

Pharma R&D Data Integration and Analytics

Presented By Jabe Wilson, Consulting Director, Text and Data Analytics
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What we hear from every customer...

*“If we only knew
what we knew...”*



Benefits of effective data integration

Costs of poor data processes

- Higher risk of erroneous outcomes
- Wasted resources
- Lower confidence in the data and the organizations using it

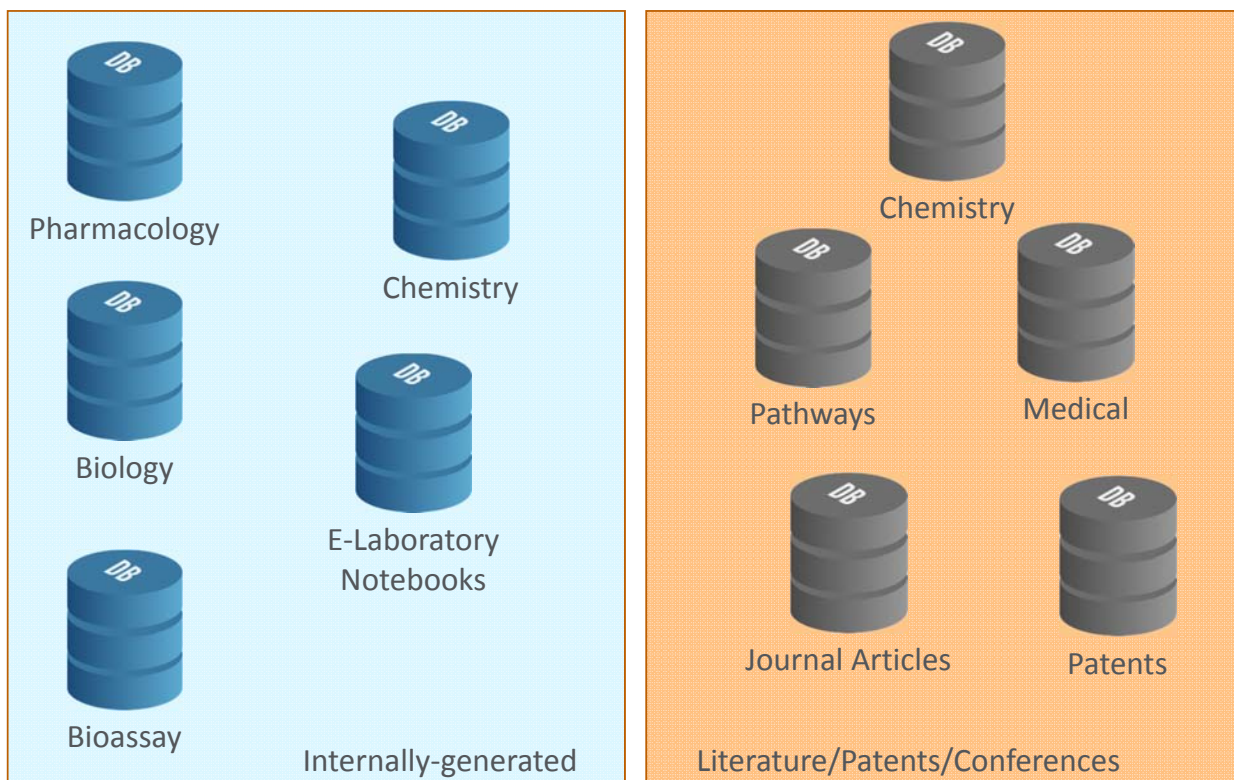


Benefits of integration

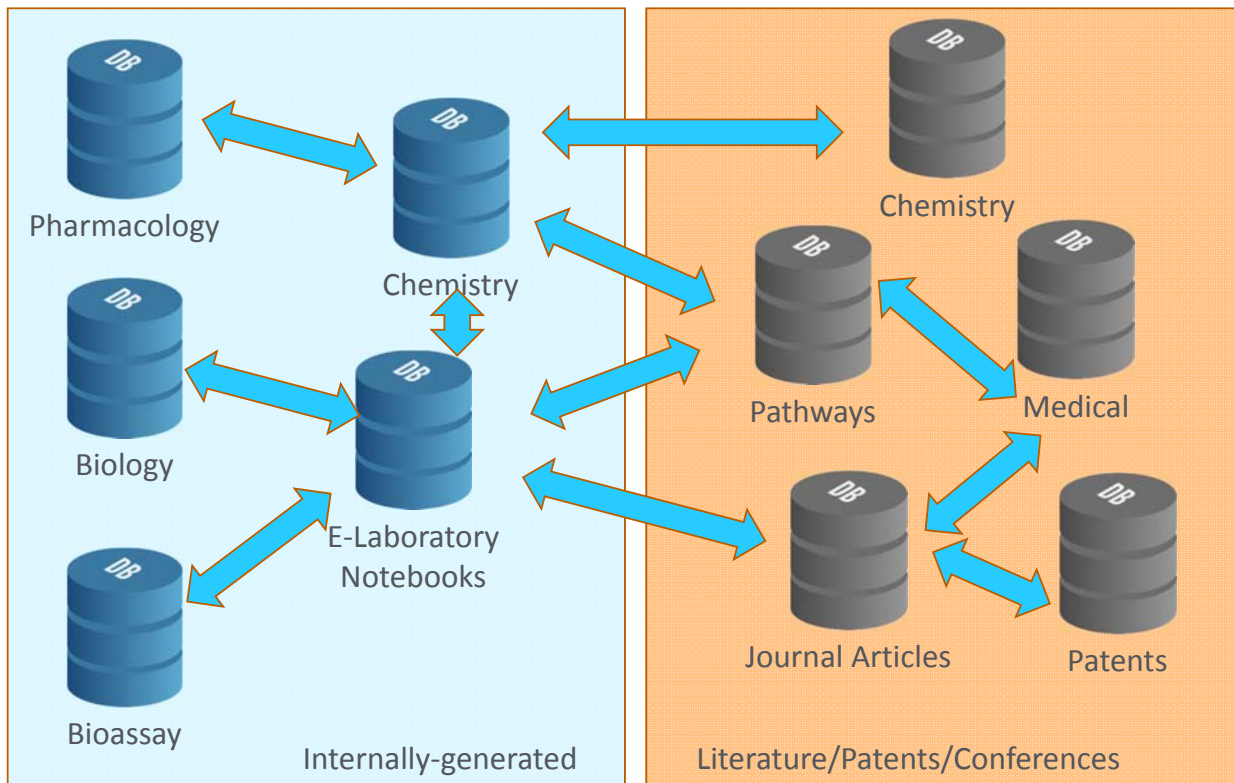
- More trustworthy research
- Higher service quality
- Improved personnel efficiency
- Reduction of redundant tasks
- Facilitation of auditing and more timely
- Relevant and specific information

Dipnall, J. F., Berk, M., Jacka, F. N., Williams, L. J., Dodd, S., & Pasco, J. A. (2014). Data Integration Protocol In Ten-steps (DIPIT): a new standard for medical researchers. *Methods (San Diego, Calif.)*, 69(3), 237–46. <http://doi.org/10.1016/j.ymeth.2014.07.001>

Normal Current Situation: Many Data Sources, Few Connections



Desired Situation: Data Sources Connected To Answer Significant Questions



Elsevier Corporate R&D Professional Services

We strengthen R&D teams by breaking barriers between data silos

Our Key Capabilities

- Access to life science data and content with proven curation, taxonomy, and semantic expertise
- Existing life science portfolio of solutions across the development spectrum
- Global footprint in corporate R&D

Our Solutions

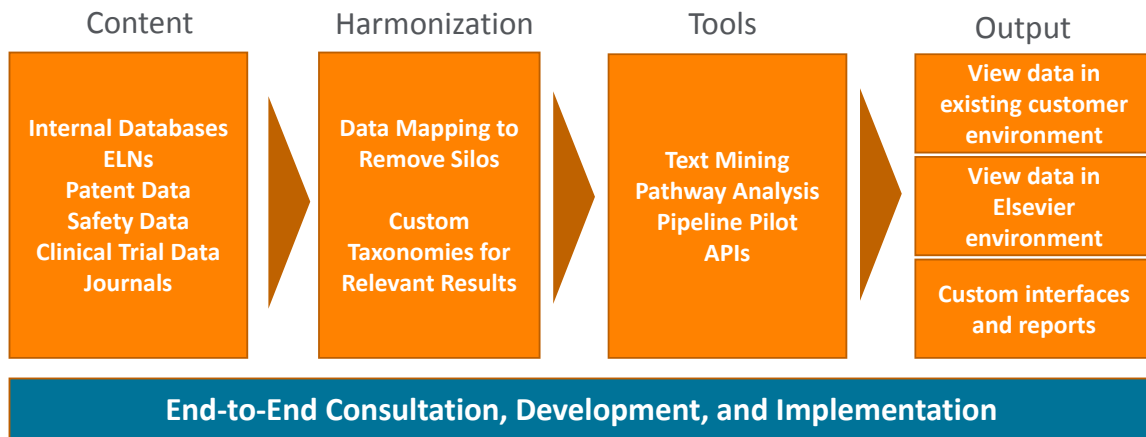
- Pharma R&D Data Integration**
Normalize data from disparate sources to fit your use cases
- Pharma R&D Data Analytics**
Get answers to questions from your internal and external data sources

R&D Benefits

- More relevant answers
- Accelerated discovery
- Better use of resources
- Fast answers to complex questions
- No longer confined to a specific application

Elsevier R&D Solutions Professional Services

We normalize and integrate information to broaden your vision...

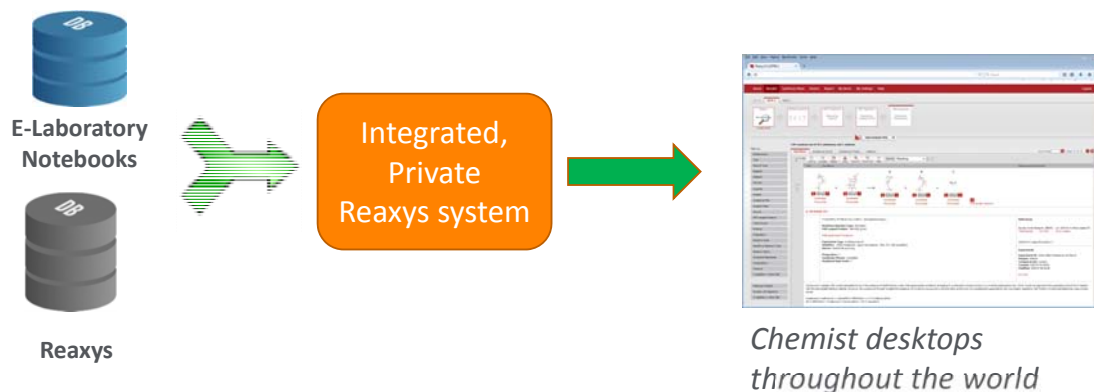


Pharma R&D Data Integration

Example: Roche Integration of ELN Data into a single chemistry database

Challenge: Chemistry information is housed in separate databases, leading to wasted time and escalating costs

Solution: Link ELN data with Reaxys data to get a holistic view of research



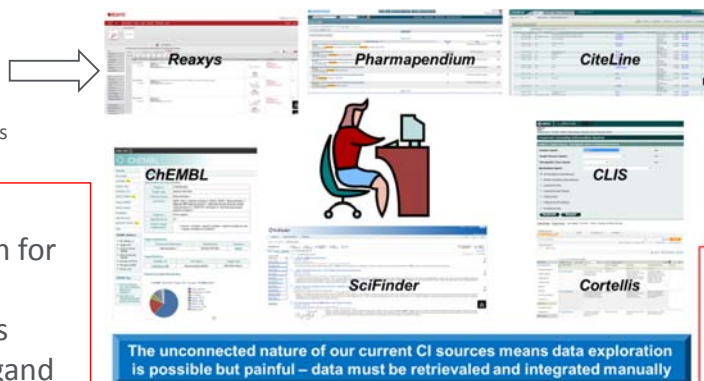
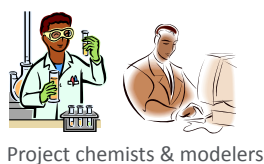
Benefits:

- Save time in collecting information; get all knowable info with one search
- Get the most utility of data resources
- See where past experiments failed so they aren't repeated
- Make better decisions
- Make quicker progress with research



Example: Consolidate competitive intelligence from multiple sources into a single view

Challenge: The unconnected nature of our current Competitive Intelligence sources makes the data exploration possible but painful...



Takes days to weeks

Questions:

- Any Information for my target?
- Any compounds similar to my ligand
- Any new MOA for my disease?

Output:

- Manual collected customized file
- Up-to-search date data
- Multi-sources

Solution: a dashboard for the latest patents and reactions related to target, indication, and compound

- Combined data sources in the customer ecosystem
 - Elsevier API's
 - Pipeline Pilot
- Created data analyses in “mashup” dashboards for convenient overview
- Extends value for multiple users:
 - Chemists
 - Informaticians
 - Group Leaders
 - Toxicologists
 - Project Teams

The dashboard interface includes a search panel on the left with filters for 'Search Type' (Bibliography or Interactions, Bibliography or All Names, BIPM's), 'Search Results' (checked), 'Keyword(s)', 'Target Name', and 'Maximum results to show' (set to 100). The main area displays 'New Data in Reaxys' with a table of patent records and 'Recent Compounds' with a table of chemical structures and associated data.

Patent Number (DTYR)	Patent Class. Code (DTFCD)	Patent Assignee (DTYR)	Patent Year (DTYR)	Journal Title (DTYR)	PubNumber (DTYR)	Number (DTYR)	Author (DTYR)
EP2846371	EP	ABBVIE INC. USA; PAU, A.; JONASSEN, OTH; FANTON, BRUNO; JONASSEN, S.; STAM, ROBERT; SCHULZ, ROLF	2015				
EP2846371	EP	ABBVIE INC. USA; PAU, A.; JONASSEN, OTH; FANTON, BRUNO; JONASSEN, S.; STAM, ROBERT; SCHULZ, ROLF	2015	Journal of the American Chemical Society	10.1021/acs.jchemed.5b00000	10.1021/acs.jchemed.5b00000	Lee, Sang-Joon; C. Campbell; J. Wang

Structure	Reaction Structure (RUBR)	Reaction Structure (RUBR)	Reaction Structure (RUBR)	Reaction Structure (RUBR)	Reaction Structure (RUBR)	Page (DTYR)	Journal Title (DTYR)	DOI (DTYR)	Number (DTYR)	Publication Year (DTYR)	Issue ID (DTYR)	Issue (DTYR)	Document Title (DTYR)
						1762	Journal of the American Chemical Society	10.1021/acs.jchemed.5b00000	62	2014	640227484	1024108	Article
						1762	Journal of the American Chemical Society	10.1021/acs.jchemed.5b00000	62	2014	640227484	1024108	Article
						1762	Journal of the American Chemical Society	10.1021/acs.jchemed.5b00000	62	2014	640227484	1024108	Article



Pharma R&D Data Analytics



Customized Data Analytics Services

Elsevier has the tools and expertise to extract information from internal and external data sources.

Our experience in Natural Language Processing and data indexing enables you to get the most relevant answers to your research questions, with less “noise”.

- We'll get you the answers
- We'll build predictive models to generate new insights
- Reduce risk in forming your pipeline strategy

Sample Use Cases

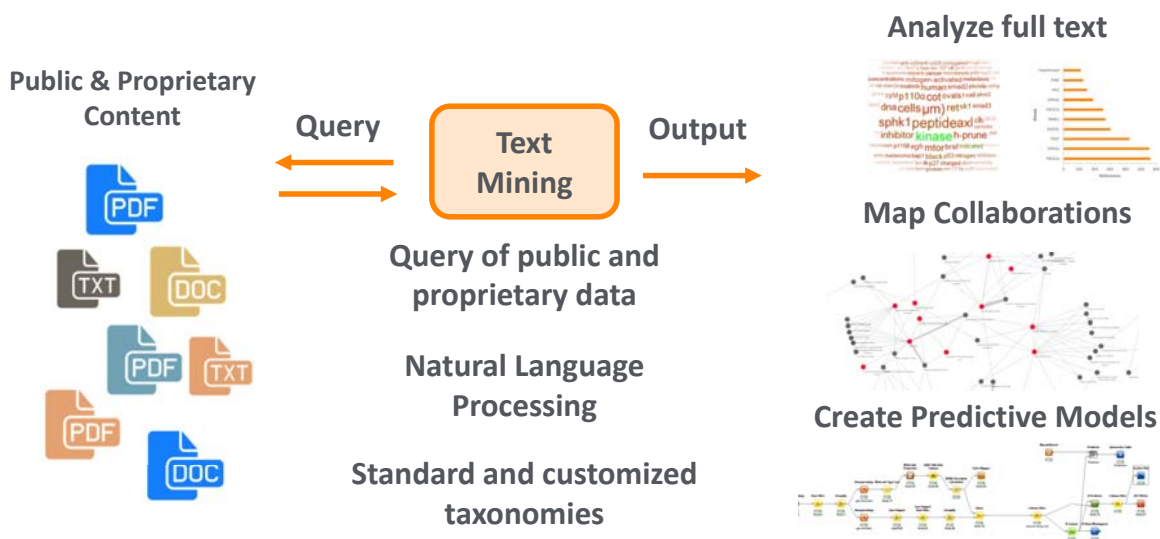
OMICS data analysis	Target Prioritization	Compound Safety Prediction
Drug Repurposing	Biomarker Discovery	Clinical Trial Optimization

Example: Gather intelligence from unstructured data

Challenge: Researchers need answers about kinase inhibitors:

- Who is studying kinase inhibitors to treat cancer?
- What cancers can they treat?
- What side-effects do they have?
- Can we predict the kinase inhibition of our compounds?

Solution: Find answers by mining data from internal and external data sets



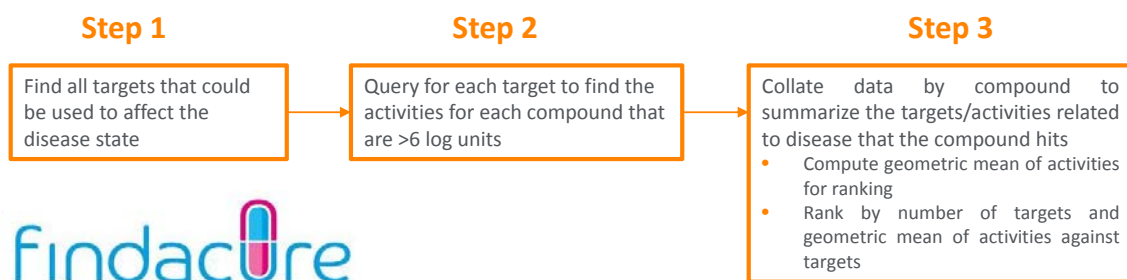
Example: Drug Repurposing

Challenge: Find an existing generic drug to fight congenital hyperinsulinism (CHI)

Solution: Professional Services used its content, tools and capabilities to provide information about a rare disease:

- Text Mining to find targets and summarize what is known about the disease mechanism
- Bioactivity data to find drugs that target those targets
- Normalized names of authors and institution to find collaborators

Automated analysis combines bioassay data with pathway data



How Professional Services extracts knowledge from data

- Ability to integrate internal and external databases into new or existing environments
- Extensive experience in life science data linking and mapping
- Decades of experience indexing life science data with taxonomies and ontologies and reducing “noise” when making queries
- Ability to mine data and unstructured text to get the most relevant answers to research questions
- Access to extensive literature databases

Summary: Elsevier Corporate R&D Professional Services

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Thank You

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Memo

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