

How One Box

Search

Can Mean Different Things to Different People

September 16, 2011



Design for **Context**

Making software applications and web sites easy to use

www.designforcontext.com

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Consider how you get stuff into that 'box'



Where shall we go for dinner?

- You: I want Greek food
Harry: As long as it has pasta too
Jack: Coffee, I need coffee
Eric: That place on the corner of Clark & Kent
Jamie: Let's find a place where we can sit outside

Search

closest gas station

United States Patent 6,174,441

COMPUTER-BASED DRUG-RETRIEVAL SYSTEM

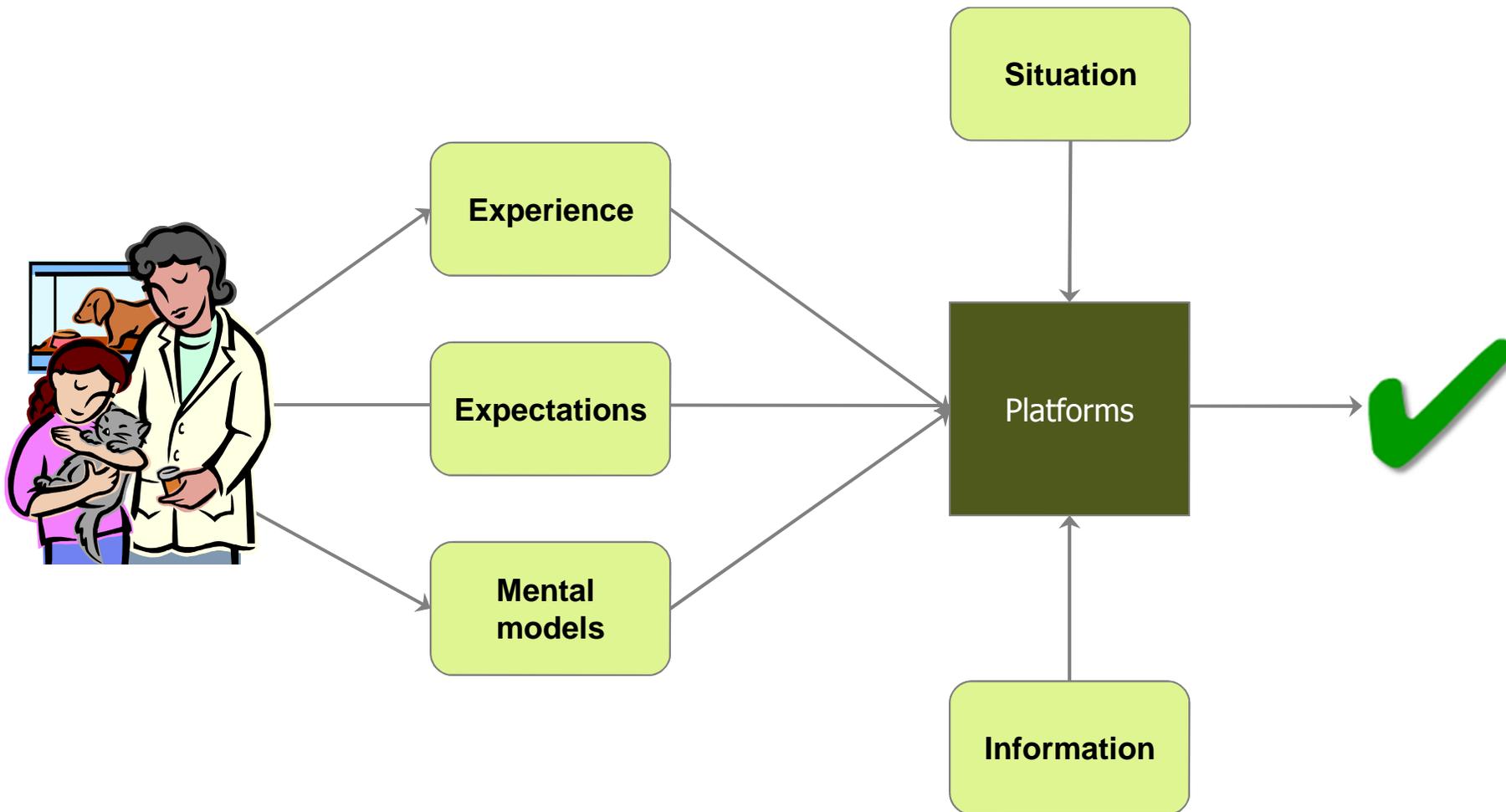
Abstract: A computer-based drug-retrieval system for identifying and retrieving drug information. The system includes a database of drug information and a user interface for searching the database. The system is designed to provide drug information to healthcare providers and patients.

Claims: 1. A computer-based drug-retrieval system comprising: a database of drug information; and a user interface for searching the database.

Drawings: The drawings show a flowchart of the system architecture and a diagram of the user interface.

Find only medications that have been approved for pediatric use

Goals: External to seeking task



When users seek & what designers must transcend

“The deepest form of understanding another person is empathy...[which] involves a shift from...observing how you seem on the outside, to ... imagining what it feels like to be you on the inside”

— attributed to Harvard Negotiation Project, Indi Young, Mental Models

Focus on...

» Needs

» Awareness

» Perception



Novices? Experts in specific domain?
Experts outside of domain?

Ability to articulate search problem

Knowing when to change tactics

Urgency and persistence of seeking

Accuracy and precision

Authority, trust, and credibility

Recognizing success

Not all searching is casual

We ♥ hardcore seekers

medical researchers | scientists | lawyers | intelligence analysts | patent examiners | librarians

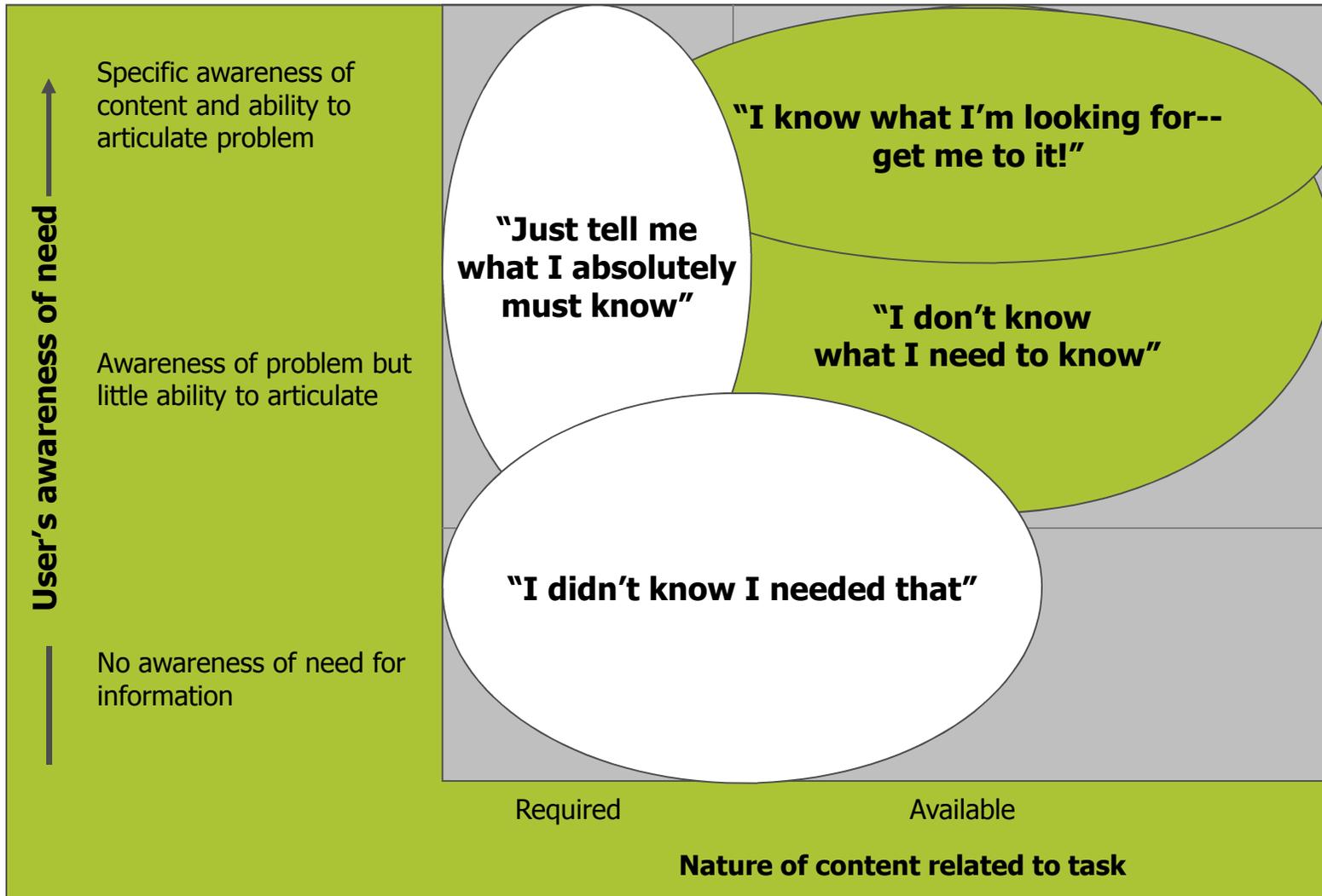
- » Finding what you were seeking doesn't mean you're done
- » Not finding what you were seeking can mean you're done

Engage in a broad variety of search strategies

Tend to be very articulate when formulating search strategy / tactics

Longitudinal perspective of search tasks

Need & Awareness

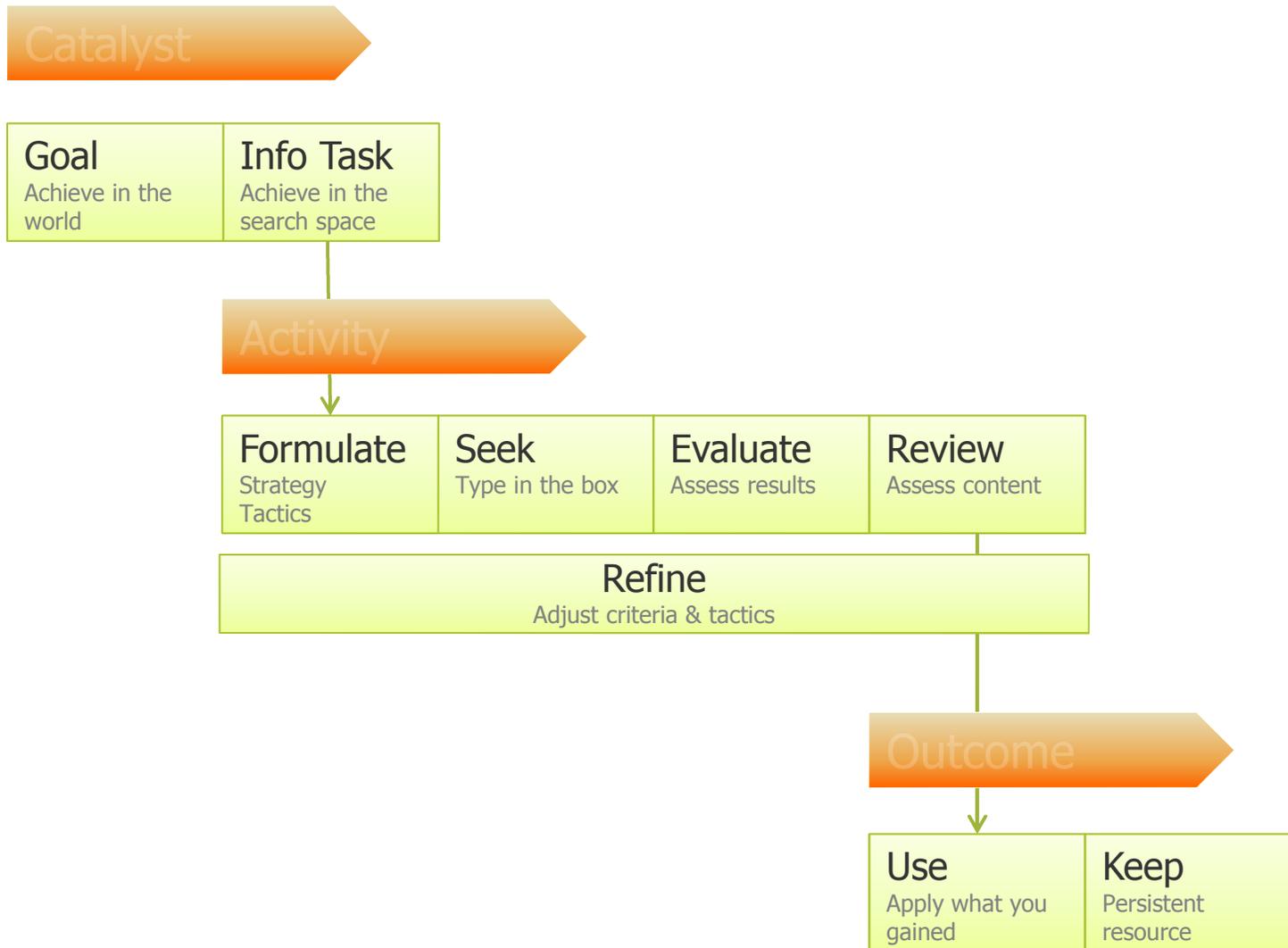


Adapted from Degler/Battle (2003). *Can Topic Maps Describe Enterprise-Wide Context?*
http://www.designforcontext.com/publications/dd-lb_topic-maps_context_extreme2003.pdf

Motivations and Understanding when Seeking

- 1 Survey
- 2 Targeted
- 3 Exploratory
- 4 Archival
- 5 Routine
- 6 Collaborative

General stages of seeking



Survey

“ What are the symptoms of arthritis? ”

Seeking Process / Stages



- » Satisficing: "good enough"
- » Tend to be single session
- » Look for correlations between results to bolster confidence
- » Focused on authoritative sources
- » Preview to support decision-making

Survey: Examples of design features

Google

▶ [Arthritis](#)



www.ncbi.nlm.nih.gov

Arthritis is inflammation of one or more of your joints. There are over 100 different types of arthritis, including osteoarthritis, rheumatoid arthritis, and psoriatic arthritis. Symptoms include joint pain, swelling, stiffness, and redness.

[Causes](#) - [Symptoms](#) - [Tests](#) - [Treatments](#)

[Arthritis Foundation | Symptoms Treatments | Prevention Tips ...](#)

www.arthritis.org/ - [Cached](#)

A voluntary health agency covering all **arthritis** and related conditions. [Osteoarthritis](#) - [Rheumatoid Arthritis](#) - [Local](#)

[WebMD Arthritis and Joint Pain Center](#)

arthritis.webmd.com/ - [Cached](#)

Get in-depth **arthritis** information here including [symptoms](#), [diagnosis](#), [treatment](#), and [prevention](#).

[Arthritis - Wikipedia, the free encyclopedia](#)

en.wikipedia.org/wiki/Arthritis - [Cached](#)

Arthritis (from Greek arthro-, joint + -itis, inflammation) is a group of disorders that involves inflammation of one or more joints. [Rheumatoid arthritis](#) - [Osteoarthritis](#) - [Knee](#)

Bing

[Arthritis](#)

Arthritis is inflammation of one or more of your joints. The main symptoms of **arthritis** are joint pain and stiffness, which typically worsen with age. The two most common types of **arthritis** are osteoarthritis and rheumatoid...

[Read the full article by Mayo Clinic](#)

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[Related conditions](#)

[Rheumatoid Arthritis](#)
[Osteoarthritis](#)
[Psoriatic Arthritis](#)
[Juvenile Rheumatoid Arthritis](#)

[Related medications](#)

[Methotrexate](#)
[Remicade](#)
[Enbrel](#)
[Humira](#)

[Recent Tweet @arthritis_org](#) · Do U play tennis? Submit a photo of U playing tennis 4 a chance to win the Ultimate Tennis Package - valued ovr \$800 <http://t.co/E7RPSI78> · 4 hours ago

[Arthritis Foundation | Symptoms Treatments | Prevention Tips ...](#)

A voluntary health agency covering all **arthritis** and related conditions. www.arthritis.org

[Arthritis - Wikipedia, the free encyclopedia](#)

[Classification](#) · [Signs and symptoms](#) · [Diagnosis](#) · [Treatment](#)

Arthritis (from Greek arthro-, joint + -itis, inflammation; plural: arthritides) is a form of joint disorder that involves inflammation of one or more joints. en.wikipedia.org/wiki/Arthritis

[Arthritis Pain and Symptoms Relief, Symptoms and Causes ...](#)

Find information and resources about **arthritis** including **arthritis** pain and symptoms relief, [diagnosis](#), [treatment](#), and [prevention](#) experience and knowledge for OA and RA at [Arthritis.com](#). www.arthritis.com

Previews (Bing)



PAGE SECTIONS

1. [Classification](#)
 Primary forms of arthritis: Osteoarthritis
 Rheumatoid arthritis Septic arthritis Gout
 and ...
2. [Signs and symptoms](#)
 Regardless of the type of arthritis, the
 common symptoms for all arthritis
 disorders include ...
3. [Diagnosis](#)
 is made by clinical examination from an
 appropriate health professional, and may
 be supported ...
4. [Treatment](#)
5. [Epidemiology](#)
6. [History](#)
7. [See also](#)
8. [References](#)

More on this page

Search within en.wikipedia.org

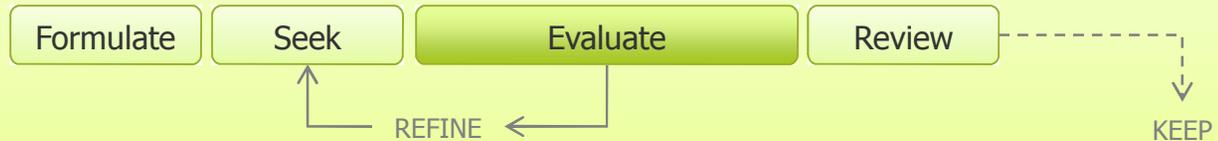
Targeted

"What is the maximum dosage for aspirin per day?"

DOSAGE v | aspirin

Search

Seeking Process / Stages



- » Typically start out with a known domain
- » Clear, known expectation of outcome or nature of outcome
- » High recognition when evaluating result set

Targeted: Examples of design features

Select All / Select None

Page 1 of 3

Title	Number	Date	Class	Inventor	Type	Preview
Paper-based adaptive testing	20040091847	11/06/2003	434/353	Creamer	Patent	
Computer-based educational system	6,149,441	11/06/1998	434/350	Pellegrino et al	Patent	
Apparatus and method for scoring nonobjective assessment materials through the application and use of captured images	5,672,060	07/1992	434/322	Poor	Patent	

Filter / Expand Results

- [Test generating and formatting system](#)
- [Testing system including removable storage means for transfer of test related data and means for issuing a certification upon successful completion of the test](#)
- [Extensible exam language \(XML\) protocol for computer based testing](#)

Different views and varying degrees of detail, depending on what is needed for recognition

Select All / Select None

Page 1 of 3

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Computer-based educational system	6,149,441	11/06/1998	434/350	Pellegrino et al	Patent	
Apparatus and method for scoring nonobjective assessment materials through the application and use of captured images	5,672,060	07/1992	434/322	Poor	Patent	

Abstract: A system and method for administering adaptive tests employs computer technology for item storage, response storage and...
 Snippet: ...administering an **adaptive assessment** on paper media... (d) providing a unique identification for each **assessment document**, each unique identification being associated with one **examinee**; (e) allowing each **examinee** to prepare... **scoring each** response using the stored...

Abstract: A computer-based educational system for use by teacher and student users and including a server computer and at least...
 Snippet: ...teacher and **student** users, comprising... server and client **input and output** elements... teacher for **grading and an evaluation**...

Abstract: An apparatus and method are provided for scoring...
 Snippet: ...displaying to a human **scorer** an image... mate by the scorer... a digitized image of said **assessment** mate

Select All / Select None

Page 1 of 3

United States Patent 20040091847

Patent Number: 6,149,442

Pub. No. 2004/018477 A1

ABSTRACT

A system and method for administering adaptive tests employs computer technology for item storage, response storage and... (d) providing a unique identification for each assessment document, each unique identification being associated with one examinee; (e) allowing each examinee to prepare... scoring each response using the stored...

[Paper-based adaptive testing](#)
20040091847, 11/06/2003, 434/353

United States Patent 5,672,060

Patent Number: 5,672,060

Pub. No. 07/1992

ABSTRACT

An apparatus and method are provided for scoring... displaying to a human scorer an image... mate by the scorer... a digitized image of said assessment mate

[Apparatus and method for scoring nonobjective assessment materials through the application and use of captured images](#)
5,672,060, 07/1992, 434/322

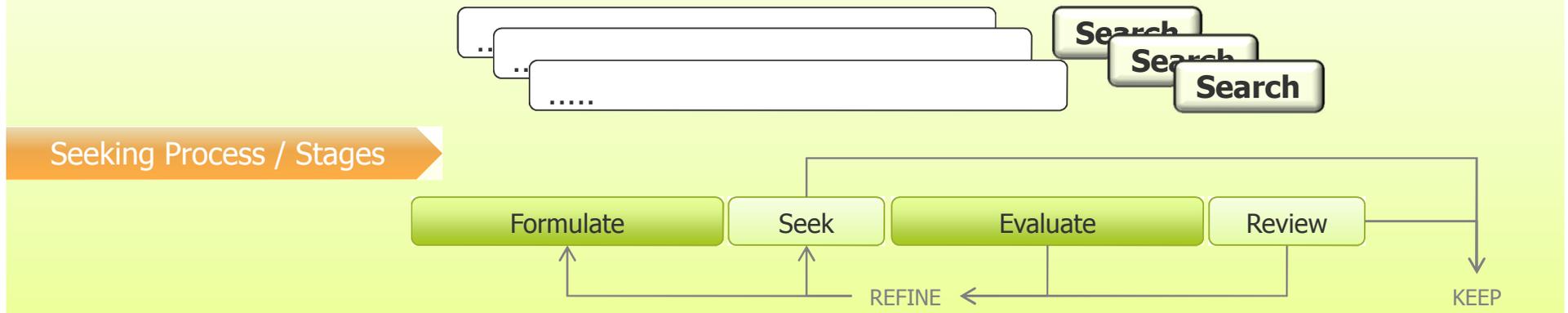
Targeted: Examples of design features

Summary information to disambiguate, and help get to the most relevant result sets

Recommended dosage for treating...	Dosage based on age...	Dosage based on drug form...	Recommended dosage based on drug interactions...
<ul style="list-style-type: none">• Pain & anti-inflammatory• Headaches• Stroke• Heart attack• Arthritis	<ul style="list-style-type: none">• Infant• Under 18• 18-65• 65 and over	<ul style="list-style-type: none">• Liquid• Powder• Solution• Tablet, delayed release• Rectal suppository	<ul style="list-style-type: none">• salicyclates• antidiabetic• corticosteroids• immunosuppresants
search results			

Exploratory

“Preparing research paper on effectiveness of physical therapy vs. drugs for arthritis treatment”



- » Longitudinal
- » Iterative, layered, evolving
- » Search strategy is a critical component
- » Inputs to search formulation must be actionable
- » Outcomes must be actionable: capture, organize, save

Exploratory: Examples of design features

Search input must be actionable e.g. tagging or flagging for search

The increase in OA-related musculoskeletal pain especially in the growing elderly population has created heightened interest in effective treatments with better safety profiles. The Glucosamine/chondroitin Arthritis Intervention Trial (GAIT) was designed to examine the effects of the dietary supplements glucosamine and **chondroitin sulfate** given alone or in combination as compared to **celecoxib** or placebo on pain associated with osteoarthritis of the knee. The primary symptomatic outcome assessment of the GAIT study was after 24 weeks of randomized, double-blinded, placebo-controlled therapy.[6] An ancillary structural study describing the effect of the agents on **radiographic joint space** width loss for up to 4 years has also recently been reported.[7] To date, very few have been reported for the long-term treatment of OA with an agent including the supplements and celecoxib studied here. Patients in the structural study continued to have safety and clinical efficacy assessments at all scheduled visits. This paper details the clinical efficacy and safety experience with these agents alone and in combination along with celecoxib as compared to placebo in patients from this subset of GAIT over 24 months of follow-up.

- Add note, action
- Search on this now
- Tag for search

Prior search formulations and strategies are products

- arthritis** – synonyms and instances
- Ankylosing spondylitis
 - Gonococcal arthritis
 - Gout
 - Juvenile rheumatoid arthritis
 - Psoriatic arthritis
 - Reactive arthritis (Reiter syndrome)
 - Rheumatoid arthritis (in adults)
 - Scleroderma
 - Systemic lupus erythematosus (SLE)
- [+ Add another](#)

Exploratory: Examples of design features

Outcomes must be actionable

Title	Date	Publication	Author	Preview
<input type="checkbox"/> Dietary supplements for osteoarthritis.	1989 May;18(4)	Semin Arthritis Suppl. Rheum. 7	Gregory PJ, Sperry M, Wilson AF	
<p>Abstract: A large number of dietary supplements have been used for osteoarthritis and as many as one third of those patients have used a supplement to treat their condition. Glucosamine-containing supplements...</p> <p>KWIC: Following feedback from Osteoarthritis Research International members on the draft guidelines and six Delphi rounds consensus was reached on 25 carefully worded recommendations. Optimal management of patients with OA hip or knee requires a combination of non-pharmacological and pharmacological modalities of therapy. Recommendations cover the use of 12 non-pharmacological modalities: education and self-management, regular telephone contact, referral to a physical therapist, aerobic, muscle strengthening and water-based exercises, weight reduction, walking aids, knee braces, footwear and insoles, thermal modalities, transcutaneous electrical nerve stimulation and acupuncture. Eight recommendations cover pharmacological modalities of treatment including acetaminophen, cyclooxygenase-2 (COX-2) non-selective and selective oral non-steroidal anti-inflammatory drugs (NSAIDs), topical NSAIDs and capsaicin, intra-articular injections of corticosteroids and hyaluronates, glucosamine</p>				
<input type="checkbox"/> OARSI recommendations for the management of hip and knee osteoarthritis. Part II: OARSI evidence-based, expert consensus guidelines.	2008 Feb;16(2)	Osteoarthritis Cartilage :137-62	Zhang W, Moskowitz RW, Nuki G, Abramson S, Altman RD, et al.	
<p>Abstract: To develop concise, patient-focussed, up to date, evidence-based, expert consensus recommendations for the management of hip and knee osteoarthritis (OA), which are adaptable and designed to assist physicians and allied health care professionals in general and specialist practise throughout the world....</p> <p>KWIC: Loss of cartilage in OA is usually assessed as a radiographic interbone distance. Precision and reproducibility in the measurement of this distance are improved by application of standardized acquisition protocols. Each protocol attempts to address difficulties inherent in obtaining reproducible positioning and projection of the joint. At the inception of this study, both anteroposterior (AP) and posteroanterior (PA) projection protocols using various degrees of knee flexion with or without fluoroscopic guidance of positioning were under scrutiny (6-12). Fluoroscopy was not commonly employed due to limited availability, difficulty in achieving and maintaining technician training and the need to minimize cost and radiation exposure. Using available approaches, a narrowing of approximately 0.25mm per year was observed and reported (9). The metatarsophalangeal (MTP) view of Buckland-Wright, a PA directed flexed knee view, was thought to have a balance of ease, thrift and precision adequate to detect the anticipated change in joint space width (JSW) over the two year study (10).</p>				
<input type="checkbox"/> The effect of glucosamine and/or chondroitin sulfate on the progression of knee osteoarthritis: A report from the glucosamine/chondroitin arthritis intervention trial.	07/2007	Drugs Aging. 2007;24(7):5 73-80	Sawitzke AD, Shi H, Finco MF, Dunlop DD, Bingham CO, 3rd, Harris CL, et al.322 Poor	
<p>Abstract: An apparatus and method are provided for scoring nonobjective assessment materials recorded on paper, such</p>				

Tag Categories

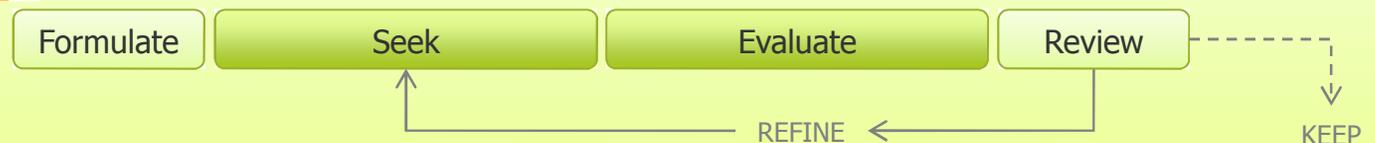
- 1 Best bets (3)
- 2 Likely (5)
- 3 Interesting (1)
- 4 Check on (9)

Add Category

Archival

"Where methotrexate caused or contributed to patient adverse events"

Seeking Process / Stages



- » Search has been comprehensive and complete
- » Important to know you have found all that there is (within limit)
- » Haven't missed critical findings
- » Comprehensive search is itself a product;
if I can't find it, does that mean:
 - it likely doesn't exist
 - not relevant to the context that I have applied
 - the search index does not successfully map the content

Archival: Examples of design features

Tools to help prompt evaluations of completeness

Related to...Methotrexate

Extend search to other similar categories

- Anti-metabolites
 - Folic acid antagonists
 - Pyrimidine antagonists
 - Purine antagonists
 - Adenosine deaminase inhibitor
- Anti-folates

Extend search to other known names

- amethopterin
- MTX
- Maxtrex (UK)
- Metoject (UK)
- Rheumatrex®
- TrexallTM

Update or Cancel

NAL

FBI African Americans [Advanced](#)

Your query has been expanded. [Show Expansions](#)

FBI AND African AND Americans

<input checked="" type="checkbox"/> Stemming	<input checked="" type="checkbox"/> Synonyms	<input checked="" type="checkbox"/> Non_preferred
<input checked="" type="checkbox"/> americanism	<input checked="" type="checkbox"/> United States (North and Central America) nation	<input checked="" type="checkbox"/> America
<input checked="" type="checkbox"/> americanized		<input checked="" type="checkbox"/> Estados Unidos de América
<input checked="" type="checkbox"/> americanization		<input checked="" type="checkbox"/> ISO840
<input checked="" type="checkbox"/> americanisms		<input checked="" type="checkbox"/> US
<input checked="" type="checkbox"/> americanize		<input checked="" type="checkbox"/> USA
<input checked="" type="checkbox"/> americanisation		<input checked="" type="checkbox"/> United States of America
<input checked="" type="checkbox"/> americanizing		<input checked="" type="checkbox"/> Vereinigten Staaten von Amerika
		<input checked="" type="checkbox"/> Verenigde Staten
		<input checked="" type="checkbox"/> États-Unis d'Amérique
<input checked="" type="checkbox"/> Non_preferred+stemming	<input type="checkbox"/> Broader Terms	<input type="checkbox"/> Narrower Terms
<input checked="" type="checkbox"/> americas	<input type="checkbox"/> North and Central America	<input type="checkbox"/> Amerasians
<input checked="" type="checkbox"/> americae		
<input checked="" type="checkbox"/> usas		

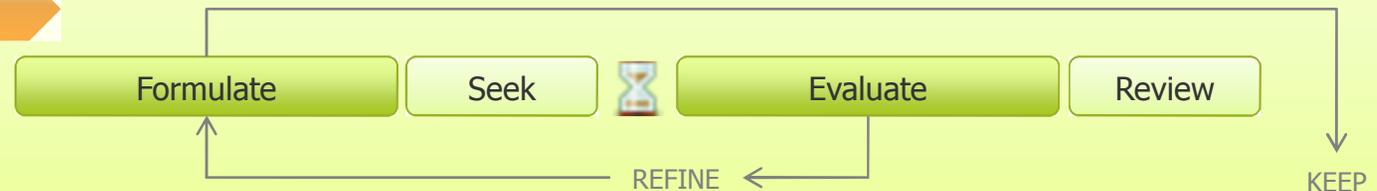
select all for this term

Update Search Cancel

Routine

"Keep me up-to-date on hematological cancer involving Velcade as an agent"

Seeking Process / Stages



- » Take a successful search strategy and give it an identity
- » Focus on new and unique results
- » Search parameters and filters are not necessarily related to a specific result set

Routine: Examples of design features

"Keep me up-to-date on hematological cancer treatments involving Velcade as an agent"

"Leukemia treatments" searches encompass...

- Leukemia 1947 to present
- Hodgkin Lymphoma
- Myeloma 1960 to present not involving radiation
- Plasma cell neoplasms

"drug delivery agent" searches encompass...

- subcutaneous injection
- nano-particle passive carrier
- monoclonal antibody
- radioimmunotherapy

Search Now



No results found

Monitor >>



"Keep me up-to-date...ignore drug deliver mechanism"

"Keep me up-to-date on myeloma treatments involving..."

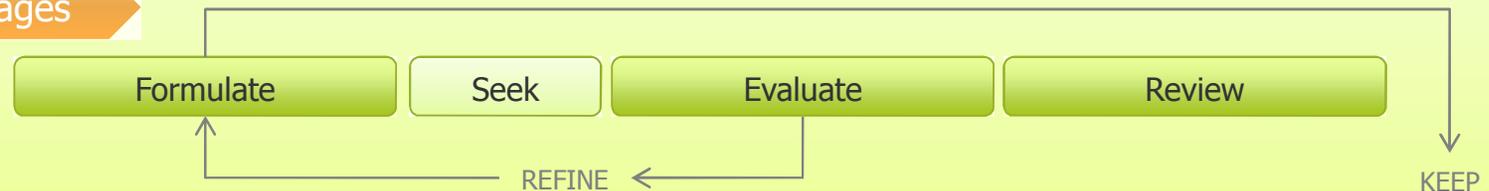
Collaborative

"What is the maximum dosage for aspirin per day?"

Is this for a child or an adult?

How many milligrams is your aspirin pill?

Seeking Process / Stages



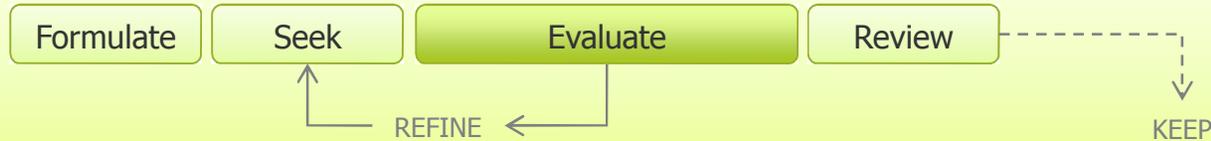
- » Agent for others
- » Sharing
- » Refinement might be multi-session, iterative, not real-time
- » Formulation task requires:
 - Negotiation to articulate goals and scope
 - Translation

Summary: Seeking Behaviors by Process / Stage

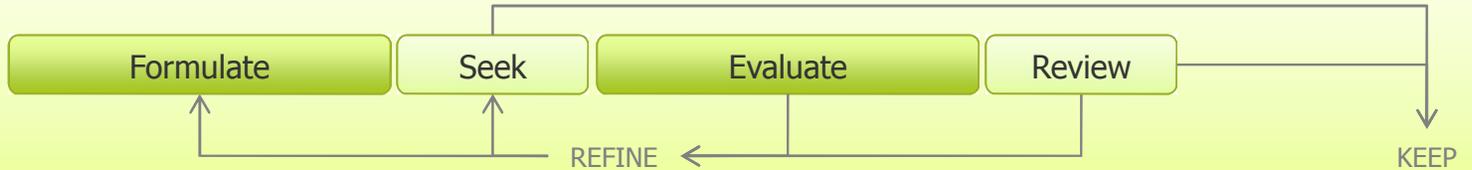
Survey



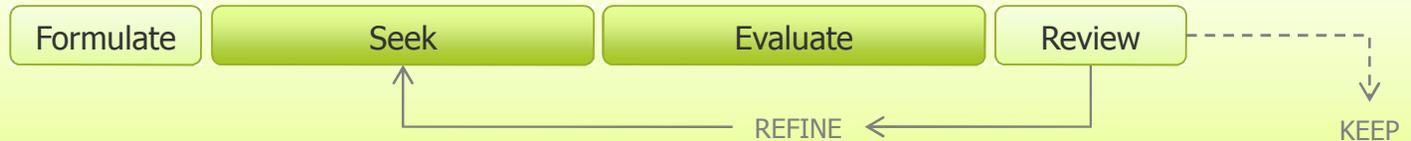
Targeted



Exploratory



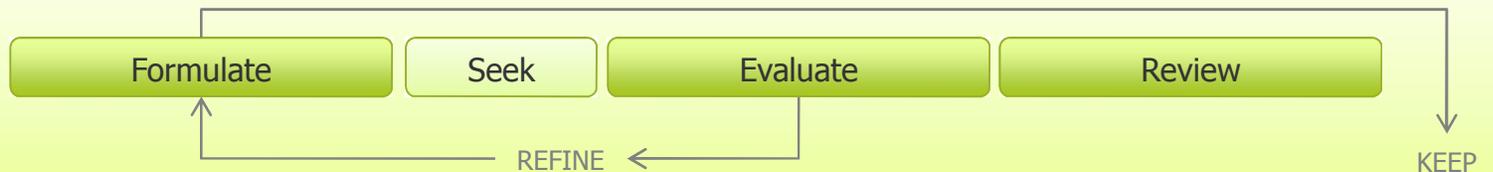
Archival



Routine



Collaborative



Thank you



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