

Think outside the search box

Dr. Tony Russell-Rose FBCS CITP CEng



What's this?

1. randomized controlled trial.pt.
2. controlled clinical trial.pt.
3. randomized.ab.
4. placebo.ab.
5. clinical trials as topic.sh.
6. randomly.ab.
7. trial.ti.
8. 1 or 2 or 3 or 4 or 5 or 6 or 7
9. (animals not (humans and animals)).sh.
10. 8 not 9
11. exp Child/
12. ADOLESCENT/
13. exp infant/
14. child hospitalized/
15. adolescent hospitalized/
16. (child\$ or infant\$ or toddler\$ or adolescen\$ or teenage\$).tw.
17. or/11-16
18. Child Nutrition Sciences/
19. exp Dietary Proteins/
20. Dietary Supplements/
21. Dietetics/
22. or/18-21
23. exp Infant, Newborn/
24. exp Overweight/
25. exp Eating Disorders/
26. Athletes/
27. exp Sports/
28. exp Pregnancy/
29. exp Viruses/
30. (newborn\$ or obes\$ or "eating disorders" or pregnan\$ or childbirth or virus\$ or influenza).tw.
31. or/23-30
32. 10 and 17 and 22
33. 32 not 31

The secret life of recruiters...

boolean strings

All Images Videos Shopping News More Settings Tools

About 16,400,000 results (0.36 seconds)

A Recruiter's Guide to Boolean Searching (and the World's Largest ...

<https://www.ere.net/a-recruiters-guide-to-boolean-searching-and-the-worlds-largest-fr...>
6 Oct 2009 - This is a great simplifier for many, but Boolean search writing is a skill that top recruiters need to know directly in order to get meaningful ...
You've visited this page 2 times. Last visit: 04/02/18

People also ask

- What is a Boolean search string?
- What is an example of a Boolean?
- What is a Boolean Google search?
- What are the three Boolean search terms?

Feedback

The Beginner's Guide to Boolean Search Operators - SocialTalent

<https://www.socialtalent.com/blog/...the-beginners-guide-to-boolean-search-operators>
5 Nov 2015 - Fully constructed Boolean search strings can look both confusing and complex. But our beginners guide to Boolean will have you creating ...

Boolean Strings | By Irina Shamaeva

<https://booleanstrings.com/>
all this in a matter of seconds and without needing any advanced Boolean syntax commands. ...
booleanstrings May 29, 2018 Boolean Leave a Comment.
About Me · Tools · CSEs · Network

Boolean Search String Examples | Boolean Black Belt-Sourcing ...

<booleanblackbelt.com/tag/boolean-search-string-examples/>
One of the things that has always struck me as extremely odd with regard to sourcing is the fact that there appears to be so little sharing of Boolean search ...
You've visited this page 3 times. Last visit: 03/06/18

Boolean search cheatsheets | Workable

<https://resources.workable.com/boolean-search-cheatsheets/>

RESULTS WARNINGS QUERY



(site:linkedin.com in:title profile) (Java AND (Design OR develop O

Sign in

All Images Videos Maps News | My saves

6,540 Results Date Language Region

Latha Balne - Java Support Developer - KCOM | LinkedIn

<https://uk.linkedin.com/in/latha-balne-83673217?trk=pub-pbmap>
• Well organized with strong problem solving skills that ... • Design, Develop and Deploy
... • Design and development of Web Alert Tool using JAVA Struts ...

Eugen Hoble - Senior J2EE Engineer - Crosscap Media ...

<https://ca.linkedin.com/in/emh2k7>
Full Stack Senior J2EE Engineer ... module as well as for Rental and Supportive
Program module. Technologies: Java, EJB ... problem solving and ...
Title: Reality is merely an illusion, albei... Industry: Computer Software
Connections: 457 Location: Toronto, Canada

Artem Gluhovskiy - Java Software Engineer - Exadel | ...

<https://by.linkedin.com/in/artem-gluhovskiy>
Java Software Engineer at Exadel. ... * Java 8 * Hibernate * Spring ... The repository of
code examples for Java standard APIs and libraries, design patterns and ...
Title: Java Software Engineer at Exadel Industry: Computer Software
Connections: 47 Location: Belarus

Shahzeb Khan - Sr. Java Developer - WizTech Pakistan ...

<https://pk.linkedin.com/in/shahzebkhani11>
Expertise lies in design, develop, integration, problem solving skills, ... Java, Spring
3.0, LDAP; Working on the development of Project providing services to.
Title: Sr. Java Developer at WizTech ... Industry: Information Technology and ...
Connections: 447

Aamir Naeem - Java Integration Developer (Software ...

<https://pk.linkedin.com/in/aamir-naeem-92787311b?trk=prof-samename...>
... design and problem solving capabilities. ... problem solving skills and allow me to
... design and development of Web Alert Tool using JAVA Struts ...

Think outside the search box – www.2dsearch.com

And others

```
1 A01N0025-004/CPC
2 RODENT OR RAT OR RATS OR MOUSE OR
MICE
3 BAIT OR POISON
4 2 AND 3
5 1 OR 4
6 AVERSIVE OR ADVERSIVE OR DETER? OR
REPEL?
7 NONTARGET OR (NON WITH TARGET) OR
HUMAN OR DOMESTIC OR PET OR DOG OR
CAT
8 6 AND 7
9 8 AND 5
10 BITREX OR DENATONIUM OR BITREXENE
OR BITTERANT OR BITTER
11 10 AND 5
12 9 OR 11
```

```
(
  (
    (~Magnolia OR ~Magnolias) AND
    ('~Paul ~Anderson' OR '~Paul ~Thomas' OR paul* OR thom*
OR anders*)
  ) OR
  'jeremy blackman*' OR jeremy OR Jerem* OR
  (
    (~incredible OR ~coincidences) AND
    (role* OR chance* OR life* OR investigat* OR disturb*)
  ) OR
  (
    (~C NOT
      ('~John C' OR
        (
          (
            ('~Mister C' AND ~Shamen) OR
            ('~Tom C' AND ~Scientology)
          )
        )
      )
    )
  ) OR ~XCs OR ~CV OR ~CVs OR
  (
    (
      (~CKR OR ~CKRs) NOT ('CKR 123' OR lawyer)
    )
  )
)
```

And more...

(topic:"d5f485b9\-aabo\-4d95\-a83b\-28b2dec90oc" AND (topic:"bag42587\-854e\-407d\-81dc\-812ee29624bd" OR topic:"805a2281\-8fo4\-42b7\-a451\-e2b7daac4db1" OR topic:"1fc2a4f5\-3f23\-4c80\-943c\-42f789d11644" OR topic:"91e4df78\-db55\-4d63\-be65\-2fad1afa77a7" OR organization:"Argos" OR organization:"Sainsbury" OR organization:"Marks and Spencer" OR organization:"Morrisons" OR organization:"Signet" OR organization:"Rapha" OR organization:"Vodafone" OR organization:"Evans Cycle" OR organization:"The Body Shop" OR organization:"Homebase" OR organization:"Topps Tiles" OR organization:"Carphone Warehouse" OR organization:"B\&Q" OR organization:"Tesco" OR organization:"Lidl" OR organization:"Aldi" OR organization:"Waitrose" OR organization:"John Lewis" OR organization:"Dixons" OR organization:"Alliance Boots" OR organization:"AS Watson" OR organization:"Halfords" OR organization:"Vision Express" OR organization:"Pets at Home" OR organization:"Asda" OR organization:"Pret a Manger" OR organization:"Greggs" OR organization:"Majestic Wine" OR organization:"Ocado" OR organization:"Selfridges" OR organization:"Nike" OR organization:"Adidas" OR organization:"Walmart" OR organization:"Woolworths" OR organization:"Debenhams" OR organization:"Halfords" OR organization:"Punch Taverns" OR organization:"Monarch Group" OR organization:"Whitbread" OR organization:"Carnival Cruise" OR organization:"KFC" OR organization:"Yum\!" OR organization:"Costa Coffee" OR organization:"Pizza Hut" OR organization:"Greene King" OR organization:"Carluccio's" OR organization:"Gondola" OR organization:"Starbucks" OR organization:"Sodexo" OR organization:"SSP" OR organization:"Nando's" OR organization:"Avis" OR organization:"Paddy Power" OR organization:"Easyjet" OR organization:"Emaar" OR organization:"Nuffield Health" OR organization:"Safestore" OR organization:"TUI" OR organization:"Merlin Entertainment" OR organization:"Virgin Atlantic" OR organization:"IHG" OR organization:"Virgin Active" OR organization:"Thomas Cook" OR organization:"Odeon Hilton" OR organization:"Pizza Express" OR organization:"Zizzi's" OR organization:"Gemfields" OR organization:"Orlebar Brown" OR organization:"Rebecca Trowell" OR organization:"Spring Studios" OR organization:"Loewe" OR organization:"Jimmy Choo" OR organization:"Burberry" OR organization:"Conce Nast" OR organization:"Zadig \& Voltaire" OR organization:"Prada" OR organization:"Fendi" OR organization:"French Connection" OR organization:"Lyle \& Scott" OR organization:"LK Bennett" OR organization:"Alexander Wang" OR organization:"Sandro" OR organization:"Isabel Marant" OR organization:"Rag \& Bone" OR organization:"J Crew" OR organization:"Maje" OR organization:"Ralph Lauren" OR organization:"Tommy Hilfiger" OR organization:"Michael Kors" OR organization:"Kenzo" OR organization:"Pringle of Scotland" OR organization:"Heidi Klein" OR organization:"Louis Vuitton" OR organization:"Lanvin" OR organization:"Loewe" OR organization:"Chanel" OR organization:"Valentino" OR organization:"Celine" OR organization:"Dior" OR organization:"Alexander McQueen" OR organization:"Victoria Beckham" OR organization:"Sonia Rykel" OR organization:"Bally" OR organization:"Notonthehighstreet" OR organization:"Rupert Sanderson" OR organization:"Dunhill" OR organization:"De Beers" OR organization:"Swarovski" OR organization:"Hermes" OR organization:"Cartier" OR organization:"David Yurman" OR organization:"Mulberry" OR organization:"Tiffany \& Co" OR organization:"Boucheron" OR organization:"Lancel" OR organization:"Marc Jacobs" OR organization:"Longchamp" OR organization:"Kate Spade" OR organization:"Salvatore Ferragamo" OR organization:"Asos" OR organization:"Net a porter" OR organization:"Astley Clarke" OR organization:"Fenwick" OR organization:"Yoox" OR organization:"Harrods" OR organization:"Selfridges" OR organization:"MyTheresa" OR organization:"Lane Crawford" OR organization:"Liberty of London" OR organization:"Gucci" OR organization:"Armarni" OR organization:"Zara" OR organization:"Topshop" OR organization:"Arcadia" OR organization:"Balenciaga" OR organization:"Stella McCartney" OR organization:"Brioni" OR organization:"Bottega Veneta" OR organization:"Christopher Kane" OR organization:"Anya Hindmarch" OR organization:"Business of Fashion" OR organization:"3i" OR organization:"Active Private Equity" OR organization:"Advent International" OR organization:"Advent" OR organization:"Apollo Global Management" OR organization:"Apollo" OR organization:"Apax" OR organization:"Apax" OR organization:"Augmentum Capital" OR organization:"Bain" OR organization:"Endless" OR organization:"BC Partners" OR organization:"Better Capital" OR organization:"HuttonCollins" OR organization:"Hutton Collins" OR organization:"Bridgepoint" OR organization:"Business Growth Fund" OR organization:"CDR" OR organization:"Darwin" OR organization:"Duke Street Capital" OR organization:"Electra Partners" OR organization:"Exponent" OR organization:"European Capital" OR organization:"General Atlantic" OR organization:"Hilco" OR organization:"Inflexion" OR organization:"KKR" OR organization:"LGV" OR organization:"Lion" OR organization:"Magenta Partners" OR organization:"Montagu" OR organization:"Octopus" OR organization:"Octopus Capital" OR organization:"Piper Private Equity" OR organization:"Piper" OR organization:"Sun Capital" OR organization:"TA Associates" OR organization:"Warburg Pincus" OR organization:"Charterhouse" OR organization:"Primary Capital" OR organization:"Bowmark" OR organization:"Beringea" OR organization:"Business Growth Fund" OR organization:"Bridgepoint" OR organization:"Caird Capital" OR organization:"CapVest" OR organization:"Cerberus Capital" OR organization:"CBPE" OR organization:"CCMP" OR organization:"CDR" OR organization:"Change Capital" OR organization:"Cinven" OR organization:"CVC" OR organization:"Duke Street" OR organization:"EC1" OR organization:"Electra" OR organization:"Encore" OR organization:"EQT" OR organization:"Equistone" OR organization:"Graphite Capital" OR organization:"Caledonian" OR organization:"Kings Park Capital" OR organization:"L Capital" OR organization:"LDC"

Agenda

- Understanding the problem
 - User needs, goals & tasks
- Design exploration
 - Alternative solutions
- Evaluation
 - Moving the needle
- Exploitation
 - Gaining traction
- Summary

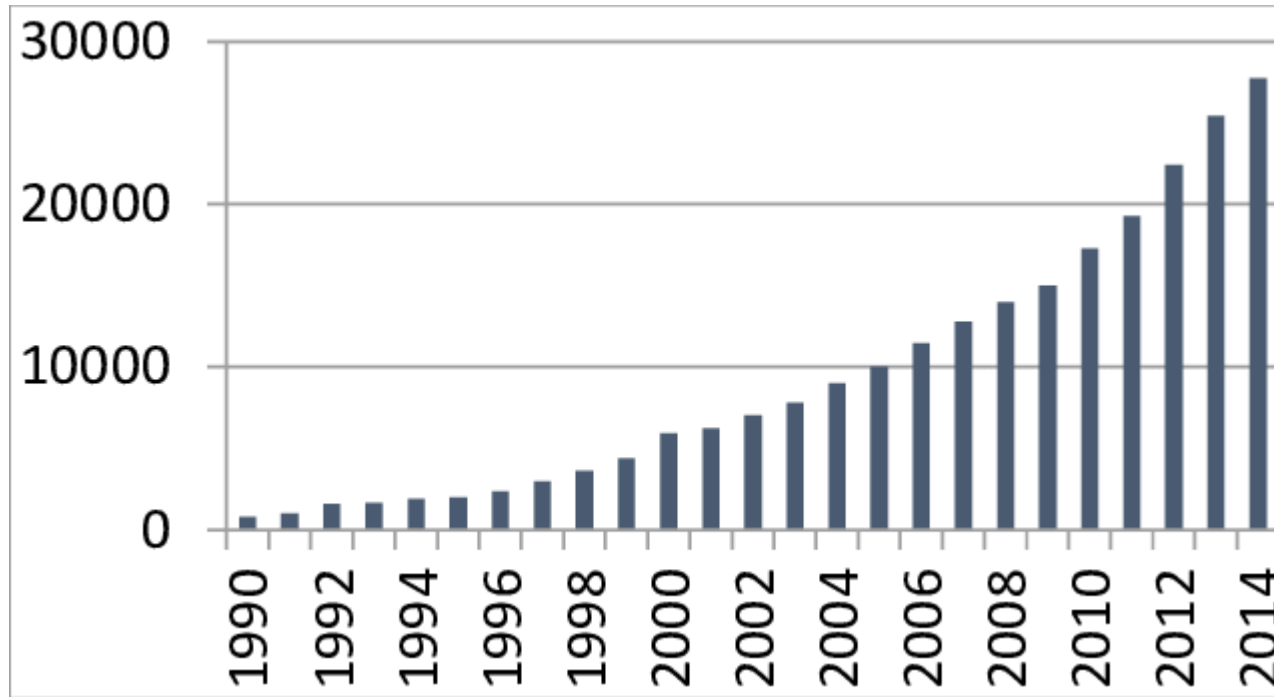
Professional search

- Keyword search is not good enough
 - 'Advanced' search is anything but
- Patent, healthcare, recruitment, media...
 - Professional search needs to be:
 - Comprehensive
 - Repeatable
 - Transparent

Healthcare Information

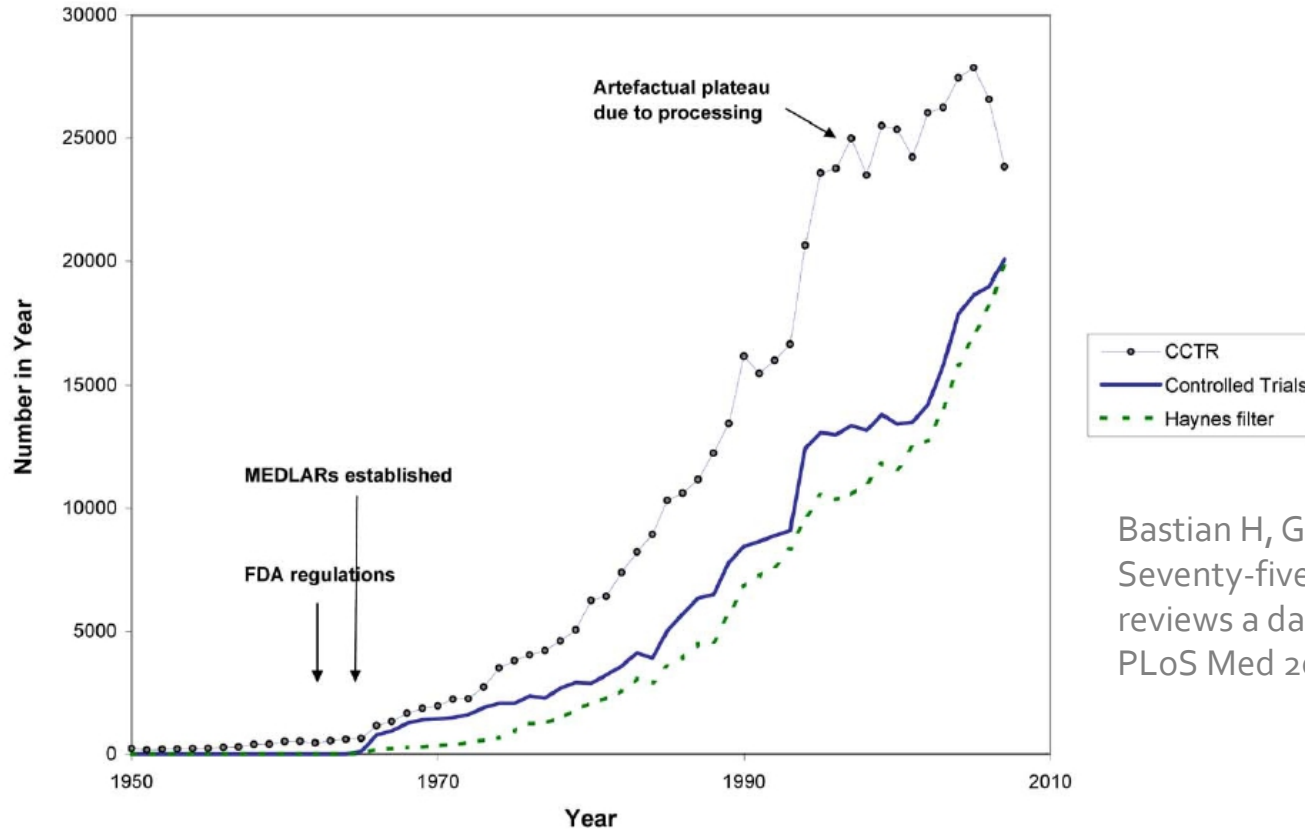
- Evidence based medicine
- *"A systematic review summarises the results of healthcare studies (controlled trials) and provides a high level of evidence on the effectiveness of healthcare interventions. Judgments may be made about the evidence and inform recommendations for healthcare."*
- Cochrane Consumer Network, <https://consumers.cochrane.org/what-systematic-review>

Big data in healthcare



Bekhuis T, Tseytlin E, Mitchell KJ. A Prototype for a Hybrid System to Support Systematic Review Teams: A Case Study of Organ Transplantation. *Proceedings IEEE International Conference on Bioinformatics and Biomedicine*. 2015;2015:940-947.

Big data in healthcare



Bastian H, Glasziou P, Chalmers I.
Seventy-five trials and eleven systematic
reviews a day: how will we ever keep up?
PLoS Med 2010 Sep 21;7(9)

An imperfect process

- *"Errors in the search strategy of a systematic review may undermine the integrity of the evidence base used in the review"*
 - Sampson M, McGowan J. Errors in search strategies were identified by type and frequency. J Clin Epidemiol 2006 Oct;59(10):1057-1063
- 63 MEDLINE search strategies examined
 - 90.5% contained ≥ 1 errors
 - 82.5% contained errors that could potentially lower recall of relevant studies
 - The most common search errors were
 - missed MeSH terms (44.4%)
 - unwarranted explosion of MeSH terms (38.1%)
 - irrelevant MeSH or free text terms (28.6%)
 - Missed spelling variants, combining MeSH and free text terms in the same line, and failure to tailor the search strategy for other databases (20.6%)
 - Logical operator error occurred in 19.0% of searches

Quiz time! 2008, or 2018?

The image is a collage of three screenshots from different development environments, illustrating the evolution of IDEs over time.

Top Left: Eclipse Platform (2008)
The screenshot shows the Eclipse IDE interface. The title bar reads "Java Lite - My First Assignment/src/Fibonacci.java - Eclipse Platform". The menu bar includes File, Edit, Source, Refactor, Navigate, Search, Project, Run, Window, and Help. The toolbar contains various icons for file operations and development. The "Lite Java Project Explorer" on the left shows a project named "My First Assignment" with a package structure including "src", "(default package)", and "Fibonacci.java". The main editor displays the code for "Fibonacci.java":

```
public class Fibonacci {  
    public static void main(String[] args) {  
        System.out.println("Fibonacci");  
    }  
  
    public static long fib(int n) {  
        if (index == 0) return 0;  
        if (index == 1) return 1;  
        return fib(n-1) + fib(n-2);  
    }  
}
```

Top Right: IntelliJ IDEA (2018)
The screenshot shows the IntelliJ IDEA IDE interface. The title bar reads "workspace | Project | Edit | Assistant | Run | Git | Profile | Help". The left sidebar shows a project named "web-java-petclinic (mysql)" with a package structure including "src", "main", "java", "org.springframework.samples.petclinic", "model", "repository", "jdbc", "jpa", "springdatajpa", "OwnerRepository.java", "PetRepository.java", "VetRepository.java", "VisitRepository.java", "service", "util", "web", "index.html", "overview.html", "test.html", "resources", "pom.xml", "readme.md", and "webapp". The main editor displays the code for "OwnerRepository.java":

```
/**  
 * conventions so this interface can easily be extended for Spring Data  
 *  
 * @author Ken Krebs  
 * @author Juergen Hoeller  
 * @author Sam Brannen  
 * @author Michael Isvy  
 */  
public interface OwnerRepository {  
  
    /**  
     * Retrieve <code>Owner</code>s from the data store by last name, re  
     * with the given name.  
     *  
     * @param lastName Value to search for  
     * @return a <code>Collection</code> of matching <code>Owner</code>s  
     * found  
     */  
    Collection<Owner> findByLastName(String lastName) throws DataAccessException;  
  
    /**  
     * Retrieve an <code>Owner</code> from the data store by id.  
     *  
     * @param id the id to search for  
     */  
    Owner findById(int id) throws DataAccessException;  
}
```

Bottom: Terminal Window
The terminal window shows the output of a command executed in a shell. The command is `ls -la /projects/web-java-petclinic`. The output is a table with columns: Name, Size, Modify time, and Owner. The table lists the contents of the directory, including files like .che, .git, pom.xml, target, and readme.md, and subdirectories like src, test, resources, and webapp.

Quiz time! 2008, or 2018?



World Health
Organization



World Health
Organization

INTERNATIONAL CLINICAL TRIALS REGISTRY PLATFORM SEARCH PORTAL

[Home](#) [Advanced Search](#)

Fields can be left blank

Look for trials with

[Home](#) [Advanced Search](#)

[Search Tips](#)

[ICTRP website](#)

[Contact us](#)

Fields can be left blank. Click on the field name hyperlink for an explanation of each search field

Look for trials with the exact phrase or contains

☐ Search for [clinical trials in children](#)

[Recruitment status](#) is

[Primary sponsor](#) is or contains

[Secondary ID](#) is or contains

[Countries of recruitment](#) are

[Date of registration](#) is between

[Primary sponsor](#) is or contains

[Secondary ID](#) is or contains

[Countries of recruitment](#) are

[Date of registration](#) is between

[Primary sponsor](#) is or contains

[Secondary ID](#) is or contains

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[Secondary ID](#) is or contains

[Countries of recruitment](#) are

[Date of registration](#) is between

[Primary sponsor](#) is or contains

[Secondary ID](#) is or contains

[Countries of recruitment](#) are



and



Sort by

[Search Tips](#)

Disclaimer: Trials posted on this search portal are not endorsed by WHO, but are provided as a service to our users. In no event shall the World Health Organization be liable for any damages arising from the use of the information linked to in this section. None of the information obtained through use of the search portal should in any way be used in clinical care without consulting a physician or licensed health professional. WHO is not responsible for the accuracy, completeness and/or use made of the content displayed for any trial record.

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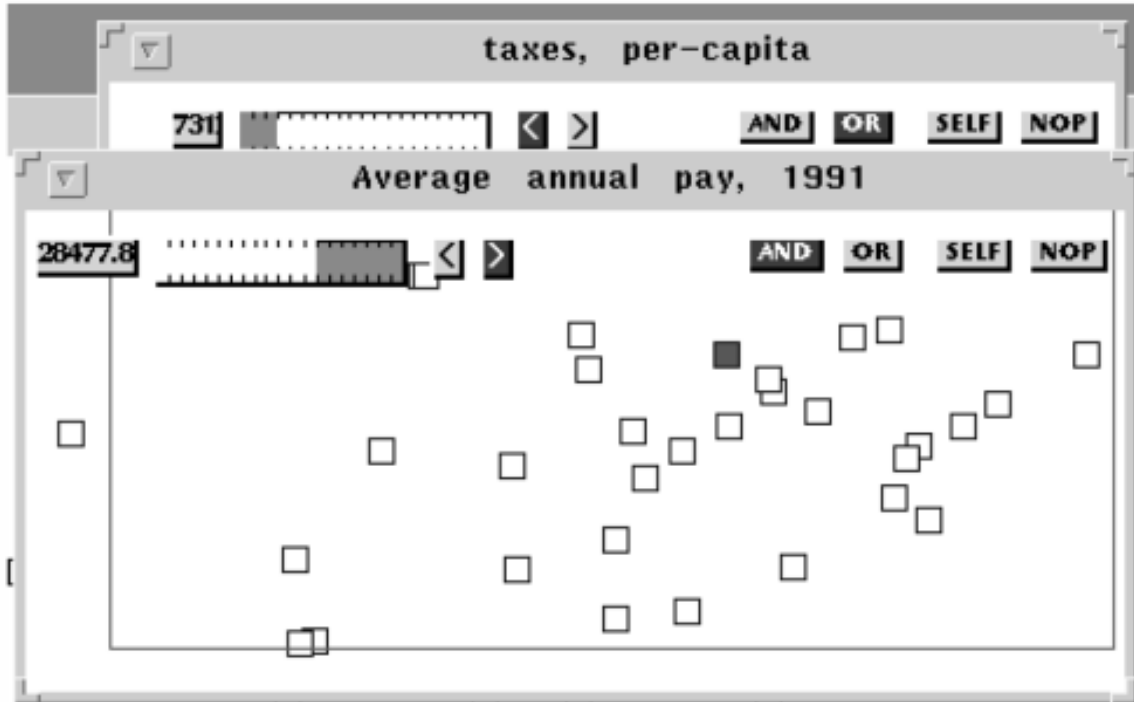
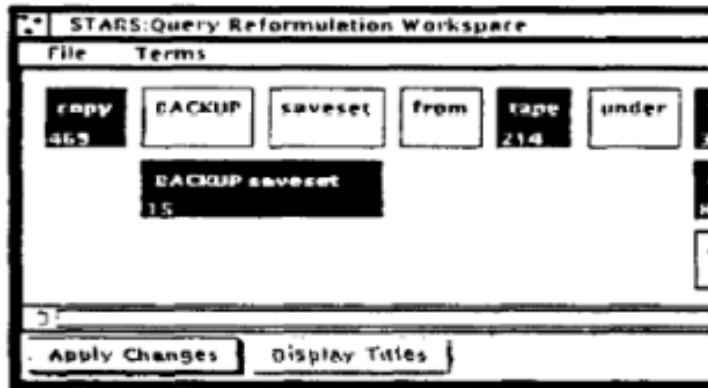
Learning from other disciplines

- Search strategies are:
 - Complex, logical constructs
 - Read many more times that they are written
 - Exhibit abstraction, modularity, encapsulation
 - Maintained, shared, optimised...
- *"For the IBM PC in the early 1980s, the software development process was text edit, compile, write down the errors, and debug with your eyes."*
 - The History of Visual Development Environments, <https://www.mendix.com/blog/the-history-of-visual-development-environments-imagine-theres-no-ides-its-difficult-if-you-try/>

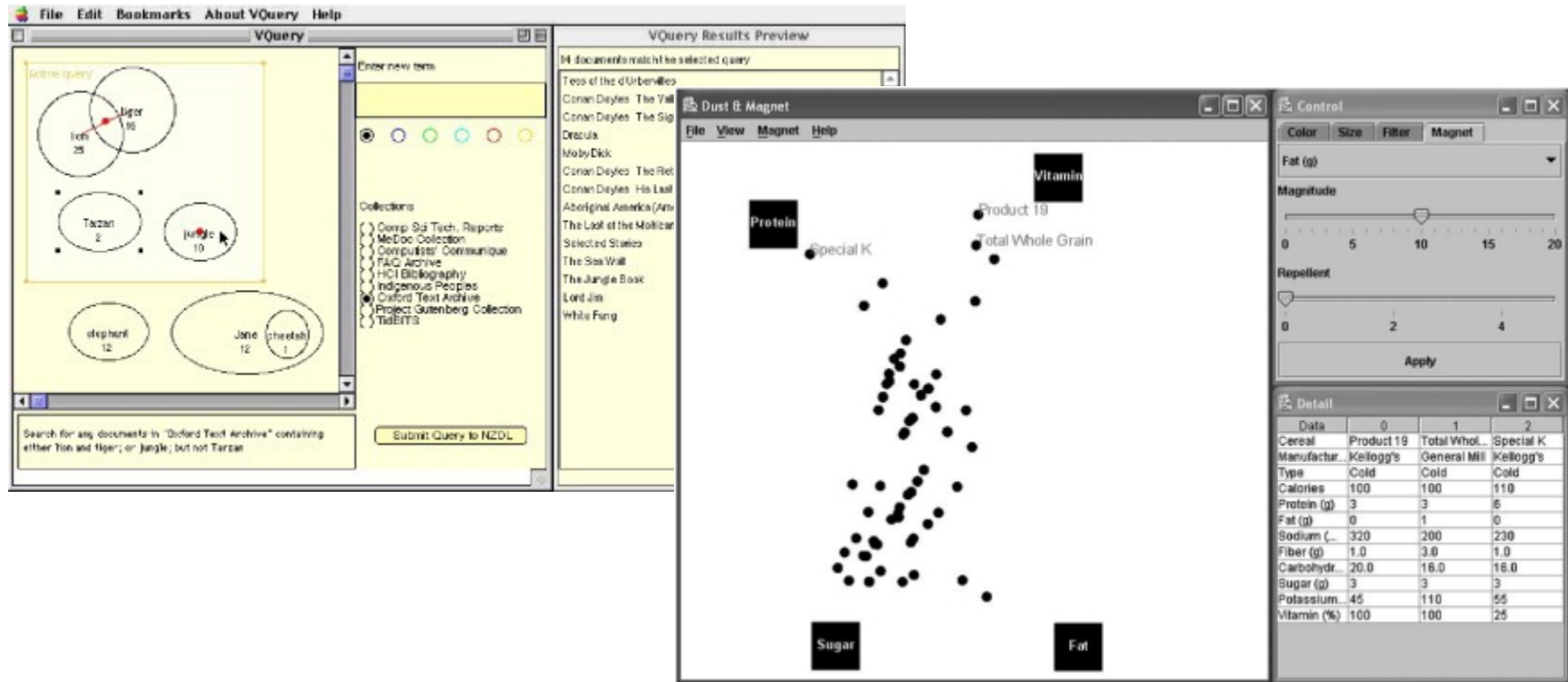
Thinking outside the search box

- What if we could *visualize* search strategies?
 - Use metaphors the user already understands
 - Separate keyword selection from query manipulation
 - Provide a 'scratchpad' & 'debugging aids'
 - Provide instant feedback
 - Support abstraction (levels of composition)
 - Provide query suggestions

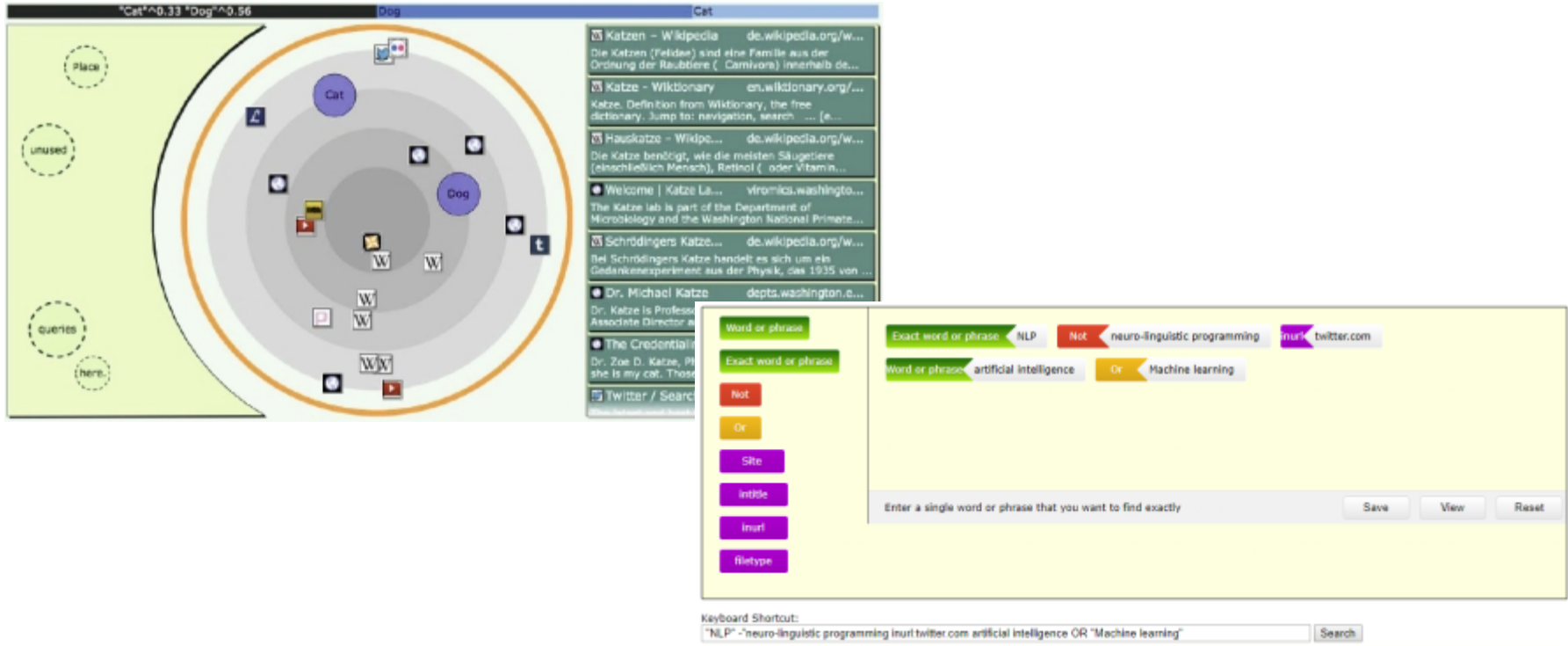
Anick et al (1989), Fishkin & Stone (1995)



Jones (1998), Yi et al (2005)

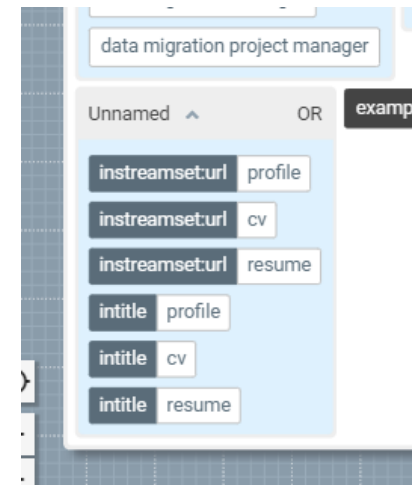
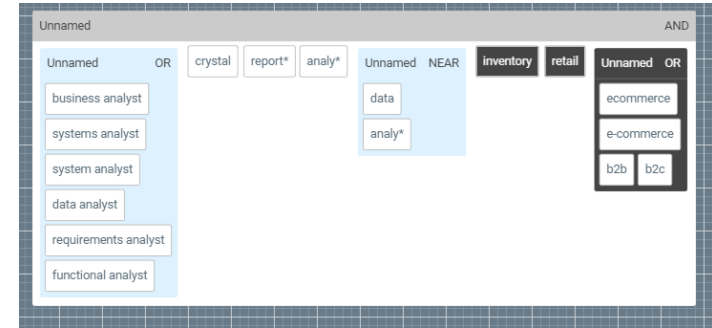


Nitsche & Nurnberger (2013), Boolify (2014?)



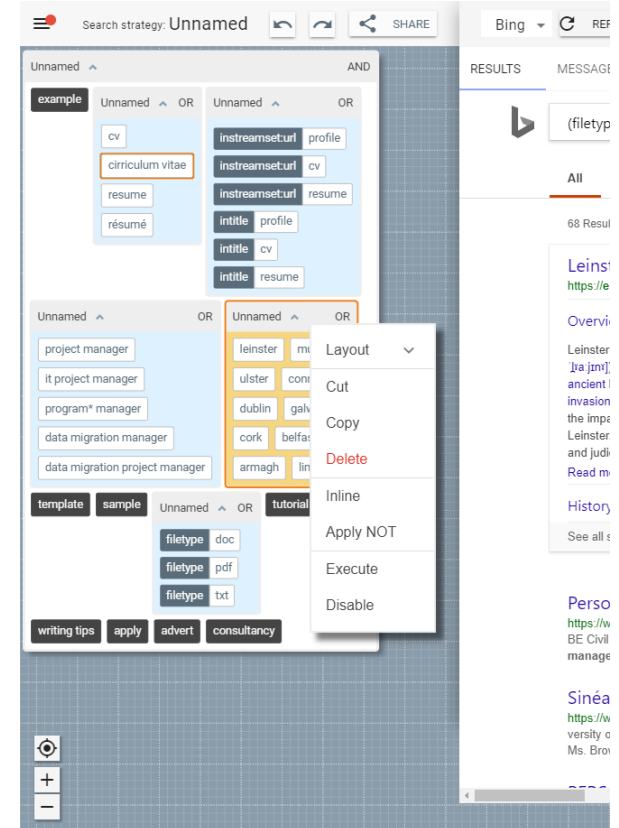
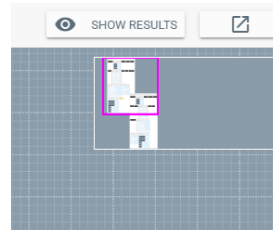
Query formulation

- Concepts are objects on a 2d canvas
- Relationships expressed via direct manipulation
 - Only syntactically correct expressions
 - Make the semantics transparent
 - Support arbitrary levels of abstraction
- Support platform-specific operators



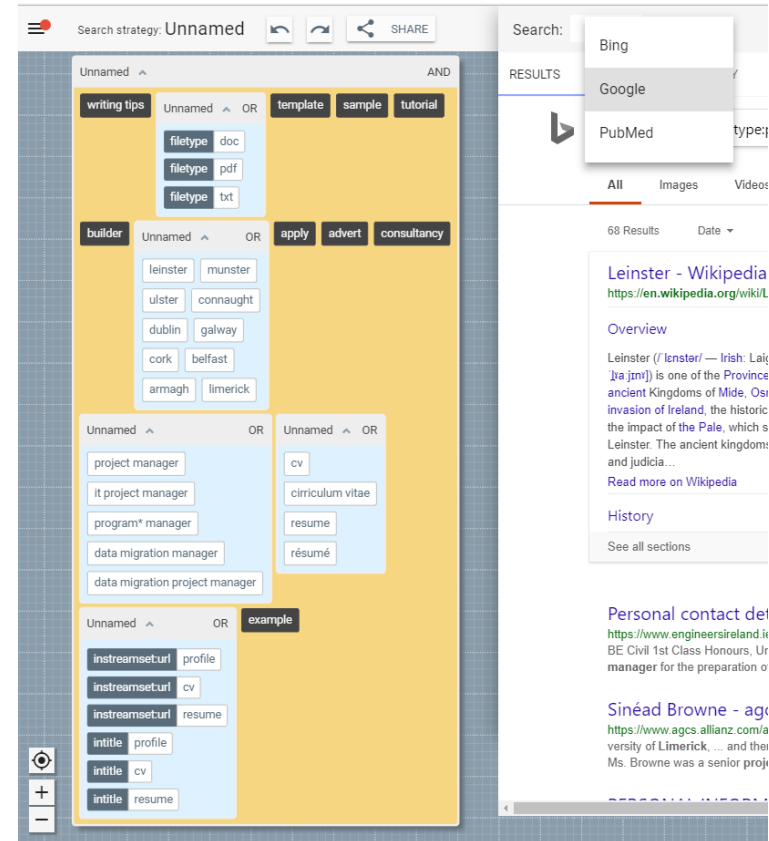
Query refinement

- Cut, copy, paste
- Single or multiple select
 - Lasso
- Undo / redo
- Mapping metaphor
 - Conceptual zoom
 - Overview+detail



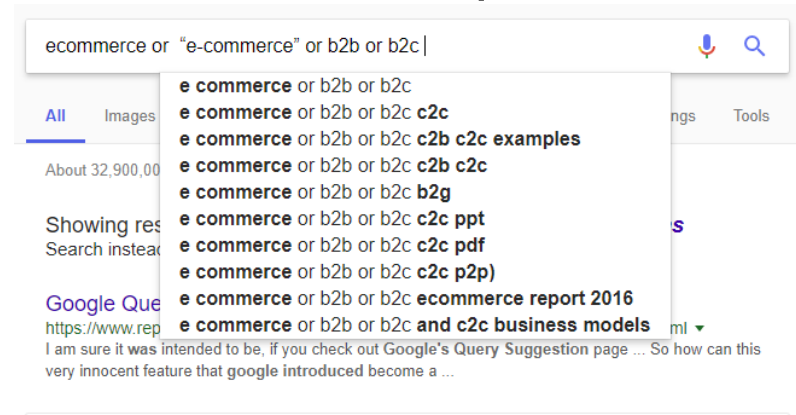
Executing queries

- Semantic layer:
 - Google, Bing, PubMed...
 - ...your DB?
- Universal representation?
 - Mappings may be ambiguous
- Boolean string I/O



But what about content?

- Term selection is common source of inefficiency & error
 - Apply query suggestions?



- *("business analyst" or "systems analyst" or "system analyst" or "data analyst" or "requirements analyst" or "functional analyst") and crystal and report* and analy* and data near analy* and not inventory and not retail and not (ecommerce or "e-commerce" or b2b or b2c)*

Suggestions in context

Search strategy: findUXjobs

Search Engine: Bing

RESULTS WARNINGS QUERY

Hide Results

Sign in

Language Region

My saves

Feedback

Think outside the search box - www.2usearch.com

Based on "Interaction design"

SELECT ALL

- ☐ Design
- ☐ Human-computer interaction
- ☐ ID
- ☐ Interaction cost
- ☐ Interaction Designer
- ☐ Interaction designer
- ☐ IxD
- ☐ Multimodal interaction
- ☐ Social interaction design
- ☐ SoftFace
- ☐ Technical communication
- ☐ Usability

CANCEL ADD SELECTED TERMS

Job sites OR

- site:dice.com
- site:cwjobs.co.uk
- site:monster.co.uk
- site:linkedin.com/jobs
- site:indeed.co.uk

Technical skills AND

- Interaction design
- HCI
- UX OR
- UX
- user experience
- user interface

Locations OR

- UK
- London
- Surrey

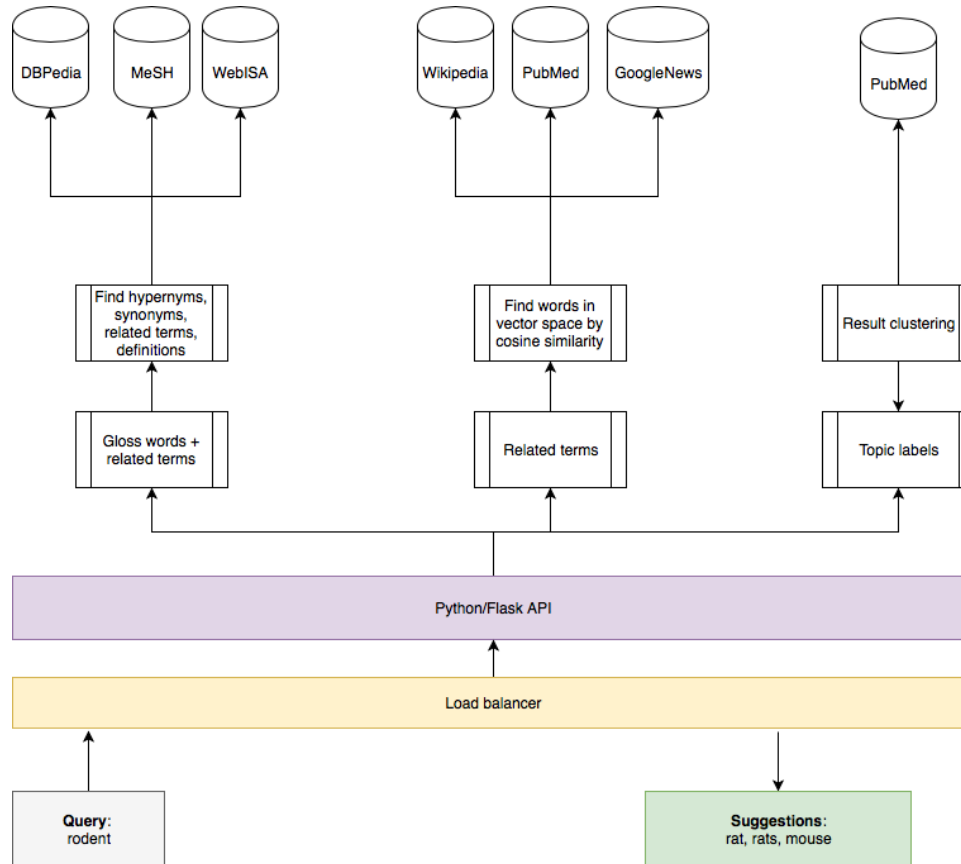
Roles OR

- architect
- designer
- researcher

Query suggestions

- No access to source documents(!)
- Various methods:
 - Global, ontology lookup
 - DBPEDIA, WEBISA, MeSH, etc.
 - Global, word embeddings
 - Wikipedia, GoogleNews, PubMed, bespoke
 - Local, document clustering
 - Carrot2 + PubMed search result snippets

NLP architecture



T.G. Russell-Rose and Phil Gooch, "2dSearch: a visual approach to search strategy formulation", Proceedings of DESIRES: Design of Experimental Search & Information REtrieval Systems, Bertinoro, Italy, 28-31 August 2018

Evaluation

- Query suggestion != query expansion
 - Relevance ranking less important
 - Terms are added to a specific (sub) expression
 - Need to consider individual candidate terms
- Methodology: can we (re)generate published strategies?
 - CLEF 2017 eHealth Lab

Evaluation (ontology terms)

Service	P	R	F
DBPEDIA	0.017	0.040	0.024
WEBISA	0.001	0.003	0.002
MeSH	0.045	0.012	0.019
BNF	0.002	0.001	0.001

Beel, J., & Langer, S. (2015, September). A comparison of offline evaluations, online evaluations, and user studies in the context of research-paper recommender systems. In International Conference on Theory and Practice of Digital Libraries (pp. 153-168). Springer, Cham.

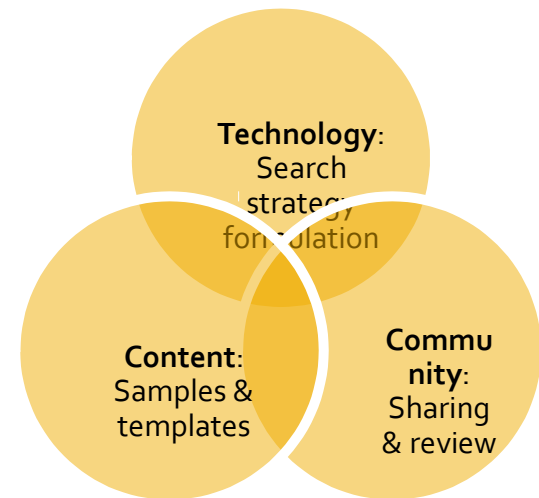
Evaluation (word embeddings)

Model	P	R	F
Word2vec (News)	0.016	0.025	0.019
GloVe (Wikipedia)	0.019	0.030	0.024
Word2vec (PubMed)	0.028	0.042	0.034
FastText (Wikipedia)	0.024	0.038	0.029
Word2vec (PubMed unigram)	0.031	0.047	0.037
Word2vec (PubMed trigram)	0.035	0.052	0.042

T.G. Russell-Rose and Phil Gooch, "2dSearch: a visual approach to search strategy formulation",
Proceedings of DESIRES: Design of Experimental Search & Information REtrieval Systems, Bertinoro,
Italy, 28-31 August 2018

But what about content (reuse)?

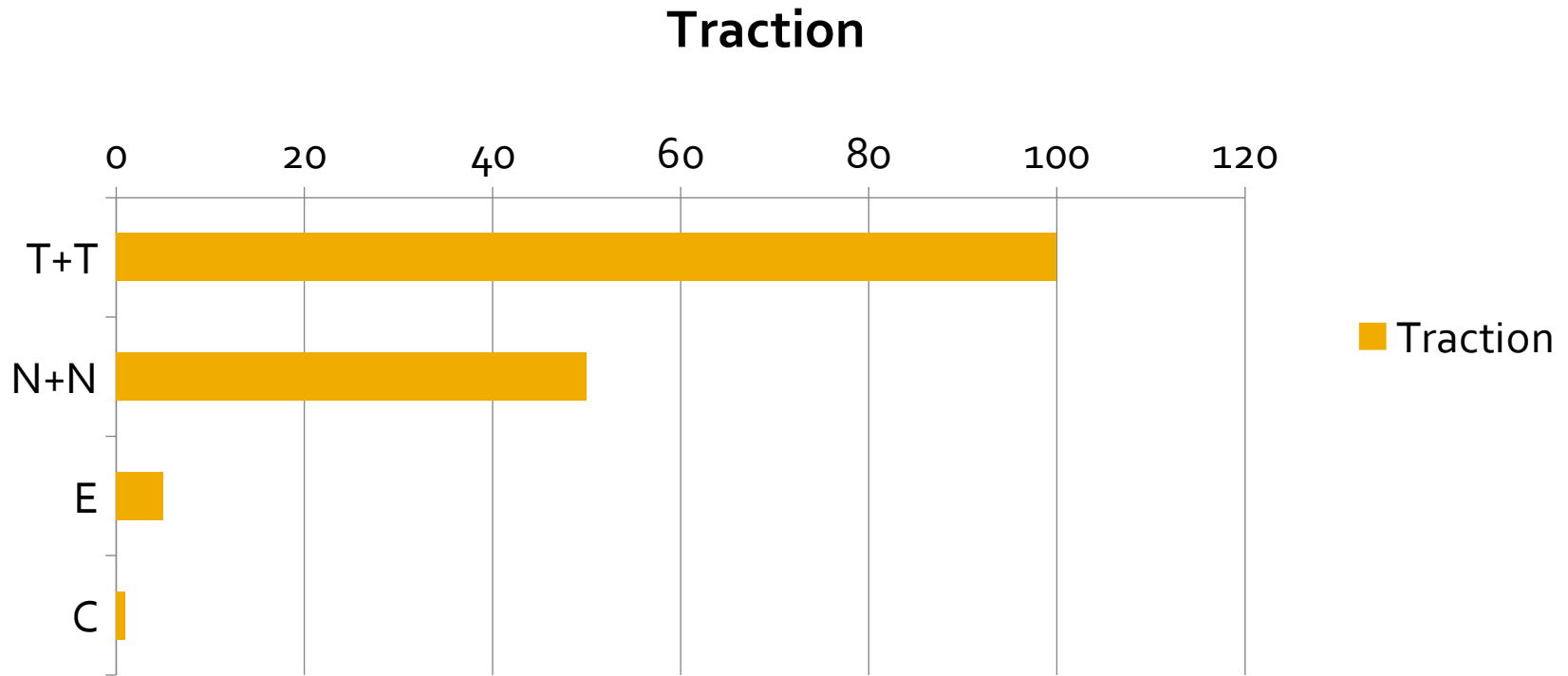
- Open content repository:
 - Templates and best practices
 - Library of shared strategies (aka 'GitHub')
 - Community of practice (aka 'SO')



But the hardest part...

- If you build it, they won't come
 - *"Most startups don't fail at building a product. Most startups fail at getting traction"*
 - Gabriel Weinberg

A taxonomy of traction ...



But the hardest part...

- What is 'it' anyway?
 - Pick a problem small enough to solve (and ignore the rest)
- Having competitors is GOOD
 - Proof of market
 - Promotes awareness of the problem/solution
 - Helps you identify what else you need to complete the product
 - Gives a realistic pricing model

Further work

- Formal user-centric evaluation
 - App in context (e.g. vs traditional query builder)
 - Quality of query suggestions
- R&D projects:
 - (semi) automated strategy translation
 - (semi) automated strategy generation (from job specs)
 - Combining set retrieval with ranked retrieval
 - De-duping, optimising, comparing...

Summary

- Reimagining 'advanced search'
 - Eliminate syntactic error
 - Make semantics transparent
 - Provide support for reuse, optimisation, best practice
- Looking for:
 - Early adopters, R&D collaborations
 - Evaluation partners
- Try it out: <https://www.2dsearch.com>

Thank you

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