

Exam 2 Review Session



INFO 200: Intellectual Foundations of Informatics

Winter 2021

Overview

Weeks 4-6

Lecture 7: Information Systems and Power

Lecture 8: Software User Interface Design, Product Design

Lecture 9: Accessible Design

Lecture 10: The Designed Object over Time

Lecture 11: Search Engines, Mis/dis-information

Lecture 12: Data Modeling and Encoding, Information Architecture and Search

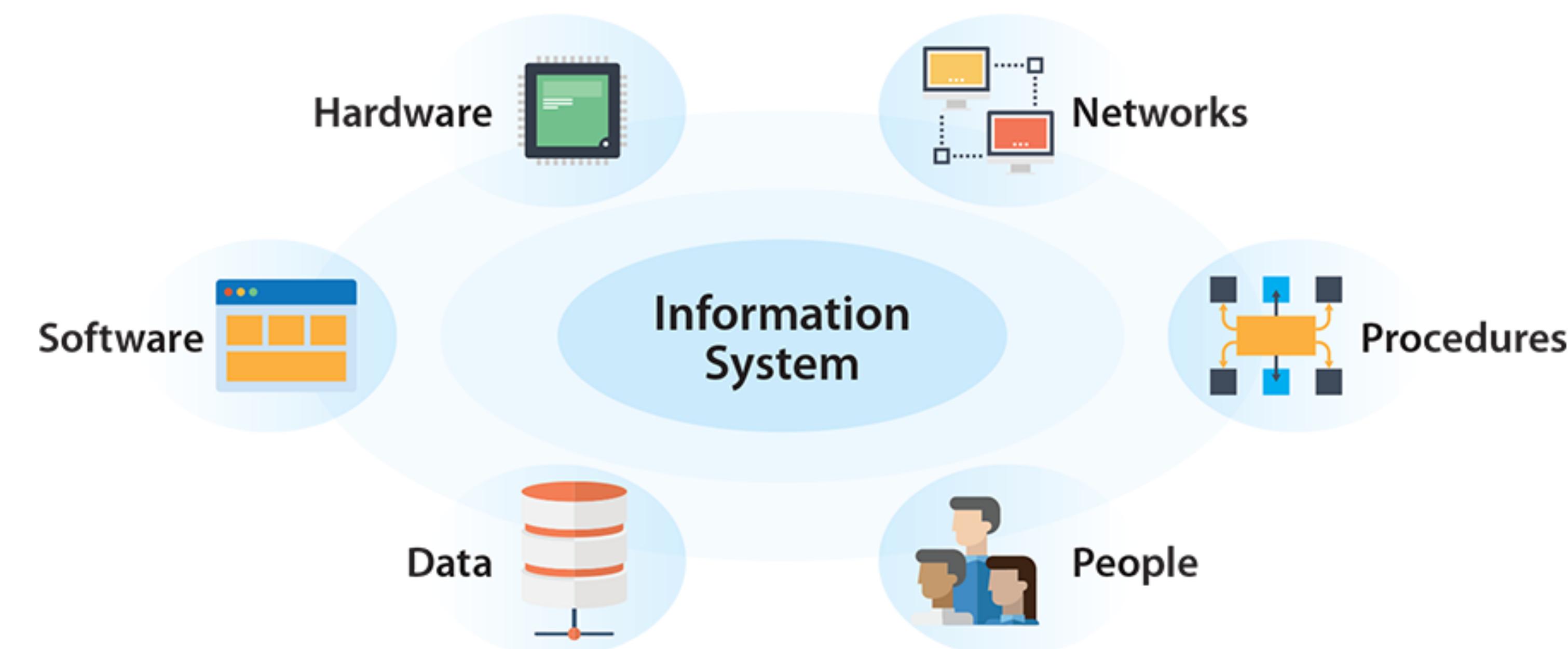
Reading: What is an Information System?

Week 4, Lecture 7

Components of an Information System

- **Hardware** - tangible, physical portion (ex. computer, keyboard, flash drive)
- **Software** - instructions for hardware (ex. operating systems and applications – iOS, Windows, Microsoft Excel)
- **Data** - collection of facts (ex. phone number, address, social media account)
- **People** - people involved in the system (ex. support staff, developers, system analysts)
- **Processes** - series of steps taken to achieve a goal

These components collect, store, organize, and distribute information throughout an organization.



Reading: What is an Information System?

Week 4, Lecture 7

History of Information Systems

Mainframe Era (1970s) - computers were seen as an efficient way to do calculations

PC Revolution (mid-1980s) - standalone machines not connected to a network (IBM PC, Apple Computer)

Client-Server (late 1980s to early 1990s) - began to connect computers to collaborate and share resources

- PCs (clients) connected to a central computer (server)

Internet, WWW, and E-Commerce (mid-1990s to early 2000s) - long distance transmission between computers

- Beginning of the internet and world-wide web; eBay and Amazon were founded in 1994
- Dot-com boom and bust - rush of investment in Internet-based companies

Web 2.0 (mid-2000s to present) - use of technology in businesses evolved rapidly; ethical issues began to emerge

Post-PC (today and beyond) - slight drop in PC sales and acceleration in smartphone sales

Information Systems and Power

Week 4, Lecture 7



Information systems are present in almost every aspect of life

- Created in response to needs, uses, and requirements
- Help organize things, create efficiency, and meet goals

Good information systems are...

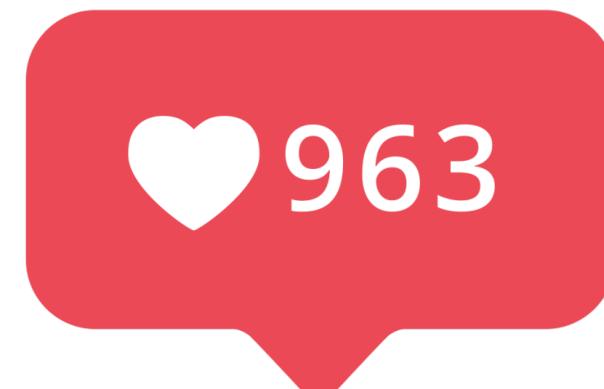
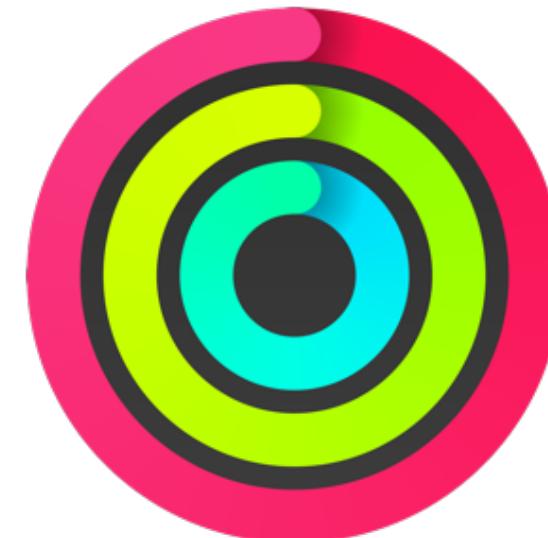
- Effective, efficient, accurate, reliable
- Fair, just, socially responsible, promote certain values (**design choices**)

Video: Brain Hacking

Week 4, Lecture 8

Techniques to get you to use the product for as long as possible and come back for more (addiction)

- Snapchat streaks
- Apple Watch rings
- Instagram likes



Weakening our relationships to each other and destroying our ability to focus

The longer you use a product, the more data is collected about you

- You become the product

Reading: The hamburger menu doesn't work

Week 4, Lecture 8

Issues

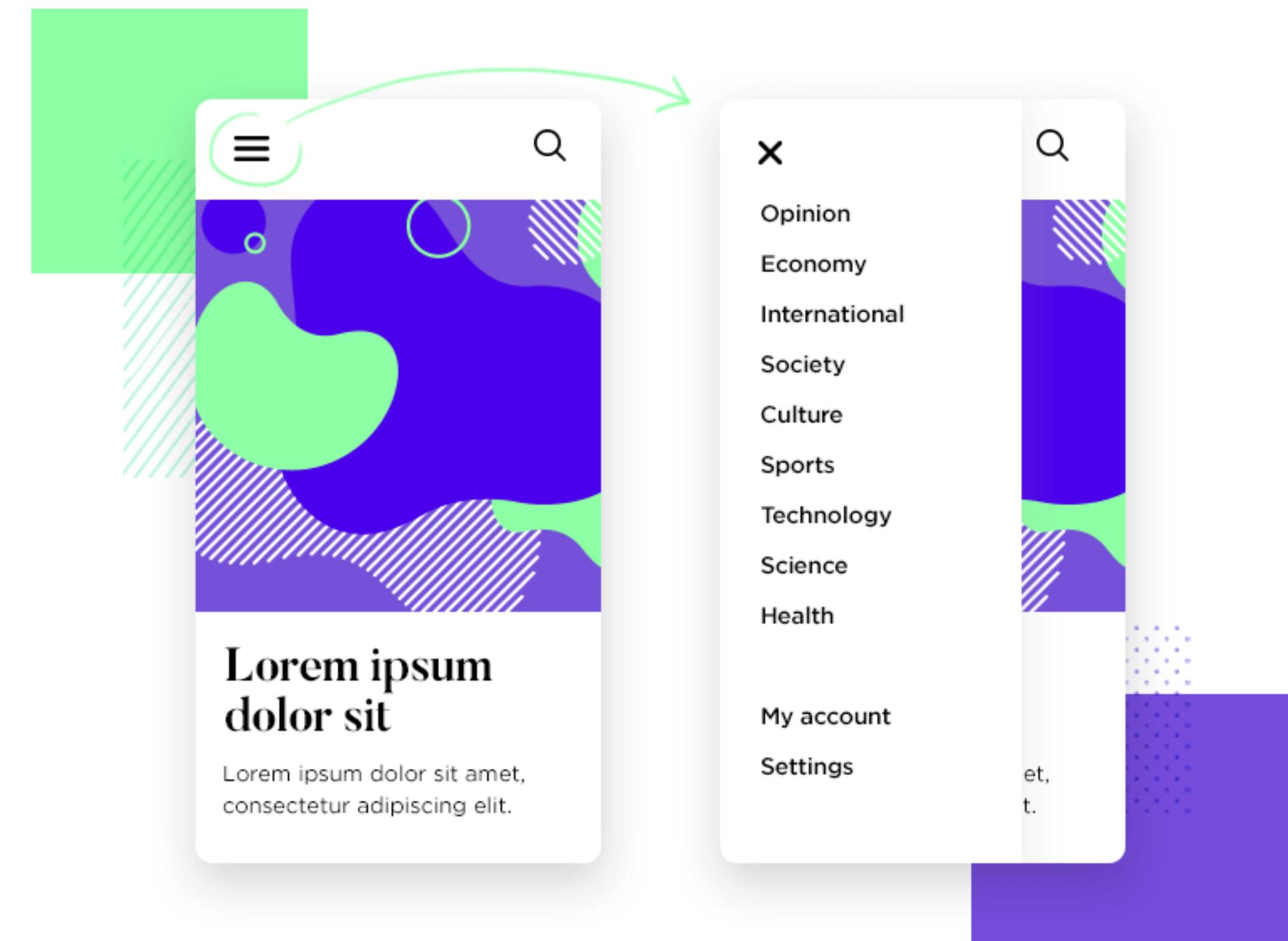
- Everything in the menu is hidden by default
- User is unaware that what they're looking for is under the menu
- Decrease in engagement

Why it's still so popular

- Looks clean
- Trends > logic
- It's built into everything

Alternatives

- Tab bars
- Priority+ menu



Software User Interface Design

Week 4, Lecture 8

User interface (UI) - the means through which a user and a device interact

User experience (UX) - how the user interacts with and experiences a product

USER EXPERIENCE



USER INTERFACE



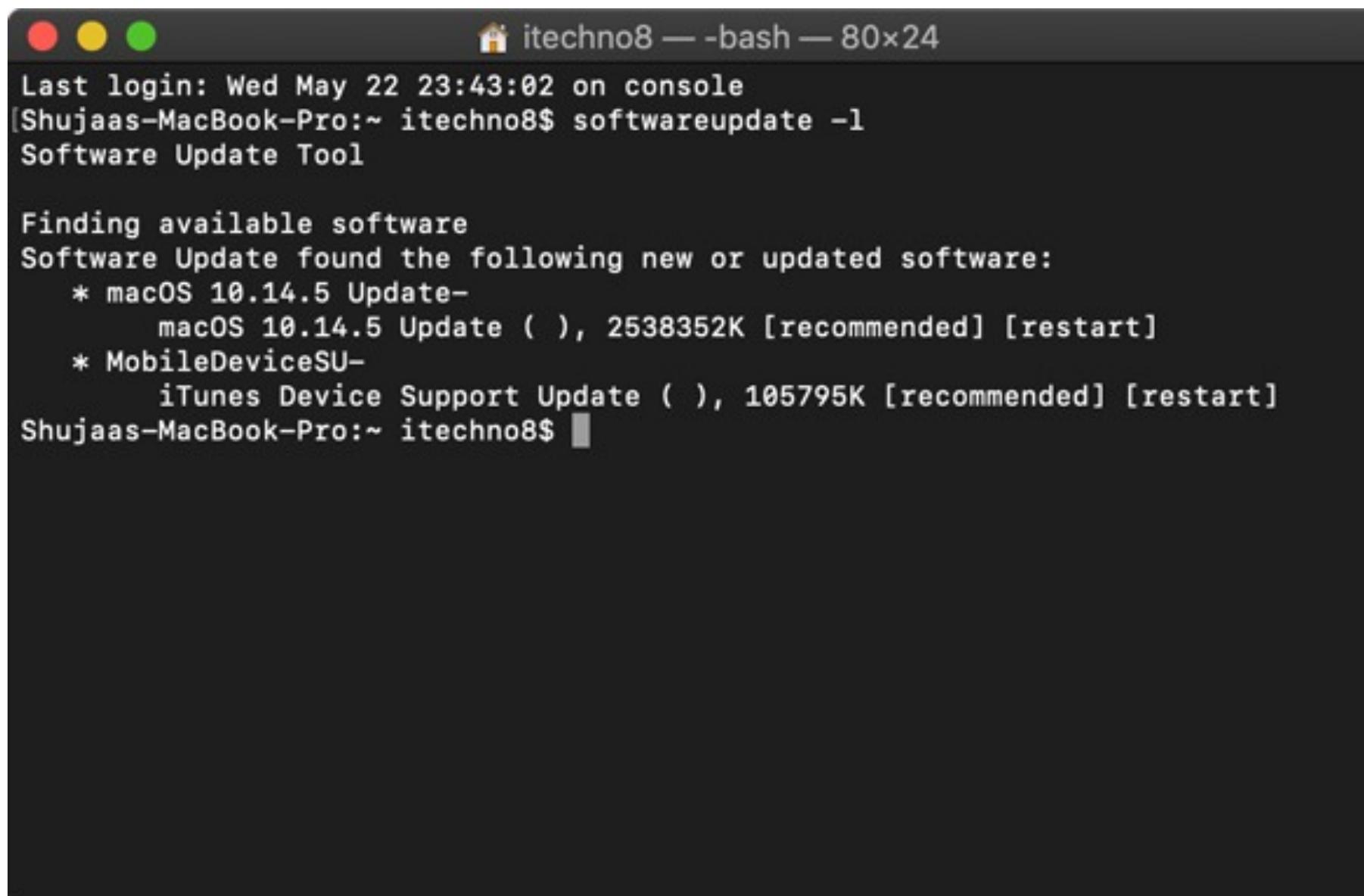
Software User Interface Design

Week 4, Lecture 8

Command Line Interface (CLI) - interact with computer through text

- Faster, more powerful, scriptable

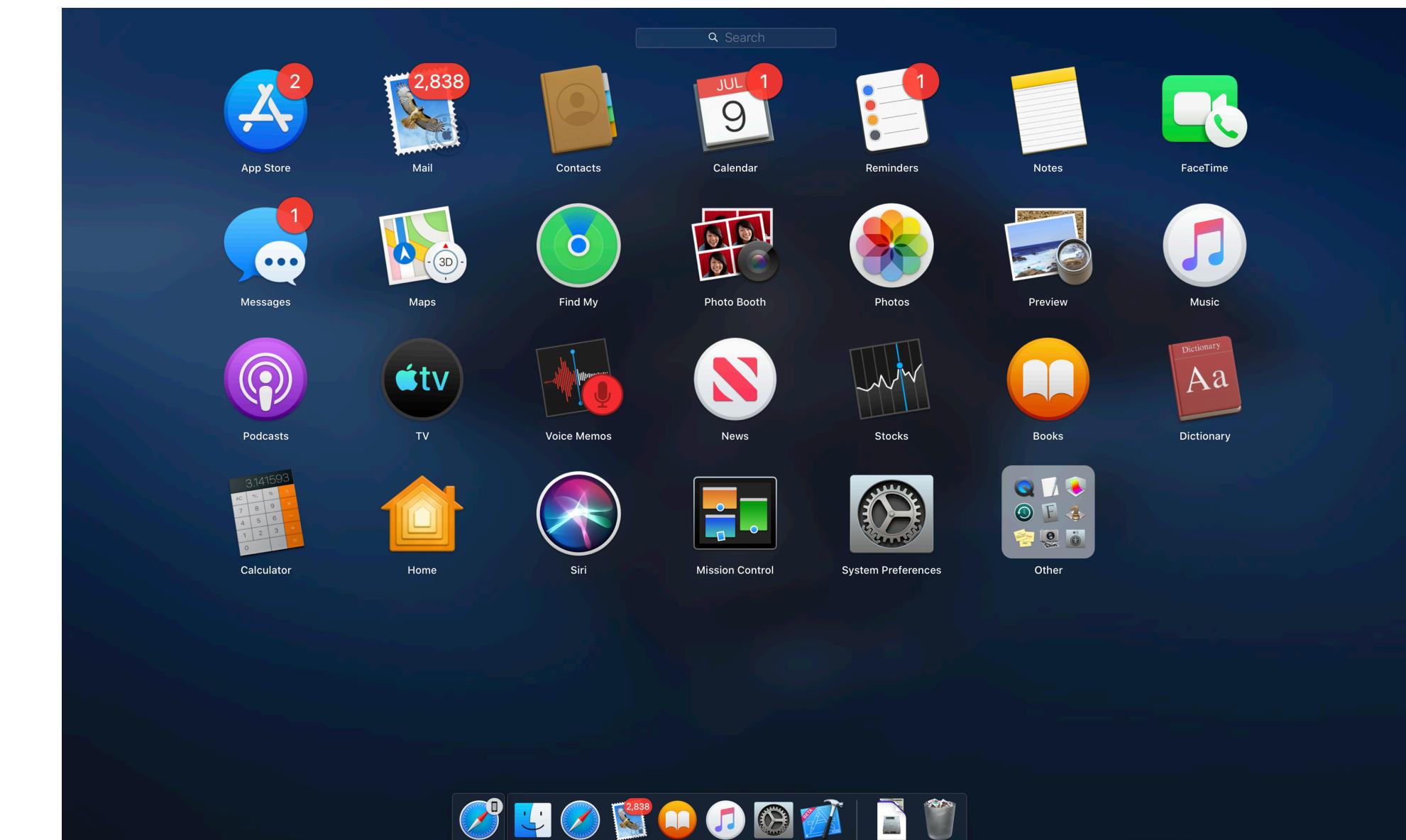
Graphical User Interface (GUI) - interact with computer through visual components



```
itechno8 — bash — 80x24
Last login: Wed May 22 23:43:02 on console
[Shujaas-MacBook-Pro:~ itechno8$ softwareupdate -l
Software Update Tool

Finding available software
Software Update found the following new or updated software:
* macOS 10.14.5 Update-
  macOS 10.14.5 Update ( ), 2538352K [recommended] [restart]
* MobileDeviceSU-
  iTunes Device Support Update ( ), 105795K [recommended] [restart]
Shujaas-MacBook-Pro:~ itechno8$
```

Command Line Interface



Graphical User Interface

Software User Interface Design

Week 4, Lecture 8

Color

Typography and fonts

Buttons and dialog boxes

Icons

Visual Hierarchy



Purple

PMS: 2685

CMYK: 93/100/18/21

RGB: 51/0/111

HEX: 4b2e83

Gold

PMS: 7502

CMYK: 0/13/43/13

RGB: 232/211/162

HEX: b7a57a

HEX: e8e3d3 (Web only)

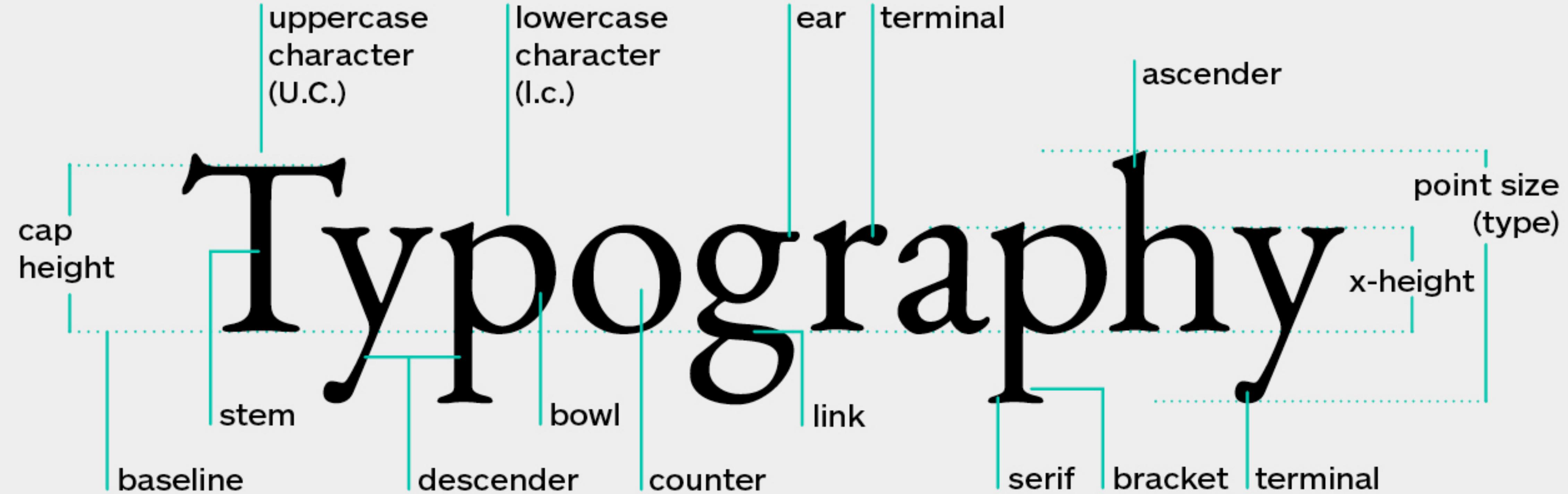
Metallic gold

PMS: 871

CMYK: 30/35/60/0

RGB: 145/123/76

HEX: 85754d



Helvetica Neue 35 Thin

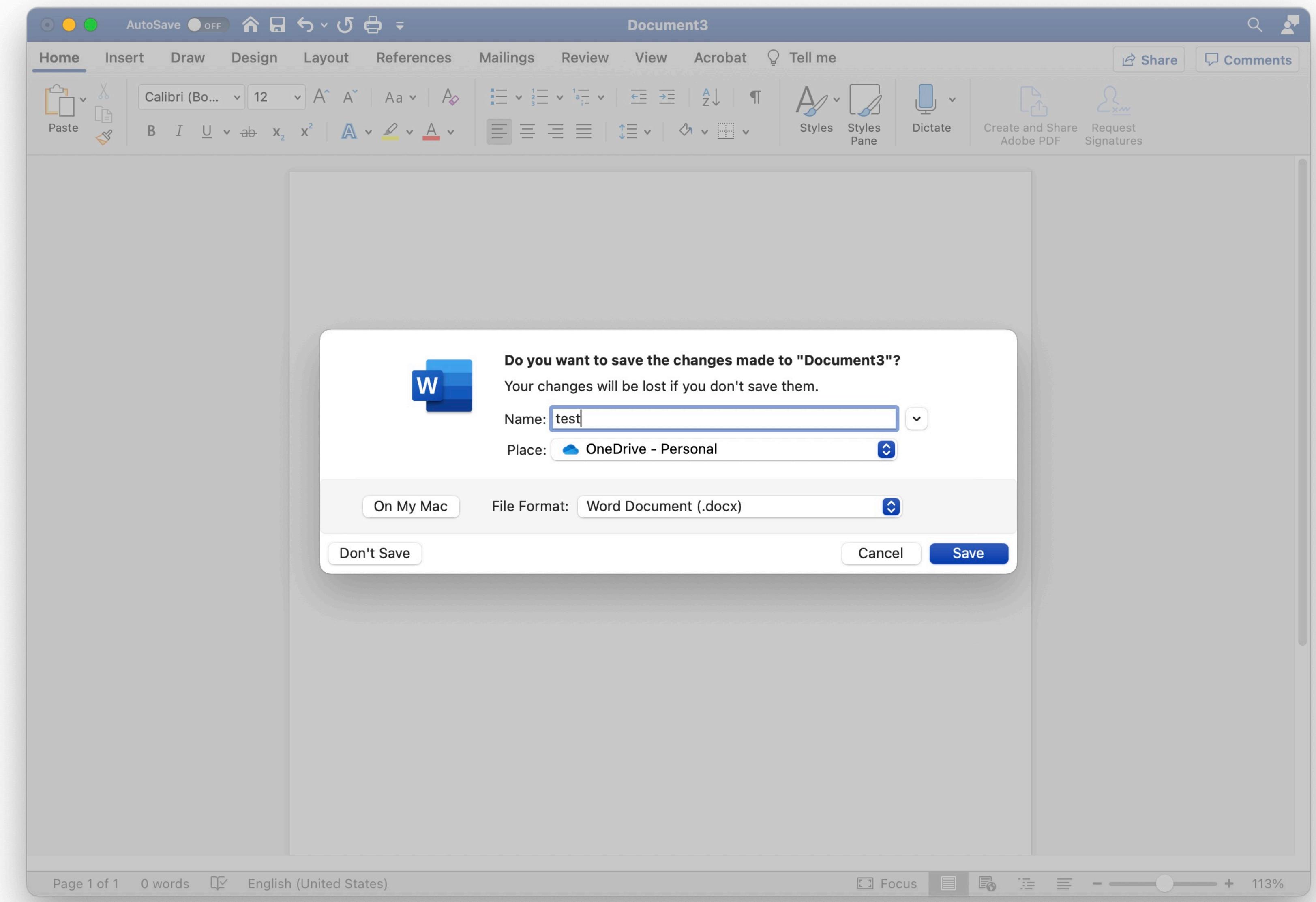
Helvetica Neue 45 Light

Helvetica Neue 55 Roman

Helvetica Neue 65 Medium

Helvetica Neue 75 Bold

Helvetica Neue 85 Heavy



Microsoft Word



UW Icons

And you will read this last

**You will read
this first**

And then you will read this

Then this one

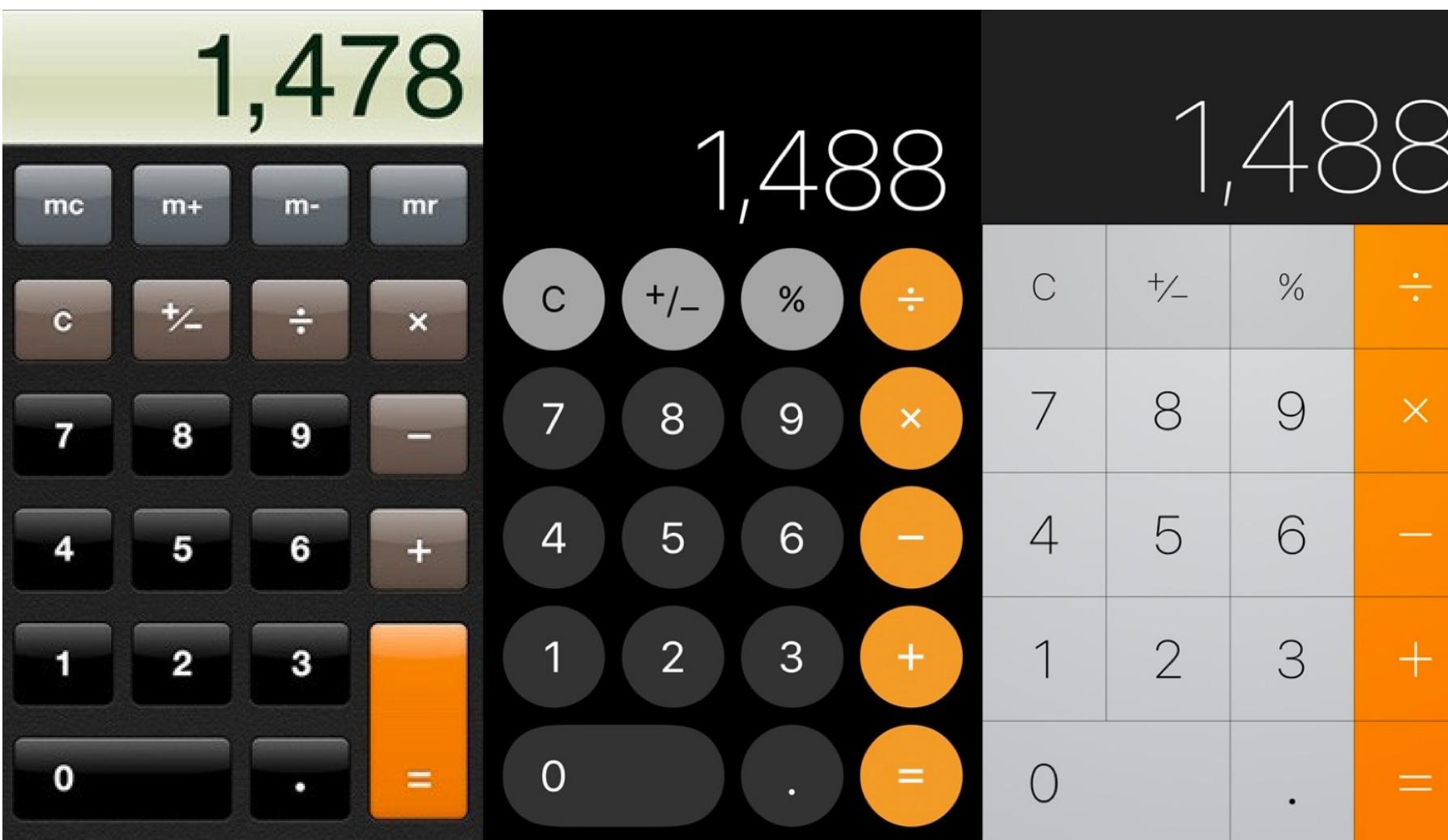
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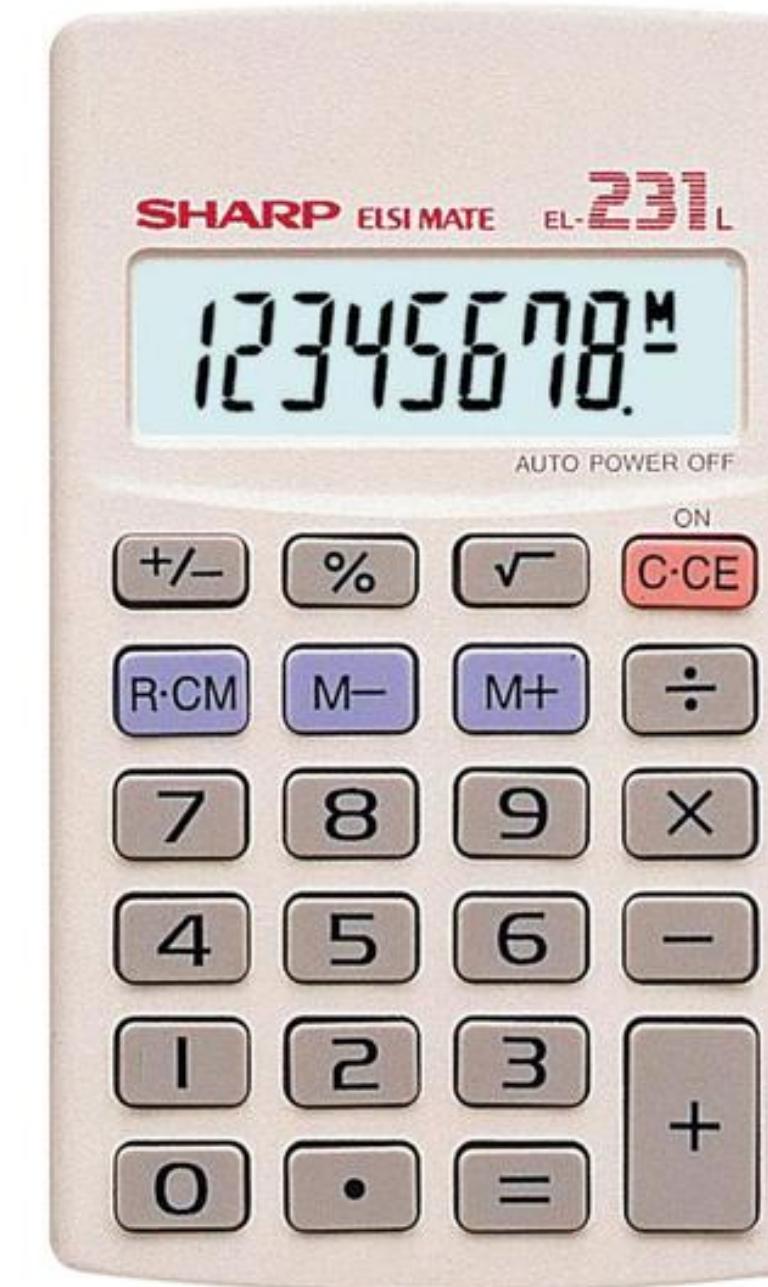
Software User Interface Design

Week 4, Lecture 8

Skeuomorphism - making items that are represented resemble their real-world counterparts



iOS Calculator



SHARP Calculator

Accessible Design

Week 5, Lecture 9



Spectrum of ability - people have varying degrees of ability in different areas

Disability - long-term or permanent impairment of an ability

Accessible design accounts for variations in ability

Universal design is the design of products to make them accessible to all people

Major companies have started embracing accessible design

- Microsoft, Apple, Facebook, Google, etc.

The Designed Object over Time

Week 5, Lecture 10

What is a book?

According to Kilgour...

“a storehouse of human knowledge intended for dissemination in the form of an artifact that is portable - or at least transportable - and that contains arrangements of signs that convey information”



Clay tablet

The Designed Object over Time

Week 5, Lecture 10

What caused the evolution of the book? (Kilgour)

1. Societal need for information
2. Technological knowledge and experience
3. Organizational experience and capability
4. The capability of integrating a new form into existing information systems
5. Economic viability

The Designed Object over Time

Week 5, Lecture 10

The evolution of the book (Kilgour)

2500 BC - Clay tablet

2000 BC - Papyrus scroll

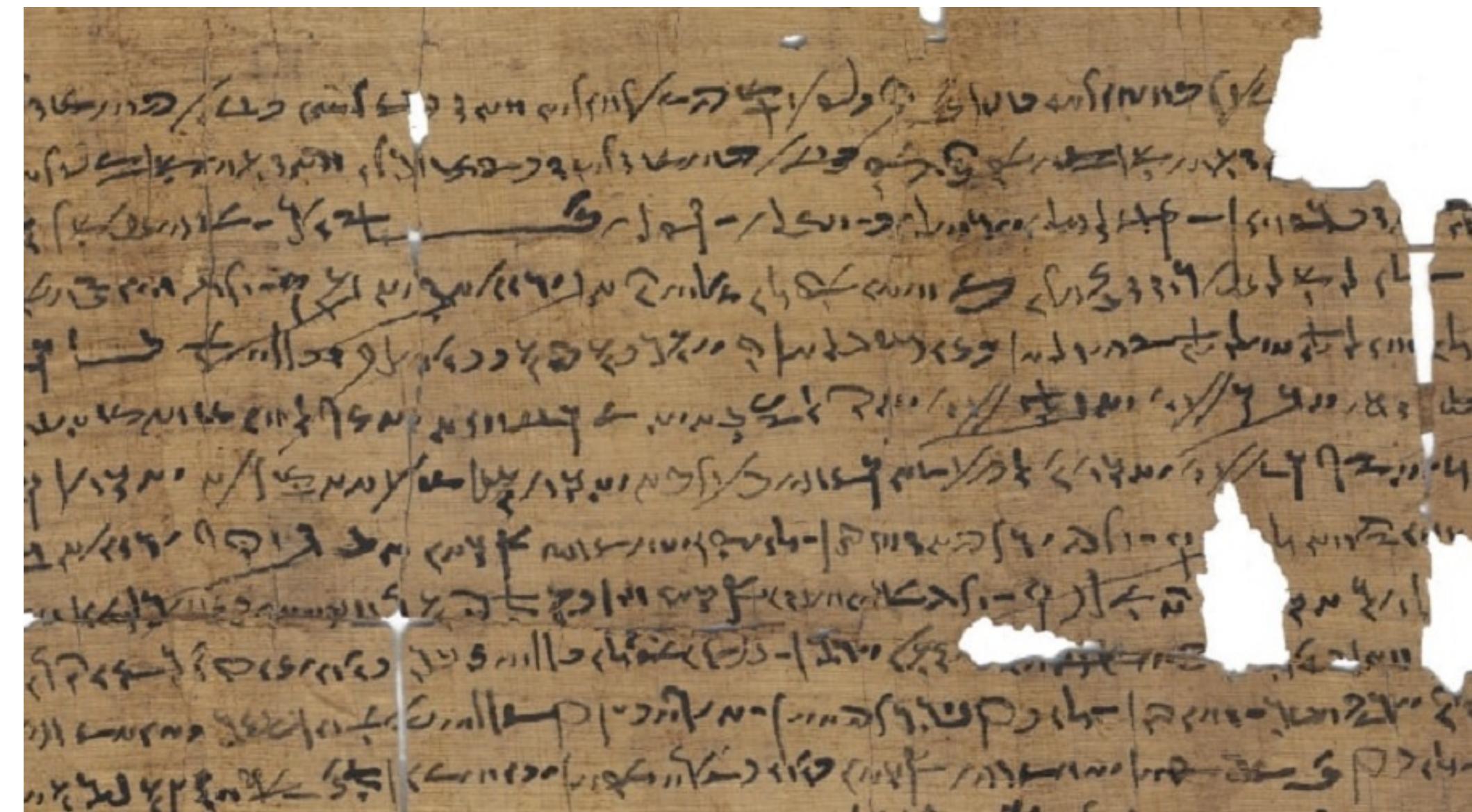
150 AD - Codex

1450 - Printing

1800 - Steam power

1970 - Offset printing

2000 - Electronic book (e-book)



Papyrus scroll

The Designed Object over Time

Week 5, Lecture 10

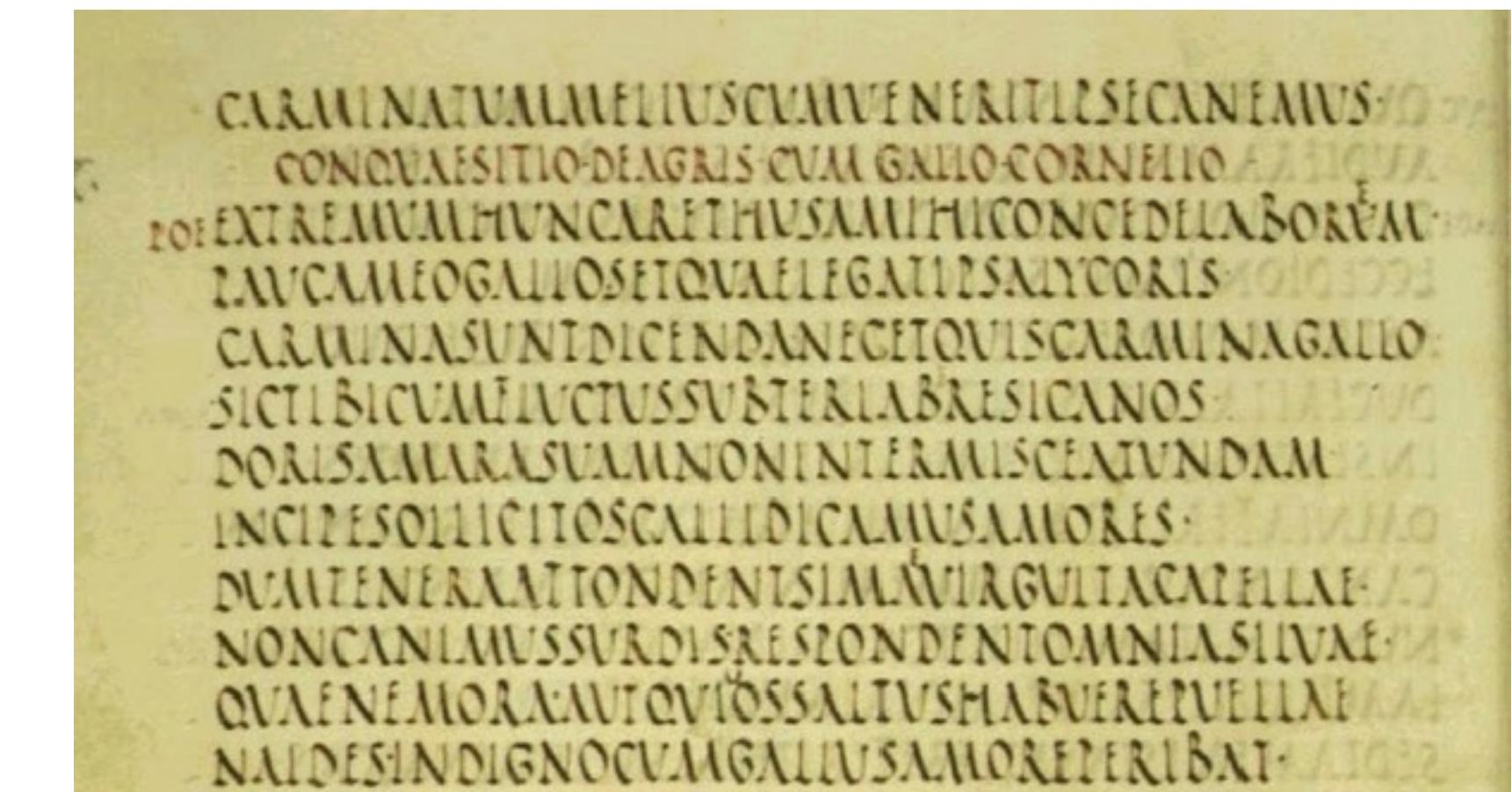
Paragraphos - a mark in ancient Greek that denoted a division in the text

Incipit - identifying label for the opening words of a text

Explicit - identifying label for the ending of a text

Boustrophedon - a style of writing in which words are written from right to left and then left to right on alternating lines

Scriptio continua - a style of writing without spaces



Scriptio continua

Search Engines

Week 6, Lecture 11

Search engines can help us find...

- Information we need to make a decision
- Information we want or need
- Information to verify things we hear
- Entertainment (music, movies, etc.)
- Other people (family, friends, coworkers, etc.)



Search engines facilitate information seeking behavior.

Search Engines

Week 6, Lecture 11



How does a search engine work?

- **Web crawler** - piece of software that continually visits webpages

3 functions of a search engine

1. **Crawling** - scour billions of webpages for content
2. **Indexing** - store and organize the content
3. **Ranking** - order content by relevance to the user

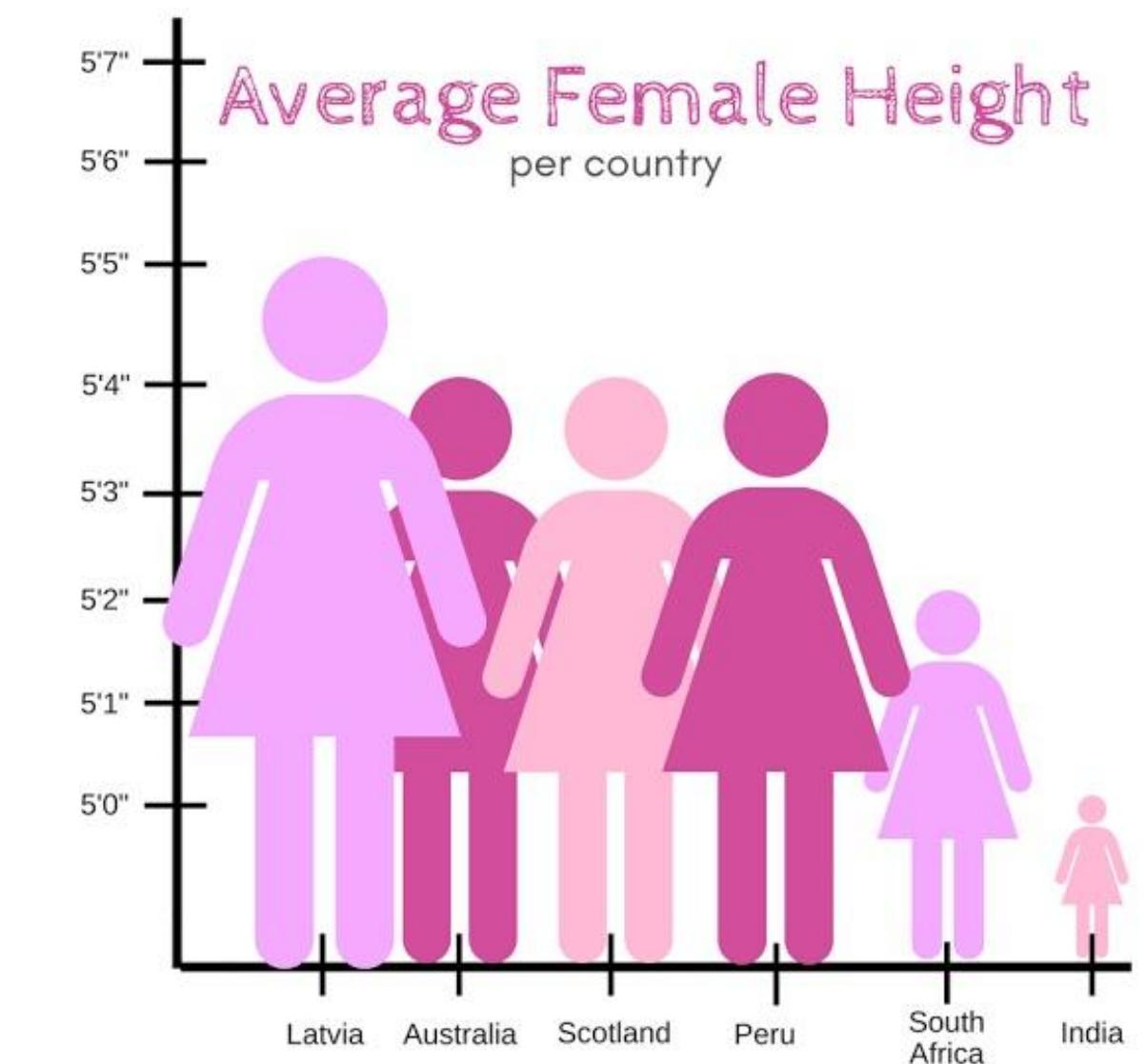
Search Engine Optimization (SEO) - helping websites appear higher on results lists

Mis/dis-information

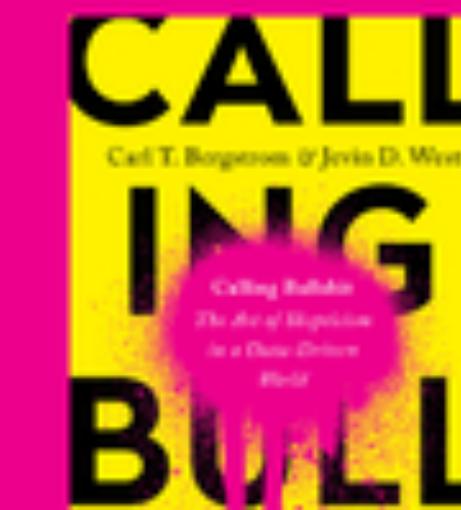
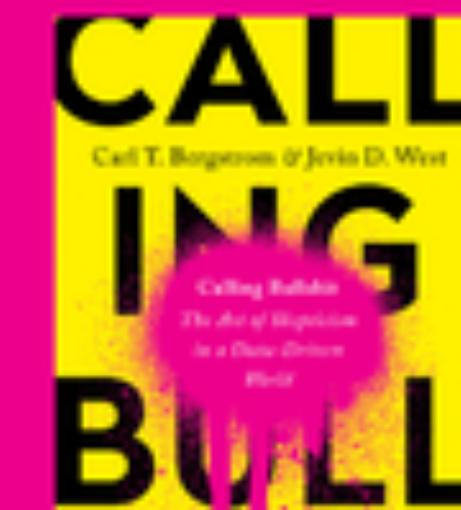
Week 6, Lecture 11

A few key takeaways from the talk...

- Numbers should always be put into context
- Correlation does **not** imply causation
- **Selection bias** - bias that stems from not using a randomized sample



www.callingbullshit.org



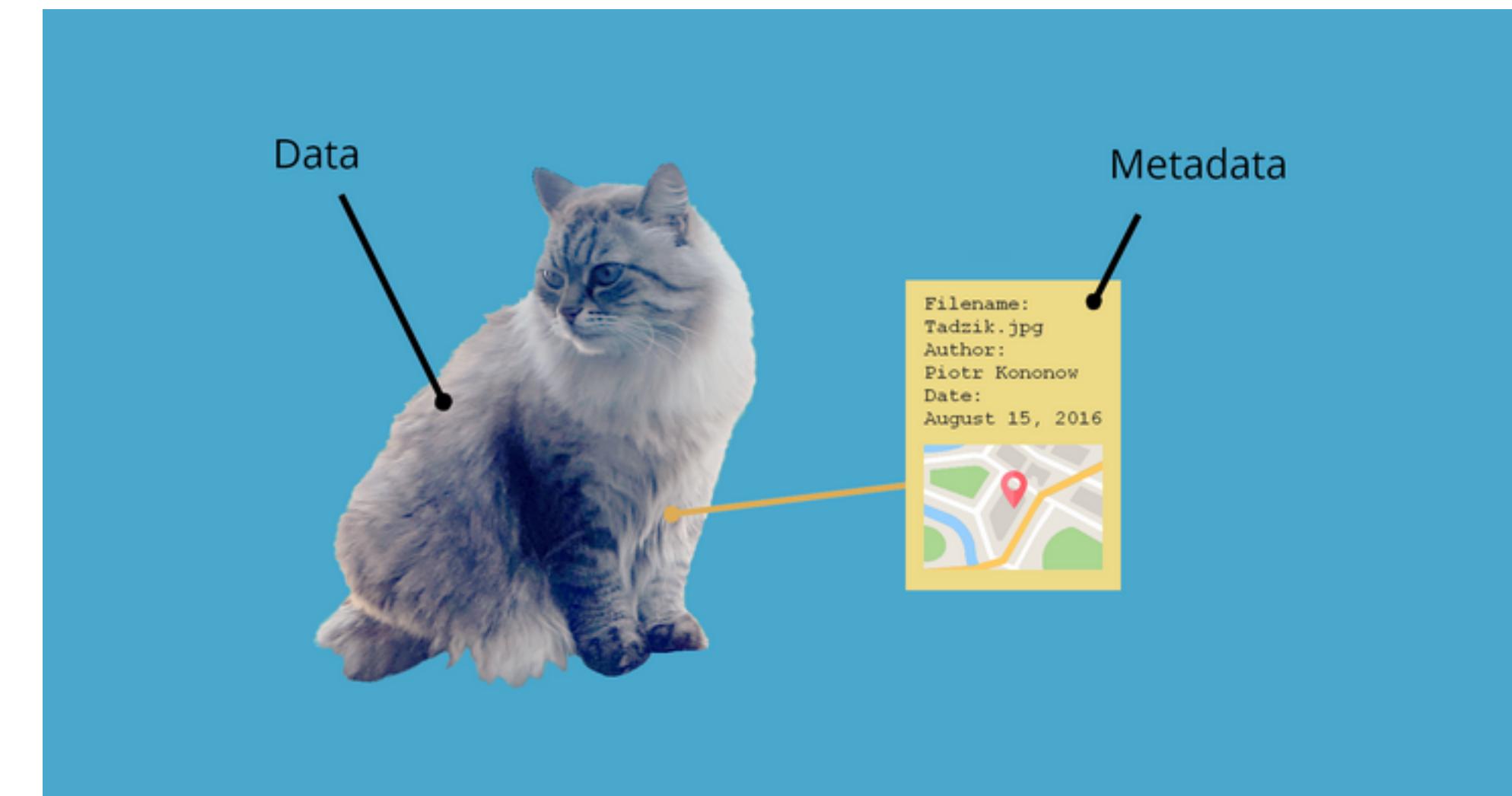
Data Modeling and Encoding

Week 6, Lecture 12

What is search?

Search - the matching of representations (**metadata**) in a database using an algorithm

- **Metadata** - data about data
- **Structured search**



Data Modeling and Encoding

Week 6, Lecture 12

How can we encode text into files?

Character sets - define a mapping between sets of bits and characters

- Unicode (text)
- Raster (images)
- Sound encoding

character	encoding	bits
A	UTF-8	01000001
A	UTF-16	00000000 01000001
A	UTF-32	00000000 00000000 00000000 01000001
あ	UTF-8	11100011 10000001 10000010
あ	UTF-16	00110000 01000010
あ	UTF-32	00000000 00000000 00110000 01000010

Data Modeling and Encoding

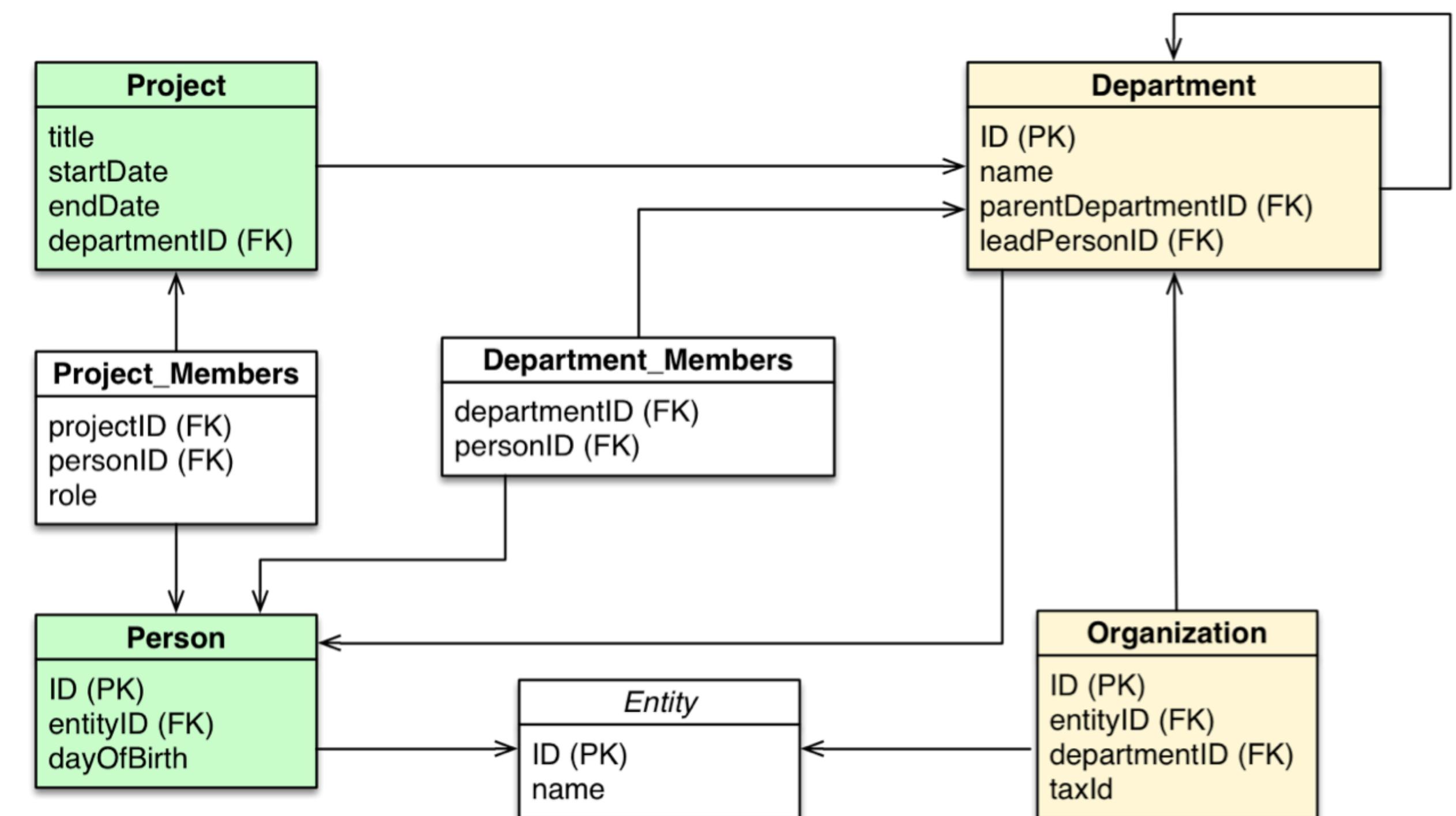
Week 6, Lecture 12

Relational Database Management System (RDBMS)

- Type of database that stores data into tables
- Data can be added, navigated, tabulated, updated, and deleted

Schema - structure of a database

- Visually represented using an **entity-relationship diagram (ERD)**



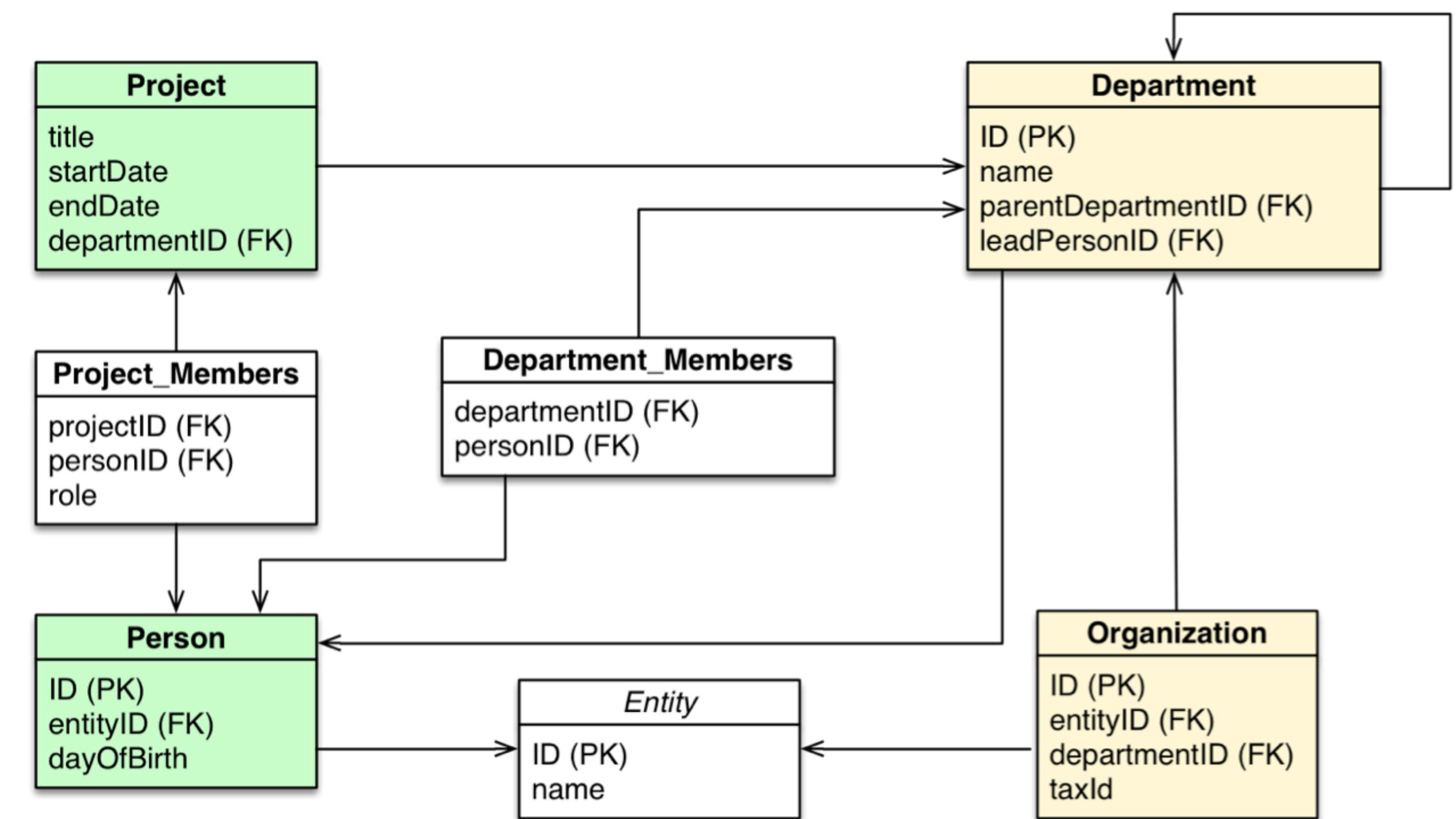
Entity-relationship diagram

Data Modeling and Encoding

Week 6, Lecture 12

Entity-relationship diagram (ERD)

- **Entity** - person, place, or thing in the system
 - Project, Department, Person
- **Relationship** - how the entities are related
 - Project has multiple project members
- **Attribute** - information about entities
 - Project: startDate, endDate
 - Person: dayOfBirth



Entity-relationship diagram

Information Architecture

Week 6, Lecture 12

Information architecture - science of organizing and structuring information

Classification

- Grouping things together based on shared qualities
- Forms a **taxonomy**

HIERARCHY OF BIOLOGICAL CLASSIFICATION



Biological taxonomy

Information Architecture

Week 6, Lecture 12

Faceted classification

- Organizing by multiple taxonomies

Home Improvement

Shop All Home Improvement

Bathroom Renovation

Building Materials

Ceiling Fans

Doors and Gates

Electrical

Fasteners

Flooring

Floor & Wall Tiles

Garage & Storage

Generators

Hardware

Home Safety

Heating

Fireplaces

Heaters

Stoves

Water Heaters

Weatherproofing

Cooling

Air Conditioners

Evaporative Coolers

Fans

Portable Air Conditioners

Wall Air Conditioners

Window Air Conditioners

Featured Shops

Home for the Holidays

DIY & Done

Winter Prep

Home Remodeling

Moving Center

Contractor Portal

Emergency Prep

Shop Pro Tools

Shop Pools, Hot Tubs & Supplies

Hot Tubs

Swimming Pools

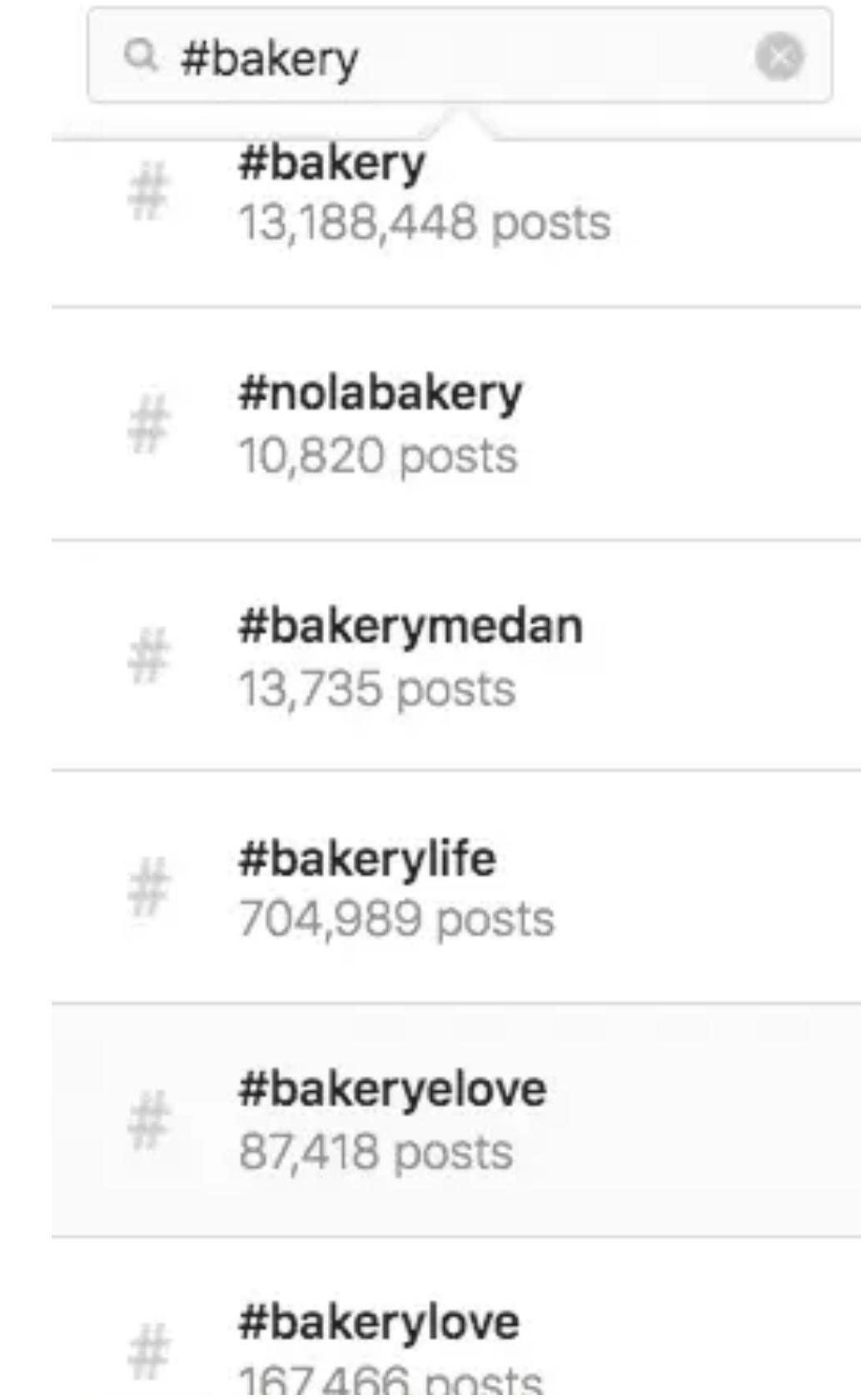
Walmart

Information Architecture

Week 6, Lecture 12

Folksonomy

- Users can add tags to items using words



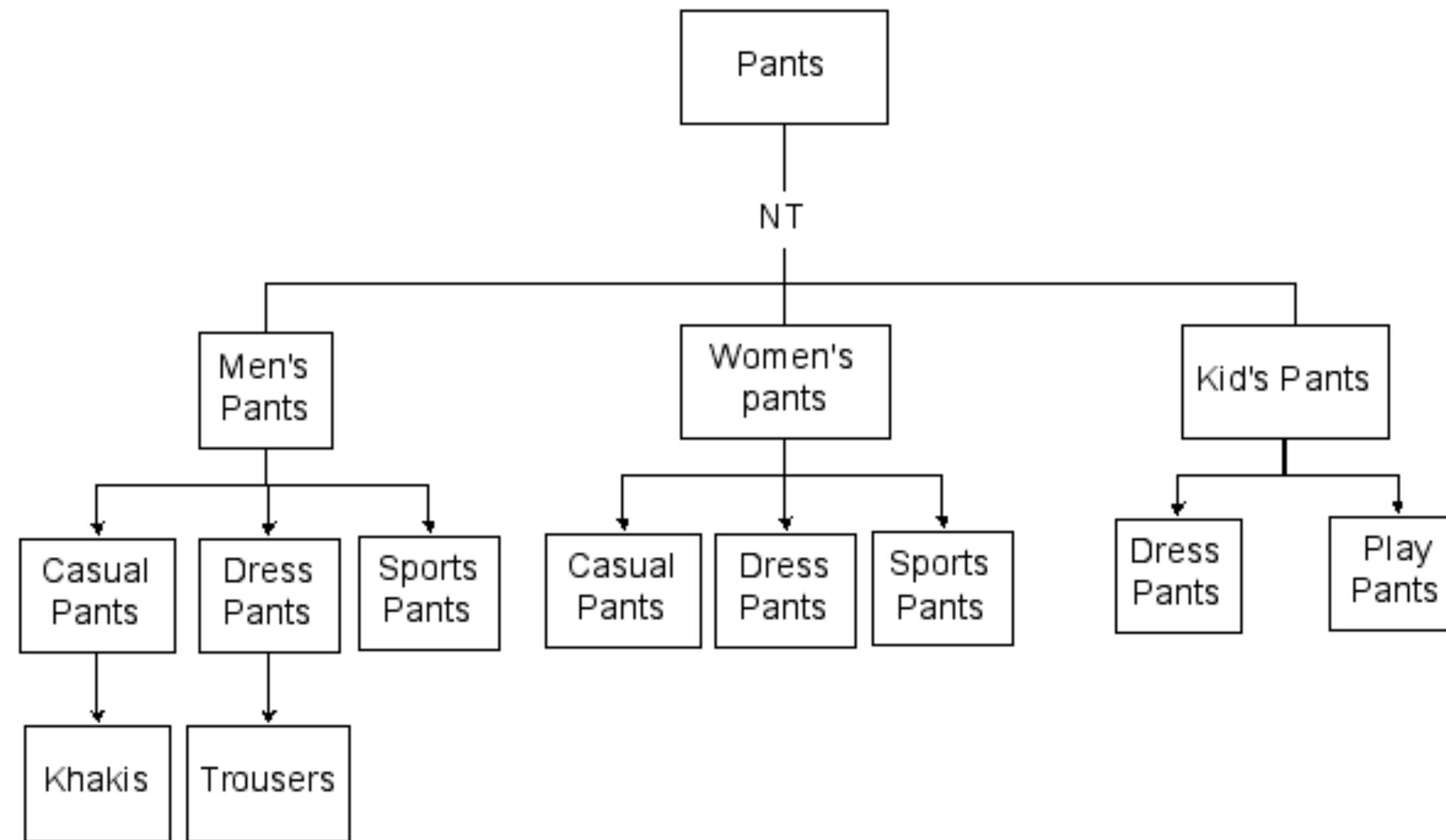
Instagram

Information Architecture

Week 6, Lecture 12

Controlled vocabulary

- Constructed sets of words and phrases that help people organize and search data



Information Architecture

Week 6, Lecture 12

Synonymy

- Words that have similar meanings



teacher

/'tēCHər/

noun

a person who teaches, especially in a school.
"a history teacher"

Similar:

educator

tutor

instructor

pedagogue

schoolteacher

schoolmaster

schoolmistress

master

mistress

governess

educationalist

educationist

supply teacher

coach

trainer

lecturer

professor

don

fellow

reader

academic

guide

mentor

guru

counselor

sophist

dominie

pandit

Information Architecture

Week 6, Lecture 12

Polysemy

- Word or phrase that has multiple meanings

crane noun

 Save Word

\ 'krān \

Definition of crane (Entry 1 of 5)

- 1 : any of a family (Gruidae of the order Gruiformes) of tall wading birds superficially resembling the herons but structurally more nearly related to the rails
- 2 : any of several herons
- 3 : an often horizontal projection swinging about a vertical axis: such as
 - a : a machine for raising, shifting, and lowering heavy weights by means of a projecting swinging arm or with the hoisting apparatus supported on an overhead track
 - b : an iron arm in a fireplace for supporting kettles
 - c : a boom for holding a motion-picture or television camera

Questions?