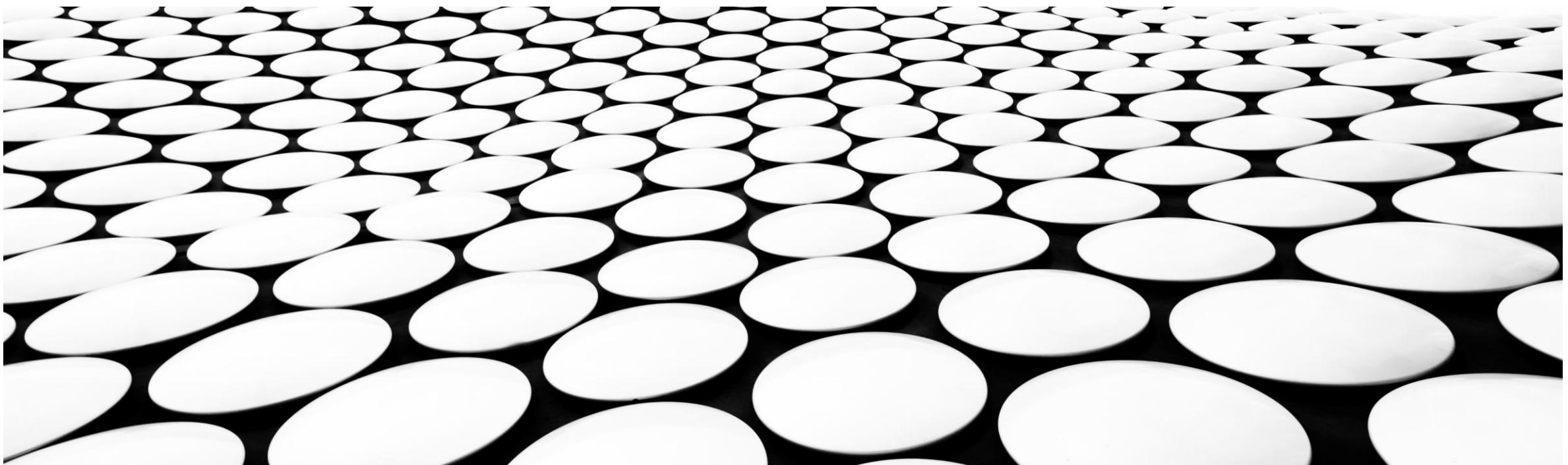


# HUMAN COGNITION AND ITS IMPACT ON UI DESIGN





## HUMAN COGNITION AND ITS IMPACT ON UI DESIGN

- Introduction
- Memory (short term / long term)
- System Image (organisation)
- System Image (different personas)
- Reasoning processes

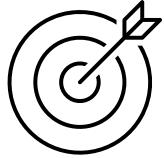
- Attention
- Perception
- Language
- Learning

Week 6

Week 7

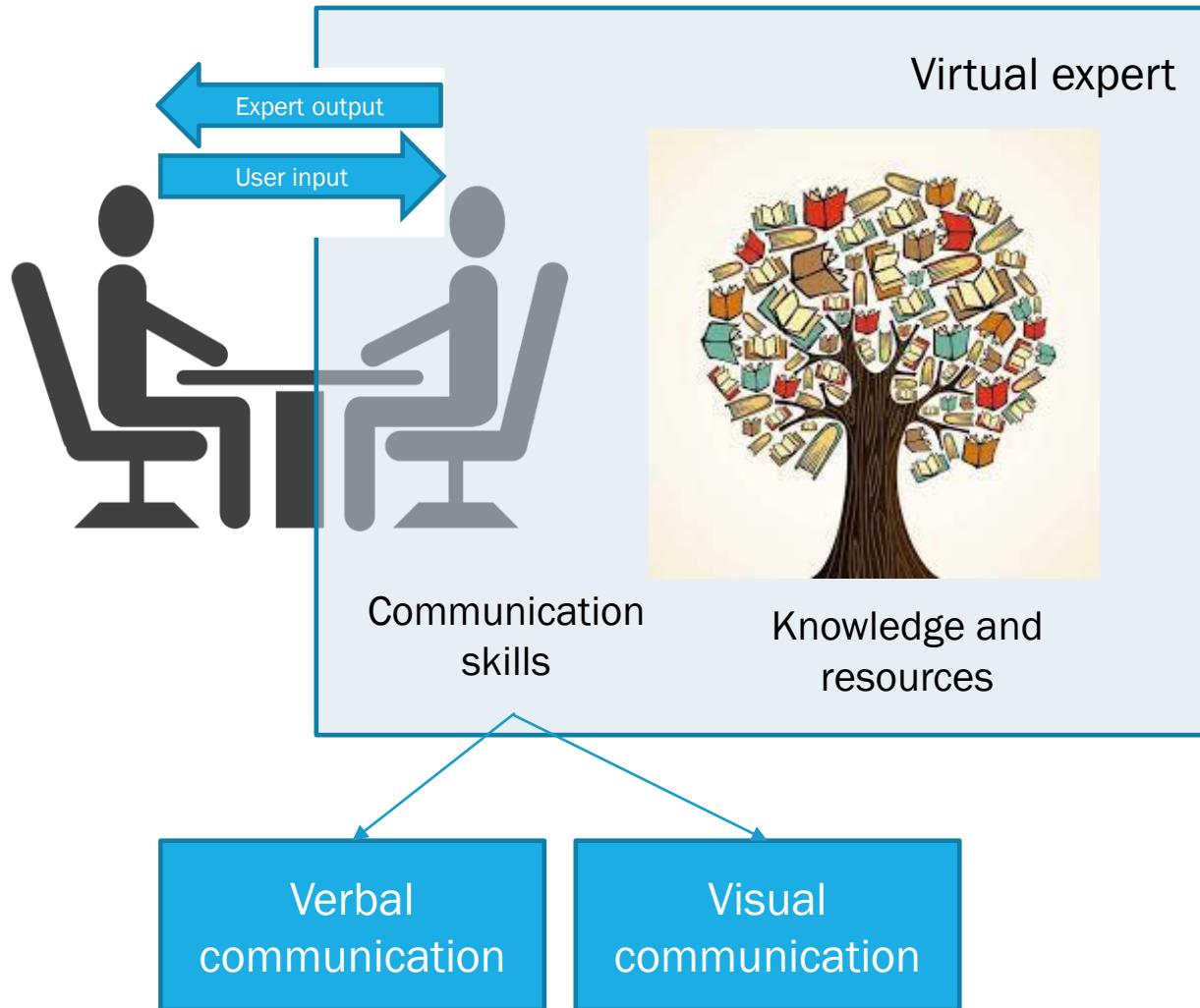
Order is different  
from videos

# Introduction

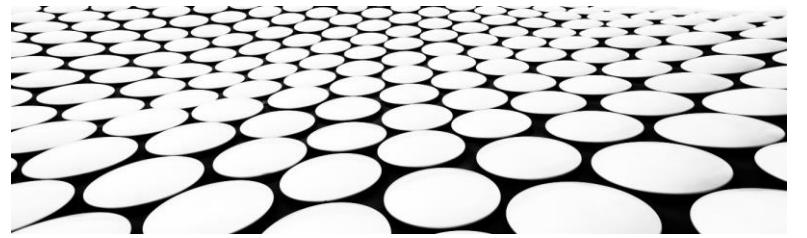


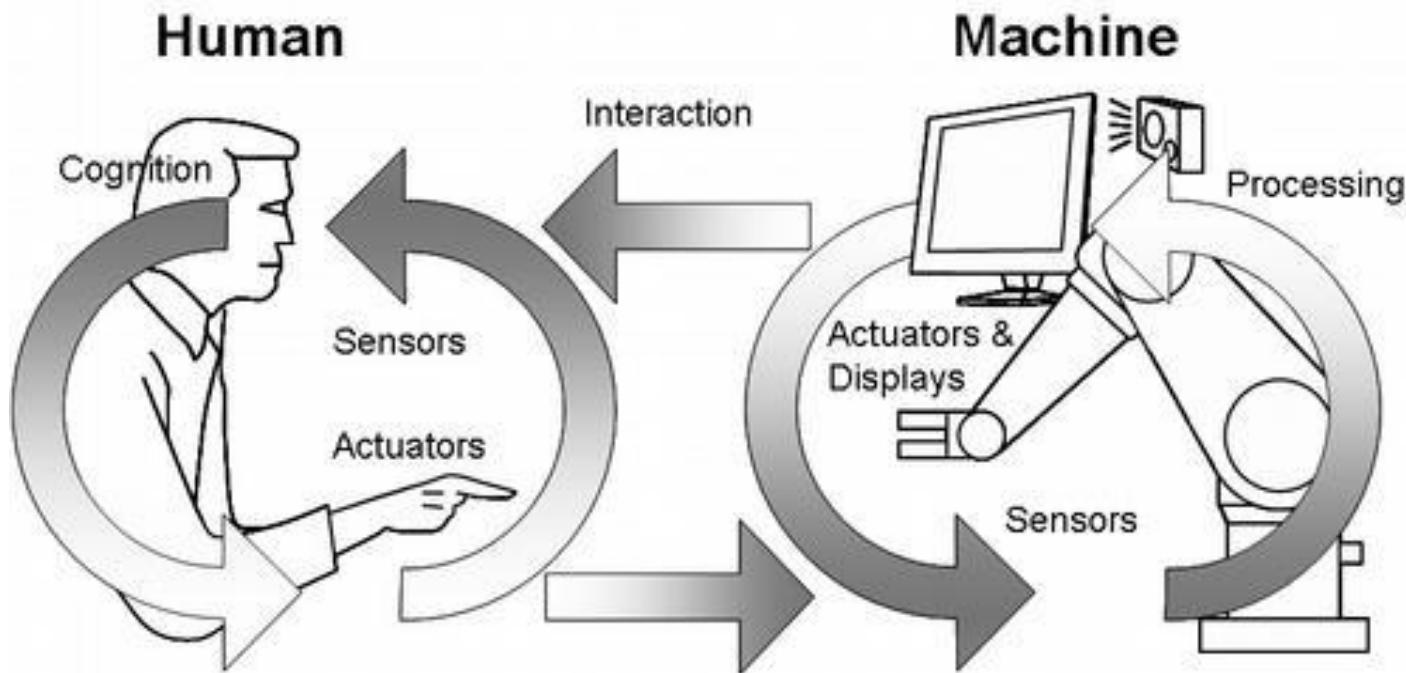
## GOALS OF THE PRESENTATION

- Introduction to different aspects of cognition
- Introduction to the idea of system image

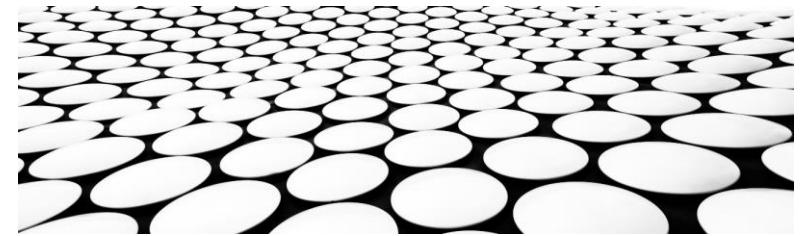


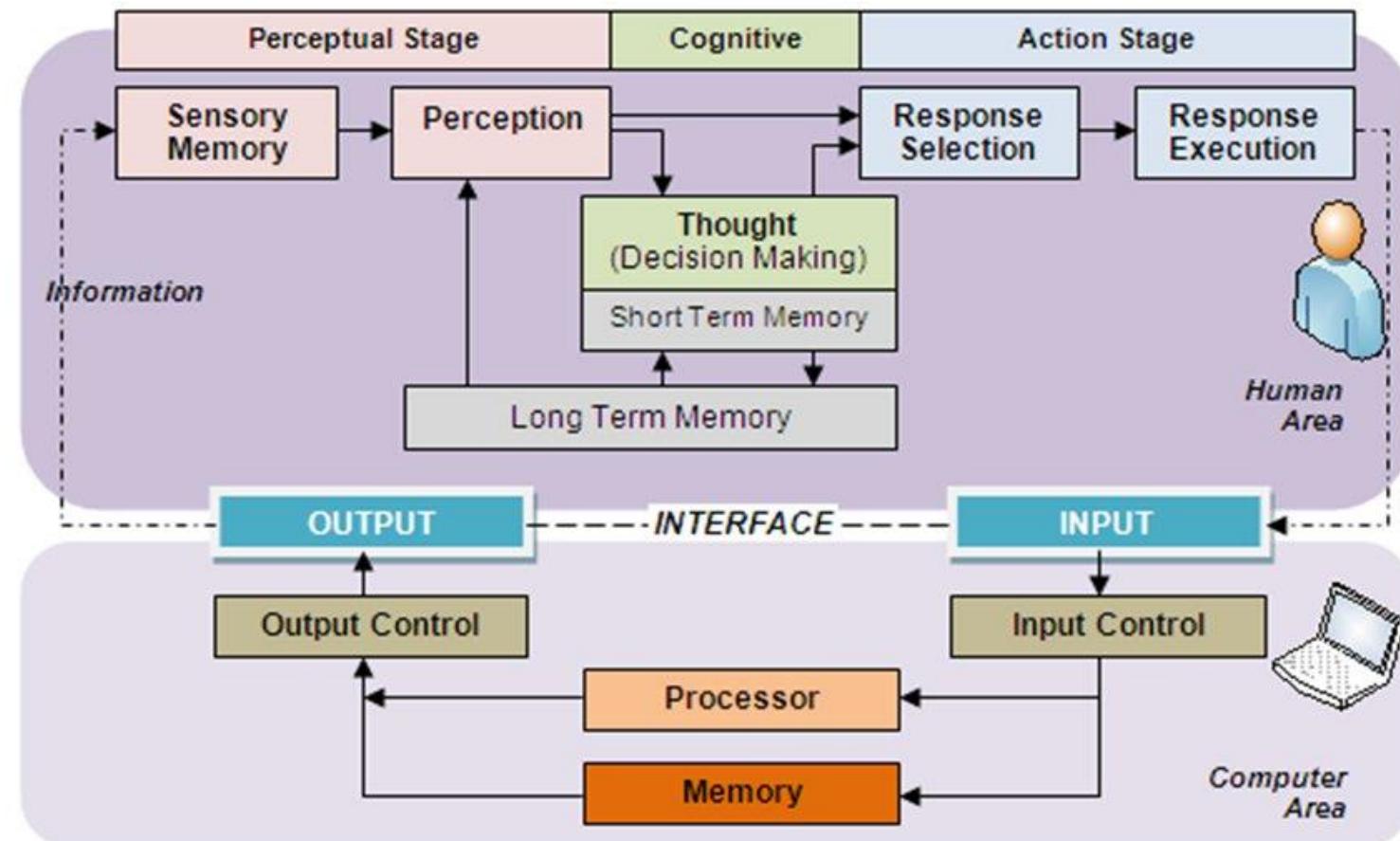
**How does the user « functions »?**



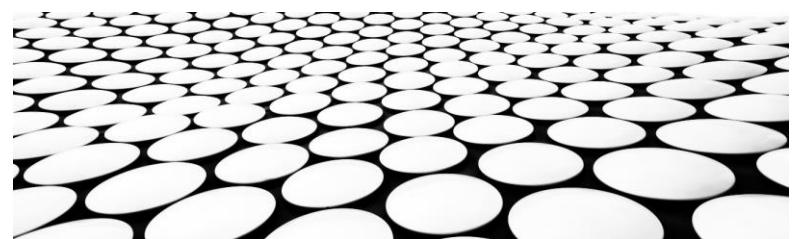


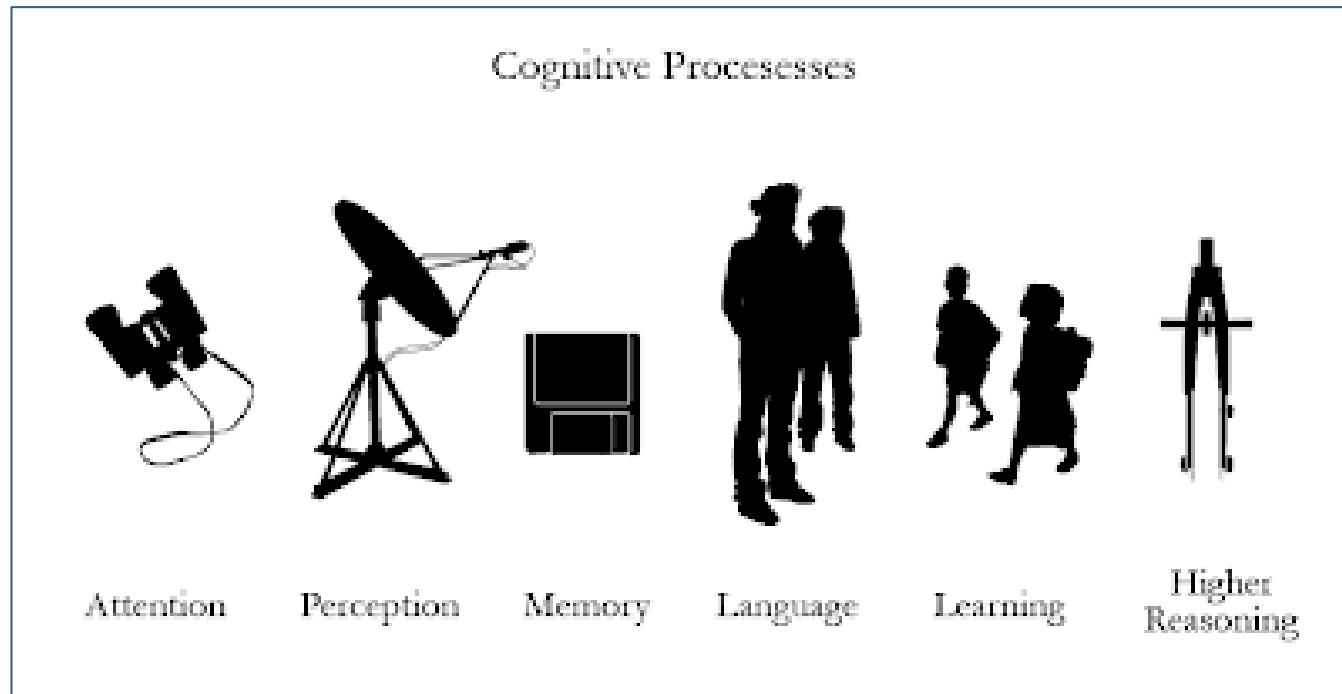
Simple view





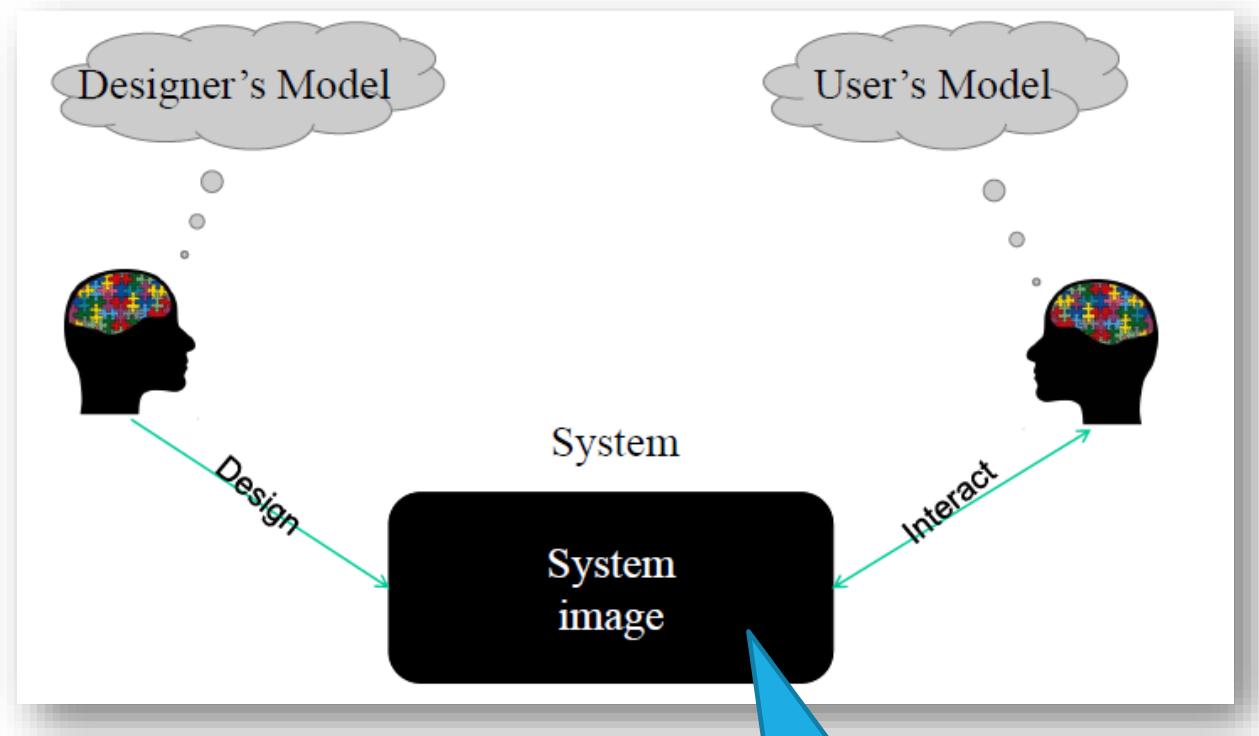
## Complex view



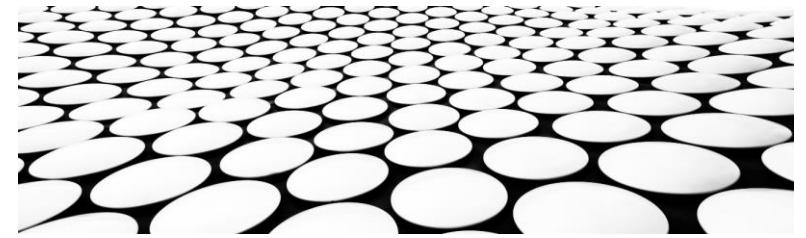


Info/Image Source

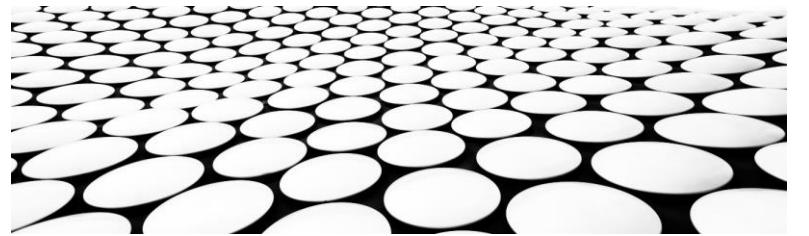




## System Image



## System Image

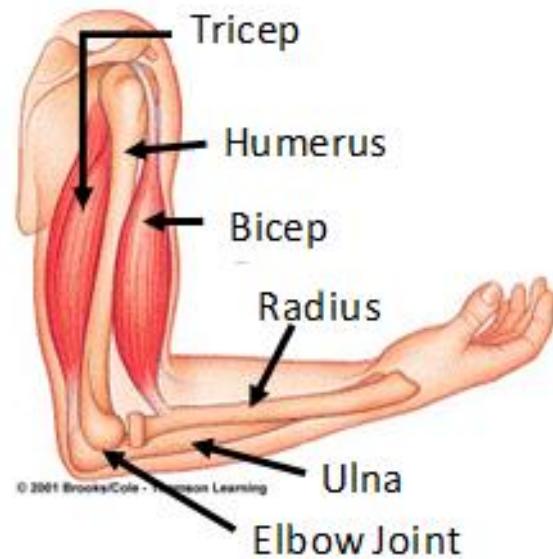


### System image must:

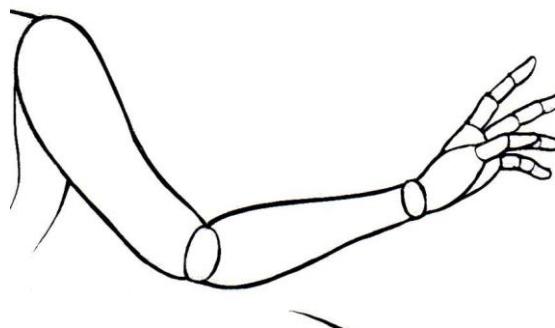
- Reflect the personality of your business
- Match the level(s) of knowledge of your users
  - Expert / Novice
- Match cognitive abilities of your users (attention, perception, short-term memory, etc.)
- Match the knowledge organization of your users (long-term memory)
- Help users in their interactive processes

There must be compatibility!

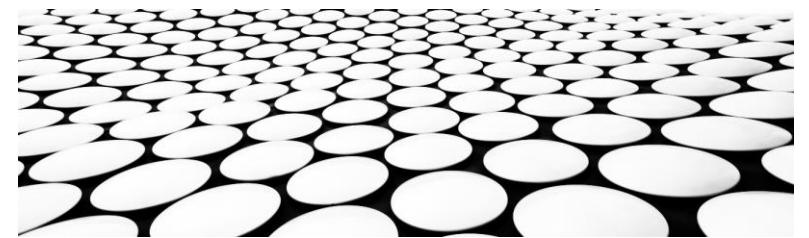
System's model

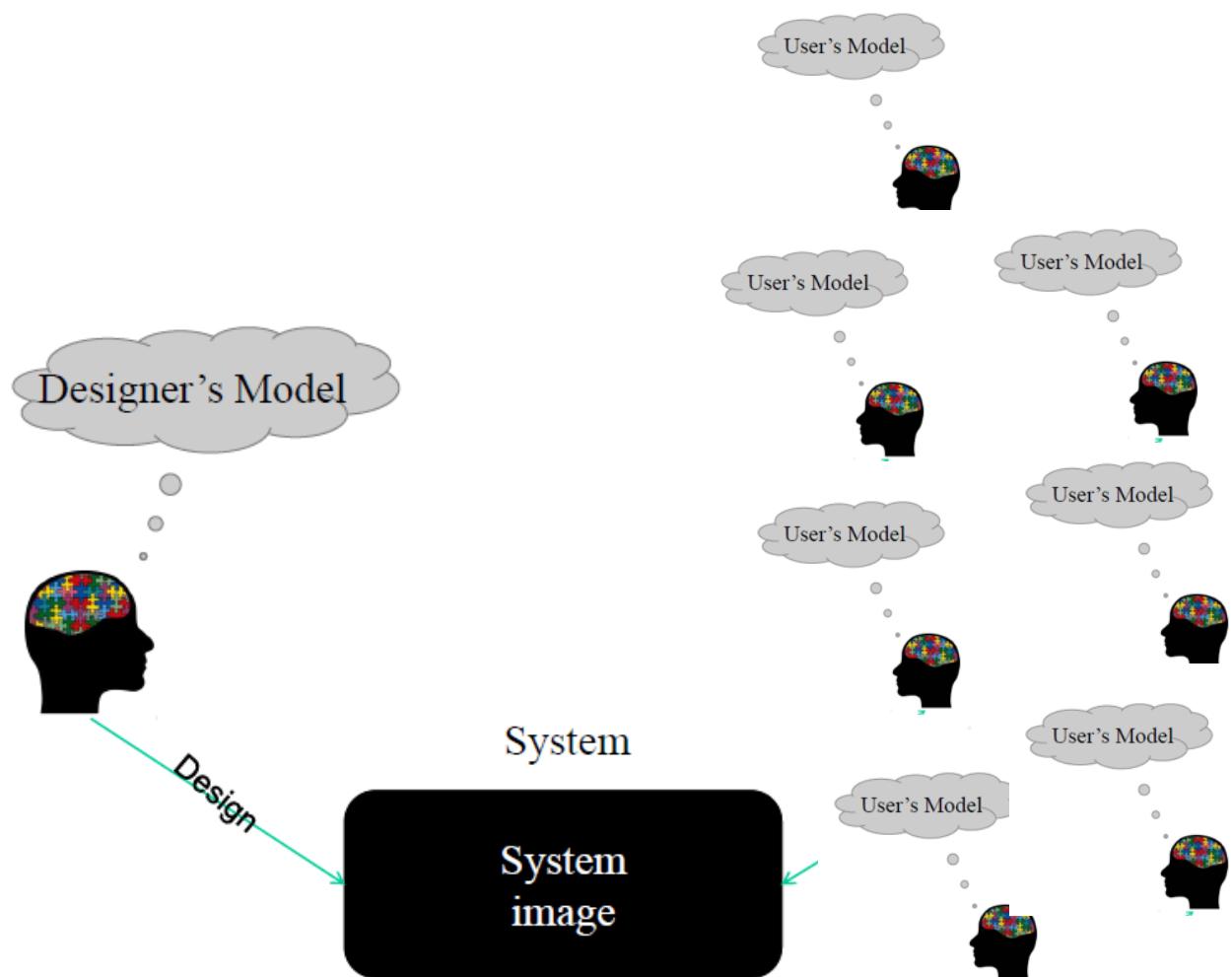


User model

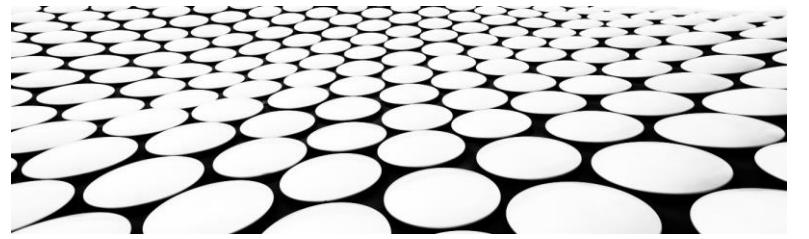


## Mental models





**Different Personas = different models**



The « users » (at the start of design or even production) must be the defined personas.

Back-end data may be in databases with an organization already fixed.

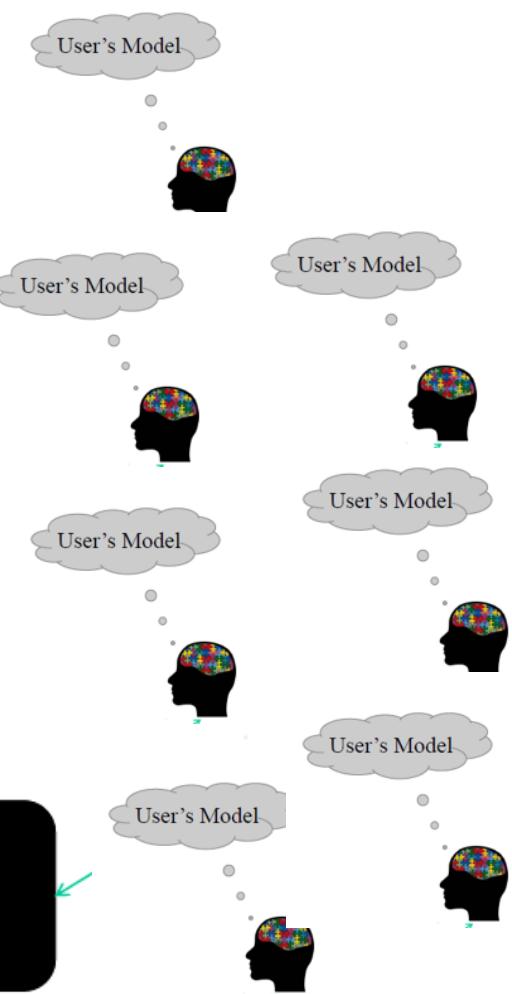
Designer's Model



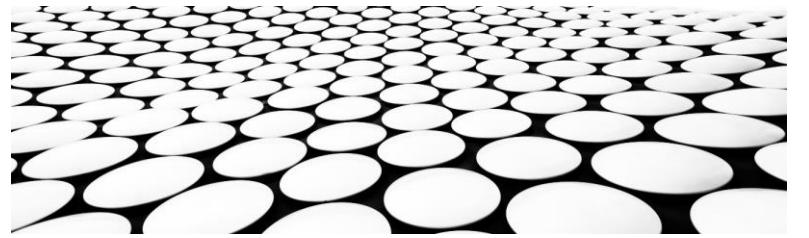
Design

System

System  
image



## Back-end constraints



**Tangerine**

**Earn some cha-ching**

Sign up as a Client using promo code EARNMORE today. You could earn up to \$400 cash back on eligible purchases and a 2.75% Savings rate.<sup>†</sup>

**Learn More**

Up to \$400 cash back | Earn 10% back\* | Great GIC Rate

**What can we help you with today?**

**Saving**  
Grow your money and save for your goals.

**Spending**  
No-fee direct chequing Money-Buy Credit Cards

**Leons** HOT TRENDS EVENT

**HOT DEALS ON PATIO FURNITURE**

**50% OFF SELECT SOFAS**

**50% OFF SELECT DOUBLE/QUEEN/KING BEDS**

**SAVE \$1000<sup>†</sup> WHEN YOU SPEND \$6500 OR MORE ON MAJOR APPLIANCE PACKAGES**

**SAVE UP TO \$700 ON SELECT MATTRESSES**

**SAVE UP TO \$300 ON SELECT TVs**

**CREDIT AVAILABLE**

**Study**

COVID-19: last update (March 28, 2022, 13:55)

uOttawa

CURRENT STUDENTS | FACULTY AND STAFF | ALUMNI | GIVE

Study | Campus life | Research and innovation | About us

Why choose uOttawa → Undergraduate studies →

Graduate studies → Professional development →

International students → University fees →

Financial aid and awards → Applying to uOttawa →

Campus tours and admissions events → Bilingual studies and language →

**metro my grocer**

MY ONLINE GROCERIES

Search products, recipes and articles

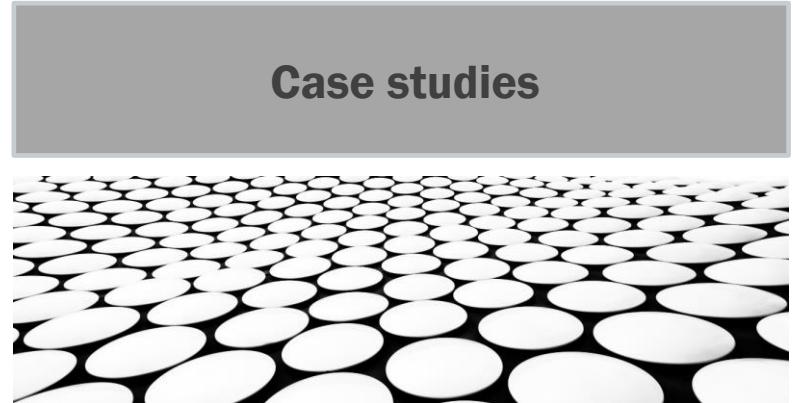
Your store Metro Plus Kelly Maloney

My List

ONLINE GROCERY | FLYER AND COUPONS | RECIPES | PRODUCTS TO DISCOVER | METRO&MOI | MY HEALTH MY CHOICES

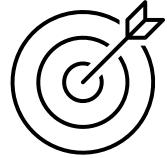
FIRST ONES IN SUMMER  
ENJOY FRESH LOBSTER BEFORE EVERYONE ELSE!

From May 12<sup>th</sup> to 18<sup>th</sup>, 2022



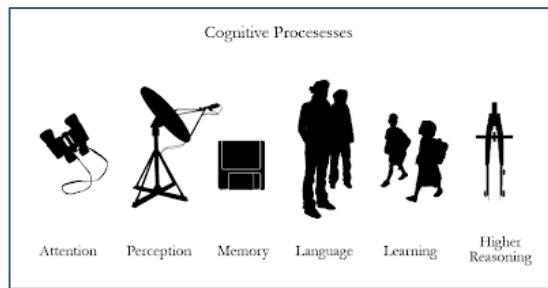


Memory

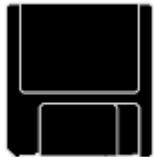


## GOALS OF THE PRESENTATION

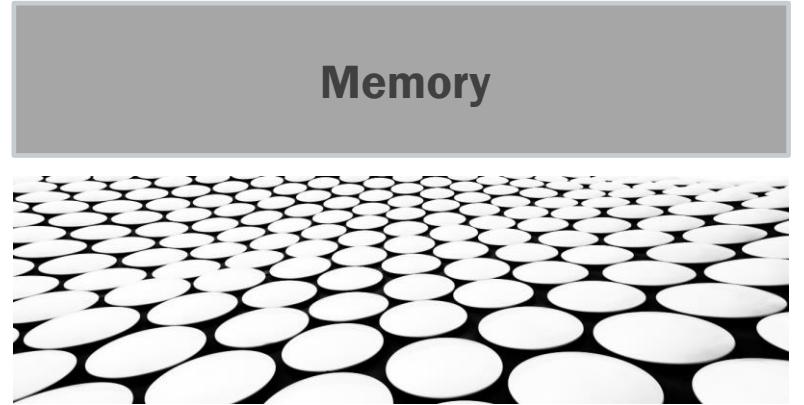
- Short vs Long term memory



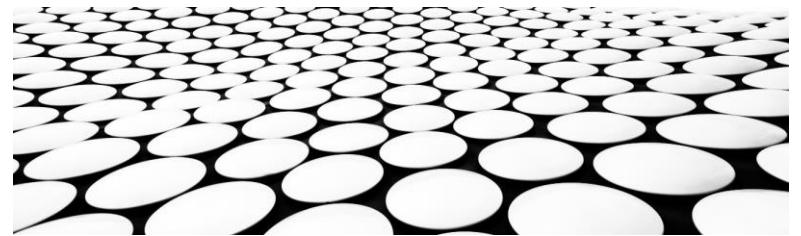
**Memory:** process for storing, finding, and accessing knowledge. Enables people to recall and recognize entities, and to determine appropriate actions.



*Design implications:* do not overload user's memory; leverage recognition over recall when possible.



## MEMORY



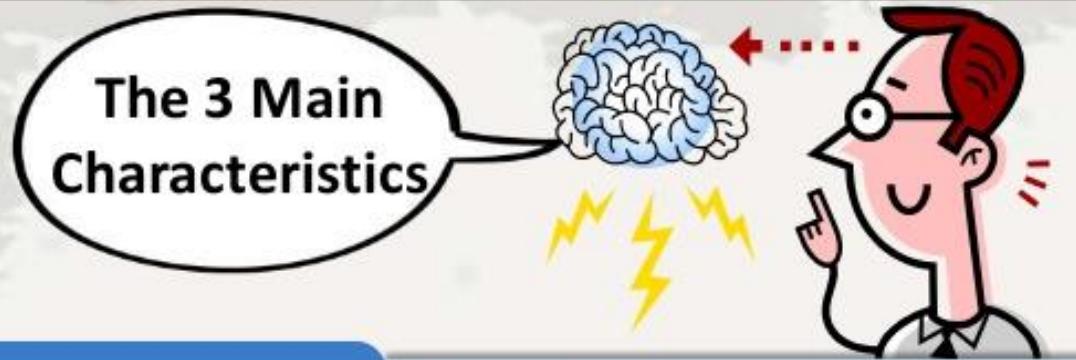
### Short-Term (Working)

- 10 to 30 seconds
- 3 to 4 items (easily)
- 7 +- 2 (according to many studies)
- limited capacity
- instant recall

### Long-Term (Knowledge)

- Active: 2000-3000 words (recall)
- Passive: 10000 words (recognition)
- Slower recall, needs organization

## Short-term Memory Characteristics

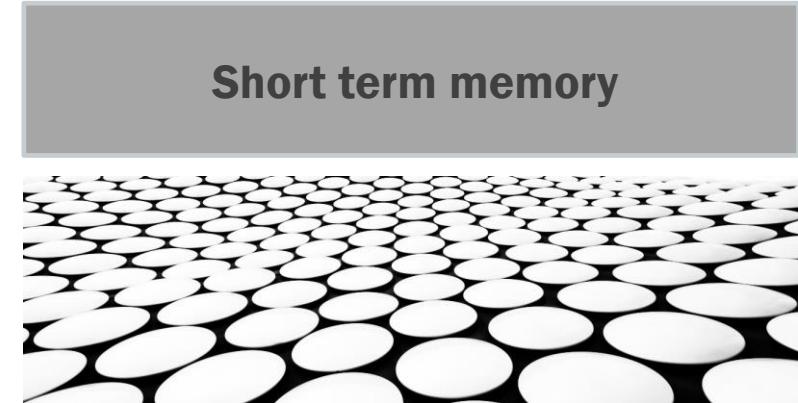


The 3 Main Characteristics

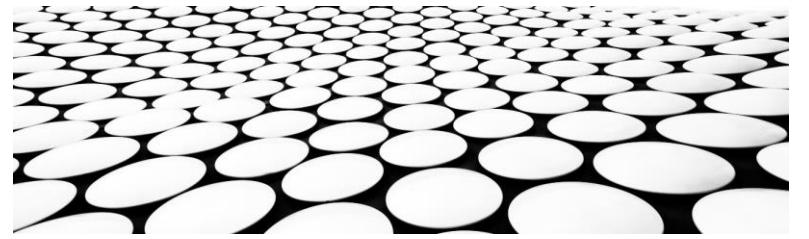
**Brief Duration** Last up to 20 seconds.

**7 ± 2 Chunks** Its **capacity** is limited to  $7 \pm 2$  chunks of independent information (Miller's Law)

**Weakening** Reasons for weakening of memory, include (*medication, sleep deprivation or a head injury*)



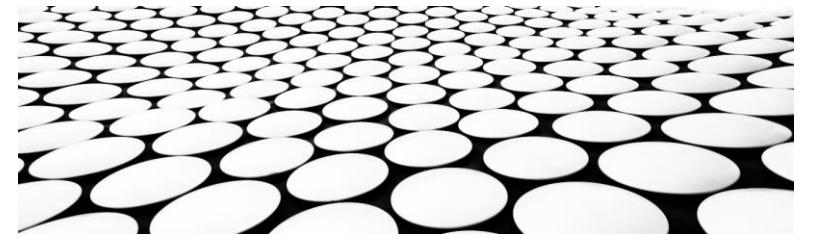
## Short-term memory test

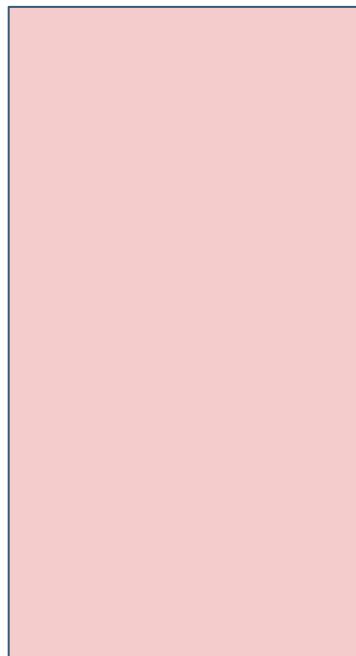


There will be a list of terms to memorize

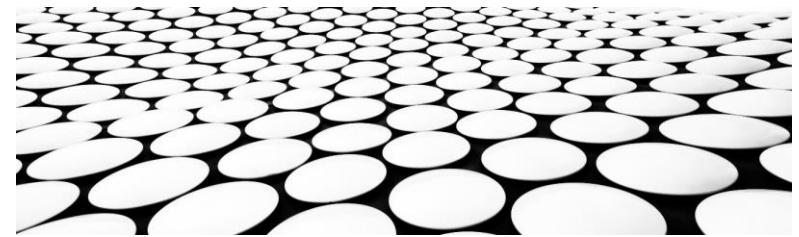
Macadamia  
Cheese  
Pear  
Milk  
Walnuts  
Nectarine  
Pecans  
Raspberry  
Yogurt

### Short-term memory test



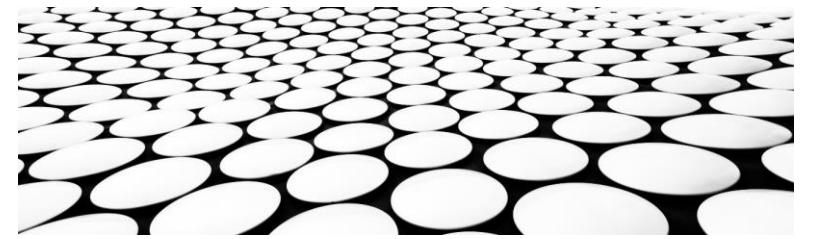


## Short-term memory test



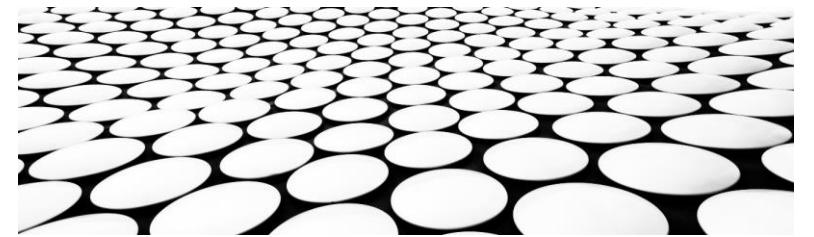
Macadamia  
Cheese  
Pear  
Milk  
Walnuts  
Nectarine  
Pecans  
Raspberry  
Yogurt

### Short-term memory test



## Alphabetical Order

Cheese  
Milk  
Macadamia  
Nectarine  
Pear  
Pecans  
Raspberry  
Walnuts  
Yogurt

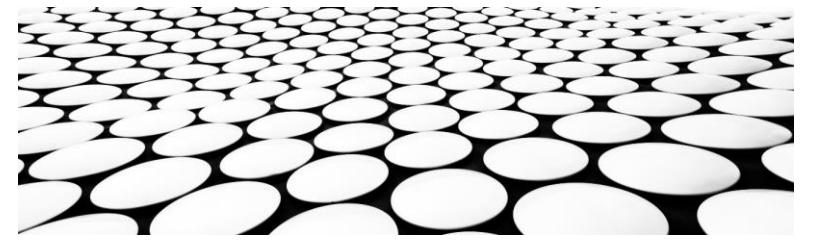


## Arbitrary grouping

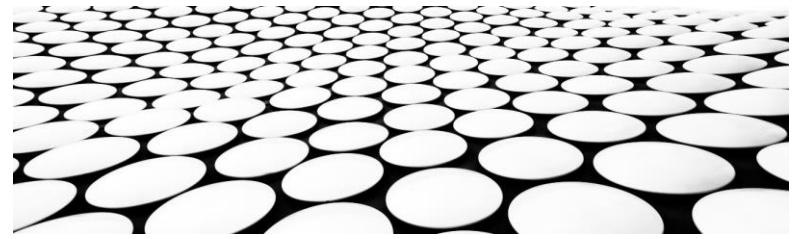
Cheese  
Macadamia  
Milk

Nectarine  
Pear  
Pecans

Raspberry  
Walnuts  
Yogurt



## Categorization



### Dairy Products

Cheese  
Milk  
Yogurt

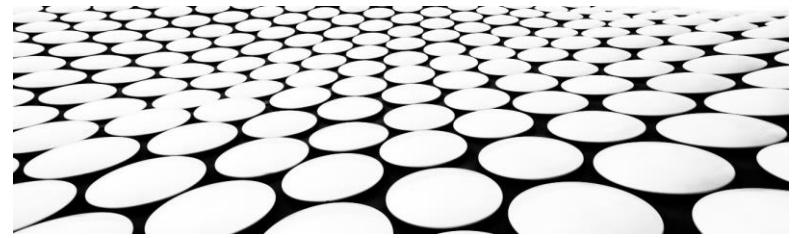
### Fruits

Raspberry  
Nectarine  
Pear

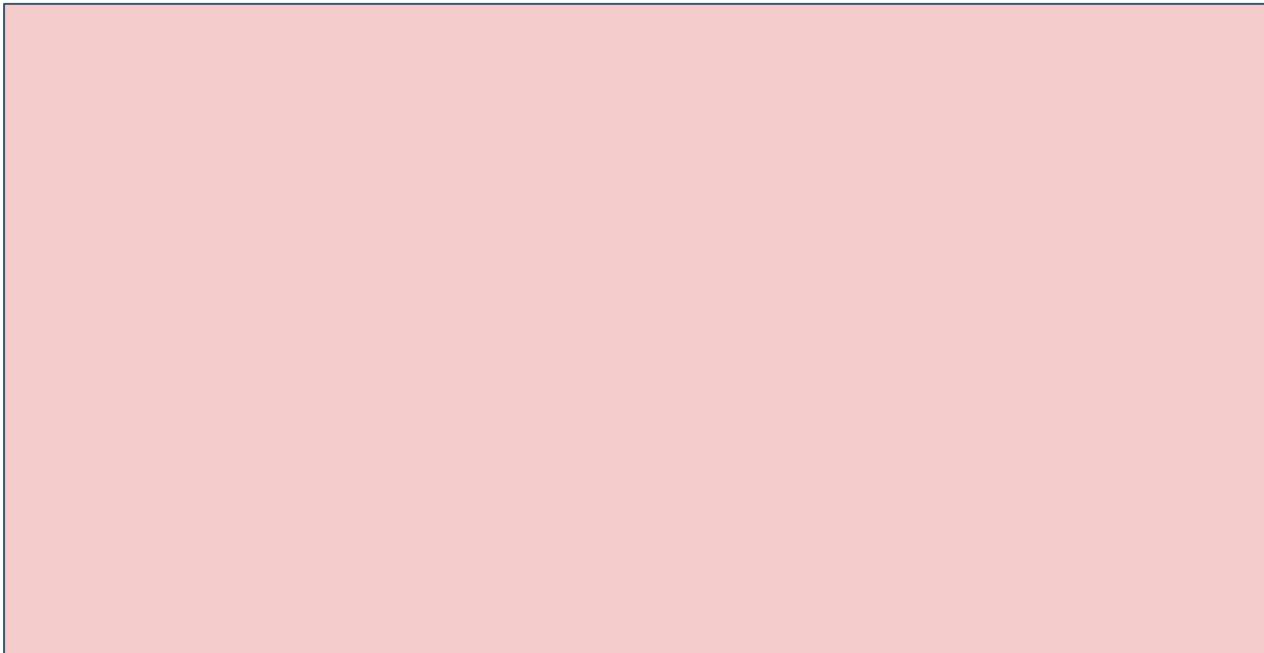
### Nuts

Pecans  
Walnuts  
Macadamia

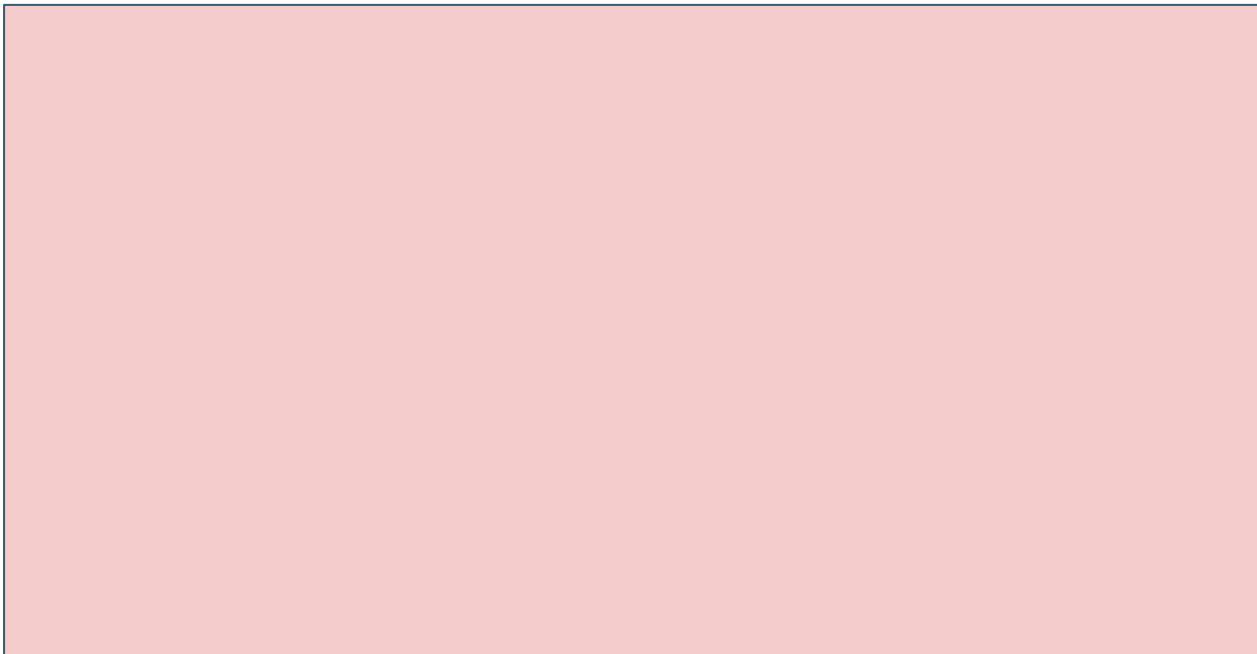
## Short-term memory test



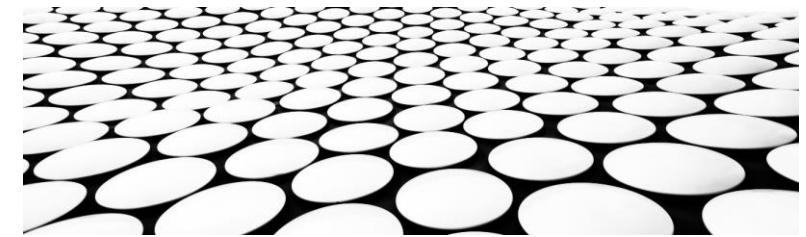
There will be a set of images to memorize.



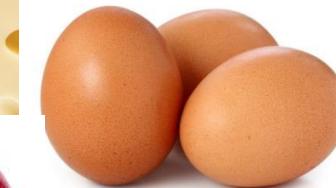


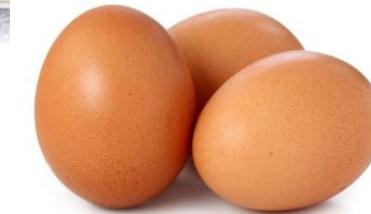


## Short-term memory test





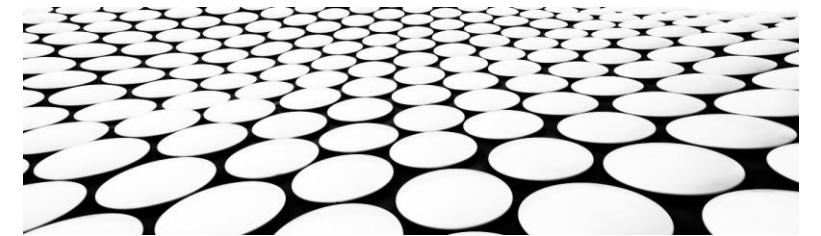




## Short term memory test

Very nice test, with repeated images to identify.

<https://www.memorylosstest.com/free-short-term-memory-tests-online/>



# Memory Test Challenge

**Choose Your Test**

Test 1: Animal Pictures

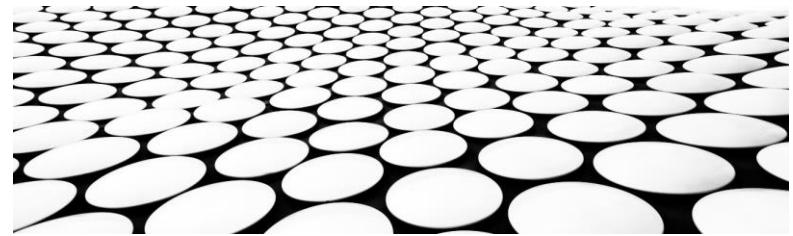


**Start Test >**



Tap Repeated Images, or Press Keyboard Spacebar

## Memory limitations – Impact on UI design

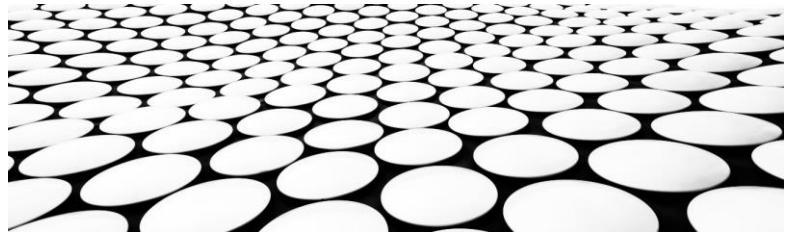


- Short term memory can contain  $7 \pm 2$  items
  - Avoid situations where users have to remember more than this
  - Logical grouping helps
- A meaningful UI element will be easier to remember
  - Use effective words (non-ambiguous and specific)
  - Icons can be analogies, but not arbitrary choices
- People can more easily recognize than recall
  - Use menus, icons, word completions, look-ups

# Knowledge organization

## *Semantic Networks*

## MEMORY



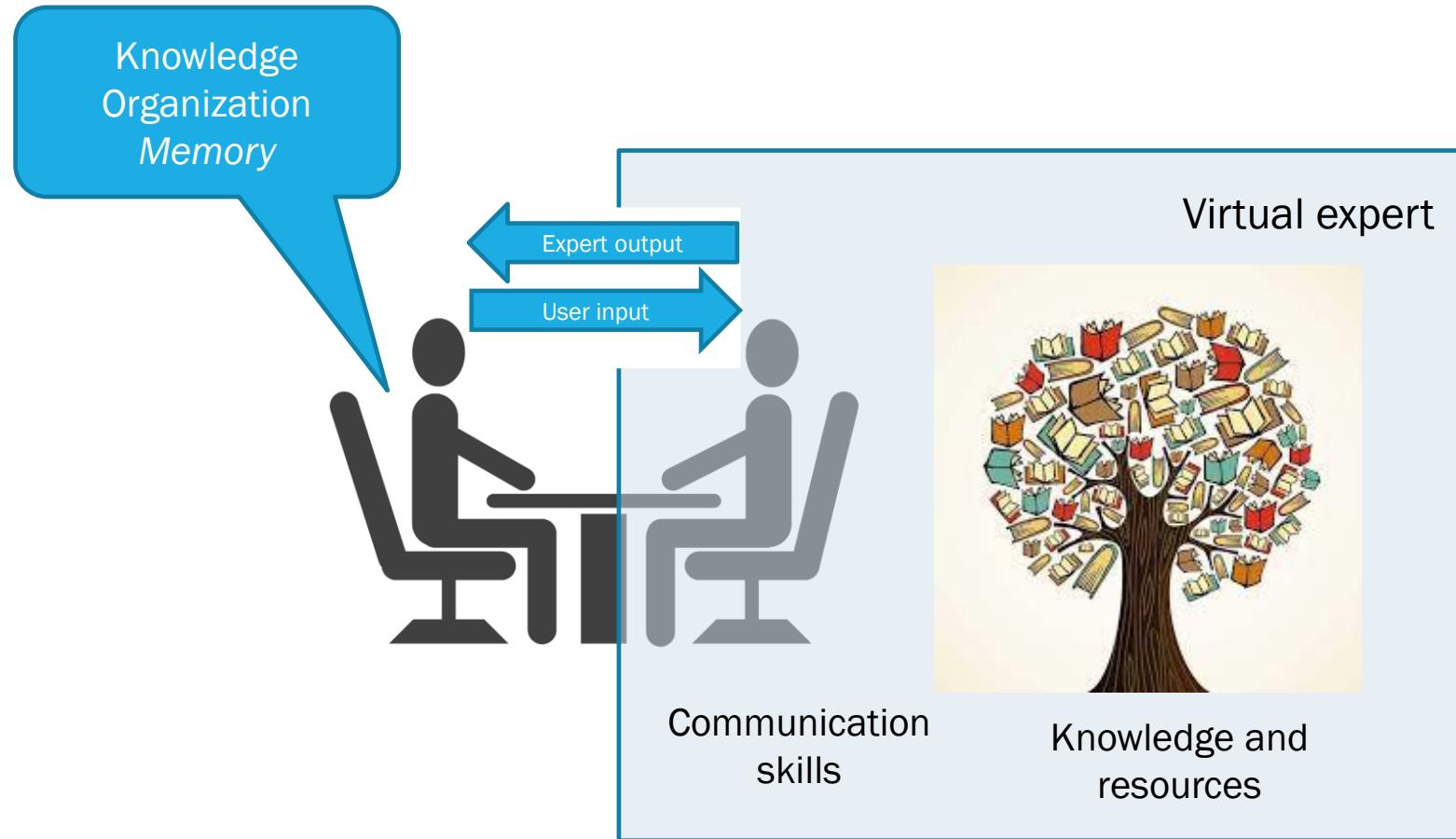
### Short-Term (Working)

- 10 to 30 seconds
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- instant recall

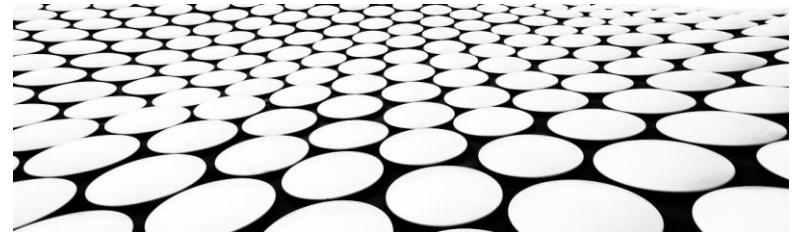
### Long-Term (Knowledge)

- Active: 2000-3000 words (recall)
- Passive: 10000 words (recognition)
- Slower recall, needs organization

This organization is not  
always simple or  
unique

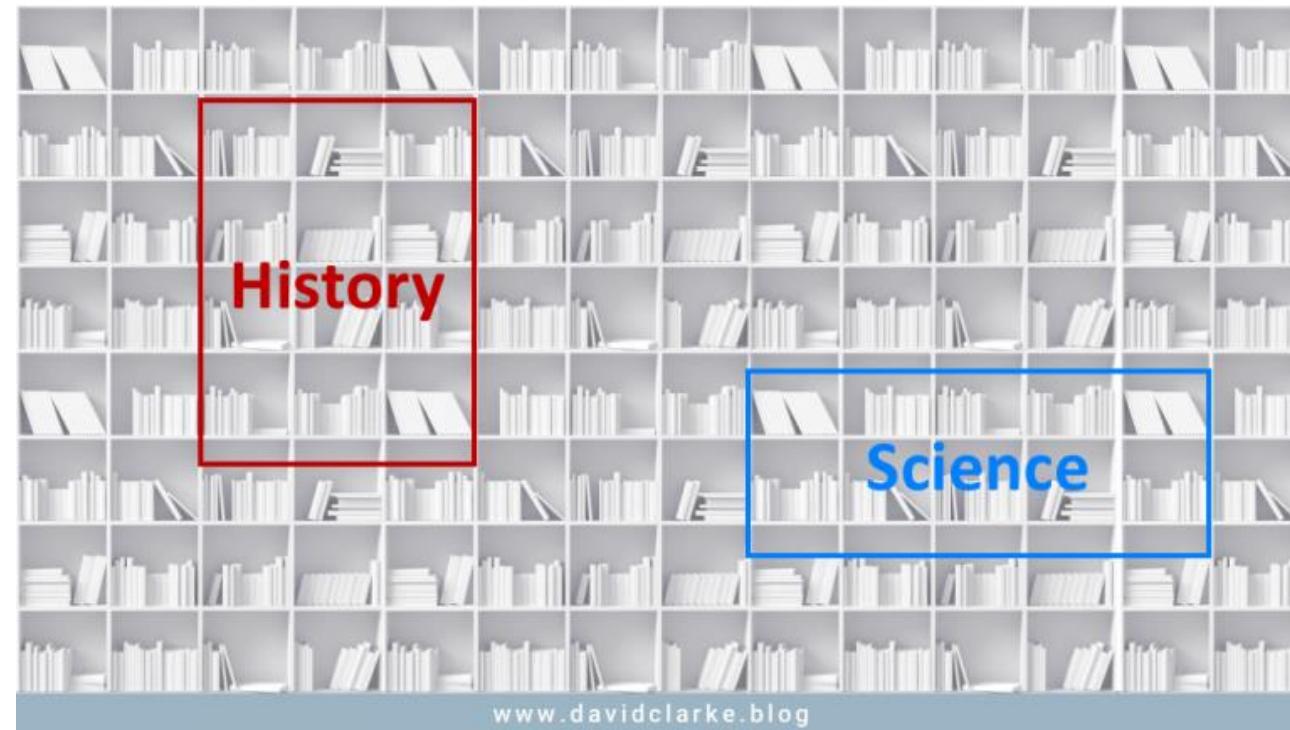


## Knowledge organization



Knowledge  
Organization  
Databases

## Organization



# Renaud-Bray

## LIVRES + CADEAUX + JEUX

New releases

Paperback books

Coups de cœur

Best sellers

Gift cards

The good deals

### FICTION, LITTÉRATURE

French and foreign novels

Quebec, Canada literature

Detective novels

Science fiction, fantasy

Teenage literature

Poetry, theater, literary essays

### LIFESTYLE

Cooking

Psychology, health

Motherhood, child psychology

Sexuality

### COMIC, YOUTH, HUMOR

Comic books

Humor

Youth

### CULTURE AND SOCIETY

Arts

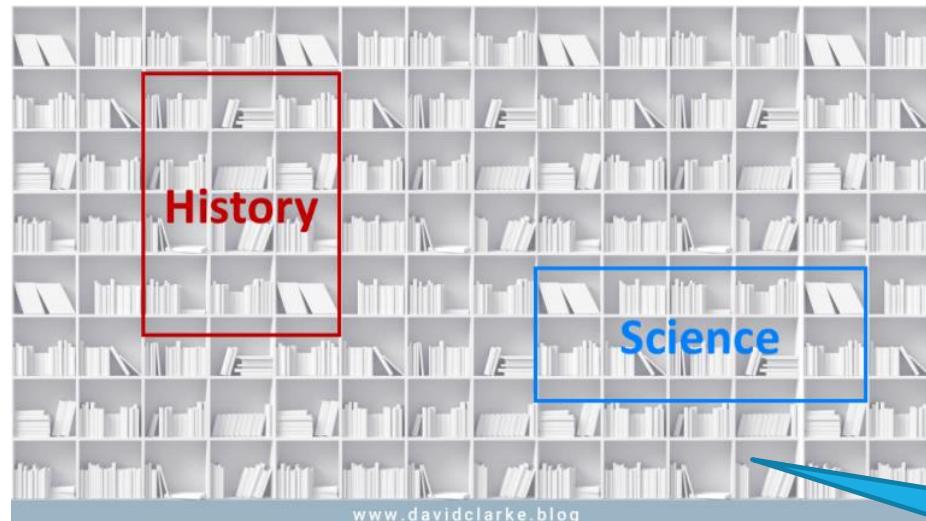
Biographies

Essays

Management, economy, law

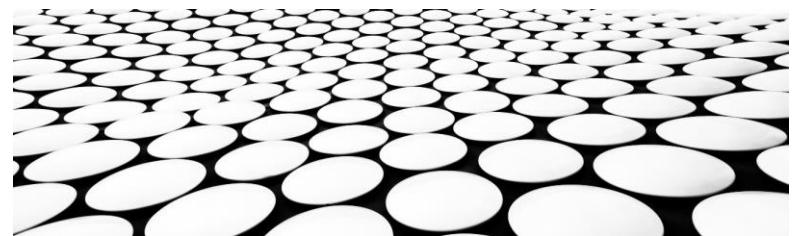
History, politics

Religion, esoterism



In a "virtual" world, in our system image, we may have multiple organizations or search filters.

## Organization

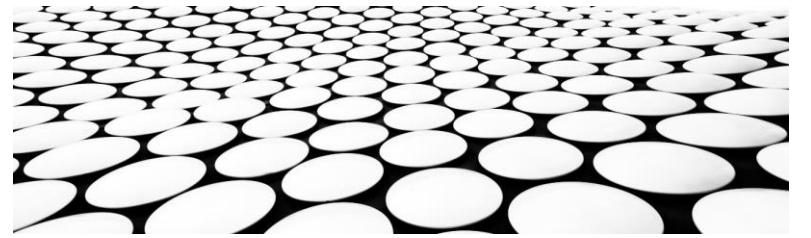


« Physical world », we must choose one organization.

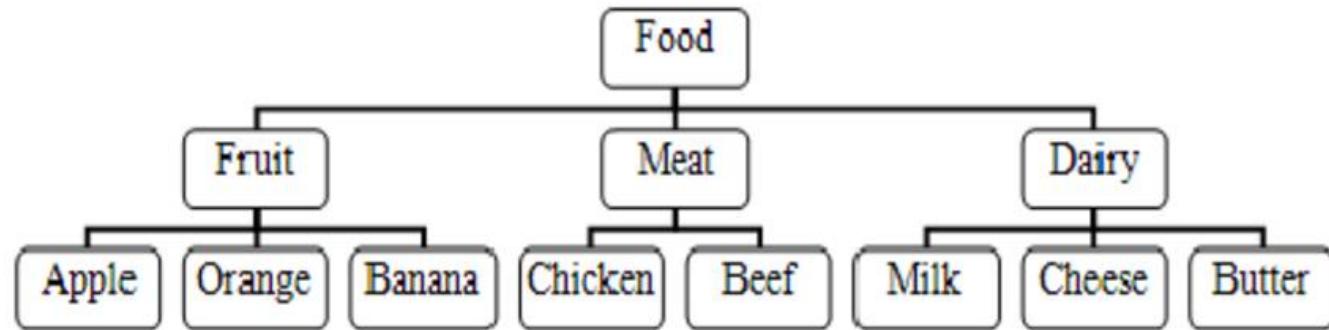
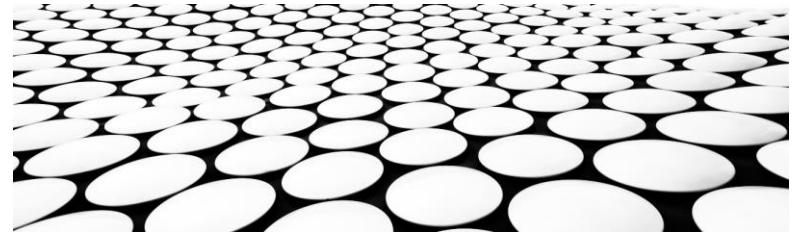
## Principles for knowledge organization

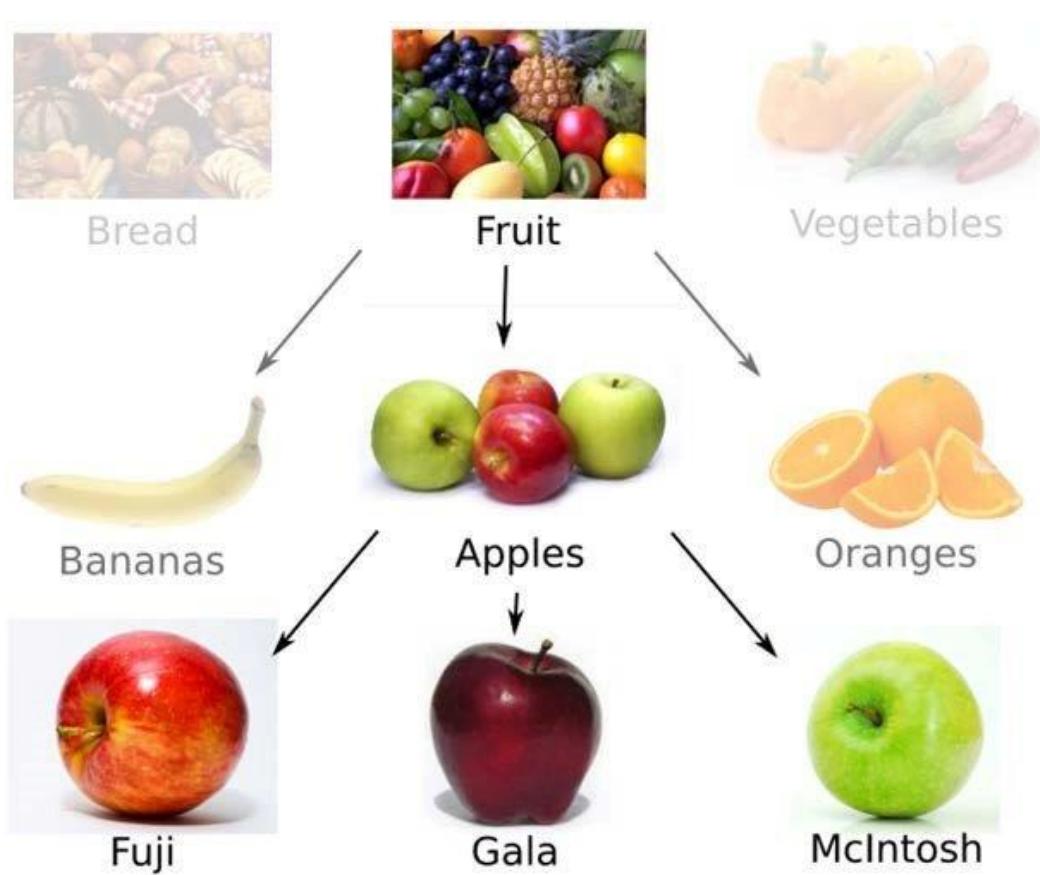
- Taxonomy (*is-a*)
- Meronymy (*part-of*)
- Attributes
- Other relations

### Organization principles

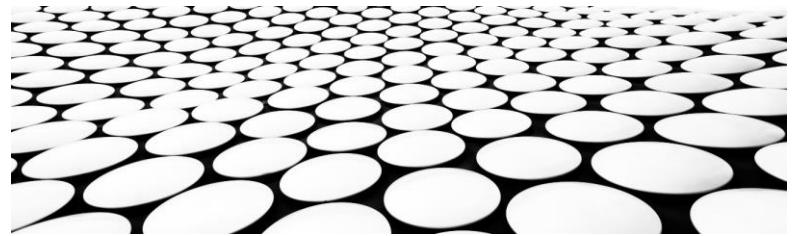


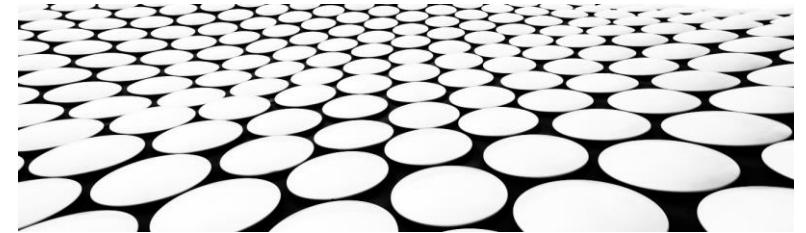
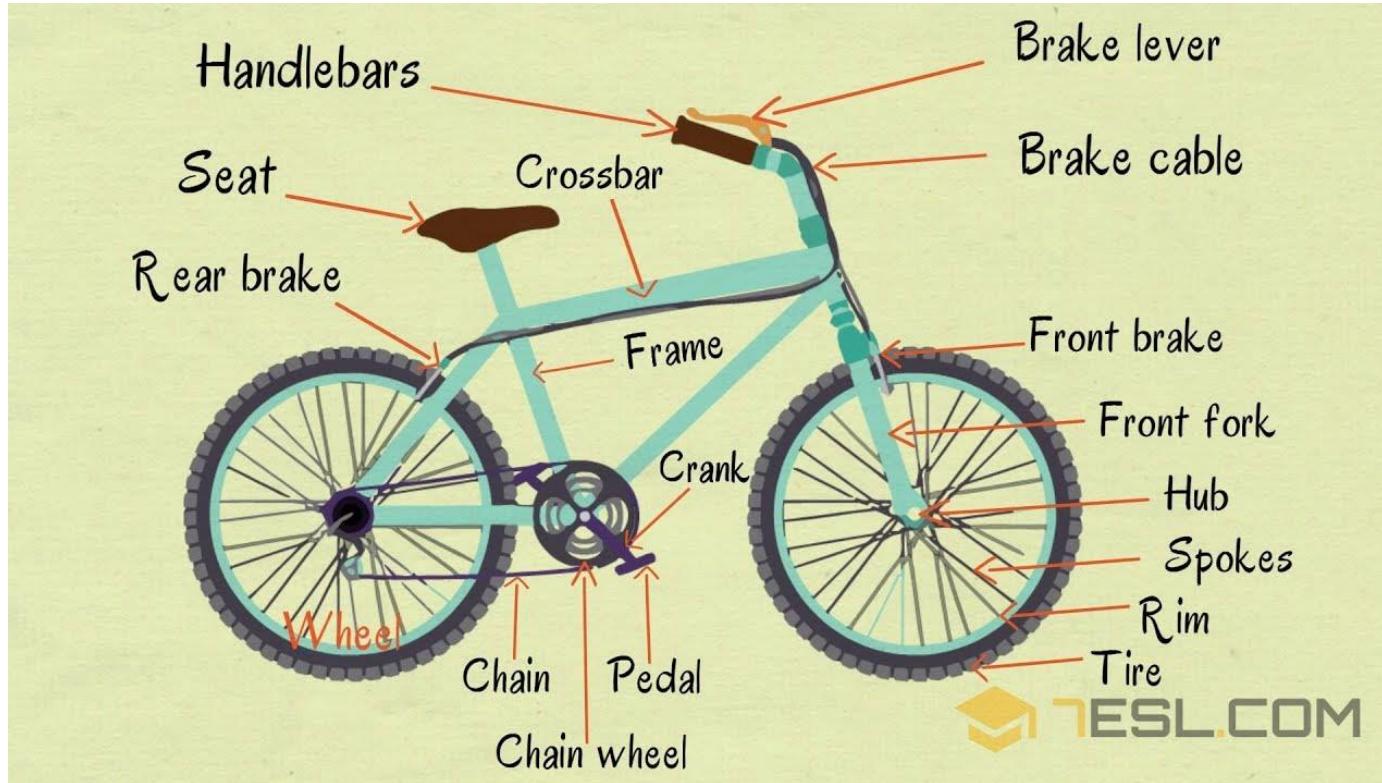
## taxonomy

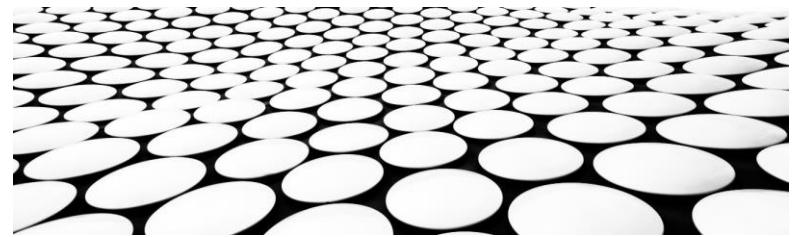




## Taxonomy - granularity

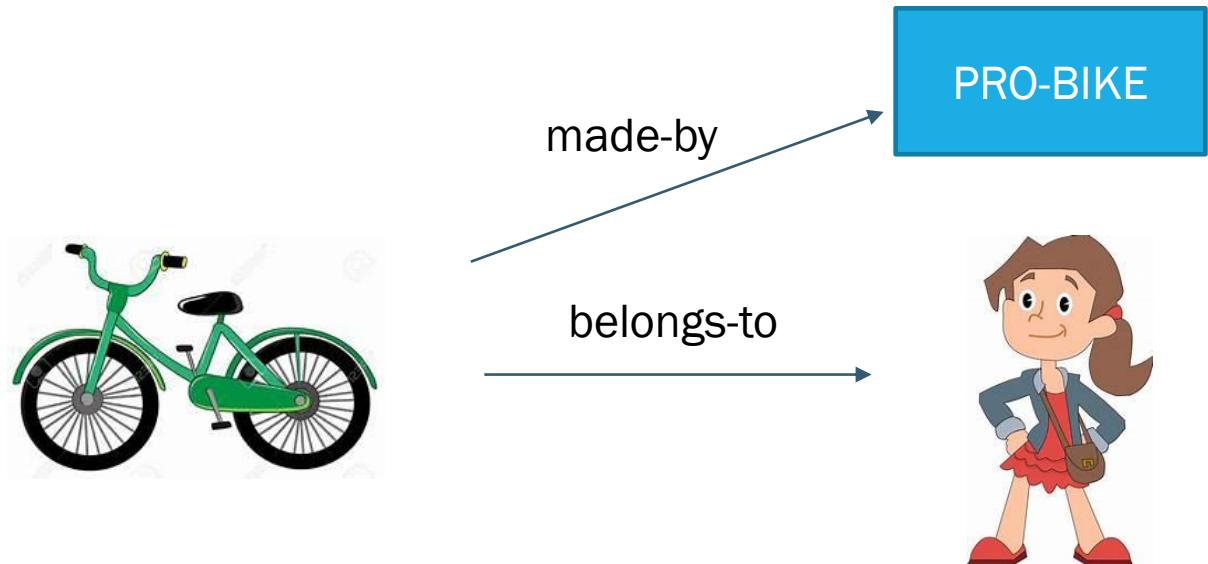


**meronymy**

**attributes**

Attribute	Value
Color	Green
Buying date	June 15th 2018



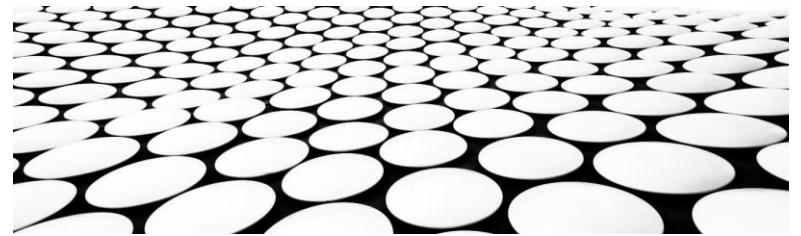


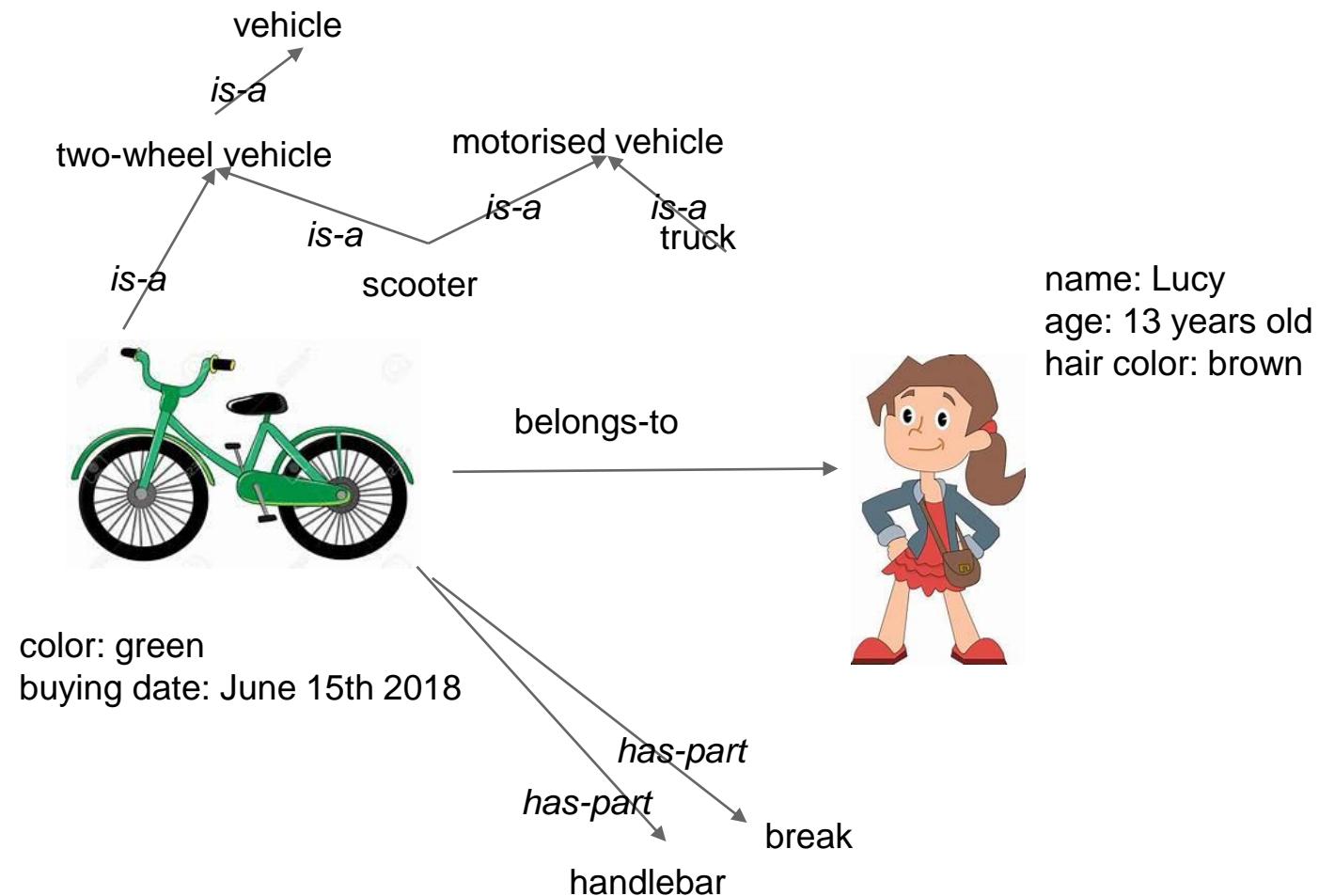
color: green

buying date: June 15th 2018

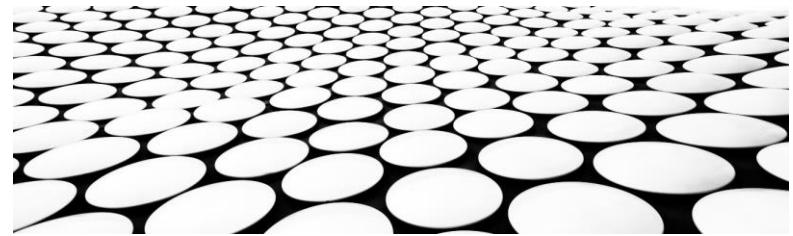
name: Lucy  
age: 13 years old  
hair color: brown

## Other relations

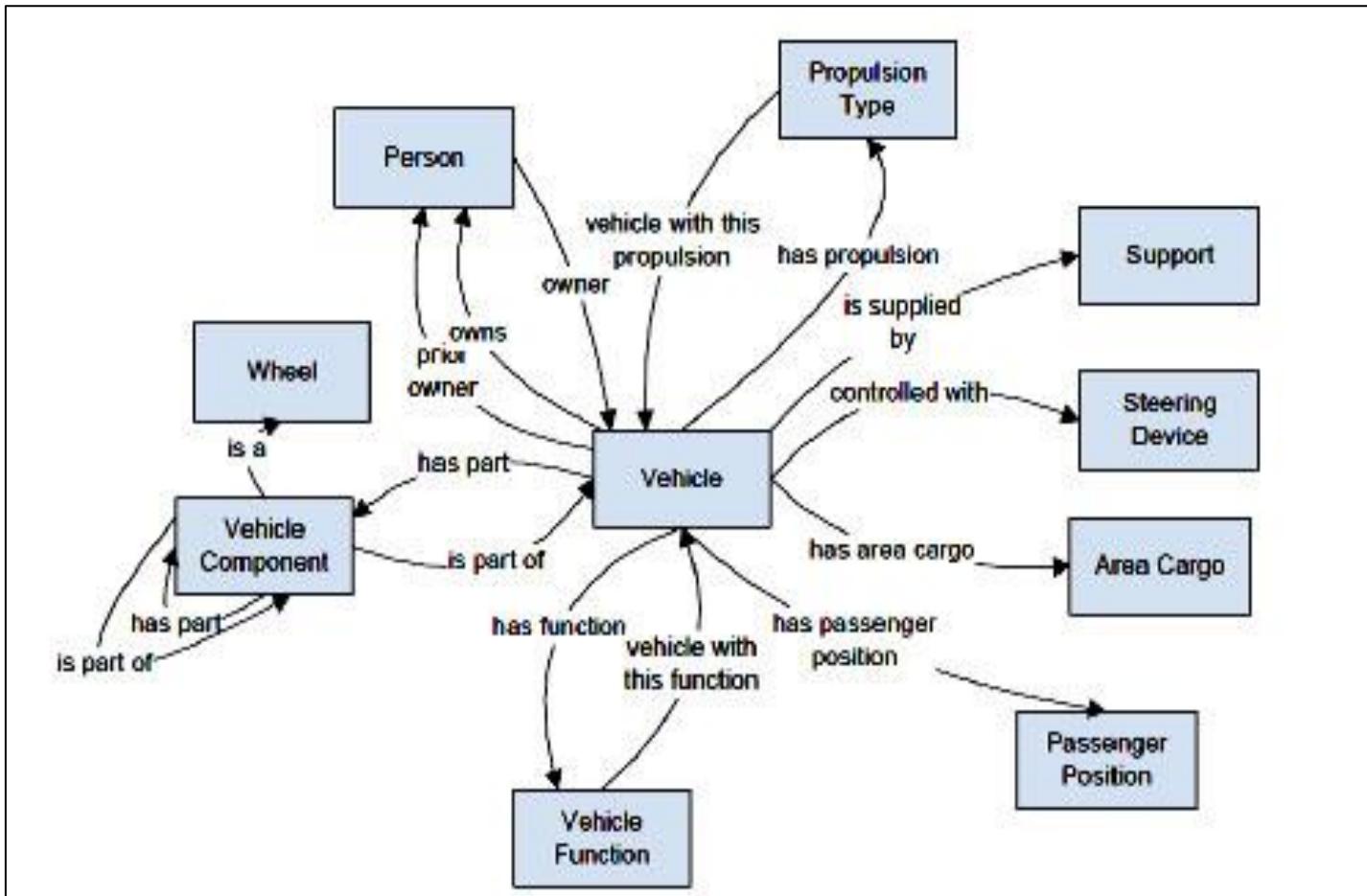




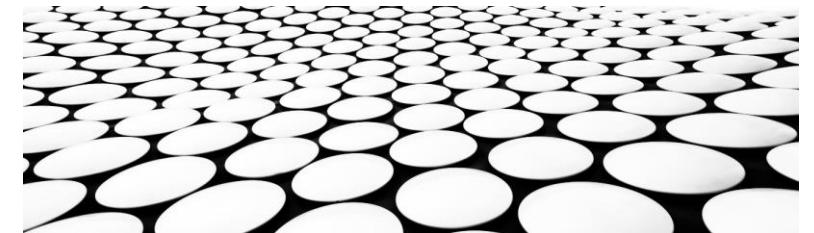
## Semantic network

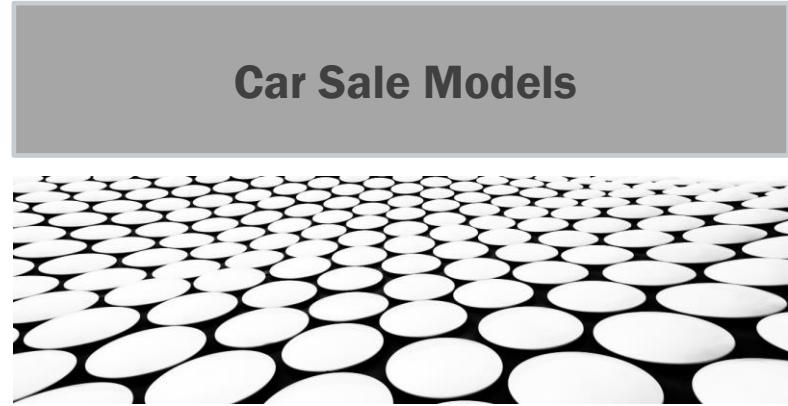
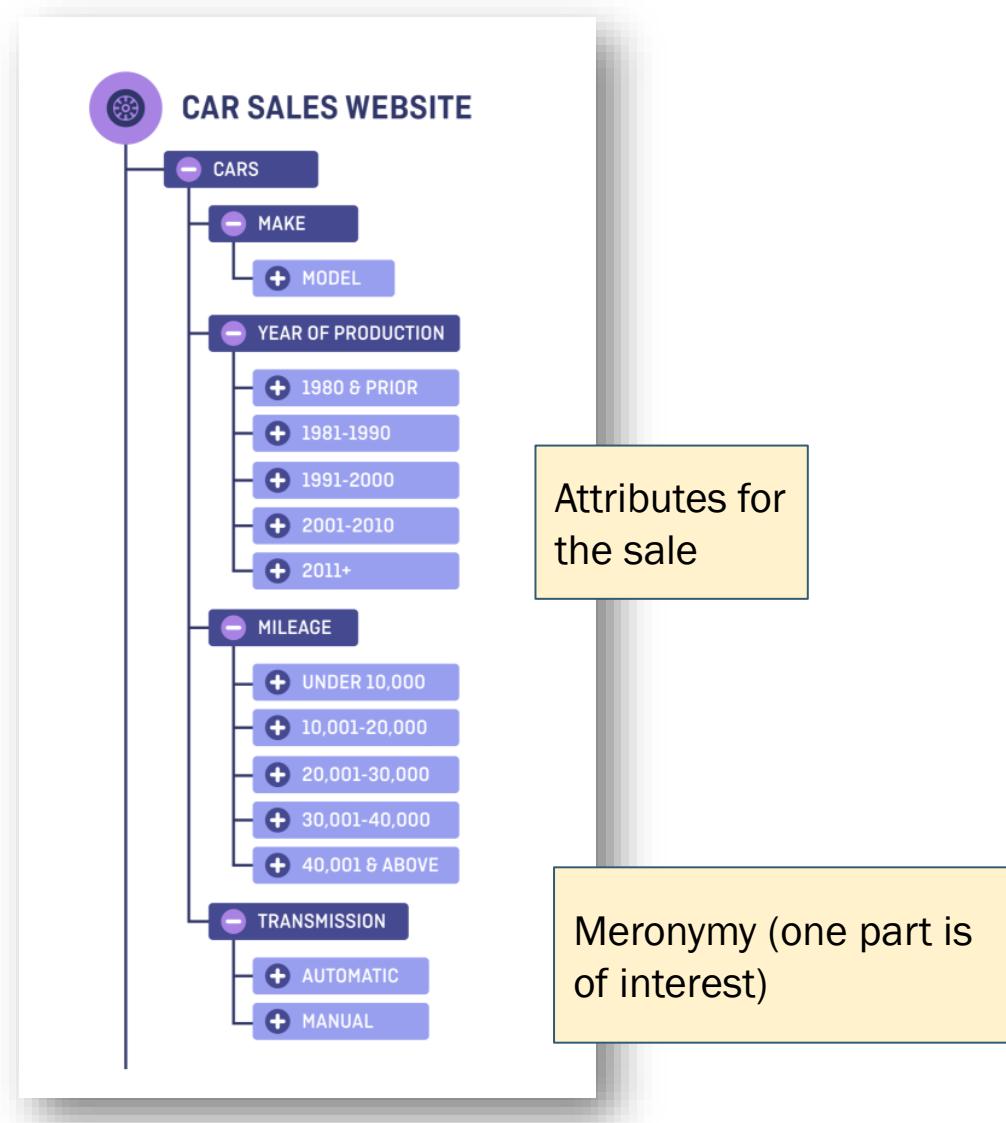


A semantic network that is too detailed or generic may not be useful

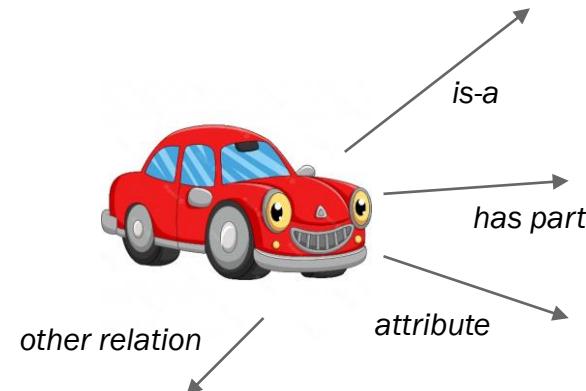


## Semantic Network





User's semantic network – Car buyer



**Types of car are of interest**

**Book a Car**      **View/Modify/Cancel a Reservation**

- 1** Pickup Location (City, State, Airport Code or US Zip Code)  
Ottawa International Airport  
[Help me find a location](#)  
 Return car to a different Hertz location
- 2** Pickup Date & Time:  
 08:00 PM ▾
- 3** Return Date & Time:  
 08:00 PM ▾

Please Select an Age ?  
25+ ▾

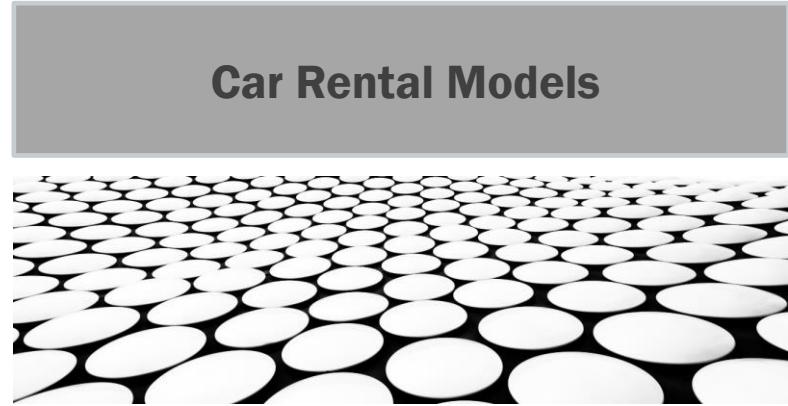
Rental Car Type: ?  
No Preference ▾

Use My Hertz Gold Plus Rewards Points  
[Learn More About Your Points](#) ?

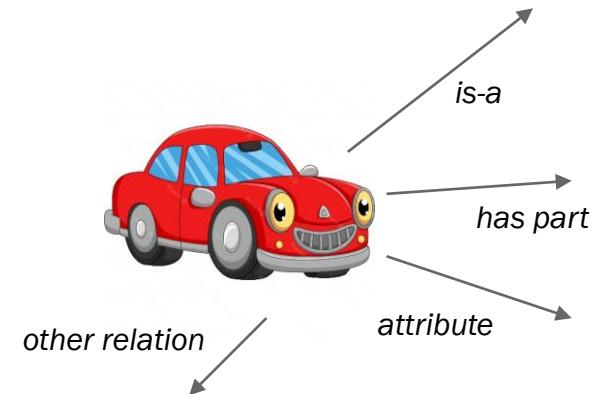
Enter a Discount or Promo Code ?

**Book as a Member**      **Book as a Guest**

Show Me All  
Economy  
Compact  
Midsize SUV  
Standard SUV  
Fullsize  
4x4 Midsize  
4x4  
Premium  
Convertible  
Minivan  
Green Traveler Collection



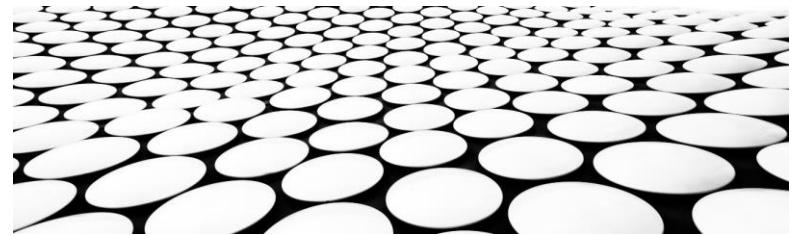
User's semantic network – Car renter



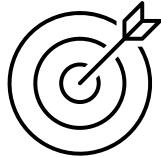
## To help design a UI

- List important terms (entities)
  - Think about entities in the domain/application
  - Include useful entities for various personas
- Design a semantic network with these terms
  - Think about entity descriptions (important attributes)
  - Think about the relations between entities
- The expression of entities and their relationships in the form of a semantic network will help to reflect on various organizational and navigational patterns

## Semantic Networks

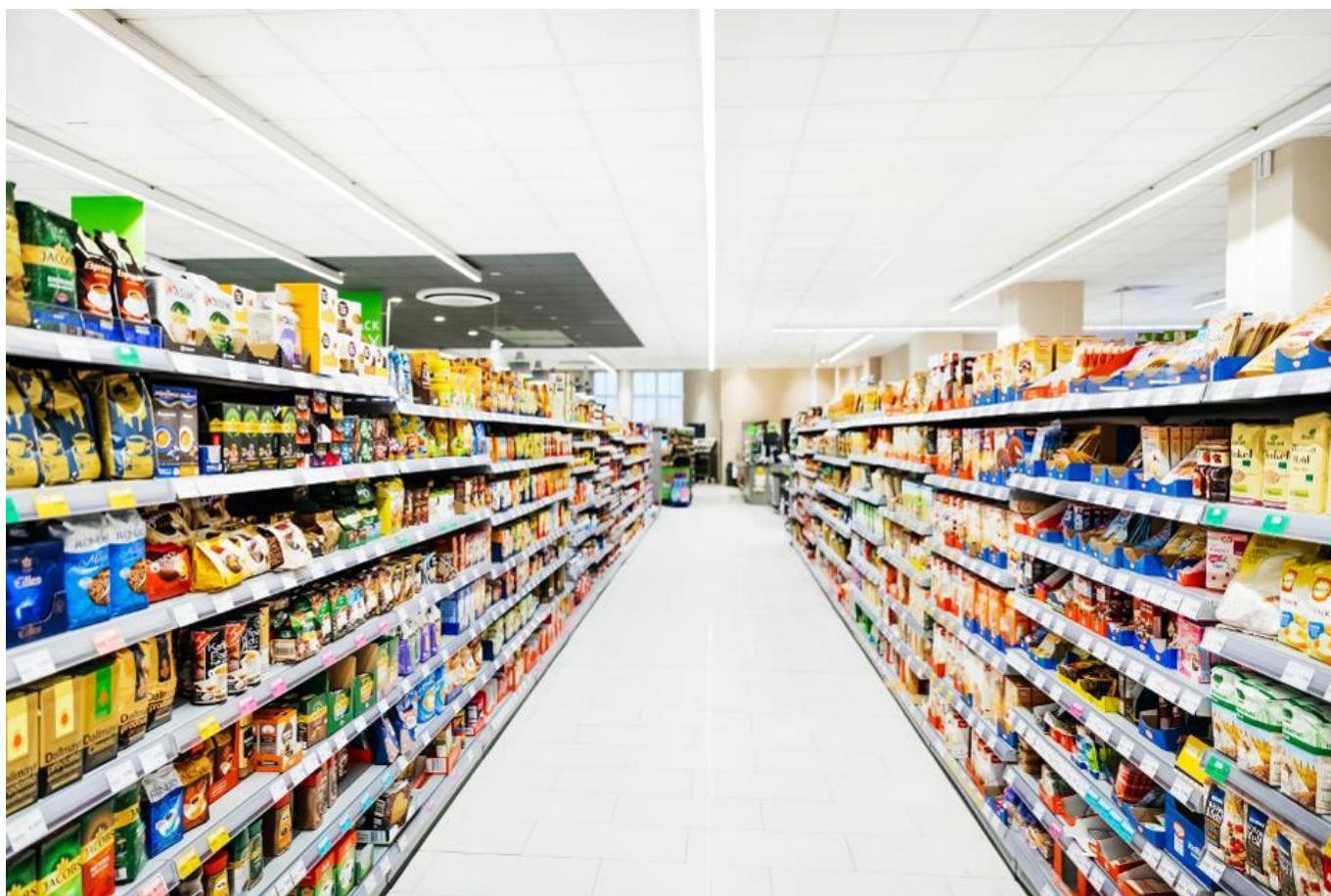


# System Image *Knowledge Organization*

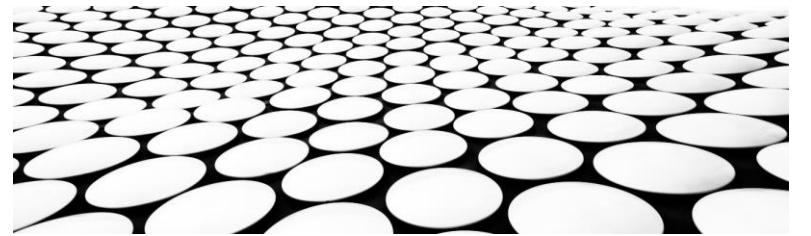


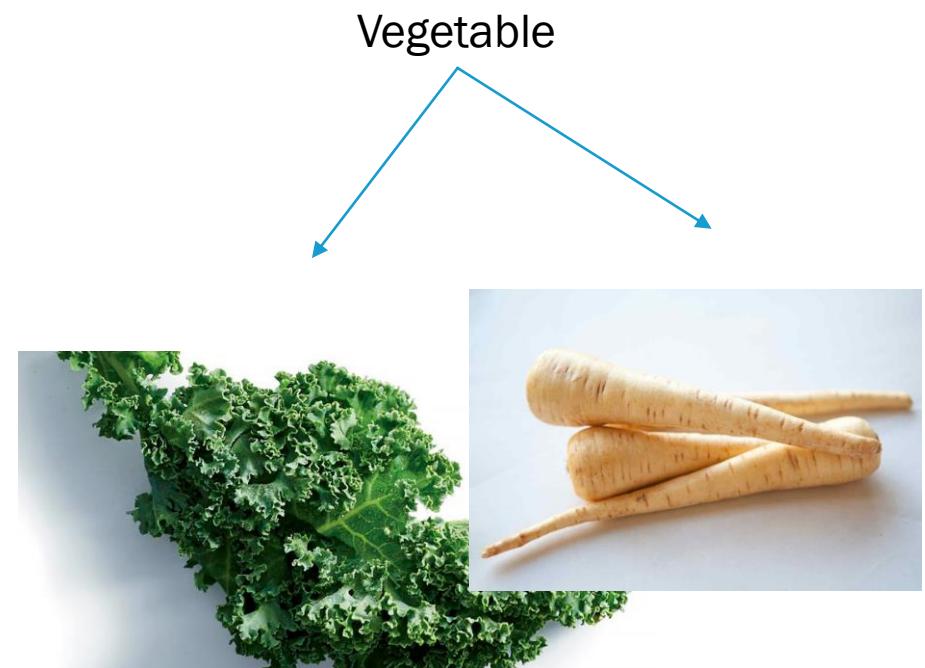
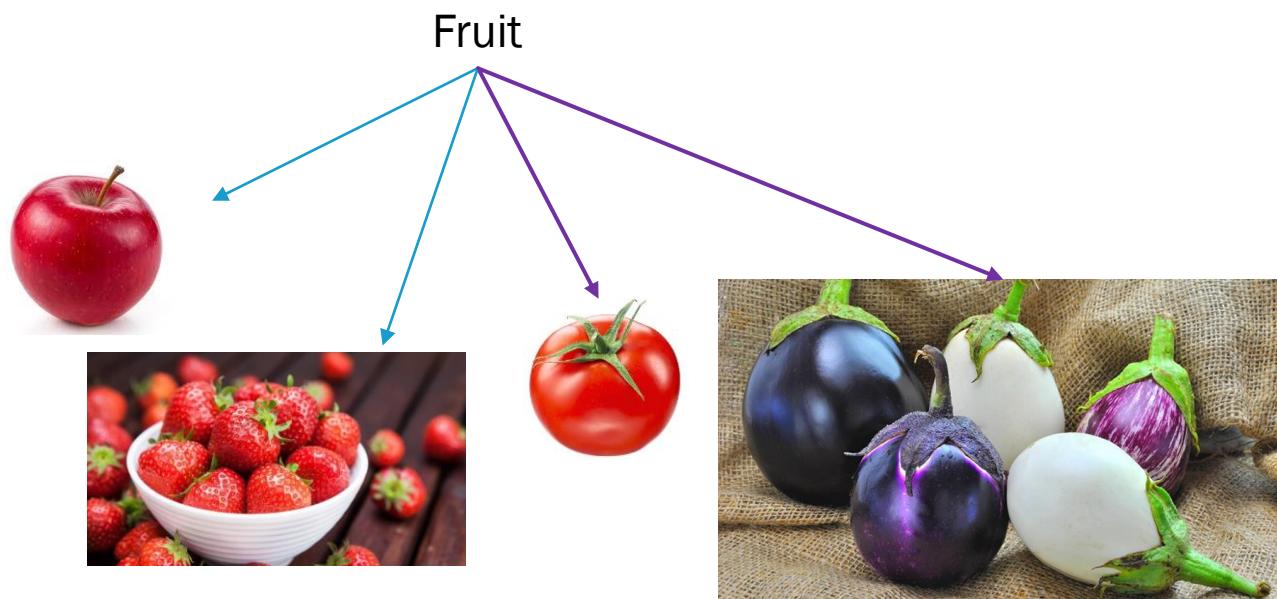
## GOALS OF THE PRESENTATION

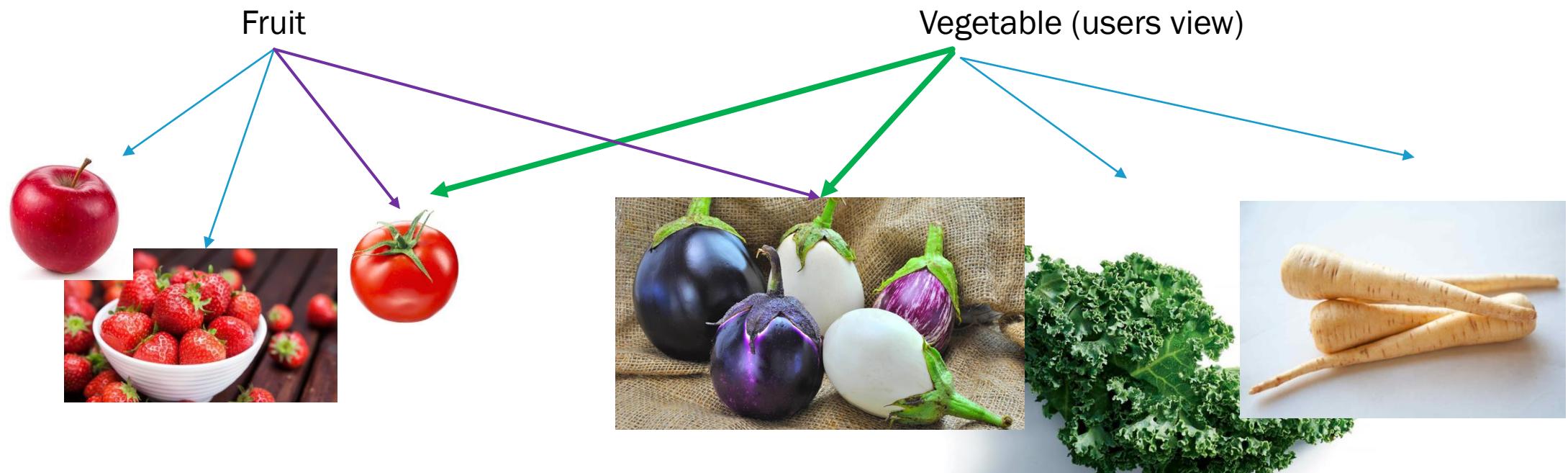
- System image – focus on knowledge organization
- Case study on grocery stores (looking at a single sale item)
- Case study on university websites (looking at program offering)



## Physical System Image



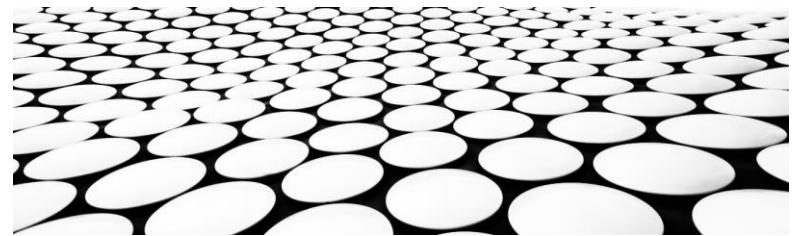




What is the organization of information (system image)?

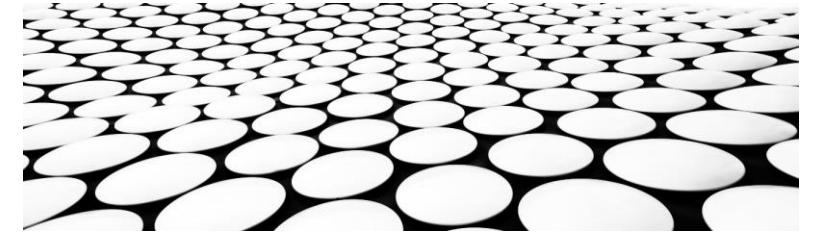
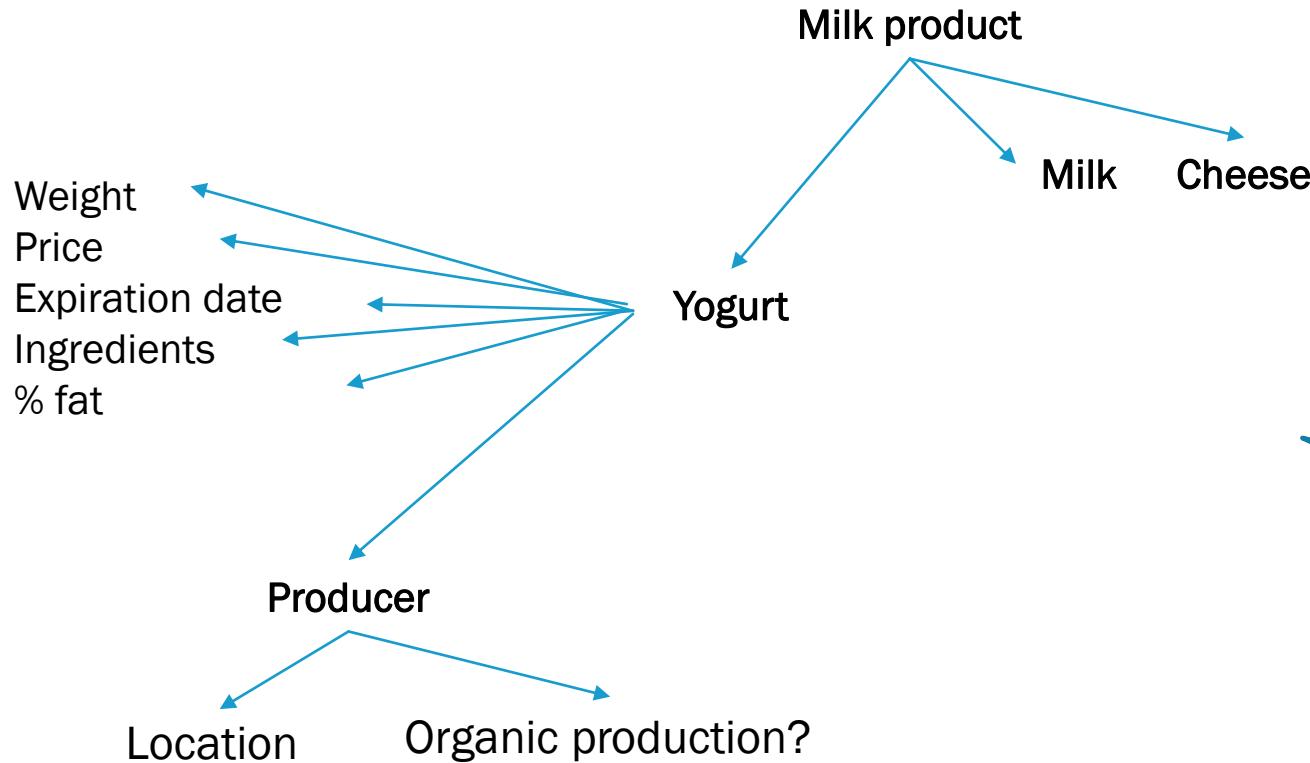
- Is it related to the semantic network?
- Faceted search

### Case study – Grocery store



*metro*

## Semantic Network



Faceted search should be inspired by this network

**Brand**

Search for brands  

Activia  
 Oikos  
 Liberte  
 Yoplait  
 President's Choice

[Show all brands](#)

**Deals**

Multi-Buy  
 Price Reduction  
 PC Optimum Points

**Price**

**Sellers**

**Dietary**



**Price**

\$5 and under  
 \$5-\$10  
 \$10-\$15  
 \$15-\$20

**Sellers**

Search for sellers  

loblaw

**Dietary**

Gluten Free  
 Organic



**Aisles**

- Dairy & Eggs (257)
- Fruits & Vegetables (1)
- Organic Groceries (2)
- Pantry (1)
- Vegan & Vegetarian Food (4)

**Brands**

- Irresistibles (18)
- Activia (35)
- Astro (15)
- Babybel (1)
- Beyond Moo (2)

[Show 20 More +](#)

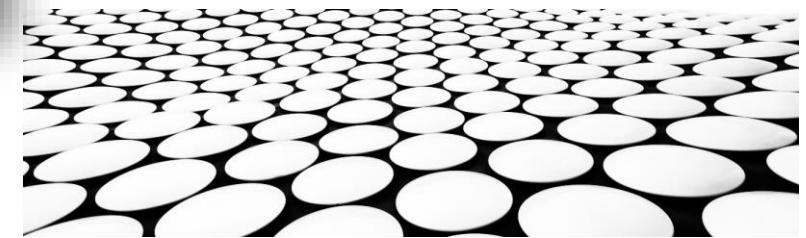
**My Health My Choices**

-  Agave Nectar (1)
-  Excellent Source of Calcium (9)
-  Gluten Free (2)
-  Good Source of Calcium (96)
-  Keto (25)
-  Lactose Free (13)
-  Low FODMAP (33)
-  Non GMO (15)
-  Organic (5)
-  Plant Based (24)
-  Source of Calcium (228)
-  Unsweetened (43)
-  Vegan (4)

# metro

**Deals**

- Flyer & Deals (38)
- Air Miles Promotions (68)
- All Deals (116)

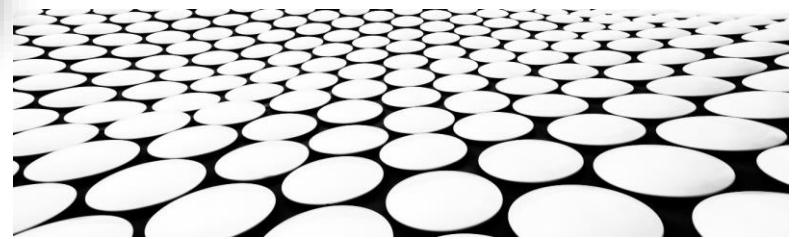
**Faceted Search**

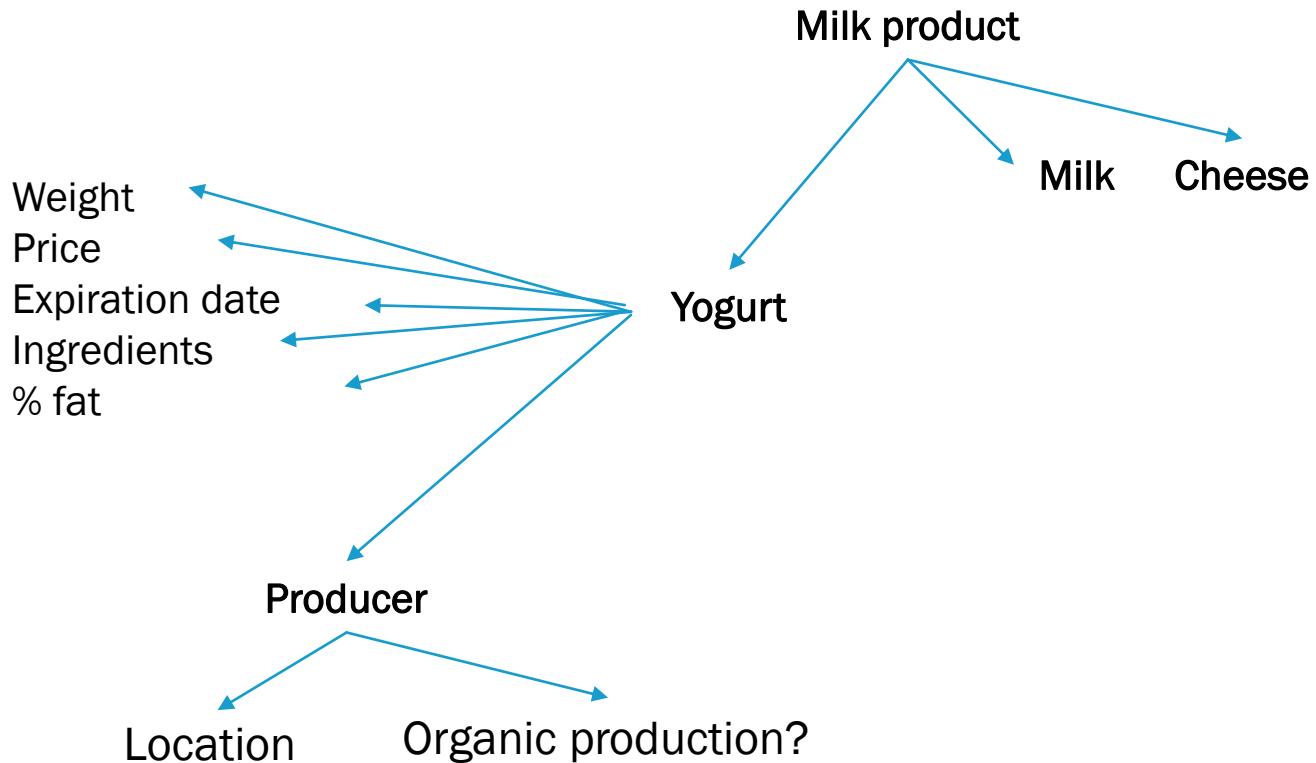
**ADDITIONAL FILTERS**

- Aliments du Québec (123)
- In Flyer (35)
- In Promotion (54)
- New Product (0)
- Popular Products (45)

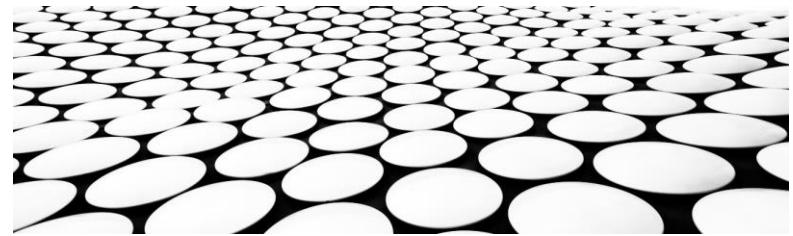
**BRANDS**

- Activia (3)
  - Activia Drinkable (1)
  - Astro (9)
  - Chagnon (2)
- [+ 18 to show](#)

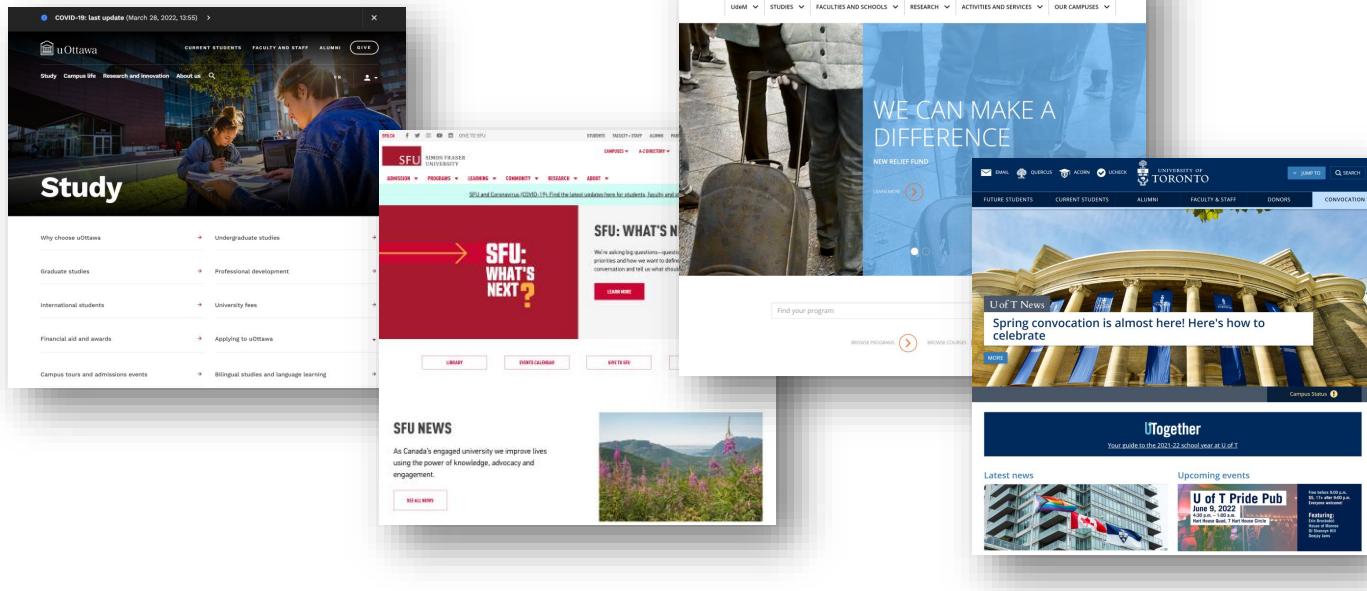
**Faceted Search**



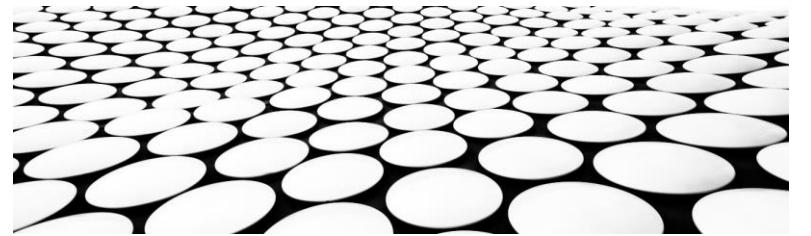
## Semantic Network / site organization

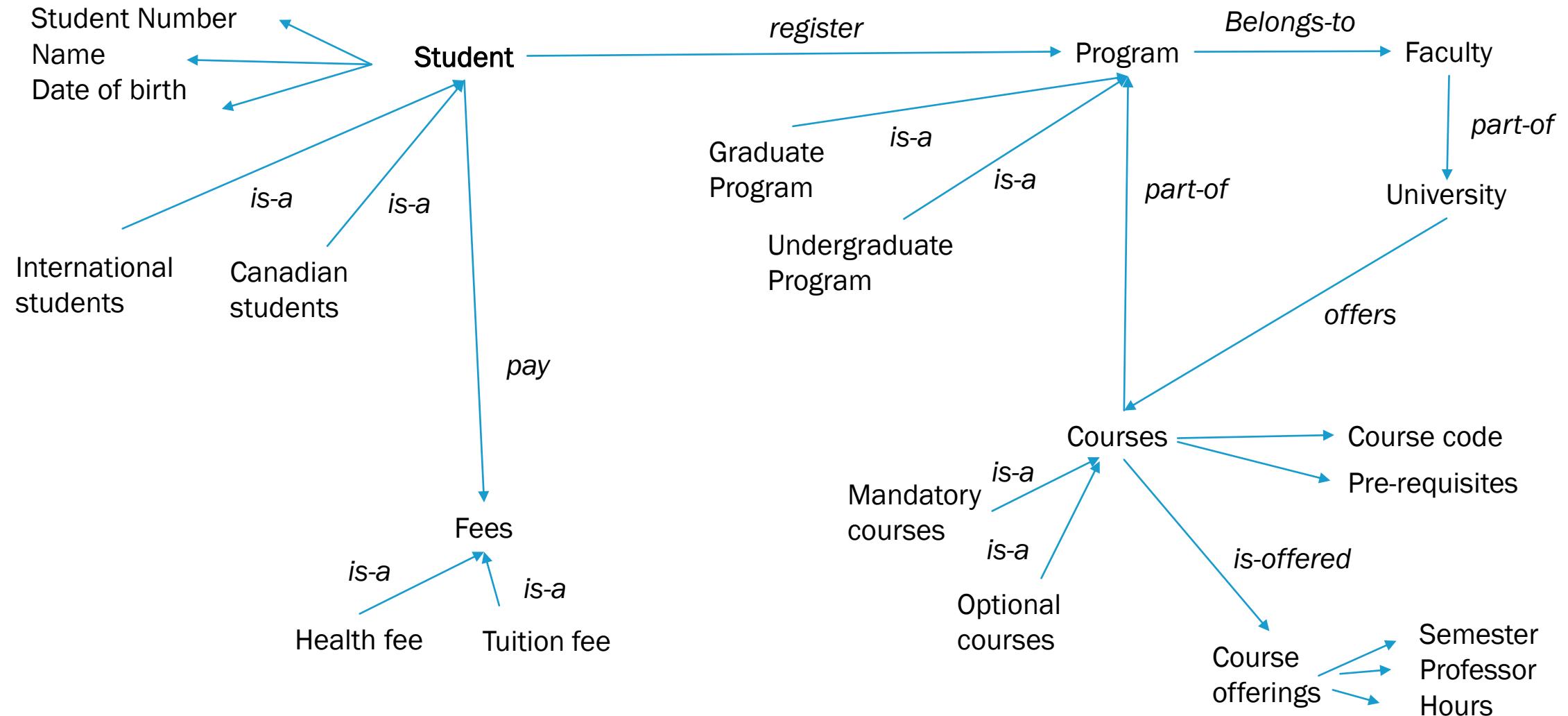


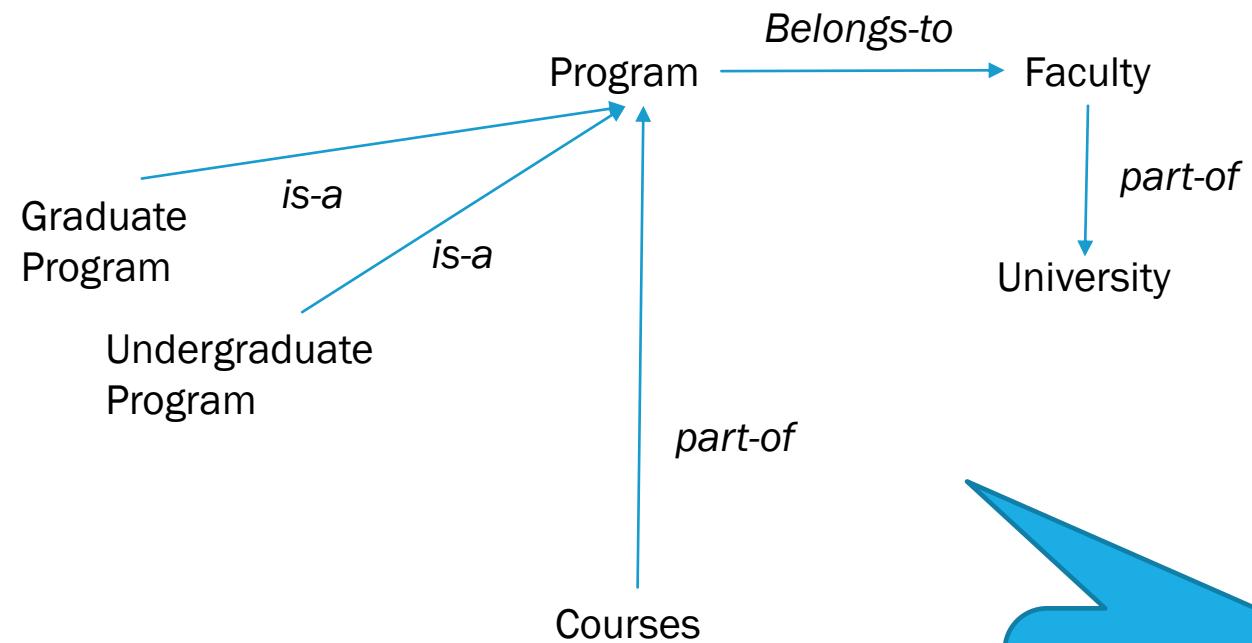
What is the organization of information (system image)?  
 - How do they present their programs?



## Case study - Universities







View too simplified... The list of programs is long and there are several attributes.

## Programs

Narrow your results and scroll to view.

**Reset**

**Level**

- Undergraduate studies
- Graduate studies
- Undergraduate studies / Graduate Studies

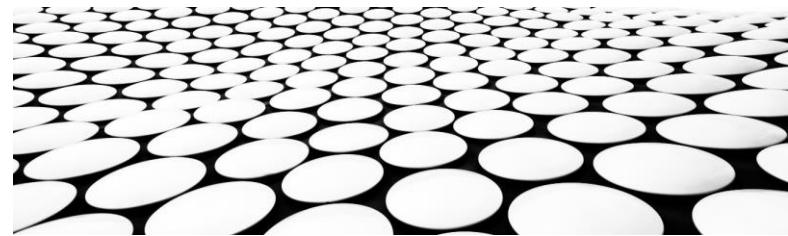
**Type of program**

- Bachelor's
- Juris Doctor
- Minor
- Certificate
- Licentiate
- Online
- Doctorate
- Major
- Option
- Dual Degrees
- Master's
- Microprogram
- Graduate diplomas

**Faculty**

- Arts
- Health Sciences
- Medicine
- Education
- Law
- Science
- Engineering
- Management (Telfer)
- Social Sciences

## Case study – University (1)

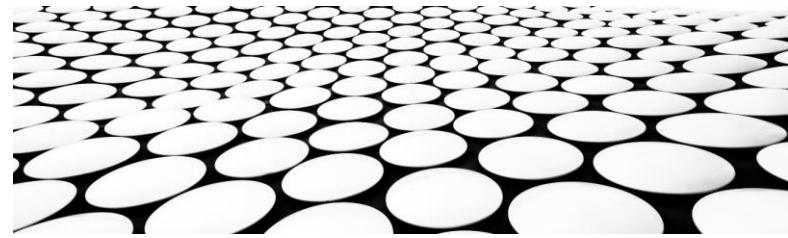


Catalogue 2023



Discipline		
<input type="checkbox"/> Accounting	<input type="checkbox"/> English as a Second Language	<input type="checkbox"/> Mathematics
<input type="checkbox"/> Advanced Materials and Manufacturing	<input type="checkbox"/> Entrepreneurship	<input type="checkbox"/> Mechanical Engineering
<input type="checkbox"/> Anthropology	<input type="checkbox"/> Environment	<input type="checkbox"/> Media
<input type="checkbox"/> Art History	<input type="checkbox"/> Environmental Engineering	<input type="checkbox"/> Medicine
<input type="checkbox"/> Arts	<input type="checkbox"/> Environmental Science	<input type="checkbox"/> Medieval and Renaissance Studies
<input type="checkbox"/> Audiology	<input type="checkbox"/> Environmental Sustainability	<input type="checkbox"/> Microbiology and Immunology
<input type="checkbox"/> Bilingualism	<input type="checkbox"/> Epidemiology	<input type="checkbox"/> Music
<input type="checkbox"/> Biochemistry	<input type="checkbox"/> Ethics	<input type="checkbox"/> Neuroscience
<input type="checkbox"/> Bioinformatics	<input type="checkbox"/> Experimental Medecine	<input type="checkbox"/> Nursing
<input type="checkbox"/> Biology	<input type="checkbox"/> Feminist and Gender Studies	<input type="checkbox"/> Occupational Therapy
<input type="checkbox"/> Biomedical Engineering	<input type="checkbox"/> Finance	<input type="checkbox"/> Ophthalmic Medical Technology
<input type="checkbox"/> Biomedical Science	<input type="checkbox"/> Fine Arts	<input type="checkbox"/> Pathology
<input type="checkbox"/> Biopharmaceutical Science	<input type="checkbox"/> Food and nutrition	<input type="checkbox"/> Pedagogy
<input type="checkbox"/> Biophysics	<input type="checkbox"/> French	<input type="checkbox"/> Philosophy
<input type="checkbox"/> Biostatistics	<input type="checkbox"/> French as a Second Language	<input type="checkbox"/> Physics
<input type="checkbox"/> Biotechnology	<input type="checkbox"/> Genetics	<input type="checkbox"/> Physiotherapy
<input type="checkbox"/> Business	<input type="checkbox"/> Geography	<input type="checkbox"/> Political Science
<input type="checkbox"/> Canadian Law	<input type="checkbox"/> Geology	<input type="checkbox"/> Psychology
<input type="checkbox"/> Canadian Studies	<input type="checkbox"/> Geomatics and Spatial Analysis	<input type="checkbox"/> Public Administration
<input type="checkbox"/> Celtic Studies	<input type="checkbox"/> Gerontology	<input type="checkbox"/> Public Health
<input type="checkbox"/> Chemical Engineering	<input type="checkbox"/> Global Studies	<input type="checkbox"/> Public Policy

## Case study – University (1)



Long list, and most are not possible with the previous choices.

◀ PROGRAMS

# FACULTIES

A-Z PROGRAMS

FACULTIES

SELECT A FACULTY:

[FACULTY OF APPLIED SCIENCES](#)

[FACULTY OF EDUCATION](#)

[FACULTY OF ARTS AND SOCIAL SCIENCES](#)

[FACULTY OF ENVIRONMENT](#)

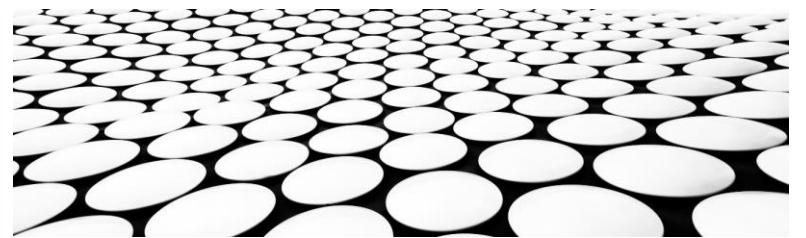
[BEEDIE SCHOOL OF BUSINESS](#)

[FACULTY OF HEALTH SCIENCES](#)

[FACULTY OF COMMUNICATION, ART AND TECHNOLOGY](#)

[FACULTY OF SCIENCE](#)

## Case study – University (2)



2022

**◀ PROGRAMS****A-Z PROGRAMS****FACULTIES****A TO Z PROGRAM LIST**

A B C D E F G H I J K L M N O P R S T U V W

**A**

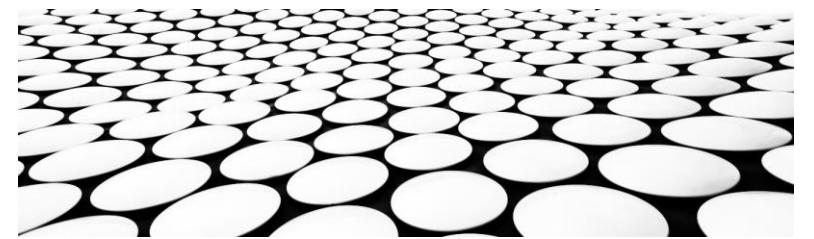
[Accounting \(Business\)](#)  
[Actuarial Science](#)  
[African Studies](#)  
[Anthropology](#)  
[Anthropology and Communication](#)  
[Anthropology and Criminology](#)  
[Anthropology and Gender, Sexuality, and Women's Studies Joint Major](#)  
[Anthropology and Linguistics](#)  
[Applied Biology](#)  
[Applied Mathematics](#)  
[Applied Physics](#)  
[Archaeology](#)  
[Archaeology and Anthropology](#)  
[Archaeology and Indigenous Studies](#)  
[Art, Performance and Cinema Studies](#)

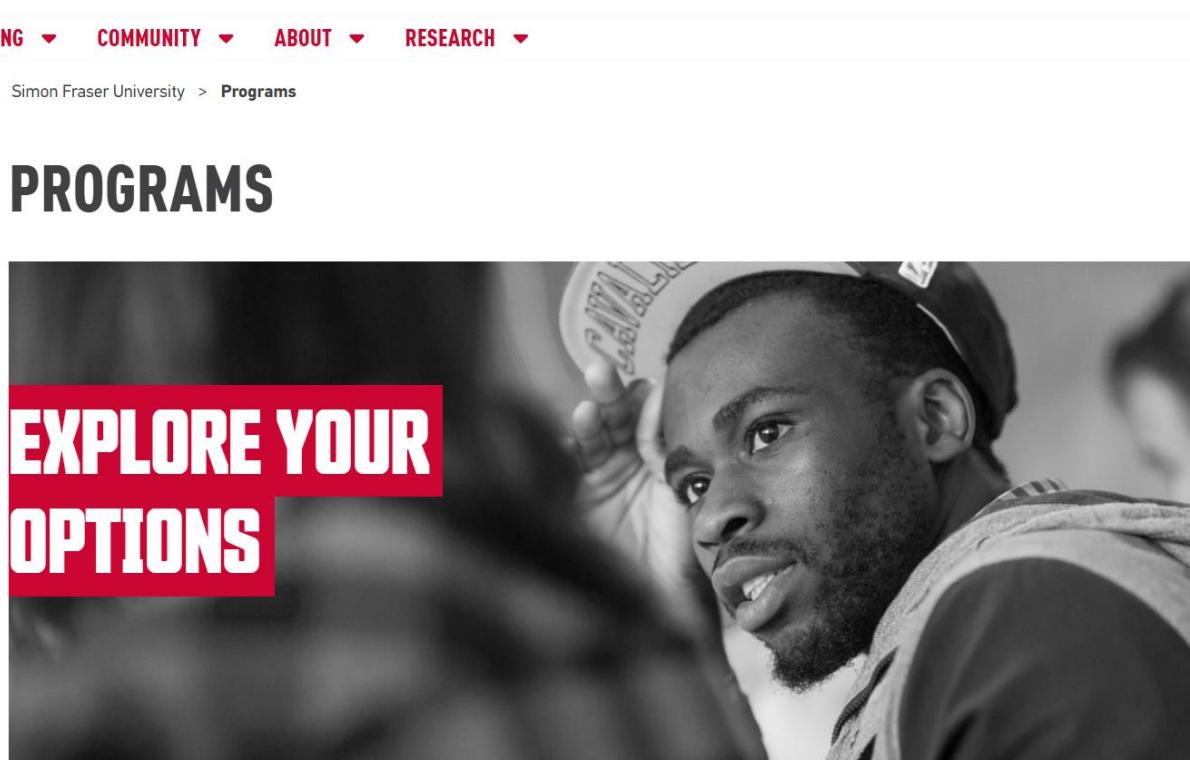
**H**

[Health Care Systems](#)  
[Health Ethics](#)  
[Health Sciences BA](#)  
[Health Sciences BSc](#)  
[Hellenic Studies](#)  
[History](#)  
[History and Gender, Sexuality, and Women's Studies](#)  
[History and Humanities](#)  
[Human Geography](#)  
[Human Resource Management](#)  
[Humanities](#)  
[Humanities and Gender, Sexuality, and Women's Studies Bachelor of Arts](#)

**I**

[Indigenous Studies](#)

**Case study – University (2)**

**PROGRAMS**[WHAT CAN I STUDY?](#)[FACULTIES + DEPARTMENTS](#)[ATHLETICS + RECREATION](#)[FOR INDIGENOUS PEOPLES](#)[FOR INTERNATIONAL STUDENTS](#)[OPTIONS IN FRENCH](#)**PROGRAMS****EXPLORE YOUR  
OPTIONS**

Whether you're looking for an unconventional study program or for flexible options to accommodate your life and work styles, we can help you find your fit.

Now many items within the Programs menu, but some are not related to programs (e.g. athletics)

## Fields of study

Explore the main fields of study at the Université de Montréal and consult the related programs.



Environmental planning and design



Arts and music



Communication



Law



Economics and politics



Teaching and education sciences



Environment and sustainable development



Literature and languages



Administration and management sciences



Health sciences



Life sciences



Environmental planning and design



Fundamental and applied sciences



Social sciences

Soci:



Arts and music



Communication

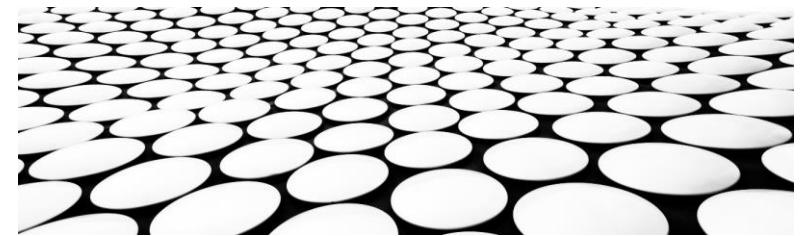


### Arts and music

A space for artistic cross-pollination

Music, cinema studies, art history  
Creation, composition, performance

[Undergraduate \(fr\) >](#) [Graduate >](#)



## Case study – University (3)



2023

**Refine your results**

**REMOVE ALL FILTERS**

**SEARCH WITHIN RESULTS**

Keywords 

**FIELD OF STUDY**

- Administration and Management Sciences (30)
- Arts and Music (17)
- Communication (8)
- Economics and Politics (14)
- Environmental Planning and Design (7)

**LEVEL**

- Doctorate (5)
- Graduate Diploma in Advanced Professional Studies (Doctorate Level) (2)
- Master's Degree (5)
- Specialized Graduate Diploma (5)

**SESSION** 

**MODE OF STUDY** 

-  Half-time (7)
-  Full-time (16)
-  Part-time (8)

**PERIOD** 

-  Daytime (17)
-  Evening (3)

**INTERNSHIP** 

**SPECIFICS** 

-  Open during the next fall session (17)
-  Directed study track (2)
-  Open during the next winter session (16)
-  Dissertation or thesis track (8)
-  Without dissertation or thesis track (4)
-  International exchange option (11)
-  Offered jointly with other institutions (2)

2023

**Refine your results**

**REMOVE ALL FILTERS**

**SEARCH WITHIN RESULTS**

Keywords 

**FIELD OF STUDY**

- Administration and Management Sciences (30)
- Arts and Music (17)
- Communication (8)
- Economics and Politics (14)
- Environmental Planning and Design (7)

**LEVEL**

- Doctorate (5)
- Graduate Diploma in Advanced Professional Studies (Doctorate Level) (2)
- Master's Degree (5)
- Specialized Graduate Diploma (5)

**SESSION** 

**MODE OF STUDY** 

- Half-time (7)
- Full-time (16)
- Part-time (8)

**PERIOD** 

- Daytime (17)
- Evening (3)

**INTERNSHIP** 

**SPECIFICS** 

- Open during the next fall session (17)
- Directed study track (2)
- Open during the next winter session (16)
- Dissertation or thesis track (8)
- Without dissertation or thesis track (4)
- International exchange option (11)
- Offered jointly with other institutions (2)

**A space for artistic cross-pollination**

Inspired by the interdisciplinary exploration taking place in the contemporary art world, UdeM has developed innovative programs that spark every kind of artistic flame.



In the Faculty of Music, performers, composers and theorists delve deeply into all types of music, from digital and world music to baroque, classical, opera and jazz, and explore the connections between music, art and society.

As for the Department of Art History and Film Studies, it takes a unique approach focusing on theory, history and research-creation, while remaining open to multiple forms of artistic expression.

**PROGRAMS OF STUDY**      **THESIS**      **PERIOD**

<b>Art History FR</b> 		
Master's Degree   45 credits   2-170-1-0		
<b>Art History FR</b> 		
Doctorate   90 credits   3-170-1-0		
<b>Cinema Studies FR</b> 		
Doctorate   90 credits   3-171-1-0		
<b>Digital Music FR</b> 		
Specialized Graduate Diploma   30 credits   2-615-1-2		
<b>Fine Arts and Creative Technologies FR</b> 		
Specialized Graduate Diploma   30 credits   2-960-1-2		
<b>Museum Studies FR</b> 		
Master's Degree   45 credits   2-131-1-0		
<b>Music FR</b> 		
Master's Degree   45 credits   2-600-1-1		
<b>Music FR</b> 		
Doctorate   90 credits   3-600-1-2		

2023

Faceted search followed by presentation of results.

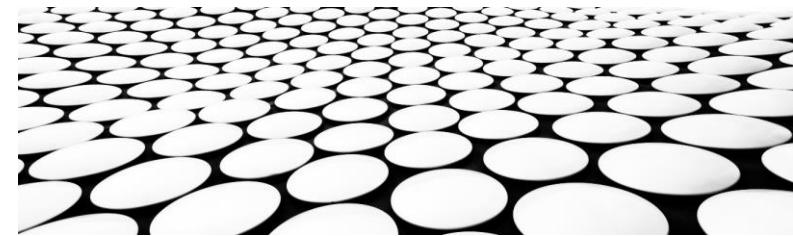
## Programs of Study

Dive into your interests and develop your passions at U of T. We offer over 700 undergraduate and 200 graduate programs across three campuses in the Greater Toronto Area. From architecture to medicine, music to urban studies, we've got what you're looking for.

① Find the program that is the best fit for you. Selecting the "undergraduate" or "graduate" options will filter your results and refresh the page. You can also search programs by keyword.

<input checked="" type="radio"/> UNDERGRADUATE	<input type="radio"/> GRADUATE	<input type="checkbox"/>	SEARCH	Degree Type	<input type="button" value="RESET"/>
<b>Accounting</b> Bachelor of Commerce Specialist	<b>Accounting</b> Bachelor of Commerce Specialist	<b>Actuarial Science</b> Honours Bachelor of Science Specialist, Major	<b>African Studies</b> Honours Bachelor of Arts Specialist, Major, Minor	<b>American Studies</b> Honours Bachelor of Arts Major, Minor	
Mississauga	St. George	St. George	St. George	St. George	
<b>Animal Physiology</b> Honours Bachelor of Science Major	<b>Anthropology</b> Honours Bachelor of Science Major	<b>Anthropology</b> Honours Bachelor of Science Specialist, Major, Minor	<b>Anthropology</b> Honours Bachelor of Arts Specialist, Major	<b>Anthropology</b> Honours Bachelor of Science Specialist, Major, Minor	
St. George	St. George	Mississauga	Scarborough	Scarborough	
<b>Anthropology</b> Honours Bachelor of Arts Specialist, Major, Minor	<b>Anthropology</b> Honours Bachelor of Arts Specialist, Major, Minor	<b>Applied Mathematics</b> Honours Bachelor of Science Specialist	<b>Applied Statistics</b> Honours Bachelor of Science Specialist, Major, Minor	<b>Archaeology</b> Honours Bachelor of Arts Specialist	
St. George	Mississauga	St. George	Mississauga	St. George	
<b>Architectural Studies</b> Honours Bachelor of Arts	<b>Art and Art History (joint program with Sheridan College)</b>	<b>Art History</b> Honours Bachelor of Arts	<b>Art History</b> Honours Bachelor of Arts	<b>Art History and Visual Culture</b>	

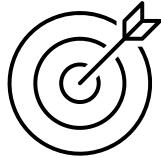
## Case study – University (4)



2022

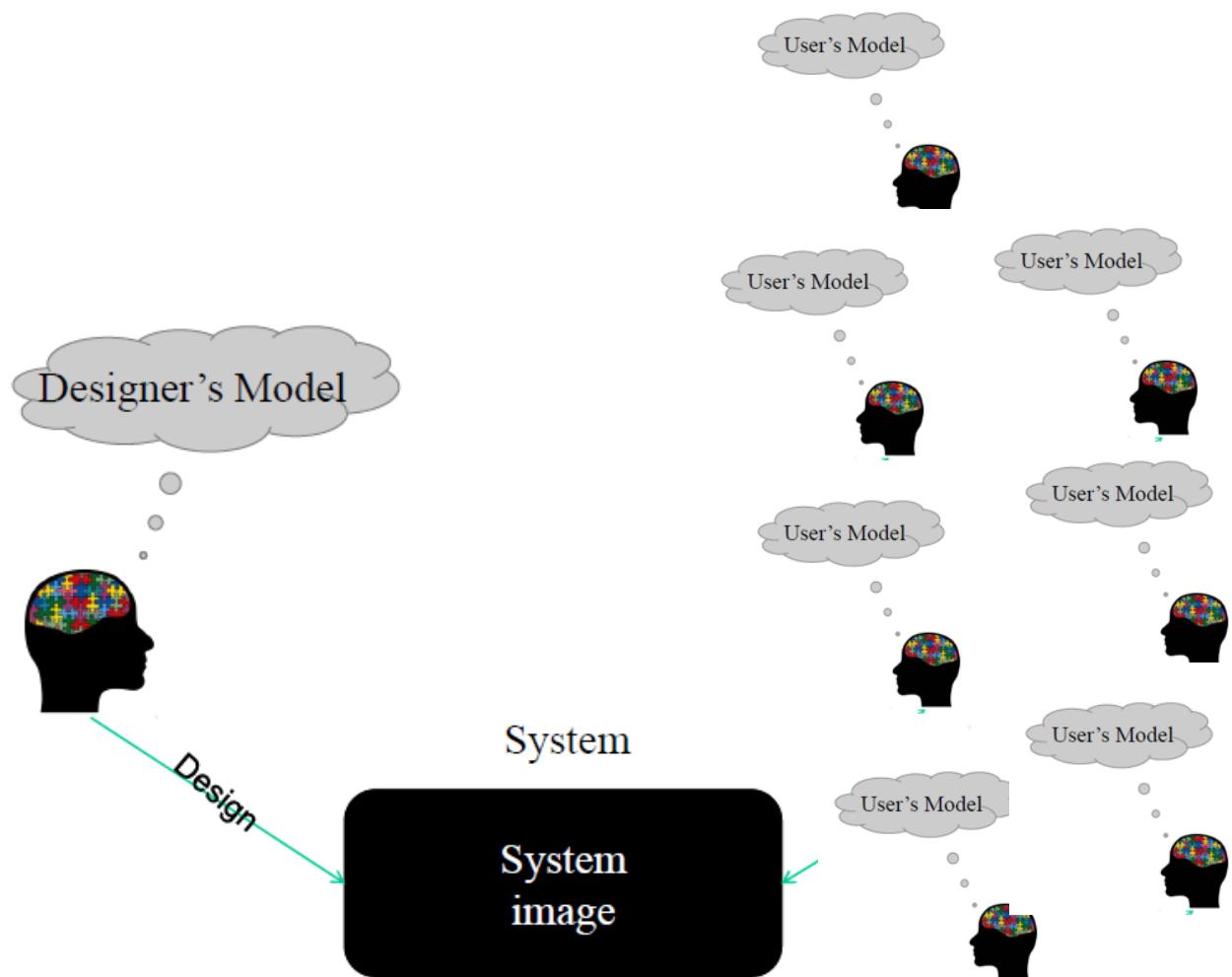
# System Image

*Different personas / different views and goals*

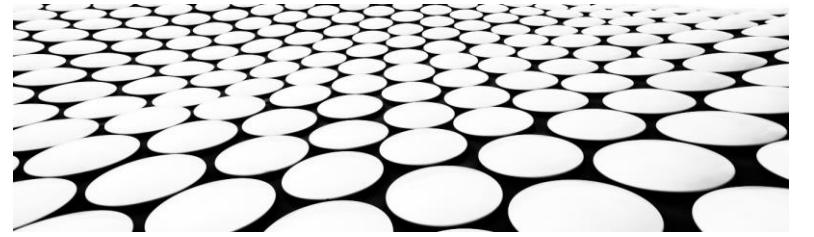


## GOALS OF THE PRESENTATION

- System image – focus on access by different personas
- Case study on university websites (looking at navbars to view their different entry points)



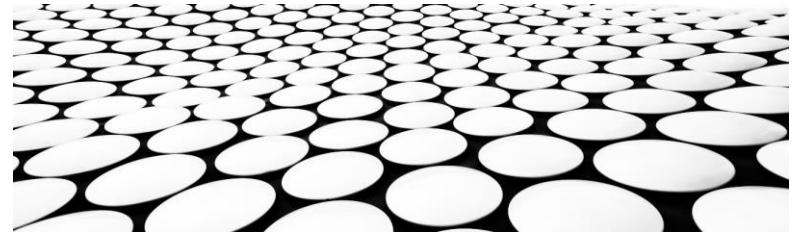
**Different Personas = different models**



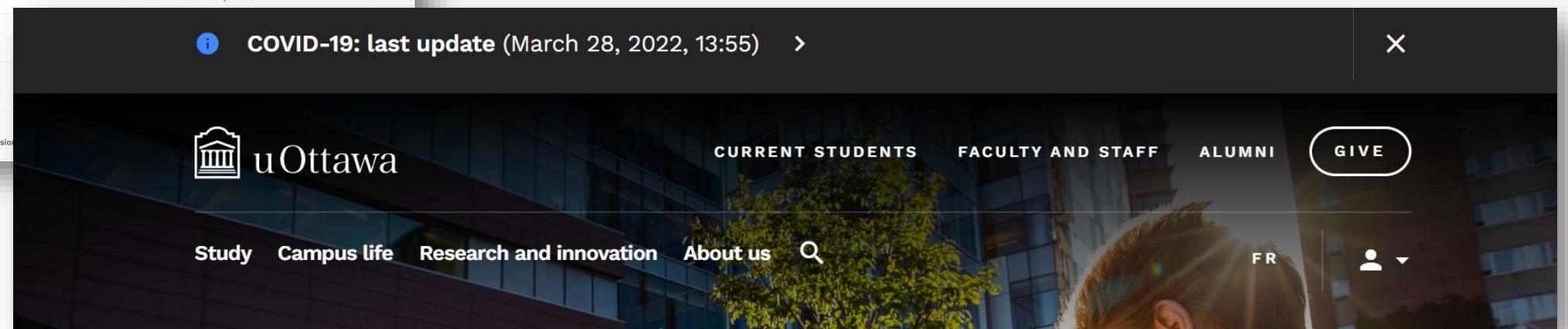
## System Image

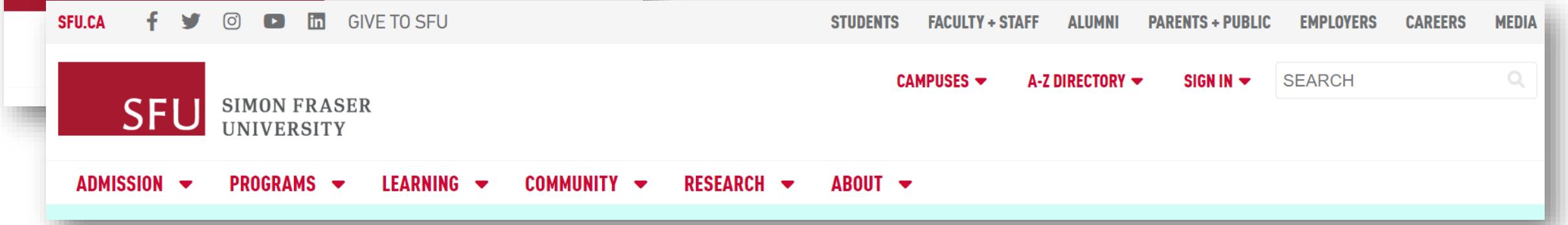
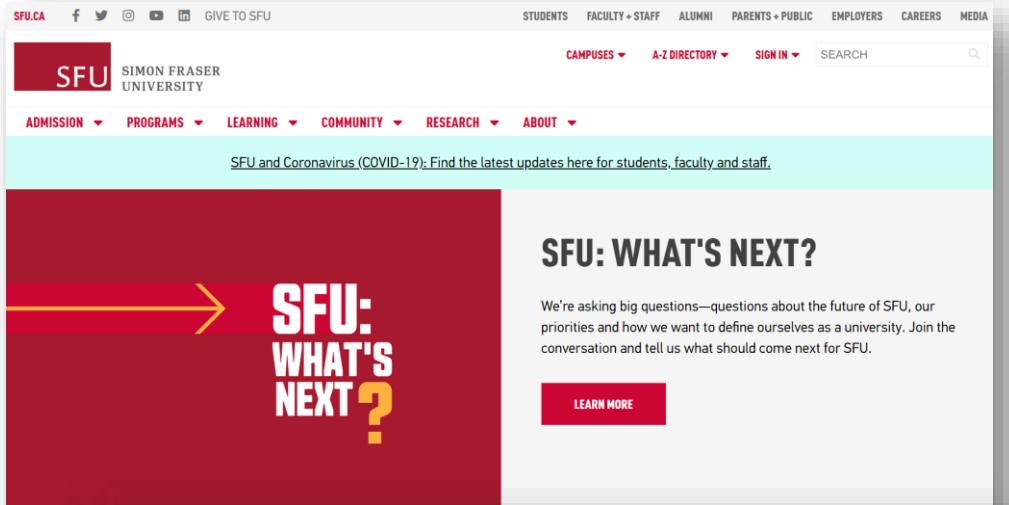
### System image must:

- Reflect the personality of your business
- Match the level(s) of knowledge of your users
  - Expert / Novice
- Match cognitive abilities of your users (attention, perception, short-term memory, etc.)
- Match the knowledge organization of your users (long-term memory)
- Help users in their interactive processes

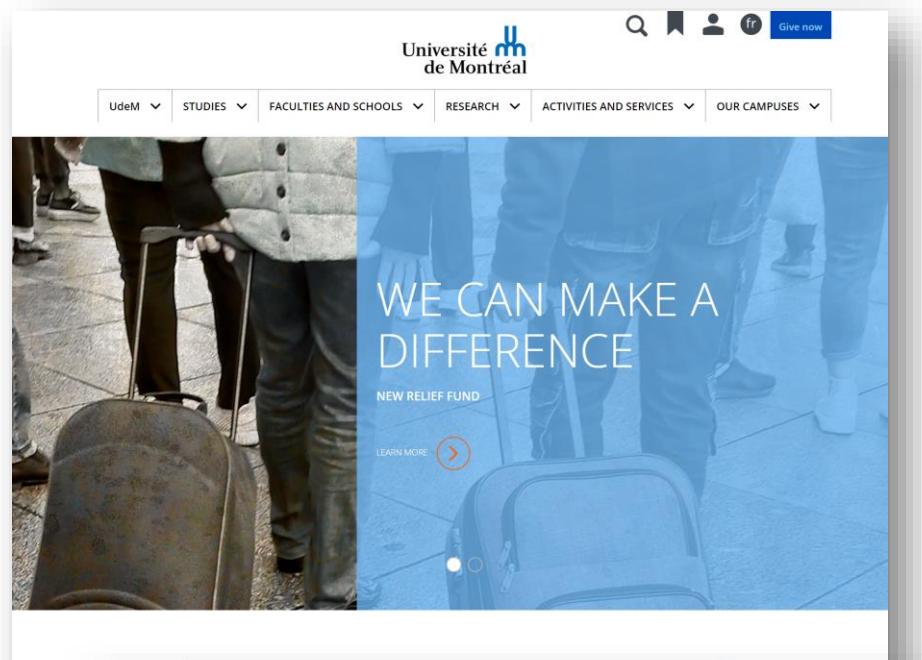


Perhaps we can think of different entry points for different users and have semantic networks targeted to each

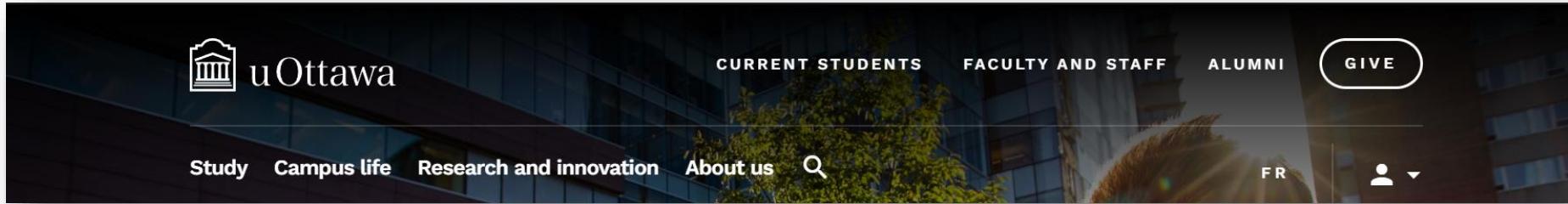




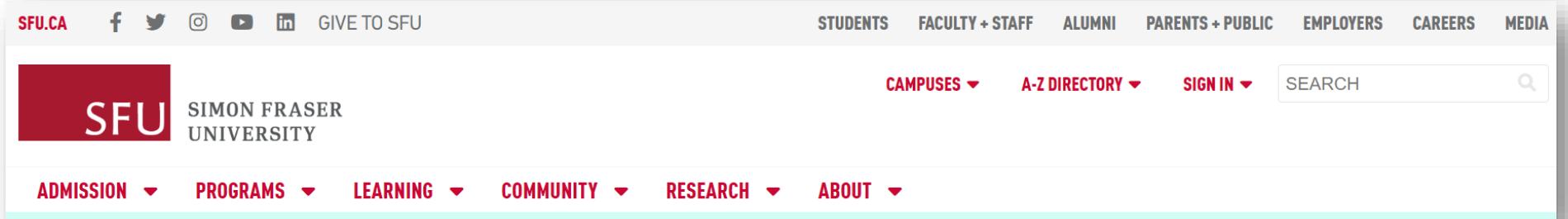
2022



The screenshot shows the official website of the University of Toronto. At the top, there is a dark blue header bar with the university's crest and name. Below this, a light blue navigation bar contains links for Future Students, Current Students, Alumni, Faculty & Staff, Donors, and Convocation. A search bar and a 'Jump To' dropdown are also present. The main content area features a large image of a classical building with columns and blue banners. A prominent white overlay box displays 'U of T News' and a headline: 'Spring convocation is almost here! Here's how to celebrate'. Below this, a 'MORE' button and a 'Campus Status' link are visible. A secondary dark blue banner at the bottom left is titled 'UTogether' and describes it as 'Your guide to the 2021-22 school year at U of T'. The footer is a dark blue bar with links for Email, Quercus, Acorn, and Ucheck, along with the university's crest and name. It also includes a 'Jump To' dropdown and a search bar. The footer navigation bar is identical to the one in the header.



The screenshot shows the homepage of the University of Ottawa (uOttawa). At the top left is the uOttawa logo. The top navigation bar includes links for CURRENT STUDENTS, FACULTY AND STAFF, and ALUMNI, along with a GIVE button. Below the navigation is a secondary menu with links for Study, Campus life, Research and innovation, About us, and a search icon. A language switcher (FR) and a user profile icon are also present.



The screenshot shows the homepage of Simon Fraser University (SFU). The top header features the SFU logo, social media icons, and a GIVE TO SFU link. The main navigation menu includes STUDENTS, FACULTY + STAFF, ALUMNI, PARENTS + PUBLIC, EMPLOYERS, CAREERS, and MEDIA. Below the main menu are links for CAMPUSES, A-Z DIRECTORY, and SIGN IN, along with a search bar. The secondary navigation menu at the bottom includes ADMISSION, PROGRAMS, LEARNING, COMMUNITY, RESEARCH, and ABOUT.



The screenshot shows the homepage of the Université de Montréal. The top header features the university logo, a search icon, a bookmark icon, a user icon, a French language indicator (fr), and a Give now button. The main navigation menu includes UdeM, STUDIES, FACULTIES AND SCHOOLS, RESEARCH, ACTIVITIES AND SERVICES, and OUR CAMPUSES.

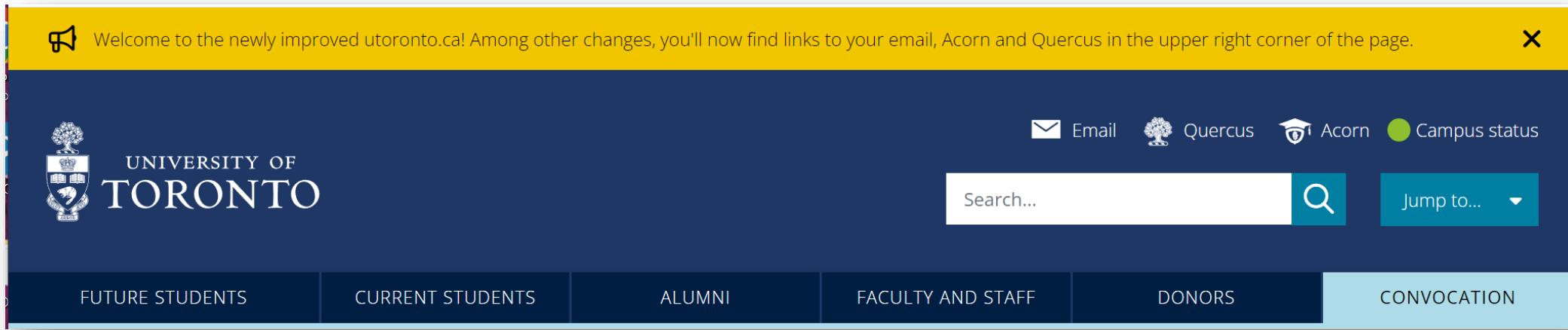


The screenshot shows the homepage of the University of Toronto. The top header features links for EMAIL, QUERCUS, ACORN, UCHECK, and the UNIVERSITY OF TORONTO logo. To the right are JUMP TO and SEARCH buttons. The main navigation menu includes FUTURE STUDENTS, CURRENT STUDENTS, ALUMNI, FACULTY & STAFF, DONORS, and CONVOCATION.



The header of the University of Toronto website features a dark blue background. On the left, there are links for "EMAIL" (with an envelope icon), "QUERCUS" (with a tree icon), "ACORN" (with a graduation cap icon), and "UCHECK" (with a checkmark icon). In the center is the "UNIVERSITY OF TORONTO" logo with its crest. On the right, there is a "JUMP TO" dropdown menu and a search bar with a magnifying glass icon.

FUTURE STUDENTS CURRENT STUDENTS ALUMNI FACULTY & STAFF DONORS CONVOCATION



A yellow horizontal bar at the top contains a megaphone icon and the text: "Welcome to the newly improved utoronto.ca! Among other changes, you'll now find links to your email, Acorn and Quercus in the upper right corner of the page." To the right of the message is a close button (an 'X').

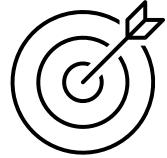
The header includes the "UNIVERSITY OF TORONTO" logo, links for "Email" (envelope icon), "Quercus" (tree icon), "Acorn" (graduation cap icon), and "Campus status" (green circle icon), a search bar with a magnifying glass icon, and a "Jump to..." dropdown menu.

FUTURE STUDENTS CURRENT STUDENTS ALUMNI FACULTY AND STAFF DONORS CONVOCATION

2022/2023

# Reasoning

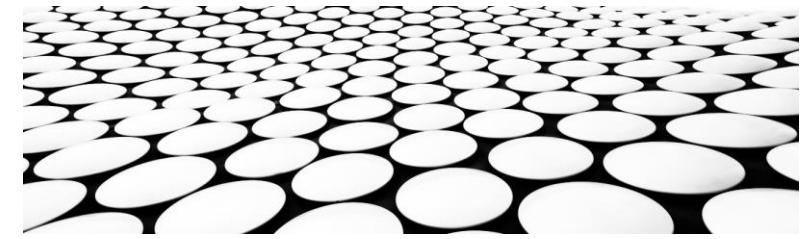
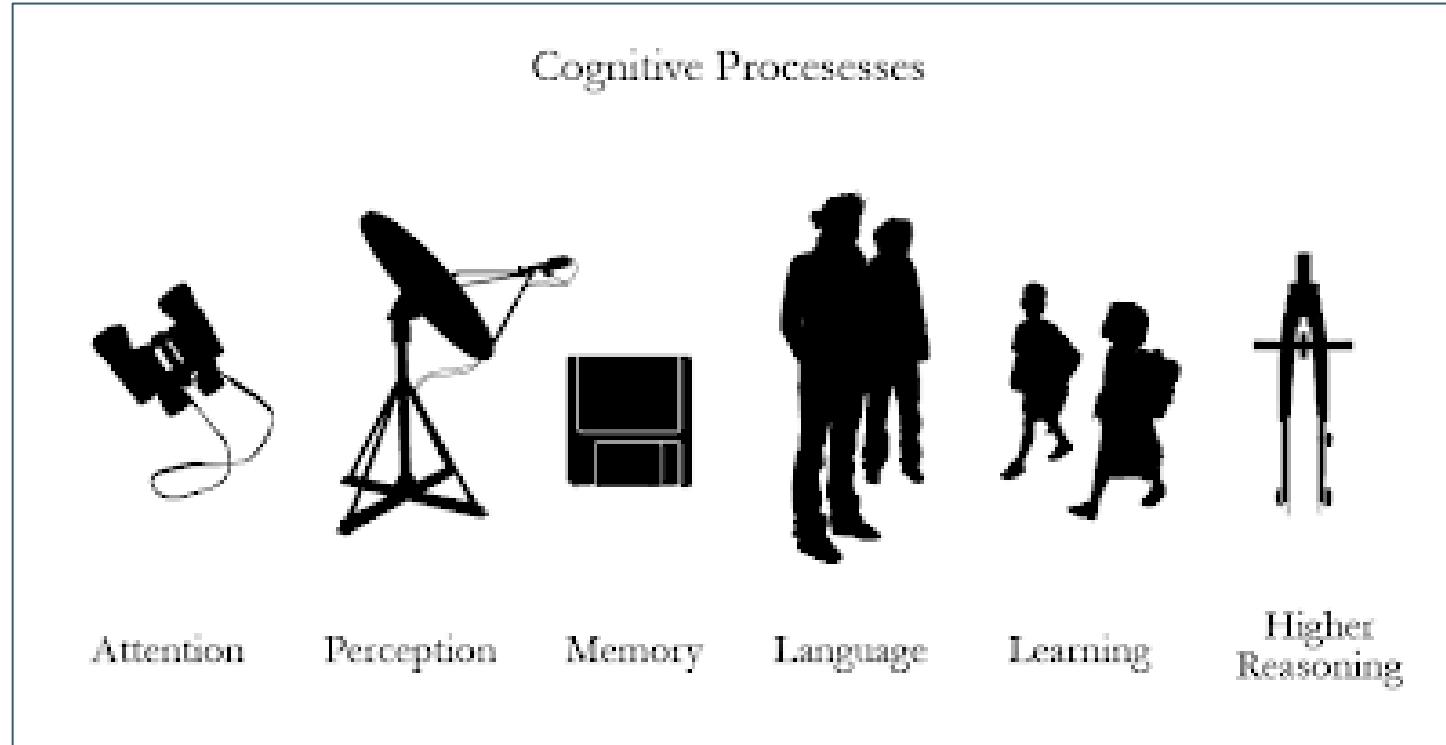
*Interactive processes*

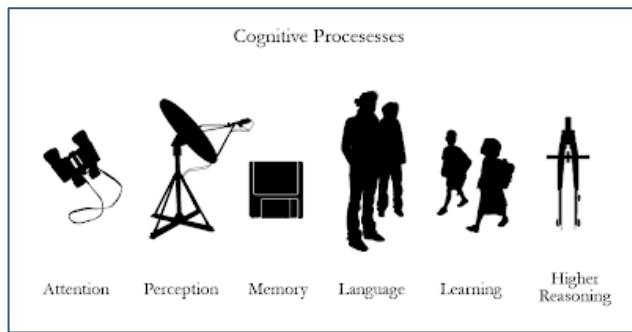


## GOALS OF THE PRESENTATION

- Presentation of 8 interactive processes

## Six cognitive processes



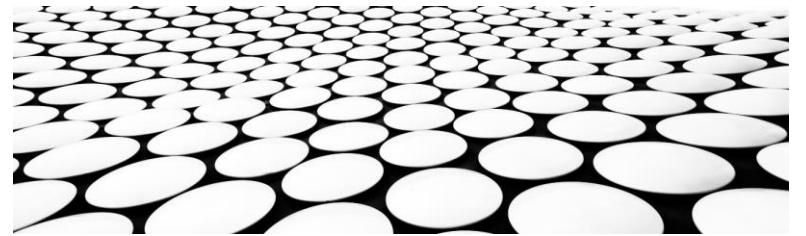


**Higher reasoning:** processes that involve reflective cognition such as problem-solving, planning, reasoning, decision-making.



*Design implications:* make it easy for users with higher levels of expertise to access additional information and functionality to carry out tasks more efficiently.

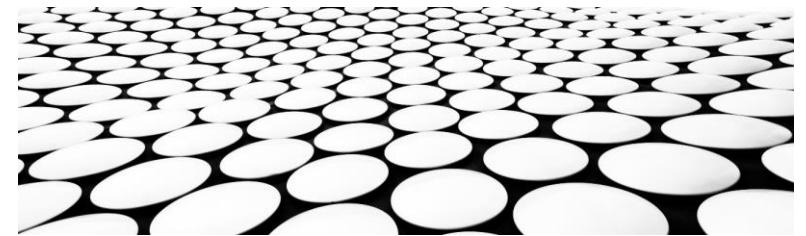
## Higher reasoning



1. Follow instructions
2. Absorb information
3. Perform a monitored activity
4. Explore in the divergent/convergent model
5. Analyze results
6. Design
7. Communicate
8. Plan / organize

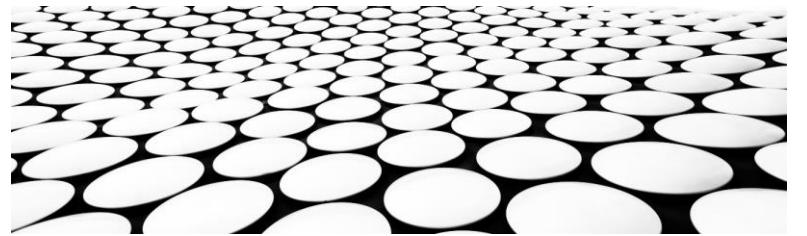


## Interactive processes





Where do these processes come from?

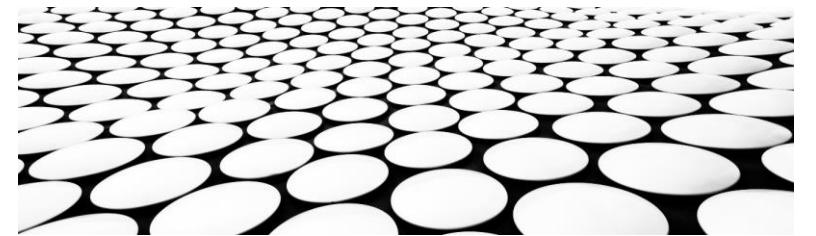


- Follow a recipe
- Install a software

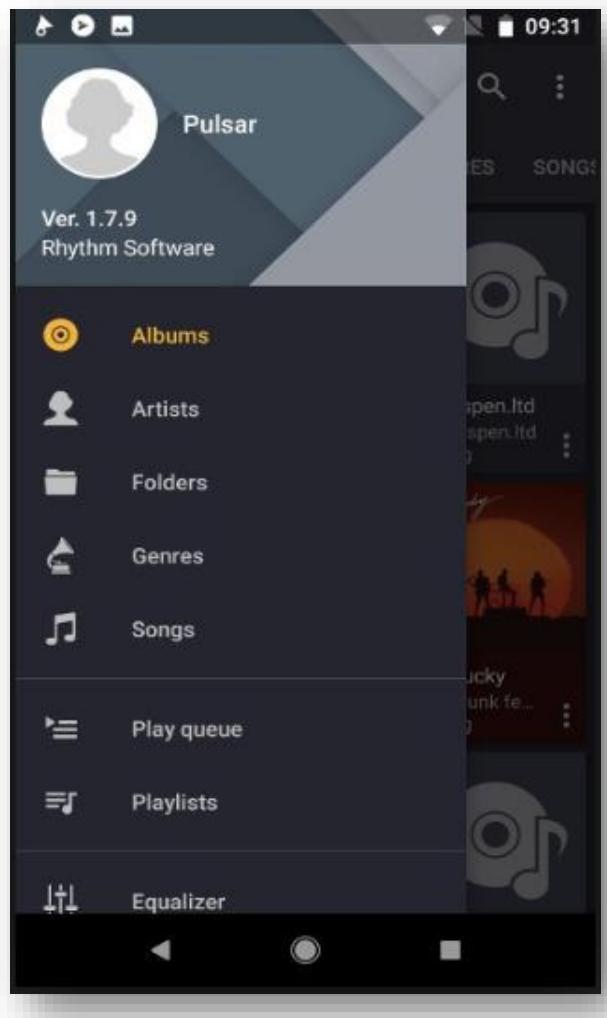
Linear (step-by-step) process



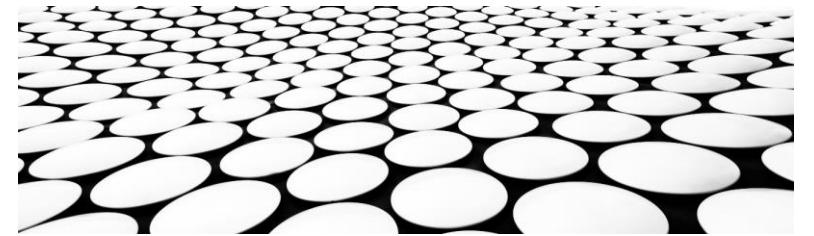
## (1) Follow instructions



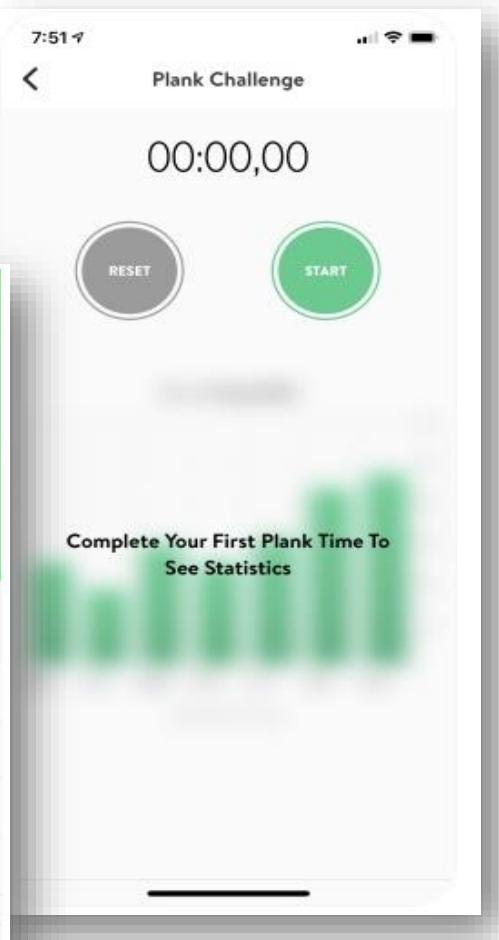
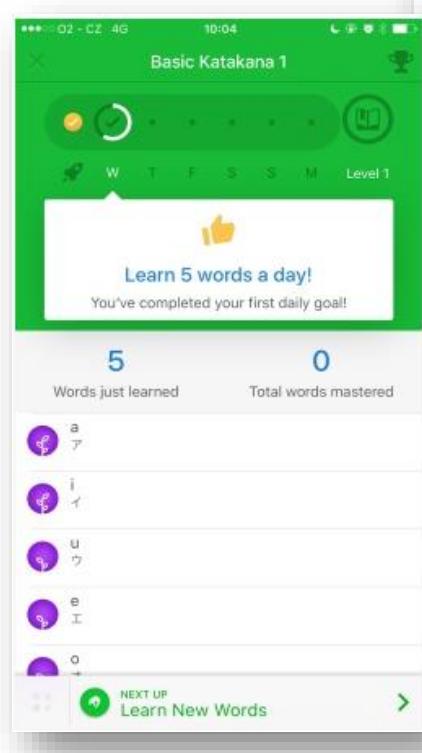
- Watch a video
- Read the newspaper
- Listen to music



## (2) Absorb information

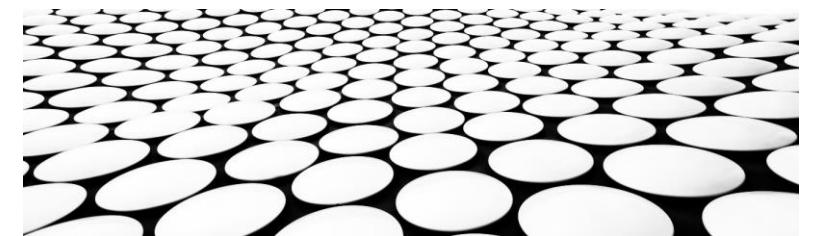


- Requires monitoring
  - Time oriented
  - Goal oriented



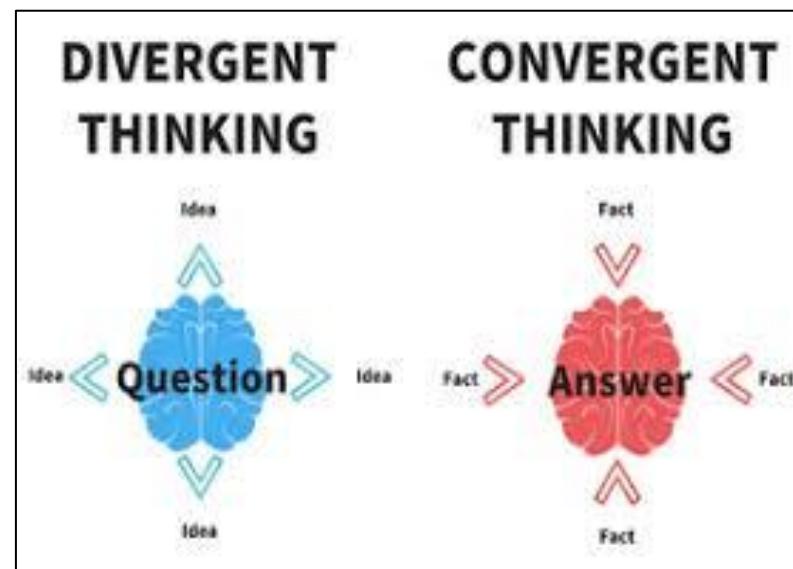
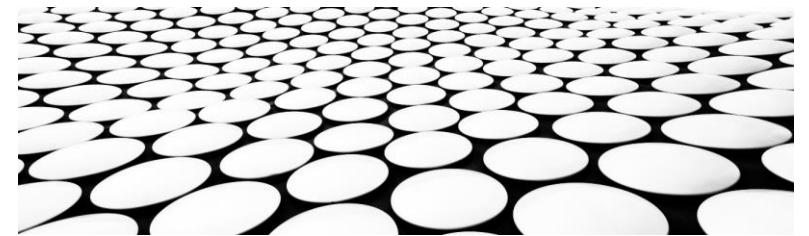
pttrns.

### (3) Perform a monitored activity



- Divergence
  - Exploring options
  - Search for information
- Convergence
  - Get directions
  - Find a restaurant
  - Obtain a quote

#### (4) Explore (divergent/convergent)



Appliances

**Computers, Tablets & Accessories** >

- Printers, Ink & Office Supplies
- Cell Phones
- Cameras, Camcorders & Drones
- Baby, Maternity & Beauty
- Headphones, Speakers & Audio
- Musical Instruments
- TV & Home Theatre
- Video Games & Movies
- Fitness, Luggage & Fashion
- Wearable Technology
- Smart Home & Car Electronics
- Toys, Sports & Recreation
- Home, Furniture & Kitchen

**Computers, Tablets & Accessories**

[Explore More >](#)

**Computers**

- Laptops
- MacBooks
- 2-in-1 Laptops
- Gaming Laptops
- Desktop Computers

[Explore More >](#)

**Computer Accessories & Components**

- Monitors
- Drives & Storage
- WiFi & Networking
- Mice & Keyboards
- Video Cards & PC Components

[Explore More >](#)

**Tablets, iPads & eReaders**

- Apple iPad
- Android Tablets
- Windows Tablets
- iPad & Tablet Accessories
- eReaders

[Explore More >](#)

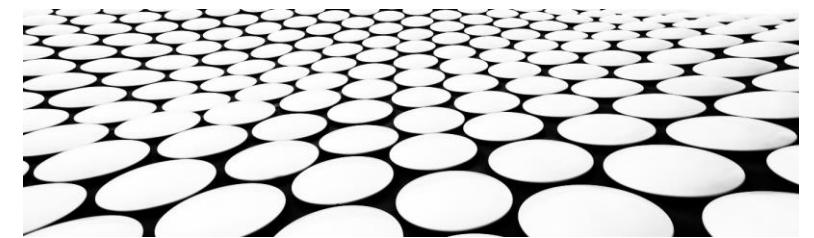
**Printers, Scanners & Fax**

- Ink & Toner
- Office Supplies



**Breadcrumbs pattern or menu with sections**

## (4) Example of exploration



**Meals**

- Breakfast
- Brunch
- Lunch
- Dinner

---

**Price**

- Cheap Eats
- Mid-range
- Fine Dining

---

**Location**

Neighbourhoods:

- Byward Market Area
- Hintonburg
- Kanata

More ▾

---

**Establishment Type**

- Restaurants
- Quick Bites
- Dessert

More ▾

---

**Cuisines & Dishes**

- Asian
- Pizza
- American

More ▾

---

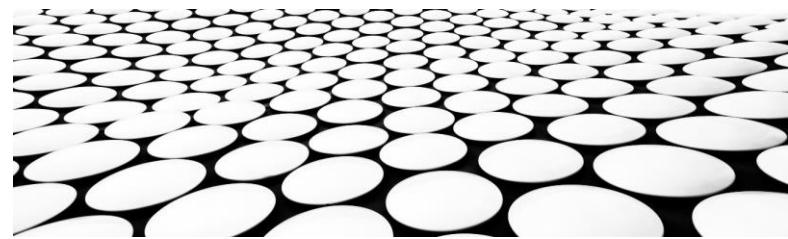
**Dietary Restrictions**

- Vegetarian Friendly
- Gluten Free Options
- Vegan Options
- Halal



Faceted Search

#### (4) Example of exploration



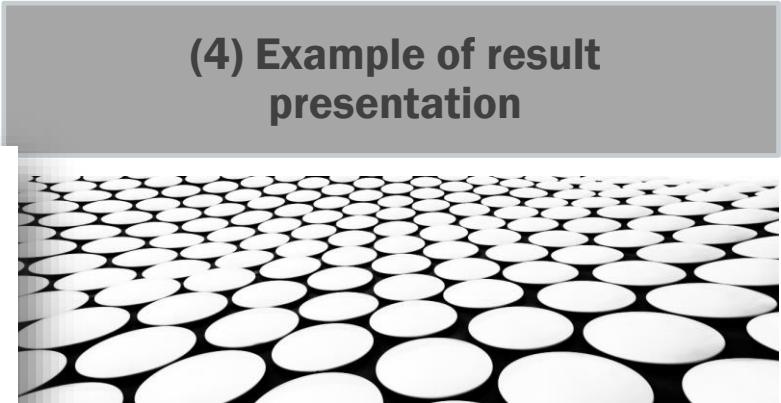
**Sort by** Relevance ^

Relevance

- Price (Low to High)
- Price (High to Low)
- A-Z (alphabetical)
- Newest to Oldest Products

			
Astro, Original Balkan Balkan Style Yogurt	Activia, Yogurt With Probiotics, Vanilla	IOGO, Nano Drinkable Yogurt, Strawberry	Liberte, Greek Plain 0% MF Yogurt, High in
<b>\$4.99 ea</b> \$0.67 / 100g	<b>MULTI</b> Ends 06/07 <b>\$3.50 MIN 2</b> <b>\$4.49 ea</b> \$0.69 / 100g	<b>\$4.99 ea</b> \$0.89 / 100ml	<b>\$6.49 ea</b> \$0.87 / 100g
<b>ADD</b>	<b>ADD</b>	<b>ADD</b>	<b>ADD</b>
			
Activia, Yogurt With Probiotics, Vanilla	Oikos, Greek Yogurt, Key Lime Flavour, 2%	Oikos, Greek Yogurt, Vanilla Flavour, 2% M.F.,	Activia, Probiotic Yogurt, Strawberry/Blueberry
<b>SALE</b> Ends 06/07 <b>SAVE \$0.70</b> <del>\$5.69</del> \$4.99	<b>MULTI</b> <b>\$4.00 MIN 3</b> <b>\$4.79 ea</b>	<b>MULTI</b> <b>\$4.00 MIN 3</b> <b>\$4.79 ea</b>	<b>\$6.29 ea</b>

## (4) Example of result presentation



**Product (A-Z)**

Relevance

Product (A-Z)

Product (Z-A)

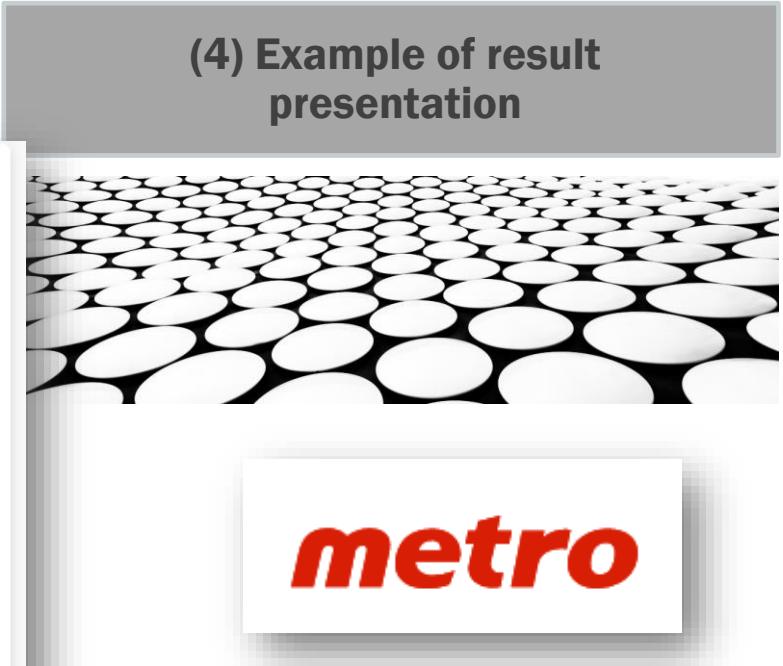
Price (low to high)

Price (high to low)

Popularity

<b>LIBERTÉ</b> 0% Banana Flavoured Yogurt, Greek 750 g <a href="#">Other varieties</a>	<b>iÖGO</b> 0% Berries Flavoured Yogurt Variety Pack 16x100 g <a href="#">Other varieties</a>	<b>OIKOS</b> 0% Cherry Flavoured Greek Yogurt 4x100 g <a href="#">Other varieties</a>	<b>YOPLAIT</b> 0% Cherry Flavoured Yogurt Without Added Sugar, Source 630 g <a href="#">Other varieties</a>	<b>OIKOS</b> Sponsored 0% Plain Greek Yogurt, High Protein 650 g <a href="#">5 AIR MILES® Bonus Miles when buying 2</a>
\$7.59 ea. \$1.01 /100g	\$7.49 ea. \$0.47 /100g \$6.49 ea. Valid until Jun 7, 2023	\$4.49 ea. \$1.12 /100g \$5.29 ea. Valid until Jun 7, 2023	\$6.49 ea. \$0.52 /100g \$4.99 ea. Valid until Jun 7, 2023	\$6.49 ea. \$1.00 /100g \$7.99 ea. Valid until Jun 7, 2023
<b>iÖGO</b> 0% Citrus Flavoured Yogurt Variety Pack 16x100 g <a href="#">Other varieties</a>	<b>OIKOS</b> 0% Coconut Flavoured Greek Yogurt 4x100 g <a href="#">Other varieties</a>	<b>RIVIERA</b> 0% Lactose Free Plain Greek Yogurt 750 g <a href="#">Other varieties</a>	<b>LIBERTÉ</b> 0% Lactose Free Vanilla Greek Yogurt 750 g <a href="#">Other varieties</a>	<b>OIKOS</b> Sponsored 11% Plain Yogurt 750 g <a href="#">5 AIR MILES® Bonus Miles when buying 2</a>
\$7.49 ea. \$0.47 /100g	\$4.49 ea. \$1.12 /100g	\$5.99 ea. \$0.80 /100g	\$7.59 ea. \$1.01 /100g	\$6.49 ea. \$0.87 /100g

## (4) Example of result presentation

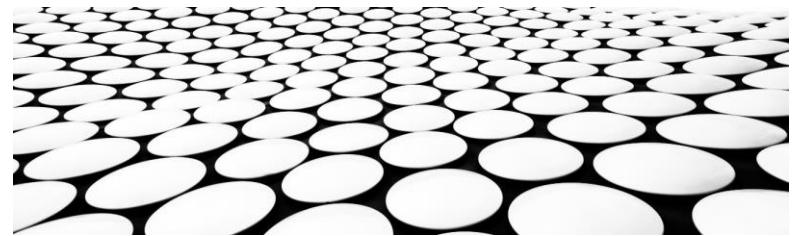


Sort within: Alphabetical order (A-Z) ▾

« < 1 > »

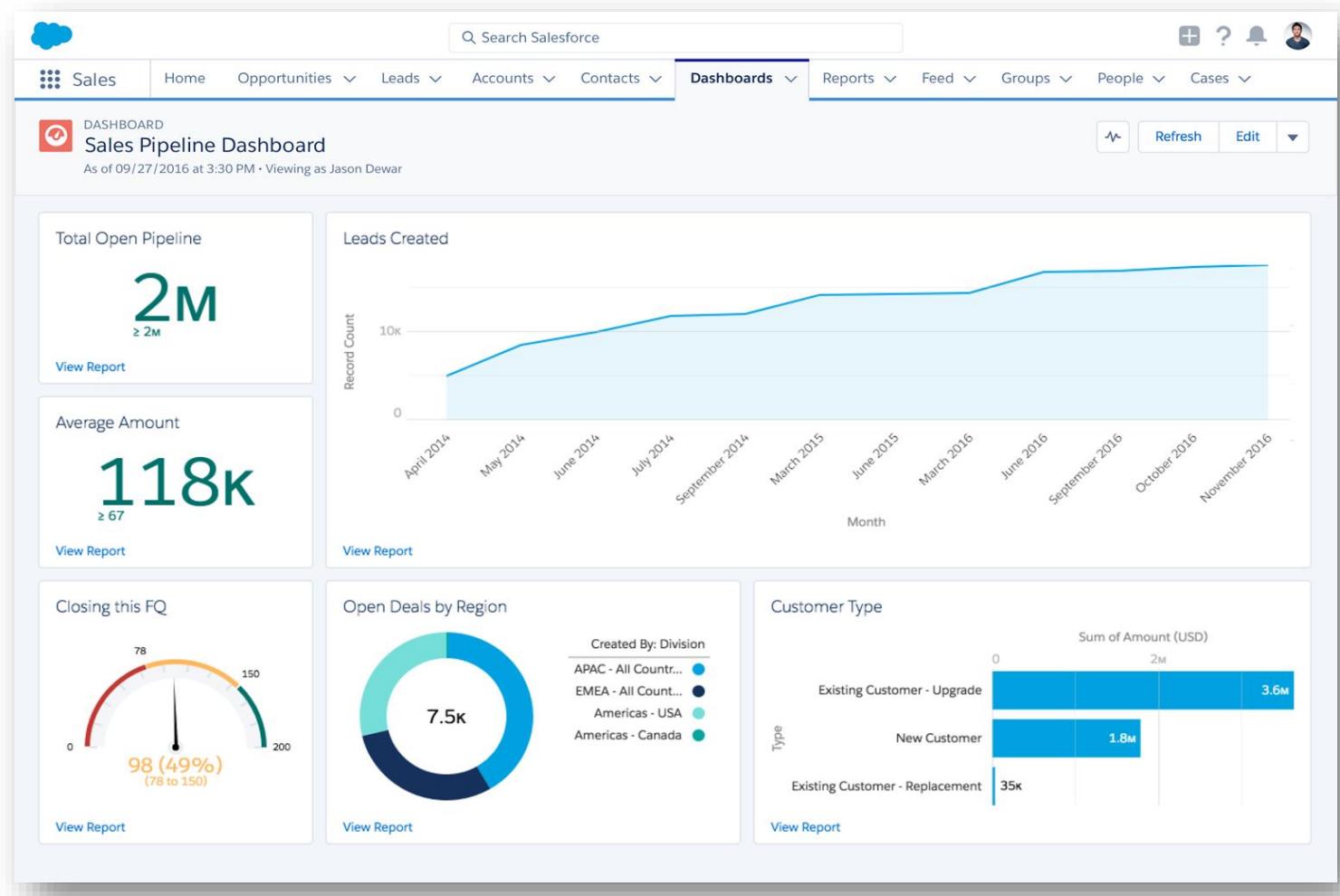
			
Astro Fruit Bottom Multipack Yogurt 12 x 100 g	Astro 2% Plain Yogurt 750 g	Astro Banana Cream 6% Yogurt Original 650 g	Astro Fruit Bottom Multipack Yogurt 12 x 100 g
<b>\$5.49</b>	<b>\$4.49</b>	<b>\$4.49</b>	<b>\$5.49</b>
0.729 \$0.46 / 100 G	0.60 \$0.60 / 100 G	0.69 \$0.69 / 100 G	0.729 \$0.46 / 100 G
<b>ADD TO CART</b>	<b>ADD TO CART</b>	<b>ADD TO CART</b>	<b>ADD TO CART</b>
<b>ADD TO LIST</b>	<b>ADD TO LIST</b>	<b>ADD TO LIST</b>	<b>ADD TO LIST</b>

## (4) Example of result presentation

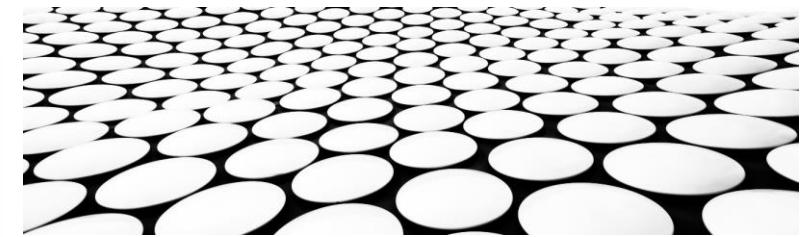


Incorrect results

- Data visualization / analysis



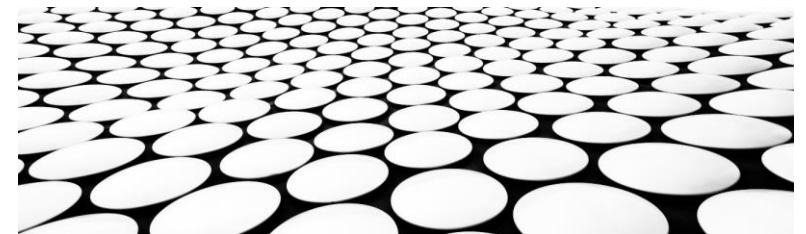
## (5) Analyse results



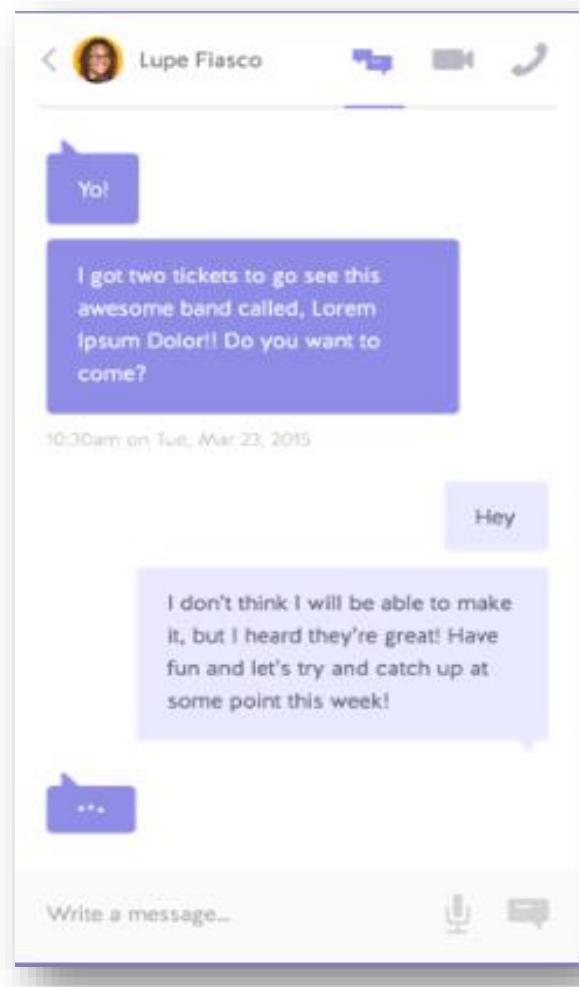
- Coding (programming)
- Drawing a picture
- Writing a report
- Composing music

The screenshot shows a digital music composition interface. At the top, there are input fields for Title (Auld Lang Syne), Artist (myself), Tempo (60), Meter (4/4), Root (C), and Genre (Blues). Below these are checkboxes for preview, melody (checked), accompaniment (checked), and selection only. The main area displays two staves of musical notation. The top staff features a green decorative element on the left. The bottom staff includes a red vertical line with a sunburst graphic. The notation consists of various colored note shapes (green, blue, red) and rests. A piano-roll style timeline at the bottom shows a sequence of notes corresponding to the staves above. The interface also includes a toolbar with various musical symbols and a keyboard diagram at the bottom.

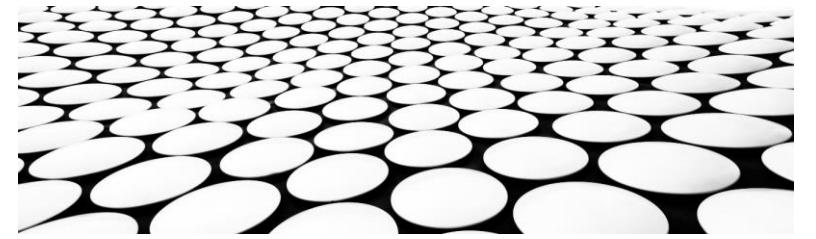
## (6) Design



- Express an opinion
- Obtain feedback
- Chat (dialog)



## (7) Communicate



- Planning a meeting
- Planning a set of tasks

Staffjoy Logo

EMPLOYEES

SCHEDULER

SHIFT TRADES

HISTORY

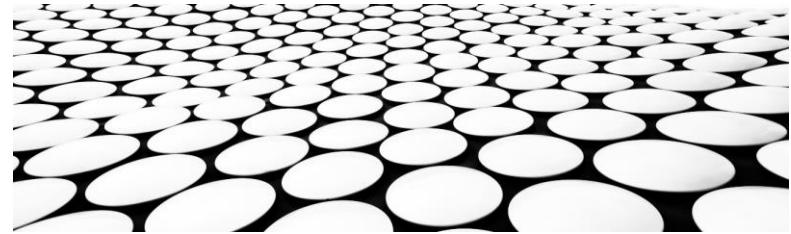
NAVIGATION 1

Week of Aug 15, 2016      BY EMPLOYEE/ROLE/TIME      DAY/WEEK/MONTH      SORT BY TIME/A-Z      PUBLISH/UNPUBLISH

Timezone: PDT -07

	MON, Aug 15	TUE, Aug 16	WED, Aug 17	THU, Aug 18	FRI, Aug 19	SAT, Aug 20	SUN, Aug 21
Unassigned Shifts							
 <b>Tommy Koo</b>	9A - 5P 8 hours Designer						
 <b>Tommy Koo</b>	9A - 5P 8 hours Designer						
 <b>Tommy Koo</b>	9A - 5P 8 hours Designer						
 <b>Tommy Koo</b>	9A - 5P 8 hours Designer						
 <b>Tommy Koo</b>	9A - 5P 8 hours Designer						
 <b>Tommy Koo</b>	9A - 5P 8 hours Designer	9:00 AM 5:00 PM 8 Hours total					
 <b>Tommy Koo</b>	9A - 5P 8 hours Designer						

## (8) Plan / Organize





## SUMMARY

- Presentation of 8 interactive processes
  1. Follow instructions
  2. Absorb information
  3. Perform a monitored activity
  4. Explore in the divergent/convergent model
  5. Analyze results
  6. Design
  7. Communicate
  8. Plan / organize





## HUMAN COGNITION AND ITS IMPACT ON UI DESIGN

- Introduction
- Memory (short term / long term)
- System Image (organisation)
- System Image (different personas)
- Reasoning processes

- Attention
- Perception
- Language
- Learning

Week 6

Order is different  
from videos

Week 7