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Leveraging IP Data to Drive Breakthrough Innovation

Speakers

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Leveraging IP Data to Drive Breakthrough Innovation

1. Patent data and innovation
   - Can patent data really be useful in finding breakthrough innovation?

2. Patent landscape
   - What is it?
   - What is it not?
   - Who asks for it? When?
   - What is expected?

3. Case study: Real time fluid analysis
   - What is this?
   - What was the context?
   - Landscape analysis

4. Best practices
   - Data cleaning
   - Data categorization
   - Presentation
Can patent data really be useful in finding breakthrough innovation?

- Patent data and innovation
- Patent landscape
- Case study
- Best practices
YES!

Patent data can be extremely useful in finding breakthrough innovation.

18 month publication lag
* Irrelevant if disclosure of the technology is ONLY coming from patent publications
University and Non-Profit Sectors have become more sophisticated re IP
Technology closer to industrial use is usually found only in IP

Practicality of Patent Data
Patent data for broad patent landscapes is:
- Easy to use (consistent & meta-tagged)
- Cost-effective
What is a patent landscape? What is it not?
According to the World Intellectual Property Organization:

“A patent landscape is an overview of patenting activity in a field of technology.”

Enhanced definition:

The ability to gather hundreds or thousands of patent records of interest; and with the use of software and data analysis tools, the further ability to spot trends and emergent activities not otherwise discernable via “day-to-day” patent database searching.
They are not a crystal ball (they may not predict the future)

They do not easily point out “white space” (it’s still “hard to know what you don’t know”)

It’s not going to tell you or your audience what to do next (but it will help you define recommendations based upon REAL DATA)

- “we recommend more in-house resources…”
- “we recommend external purchase…”
- “we recommend an IP ring-fencing strategy…”
- NOT SPECIFIC ANALYSIS OF INDIVIDUAL PATENTS
Who asks for landscapes within your organization? When? What is expected?
Who asks for landscapes:

- Technology organization
- Business management

When do they ask:

- Technology organization
  - Beginnings of new Research Projects
  - Throughout Product Lifecycle Stages
- Business management
  - During Strategy Development
  - For Investor & Public Relations Purposes
Who asks for landscapes?  
When?  What is expected?

**What** is expected:

- Technology organization
  - Raw data
  - The “Nitty Gritty” (SPECIFICS)
  - Full Text
  - Collaborative & Iterative

- Business management
  - Visuals
  - The “Big Picture”
  - Short Reports
  - Specific Recommendations
What is this technology about?
What was the context of this acquisition?
ICE Core® Fluid Analysis Service

At Last. Downhole Fluid Analysis with Lab-Quality Results.

Until now, downhole fluid analysis has been limited. Optical analyzers could tell you when your sample was pure enough to collect, but rarely could they tell you which fluid components were present and in what proportions.

Available in the Integrated Characterization Section (ICS) of Halliburton’s proven Reservoir Description Tool (RDT™) tester, the revolutionary, new Halliburton ICE Core™ technology can give you that information.

Fluid analysis is done downhole to understand the reservoir environment

- Production zones
- Contamination (sulfur, methane, etc.)

O&G technology was limited

- Not real-time (samples traveled back to surface for analysis)
- Sample integrity in question
Technology Organization question:
• Is there anything in another industry that may solve our problem?

HOWEVER, the downhole environment is not ideal:
• High temperature/high pressure
• Harsh contaminants
• Compact spaces
2010 Query:

(((fluid+ OR oil+ OR crude OR C1 OR C2 OR C3 OR C4 OR C5 OR saturates OR aromatic OR hydrocarbon+ OR resins OR asphalt+ OR water OR groundwater OR petroleum OR methane OR (earth OR geological OR sub_terran+ OR hydrological) 2W (material OR sample?))) 3D (analy+ OR monitor+ OR assess+ OR ((composition+ OR species) 2D (discriminat+ OR measur+ OR sense OR sensing OR fingerprint+ OR evaluat+))))/TI/ICLM) OR (G01N-033/2823)/IPC/CPC)

AND

((spectroscop+ OR spectromet+ OR spectral)/TI/AB/CLMS OR (G01J-003+ OR G01N-021/31+ OR G01N-021/33+ OR G01N-021/35+ G01N-021/39+ OR G01N-2021/31+ OR G01N-2021/33+ OR G01N-2021/35+ OR G01N-2021/39+)/IPC/CPC)

AND

(in_situ OR real_time OR ((harsh+ OR robust+ OR challeng+) 2D (environ+ OR condition?))) OR (high W (temperature OR pressure)))/TI/AB/CLMS/DESC

NOTE: Query run ~12-31-2010
Real time fluid analysis: technology description and context

Patent data and innovation
Patent landscape
Case study
Best practices

2010 Query:

(((fluid+ OR oil+ OR crude OR C1 OR C2 OR C3 OR C4 OR C5 OR saturates OR aromatic+ OR resins OR asphalt+ OR water OR groundwater OR petroleum OR methane OR ((earth OR geological OR sub_terranean OR hydrological) 2W (material OR sample?))) OR (composition+ OR species) 2D (discriminat+ OR measure OR sensing OR fingerprint+ OR evaluat+)))/TI/ICLM) OR (G01N-033/2823)/IPC/CPC)

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((spectroscop+ OR spectromet+ OR spectral)/TI/AB/CLMS OR (G01J-003+ OR G01N-021/31+ OR G01N-021/33+ OR G01N-021/35+ OR G01N-021/39+ OR G01N-2021/31+ OR G01N-2021/33+ OR G01N-2021/35+ OR G01N-2021/39+))/IPC/CPC)

AND
(in_situ OR real_time OR ((harsh+ OR robust+ OR challenging) 2D (environmental OR condition?))) OR (high W (temperature OR pressure)))/TI/AB/CLMS/DESC

NOTE: Query run ~12-31-2010

The WHAT we’re trying to do
The HOW (keep it as BROAD as possible)
Note the lack of specific oilfield industry IPC/CPC codes
The REQUIREMENTS/PROBLEMS to be overcome
The resulting dataset:

- 765 patent families

Results from diverse assignees:
- Pharm/Med/Biotech (Becton Dickinson, BMS, Pfizer, etc.)
- Traditional Analytical (Agilent, Waters, Horiba, etc.)
- Universities/Non-Profits (too many to name…)
- Traditional Chemical (3M, BASF, DuPont, Dow, etc.)
- Miscellaneous Industrial (Honeywell, Monsanto, etc.)
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The results of the search brought one patent family from Univ of So Car; how do you find the needle in the haystack?
WITH A LOT OF HARD WORK!

A disciplined approach:
• Close collaboration with technical experts (and business experts)
• Iterative process (insights gained lead to new keyword queries, sub-analyses conducted, etc.)
• Third party patent analysis tools help
  • With prioritization
  • Speeds up the process
  • Helps lessen “dead-ends”
Utilizing Patent Analysis Software such as Questel Orbit

How do you find the needle in the haystack?

Patent data and innovation
Patent landscape
Case study
Best practices
How do you find the needle in the haystack?

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Patent landscape

Case study

Best practices
How do you find the needle in the haystack?

Patent data and innovation
Patent landscape
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Best practices
What does the current landscape look like now?
2016 Query:

(((fluid+ OR oil+ OR crude OR C1 OR C2 OR C3 OR C4 OR C5 OR saturates OR aromatic OR hydrocarbon+ OR resins OR asphalt+ OR water OR groundwater OR petroleum OR methane OR ((earth OR geological OR sub_terran+ OR hydrological) 2W (material OR sample?)))

3D (analy+ OR monitor+ OR assess+ OR ((composition+ OR species) 2D (discriminat+ OR measur+ OR sense OR sensing OR fingerprint+ OR evaluat+))))/TI/ICLM) OR (G01N-033/2823)/IPC/CPC)

AND

((spectroscop+ OR spectromet+ OR spectral) OR (multi_variate? 2D optical 2D comput+) OR (integrat+ 2D comput+ 2D element?))/TI/AB/CLMS OR (G01J-003+ OR G01N-021/31+ OR G01N-021/33+ OR G01N-021/35+ G01N-021/39+ OR G01N-2021/31+ OR G01N-2021/33+ OR G01N-2021/35+ OR G01N-2021/39+))/IPC/CPC)

AND

(in_situ OR real_time OR ((harsh+ OR robust+ OR challeng+) 2D (environ+ OR condition?)) OR (high W (temperature OR pressure)))/TI/AB/CLMS/DESC

NOTE: Query run ~7-21-2016
2016 Query:

(((fluid+ OR oil+ OR crude OR C1 OR C2 OR C3 OR C4 OR C5 OR saturates OR aromatic OR hydrocarbon+ OR resins OR asphalt+ OR water OR groundwater OR petroleum OR methane OR ((earth OR geological OR sub_terran+ OR hydrological) 2W (material OR sample?))) 3D (analy+ OR monitor+ OR assess+ OR ((composition+ OR species) 2D (discriminat+ OR measur+ OR sense OR sensing OR fingerprint+ OR evaluat+)))))/TI/ICLM) OR (G01N-0033/2823)/IPC/CPC)

AND

((spectroscop+ OR spectromet+ OR spectral) OR (multi_variante? 2D optical 2D comput+) OR (integrat+ 2D comput+ 2D element?))/TI/AB/CLMS OR (G01J-003+ OR G01N-021/31+ OR G01N-021/33+ OR G01N-021/35+ G01N-021/39+ OR G01N-2021/31+ OR G01N-2021/33+ OR G01N-2021/35+ OR G01N-2201/39+)/IPC/CPC)

AND

(in_situ OR real_time OR ((harsh+ OR robust+ OR challeng+) 2D (environ+ OR condition?))) OR (high W (temperature OR pressure)))/TI/AB/CLMS/DESC

NOTE: The HOW query has been modified to reflect new learnings and new terminology since 2010

NOTE: Query run ~7-21-2016
Current landscape

Patent data and innovation

Patent landscape

Case study

Best practices
Current landscape

Patent data and innovation

Patent landscape

Case study

Best practices
Current landscape

Patent data and innovation

Patent landscape

Case study

Best practices
Valuation metrics for technical and use

- Reassignment frequency
- Cite velocity
- Avg fnd cites
- Avg fnd cites by others
- New in last five years
- High fnd cites
- Non-patent refs vs patent refs
- Shark presence
- Predator presence
- Company fences
- Fnd vs back cites
- Self vs others’ cites
- Radicalness index
- Originality index
- Generality index
- High IPC dispersity
- Avg IPC dispersity
- IPC dispersity
- High back cites

- Outstanding
- Above average
- Below average
- Portfolio source
Best practices from creating a dataset to presenting the analysis?
Best practices:

- Purpose of the landscape
- Audience of final work product
- Need ACTIVE PARTICIPATION from technical experts (and business experts as needed)
- Beginning dataset creation is just as important as subsequent analysis
- This is an ITERATIVE PROCESS
Tools like Orbit.com will perform a lot of data cleaning; is it enough? What can be done to make it even better?
Importance of Clean Data:
• Assignee clean-up
• Patent family-ship
• Legal Status
• Critical Dates

All of the above are important, but what’s most important to me is the ability to add my own labels AND even sometimes manipulate the above to suit my needs

QUICK APPLICATION OF IMPORTANT “FRAMES OF REFERENCE”/OVERLAYS
Clean Data:
- Needs to be consistent
- Needs to be meta-tagged/fielded
- Available for customer use ASAP
- Changes made to data fields needs to be history footprinted

My manual changes to these fields to suit my needs should NOT affect my ability to create one-click charts/graphs
Data cleaning: Available for customer use as soon as possible
Data-categorization:

Why?

What options are available?
Importance of Data Categorization:

• Internal (Company categorizations)
  • Product Lines
  • Revenue Streams
  • Company-specific categorization of technology

• External
  • Patent-Specific (IPC/CPC codes)
  • Third party categorization (Questel Orbit Technical Concepts & Technology Domains)
  • Industry-Specific (Spears Reports for O&G)
Assigning internal categories to competitors’ and others’ data is NOT TRIVIAL

- **Manual Assignment**
  - Most accurate
  - Time consuming
  - Expensive (requires internal expert time)

- **Machine-Assisted**
  - Faster
  - Relatively Inexpensive
  - INACCURATE
Data categorization
Machine-assisted Categorization Assignment:

- Third party analysis providers should keep trying as artificial intelligence/technology keeps improving

- Low accuracy is better than no accuracy (it moves you “further down the road” than where you started)
  - Internal alert result routing system
  - Can give a peek into the outside world where none exists
Define your own categorizations to focus on your domains of interest

- Downhole spectroscopy ➔ downhole NR spectroscopy
- Ultraviolet spectroscopy ➔ (ultraviolet OR ultra violet OR UV) NR spectroscopy
- Beverage ➔ beverage
- Oil Gas ➔ oil OR gas OR gasoil OR fuel OR petrol*
How do you ensure your presentation goes well?
Presentation Tips:

- Make the results easily understandable
- Visuals that tell the story in a single snapshot can be powerful
- Be ready to have your data/graphs challenged
  - Especially from Business management
  - The “outside world” vs the “inside world”
- Make next steps/recommendations clear
Presentation Tips:

• Have raw data, queries, discarded records ready if needed

• Keep careful track of your entire analysis methodology FROM BEGINNING TO END (your analysis should be recreate-able)

• Be ready to ITERATE AGAIN following the presentation (including starting all over from scratch)