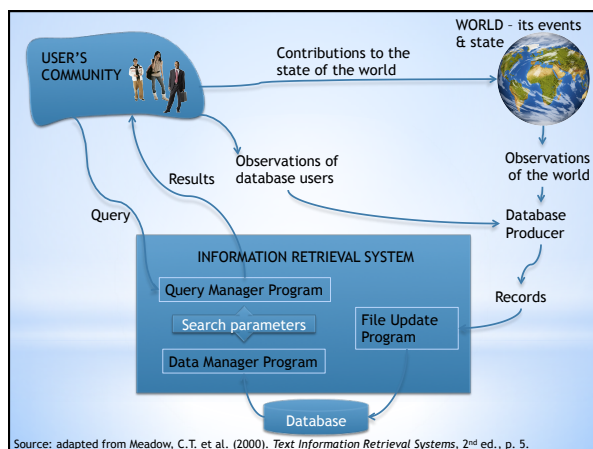
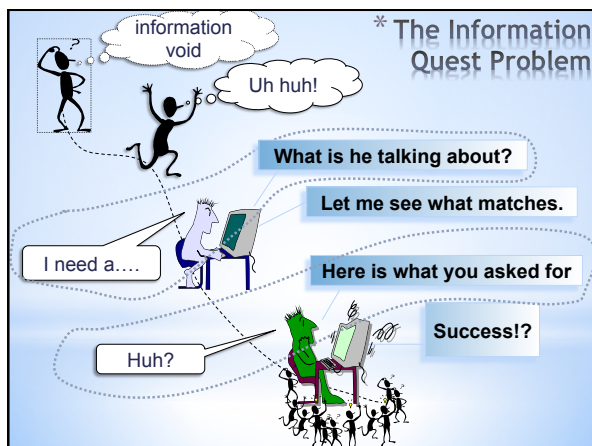


* User-oriented Information Retrieval

Elaine Toms
Information School
University of Sheffield
e.toms@sheffield.ac.uk

PROMISE Winter School, Zinal Switzerland, January 23-27, 2012



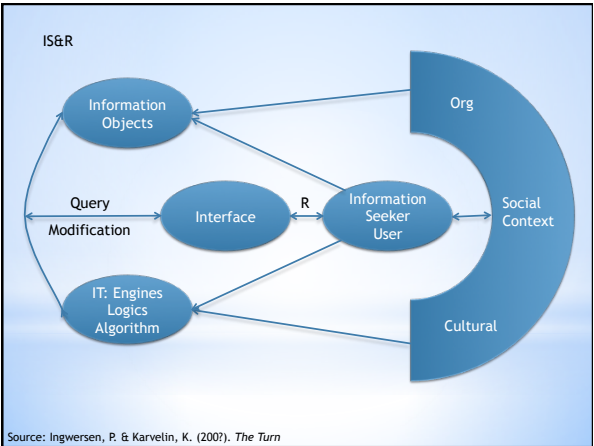
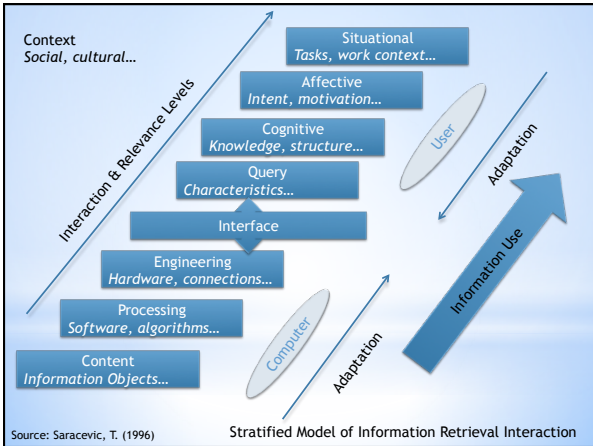
- * Models, models and more @#\$%^&* models; how do we explain where information comes from, and how is it re-exploited
- * Information retrieval - *in context*
- * "Messy" users, and what do we need to know about them
- * Equally muddled task, situation and information use environment
- * The Interface: connecting IR with the user and task environment

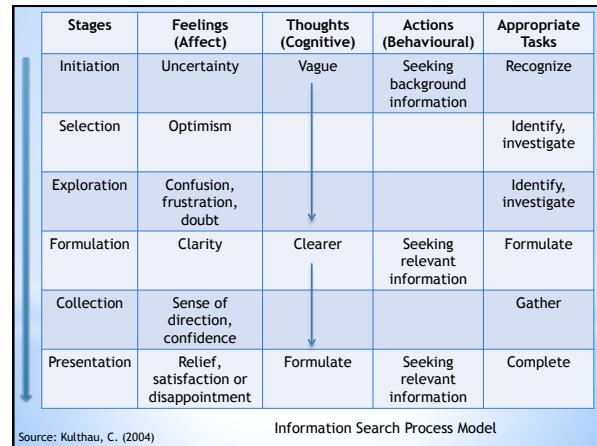
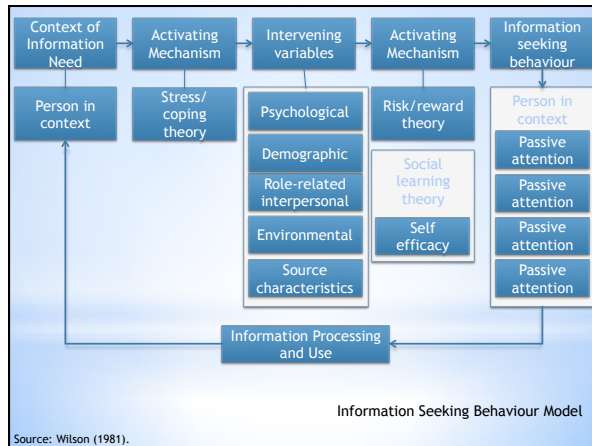
* Outline

*Information Models

- * Bates (1981)
- * Belkin et al (1978, 1982a,b)
- * Belkin et al (1993, 1995a)
- * Bystrom & Jarvelin (1995)
- * Guthrie
- * Henry et al (1980)
- * Ingwersen & Wormell (1989)
- * Ingwersen & Jarvelin
- * Johnson (1997)
- * Krikelas (1983)
- * Kuhltau (1991, 1993a)
- * Leckie et al. (1996)
- * Saracevic (1996)
- * Spink, Greisdorf & Bateman (1998)
- * Taylor (1968)
- * Wang & Soergel (1998)
- * Vakkari (2001a,b)
- * Wilson 1981, 1994, 1997, 1999a,

* Model Mania





Sense-making (Dervin): theoretical and methodological approach to information seeking:



Information need is difficult to express because it represents a lack of information

Anomalous State of Knowledge (ASK) (Belkin)

Information is user and task situated – has no value apart from user.

* Information Need

- * Describe the information use environment
- * Serve to scope out the research space
- * Not prescriptive or predictive
- * Position IR within the real world context
- * Some based on empirical data; some purely a theoretical perspective waiting to be tested

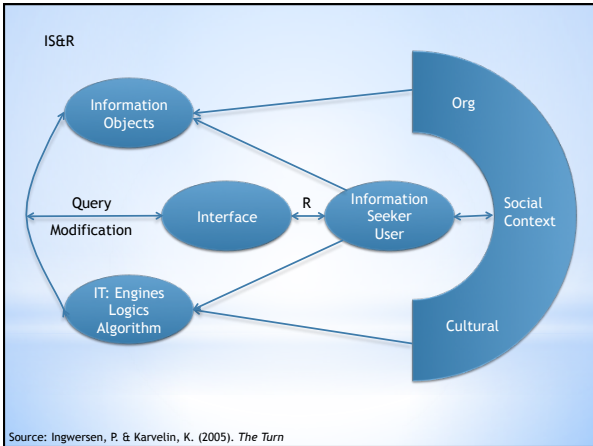
* Summary: what have these models achieved?

*Information Retrieval in Context

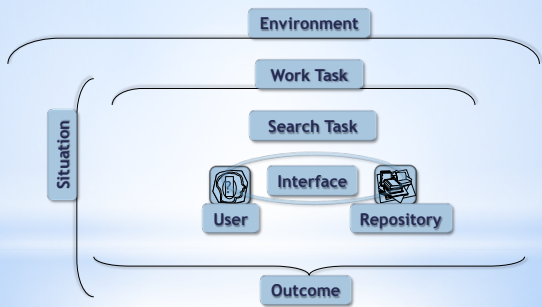
*There is no term that is more often used, less often defined, and when defined, defined so variously as **Context**. Context is something you swim in like a fish. You are in it. It is you.”
Dervin

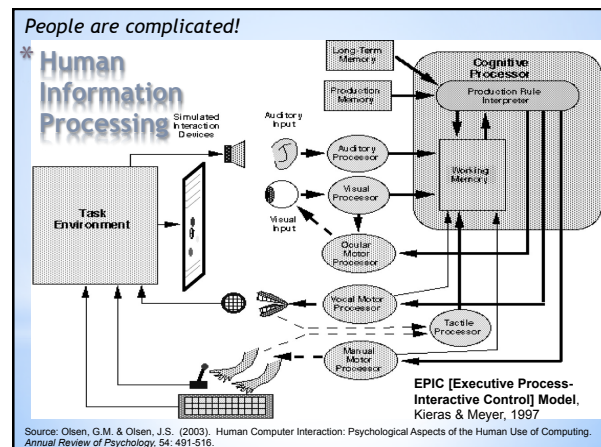
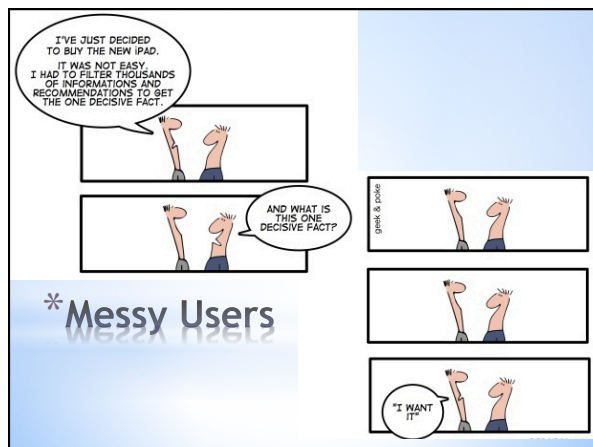
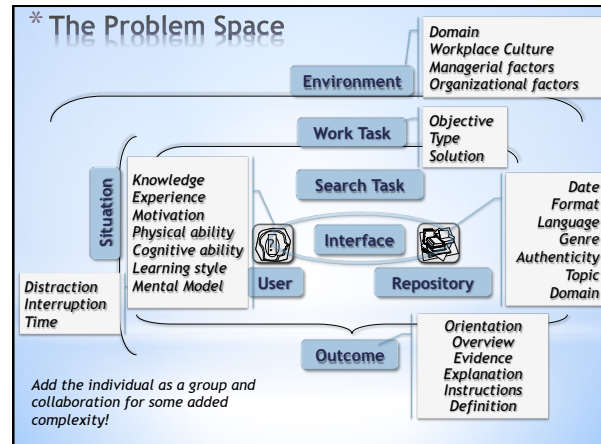
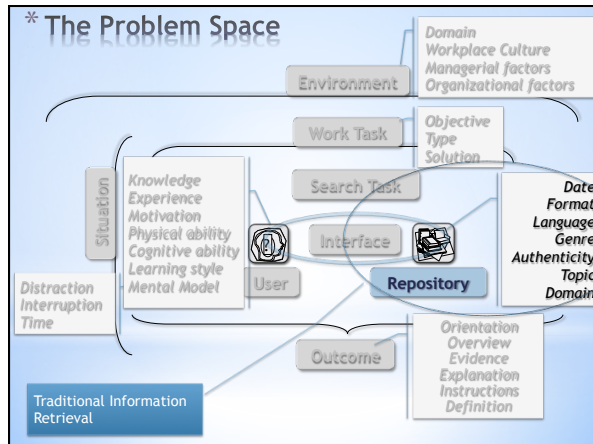
*Context?

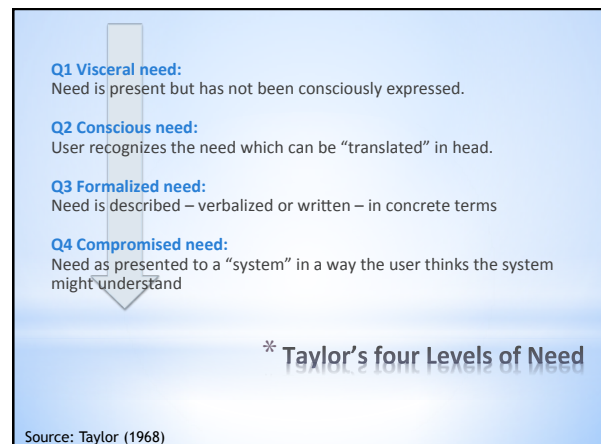
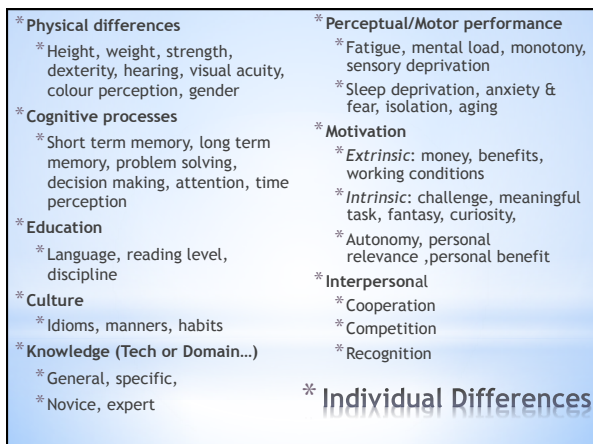
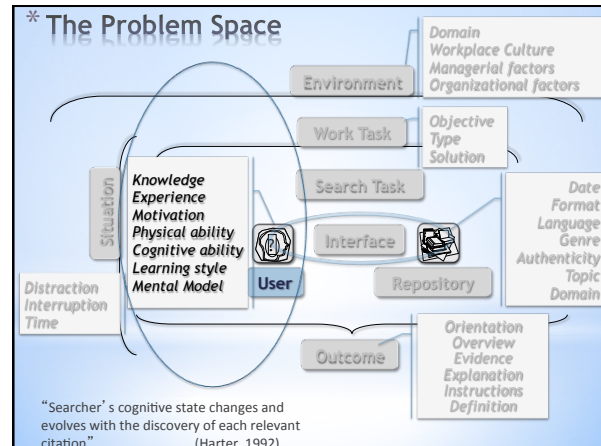
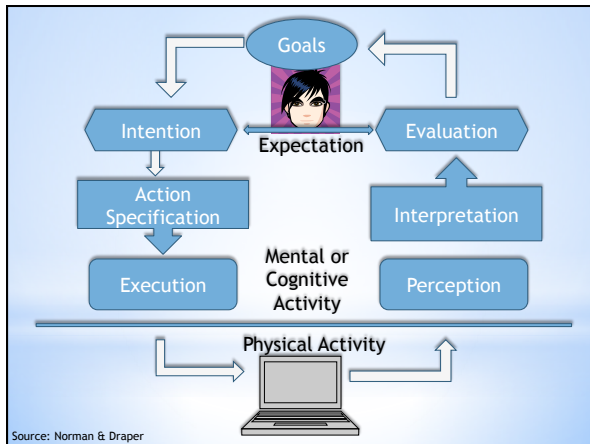
Source: Dervin, B. (1996). p. 13



*The Problem Space







Initial Question	Negotiated Question
Do you have anything on housing? ➡	What are the rights of a tenant in a rental situation?
Where are your books on Canada? ➡	I need a picture of an attacking grizzly bear for a book I am illustrating.
How extensive is your library? ➡	I need a book on wedding etiquette that tells me what to do as a best man.
Does anyone on your staff speak German? ➡	Will the library buy my collection of German books?
Do you have a copy of the Ocala, Florida newspaper? ➡	Does Ocala Florida have a car rental agency that I can contact?

* What People Really Want to Know

Source: Ross, Nilsen & Dewdney, 2002

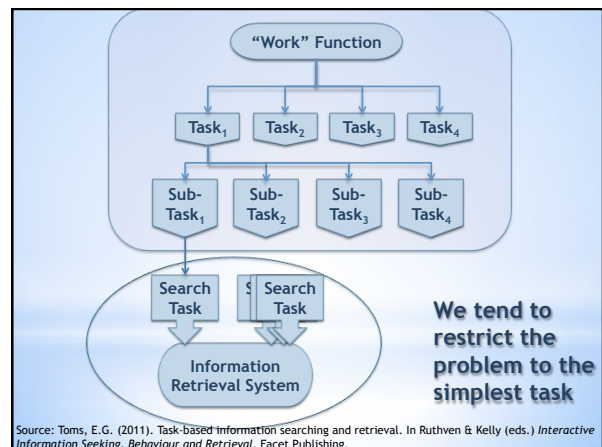
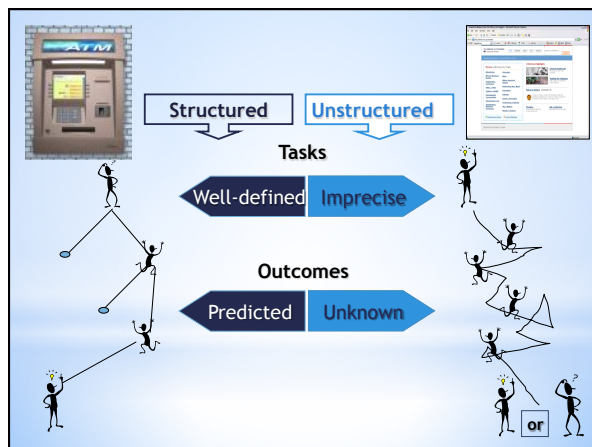
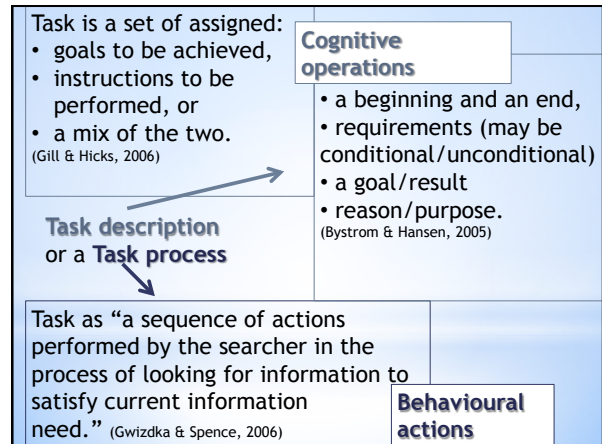
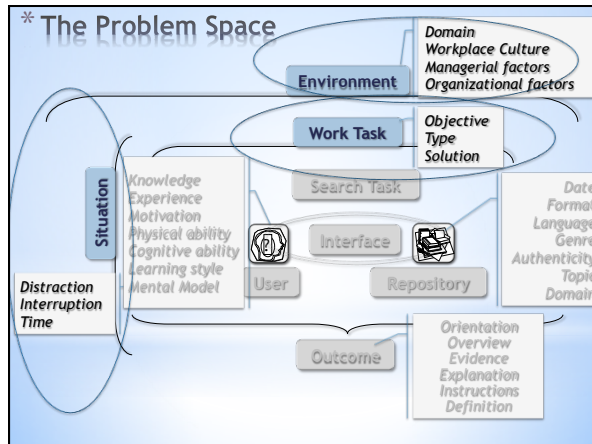
attractions of france	france tourism	paris tourism
caterdral in chartres	France Tourist Info	rental cars in paris
cathedral chartres	french geography	TGV
cathedral Chartres	French Tourist Sites Chartres	tourism france
cathedral in Chartres	French Tourist Sites Versailles	tourist guide paris
Cathedral in Chartres	french transit	tourist guide to the
Cathedral in Chartres	hot to get to Cathedral in	cathedral in chartres
architecture	Chartres	transportation in paris
cathedral in Chartres location	how far is chartres from	travel around paris
Cathedral in Chartres map	paris	travel france
cathedral in chartres paris	map of france	travel paris chartres
Chartres	map of greater paris region	travel to paris
chartres	metro in Paris	travel to versailles from
chartres cathedral	palace in Versailles	paris
Chartres cathedral	palace versailles	travelling france
Chartres Cathedral France	paris	Versailles
chartres distance from paris	Paris	versailles
Chartres France	Paris chartres	versailles architecture
Chartres in France	paris to versailles	Versailles dining
distance france		
distance from paris to	paris tourist sites	Versailles hotels
versailles	rail in France	versailles palace
france	railway chartres	versailles paris
France map	railway versailles	Versailles tourism

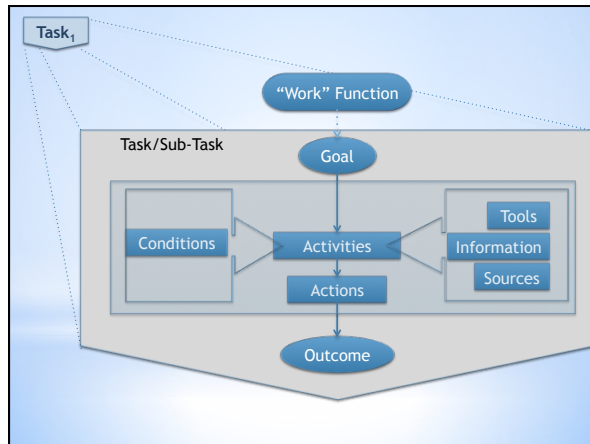
* Articulating their needs

* Still needs more work, but..
* Knowledge of domain
* Knowledge of process
* Experience
* Cognitive Load
* Mental model
* Digital (vs. non digital) natives
* Etc.,
* Challenge: what is the most parsimonious set that influences how one interacts with digital devices?

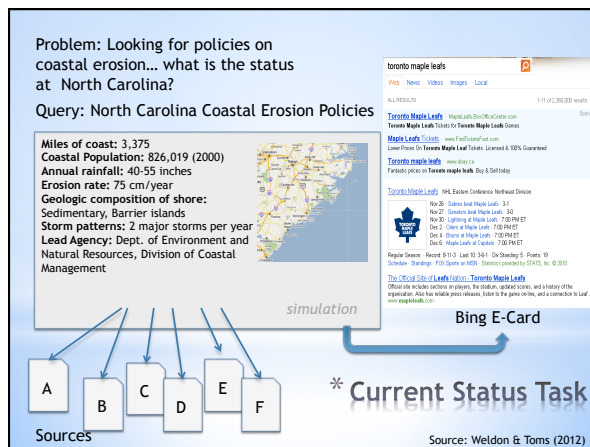
* What does make a "difference"?

* Muddled Task Environment





Name	Definition	Example
Where	Where does [Variable x] occur	<i>Where do human activities occur along the XXX coast?</i>
How to	How to [Variable x]	<i>What is the best practice for X</i>
Scope	What is the scope/mandate/ jurisdiction of [Variable x]	<i>What is the mandate of department of X?</i>
Current status	Current status for a certain area	<i>What is the current status of lobster catch in Mahone Bay?</i>
Condition	Condition before/after a [date, event, threshold]	<i>What changes have occurred since the tidal turbine was installed in the Minas Passage?</i>
Trend	For [Variable x] based on [date range]	<i>What is the water temperature pattern over last 10 years?</i>
Expertise	Expertise in [Variable x]	<i>Who has expertise in oil pollution in the coastal zone?</i>
Stats	Statistics on [Variable x]	<i>What is the temperature of X</i>
Compare	Incidence of [variable x]	<i>Compare the X with Y</i>
Relation	Connect two or more variables	<i>Which species live in brackish coastal zone?</i>



* A "search task" is just one step in the processing of performing a larger "work task" that is part of "work system" that may be impacted by situation.

* Which is more important:

- * Characteristics of the user?
- * Characteristics of the task?
- * Both or some of both?

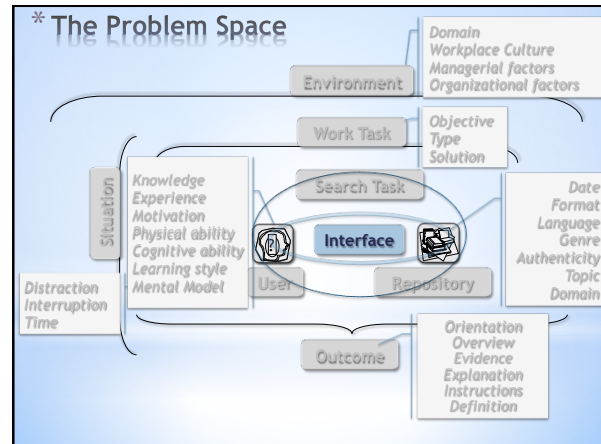
*** Summary: the Task Environment**

FRANK & ERNEST

*** Interaction & Interface**

On the border between content and people

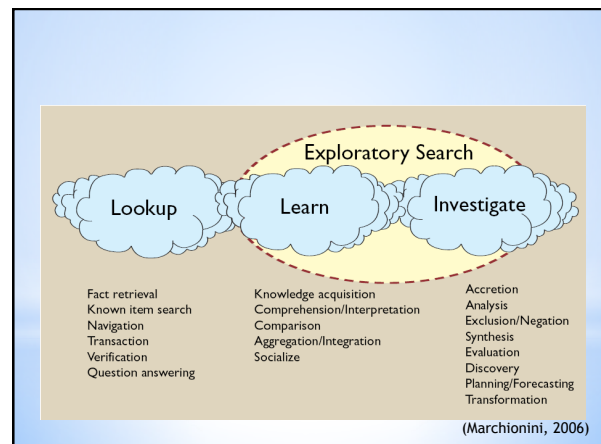
A man should keep his little brain stocked with all the furniture that he is likely to use, and the rest he can put away in the lumber room of his library, where he can get it if he wants it.
Sherlock Holmes



Progress?

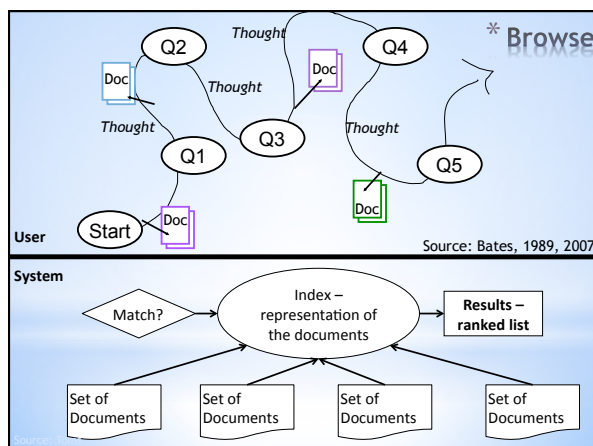
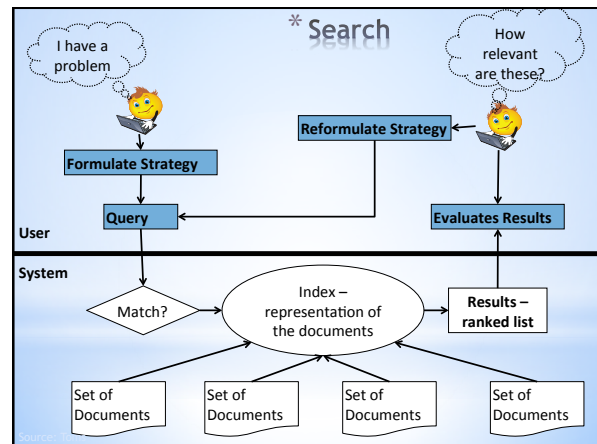
From the ultimate in simplicity to the ultimate in complexity

*** Interface Development**



	Search	Browse	Chance or Serendipity
Goal	Defined	Fuzzy	Undefined or submerged
Mode	By Specifying	By Recognizing	By Recognizing
Method	Query	Navigation Knowledge Discovery Scanning	Trigger Landmark
Evaluation	System match of terms	Human match of concepts	Human match of concepts

* Distinctions



Scanning Modes on the Web

Undirected Viewing *(no specific information need)*

Information Need: General areas of interest; specific need to be revealed

Information Seeking: "Sweeping" -- Scan broadly a diversity of sources, taking advantage of what's easily accessible

Information Use: "Browsing" -- Serendipitous discovery

Conditioned Viewing *(selected topics or certain types of information)*

Information Need: Able to recognize topics of interest

Information Seeking: "Discriminating" -- Browse in pre-selected sources on pre-specified topics of interest

Information Use: "Learning" -- Increase knowledge about topics of interest

CHOO, C., DETLOR, B., TURNBULL, D.. Information seeking on the Web: An integrated model of browsing and searching. First Monday, North America, 5, feb. 2000

Scanning Modes on the Web (continued)

Informal Search (*deepen knowledge and understanding*)

Information Need: Able to formulate simple queries

Information Seeking: "Satisfying" -- Search is focused on area or topic, but a good-enough search is satisfactory

Information Use: "Selecting"-- Increase knowledge on area within narrow boundaries

Formal Search (*obtain specific information or types of information*)

Information Need: Able to specify targets in detail

Information Seeking: "Optimizing" -- Systematic gathering of information about an entity, following some method or procedure

Information Use: "Retrieving" -- Formal use of information for decision-, policy-making

Behavioural modes and moves of information seeking on the web

	Undirected viewing	Conditioned Viewing	Informal search	Formal search
Starting	x			
Chaining	x			
Browsing		x		
Differentiating		x	x	
Monitoring		x	x	x
Extracting			x	x

Mapped the web based modes to behavioural modes of Ellis (1989)

Choo, C., Detlor, B., Turnbull, D. (2000). Information seeking on the Web: An integrated model of browsing and searching. First Monday, North America, 5, Feb. 2000.

"We wish to...ask what the goals and needs of the users are, what tools they need, what kind of tasks they wish to perform, and what methods they would prefer to use. **We would like to start with the users and to work from there**".

From Norman and Draper's *User Centered Systems Design* emerged out of a workshop at the University of California, San Diego in 1984

47

* Input features: which allow the user to express what they are looking for

➡ Search box, QBE, form fillin, faceted metadata, categories;

* Control features: which help users to modify or restrict their input

➡ Corrections, sorting, IQE + assistance, filters, grouping; relevance feedback; "bookbag"

* Informational features: which provide results or information about results

➡ Text snippets, images, thumbnails, shortcuts, techniques for visualizing relevance or content

* Personalisable features: which relate to searchers and previous interactions

Source: Wilson, White

Source: Wilson

* **Framework for SUI**

Source: Wilson, M. (2011). Interfaces for Information Retrieval, and White, R.W. Interactive Techniques. In Ruthven & Kelly. *Interactive Information Seeking, Behaviour & Retrieval*. Facet

What have we done?

		Answer				
	Aboutness	Set 1	Set 2	Set 3	Set 4	Set 5
1.xml	2	x			x	x
2.xml	3					
3.xml	4	x		x		
4.xml	5				x	x
5.xml	2		x			
6.xml	4		x		x	
7.xml	3		x			
8.xml	5					x
9.xml	2					
10.xml	5			x		

User Trail of Doc View: R1..NR..R2...R2...R3...NR...R4...NR...R3...R1

Need to write a term paper

Stages

- ☐ Looking for a topic
- ☐ Looking for background material to understand topic
- ☐ Looking for evidence and original sources
- ☐ Almost finished

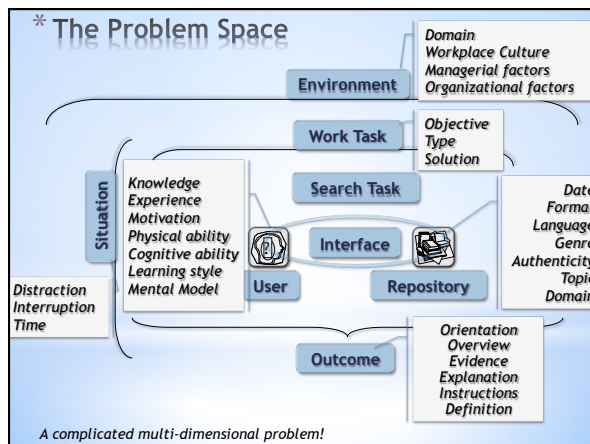
Source: Vakkari

What activities are performed?

What tools are needed to get the work done?

How does/should system output change over the course of the task

* Imagine the student work environment...



* Purpose more than anything else determines the character of a system - the type of information stored, the nature of the requests, the class of customer. Purpose specifies not only why information is needed but to a large extent the form in which it is needed.

Hays, R.M. *The analysis of retrieval systems*.

* What is our goal?



* What we want to achieve?

- * Ingwersen, P. & Järvelin, K. (2005). *The Turn: Integration of Information Seeking and Retrieval in Context*. Springer.
- * Ruthven, I. & Kelly, D. (Eds.) (2010). *Interactive Information Behaviour, Seeking and Retrieval*. Facet.
- * Case, D. O. (2007). *Looking for Information: A Survey of Research on Information Seeking, Needs, and Behavior*. 2nd ed. Academic Press.
- * Dillon, A. (2004). *Designing Usable Electronic Text* (2nd ed.). CRC Press.
- * Hearts, M. *Search User Interfaces*.
- * Choo, C. W. (2006). *The Knowing Organization: How Organizations use Information to Construct Meaning, Create Knowledge and Make Decisions* (2nd ed.) Oxford University Press.

* Recommended Reading

Meetings:

Information Interaction in Context Conferences: IIIX 2012
Human Computer Information Retrieval Workshops: HCIR