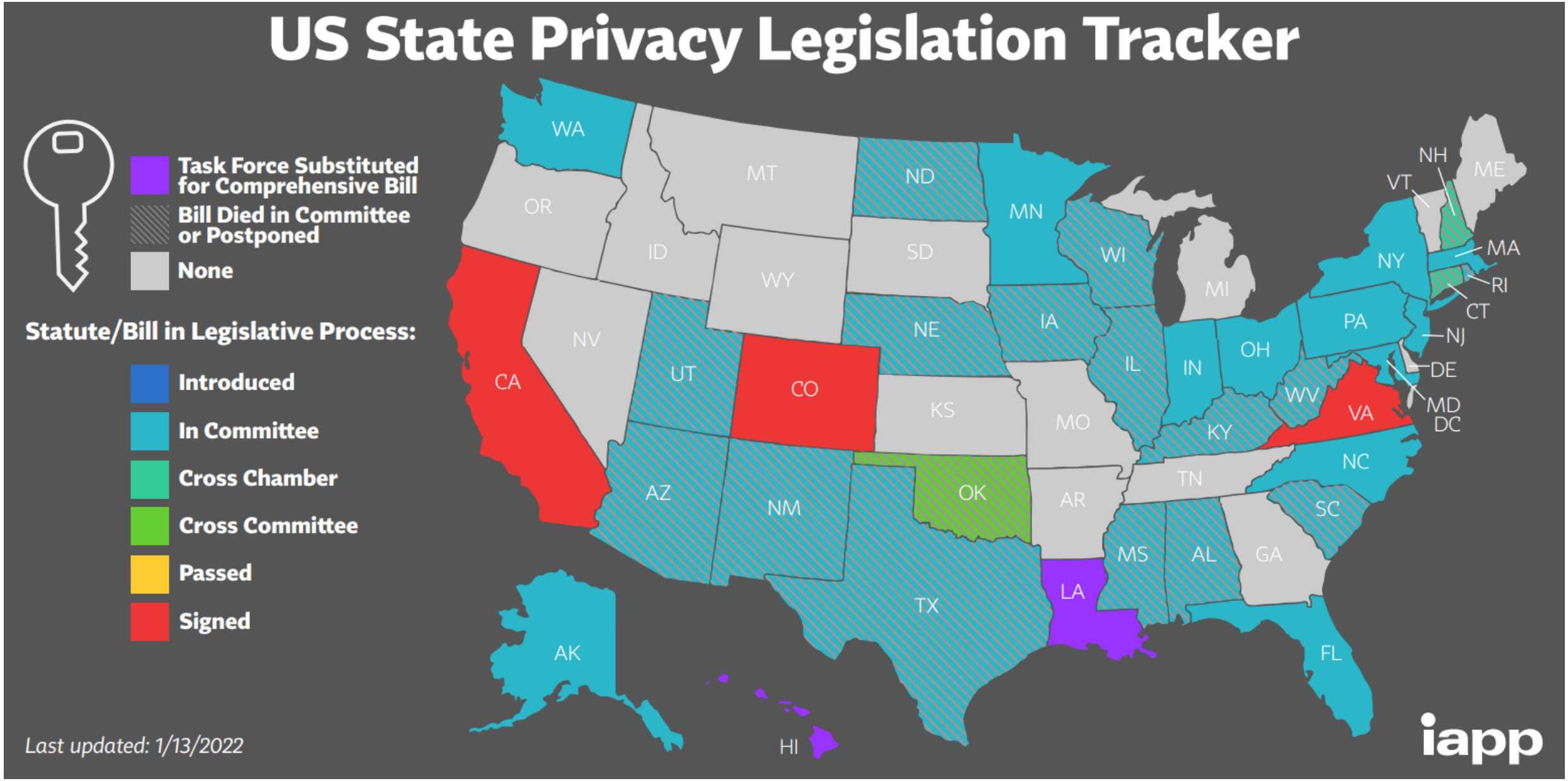
Concordia University coronavirus ‘outbreak’ attributed to more than 50 ‘false positives’

Are L.A. County’s new COVID restrictions rea necessary? We talk to the experts

Coronavirus infections are higher than ever, COVID-19 deaths are not. Why?

State Data Privacy Laws in Effect

- **California Consumer Privacy Act (CCPA) – Effective date: 1/1/2020**
- California Privacy Rights Act (CPRA) – Effective date: 1/1/2023
- Colorado Privacy Act (CPA) – Effective date: 1/1/2023
- Virginia Consumer Data Protection Act – Effective date: 1/1/2023



https://iapp.org/media/pdf/resource_center/State_Comp_Privacy_Law_Map.pdf
https://iapp.org/resources/article/us-state-privacy-legislation-tracker/

Hilton Hotels fined for credit card data breaches

1 November 2017

Share

Top Sto

Ex-Marine bar attack

The bar was country mus opened fire,

1 hour ag

US Supre ribs

3 hours ag

Russia pr Democrat

2 hours ag

Feature

Hilton Hotels fined for credit card data breaches

1 November 2017

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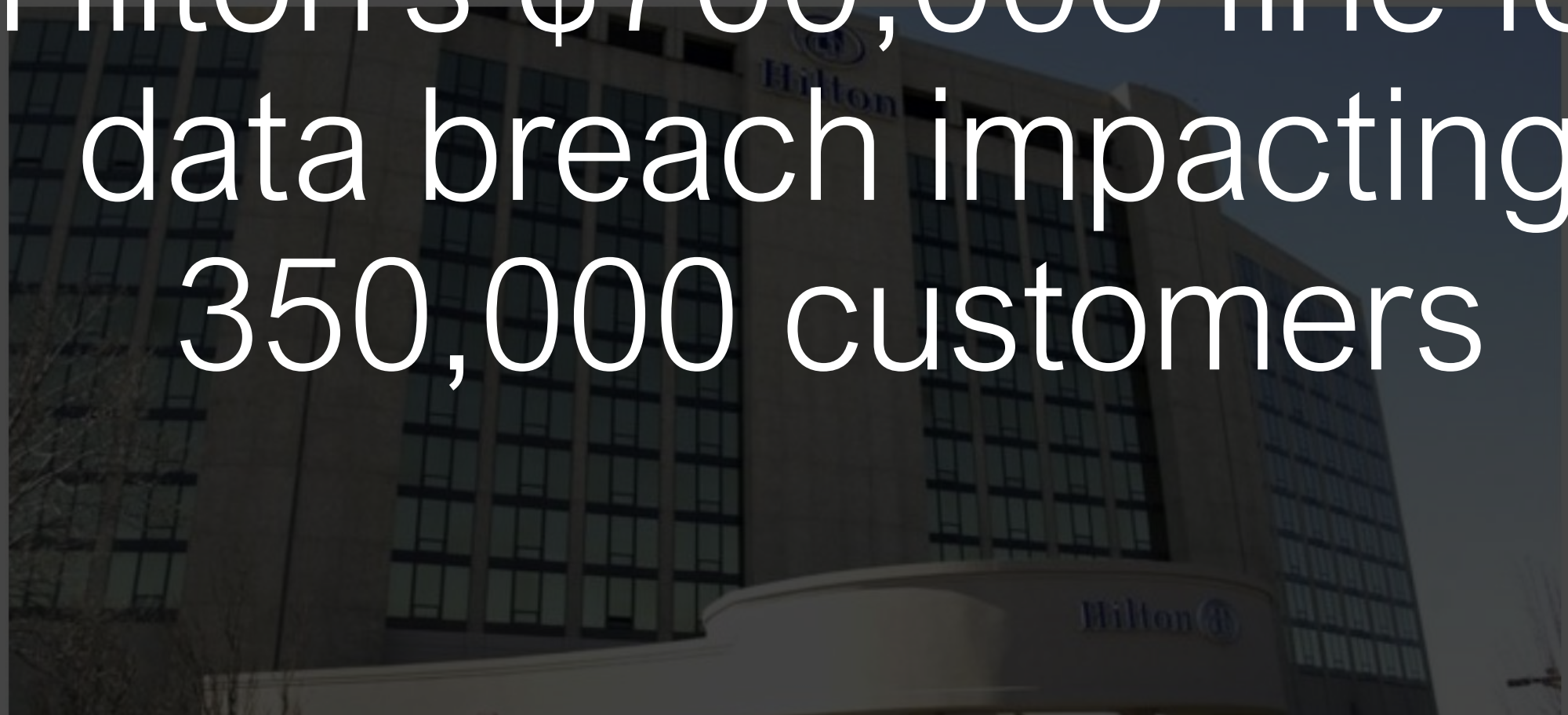
Hilton's $700,000 fine for data breach impacting 350,000 customers



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Feature

Under the European Union's General Data Protection Regulation (GDPR) the fine would have been 4% of Hilton's global revenue ($420 million)

GDPR requires *data security by design and default…*

Data protection capabilities must work from beginning to end of data processing to enable protection of individuals' personal data by default

Art. 25 GDPR

Data protection by design and by default

(1) Taking into account the state of the art, the cost of implementation and the nature, scope, context and purposes of processing as well as the risks of varying likelihood and severity for rights and freedoms of natural persons posed by the processing, the controller shall, both at the time of the determination of the means for processing and at the time of the processing itself, implement appropriate technical and organisational measures, such as pseudonymisation, which are designed to implement data-protection principles, such as data minimisation, in an effective manner and to integrate the necessary safeguards into the processing in order to meet the requirements of this Regulation and protect the rights of data subjects.

(2) The controller shall implement appropriate technical and organisational measures for ensuring that, by default, only personal data which are necessary for each specific purpose of the processing are processed. That obligation applies to the amount of personal data collected, the extent of their processing, the period of their storage and their accessibility. In particular, such measures shall ensure that by default personal data are not made accessible without the individual's intervention to an indefinite number of natural persons.

(3) An approved certification mechanism pursuant to Article 42 may be used as an element to demonstrate compliance with the requirements set out in paragraphs 1 and 2 of this Article.

Danezis, G. et al. (2014) "Privacy and Data Protection by Design", European Union Agency for Network and Information Security (ENISA)

D' Acquisto, G. et al. (2015) "Privacy by design in big data", European Union Agency for Network and Information Security (ENISA)

Key General Data Protection Regulation (GDPR) requirements:

1. **Collection** of personal data is **fully avoided or minimized** at the earliest stage of processing
2. Data subjects give **specific, informed and explicit consent** to the processing of their data
3. Data subjects have **right to access, review and rectify** their personal data
4. Data subjects have the **right to withdraw given consent** with effect for the future and
   - Block access
   - Constrain processing and use
   - Erase their personal data
5. Personal **data obtained for one purpose must not be processed for other purposes** not compatible with the original purpose

Achieving “Privacy by Design” is difficult

Privacy is a complex, multifaceted and contextual notion

Not the primary requirement of an information system

May come into conflict with other requirements

> “…privacy and data protection features are… ignored by traditional engineering approaches when implementing desired functionality.
>
> - *This ignorance is caused by limitations of awareness and understanding of developers and data controllers as well as lacking tools to realize privacy by design”*

Danezis, G. et al. (2014) “Privacy and Data Protection by Design”, European Union Agency for Network and Information Security (ENISA)

Privacy and Data Protection by Design

"Although the concept has found its way into legislation as the… European General Data Protection Regulation, **its concrete implementation remains un-clear at the present moment**"

Danezis, G. et al. (2014) "Privacy and Data Protection by Design", European Union Agency for Network and Information Security (ENISA)

Some challenging data protection requirements may be solved with techniques presented in this webinar…

1. **Collection** of personal data is **fully avoided or minimized** at the earliest stage of processing
2. Data subjects give **specific, informed and explicit consent** to the processing of their data
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   - Erase their personal data
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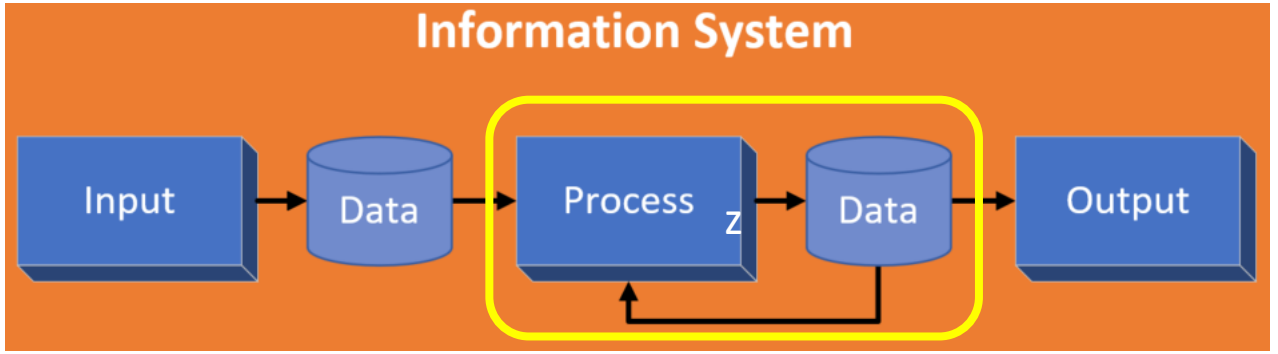
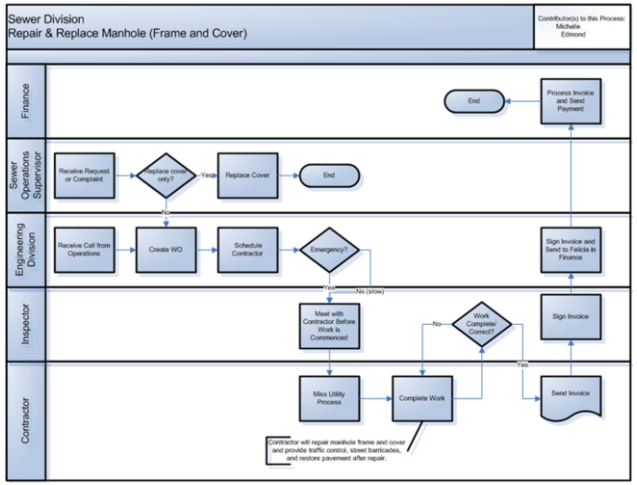
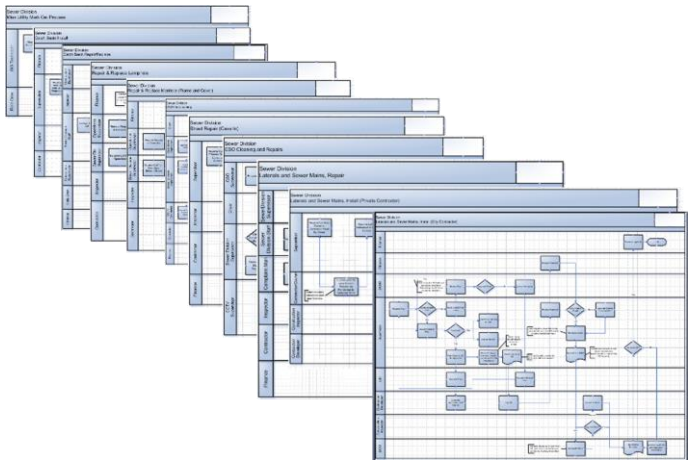
As a practical matter…

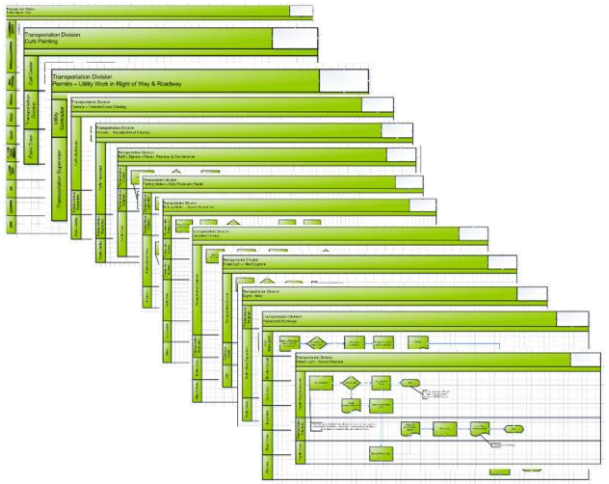
Data within information systems are often stored and organized as datasets within files and/or databases…



Regardless of application, there is reliance on data processing workflows to produce and use information

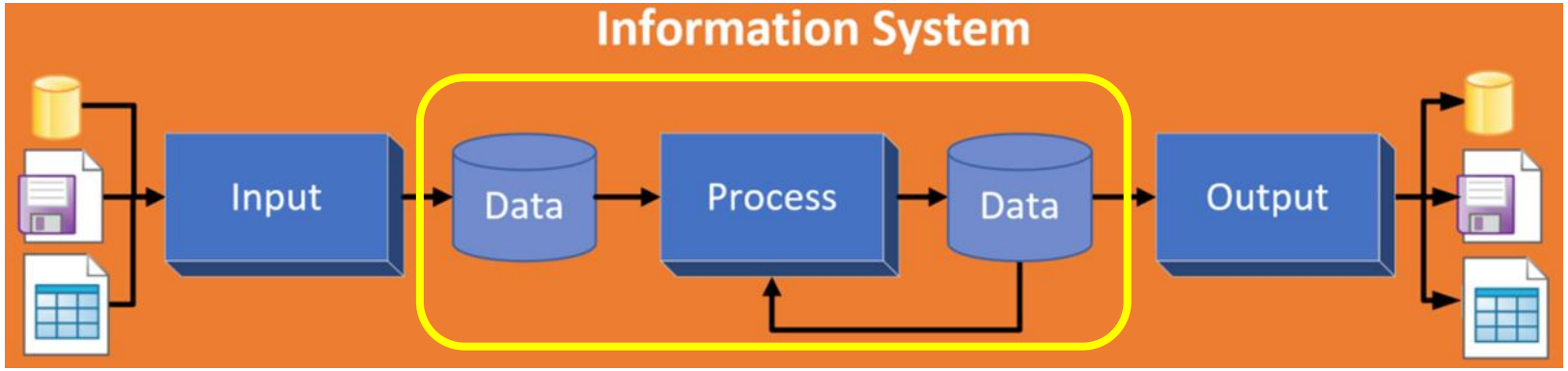




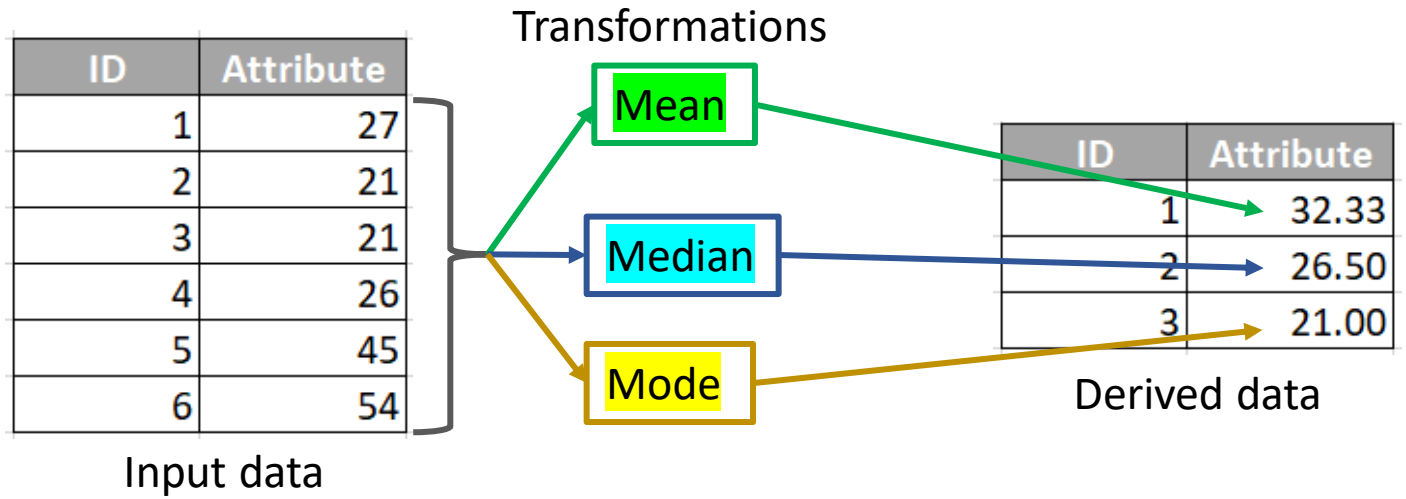


Data processing often transforms existing data into new data, which is a double-edged sword…

- *The resulting database may have more information than the older version*



- *The **meaning** of the new information, however, **is exogenous and not found in the data itself***



ID	Attribute
1	27
2	21
3	21
4	26
5	45
6	54

ID	Attribute
1	32.33
2	26.50
3	21.00

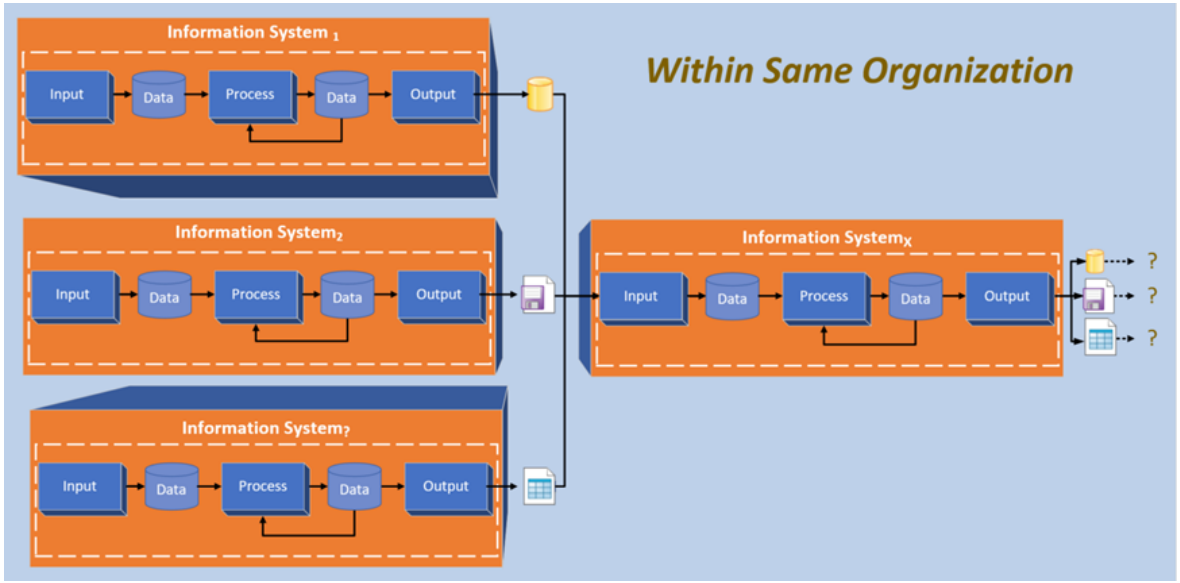
Evaluating & judging data's "fitness for use"

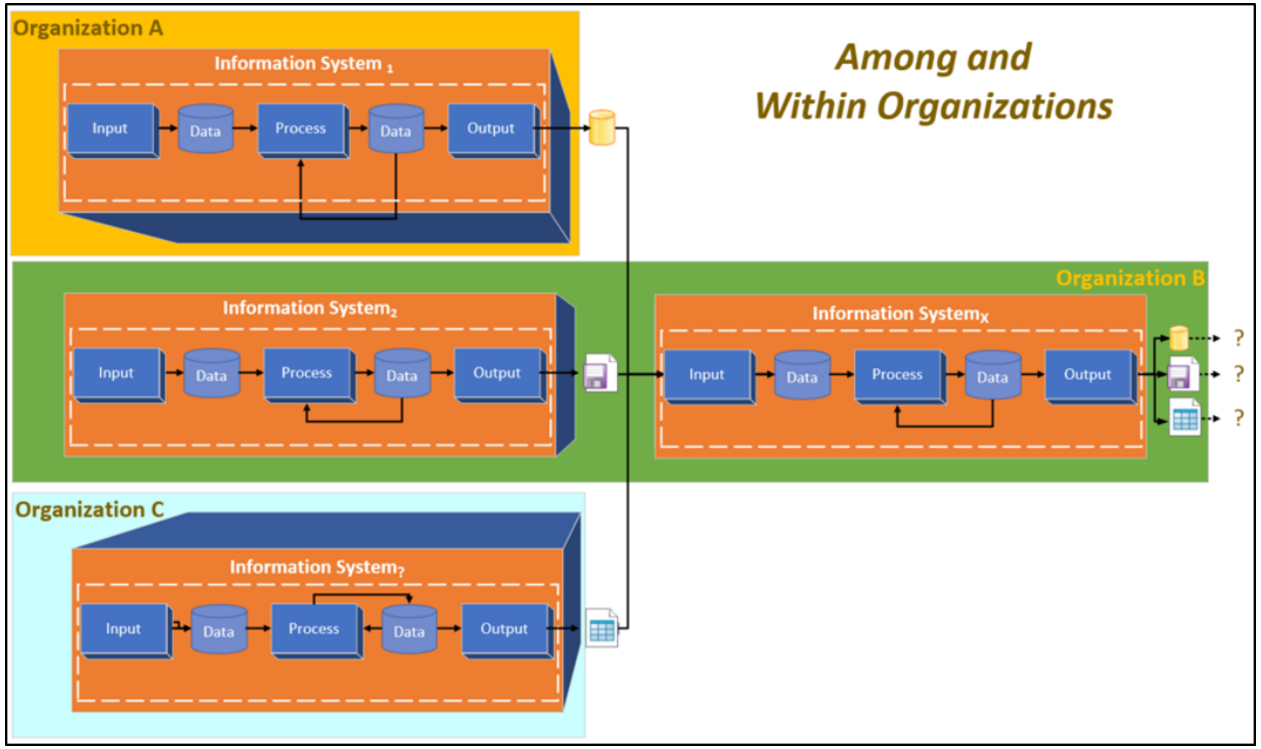
- **Is not the responsibility of the producer**
- **Is the responsibility of the user …and IT Auditor**

Data produced for one purpose is often used to serve other purposes

Data producers should provide information about data that permit informed determinations of fitness for use

Datasets are often exchanged without information needed to determine their fitness for use…





Provenance

Provenance traces back to 1294 in Old French as a derivative of the Latin *provenire*

- *To come from, to be due to, be the result of*

In the art domain, provenance entails an artifact's complete ownership history

The Bridge at Villeneuve-la-Garenne
1872
by Alfred Sisley British

Traditional Provenance

Durand-Ruel, Paris, August 23, 1872 [1];
Catholina Lambert, New Jersey;
Lambert sale, American Art Association, Plaza Hotel, New York, NY,
February 21, 1916 until February 24, 1916, no. 67;
Durand-Ruel, Paris, until at least 1930;
purchased by Simon Bauer, Paris, by June 1936 [2];
anonymous sale, Parke-Bernet Galleries, Inc., February 25, 1970, no. 19 [3];
Sam Salz, Inc., New York, NY;
purchased by Museum, May 1971.

Notes:
[1] bought from the artist.
[2] Listed and illustrated in "List of Property Removed from France during the War 1939-1945" (no. 7114, as belonging to Simon Bauer).
[3] "Highly Important Impressionist, Post-Impressionist & Modern Paintings and Drawings", illustrated.

Standardizing Museum Provenance — David Newbury *(@workergnome)*

Newbury, D. (2017) "Standardizing Museum Provenance for the Twenty-First Century", from talk given at the Yale Center for British Art

There is an established research process for obtaining an artifact's trusted provenance

- *This information is highly valued, particularly to authenticate real versus fraudulent works*

"Provenance" is now increasingly used in a broad range of fields with various degrees of conflation of two closely related but distinct concepts of *trust* and *metadata*

Tullis, J.A. et al., 2016, "Geoprocessing, Workflows, and Provenance", in Remote Sensing Handbook: Remotely Sensed Data Characterization, Classification, and Accuracies, edited by P. Thenkabail, Vol. 1., pp. 401-422, Boca Raton, FL: CRC Press.

Provenance

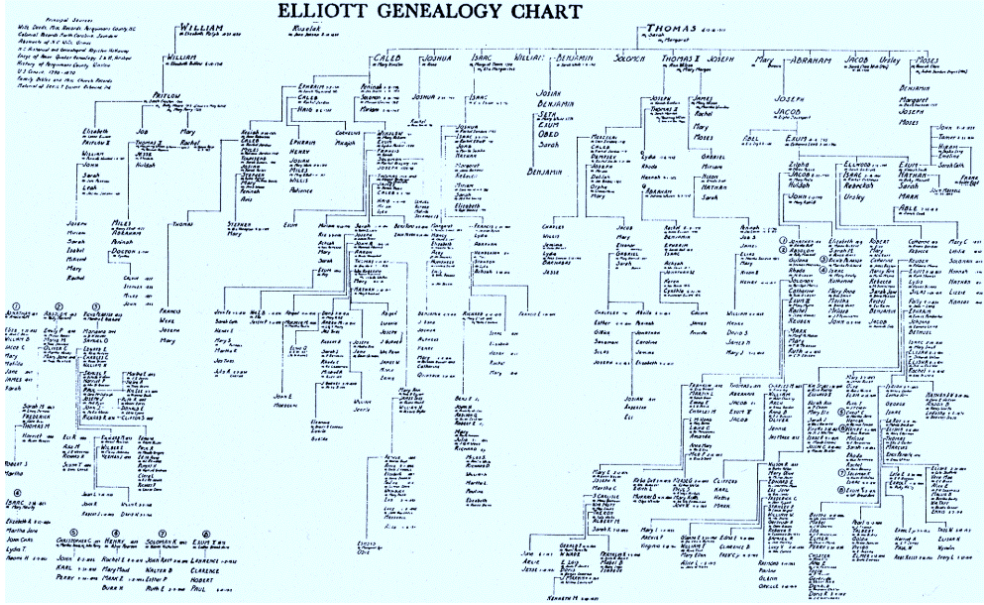
W3C Provenance Incubator Group's definition of provenance (in a web resource context):

- Provenance is a record that describes entities and processes involved in producing and delivering or influencing a resource
- Provenance provides a critical foundation for assessing authenticity, enabling trust, and allowing reproducibility
- Provenance assertions are contextual metadata that can become important records with their own provenance

https://www.w3.org/TR/prov-primer/

W3C = World Wide Web Consortium

Provenance and data lineage

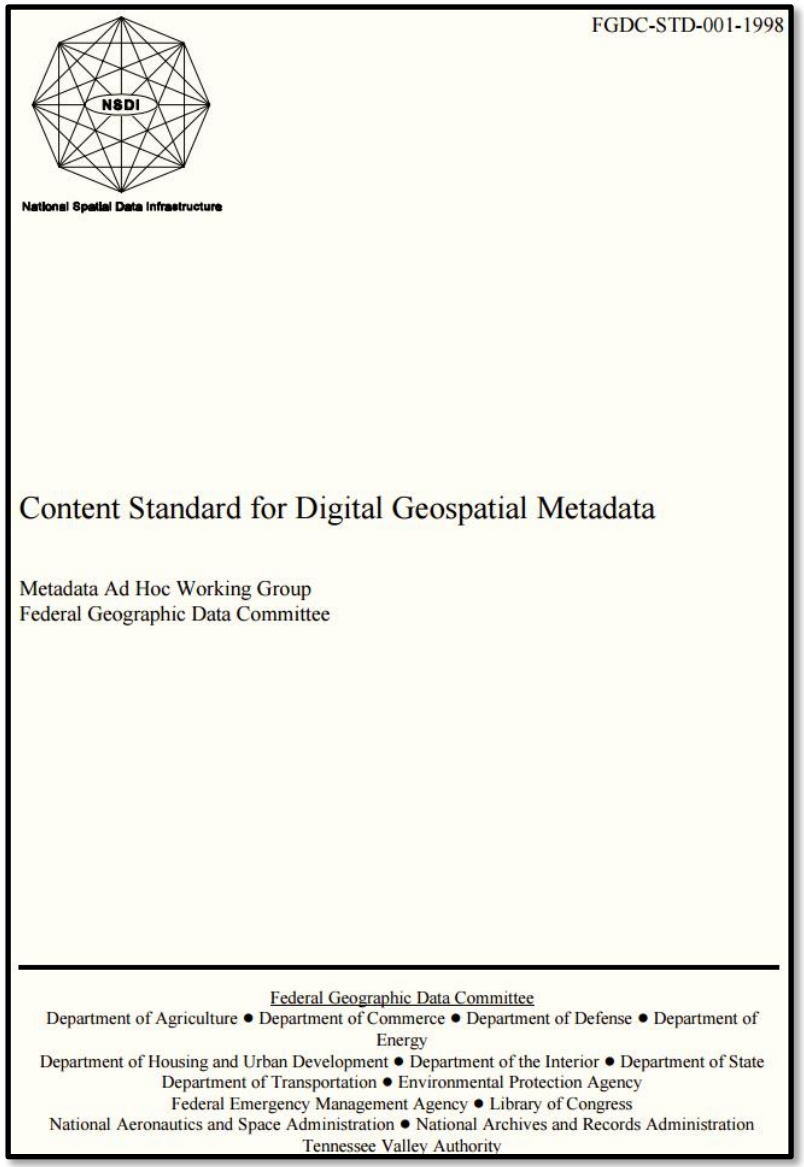


"Data provenance" and "data lineage" is used here interchangeably, overlooking subtle differences in their meanings

- Data provenance suggests process history
- Data lineage implies a kind of genealogy or data pedigree record relative to both:
  1. Sources of data
     +
  2. Processing applied to the sources to produce an information product

Data lineage metadata can aid understanding and establish trust of data…

Early metadata standards for documenting lineage of data produced with Geographic Information Systems



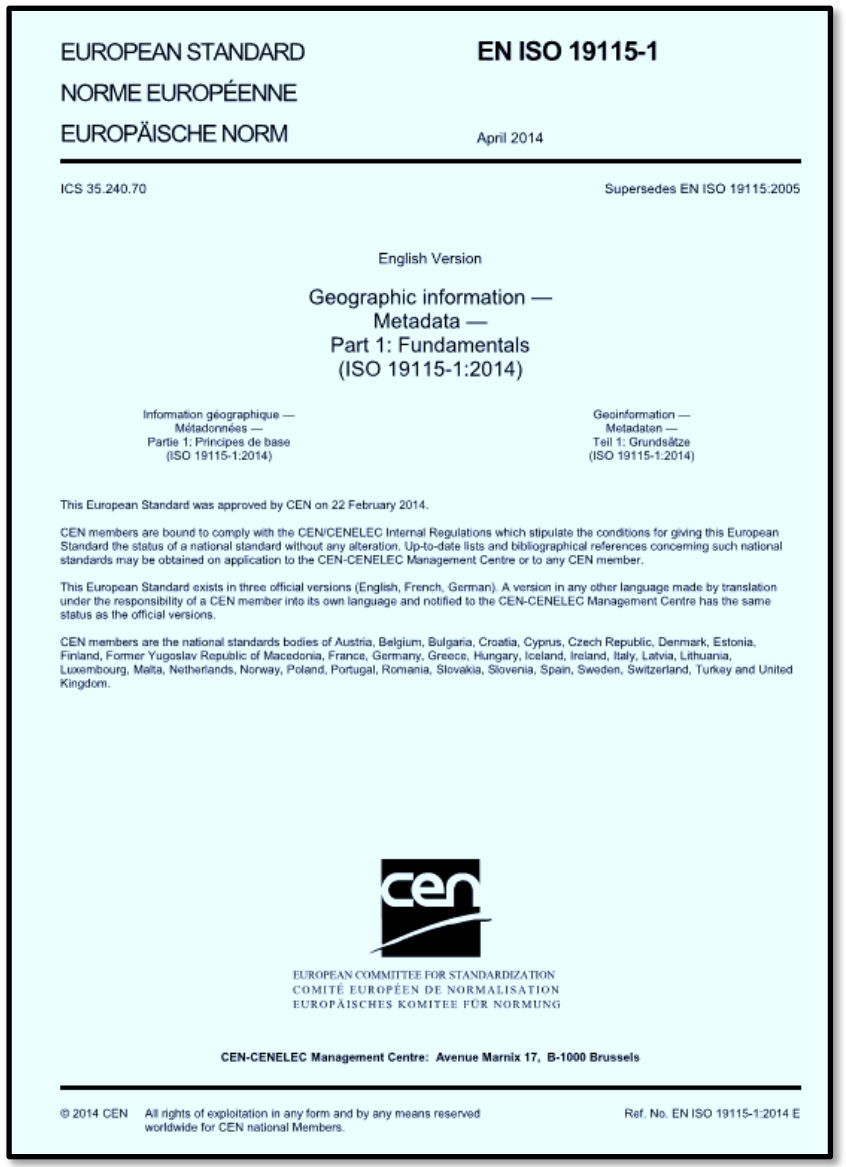
FGDC-STD-001-1998

National Spatial Data Infrastructure

Content Standard for Digital Geospatial Metadata

Metadata Ad Hoc Working Group
Federal Geographic Data Committee

Federal Geographic Data Committee
Department of Agriculture ● Department of Commerce ● Department of Defense ● Department of Energy
Department of Housing and Urban Development ● Department of the Interior ● Department of State
Department of Transportation ● Environmental Protection Agency
Federal Emergency Management Agency ● Library of Congress
National Aeronautics and Space Administration ● National Archives and Records Administration
Tennessee Valley Authority



EUROPEAN STANDARD
NORME EUROPÉENNE
EUROPÄISCHE NORM

EN ISO 19115-1

April 2014

ICS 35.240.70

Supersedes EN ISO 19115:2005

English Version

Geographic information — Metadata — Part 1: Fundamentals (ISO 19115-1:2014)

Information géographique — Métadonnées — Partie 1: Principes de base (ISO 19115-1:2014)

Geoinformation — Metadaten — Teil 1: Grundsätze (ISO 19115-1:2014)

This European Standard was approved by CEN on 22 February 2014.

CEN members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration. Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the CEN-CENELEC Management Centre or to any CEN member.

This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CEN member into its own language and notified to the CEN-CENELEC Management Centre has the same status as the official versions.

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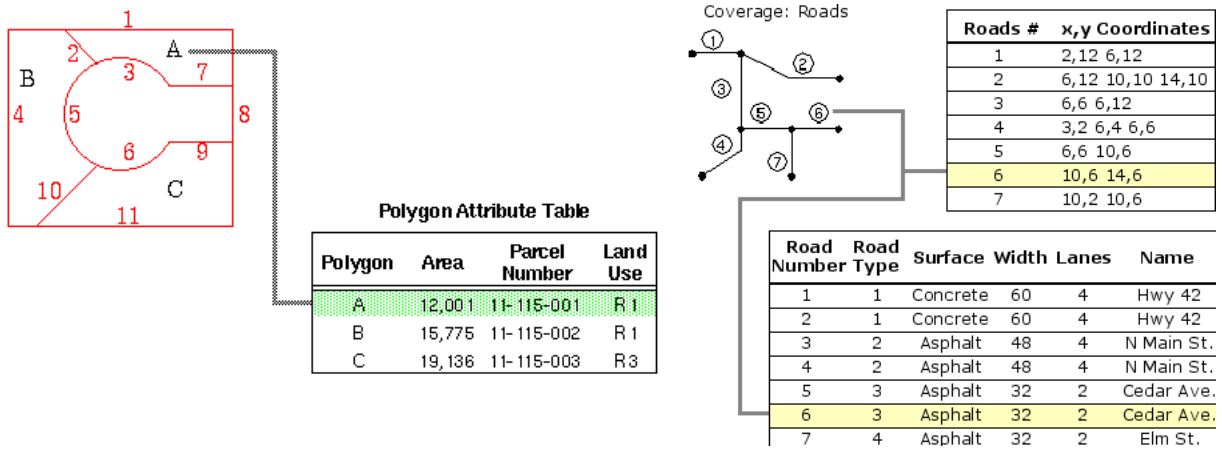
EUROPEAN COMMITTEE FOR STANDARDIZATION
COMITÉ EUROPÉEN DE NORMALISATION
EUROPÄISCHES KOMITEE FÜR NORMUNG

CEN-CENELEC Management Centre: Avenue Marnix 17, B-1000 Brussels

Ref. No. EN ISO 19115-1:2014 E

Geographic Information System (GIS)

- Provides similar data import, query, manipulation, analysis (e.g. statistics), reformat, display/visualization, output and report capabilities as other information systems
- Also organize their data in
  - Data base management systems
  - File systems



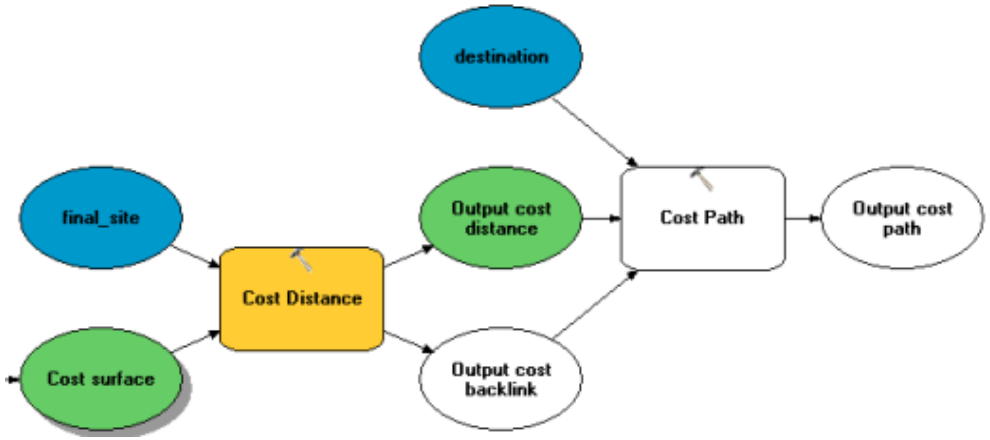
Polygon Attribute Table

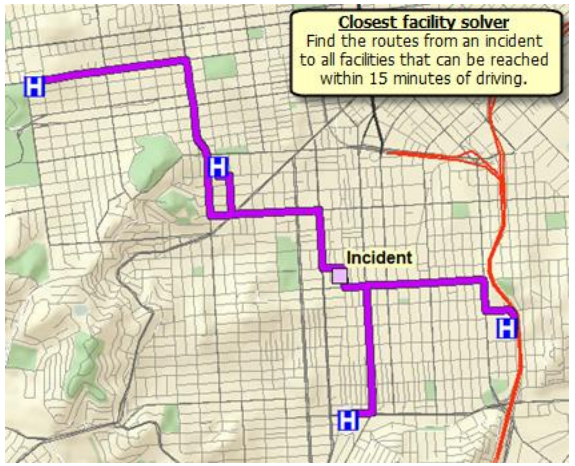
Polygon	Area	Parcel Number	Land Use
A	12,001	11-115-001	R1
B	15,775	11-115-002	R1
C	19,136	11-115-003	R3

Roads #	x,y Coordinates
1	2,12 6,12
2	6,12 10,10 14,10
3	6,6 6,12
4	3,2 6,4 6,6
5	6,6 10,6
6	10,6 14,6
7	10,2 10,6

Road Number	Road Type	Surface	Width	Lanes	Name
1	1	Concrete	60	4	Hwy 42
2	1	Concrete	60	4	Hwy 42
3	2	Asphalt	48	4	N Main St.
4	2	Asphalt	48	4	N Main St.
5	3	Asphalt	32	2	Cedar Ave.
6	3	Asphalt	32	2	Cedar Ave.
7	4	Asphalt	32	2	Elm St.

- With the addition of spatial analysis and cartographic mapping capabilities





FGDC-STD-001-1998

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Department of Agriculture ● Department of Commerce ● Department of Defense ● Department of Energy
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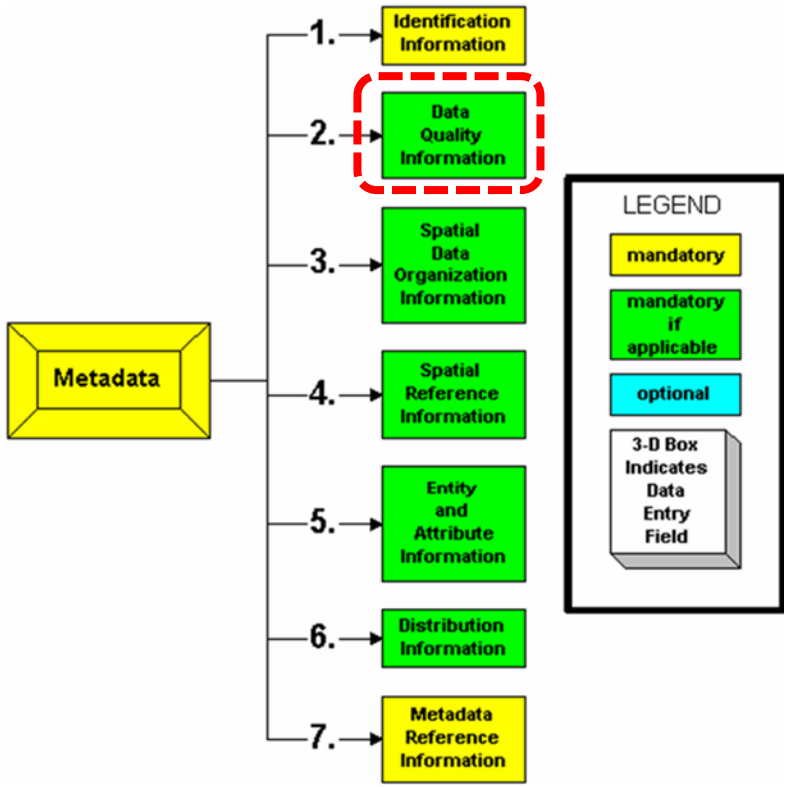
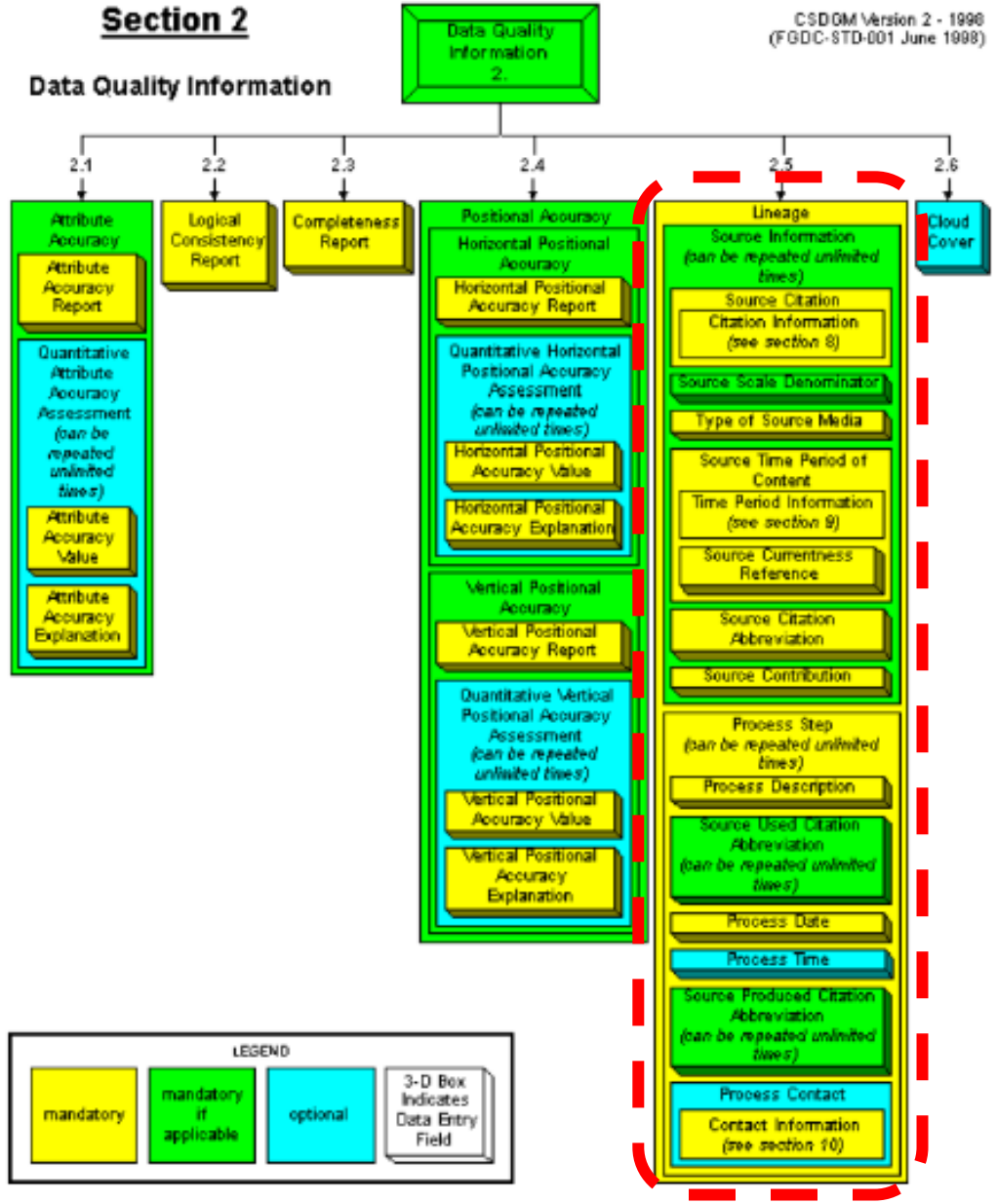
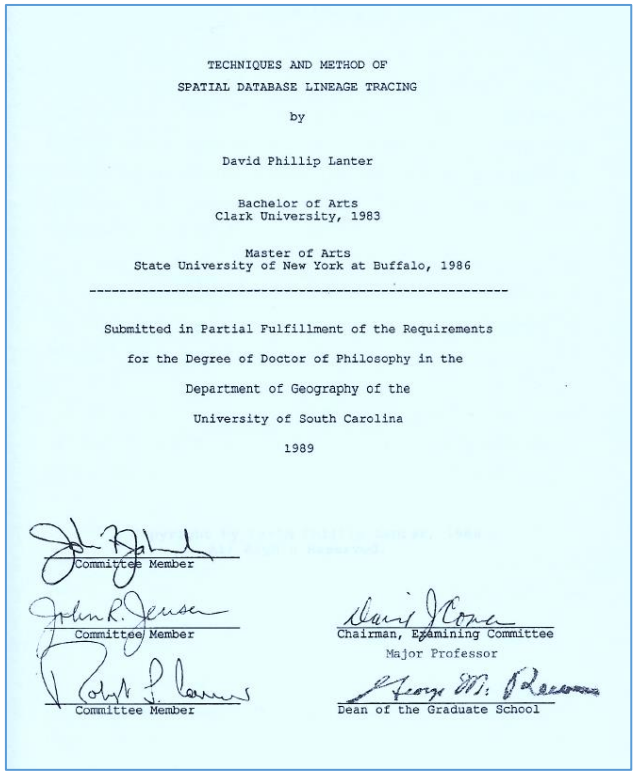
Department of Transportation ● Environmental Protection Agency
Federal Emergency Management Agency ● Library of Congress
National Aeronautics and Space Administration ● National Archives and Records Administration
Tennessee Valley Authority





1st automated capability for tracking the lineage of data throughout their processing in information systems



TECHNIQUES AND METHOD OF
SPATIAL DATABASE LINEAGE TRACING

by

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Submitted in Partial Fulfillment of the Requirements

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1989

Committee Member

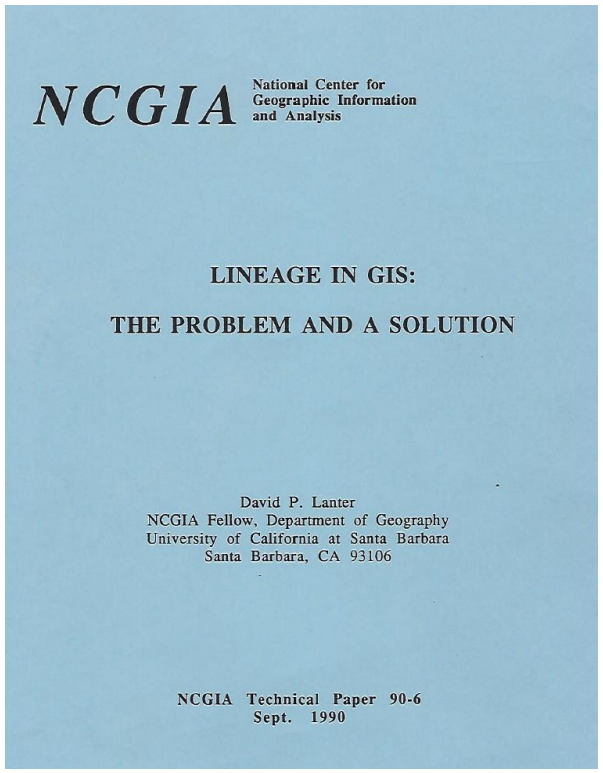
Committee Member

Committee Member

Chairman, Examining Committee

Major Professor

Dean of the Graduate School



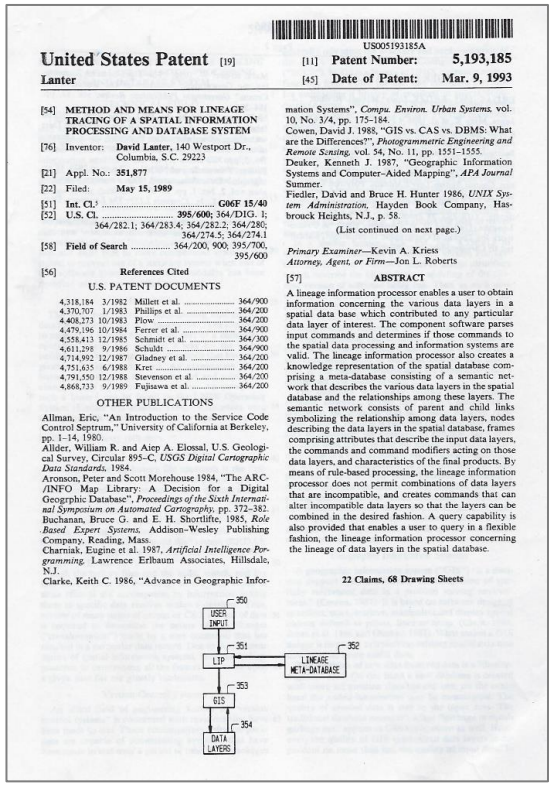
NCGIA National Center for Geographic Information and Analysis

LINEAGE IN GIS:

THE PROBLEM AND A SOLUTION

David P. Lanter
NCGIA Fellow, Department of Geography
University of California at Santa Barbara
Santa Barbara, CA 93106

NCGIA Technical Paper 90-6
Sept. 1990



US005193185A

United States Patent [19]
Lanter

[11] Patent Number: 5,193,185
[45] Date of Patent: Mar. 9, 1993

[54] METHOD AND MEANS FOR LINEAGE TRACING OF A SPATIAL INFORMATION PROCESSING AND DATABASE SYSTEM

[76] Inventor: David Lanter, 140 Westport Dr., Columbia, S.C. 29223

[21] Appl. No.: 351,877

[22] Filed: May 15, 1989

[51] Int. Cl.[5] G06F 15/40

[52] U.S. Cl. 395/600; 364/DIG. 1; 364/282.1; 364/283.4; 364/282.2; 364/280; 364/274.5; 364/274.1

[58] Field of Search 364/200, 900; 395/700, 395/600

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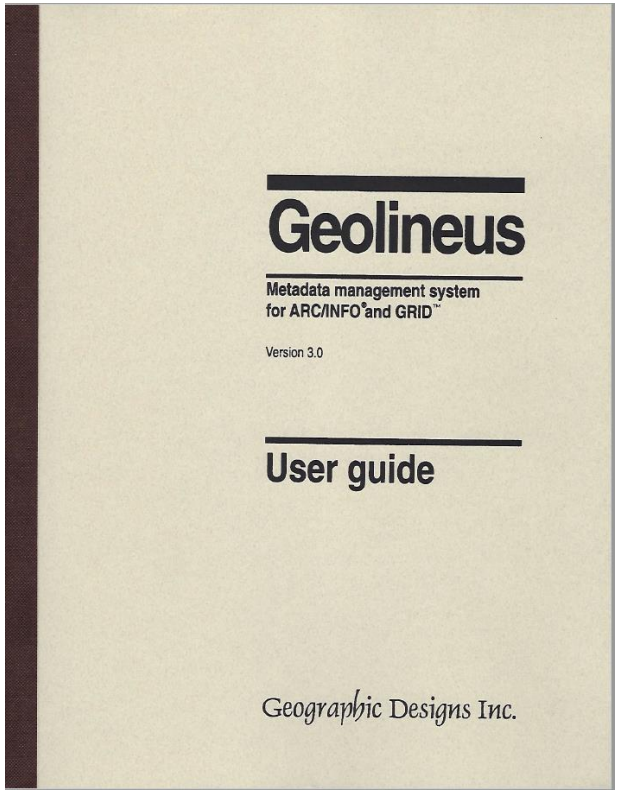
(List continued on next page.)

Primary Examiner—Kevin A. Kriess
Attorney, Agent, or Firm—Jon L. Roberts

[57] ABSTRACT

A lineage information processor enables a user to obtain information concerning the various data layers in a spatial data base which contributed to any particular data layer of interest. The component software parses input commands and determines if those commands to the spatial data processing and information systems are valid. The lineage information processor also creates a knowledge representation of the spatial database comprising a meta-database consisting of a semantic network that describes the various data layers in the spatial database and the relationships among these layers. The semantic network consists of parent and child links symbolizing the relationship among data layers, nodes describing the data layers in the spatial database, frames comprising attributes that describe the input data layers, the commands and command modifiers acting on those data layers, and characteristics of the final products. By means of rule-based processing, the lineage information processor does not permit combinations of data layers that are incompatible, and creates commands that can alter incompatible data layers so that the layers can be combined in the desired fashion. A query capability is also provided that enables a user to query in a flexible fashion, the lineage information processor concerning the lineage of data layers in the spatial database.

22 Claims, 68 Drawing Sheets



Geolineus

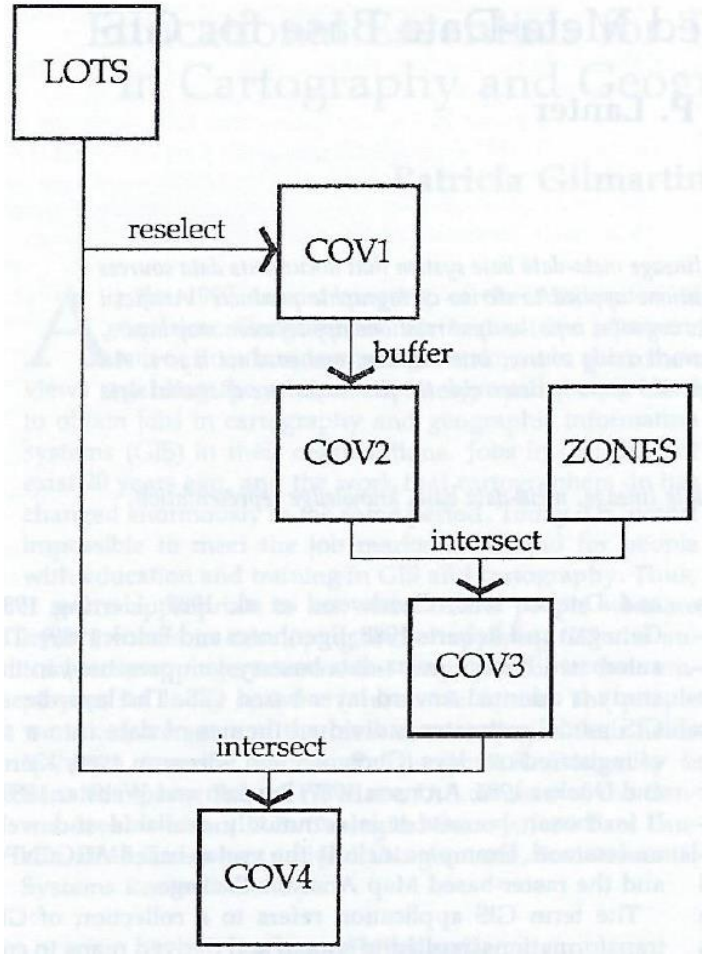
Metadata management system for ARC/INFO® and GRID™

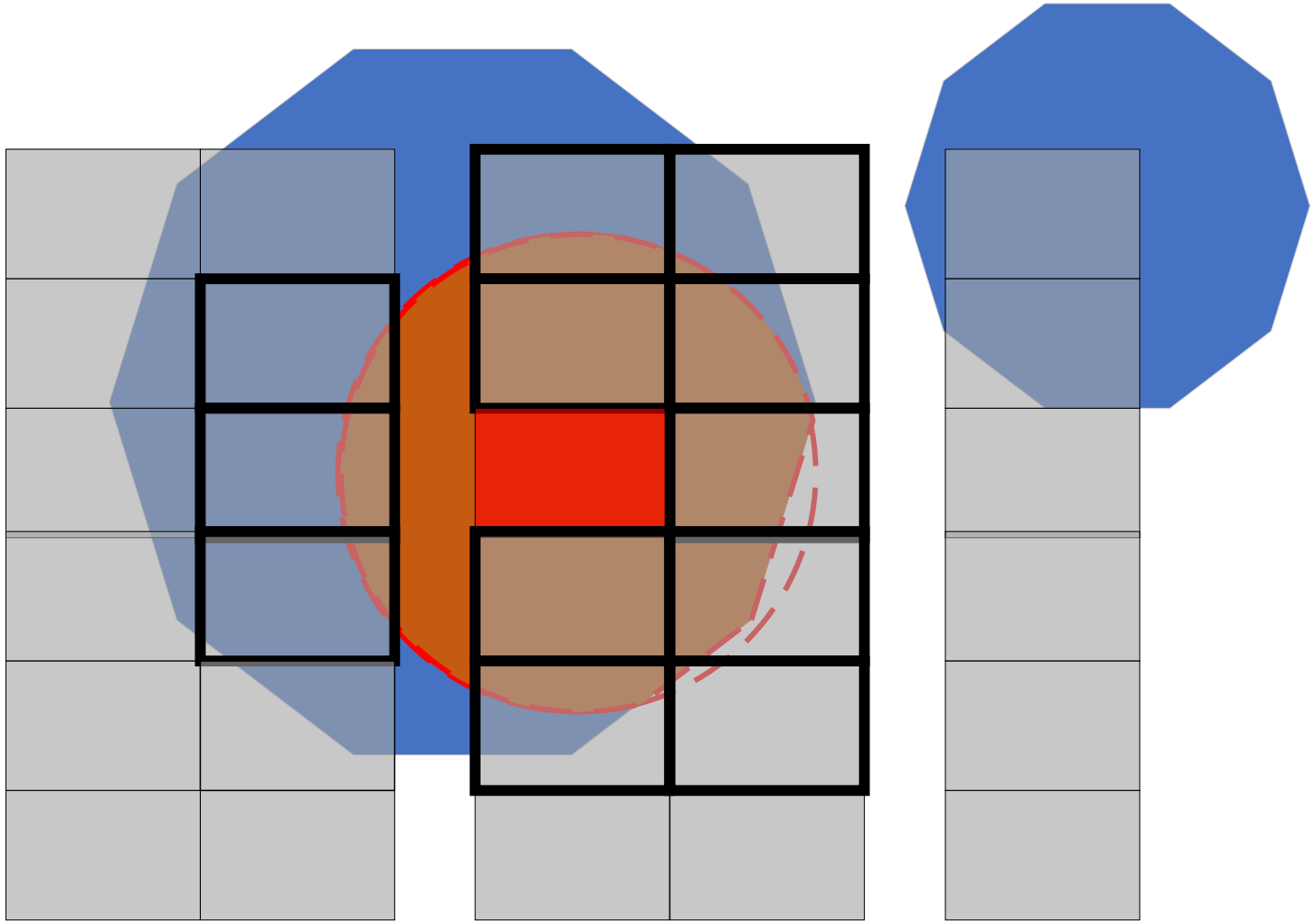
Version 3.0

User guide

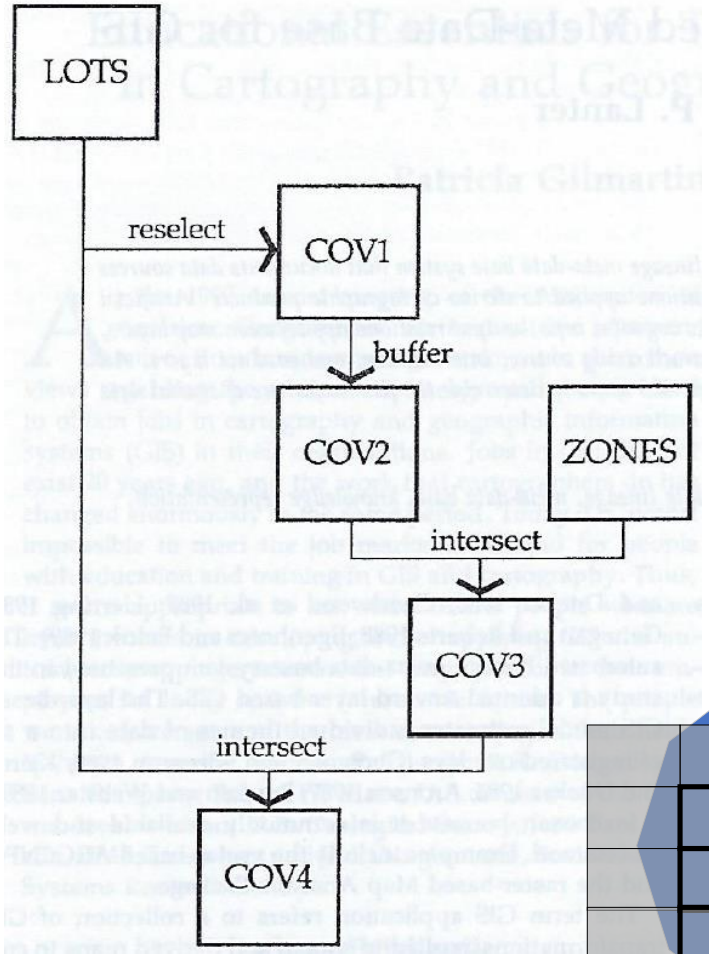
Geographic Designs Inc.

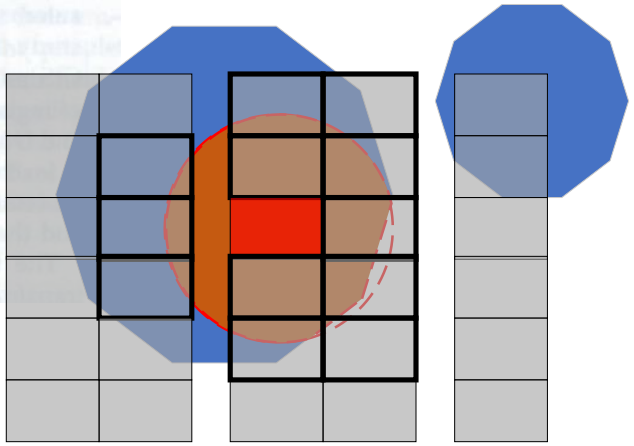
Information processing steps in the head of the user as he transformed the LOTS and ZONES datasets to derive COV4…





Information processing steps in the head of the user as he transformed the LOTS and ZONES datasets to derive COV4…



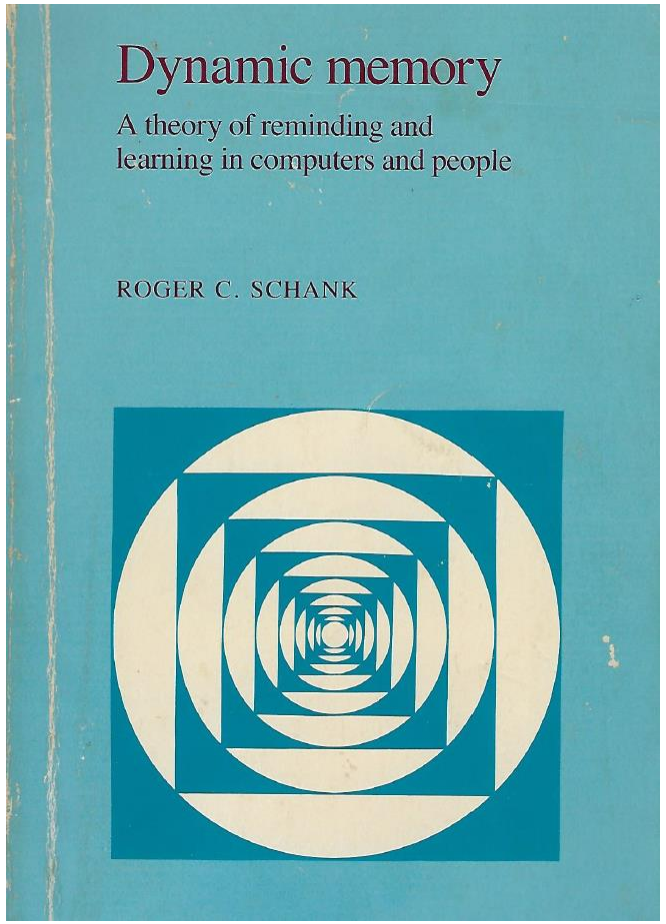


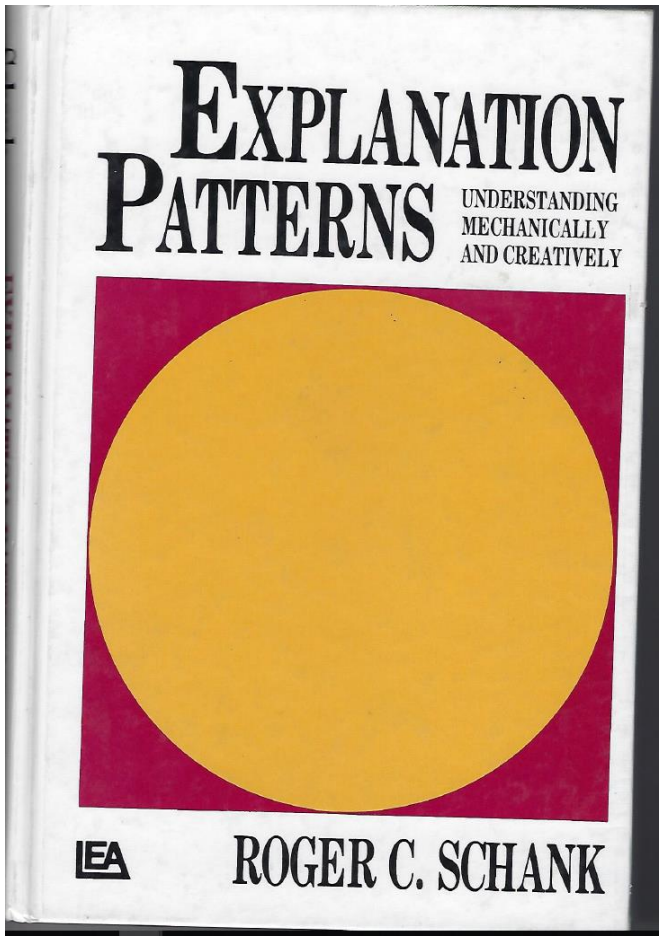
Datasets presented by the operating system after data processing concluded…

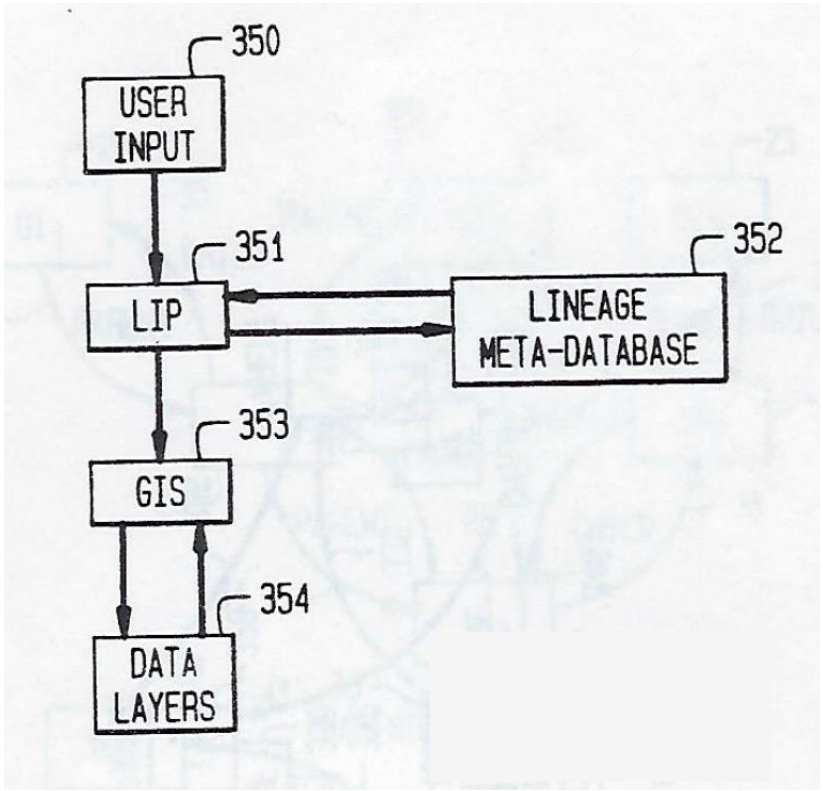
Datasets organized as files in folders

.	<DIR>	5-05-89	10:26a
..	<DIR>	5-05-89	10:26a
COV1	<DIR>	5-24-89	11:35p
LOTS	<DIR>	5-05-89	10:26a
INFO	<DIR>	5-05-89	10:26a
ZONES	<DIR>	5-05-89	10:27a
OUTPUT	<DIR>	5-05-89	10:27a
ONELOT	<DIR>	5-06-89	11:52a
DAV1	<DIR>	5-31-89	1:35p
FINAL	<DIR>	5-06-89	12:27p
COV3	<DIR>	5-24-89	11:46p
COV4	<DIR>	5-24-89	11:51p
BUF	<DIR>	5-06-89	12:21p
COV2	<DIR>	5-24-89	11:42p
DAV3	<DIR>	5-31-89	1:45p
DAV4	<DIR>	5-31-89	1:49p
DAV2	<DIR>	5-31-89	1:42p

How can I program the computer to help me remember what I knew about the data I loaded and processed on my computer?

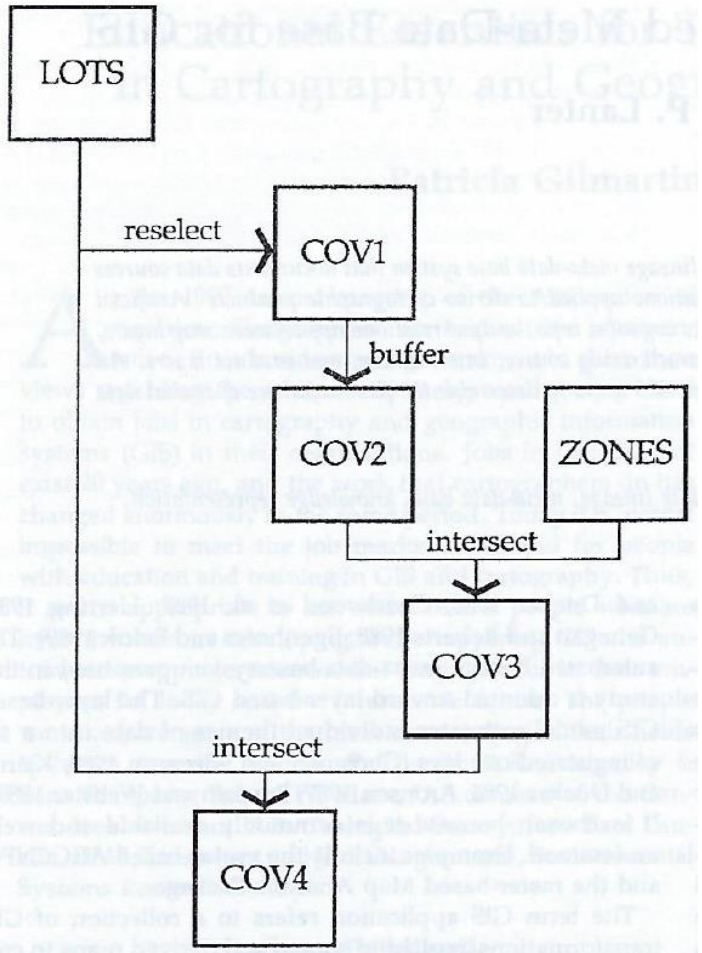


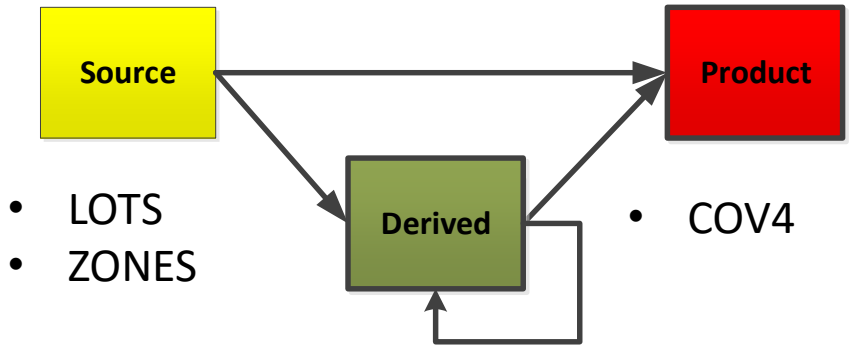




LIP = Lineage Information Processor

How do we understand differences among datasets created during processing applications?

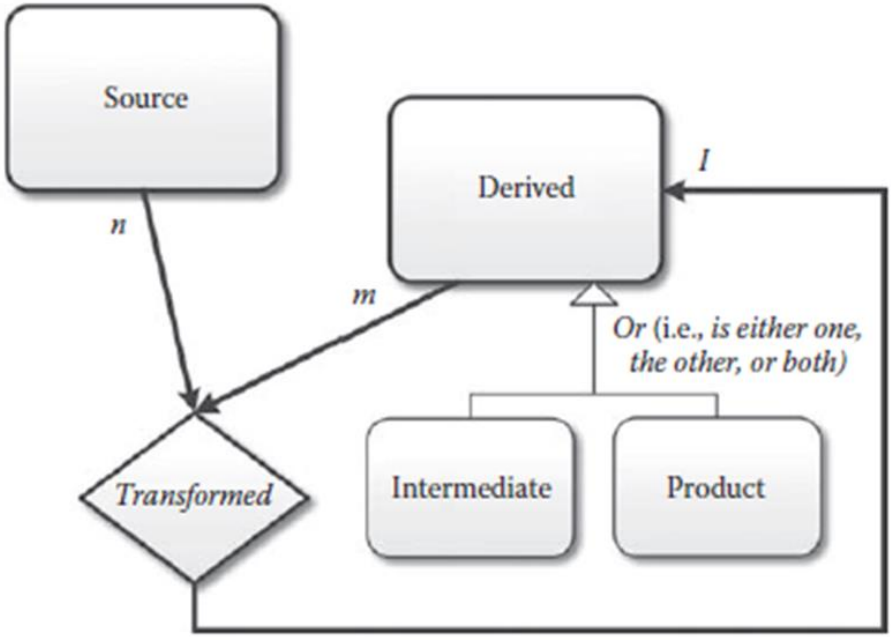




- LOTS
- ZONES

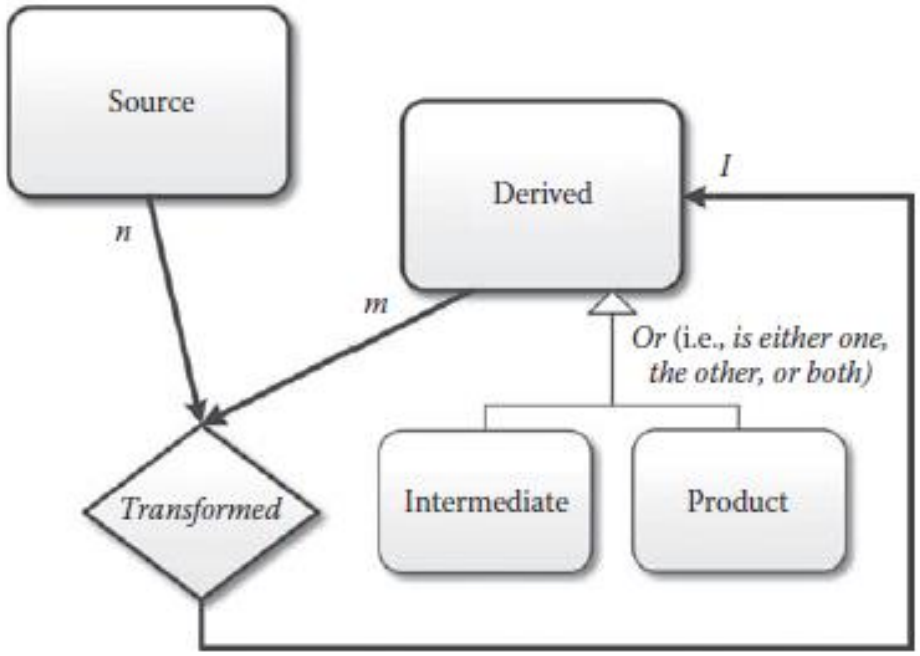
- COV4

- COV1
- COV2
- COV3



Data lineage vocabulary helps communicate how data is processed in an information system

and can aid thinking about how to meet privacy by design requirements

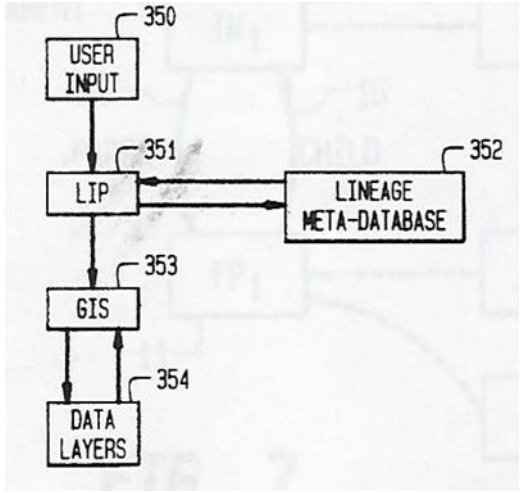


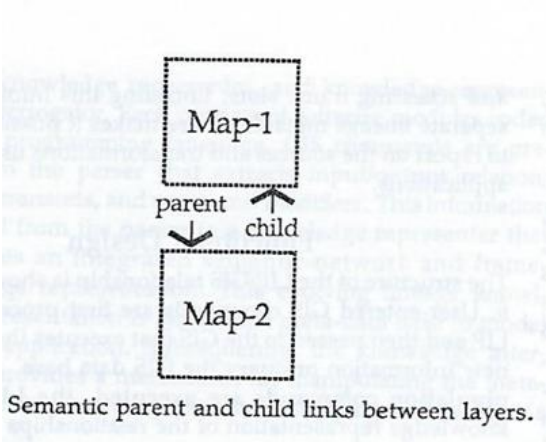
Source datasets *may contain personal data*

Derived datasets inherit this personal data from their input

- *Using transformations such as:*
  - *Relational database joins and relates*
  - *Queries, arithmetic, statistical, spatial processing…*

Semantic “parent” & “child” metadata links added to enable deductions about relationships among input & output datasets…

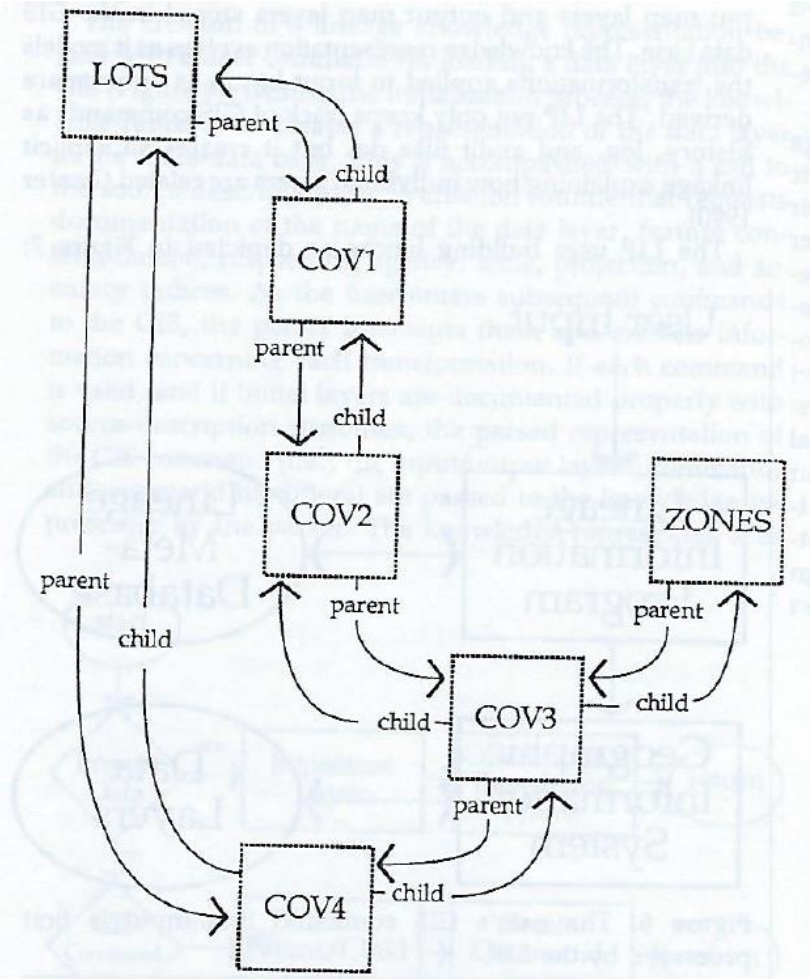




Semantic parent and child links between layers.

Input datasets provided with parent links pointing to output datasets can answer the question: ***Who am I the parent of?***

Output datasets’ child links connect them back to their input datasets can answer the question: ***Who am I the child of?***



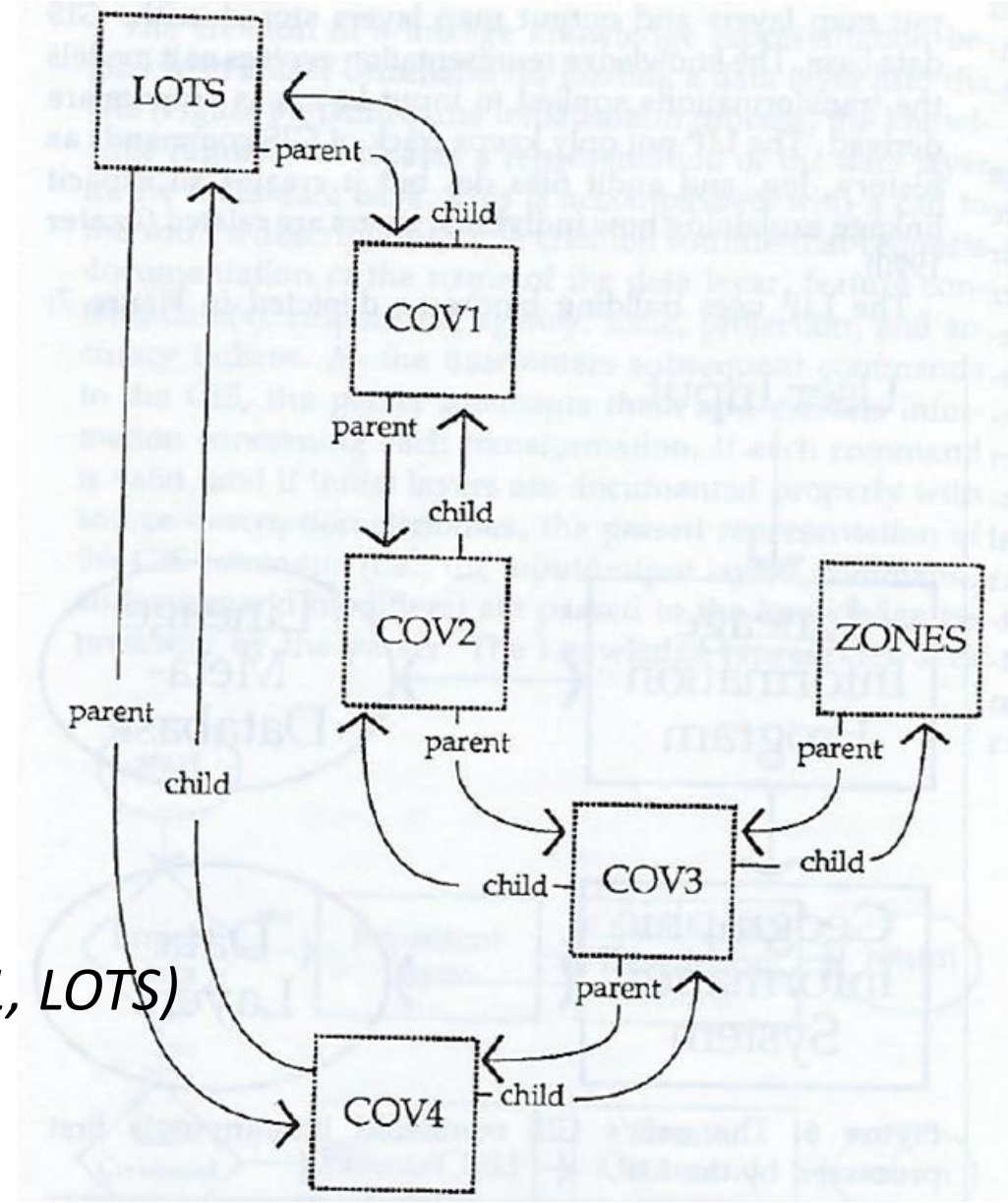
Descendants function traces parent links to identify all datasets derived from a source or other derived input dataset used within the application.

```
(defun decendents (map)
    (cond ((null map) nil)
          ((null (car (get map 'parent)))
              (print (append (list map)
                             (is a product map layer) (terpri))))
     (t
         (cond((null (cdr (get map 'parent)))
                  (decendents (car (get map 'parent))))
               (t (decendents (car (get map 'parent)))
                  (decendents (cadr (get map 'parent))))))))
```

Descendants ("LOTS") = (COV1, COV2, COV3, COV4)

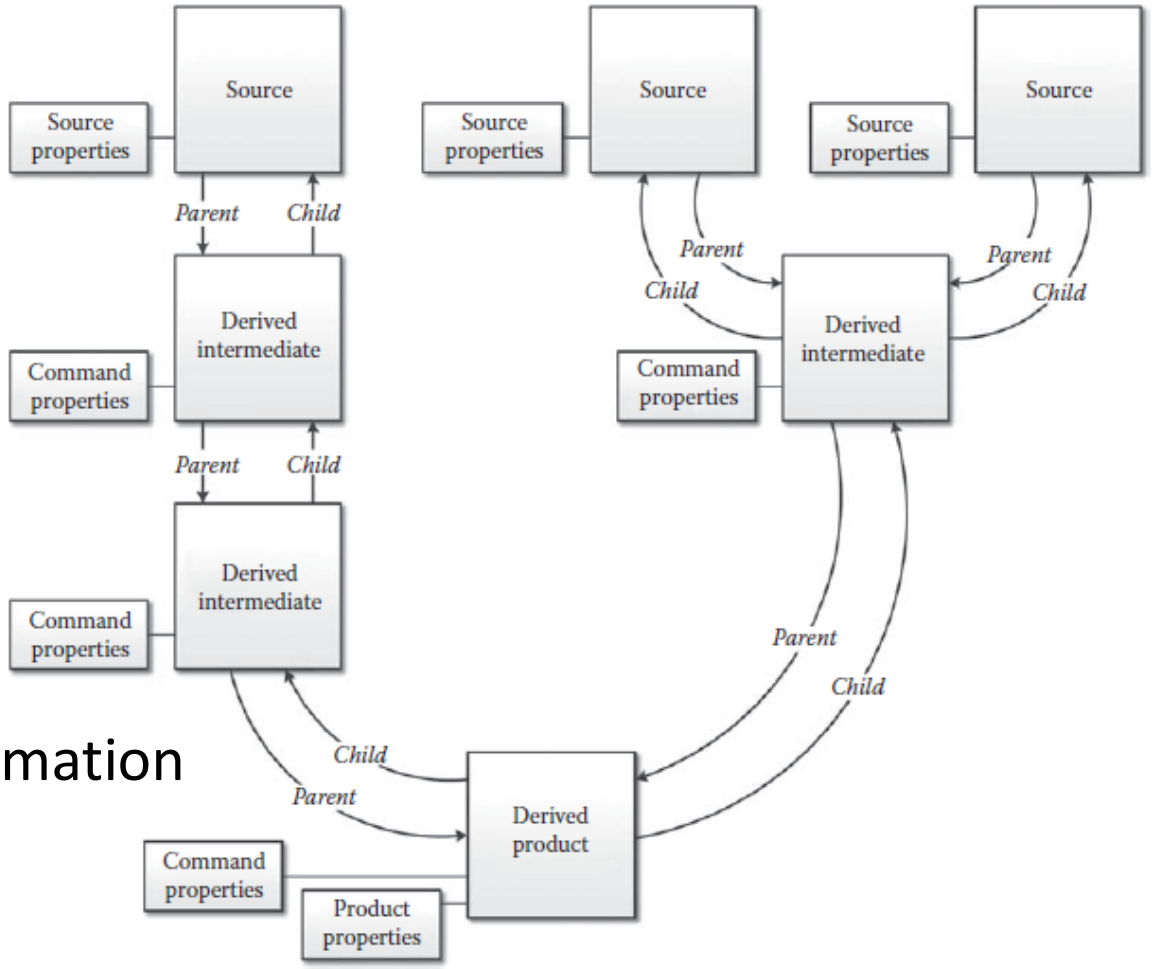
Ancestors function traces child links to identify input datasets used to create a derived dataset

Ancestors ("COV4") = (LOTS, COV3, ZONES, COV2, COV1, LOTS)



Source properties can include:

- Originating organization
- Data content (i.e. entity and attribute definitions)
- Timeliness (e.g. when collected, when acquired,…)
- Accuracy
- Confidentiality security categorization of attributes
  - Privacy sensitivity of attributes
- Integrity categorization of attributes…
- Availability categorization…



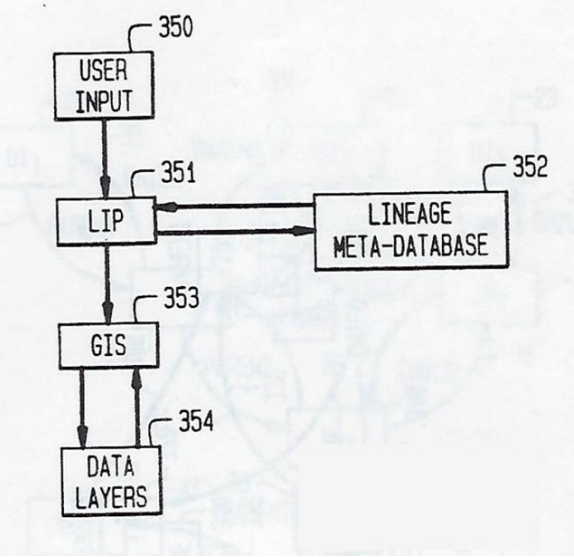
Command properties include details of the transformation

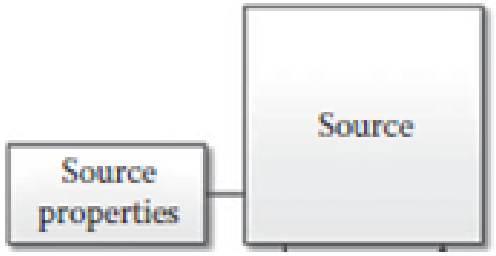
Product properties include the product's

- intended goal
- Users
- when published
- responsible manager,…

Meet Geo_lineus
source metadata input

```
(geo_lineus)I am Geo_lineus
Please give me information or ask questions: import cover landuse
landuse

What is the source name? landuse-landcover

Containing what cartographic features? hydrography urban
agriculture wetland

What is the source date? 3/12/75

What is the source agency? USGS

What is the source scale? 1/24000

What is the source projection? UTM

What is the source accuracy? +-80 meters

Thank You!
```



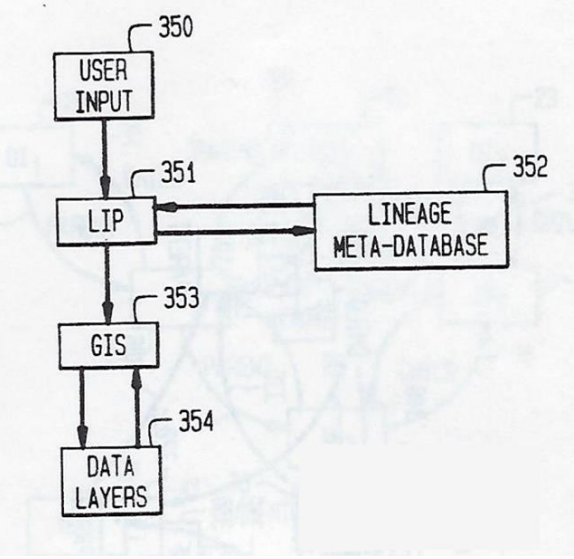


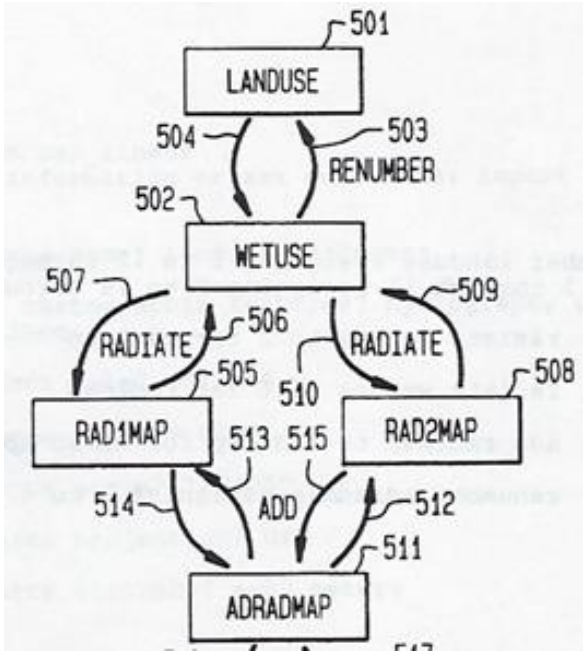
SOURCE DESCRIPTION FRAME

SOURCE:	Digital line graph
FEATURES:	Hydrography
S_DATE:	4/7/83
AGENCY:	USGS
SCALE:	1:100,000
PROJECTION:	Mercator
ACCURACY:	+-10 meters Horiz

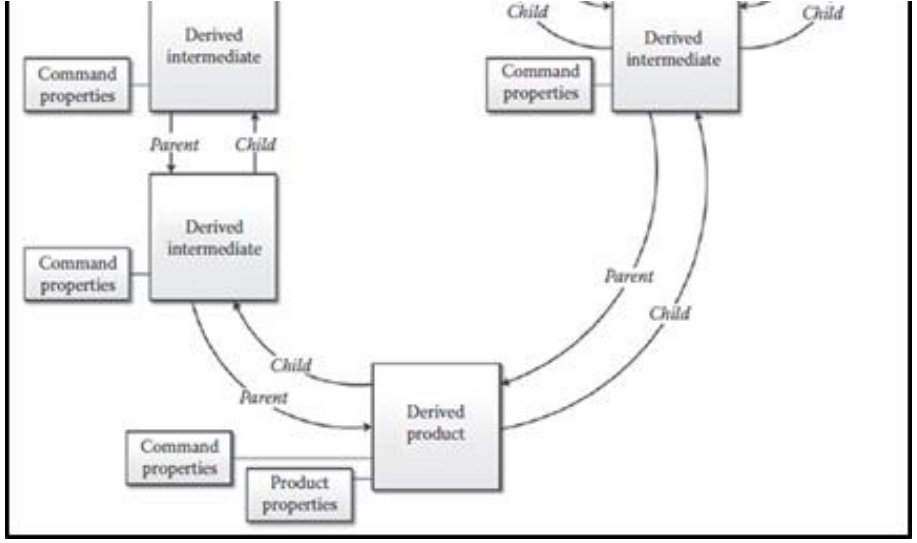
Command metadata input…

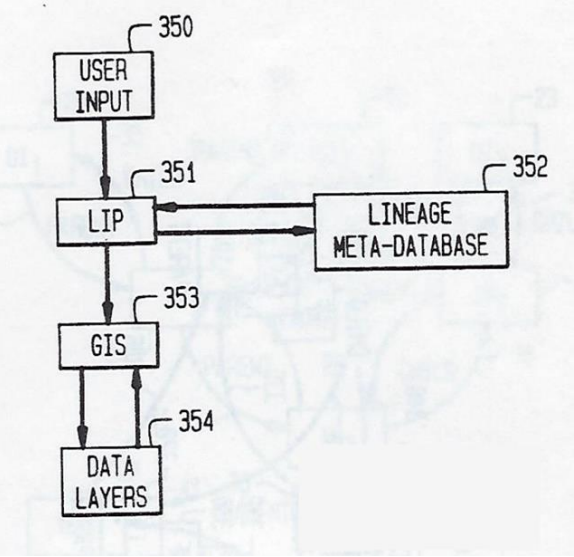
```
(geo_lineus)

(I AM GEO_LINEUS)

(PLEASE GIVE ME INFORMATION OR ASK QUESTIONS) (renumber landuse
assigning 1 to 2 through 13 assigning 0 to 1 through 11 assigning
0 to 14 through 18 for wetuse)

(I UNDERSTAND) (radiate wetuse to 2 for rad1map)

(I UNDERSTAND) (radiate wetuse to 6 for rad2map)

(I UNDERSTAND) (add rad1map to rad2map for adradmap)
```



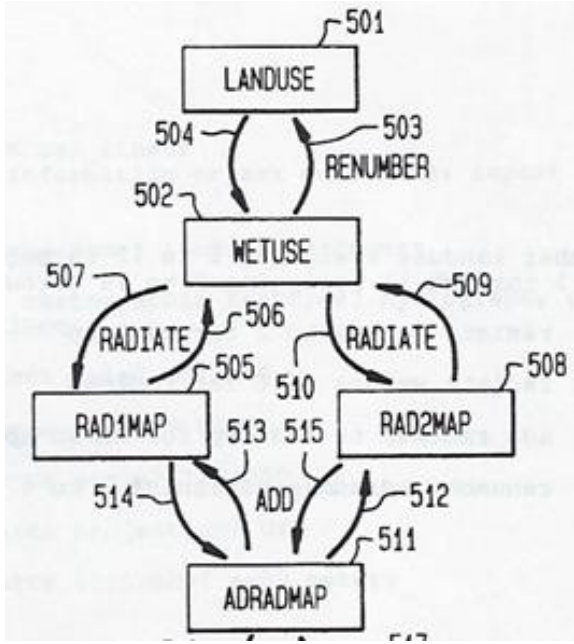


Product Metadata input…

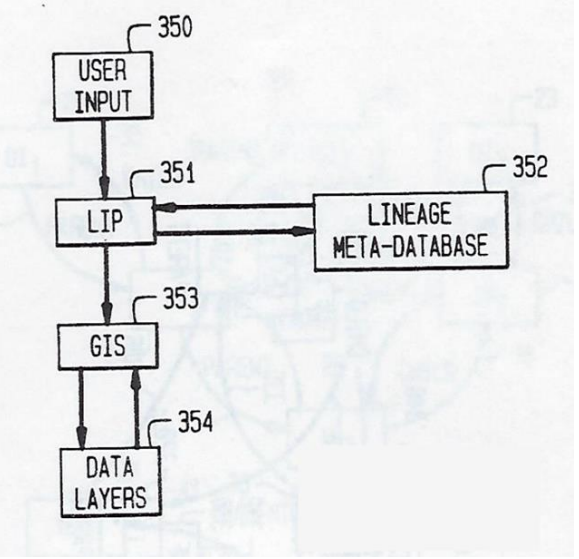




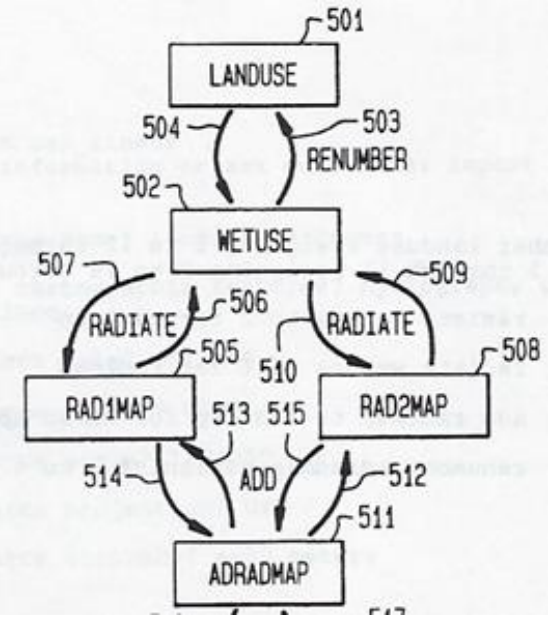

```
export cover adradmap1 eco_zones

What is the product's name? eco_zones

What is the product's use? Environmental protection of wetlands

Who are the product's users? Dept of Health and Environ.
Conservation

Who is responsible for the product? Diego Essinger

What is the product's release date? 3/5/89

Thank You!
```



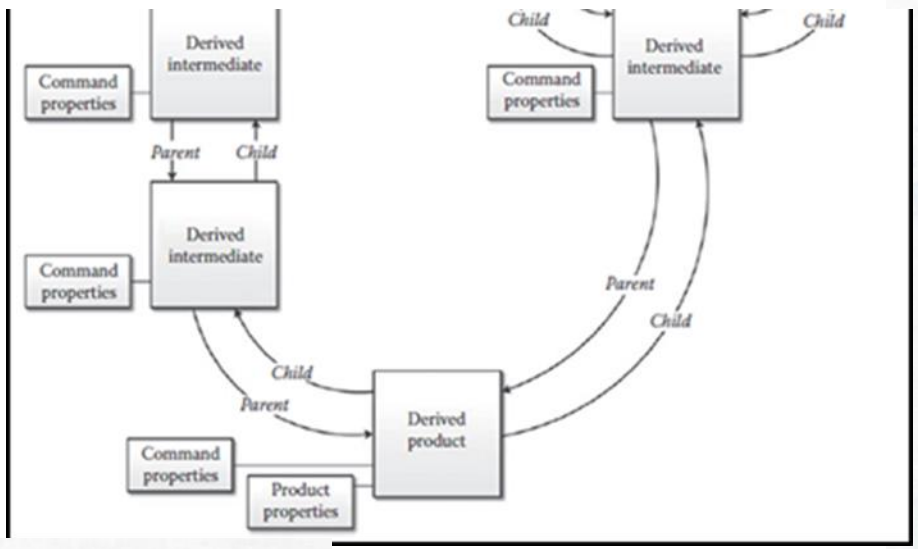
Querying metadata…

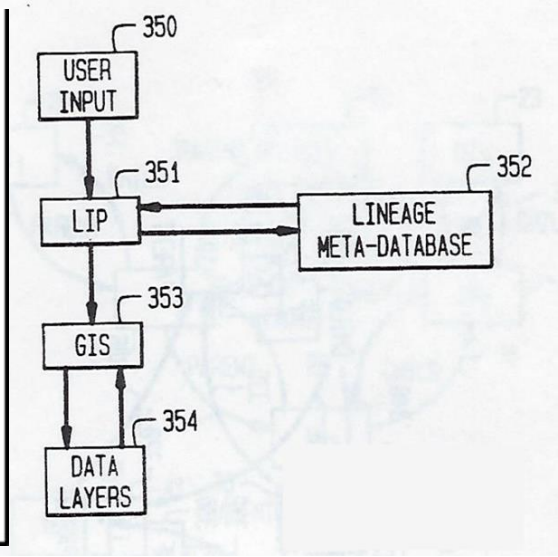



```
                    Is landuse a parent of adradmap

(YES INDEED LANDUSE IS A PARENT OF ADRADMAP)
```



Querying metadata…





What is the lineage of adradmap1

(INPUT TO ADRADMAP1 IS ADRADMAP COMMAND IS RENUMBER)

(INPUT TO ADRAPMAP IS RAD2MAP RAD1MAP COMMAND IS ADD)

(INPUT TO RAD2MAP IS WETUSE COMMAND IS RADIATE)

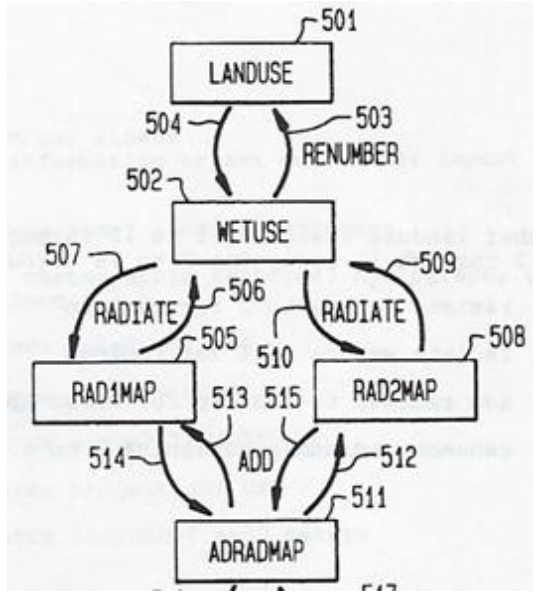
(INPUT TO WETUSE IS LANDUSE COMMAND IS RENUMBER)

(LANDUSE IS AN ORIGINAL MAP LAYER)

(INPUT TO RAD1MAP IS WETUSE COMMAND IS RADIATE)

(INPUT TO WETUSE IS LANDUSE COMMAND IS RENUMBER)

(LANDUSE IS AN ORIGINAL MAP LAYER)



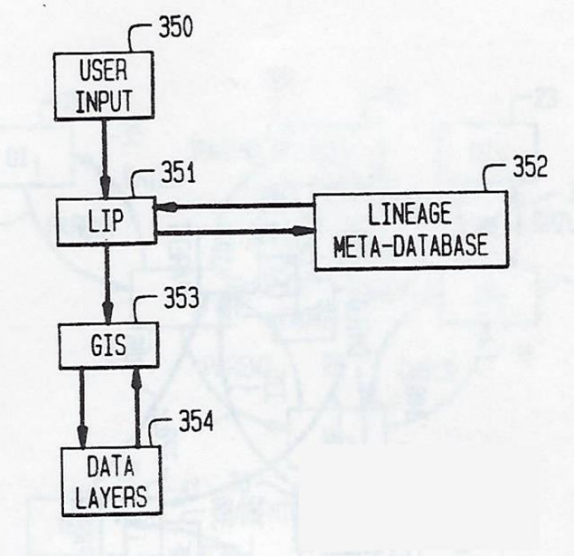
Querying metadata…

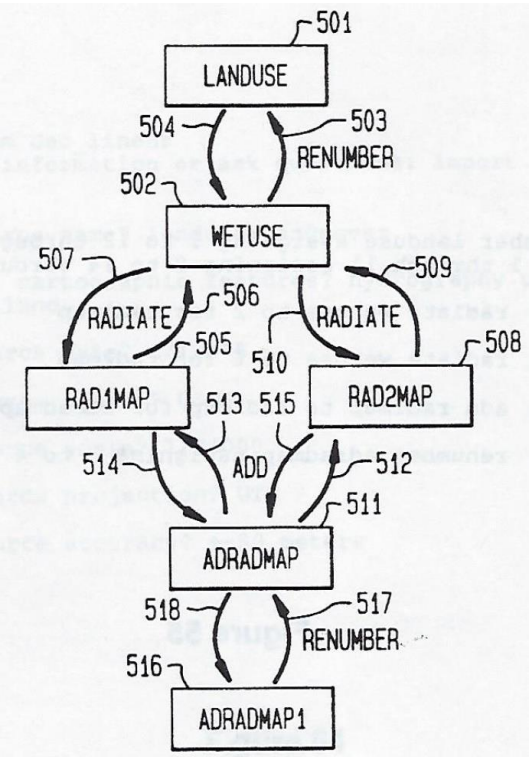
What are the final products of landuse

(ADRADMAP1 IS A PRODUCT MAP LAYER)

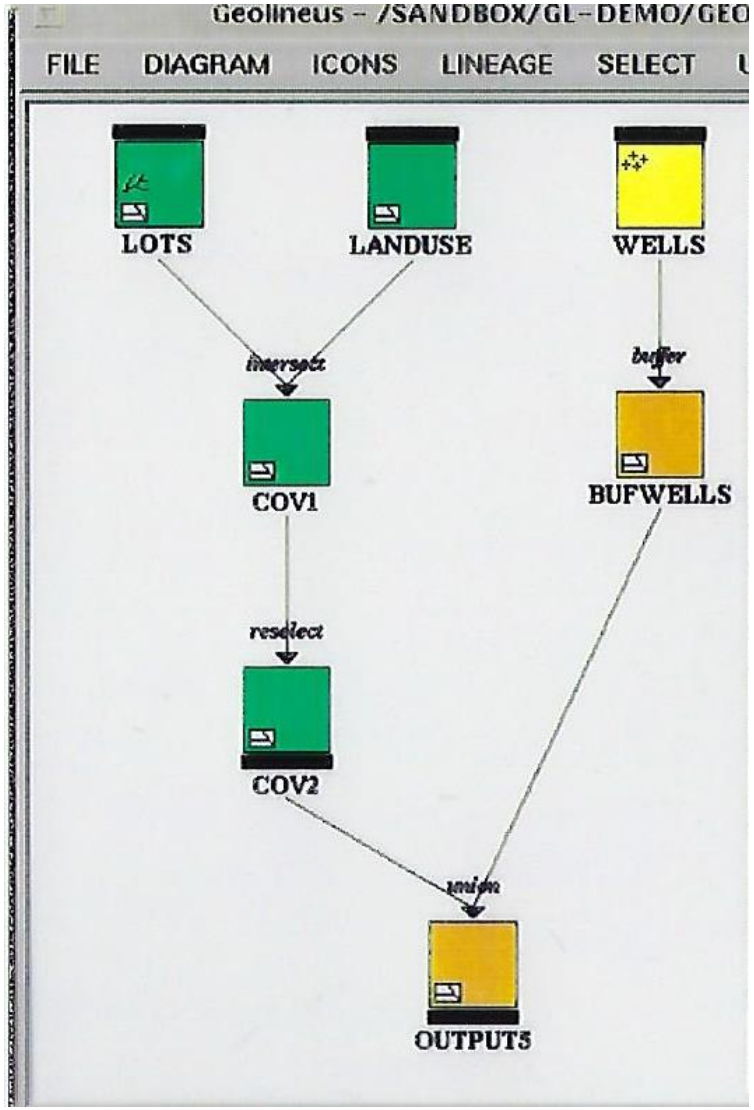
Why is rad2map a parent of adradmap1

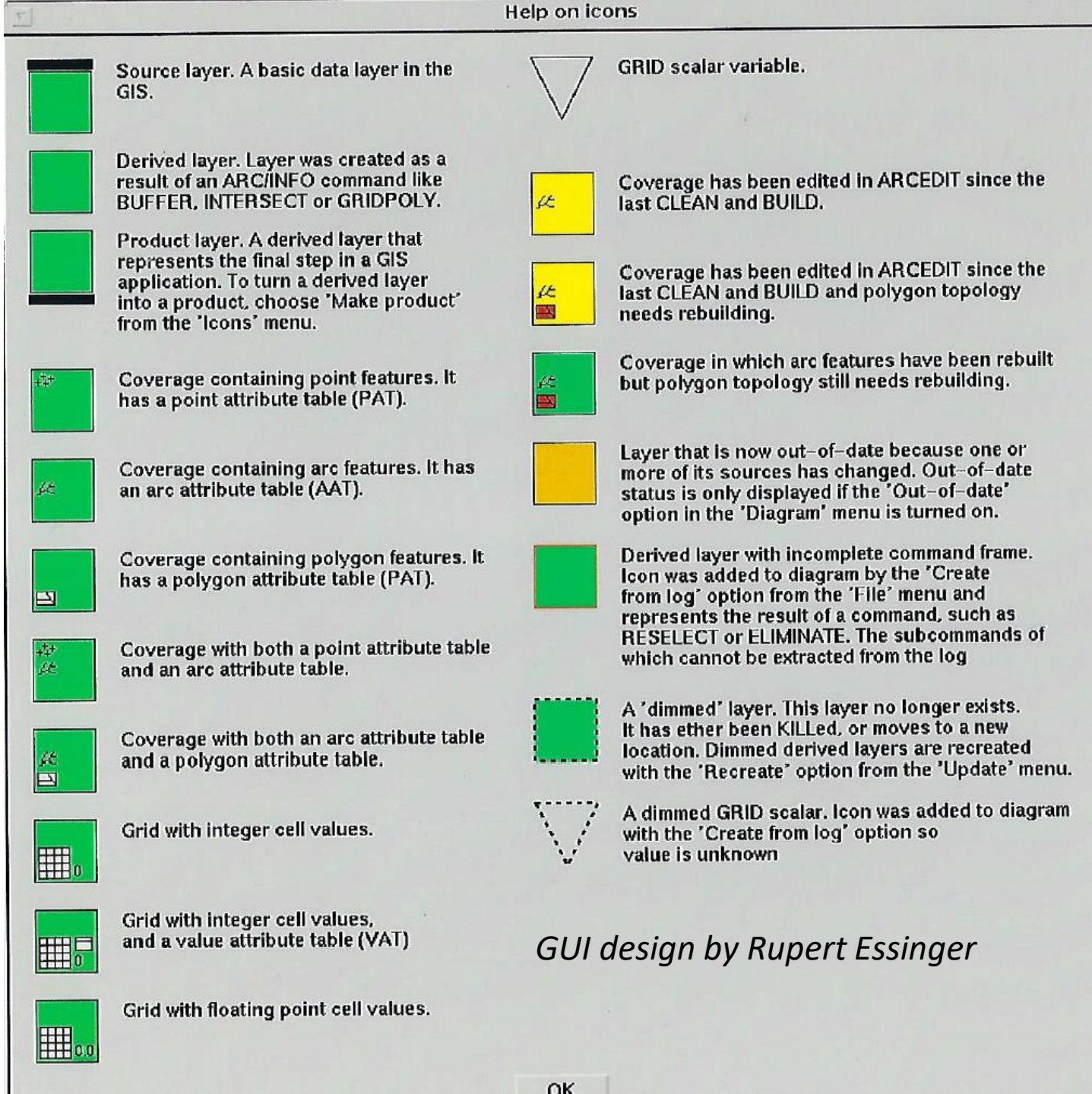
(BECAUSE RAD2MAP IS A PARENT OF ADRADMAP AND ADRADMAP IS A PARENT OF ADRADMAP1)





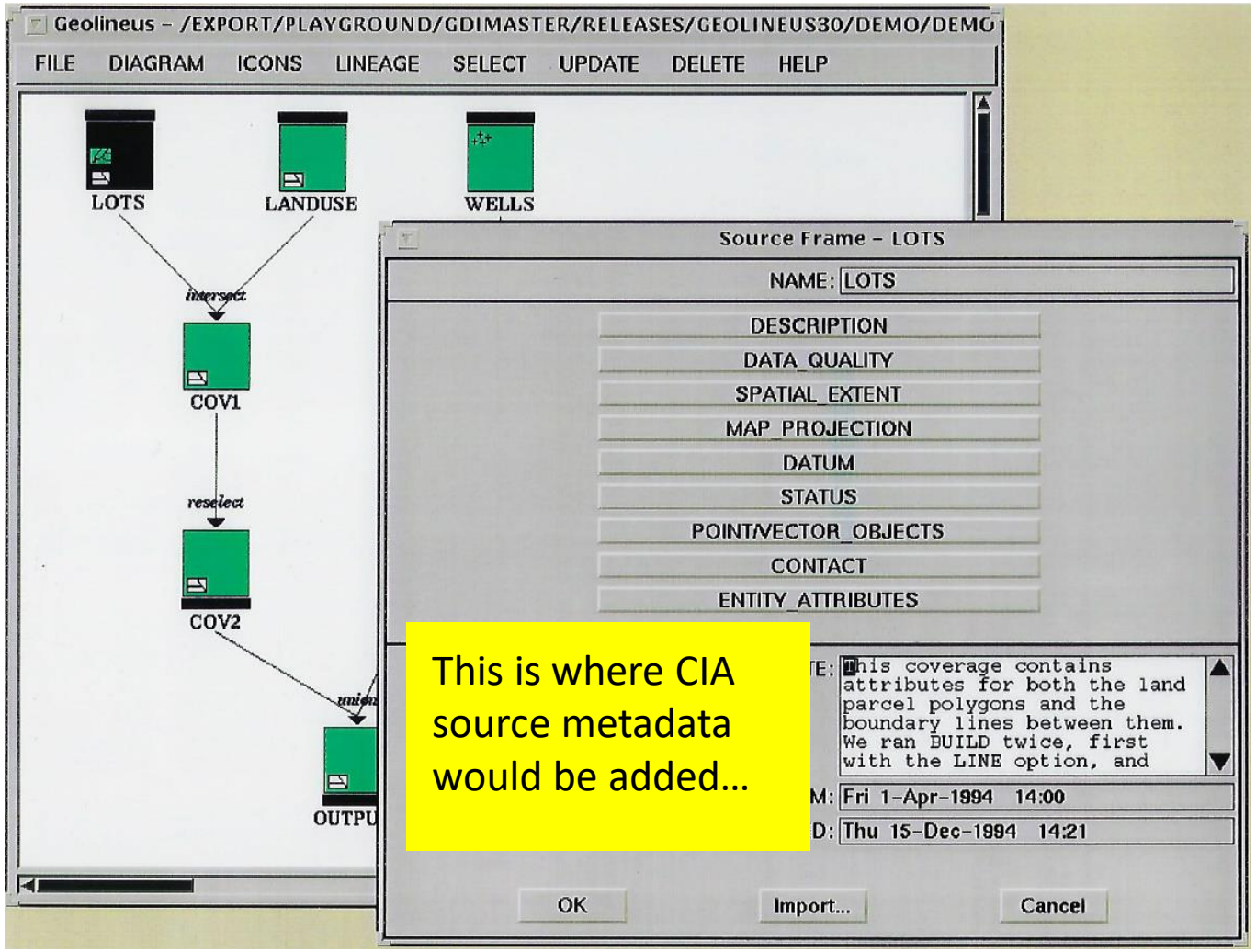
Adding a graphical user interface…

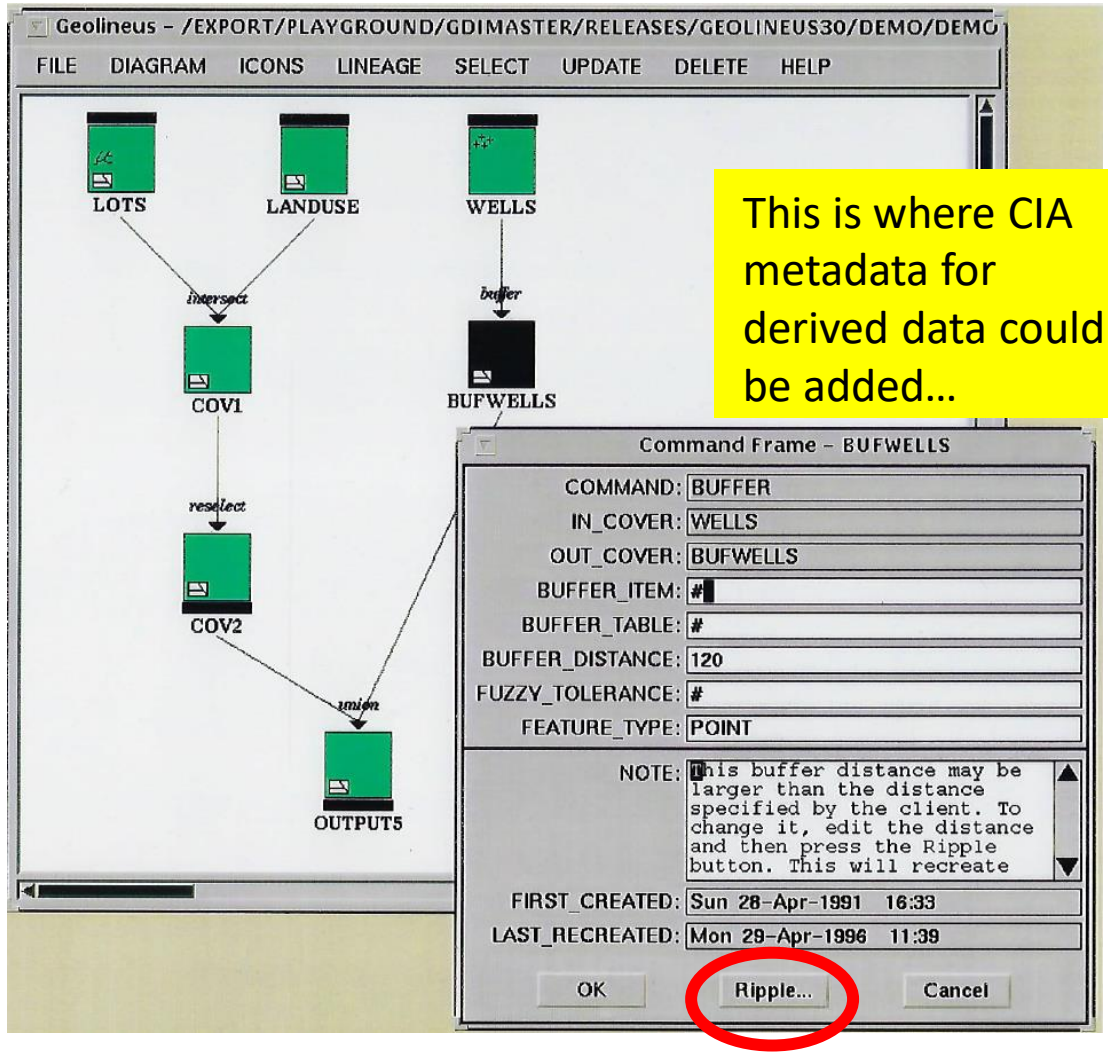




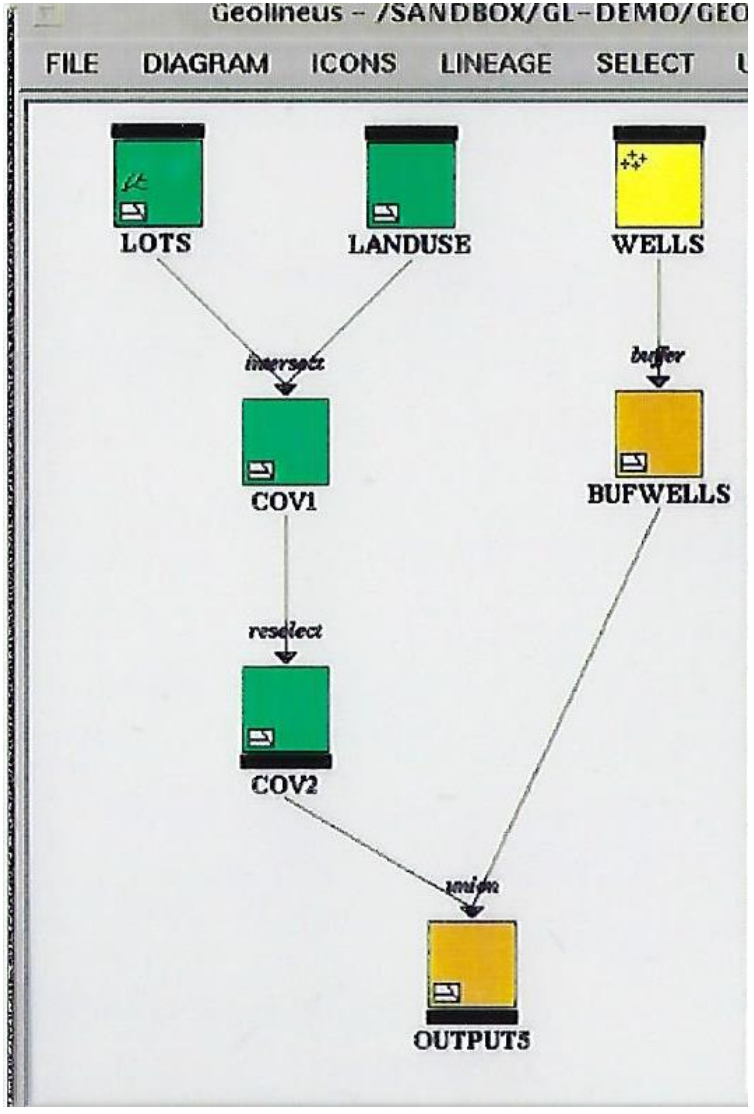
GUI design by Rupert Essinger

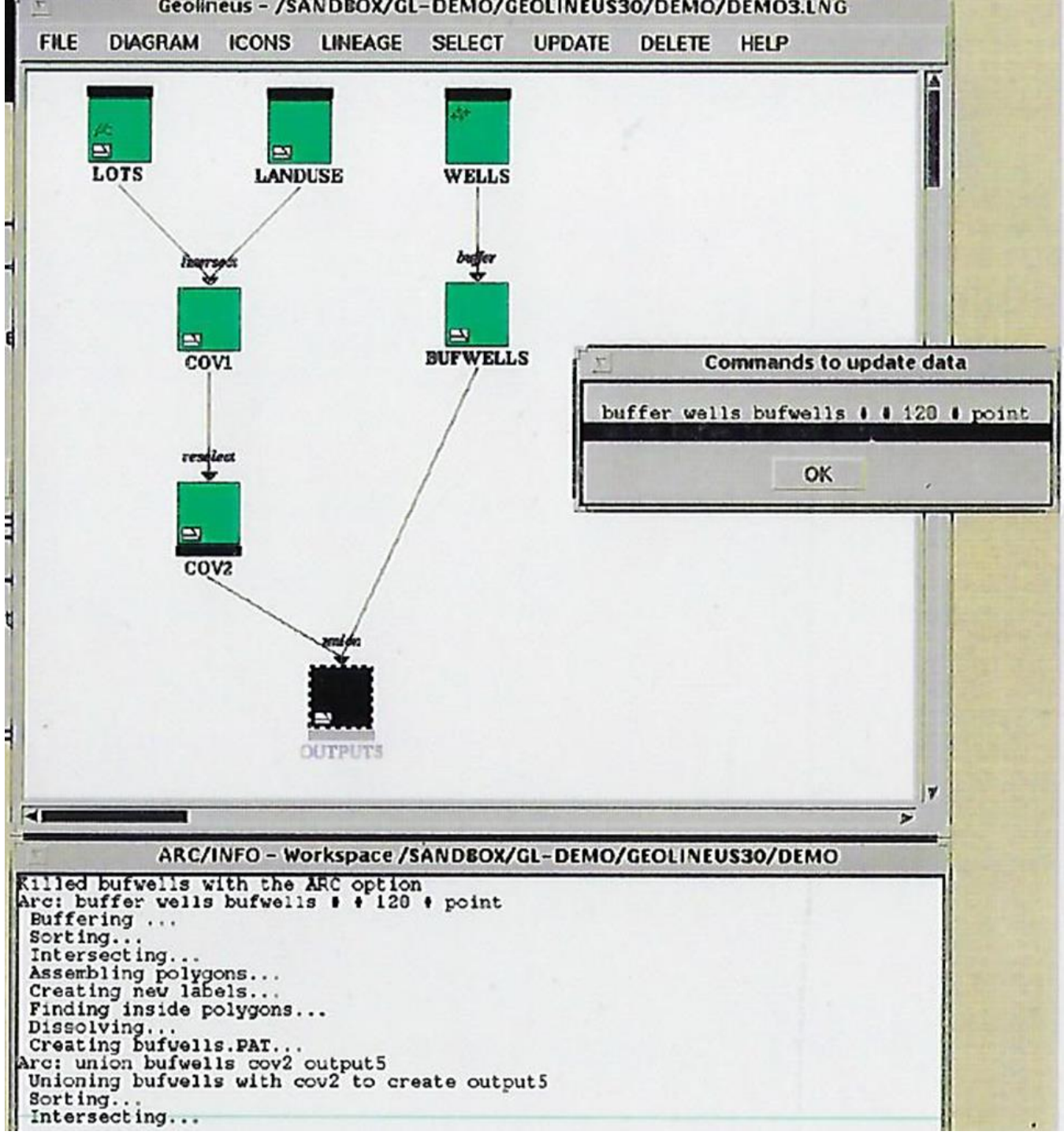
Working with source and command metadata



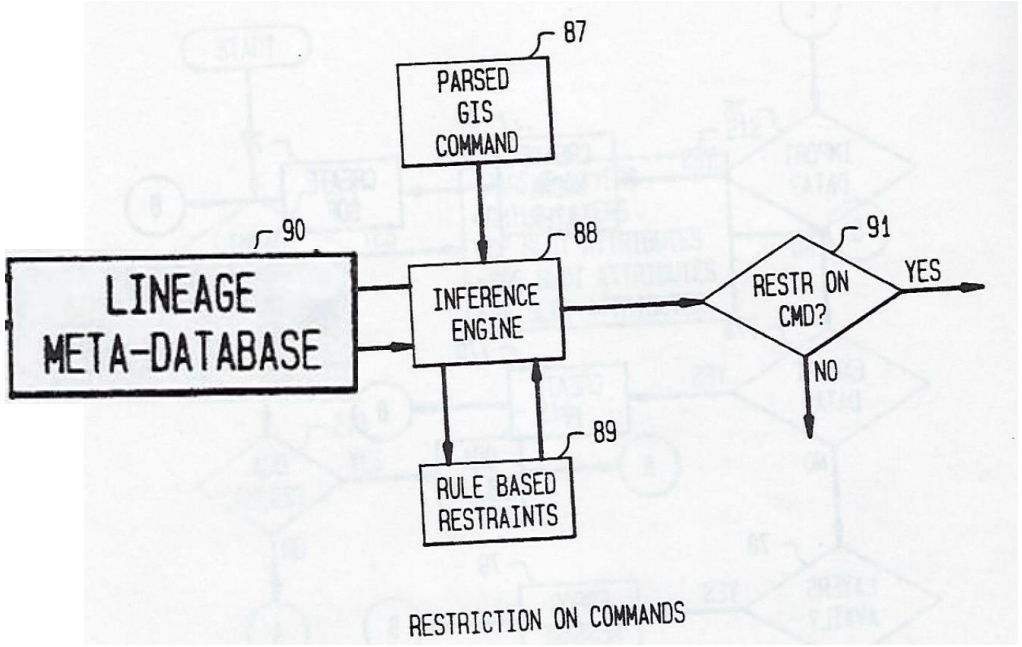


Update propagation…

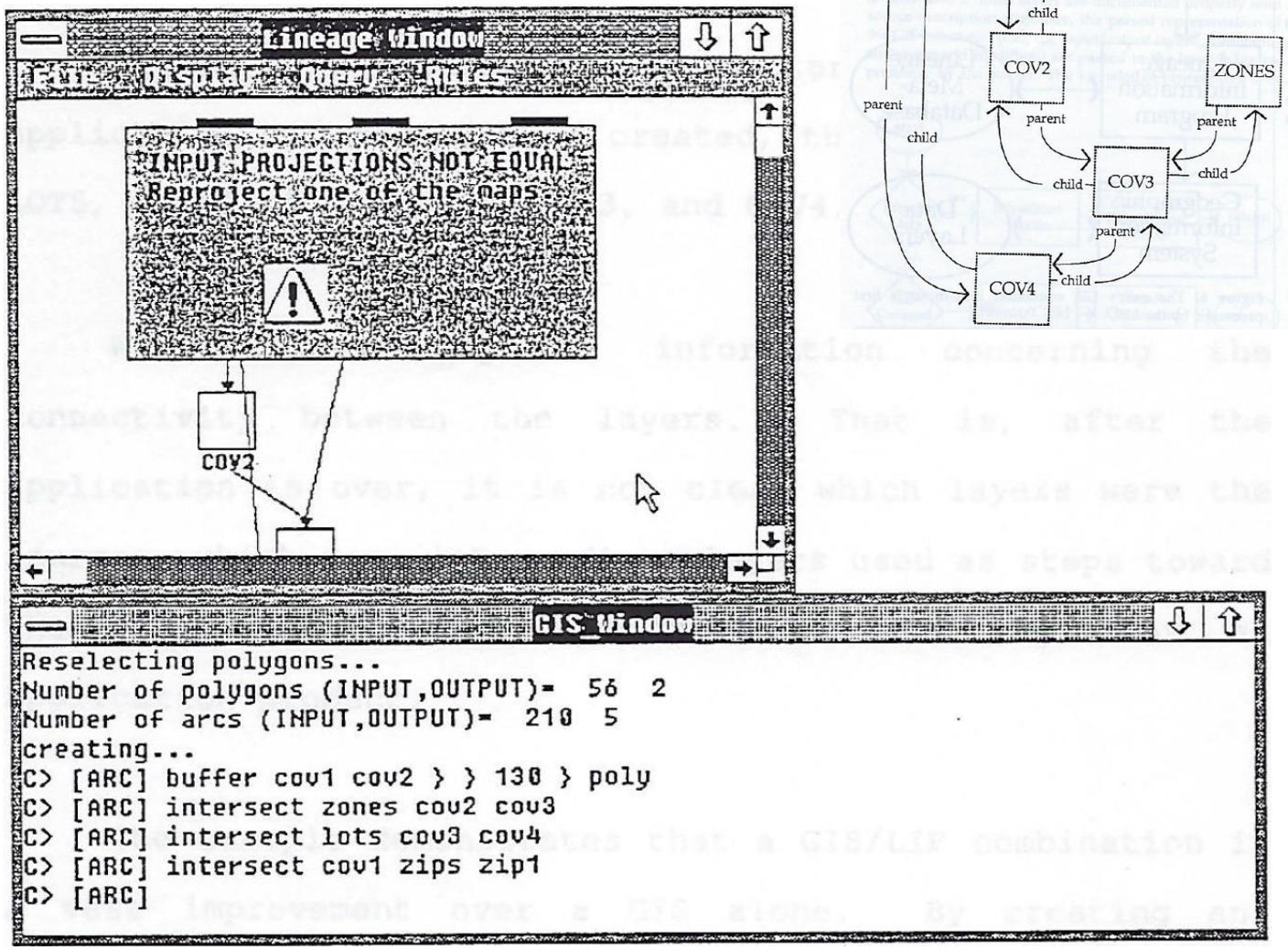




Data source metadata based integrity constraint

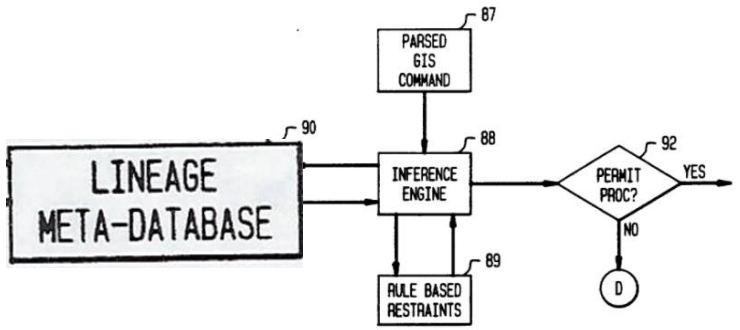


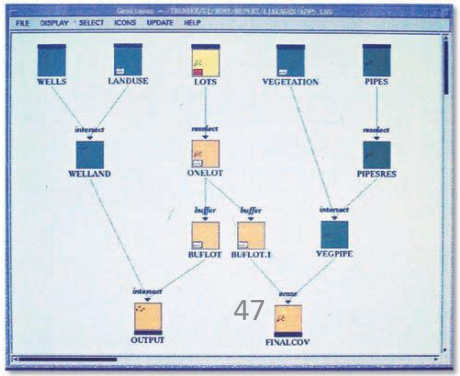

```
(setq intersect_rules

    '((rule intersect1
          (if (not (equal (scale inmap)
                          (scale intersectmap))))
          (then ("INPUT SCALES NOT EQUAL" )))

      (rule intersect2
          (if (not (equal (projection inmap)
                          (projection intersectmap))))
          (then ("INPUT PROJECTIONS NOT EQUAL")
                ("Reproject one of the maps."))  )))
```



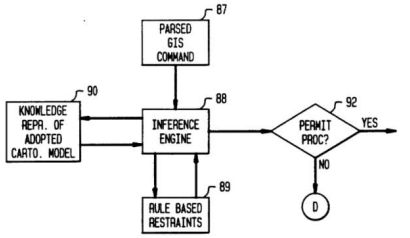
Data lineage metadata can help information systems meet key data privacy by design requirements, including:

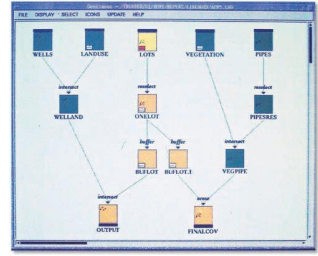
- Enabling data subjects' access, review and rectify their personal data?
- Enable data subjects to withdraw given consent with effect for the future by:
  a. Blocking access to their personal data?
  b. Constraining processing and usage of their personal data?
  c. Erasing their personal data?
- Blocking and restricting personal data obtained for one purpose from being processed for other purposes not compatible with the original purpose





Conclusion:

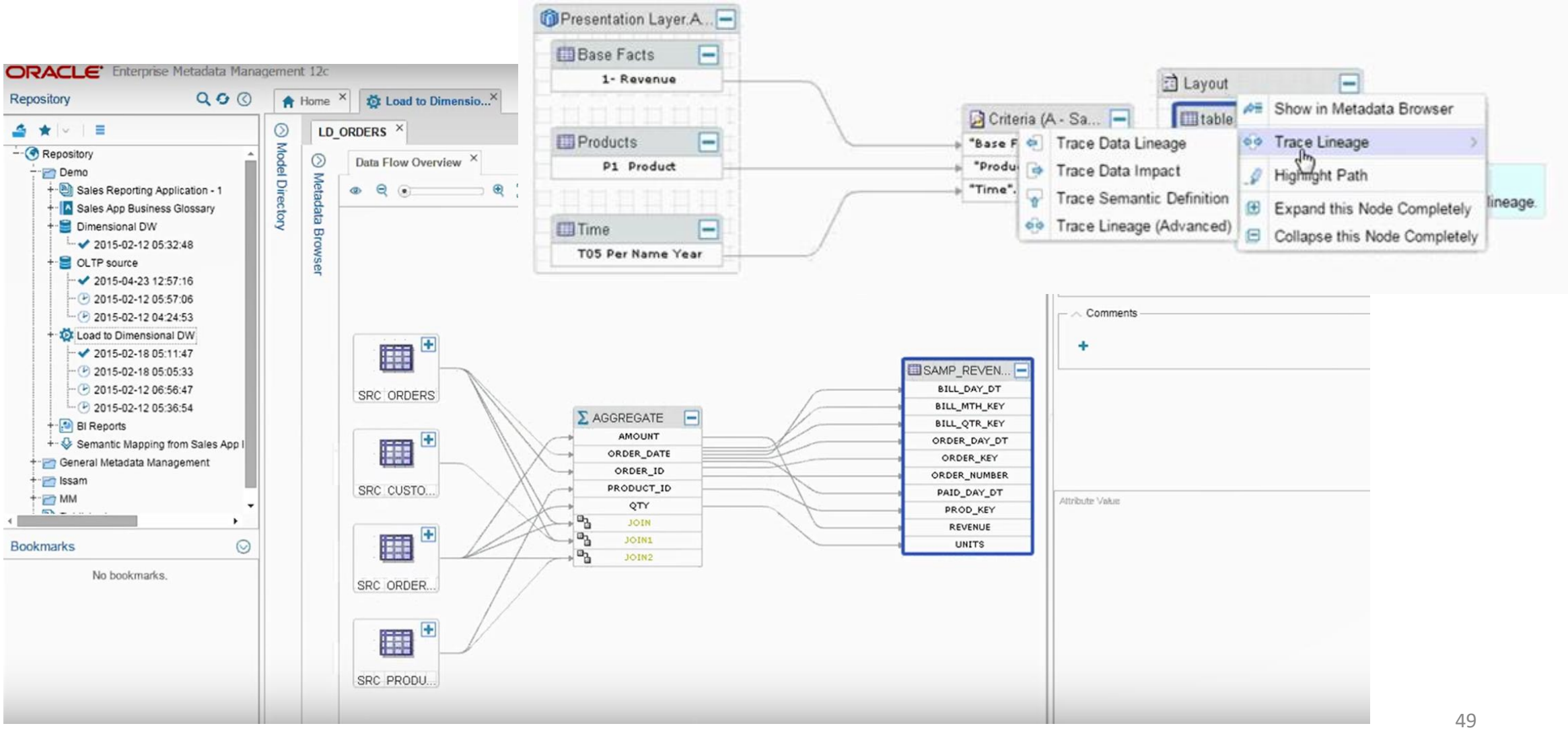




Data lineage metadata can be used to help information system developers meet key data protection by design requirements:

1. Data subjects have **right to access, review and rectify** their personal data
2. Data subjects have the **right to withdraw given consent** with effect for the future and
   - Block access
   - Constrain processing and use
   - Erase their personal data
3. Personal **data obtained for one purpose must not be processed for other purposes** not compatible with the original purpose

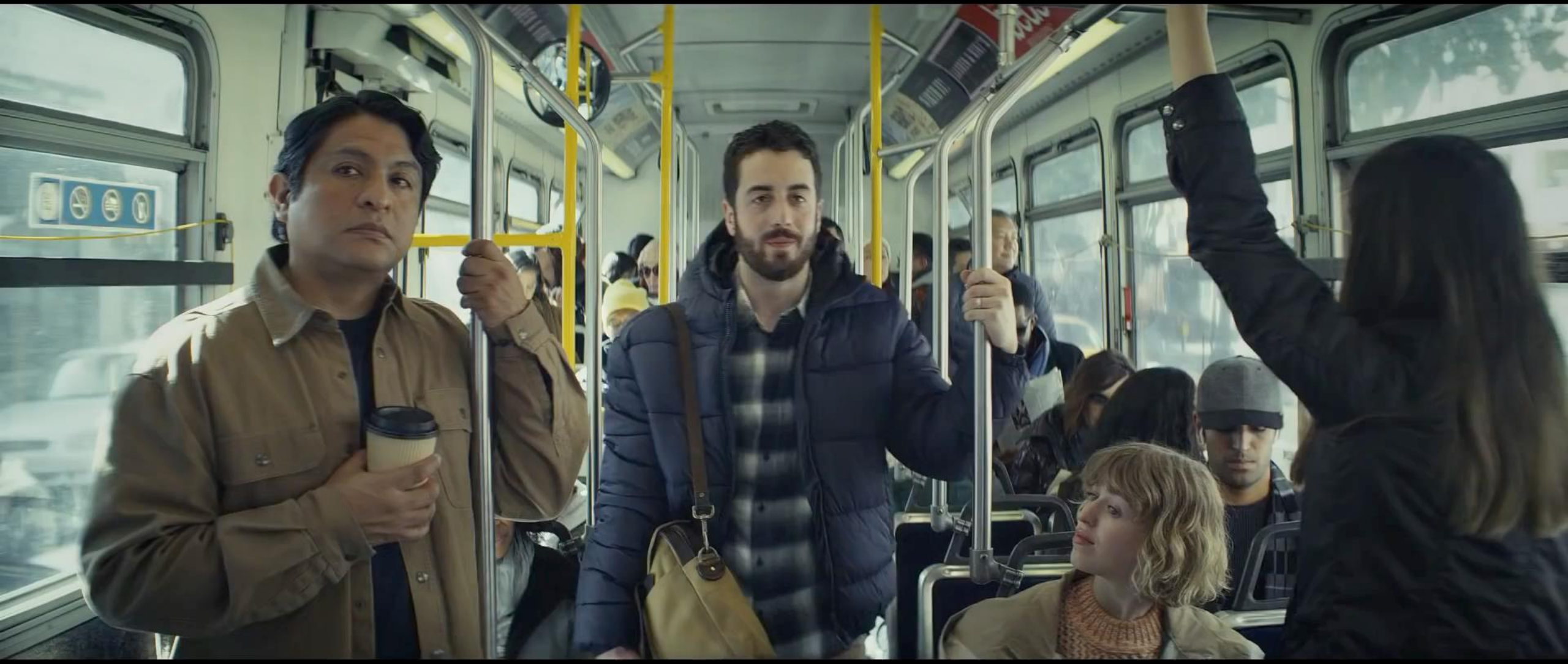
Outlook: Commercial database management systems are beginning to include lineage metadata capabilities for tracking attribute values processed and transformed among relational database tables ...

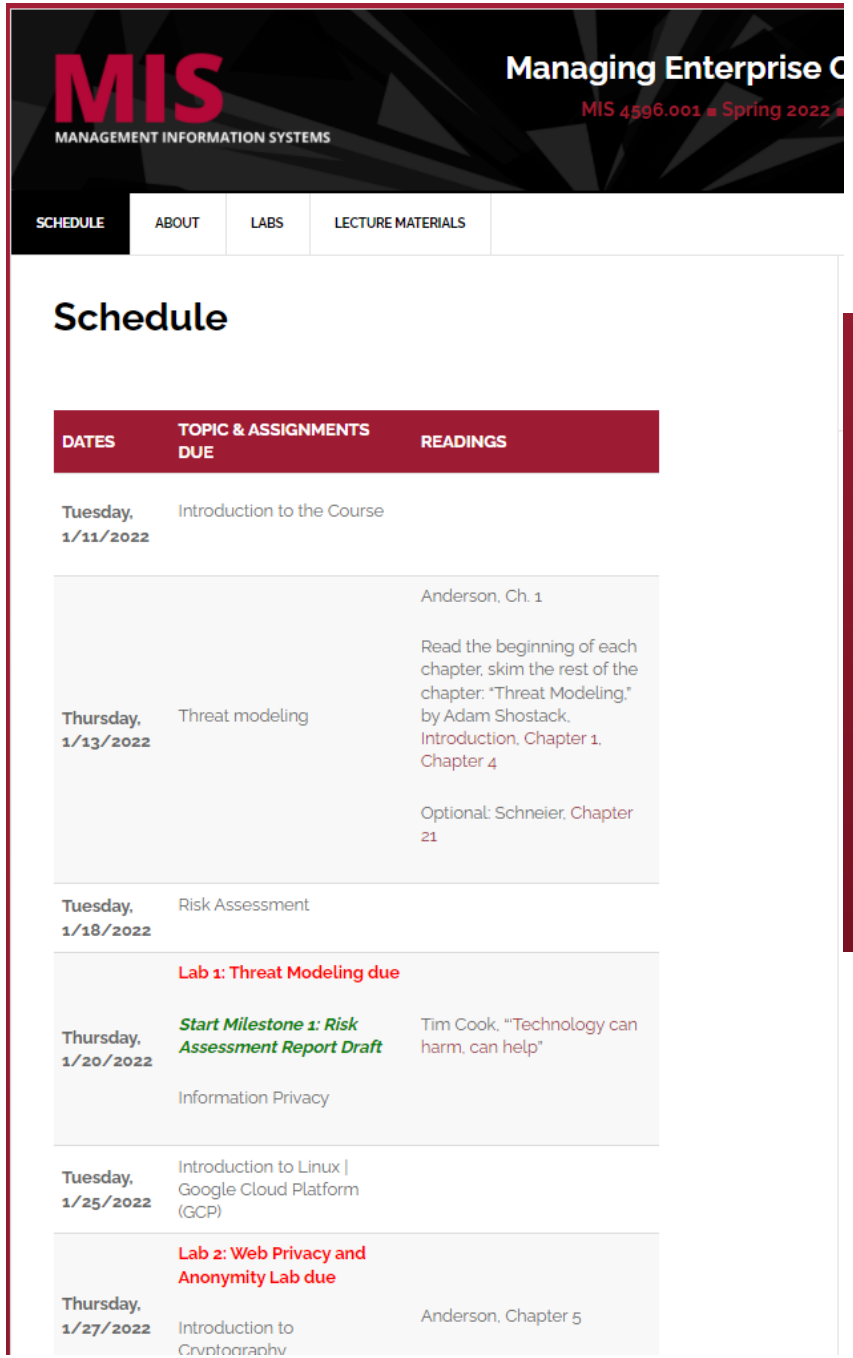


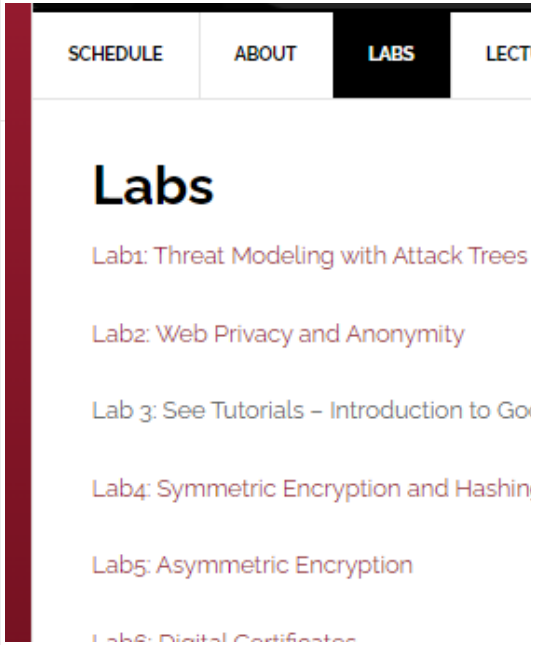
Agenda

- ✓Privacy and data protection by design
- ✓Data provenance and data lineage
  - ✓Data lineage metadata and its processing
  - ✓Audit of SCE’s enterprise information processing
  - ✓Metadata processing enables data privacy by design
- Lab: Web Privacy and Anonymity


Privacy
matters







Lab: Web Privacy and Anonymity

Overview of trackers, third party cookies, and Tor

By Drs. Dave Eargle and Anthony Vance

This lab will help you learn more about how to protect your privacy on the Web. Perform the steps below on your personal computer, not your Kali VM on Google Cloud.

Part 1: Check Out Your Data

Several major companies allow you to check out and examine the data they have on file for you. This can be very revealing.

Use this link to learn how to download your data from one or more of the following services:

- Facebook (highly recommended)
- Instagram
- Google (If you use Gmail or Google Drive, note that downloads can be large)
- Instagram
- LinkedIn
- Pinterest
- Twitter

Alternatively, see the links below to download your data from these companies:

- Amazon
- Apple
- Snapchat

If you aren't a customer for any of the above companies, try to check out your data for another company you use.

Question 1: What types of information had this online service collected about you?

Question 2: Did anything you found in the data about yourself surprise you?

Question 3: Submit to Canvas as screenshot of the files you obtained from the online service. Don't submit a screenshot of the contents of these files.

Part 2: Blocking Web Trackers

Although ad trackers are seemingly everywhere on the Web, the good news is that the newest versions of several major web browsers–such as Firefox, Brave, and Safari for Apple devices–have built-in privacy protections.

Setup Firefox

https://community.mis.temple.edu/mis4596sec001spring2022/labs/

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