Data, Information & knowledge

SARCAR Sayan
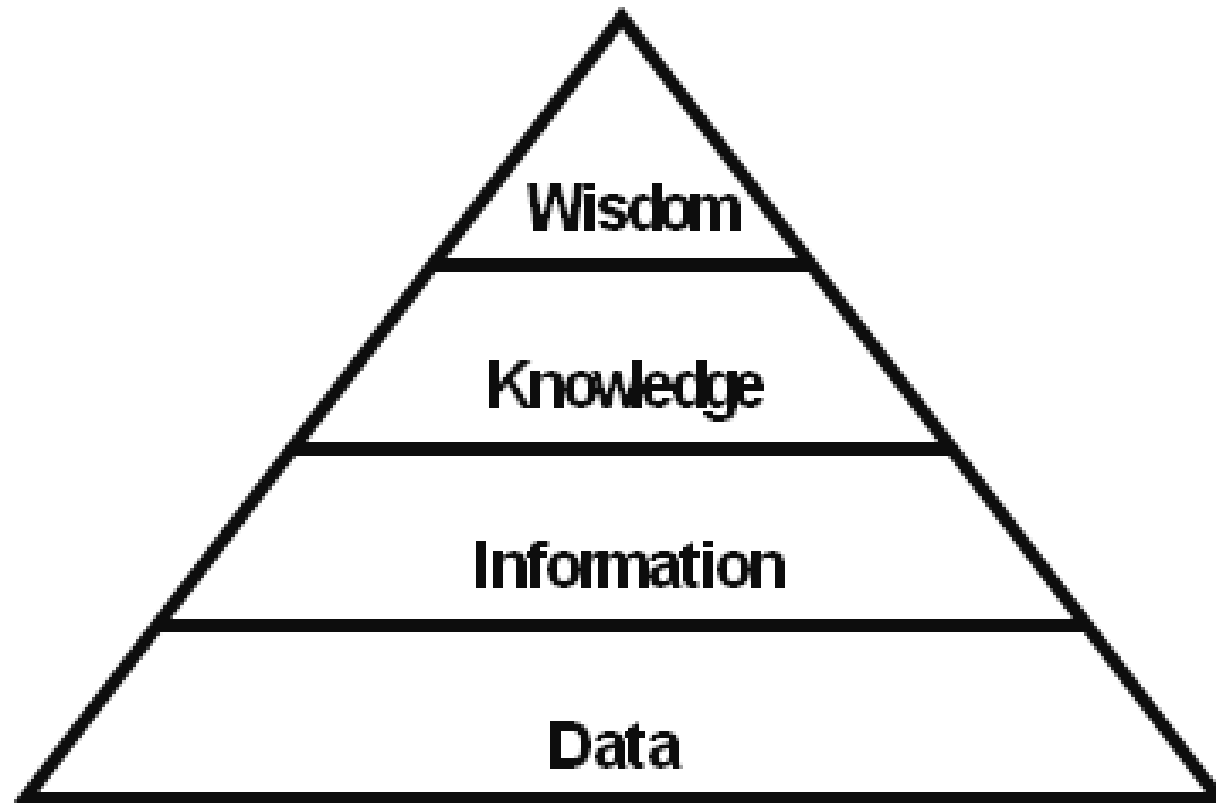
Faculty of Library, Information, and Media Science

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Contents

- Definitions of Data, Information and Knowledge

- How they are related

- Examples

- Questions for discussions

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DIKW Pyramid

Data

Wikipedia article talks of Data as:

- "…discrete, objective facts or observations, which are unorganized and unprocessed and therefore have no meaning or value because of lack of context and interpretation."

- "Sensory stimuli which we perceive through our senses, or including, sense or sensory readings of light, sound, smell, taste, and touch. "

- "recorded (captured or stored) symbols", including "words (text and/or verbal), numbers, diagrams, and images (still &/or video), which are the building blocks of communication"

Information

- Wikipedia article talks of information as:

   "organized or structured data, which has been processed
    in such a way that the information now has relevance for a
    specific purpose or context, and is therefore meaningful,
    valuable, useful and relevant."

- "data that changes us"

- "the sum total of all the facts and ideas that are available to
  be known by somebody at a given moment in time"

Knowledge

- Wikipedia article talks of knowledge as:

  Knowledge is a fluid mix of framed experience, values, contextual information, expert insight and grounded intuition that provides an environment and framework for evaluating and incorporating new experiences and information. It originates and is applied in the minds of knowers. In organizations it often becomes embedded not only in documents and repositories but also in organizational routines, processes, practices and norms.

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Data, Information, Knowledge

Data – facts and statistics collected for reference or analysis.

Information – Facts provided or learned about something or someone.

Knowledge – Facts, information, and skills acquired by a person through experience or education.

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Data vs. information

What is data?

- Data can be defined in many ways. Information science defines data as unprocessed information.

What is information?

- Information is data that have been organized and communicated in a coherent and meaningful manner.
- Data is converted into information, and information is converted into knowledge.
- Knowledge; information evaluated and organized so that it can be used purposefully.

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Why do we study information?

Human Information Interaction

People interact with information routinely

    - Seekers

    - Targeted audience

    - "Innocent bystanders"

    - Prospectors

Interactions are influenced by situational variables

Information as a personal construct

The Science of Information

- What is information?
  - It's a thing
  - It's a process
  - It's knowledge

Information as *Thing*

- Something that is evidence that:
  - we can study
  - has meaning
  - can pass from one person to another

- Tangible physical objects, items, and data are examples.

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Information as *Thing*

- Information appears to us in a material form … and can be described in a language of physical things. As material objects, [information] can then be collected, organized, and retrieved for use.

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Information as *Process*

- Information involves learning – it is the act of informing; as you learn, you change

- Information as a verb – the transfer of information; communication

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Information as *Knowledge*

- When information is internalized, it becomes part of you

- Intangible ideas such as theories, models and frameworks are examples

680	15	34	72
679	2	43	39
1359	17	77	111
68%	68%	118%	37%
54%	54%	94%	30%

BURGERVILLE

Better taste comes from better food.

NUTRICATE (nu-tri-kAt) v. To nutritionally educate.
receipt

Qty	Item	Price	Calories	Fiber(g)	Fat(g)	Carbs(g)
1	Spicy Anasazi Burger	$5.29	680	15	34	72
1	Pepper Bacon Burger	$4.69	679	2	43	39
	NUTRITION TOTALS		1359	17	77	111
	% DAILY VALUE - 2000 CALORIES		68%	68%	118%	37%
	% DAILY VALUE - 2500 CALORIES		54%	54%	94%	30%

Sub Total $9.98
TOTAL $9.98
VISA
PAID

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What are these?

π

#000000

Circumference

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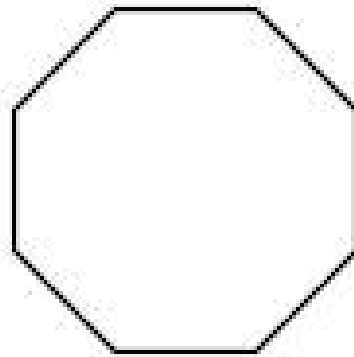
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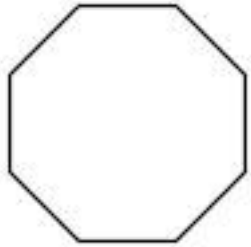
Is this Data or Information or both?

How about now?
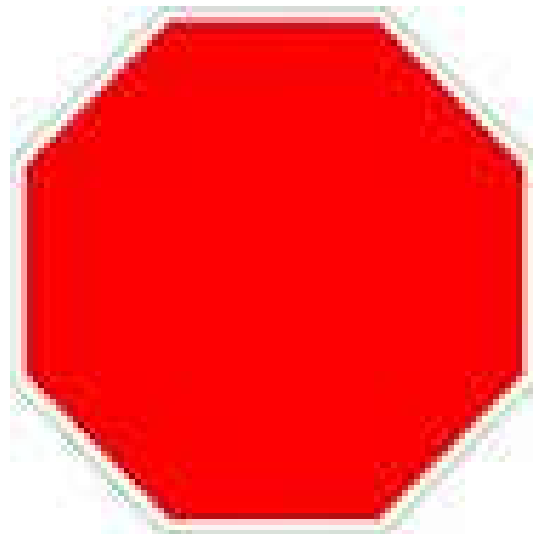
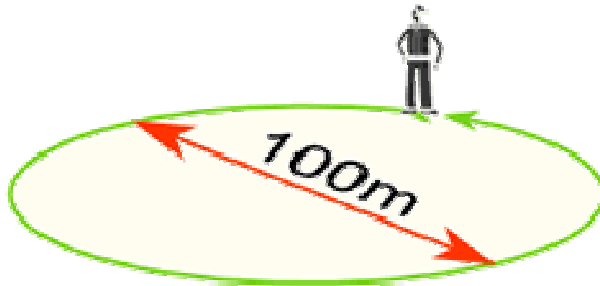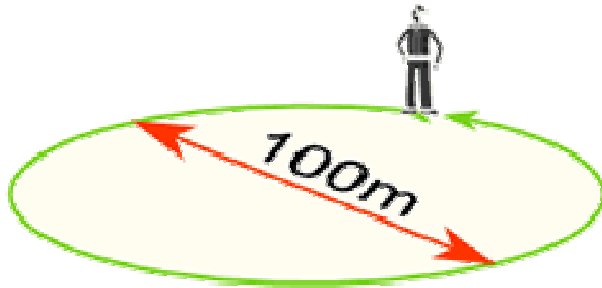# Do we have knowledge? If so, what knowledge?

π

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π

Example: You walk around a circle which has a diameter of 100m, how far have you walked?

Distance walked = Circumference = π × diameter

100m

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π

Distance walked = Circumference = π × 100m = 314.159...m = 314m (to the nearest m)

100m

Information Interaction Caveats

- We interact with information constantly
- Our interactions are related to our past experiences, our current situation, and our goals (among other things)
- We do not have the same reactions to the same piece of information
- We do not notice the same things
- Designing interaction is a complex problem

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Exercise 1

The Many Ages of Information

Stone Age   Agricultural Age
Industrial Age   Information Age

Compare the following considerations for each age:

1. What were the means of communication during this time?
2. What was the speed of the communication? What were the means for "spreading the word"?
3. What was the size of the audience?
4. How much information was transmitted in any one communication? (How big was the file?)
5. What was the purpose of transmitting the information?
6. How important was the need for an accurate and reliable answer?

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Questions to ponder

- Define Data, Information and Knowledge (do not repeat your fellow students' ideas)

- Explain the difference between data and information.

- Describe how data becomes knowledge.

- 5, 10, 15, 20 are items of data. Explain how these could become information and what knowledge could be gained from them.

- What is your project/research area? What are the entities you deal with in your research? Explain with example.

Class questions/Home assignment

Data: The number 40 000 is a piece of data, as is the name Iqbal Ahmed. Without anything else to help us, these two items of data are meaningless.

Information: If we now say that 'Iqbal Ahmed is a teacher' and '$40 000 is a teacher's salary', the data is given meaning or context, and makes more sense to us.

Knowledge: builds on the information. Knowledge is 'Iqbal Ahmed is a teacher and he earns $40 000 per year'.

Please prepare your own example for Data, Information and Knowledge

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Q & A

Please write any feedback regarding class to
sayans@slis.tsukuba.ac.jp
Sub: Informatics class feedback

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