

Using Ontologies to Create a Flexible Search Option



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The Need for CMCH

By the year 2000,
the American child between
the ages of 8 and 18 years spent

6 hours and 43 minutes

of every day with media,
more time than they spent
in school or with parents



The Need for CMCH

Attention to the subject from medical organizations:

- American Medical Association
 - 1997 "Physician's Guide to Media Violence"
- American Academy of Pediatrics policy statements
 - Commercialization of Children's Television (1988, 1992)
 - Impact of Music (1995)
 - Violence (2001)
 - Substance abuse (2001)
 - Risky sexual behavior (2001)
 - Obesity (2003)



The Need for CMCH

CMCH Mission:

To advance scientific research,
clinical interventions, and education
on the subject of media and their effects,
positive and negative,
on the physical and mental health
of children and adolescents



CMCH Database of Research

One database to bring together
all existing research on the
effects of media on child health

Searchable by researchers
from any discipline

Searchable by novice users
from the general public



Challenges

1. Multiple Disciplines
2. Multiple Vocabularies
3. Multiple Audiences
with varying levels of search experience



Challenges:

Multidisciplinary → Interdisciplinary

Media effects research is currently multidisciplinary:

- medicine
- psychology
- public health
- education
- gender studies
- communication
- sociology
- anthropology
- business
- criminal justice



Challenges: Ambiguous Vocabulary

Example -

- Aggression
- Aggressiveness
- Aggressive Behavior

Has a negative connotation in almost every field except psychology, where it can also have the positive meaning of a self-confident personality



Challenges:

Ambiguous Vocabulary

Example

Comparison of Search Results from Thumbshots.com

Search Terms	Overlap
<i>Movies vs. Films</i>	5%
<i>Media vs. "Mass Media"</i>	3%
<i>Video Games vs. Electronic Games</i>	2%
<i>Video Games vs. Computer Games</i>	27%
<i>Internet vs. "World Wide Web"</i>	0%



Challenges: Multiple Audiences

At least 6 different audiences:

- Researchers
- Clinicians
- Parents
- Teachers
- Policymakers
- Children and Adolescents



Searching: CMCH Database of Research

Needed a search mechanism to translate
across **disciplines**, across **vocabularies**,
and across **audiences**

Semantic Search of CMCH Database



Solutions: Discovering Ontologies

SemanTx Life Sciences Company

Semantic Knowledge Indexing Platform (SKIP)

Runs on National Library of Medicine ontology:
Unified Medical Language System (UMLS)



Solutions: Discovering Ontologies

Ontology:

An approved vocabulary containing defined concepts and the describable relationships between them



Solutions: Discovering Ontologies

Most common relationship

Is_A = is a type of
Human Is_A Mammal

153 possible relationships:

brought_about_by

has_ingredient

spatially_related_to

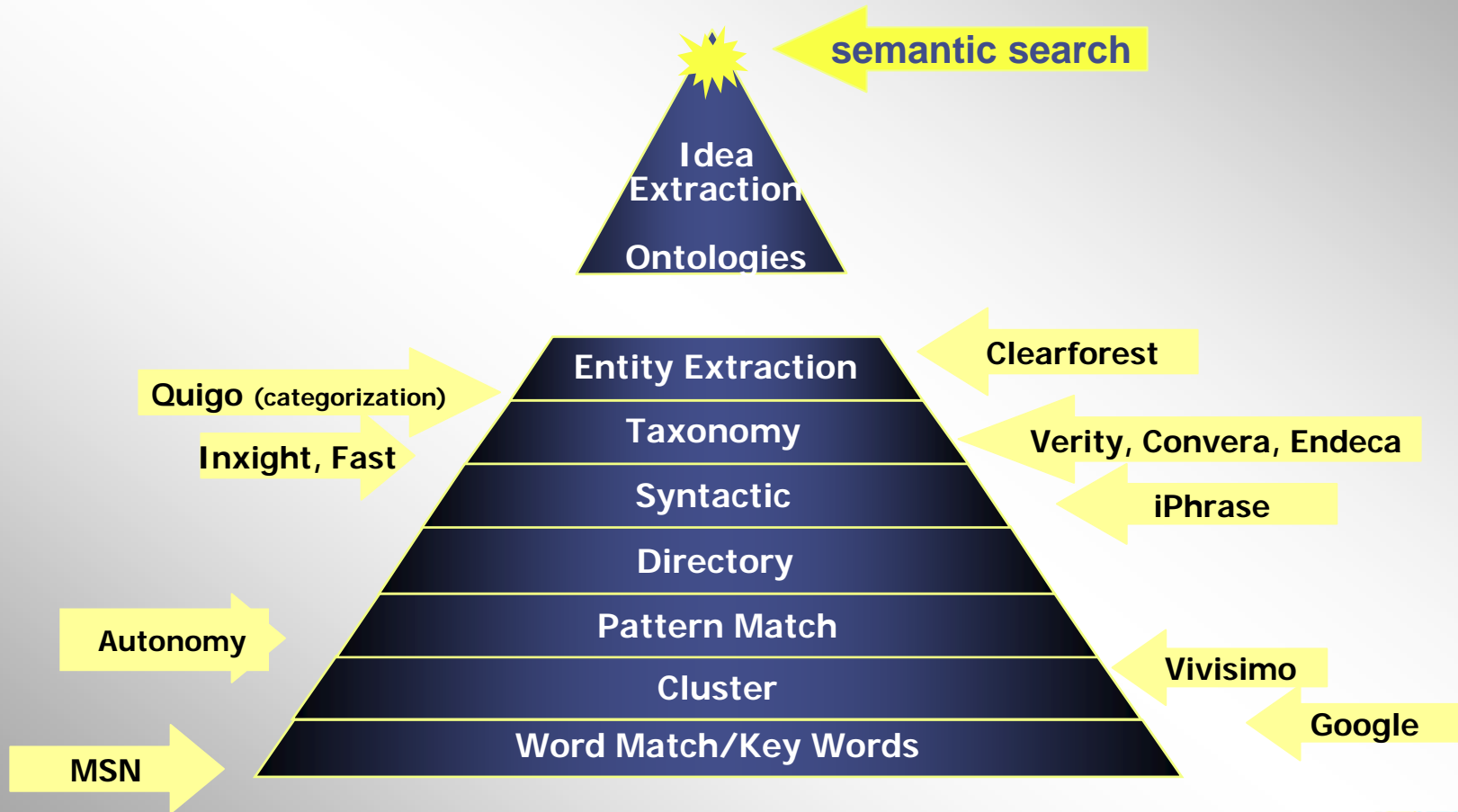
diagnosed_by

result_of

traversed_by



Comparison of Search Engines



Solutions:

Discovering Ontologies

Unified Medical Language System (UMLS)

- Created by the National Library of Medicine
- Contains over 1 million concepts
- 5 million unique concept names
- Created from more than 100 different source vocabularies



Creating the CMCH Ontology

1. Created new concepts and definitions if the terms were not part of the UMLS already

Mean World Syndrome: theory that the more television people watch, the more they believe that violence is a commonplace as it is on television.

Third Person Effect: the belief that media can and does affect the way people think, but that you are personally exempt from these effects.



Creating the CMCH Ontology

2. Added synonyms to reflect the many variations of terms

Motion Pictures

Other Names: Movies

Film

Cinema

Imitation

Other Names: Modeling

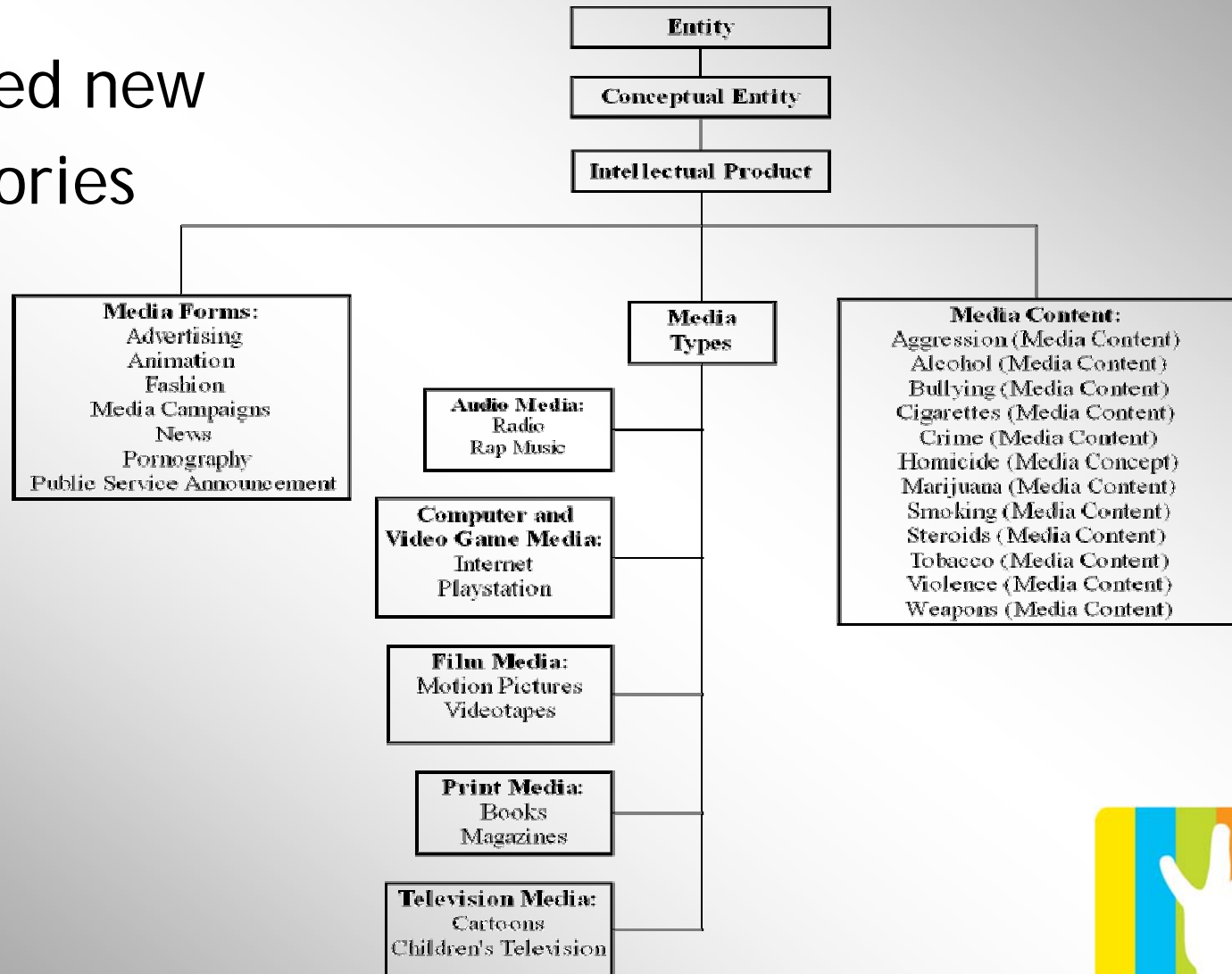
Copying

Observational Learning



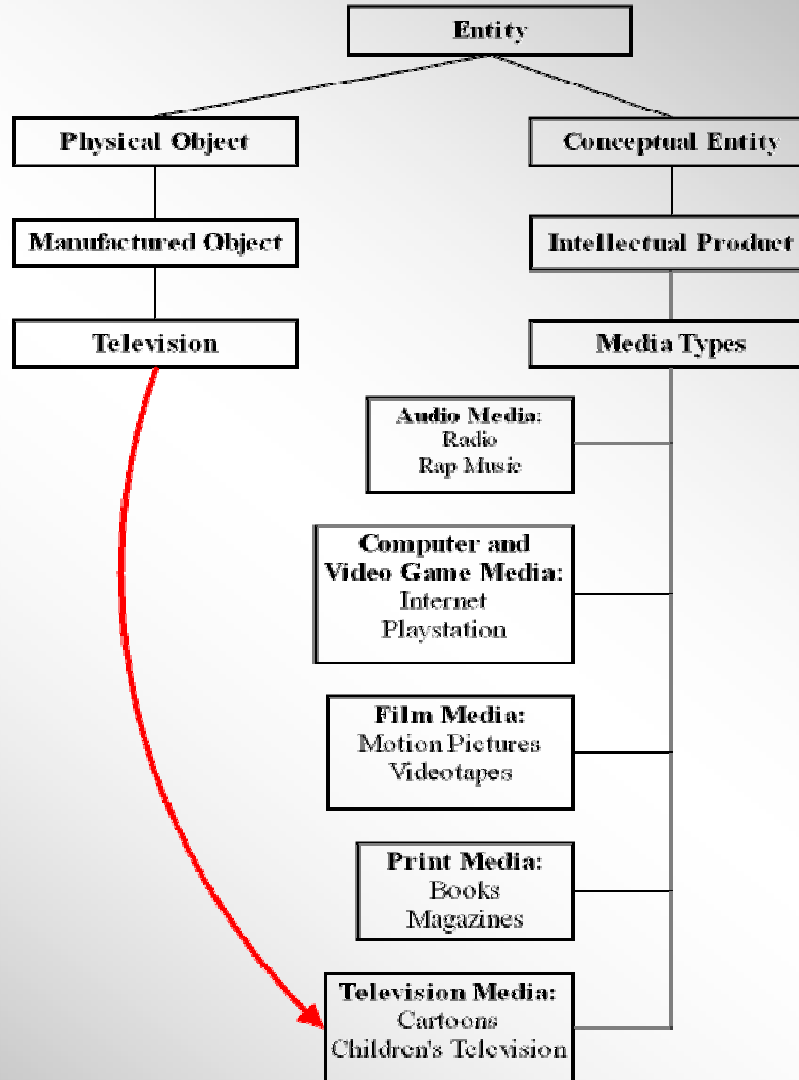
Creating the CMCH Ontology

3. Created new categories



Creating the CMCH Ontology

4. Assigned concepts to different categories where necessary



Creating the CMCH Ontology

5. Added relationships to enhance meaning

Example: Instant Messaging

Semantic Relationship	Concept
Is_A	Communications
Occurs_In	Internet
Occurs_In	Computers
Performed_By	Peer Group
Has_Occurence	Interpersonal Communication
Has_Occurence	Bullying



Searching: CMCH Database of Research

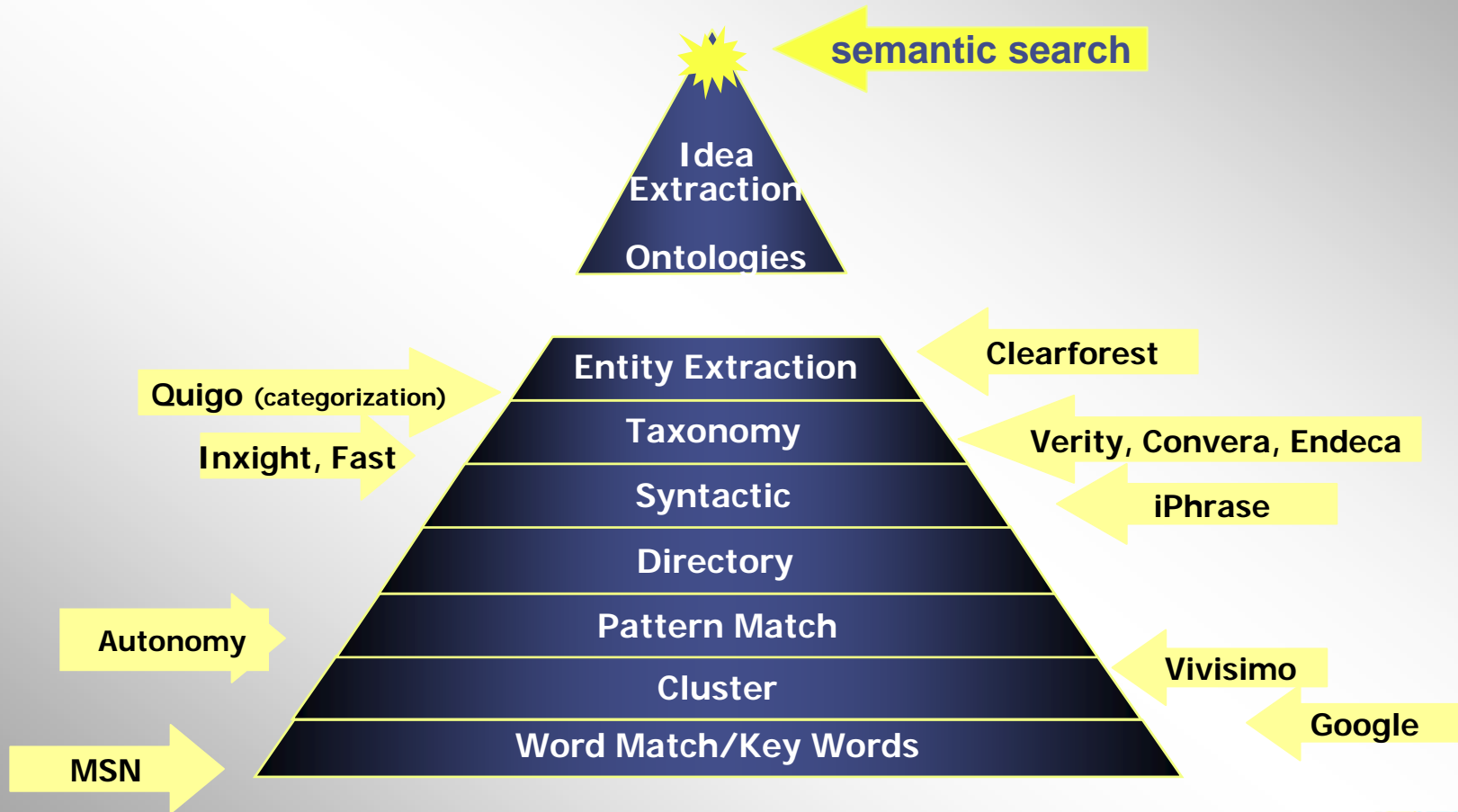
CMCH Smart Search:

Translates queries across disciplines,
across vocabularies, and across audiences

[Semantic Search of CMCH Database](#)



Comparison of Search Engines



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