

Think outside the search box

Dr. Tony Russell-Rose FBCS CITP CEng

uxlabs



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 toddlers\$ or adolescens\$ 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...

[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 Intitle: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 ...

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|-aab0|-4d95|-a83b|-28b2decd90oc" AND (topic:"bag42587|-854e|-407d|-81dc|-812ee29624,bd" OR topic:"805a2281|-8f04|-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:"Alexander McQueen" 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:"Conde 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:"Bridgpoint" 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:"Bridgpoint" 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

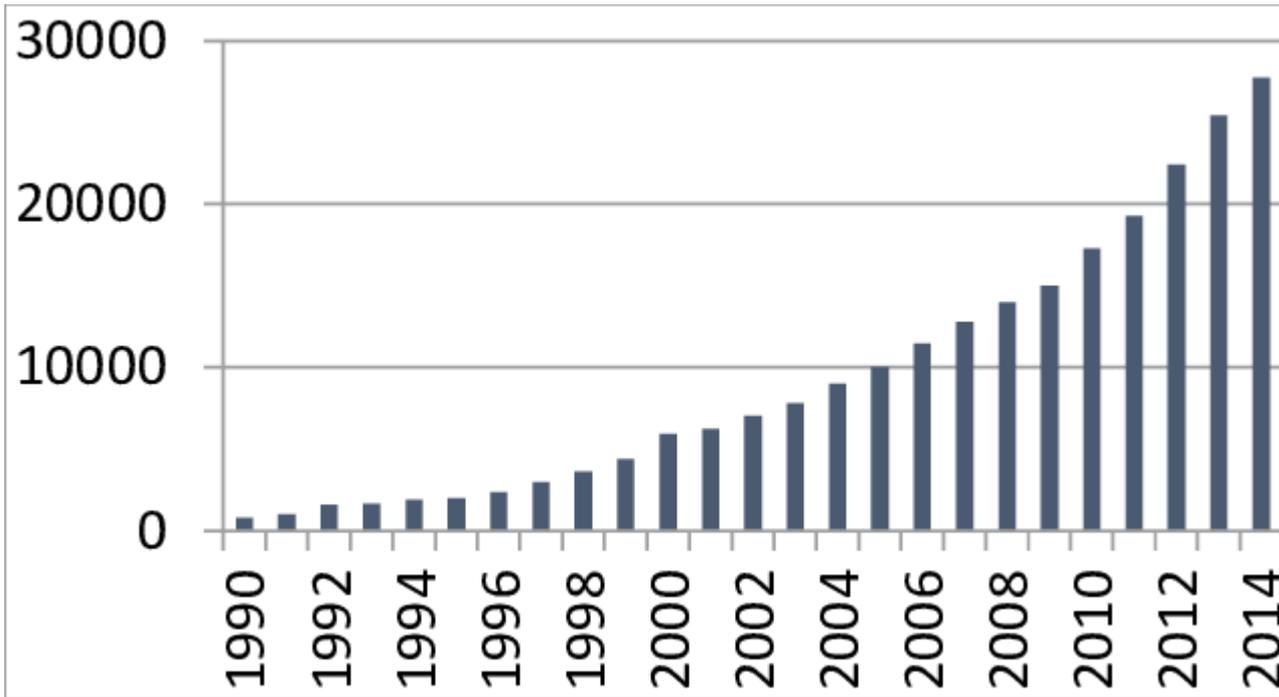
Professional search

- 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

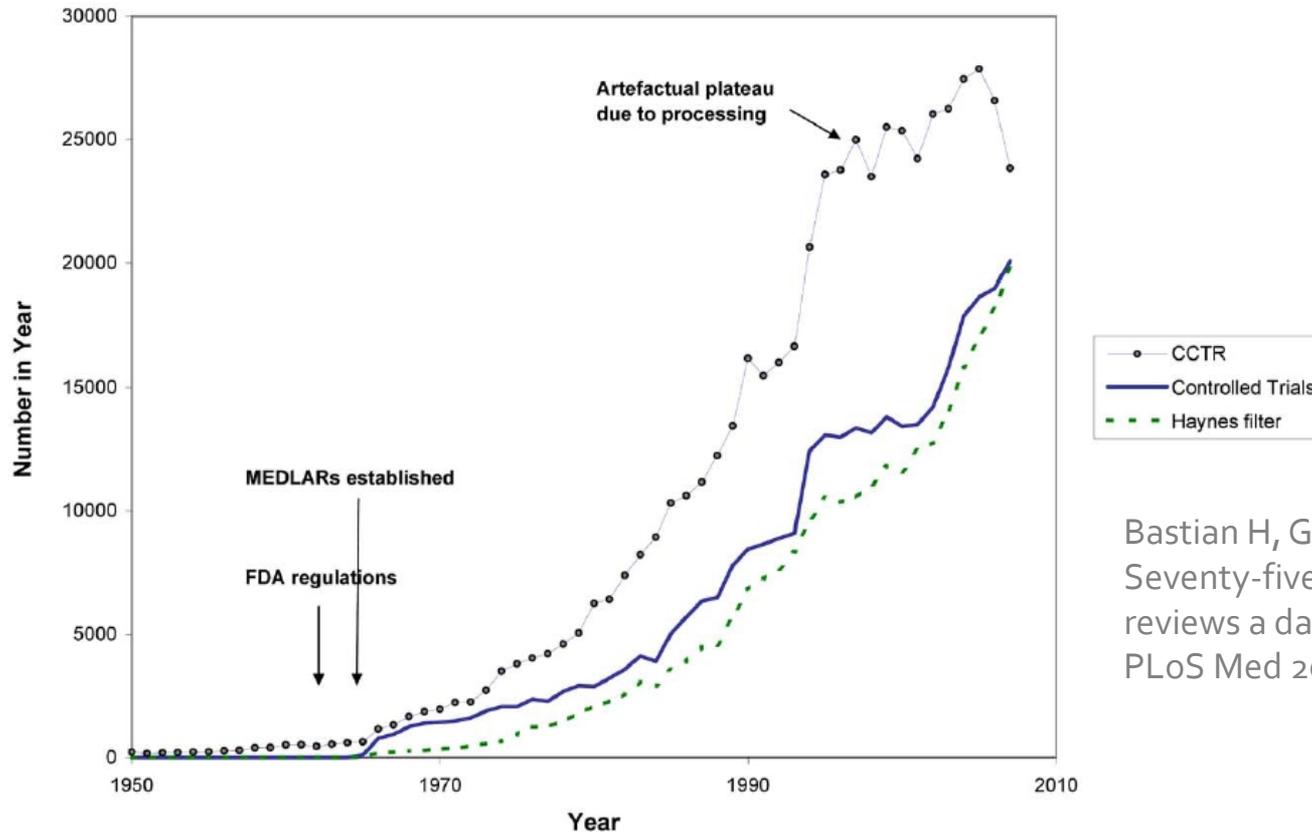
- Evidence based medicine
- *"A systematic review summarises the results of healthcare studies (controlled trials) and provides a high level of evidence on the effectiveness of healthcare interventions. Judgments may be made about the evidence and inform recommendations for healthcare."*
- Cochrane Consumer 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?



INTERNATIONAL CLINICAL TRIALS REGISTRY PLATFORM SEARCH PORTAL

Home Advanced Search

Fields can be left blank

Look for trials with

AND Example

AND Example

AND Example

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

[Countries of recruitment](#) are

[Date of registration](#) is between

[Primary sponsor](#) is or contains

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[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

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

Example: liver cancer OR

Example: Diphtheria NOT tel

Example: transplant AND im

Search for [clinical trials in children](#)

[Recruitment status](#) is

Recruiting

[Primary sponsor](#) is or contains

[Secondary ID](#) is or contains

[Countries of recruitment](#) are

Afghanistan
Albania
Algeria
American Samoa

Add country and/or territory

Clear

[Date of registration](#) is between



and



Sort by [Date of Registration](#)

Search

Clear

[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.

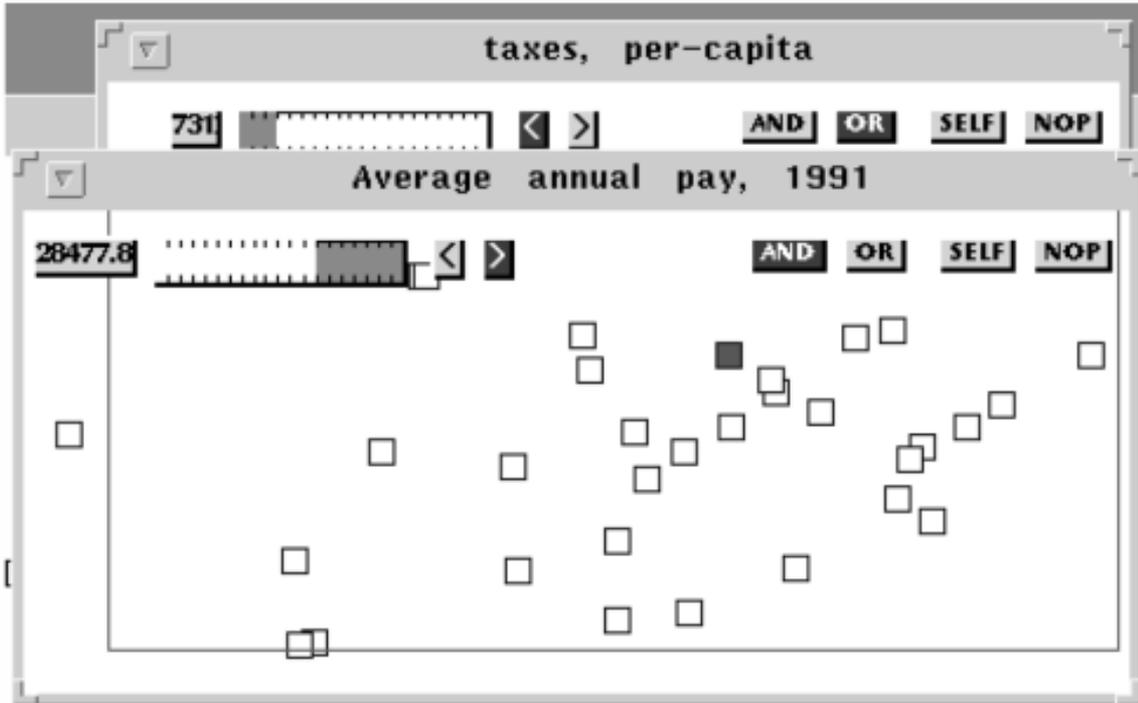
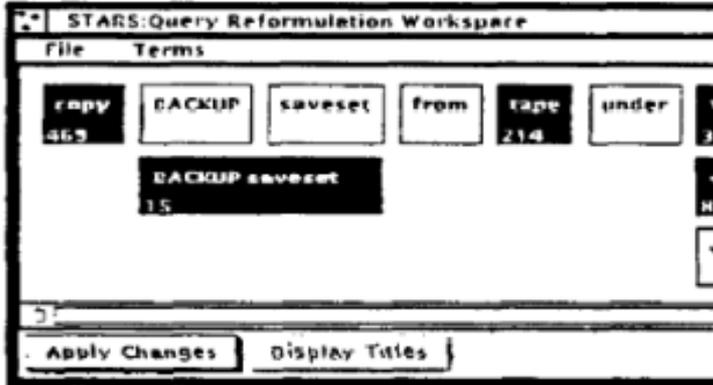
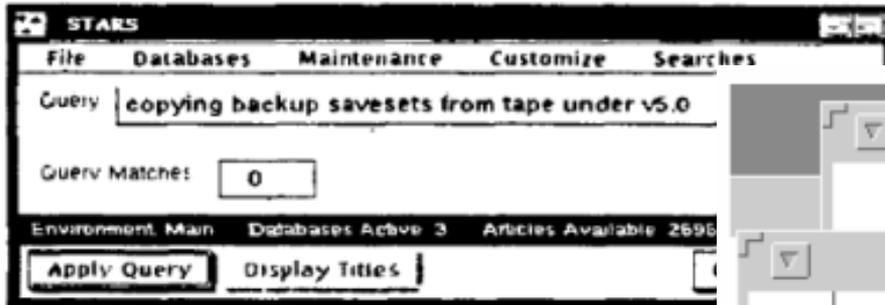
Learning from other disciplines

- Search strategies are:
 - Complex, logical constructs
 - Read many more times than 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)

The screenshot displays the VQuery interface, which is used for visualizing and executing queries. The main window is divided into several sections:

- VQuery:** Contains a query diagram with nodes labeled 'Iron 25', 'Dijor 10', 'Tazan 2', 'Jungle 10', 'stephanf 12', and 'Jane 12 (cheedah) 1'. Below the diagram is a search box with the text: "Search for any documents in 'Oxford Text Archive' containing either 'Iron and Dijor'; or 'Jungle', but not 'Tazan'". A "Submit Query to NZDL" button is also present.
- VQuery Results Preview:** Shows a list of 14 documents matching the query, including titles like "Tees of the d'Urbanilles", "Conan Doyle: The Yell", "Conan Doyle: The Sig", "Dracula", "Moby Dick", "Conan Doyle: The Red", "Conan Doyle: His Last", "Aboriginal America (Am)", "The Look of the Molecule", "Selected Stories", "The Sea Wall", "The Jungle Book", "Lord Jim", and "White Fang".
- Dust & Magnet:** A visualization window showing a scatter plot of search results. The plot is titled "Dust & Magnet" and has a menu with "File", "View", "Magnet", and "Help". The plot shows a cluster of black dots representing search results. Several labels are placed around the plot: "Protein", "Special K", "Vitamin", "Product 19", "Total Whole Grain", "Sugar", and "Fat".
- Control:** A control panel with tabs for "Color", "Size", "Filter", and "Magnet". It includes a "Fat (g)" dropdown menu, a "Magnitude" slider (0 to 20), and a "Repetent" slider (0 to 4). An "Apply" button is located below the sliders.
- Detail:** A table showing details for the search results. The table has columns for "Data", "0", "1", and "2".

Data	0	1	2
Cereal	Product 19	Total Whol...	Special K
Manufacturer	Kellogg's	General Mil...	Kellogg's
Type	Cold	Cold	Cold
Calories	100	100	110
Protein (g)	3	3	6
Fat (g)	0	1	0
Sodium (...)	320	200	230
Fiber (g)	1.0	3.0	1.0
Carbohydr...	20.0	16.0	16.0
Sugar (g)	3	3	3
Potassium...	45	110	55
Vitamin (%)	100	100	25

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

The image shows a screenshot of the 2dsearch.com interface. On the left, a circular search space is displayed with concentric rings. The outermost ring is labeled "Place", the middle ring "unused", and the innermost ring "queries". The search space contains several icons, including a blue circle labeled "Cat", a blue circle labeled "Dog", and various social media icons like YouTube, Facebook, and Twitter. A search bar at the top left shows the query "Cat^0.33 Dog^0.56".

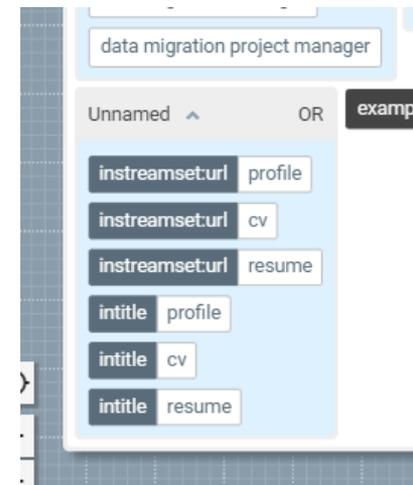
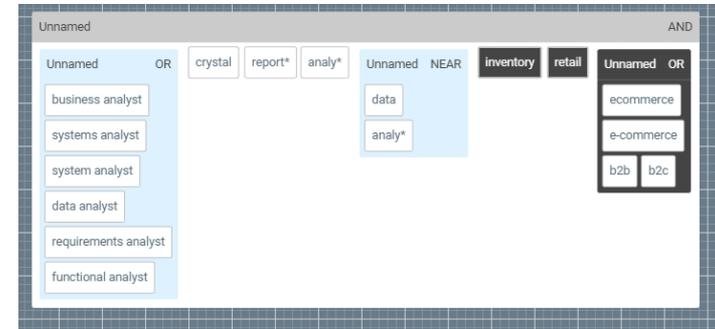
On the right, a search results panel is visible, listing several search results for "Cat". The results include:

- Katzen - Wikipedia
- Katze - Wiktionary
- Hauskatze - Wikipe...
- Welcome | Katze La...
- Schrödingers Katze...
- Dr. Michael Katze
- The Credentiali...

Below the search results, a search interface is shown with a search bar and several buttons: "Exact word or phrase", "Word or phrase", "Not", "Or", "Site", "Intitle", "Inurl", and "Filetype". The search bar contains the query: "NLP" -neuro-linguistic programming inurltwitter.com artificial intelligence OR "Machine learning".

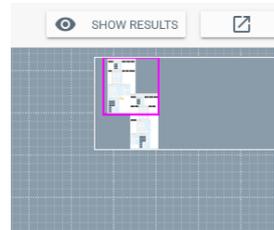
Query formulation

- 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



Search strategy: Unnamed

Unnamed ^ AND

example Unnamed ^ OR Unnamed ^ OR

- cv
- circiculum vitae
- resume
- résumé

instreamset:url profile

instreamset:url cv

instreamset:url resume

intitle profile

intitle cv

intitle resume

Unnamed ^ OR Unnamed ^ OR

- project manager
- it project manager
- program* manager
- data migration manager
- data migration project manager

leinster mi

ulster con

dublin gal

cork belfa

armagh lin

template sample Unnamed ^ OR tutorial

- filetype doc
- filetype pdf
- filetype txt

writing tips apply advert consultancy

Layout

Cut

Copy

Delete

Inline

Apply NOT

Execute

Disable

RESULTS MESSAGE

(filetyp

All

68 Result

Leins' https://e

Overvi

Leinster [ˈaɪˈlɪnɪ]ː ancient I invasion the imp Leinster and judi Read m

History

See all s

Perso https://w BE Civil manage

Sinea https://w versity c Ms. Bron

Executing queries

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

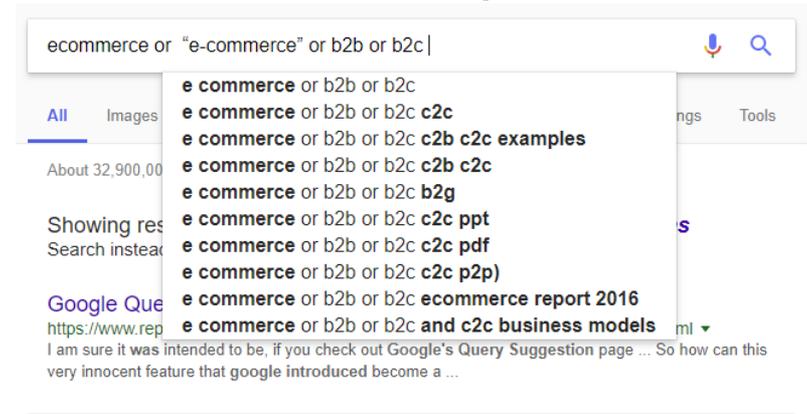
The screenshot displays a search engine interface with a query builder on the left and search results on the right. The query builder is titled "Unnamed" and shows a search strategy of "AND". It contains several query blocks:

- writing tips**: filetype doc, filetype pdf, filetype txt
- builder**: leinster, munster, ulster, connaught, dublin, galway, cork, belfast, armagh, limerick
- Unnamed**: project manager, it project manager, program* manager, data migration manager, data migration project manager
- Unnamed**: cv, curriculum vitae, resume, résumé
- Unnamed**: instreamset:url profile, instreamset:url cv, instreamset:url resume
- intitle**: profile, cv, resume

The search results on the right show a search for "Leinster - Wikipedia" with 68 results. The first result is "Leinster - Wikipedia" with the URL <https://en.wikipedia.org/wiki/Leinster>. The overview section states: "Leinster (/ˈlɛnstər/ — Irish: *Laidh na Iomhann*) is one of the Province ancient Kingdoms of Mide, Osi invasion of Ireland, the historic the impact of the Pale, which is Leinster. The ancient Kingdoms and judicia...". The history section is also visible.

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

Interaction design" ("user experience" OR UX)

Sign in

Language Region

Designer telecommunications Jobs in

Jobs/q-ui-designer-visual-designer...

Designer telecommunications jobs in London available on

Designer visual designer telecommunications job in ...

ping - monster.co.uk

Jobs/q-creative-jobs-l-epping-home...

available on Monster. Apply now for the Creative job in

About our ads Help Feedback European Data Protection

Feedback

Suggestions

Based on "Interaction design"

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

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

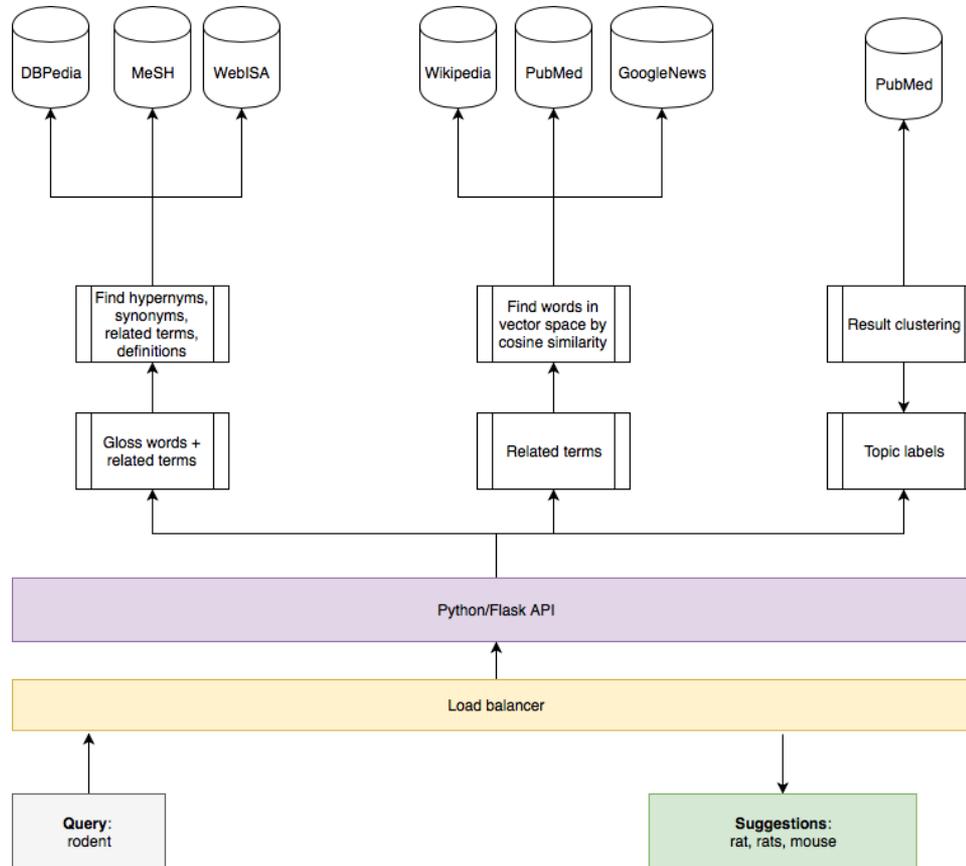
Roles OR

- 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.

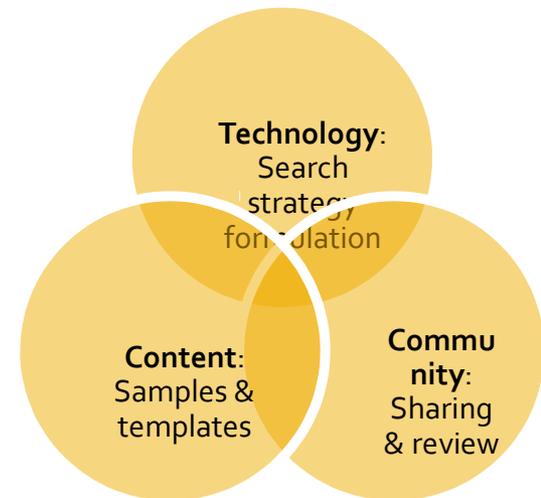
Evaluation (word embeddings)

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)?

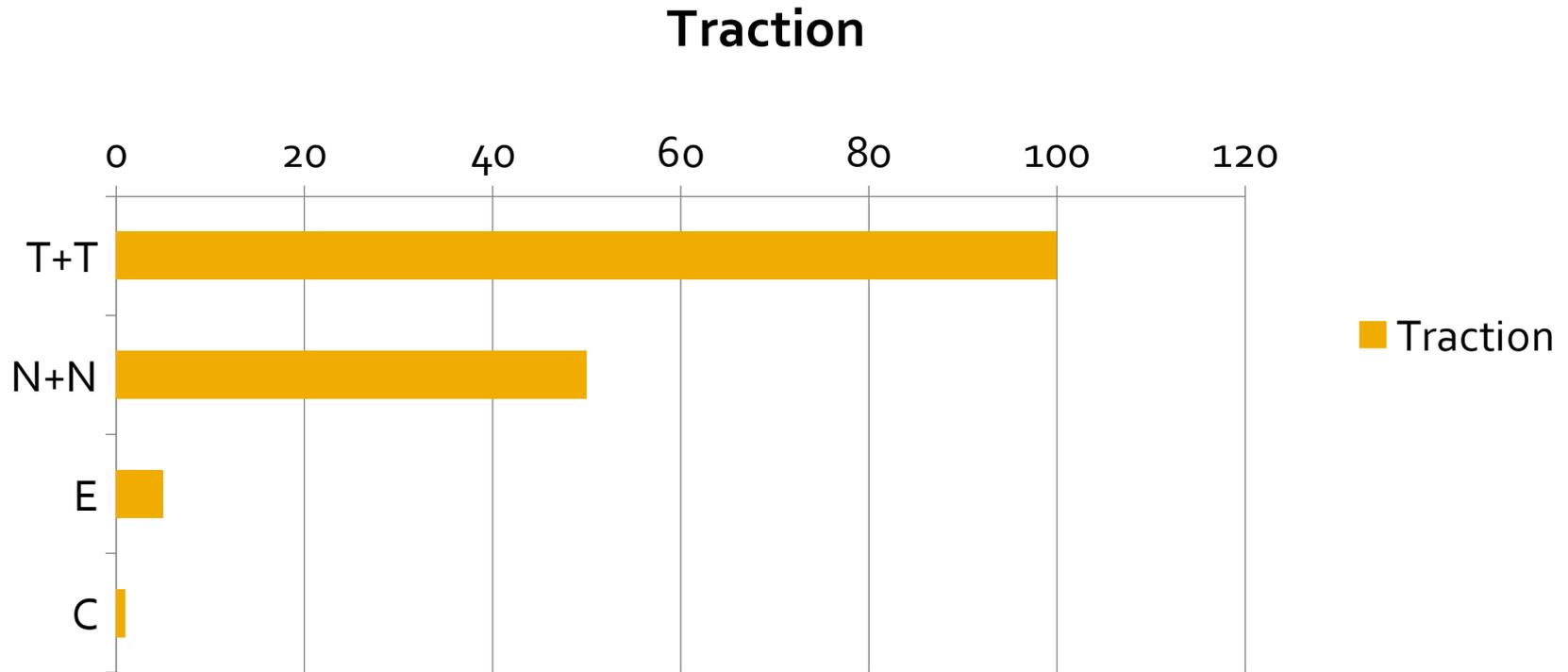
- Open content repository:
 - Templates and best practices
 - Library of shared strategies (aka 'GitHub')
 - Community of practice (aka 'SO')



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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