

The Tech Mining Framework + 2 VantagePoint Macros to Facilitate Tech Mining

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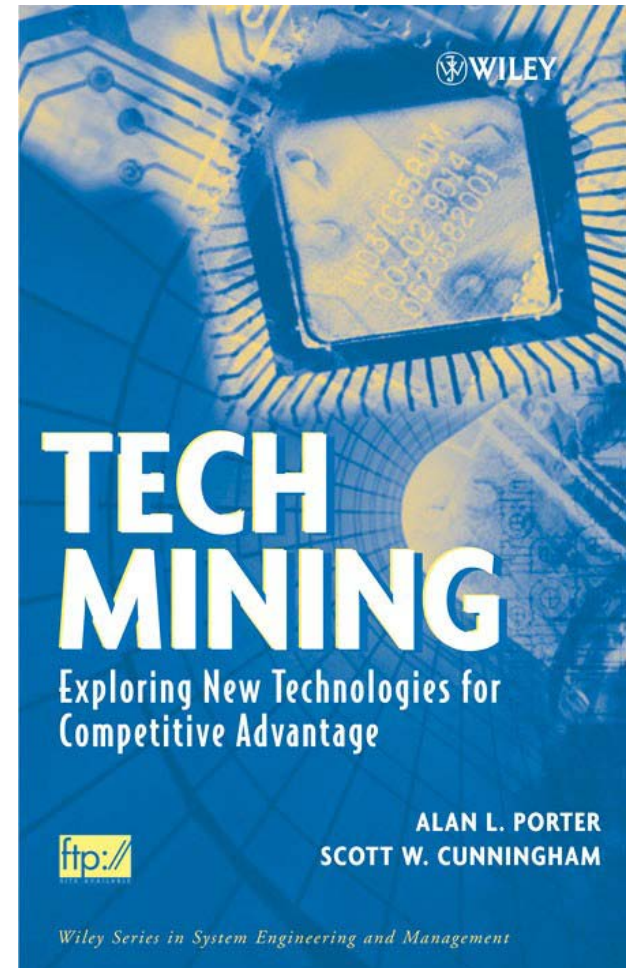
Agenda

1. **The Tech Mining Framework & Innovation Indicators**
2. **2 Macros**
 - a. **Quick Outputs in Excel from your dataset via SuperProfile**
 - b. **Activity-Diversity Indicator**
3. **Discussion**
 - **Macros?**
 - **Webinars?**
 - **Share learning?**

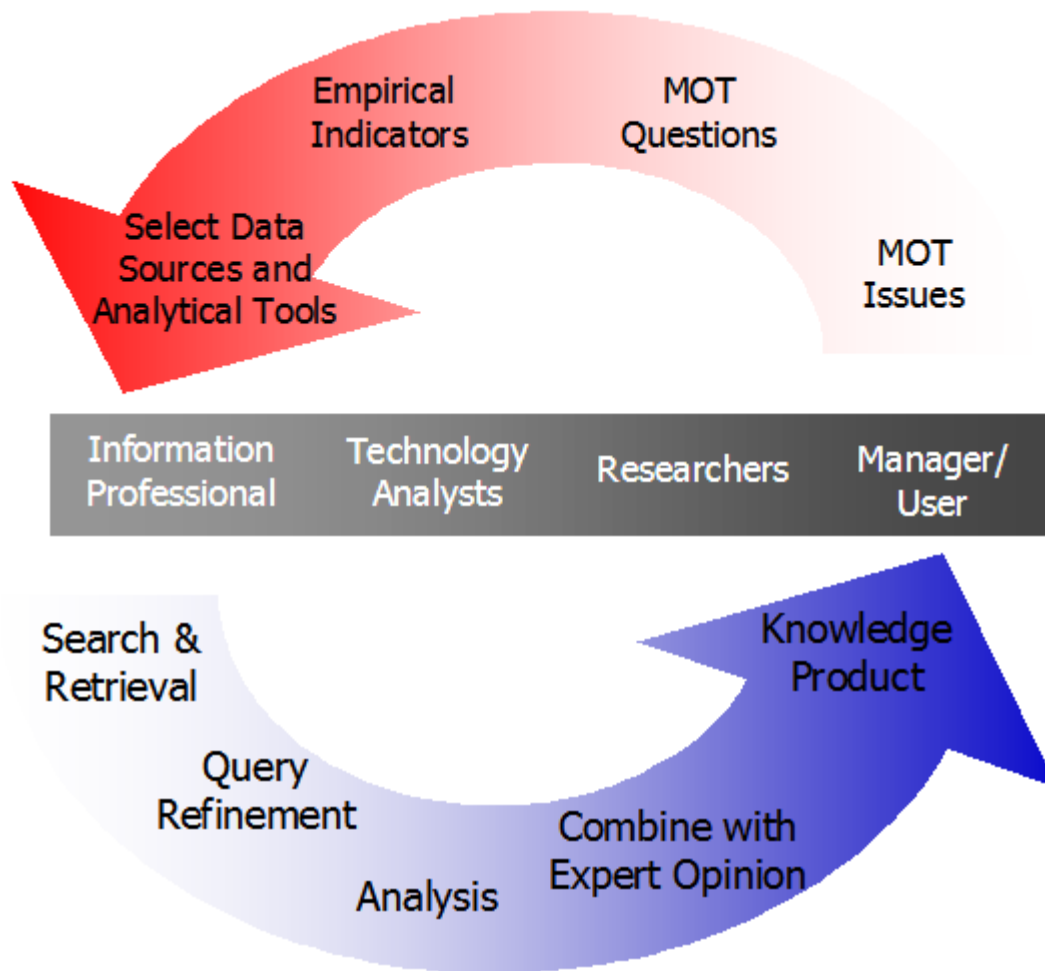
**HOW DO YOU EXTRACT
EFFECTIVE INTELLIGENCE FROM
ALL THAT SCIENCE,
TECHNOLOGY & INNOVATION
("ST&I") INFORMATION?**

Tech Mining

Alan L. Porter and Scott W. Cunningham
John Wiley & Sons Inc., 2005



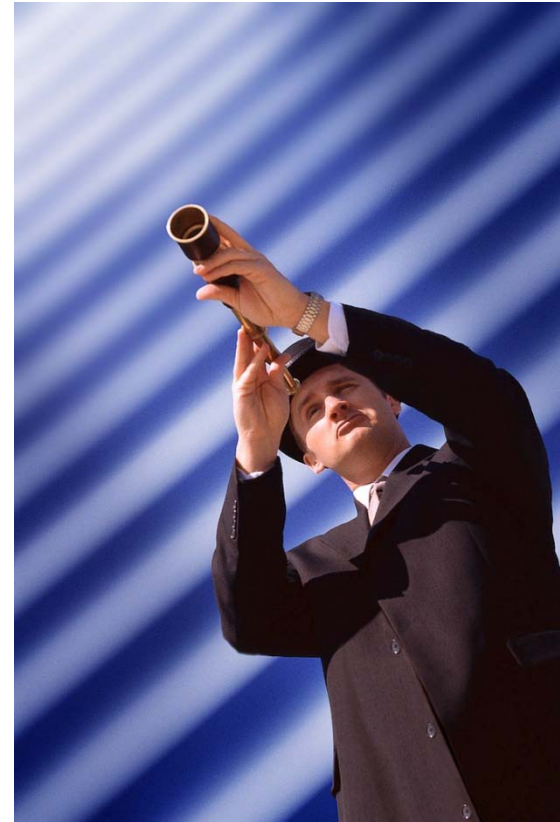
The Tech Mining Process



Tech Mining Foci

Two main types of analysis

- **Competitive Intelligence**
 - Focus on one or more target organizations
- **Technology Intelligence**
 - Focus on a target technology



The 13 MOT Issues

- R&D Portfolio Selection
- R&D Project Initiation
- Engineering Project Initiation
- New Product Development
- New Market Development
- Mergers
- Acquisition of Intellectual Property
- Exploiting one's own Intellectual Assets
- Collaboration in Technology Development
- Identifying and Assessing Competing Organizations
- **Tracking and Forecasting Emerging or Breakthrough Technologies**
- Strategic Technology Planning
- Technology Roadmapping

The 39 MOT Questions (Part 1)

- What emerging technologies merit our ongoing attention?
- What facets of this technology development are especially hot?
- What are new frontiers for this technology?
- Are there significant subtypes of the technology?
- How does this technological development fit within the technological landscape?
- What is driving this technological development?
- What are key competing technologies?
- How bright are the development prospects for this technology?
- **What are the likely development pathways for this technology?**
- What are the important component technologies?
- What is the maturity of the component technologies?
- Is there any potential for technology fusion?
- Should we apply for particular patents relating to this technology? (What claims?)
- What does the technology road map look like?

The 39 MOT Questions (Part 2)

- What is the maturation of systems which apply to this technology?
- **Which aspects of the technology match our application interests?**
- What are our opportunities in this emerging technology?
- What societal and market needs do this technology and its applications address?
- What applications offer promise for this technology?
- What are the global opportunities?
- What is the competitive environment?
- What is changing in the competitive environment?
- Does this technology offer strong commercialization prospects?
- Who are the available experts?
- Which universities or research labs lead in this technology?
- **What are the strengths and gaps within our own organization?**
- Which companies lead in this technology?
- Which companies lead in critical aspects of this technology?
- How strong are the leading companies' R&D teams?
- How do leading companies' development emphases compare to ours?

The 39 MOT Questions (Part 3)

- What other technological strengths does each leading company have?
- Characterize a company's IP relating to this technology.
- **What smaller companies or individuals have attractive IP relating to this technology?**
- Who is partnering with whom?
- Competitor profiling?
- What companies should we place on watch?
- Who might be prospects to license our IP?
- How entrepreneurial is the competitive environment?
- Assessing Competitors

Types of Questions

Text and data mining techniques are good at addressing:

- *WHO?*
- *WHAT?*
- *WHEN?*
- *WHERE?*

Additional questions usually require more human insight:

- *HOW?*
- *WHY?*

Innovation Indicators

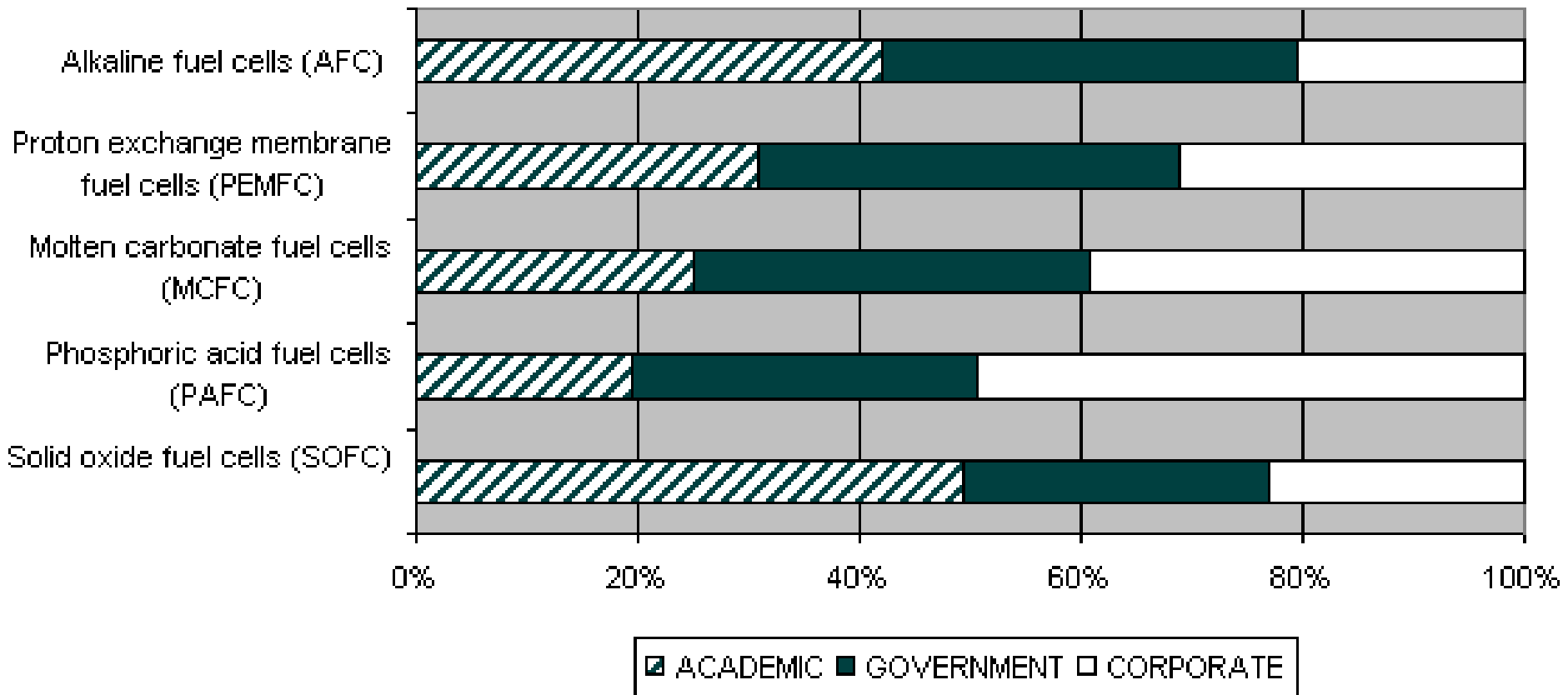
- **Technology Life Cycle Indicators**
 - e,g, growth curve location & projection
- **Innovation Context Indicators**
 - e.g., presence or absence of success factors (funding, standards, infrastructure, etc.)
- **Product Value Chain and Market Prospects Indicators**
 - e.g., applications, sectors engaged

A few of the 200+ MOT Indicators

- Velocity (rate of patenting and rate of change of patenting)
- Time slice profiles by main topics showing changing substantive emphases
- Fit growth models to gauge technology maturation
- Research Activity Landscape maps – “blackspaces”?
- Score relative science base (% of patents citing R&D papers)
- Research networking: Map co-inventor teaming
- Compare 2 companies’ IPC profiles – common interests? Complementarity?
- **% of R&D publications by industry (vs. academia or government)**

An Innovation Indicator

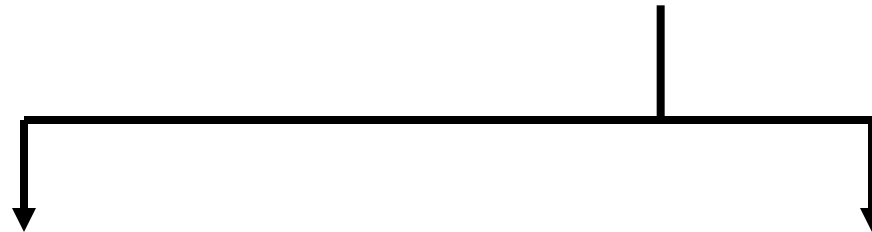
Innovation Drivers



**Any questions or comments on the
Tech Mining framework?**

The Tech Mining Approach

- Define the Management of Technology (MOT) Issues
- Break out particular MOT Questions
- Identify candidate empirical Indicators



- Identify appropriate Data Source(s)
 - Identify appropriate Analytical Tool(s)
- ←→
- Design Effective composite Representations that can be rapidly built ... **"one-pagers in one day."**

How to do Tech Mining: 8-steps

1. Spell out the questions and how to answer them
2. Get suitable data
3. Search (iterate)
4. Import into text mining software (VantagePoint)
5. Clean the data
6. Analyze & interpret
7. Represent the information well – communicate!
8. Standardize and semi-automate where possible

Questions/Comments?

2 VantagePoint Macros

- 1. SuperProfile to generate quick Excel content**
- 2. Activity-Diversity Indicator**

SuperProfile: Quick Excel Outputs from your dataset

- **Often want to “BREAKOUT” multiple fields of information for select entities from another field**
- **You can do this interactively in VP via Detail Windows and/or Matrix views**
- **But also can do via SuperProfile (in VP or MS Excel)**
- **Let’s look at some examples**

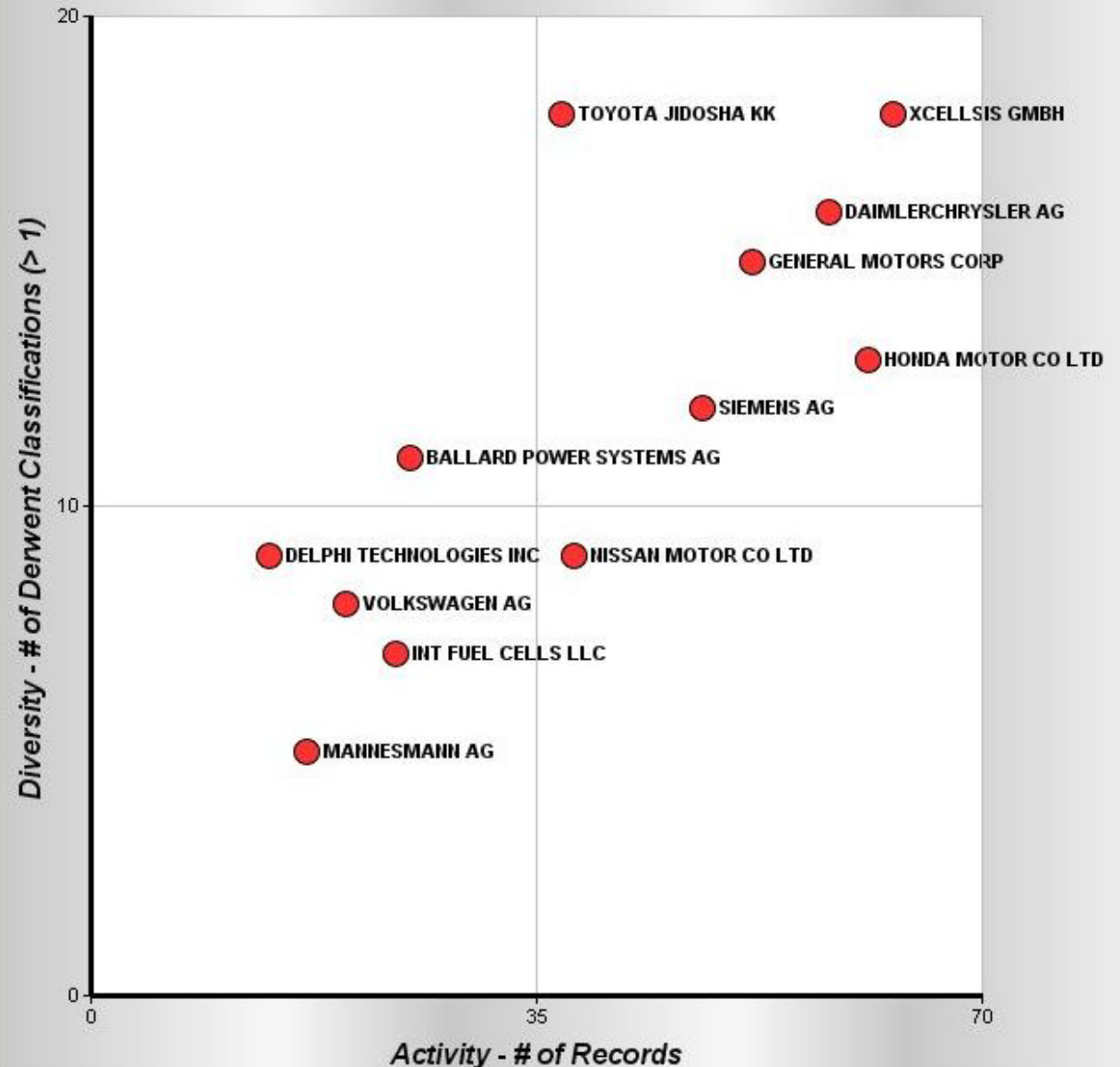
SuperProfile: Breakouts for Top 3 US Research Organizations [from Synechocystis Research Profile]

Author Affiliations	Subject Category	Key Terms	Authors
Arizona State Univ[12]	Biochemistry & Molecular Biology [5] Biophysics [3] Microbiology [2] Plant Sciences [2]	synechocystis [12] Cyanobacteria [4] Photosynthesis [4] Photosystem II [3] small CAB-like proteins SCPs [2] SYNECHOCOCCUS-ELONGATUS [2] ENERGY-TRANSFER [2] phycobilisomes [2]	Vermaas, W [5] Vermaas, W F J [4] Vavilin, D [3]
Penn State Univ[12]	Biochemistry & Molecular Biology [4] Plant Sciences [3] Multidisciplinary Sciences [2] Genetics & Heredity [2]	synechocystis [10] ELECTRON-TRANSPORT [5] Cyanobacteria [4] Photosynthesis [4]	Bryant, D A [5] Vuletich, D A [4] Lecomte, J T J [3]
Washington Univ[10]	Biochemistry & Molecular Biology [4] Multidisciplinary Sciences [2] Plant Sciences [2]	synechocystis [6] CRYSTAL-STRUCTURE [6] Photosystem II [3]	Pakrasi, H B [10] Smith, T J [4] Roose, J L [3] Kashino, Y [3]

Activity/Diversity Indicator

- **Macro for Patent Breadth vs. Activity (DWPI file)**
- **Fuel Cells – next slide**
- **Then run the macro on Bacteria sample (SCI file)**

Activity/Diversity - Patent Assignees (Cleaned) (Top)



The *Activity/Diversity* macro generates a 2-D scattergram showing:

X-axis: quantity of activity
[e.g., # of patents]

Y-axis: breadth of activity
[e.g., # of different patent classes]

This can provide insight into organizational R&D strategies -- i.e., how focused vs. broad-brush?

1. The Tech Mining Framework
2. Innovation Indicators
3. Quick Profiles from your dataset
4. Activity-Diversity Indicator
5. Discussion

- **Macros & Indicators: questions? wishes?**
- **Webinars:**
 - frequency, format
 - follow-up
 - Topics of interest?
- **Shared learning:**
 - users group? [open identity or not?]
 - VP-Academic
 - sharing tools
 - Paul Oldham – Sociomics group at University of Lancaster: <http://sociomics.blogspot.com>

Thank you!

**For additional resources, please visit
www.theVantagePoint.com**