LIS 571 Guide to Lecture 2.1 The nature of knowledge

You should be able to get this content just by reading. There is no audio recording for this lecture.

Notes

The general concepts are illustrated with examples from various subject domains. A certain amount of general education is assumed. If you do not know about Kepler's laws of planetary motion (in general, no need to know the actual formulas) or the gravitational constant, look it up on Google. After all, you are studying to be information specialists who should follow the motto "if you do not know it, look it up".

This guide is long because it supplements the lecture notes by many examples that I would talk about in a seated class. The guide could be integrated with the lecture notes to make one chapter of a book, but I did not have time to do that.

The questions are often rhetorical in that the answer is obvious and does not need to be given. Nevertheless, they encourage you to think.

1 Types of knowledge

Think about why we talk about different types of knowledge. How can understanding types of knowledge help you

- design databases?
- answer a reference question?

Think about this for all the different types of knowledge discussed

1.1

In principle, definitions are not true or false, right or wrong; they may be useful or not useful. Information about the use of a word or phrase or other sign or symbol in a given community and context can be true or false.

Assertions (statements about the real world or an imaginary world), on the other hand, can be true or false.

Information about static relationships is easier to organize and to find than information about events or actions:

To find the area of Nigeria, just look in the World Almanac or a similar source.
Where would you find information about the religious strife in Nigeria over the past 10 years?
How likely is it that you could all information needed in one place?
1.2.1

You should be able to get a sense of the distinction between Regularity and Individual detail from the examples.

Note: Science is all about deriving regularities (scientific laws) that can be used to "recreate" individual detail by deduction. For example, Kepler's laws of planetary motion can be used to compute the position of a planet at any given time from the position of the planet at one time and two parameters that characterize the orbit of the planet around the sun. From three data values we can compute with the aid of Kepler's law thousands of observations about the position of the planet made by astronomers and reported in huge books (for example by the astronomer Tycho Brahe (1546 – 1601), an enormous savings of storage space. More importantly we can compute the position of the planet at any time, past or future.

Examples of deductive reasoning:
- A physician interpreting the patient's symptoms diagnoses the disease Asthma (as opposed to some other disease that causes difficulty in breathing, then consults a textbook to find that Asthma can be treated with Theophylline and deduces that the patient should take Theophylline.
- A judge determines that the facts of a case meet the definition of burglary without aggravating circumstances given in the law, finds that the law specifies a punishment of three years in prison and deduces that the accused should be so sentenced.

Examples of case-based reasoning:
- A physician remembers that a patient she encountered five years ago had a similar combination of symptoms as the patient before her responded well to a lactose-free diet and suggests a lactose-free diet to the patient before her.
- A merchant brings a case against members of a flash mob that impeded business and caused a loss of $10,000. The judge cannot find a specific law but finds a similar case decided by another court that ruled that the flash map participants exercised their right to free expression and cannot be forced to make up the merchant's loss. So the judge issues the same ruling.
- Weather forecasters look through large amounts of weather data to find a configuration (temperature in different places and altitudes, wind strength and direction in different places, precipitation, etc.) to the configuration that exists now and predict the weather based on what happened in a similar situation in the past.

Questions:
Which kind of reasoning requires more data, deductive reasoning or case-based reasoning?

What kind of retrieval is needed for case-based reasoning?
1.2.2

From the standpoint of science, which is more important to measure precisely, the electrical conductivity of copper or the gravitational constant?

A business traveler needs to know whether a social rule, custom, or etiquette rule that applies world-wide or only in his own country. Otherwise he may offend potential business partners in a foreign country and loose a deal.

Another example of **Domain-specific knowledge** vs. **Common sense knowledge**

LIS program objectives make the following distinction:

2 **Graduates have the domain knowledge and skills required to carry out information functions.**
   Including information needs assessment, collection management, knowledge organization, information technology, user services, and pedagogy and information literacy instruction.

3 **Graduates have general knowledge and skills needed across professions.**
   Skills in management, communication and collaboration, research, and critical thinking.

What you learn in LIS 571 is applicable primarily in your future jobs as information specialists; it is domain-specific.

What you learn in LIS 581 Management of Libraries & Info Agencies you can use to manage a library, a museum, or a restaurant; it is common-sense knowledge. What you learn in a course on research methods you can use for research in many domains.

1.3

You should be able to figure out for each subtype how important it is

Examples

When giving a user data on measurements of natural or social phenomena, you must give an error range unless the user needs just a general ball park figure. In the literature values are often given with more precision than is warranted by the method by which the values are obtained (such as giving a poll number such as "approval rating 51.5%" when the margin of error of the poll is ±5%). As an information professional you must spot such cases (that border at the fraudulent) to protect the unsuspecting user.

For making decisions about economic matters (for a company or whether to refinance your mortgage) it is very important to know the **certainty** of a piece of data, especially of economic forecasts. As a reference librarian you must give the user such metadata (data about data) describing the certainty with which the data in your answer hold.
Do give data with exactly the precision the user needs, neither more nor less. This is a special case of Grice's Maxim of Quantity (see below)

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<th>Grice's Conversational Maxims</th>
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**Maxim of Quality:** Truth
- Do not say what you believe to be false.
- Do not say that for which you lack adequate evidence.

**Maxim of Quantity:** Information
- Make your contribution as informative as is required for the current purposes of the exchange.
- Do not make your contribution more informative than is required.

**Maxim of Relation:** Relevance
- Be relevant.

**Maxim of Manner:** Clarity
- Avoid obscurity of expression. ("Eschew obfuscation")
- Avoid ambiguity.
- Be brief ("avoid unnecessary prolixity").
- Be orderly.
1.4.2

On possibility statements

A famous quote from Robert F. Kennedy (used in different variations in many of his speeches)

“There are those that look at things the way they are, and ask why? I dream of things that never were, and ask why not?”
— Robert F. Kennedy, Robert Kennedy in His Own Words: The Unpublished Recollections of the Kennedy Years  www.goodreads.com/work/quotes/332487

A paraphrase of a quote from George Bernhard Shaw

“You see things; and you say ‘Why?’ But I dream things that never were; and I say ‘Why not?’”
From the play Back to Methuselah (1921) said by The Serpent to Eve in the Garden of Eden www.quotecounterquote.com/2011/07/i-dream-things-that-never-were-and-say.html

(I may have violated Grice's maxim of quantity in giving so much information about the quote.)