





Mission Statement:

Accelerate the speed and quality of scientific discovery innovation and healthcare outcomes

“We shorten the distance between questions and answers”



ACCESSING SCIENTIFIC HEALTH INFORMATION

Quotes From Research Experts:

Pfizer's David de Graff estimates that "\$18 billion is spent per year on compounds that never reach market, while \$30 billion is spent reinventing what is in the literature".

Biogen-Idec's William Hayes estimated that "1 in 4 projects undergo attrition for reasons already documented in a body of literature costing roughly \$1 trillion in the past 15 years".

WHERE SCIENTIFIC KNOWLEDGE LIVES

National Library of Medicine - MEDLINE

- ❖ World's largest biomedical & healthcare research library
- ❖ Used by over 90% of researchers & healthcare professionals
- ❖ Over 28 million scientific publications references
- ❖ 90 million unique users & 1.2 billion searches annually
- ❖ 2.4 million biomedical terms indexed in the MeSH catalog
- ❖ 180 biomedical, life science, & healthcare term vocabularies integrated into the UMLS Meta-Thesaurus

THE INDUSTRY CHALLENGE

Accessing Relevant Scientific Health Information



Term searches produces a huge lists of publications for review



Publications are primarily organized by date and term relevance



Limited scientific cataloging of related biomedical and health terms



User must read abstracts and publications to determine relevance



Awareness of medical term relationships within publications requires users to read, evaluate and annotate search results

PUBMED SEARCH FOR HEADACHE EXAMPLE



National Library of Medicine
National Center for Biotechnology Information

Log in



headache



Search

Advanced Create alert Create RSS

User Guide

Save

Email

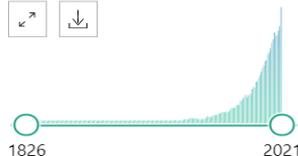
Send to

Sorted by: Best match

Display options

MY NCBI FILTERS

RESULTS BY YEAR



TEXT AVAILABILITY

- Abstract
- Free full text
- Full text

ARTICLE ATTRIBUTE

- Associated data

ARTICLE TYPE

- Books and Documents
- Clinical Trial
- Meta-Analysis
- Randomized Controlled Trial
- Review
- Systematic Review

PUBLICATION DATE

101,997 results

[Headache: classification and diagnosis].

1 Carbaat PA, Couturier EG.

Cite Ned Tijdschr Tandheelkd. 2016 Nov;123(11):539-544. doi: 10.5177/ntvt.2016.11.16122.
PMID: 27834408 Review. Dutch.

Share There are many types of **headache** and, moreover, many people have different types of **headache** at the same time. ...This classification is based on a distinction between primary and secondary **headaches**. The most common primary **headache** types are the tens ...

Headache in the elderly.

2 Kaniecki RG, Levin AD.

Cite Handb Clin Neurol. 2019;167:511-528. doi: 10.1016/B978-0-12-804766-8.00028-5.
PMID: 31753152 Review.

Share **Headache** is the most common neurologic symptom and affects nearly half the world's population at any given time. ...Secondary **headaches** are defined by their suspected etiology. A higher index of suspicion for a secondary **headache** disorder is warranted ...

Headache Diagnosis in Children and Adolescents.

3 Dao JM, Qubty W.

Cite Curr Pain Headache Rep. 2018 Feb 23;22(3):17. doi: 10.1007/s11916-018-0675-7.
PMID: 29476266 Review.

Share PURPOSE OF REVIEW: **Headache** phenotypes can differ between adults and children. While most **headaches** are due to primary **headache** disorders, in a small population, they can be an indication of a potentially life-threatening neurologic condition. The challenge I ...

Childhood Headache: A Brief Review.

4 Blume HK.

Cite Pediatr Ann. 2017 Apr 1;46(4):e155-e165. doi: 10.3928/19382359-20170321-02.
PMID: 28414397 Review.

Share Providers need to be able to identify "red flags" for worrisome causes of secondary **headaches** and recognize typical primary **headache** characteristics to provide each patient with the best possible care to

Feedback

Prior Research Prototype

Concept Search:
Search Back Forward

History

Headache

Search - Headache

Page 1 of 2061 [Next](#)

1: [Gracia-Haya M, Latasa-Imenez AM, Riso-Gomez C, Santos-Lasosa S, Mauri JA, Sanchez-Valente S, Lopez E.](#)
[Topiramate in chronic daily headache due to migraine.]
Rev Neurol. 2007 Oct 16;31(45):456-9. Spanish. PMID: 17948210 [PubMed - in process]

2: [Hakeem A, Marks AD, Bhatti S, Chang SM.](#)
When the Worst Headache Becomes the Worst Heartache!
Stroke. 2007 Oct 18. [Epub ahead of print] PMID: 17947597 [PubMed - as supplied by publisher]

3: [Bajbouj S, Richardson PG, Lacy MQ, Dispenzieri A, Greipp PR, Witzig TE, Schlossman R, Sider CE, Anderson KC, Gertz MA.](#)
Novel therapy with 2-methoxyestradiol for the treatment of relapsed and plateau phase multiple myeloma.
Clin Cancer Res. 2007 Oct 15;13(20):6162-7. PMID: 17947482 [PubMed - in process]

4: [Albayram S, Klic F, Ozer H, Baghaki S, Kocer N, Isik C.](#)
Gadolinium-Enhanced MR Cisternography to Evaluate Dural Leaks in Intracranial Hypotension Syndrome.
AJNR Am J Neuroradiol. 2007 Oct 18. [Epub ahead of print] PMID: 17947334 [PubMed - as supplied by publisher]

Legend

● UMLS relationships between Concepts

● MeSH subcategories for Co-occurring Concepts in the Published Literature

User Options

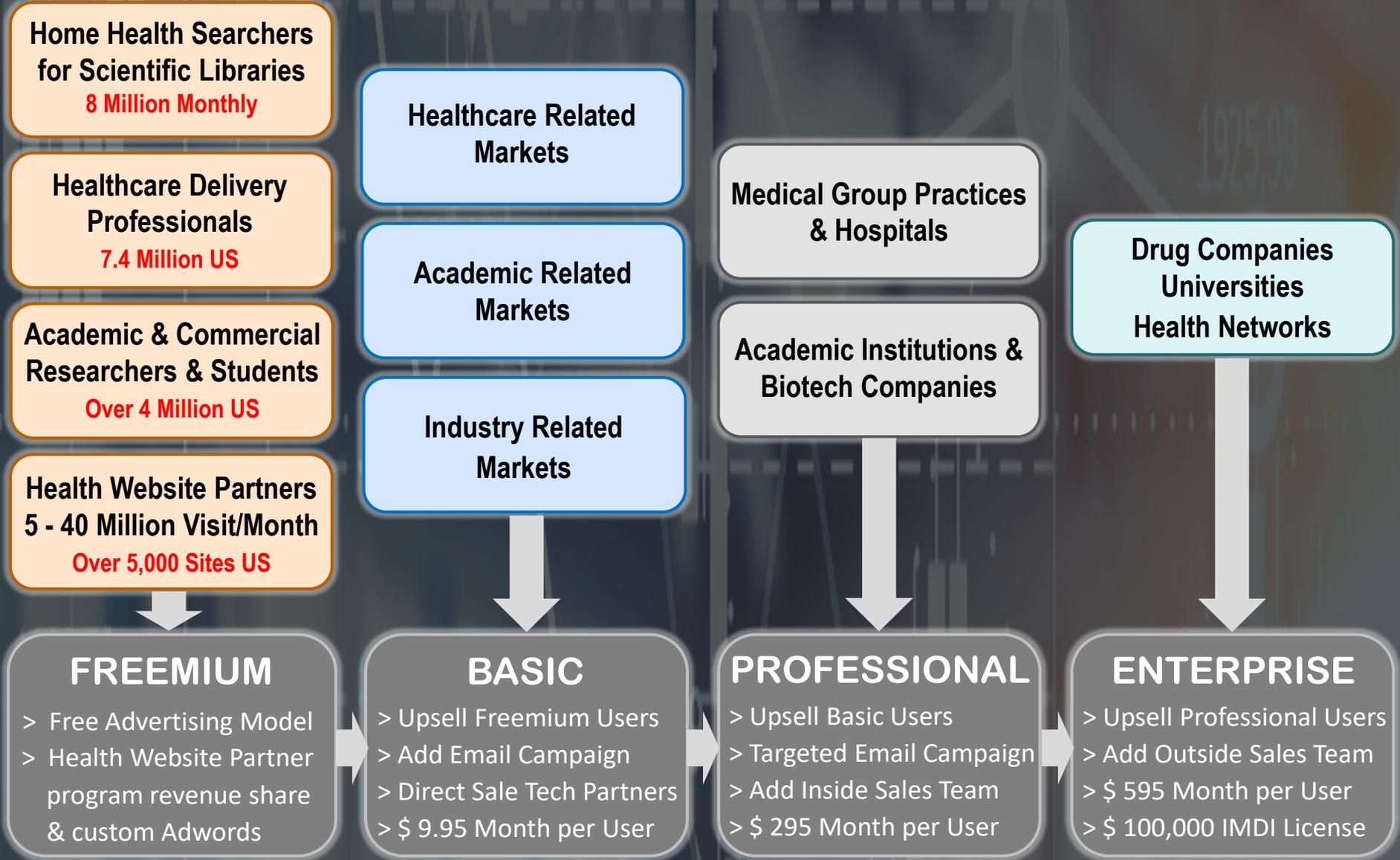
[Click Here to Run Demo Video](#)

FREEMIUM ADVERTISING REVENUE STREAM

The screenshot displays a 'Concept Search' interface. On the left, a network graph shows 'Headache' as a central node, with various related terms branching out, including 'Academic Medical Careers', 'Occupational Accident', 'Health Care Facilities, Manpower, and Services', 'Psychological Phenomena and Processes', 'Spontaneous abortion', 'Female Urogenital Diseases and Pregnancy Complications', 'Musculoskeletal, Neural, and Ocular Physiology', 'Dental headache', 'Cluster Headache', 'Facial Pain', 'Aural headache', 'Tension Headache', 'Posture headache', 'Nasal headache', 'Ocular Headache', 'Post-Traumatic Headache', and 'Snus headache'. A red circle highlights the term 'Acetaminophen' in the 'Nervous System' branch. On the right, a search results page shows 'Page 1 of 2061' and four search results. Each result is accompanied by a Google Ad: Ad #4 (Topiramate in chronic daily headache), Ad #5 (When the Worst Headache Becomes the Worst Heartache!), and Ad #6 (Gadolinium-Enhanced MR Cisternography to Evaluate Dural Leaks). A large red circle encompasses the search results and the three Google Ad boxes.

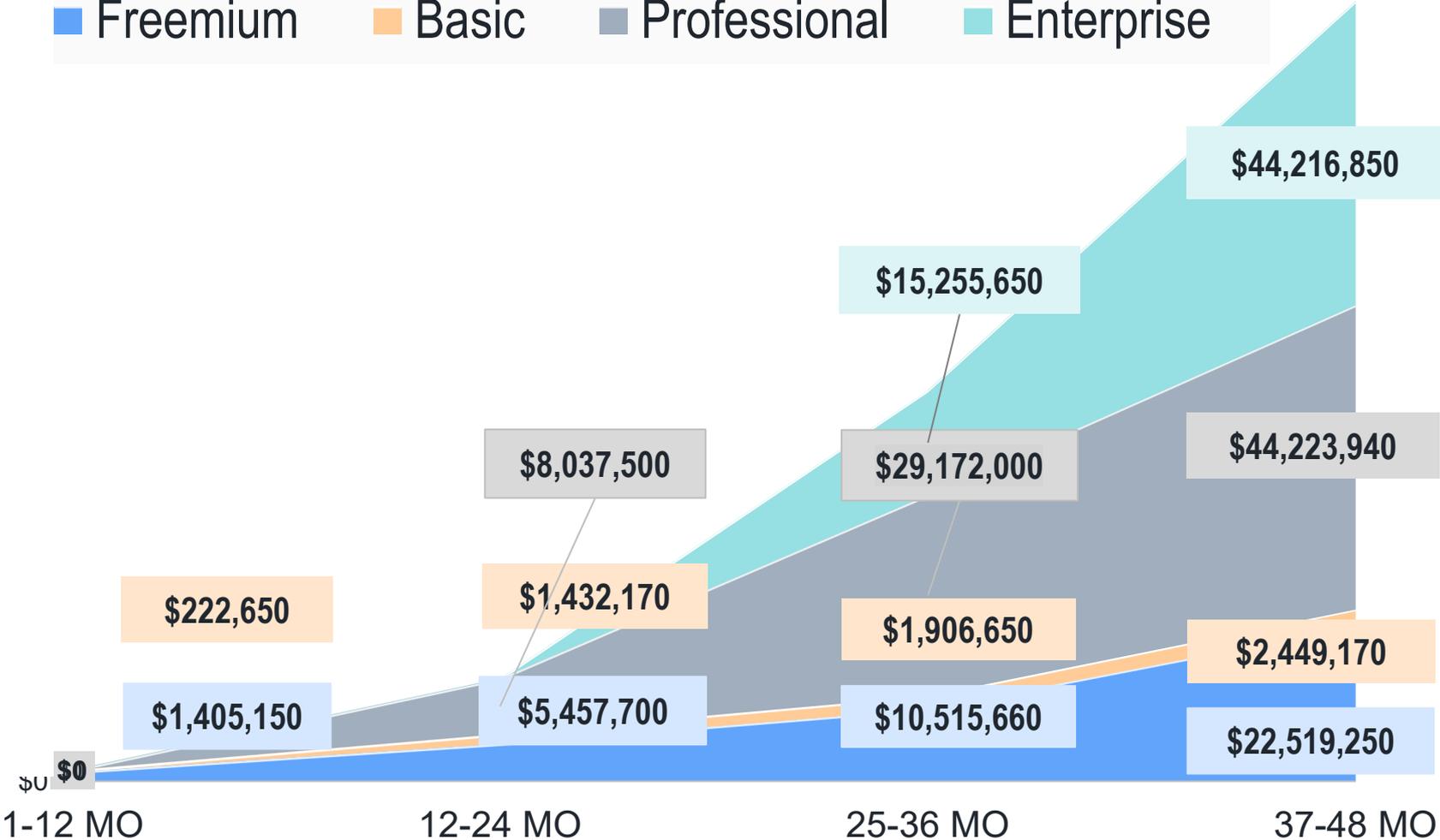
User clicks a related term or interest generating a new term graph with related terms and updated publications plus 3 new ads from Google. New ad presentation pages repeat with each new user term navigation click.

PRODUCTS & MARKETS



GROSS SALES PROJECTIONS

■ Freemium ■ Basic ■ Professional ■ Enterprise



COMPETITIVE TECHNOLOGY SPECTRUM

Freemium

Basic

Professional

Enterprise

↑ Cost

→ Capability

MEDLINE
PubMed

Google
Scholar

Elsevier
Science Direct

Linguamatics
I2E Content Store

Linguamatics
I2E NLP Platform

Cambridge
Semantics

IBM KnIT p53
Discovery

CAPITALIZATION STRATEGY

\$1,500,000

Convertible Notes Seed

\$250,000 issued to Kiwitech

\$4,500,000

Series A Private Placement
Memorandum

Use of Funds



App Development Cost for
Freemium & Basic version



Acquisition of Freemium
customers & web Partners
for marketing & upsales



Patent legal filings &
technology documentation



Staff & Operations initial
ramp up sales, marketing,
support, & infrastructure



Formalizing technology
product plan for Profiler
Basic, Mobile, Profiler
Professional & Enterprise
development

Future development will be financed through revenues earned after initial Freemium launch and Series A creating a sustainable growth model

BIOCAID TEAM



Tony Prestigiacom
Founder, CEO

A published researcher with an active portfolio of patents whose experience bridges academic, governmental and commercial R&D.



Rajnish Gupta
Chief Technology

A technologist with deep experience in healthcare informatics, enabling enterprise-wide solutions through technology, innovation, and product management.



Karen Rands
Finance & Development

Deep experience with translating technology innovation and entrepreneurship opportunities into business opportunities for private placement.



Scott Wold
Sales & Marketing

Results-driven leader with expertise and proven track record in sales, marketing and business development

BIOCAID PARTNERS



INCEPTION PROGRAM

See Patents and Publications at:

<https://independent.academia.edu/tonypresti>



QUESTIONS AND FOLLOW UP

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www.biocaid.com

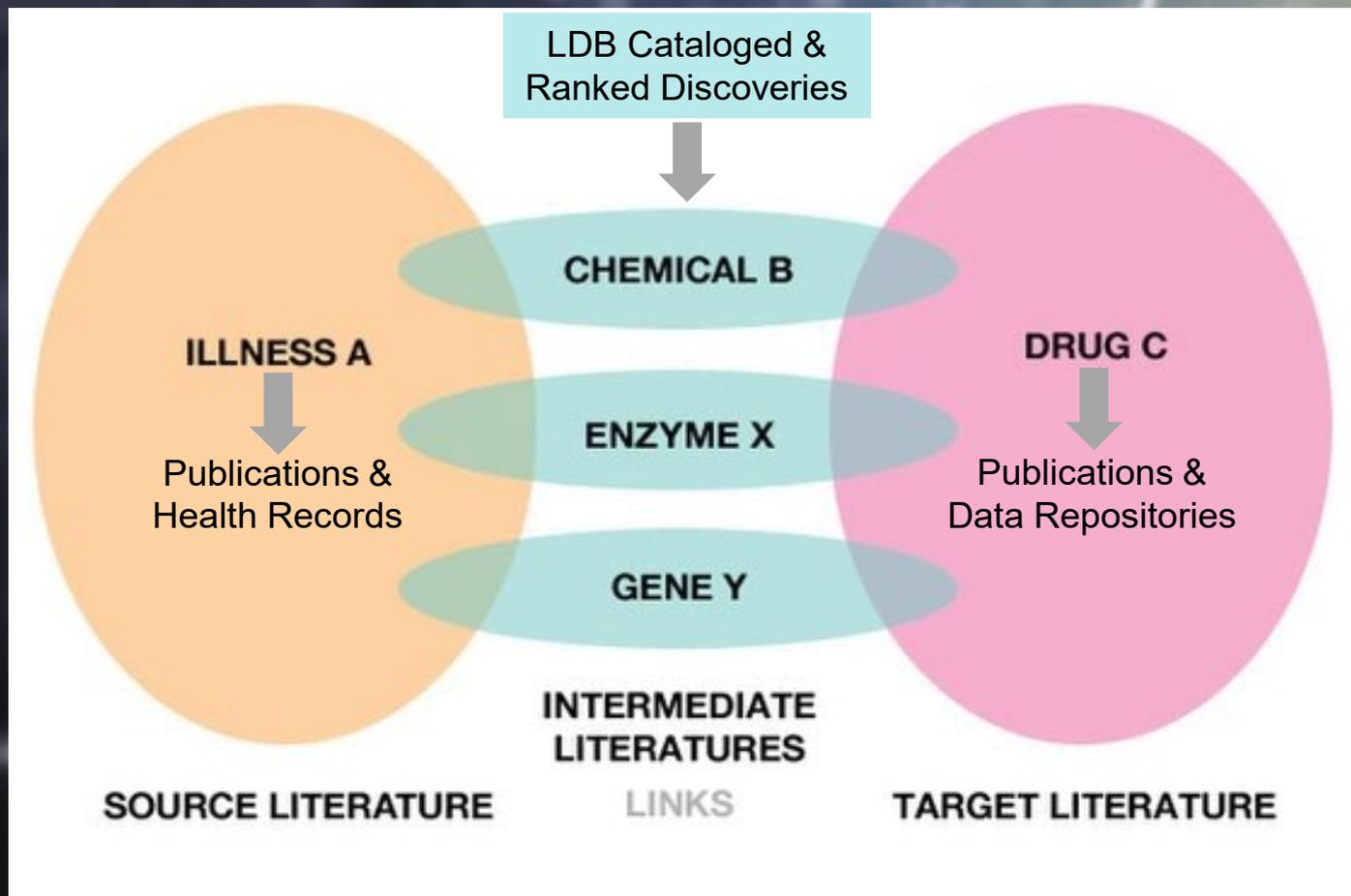




**Q & A SUPPLEMENTAL
REFERENCE SLIDES**

BIOCAID IMDI PLATFORM INTEGRATION

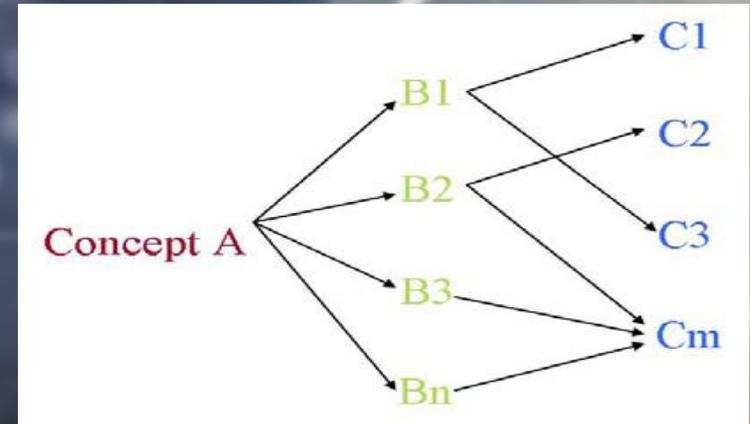
Diagram of IMDI Literature-Based Discovery Process



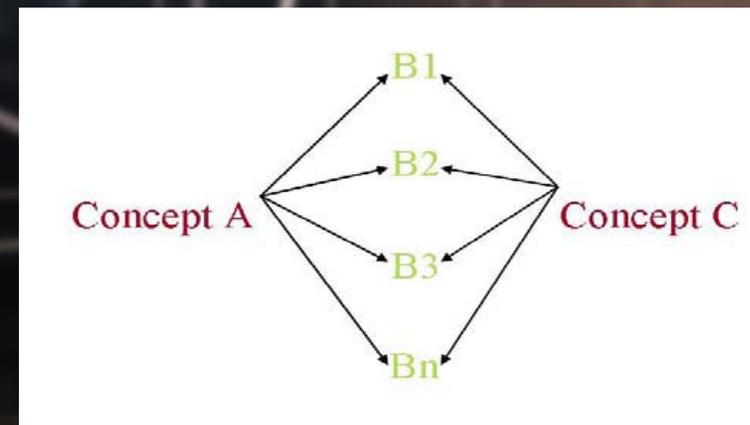
BEYOND SEARCH - LITERATURE-BASED DISCOVERY

Hypotheses Generation Approaches

In order to perform Exploratory Hypotheses Discovery and generate hypotheses with respect to known and hidden relationships, we begin by creating a Concept Network for Concept A. The Concept Network consists of all the Library Concepts that co-occur with A, which are called the 'B Concepts'. The Network is then expanded to include and catalog all of the co-occurring "C Concepts" for each the B Concept Network. Each C Concepts is indirectly connected via at least a specified minimum number of intervening B Concepts.

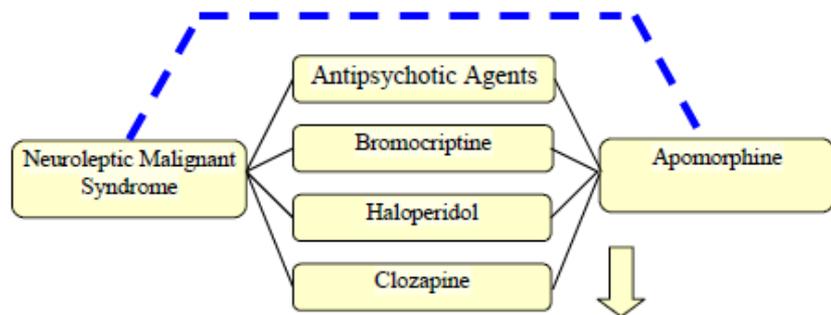


Confirmatory Hypotheses Discovery determines the existence or strength of a relationship between two Concepts. First, the researcher provides both an A and C Concept to propose hypothesis relationships between the A and C Concept. Then, IMDI relationship discovery algorithms are applied to the literature set to confirm whether a potential connection exists between A and C due to the presence of a sufficient number of intervening B Concepts that strongly co-occur with the two input Concepts, A and C. Analytic and rank algorithms can be applied

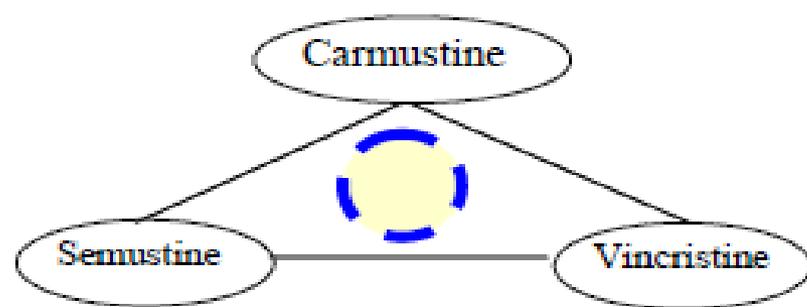


BIOCAID LITERATURE-BASED DISCOVERY ALGORITHMS

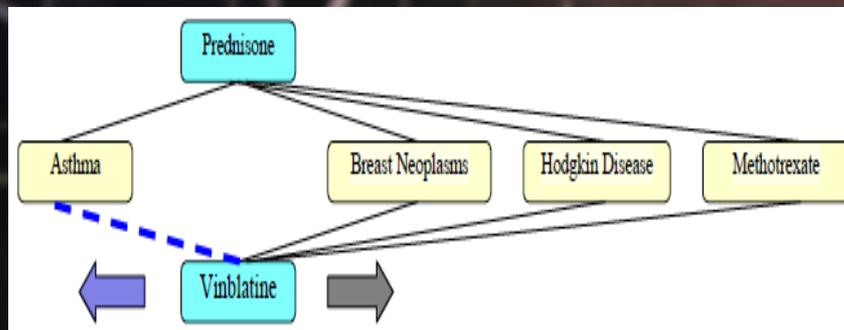
One type of hypothesis generated by BioCAID is called **"PAIRWISE"**, based on Swanson's ABC model. IMDI automatically generates and catalogs Pairwise hypotheses from the Library for visual navigation. The IMDI advantage is generation of hypotheses that are truly novel across MEDLINE and fields of research, rather than being bounded by the user's initial thinking only a select list of publications.



BioCAID's IMDI platform generates another new type of hypotheses that is called **"CHAINING"**. The basic model for chaining is that "If concept A relates to B, B relates to C, and A relates to C, then A, B, and C may be related altogether". This type of hypothesis may help identify chaining relation among chemical compounds, predict biologic pathways, and analyze combinational effects of drugs.



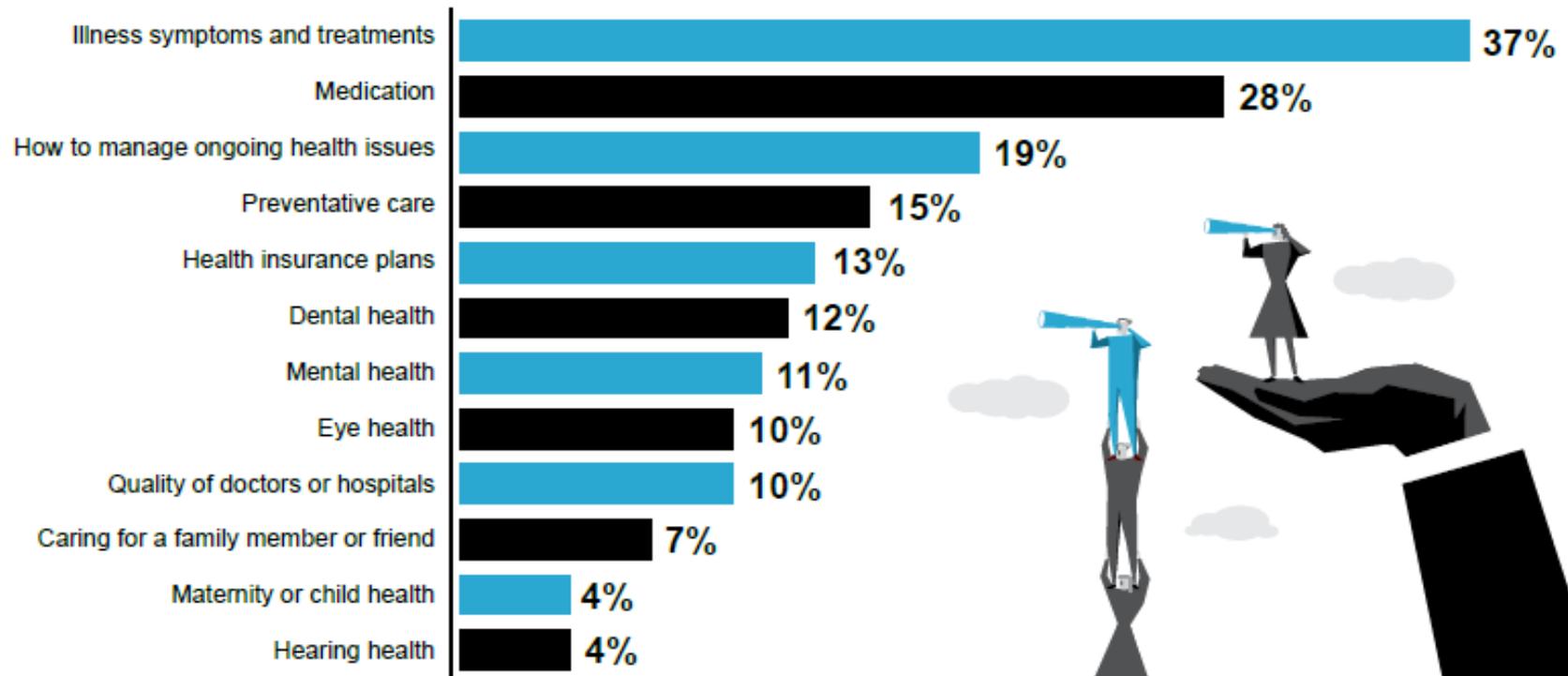
Another new type of hypotheses generated by our platform is called **"SUBSTITUTION"**, described as "If Concept A is similar with C, and A is strongly related to B, then C may be also related to B". "Vinblastine" and "Prednisone" have strong relations with many common concepts including "Methotrexate", "Breast Neoplasms", "Hodgkin Disease", and many others. These two concepts are found to be similar to each other according to context similarity. "Asthma" is one of the concepts that is associated with "Prednisone," but not with "Vinblastine".



INTERNET HEALTH SEARCHES STATISTICS

TYPES OF HEALTH-RELATED INFORMATION LOOKED FOR MOST RECENTLY

(% Healthcare Information Seekers)



Internet Health Searches: 80% of US Population annual, 34% monthly, 18% weekly - 62.5% Frustrated by the Results

USER STATISTICS – MEDLINE & IMDI

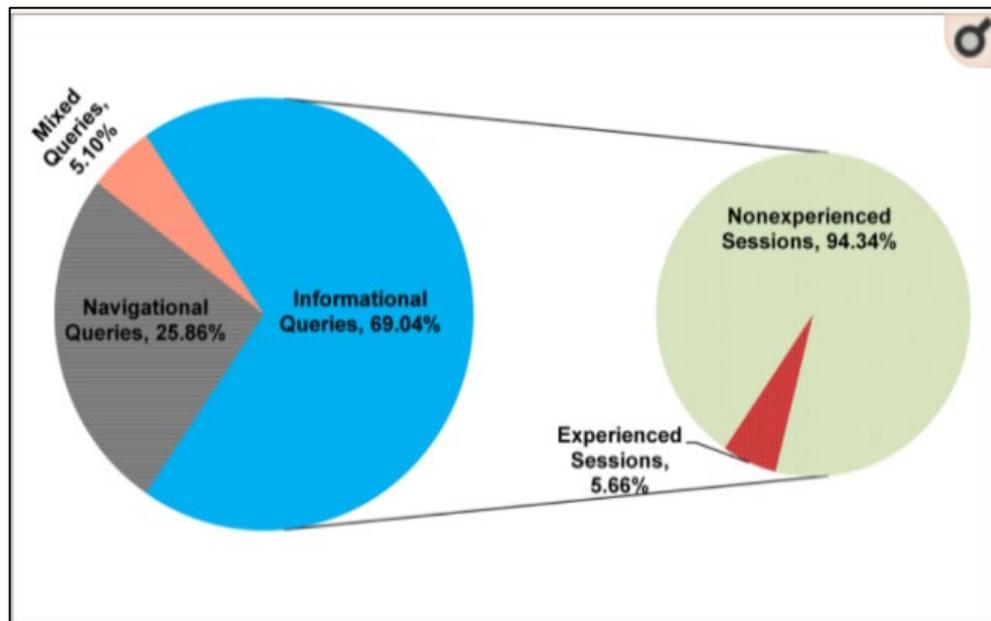


Figure 3: PubMed Search Types & User Experience

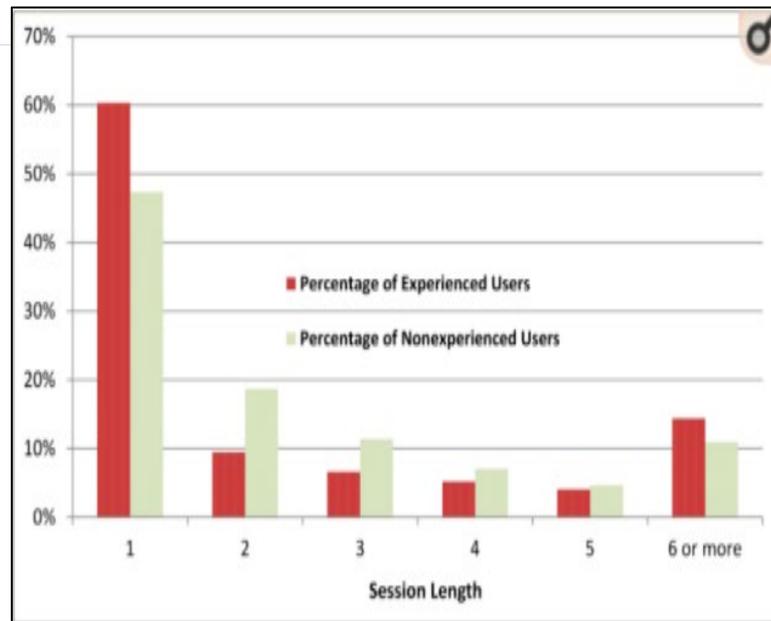


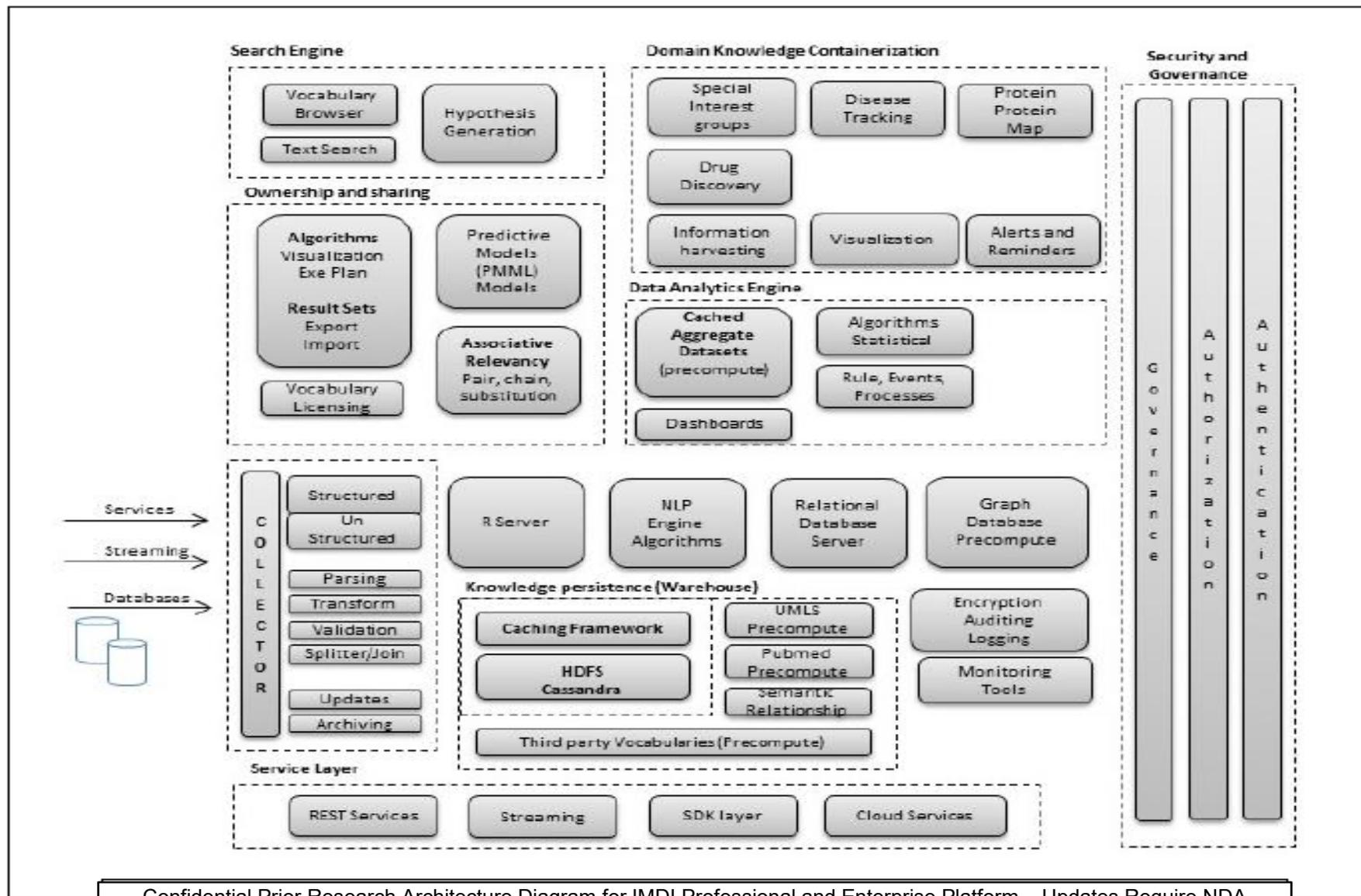
Figure 2: Experienced vs Non-Experienced User Term Searches per Session

| Freemium & Basic Projected User Statistics | | Month 12 | Month 24 | Month 36 | Month 48 |
|--|---|----------|-----------|-----------|------------|
| 1. | Daily Average Number of SaaS USERS | 20,524 | 73,185 | 271,185 | 664,039 |
| 1. | Daily Average Number of SaaS USER SESSIONS | 61,572 | 219,555 | 813,556 | 1,992,118 |
| 1. | Estimated 20% Peak SaaS SIMULTANEOUS USER SESSIONS | 513 | 1,830 | 6,780 | 16,601 |
| 1. | Peak USER NODE/EDGE Transactions per Second | 103 | 366 | 1,356 | 3,320 |
| 1. | Peak PubMed API Record RETRIEVAL LIST Requests per Second | 26 | 91 | 339 | 830 |
| 1. | Peak PubMed API Record RETRIEVAL LIST MegaBytes per Second (PubMed Cache) | 43,100 | 153,688 | 569,489 | 1,394,483 |
| 1. | Avg PubMed API RETRIEVAL LIST PAGE SEGMENT MegaBytes | 1 | 1 | 1 | 1 |
| 1. | Peak PubMed API SIMULTANEOUS PAGE SEGMENT MegaBytes | 22 | 77 | 285 | 697 |
| 1. | Cumulative Active Freemium & Profiler Basic SaaS REGISTERED USERS | 362,350 | 1,911,528 | 7,703,079 | 19,130,182 |
| 1. | Total Profiler Record Storage All Freemium & Basic REGISTERED USERS Megabytes | 27,176 | 143,365 | 577,731 | 1,434,764 |
| 1. | MARKET PENETRATION MEDLINE Monthly Searches @ 100,000,000 Per Month | 0.0554 | 0.1976 | 0.7322 | 1.7929 |

MARKET SPACE DEMOGRAPHICS

| Product Description | Addressable Market Space | Serviceable Market Space | Target Market Space | Projected Market Penetrate Month 48 |
|-----------------------------|---|---|---|--|
| Freemium Users | US Health Searches Monthly 112,000,000 | 27,000,000 Searches 56% of Addressable | 14,000,000 Searches 52% of Serviceable | Target Penetration in Month 48 = 5% |
| Basic Users | Prospective User Space 23,000,000 | Prospect 14,900,000 65% of Addressable | Prospect 7,500,000 50% of Serviceable | Target Penetration in Month 48 = 0.41% |
| Professional Users | Prospective User Space 12,500,000 | Prospect 3,800,000 31% of Addressable | Prospect 1,800,000 47% of Serviceable | Target Penetration in Month 48 = .75% |
| Enterprise Users | Prospective User Space 12,500,000 | Prospect 3,800,000 31% of Addressable | Prospect 1,800,000 47% of Serviceable | Target Penetration in Month 48 = 0.69% |
| IMDI Platform Installations | Prospective Install Space 255,000 Sites | Prospect 120,500 47% of Addressable | Prospect 42,700 35% of Serviceable | Target Penetration in Month 48 = 1.4% |

INTELLIGENT MEDLINE DISCOVERY INTEGRATION



Confidential Prior Research Architecture Diagram for IMDI Professional and Enterprise Platform – Updates Require NDA