Why Portfolio Mining?

- **What Do We Have?** Quantifying the relative strengths and weaknesses of a technology portfolio (internal or external to the business) is critical to leveraging IP for a competitive advantage.

- **What Do We Need?** Identifying gaps (white spaces) in the portfolio relative to peers and to customer needs is perhaps the most challenging mining activity – yet it can generate the most useful ROI.

- **Acquire What We Need.** Discovering assets that can be exploited in the context of your portfolio may be the difference between build vs. buy; maintain vs. expand; growth vs. hypergrowth,

- **Divest What We Don’t Need.** Capturing and protecting real technological advance is not easy and often much “junk” can collect over time, because product development is a series of activities that throws off hundreds – if not thousands of ideas (and patents);
Portfolio Mining Adds Value to Many Processes

Competitive Assessment
- Innovation trends in my industry
- Emerging and fading players

Product Development
- Patent strategy benchmarks
- New product ideas and work-arounds

Risk & Cost Management
- Assessing patents at risk
- Using patents to improve leverage

Licensing
- Identify licensing business cases
- Evaluate fees and deal pricing

Acquisitions
- Locate compatible firms, targets
- Assess value and pipeline potential
Log of number of ideas succeeding to next stage

1. 3,000 raw ideas
2. 300 ideas submitted
3. 125 small projects
4. 9 early stage developments
5. 4 major developments
6. 1.7 launches
7. 1 success

# Common Insights in Portfolio Mining

<table>
<thead>
<tr>
<th>Inventors</th>
<th>Priority Year</th>
<th>Class Codes</th>
<th>Assignee</th>
<th>Citations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Co-occurring inventors</td>
<td></td>
<td>Inventor’s technology/ies</td>
<td>An inventor’s most frequently cited patents</td>
<td></td>
</tr>
<tr>
<td>Priority Year</td>
<td>Technology trend(s)</td>
<td></td>
<td>A year’s top patenting companies</td>
<td></td>
</tr>
<tr>
<td>Priority Country</td>
<td>A country’s leading inventors</td>
<td></td>
<td>A country’s top patenting companies</td>
<td></td>
</tr>
<tr>
<td>Class Codes</td>
<td>A technology’s key inventors</td>
<td>A technology’s growth trend</td>
<td>A country’s leading technology/ies</td>
<td>A technology’s top patenting companies</td>
</tr>
<tr>
<td>Assignee</td>
<td>A company’s technology growth trend</td>
<td>Similar and associated classes of technology</td>
<td>Allied companies</td>
<td>Patents most frequently cited by a company</td>
</tr>
<tr>
<td>Citations</td>
<td>Cited inventors</td>
<td>A company’s technology inventory</td>
<td>Companies that frequently cite the patent(s)</td>
<td>Most frequently co-occurring patents</td>
</tr>
</tbody>
</table>

Source: www.questel.orbit.com

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But You Really Need Cutting-Edge Techniques

Landscape Mapping and Visualization

Intelligent Data and Text Mining

Cost, Income and Market Approach Valuation
Portfolio Mining Case Study – Out Licensing Opportunities

The Coca-Cola Company vs. PepsiCo
• Coca-Cola has been a clear leader in patenting for decades
• In 2000, the company laid off 6000+ people, and the “brain drain” effect is clear
• Pepsico appears to have implemented patent management strategies as well as increased acquisitions
• Could Coca-Cola benefit if it pursued patent enforcement vs. Pepsico?
Majority of Coca-Cola’s patents are still valid
Most patents expire in E3 term - may indicate a “buy and hold” strategy that could produce immediate savings if instead weaker patents (and associated maintenance fees) were discarded

KO Current, Corrected and Expired Patents (890 Total)

- Approx. Current Valid KO U.S. Patents - 703
- Approx Number of Patents Dropped - 180

KEY
E1: Expired four(4) years after the initial issue date.
E2: Expired eight(8) years after the initial issue date.
E3: Expired twelve(12) years after the initial issue date.
• Majority of Pepsico’s patents are still valid
• Equivalent expirations in E1, E2, E3 terms - may indicate active “culling” of portfolio

PEP Current, Corrected and Expired Patents (581 Total)

Maintenance Record Detail

- Approx. Current Valid PEP U.S. Patents - 502
- Approx Number of Patents Dropped - 80
- E1 Expired - 20
- E2 Expired - 21
- E3 Expired - 23
- CC Certificate of Correction issued - 48
- None reported - 453

KEY
E1: Expired four(4) years after the initial issue date.
E2: Expired eight(8) years after the initial issue date.
E3: Expired twelve(12) years after the initial issue date.
Top Coca-Cola Primary Classes

- Coke appears to dominate Pepsi in almost all of its top 20 Classes
- Pepsi dominates in Class 426 but Coke’s patents are in beverage technologies while Pepsi’s are in corn and potato processing (snack foods)
- Clear that Coke owns majority of technologies required to manufacture, distribute and market

KO vs. PEP Aggregate U.S. Class Code Assignments
(Ranked by KO Top 20 Classes)

Coke

Pepsi

U.S. Primary Class Codes

Total KO + PEP Patents

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This is Coca-Cola's most dominant US Subclass
Large portfolio share - are Pepsico and other beverage manufacturers infringing?
Likely that Coke's reputational concerns will eliminate desire to litigate
Alternatively, could Coca-Cola license to others and have them enforce?
• This is KO’s second-most dominant US subclass
• Note Cornelius, IMI Cornelius, IMI Wilshire & Wilshire Partners have same parent
• Cornelius, a supplier to Coke and Pepsico, may be patenting technologies “taught” to them by Coke
• Smarter policies at Coke could reduce Pepsico’s access to technology or collect license fees for access

Top Patent Owners - USC 222/129.1

DISPENSING
Plural Sources, Compartment, Containers And/Or Spaced Jacket:
Cabinet-Type Dispenser For Single Mixed Drinks
(430 Total in Class)

#2 • Total Class Dominance - 22%

THE COCA-COLA COMPANY
94

THE CORNELIUS COMPANY
22

IMI CORNELIUS INC.
21

JET SPRAY CORP.
10

SANDEN CORPORATION
10

LANCER PARTNERSHIP, LTD.
9

LANCER CORPORATION
8

SANYO ELECTRIC CO., LTD.
7

PEPSICO
0

WILSHIRE PARTNERS
6

IMI WILSHIRE INC.
6

ALL OTHERS - 1 OR 2 PATENTS EACH
243

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This document was obtained from the Cornelius website.
Since Cornelius supplies Coca-Cola and Pepsi, the products might incorporate IP from one or the other.
Shows that Pepsico depends on its suppliers for innovation/R&D in the beverage area.
If Coca-Cola better controls Cornelius’ access to its technology, it could raise Pepsico’s costs.

UNIT DESCRIPTION
• Built-in cold carbonator produces bottle-quality drinks every time
• No seasonal CO2 adjustments required for changes in water temperature
• A complete system for simplified installation
• Reduces service frequency and lowers equipment life cost
• Generates increased beverage sales and greater consumer satisfaction
• Illuminated merchandiser delivers unique, high impact marketing message
• Ice used to cool cold plate kept separate from ice dispensed into cups
• One piece ABS thermoformed plastic ice storage hopper. Durabide™ ensures all ice in the hopper is dispensable
• Unit readily accepts top mount cubers with manual ice fill capability
• Additional confirmation about Cornelius’ reliance on Coke’s technology
• Lancer also supplies Coke, Pepsi (founded by ex-Coke employee)
• These companies could represent potential licensees or infringers

<table>
<thead>
<tr>
<th>Assignee</th>
<th>Assignee Patents that Cite KO Patents</th>
</tr>
</thead>
<tbody>
<tr>
<td>IMI Cornelius Inc.</td>
<td>28</td>
</tr>
<tr>
<td>Lancer Partnership, Ltd.</td>
<td>27</td>
</tr>
<tr>
<td>Nestec S.A.</td>
<td>24</td>
</tr>
<tr>
<td>Sanyo Electric Co., Ltd.</td>
<td>22</td>
</tr>
<tr>
<td>PepsiCo Inc.</td>
<td>21</td>
</tr>
<tr>
<td>Kraft Foods, Inc.</td>
<td>20</td>
</tr>
<tr>
<td>The Procter &amp; Gamble Company</td>
<td>20</td>
</tr>
<tr>
<td>Illinois Tool Works Inc.</td>
<td>15</td>
</tr>
<tr>
<td>Ecolab Inc.</td>
<td>14</td>
</tr>
<tr>
<td>Sanden Corporation</td>
<td>12</td>
</tr>
<tr>
<td>Eastman Kodak Company</td>
<td>11</td>
</tr>
<tr>
<td>Shurflo Pump Manufacturing Company, Inc.</td>
<td>11</td>
</tr>
<tr>
<td>Whirlpool Corporation</td>
<td>11</td>
</tr>
<tr>
<td>Fuji Electric Co., Ltd.</td>
<td>10</td>
</tr>
<tr>
<td>Kimberly-Clark Worldwide, Inc.</td>
<td>10</td>
</tr>
<tr>
<td>Lancer Corporation</td>
<td>10</td>
</tr>
<tr>
<td>LJL Biosystems, Inc.</td>
<td>10</td>
</tr>
<tr>
<td>Mars Incorporated</td>
<td>10</td>
</tr>
<tr>
<td>Tate &amp; Lyle Industries, Limited</td>
<td>10</td>
</tr>
</tbody>
</table>
Portfolio Mining Case Study – In Licensing Opportunities

The Coca-Cola Company – Polyester Bottle Suppliers
• Filing history shows rising but now steadily competitive innovation
• About half of all applications become patents, so grant of 20-25 patents/year should continue
• Worth noting: 653 Japanese Abstracts; 50 European patents; 104 German patents match query

US Filing History, Polyester-Bottle Patents & Applications,
1976 - 2003
346 US Patents; 112 (Identifiable) US Applications
Top Primary U.S. Classes

- Primary class 428 dominates both polyester-bottle patents and applications
- 428 - Stock material or miscellaneous articles

US Polyester-Bottle Patents vs. Applications Class Code Assignments
(Ranked by US Primary Classes with 10 or More Granted Patents)

- 428 Stock material or miscellaneous articles
- 215 Bottles and jars
- 264 Plastic and nonmetallic article shaping or treating: processes
- 528 Synthetic resins or natural rubbers -- part of the class 520 series
- 524 Synthetic resins or natural rubbers -- part of the class 520 series
- 525 Synthetic resins or natural rubbers -- part of the class 520 series
- 220 Receptacles
- 427 Coating processes
- 523 Synthetic resins or natural rubbers -- part of the class 520 series
- 156 Adhesive bonding and miscellaneous chemical manufacture
- 425 Plastic article or earthenware shaping or treating: apparatus
- 426 Food or edible material: processes, compositions, and products
- 521 Synthetic resins or natural rubbers -- part of the class 520 series
- There are no “huge” players with granted polyester-bottle patents
- Presence of both large and small entities indicate fragmentation in research
- Also shows potential to acquire/license with KO’s market power
• Broad group of inventors with 5+ patents indicates diversity of knowledge
• No single “industry expert”
• James Matayabas only prolific inventor with applications pending – interesting outlier

Inventors of 5 or More US Polyester-Bottle Patents and Applications

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### Competitive Intelligence: J. Matayabas

- Works for Eastman Chemical; UFL grad; Lives w/ wife Deborah in Chandler, AZ
- Researcher on portfolio donated to University of South Carolina
- Expertise in polymer/clay nanocomposites
- Intelligence shows this as a promising multilayer technology for CO2 gas barrier

<table>
<thead>
<tr>
<th>Publication</th>
<th>Title/Abstract</th>
<th>Assignee</th>
<th>Filed</th>
</tr>
</thead>
<tbody>
<tr>
<td>US20040082698A1</td>
<td>Polymer/clay nanocomposite comprising a clay mixture and a process for making same</td>
<td>none</td>
<td>2003-10-14</td>
</tr>
<tr>
<td>US20040063841A1</td>
<td>Process for preparing an exfoliated, high I. V. polymer nanocomposite with an oligomer resin precursor and an article produced therefrom</td>
<td>none</td>
<td>2003-09-30</td>
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<tr>
<td>US20040127627A1</td>
<td>Polymer/clay nanocomposite comprising a clay treated with a mixture of two or more onium salts and a process for making same</td>
<td>none</td>
<td>2003-07-30</td>
</tr>
<tr>
<td>US20040124526A1</td>
<td>Gel thermal interface materials comprising fillers having low melting point and electronic packages comprising these gel thermal interface materials</td>
<td>none</td>
<td>2002-12-30</td>
</tr>
<tr>
<td>US20020193494A1</td>
<td>Process for preparing an exfoliated, high I.V. polymer nanocomposite with an oligomer resin precursor and an article produced therefrom</td>
<td>Eastman Chemical Company</td>
<td>2002-07-19</td>
</tr>
<tr>
<td>US20020165306A1</td>
<td>Process for preparing an exfoliated, high I.V. polymer nanocomposite with an oligomer resin precursor and an article produced therefrom</td>
<td>Eastman Chemical Company</td>
<td>2002-05-14</td>
</tr>
<tr>
<td>US20030166873A1</td>
<td>Thermal interface material and method of fabricating the same</td>
<td>none</td>
<td>2002-03-11</td>
</tr>
<tr>
<td>US20020169246A1</td>
<td>Process for preparing high barrier nanocomposites</td>
<td>Eastman Chemical Company</td>
<td>2002-03-06</td>
</tr>
<tr>
<td>US20020137834A1</td>
<td>Polymer/clay nanocomposite comprising a functionalized polymer or oligomer and a process for preparing same</td>
<td>Eastman Chemical Company</td>
<td>2002-02-08</td>
</tr>
<tr>
<td>US20030128521A1</td>
<td>Electronic packages having good reliability comprising low modulus thermal interface materials</td>
<td>none</td>
<td>2002-01-04</td>
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<tr>
<td>US20020143092A1</td>
<td>Chain extension for thermal materials</td>
<td>none</td>
<td>2001-12-27</td>
</tr>
<tr>
<td>US20020140082A1</td>
<td>Chain extension for thermal materials</td>
<td>none</td>
<td>2001-03-30</td>
</tr>
<tr>
<td>US20020119266A1</td>
<td>Polymer-clay nanocomposite comprising an amorphous oligomer</td>
<td>University of South Carolina Research Foundation</td>
<td>2000-12-01</td>
</tr>
<tr>
<td>US6552113</td>
<td>Polymer-clay nanocomposite comprising an amorphous oligomer</td>
<td>University of South Carolina Research Foundation</td>
<td>2000-12-01</td>
</tr>
<tr>
<td>US20020022678A1</td>
<td>Polymer/clay intercalates, exfoliates, and nanocomposites comprising a clay mixture and a process for making same</td>
<td>none</td>
<td>1999-12-01</td>
</tr>
<tr>
<td>US6384121</td>
<td>Polymer/clay nanocomposite comprising a functionalized polymer or oligomer and a process for preparing same</td>
<td>Eastman Chemical Company</td>
<td>1999-12-01</td>
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<tr>
<td>US6486253</td>
<td>Polymer/clay nanocomposite having improved gas barrier comprising a clay material with a mixture of two or more organic cations and a process for preparing same</td>
<td>University of South Carolina Research Foundation</td>
<td>1999-12-01</td>
</tr>
<tr>
<td>US6486254</td>
<td>Colorant composition, a polymer nanocomposite comprising the colorant composition and articles produced therefrom</td>
<td>University of South Carolina Research Foundation</td>
<td>1999-12-01</td>
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<tr>
<td>US6653388</td>
<td>Polymer/clay nanocomposite comprising a clay mixture and a process for making same</td>
<td>University of South Carolina Research Foundation</td>
<td>1999-12-01</td>
</tr>
</tbody>
</table>
These documents were obtained from the USC Tech Transfer website
Donated portfolio appears available for license; maybe even for sale
Could this prior art be acquired and reduce effects of monopoly pricing?

DEVELOPMENT

The polyamide-clay composite is market ready. The technology provides gas barriers to carbon dioxide and oxygen resulting in a shelf life up to 3-6 months for beers, and fruit juices. There is even the capability of producing a carbonated soft drink bottle that has a shelf life up to one year. Light transmission levels of the multi-layer bottle based on PET with internal barrier layer of polyamide-clay composite have been reduced to 5% or less and many elements of the plastics have been thoroughly tested. The multi-layer bottle based on PET with internal barrier layer of polyamide-clay composite is able to withstand temperatures of 300° F (150° C). Multi-layer PET bottles using a middle layer polymer resin barrier material are currently in production. The middle layer of the bottle is enhanced by a polyester nanocomposite medium. Additional research and development is needed to make mono-layer PET commercially viable.

FUTURE DEVELOPMENT

USC’S plans with this technology include improving the properties of PET/clay nanocomposites to allow use for applications requiring enhanced gas barrier properties, such as beverage container, etc, with the goal of achieving a market-ready PET monolayer bottle. Initial research will focus on the exfoliation of clay platelets and the uniform dispersion of novel treatment chemistries, of polymer-specific synthetic clays and of novel measurement methods.
Portfolio Mining IP Landscapes – Systematizing the Analysis

Away-From-Home Towel Dispensing
Useful Elements of a Systematic IP Landscape

1. Number of Patents and Applications
   - Patents: 139
   - Applications: 101

2. Assignee Name: Kimberly-Clark

3. Percent of Portfolio by Application Year (1990 - 2007)
   - 20%

4. Percent Recent Filed (2004-2007)
   - 77.4%

5. Top 3 Inventor Countries
   - US, UK, NE

6. (Patent Only) Quality Score Distribution (5 is the highest)
   - 1 2 3 4 5

7. Percent Similarity to Georgia-Pacific Claims Language

8. Portfolio Category Distribution
   - Dispenser Attributes
     - Cutting or Separating
     - Dispensing Static
     - Dispensing - Automatic
     - Dispensing - Manual
     - Gravity Feeding
     - Proximity Detecting
   - Dispenser Components
     - Cartridge
     - Drum
     - Motor
     - Mounting
     - Sensor or Indicator
   - Material Attributes
     - Cored
     - Coreless
     - Folded
     - Perforated
     - Stacked
     - Web
   - Places of Use
     - Office
     - Hotel or Restaurant
     - Institutional or Industrial
     - Transportation Vehicles
     - Public Restroom
     - Retail Store

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The AFH Towel Dispenser IP Landscape

* Number of documents for Top 2 Assignees is plotted on a 4X scale (compared to smaller competitors)
**Observations:**
While other patent portfolios appear more significant to Georgia-Pacific’s in terms of size and growth rate, competitor SCA shows a recent and rapidly growing interest in patenting across similar IP categories.

**Insights:**
SCA appears to be aggressively pursuing design differentiation in dispensers to encourage switching. Key segments are healthcare, industrial, commercial with significant focus on hospitality and foodservice.

**Conclusions:**
SCA should be watched carefully for infringement, and patents should be blocked where possible by understanding and attacking white spaces.

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**Observations:**
Independent inventor Maurice Granger (and family) has a significant number of patents, more so than many better known competitors.

**Insights:**
We have not identified any industry employer for Mr. Granger, whom we believe to be a French citizen. His portfolio may be available.

**Conclusions:**
The Granger portfolio should be reviewed for complementarity and his affiliation with industry should be confirmed. He may be a valuable expert or provider of advantaged geographic rights for Georgia-Pacific.
**Observations:**
The volume, focus and diversity of the Kimberly-Clark patent portfolio is more similar to the Georgia-Pacific portfolio than any other competitor.

**Insights:**
While both portfolios claim a similarly diverse range of the types of materials dispensed, automated and sensor-based dispensing is weaker in the Kimberly-Clark portfolio – it appears they are blocked by Georgia-Pacific.

**Conclusions:**
Georgia-Pacific should continue to block Kimberly-Clark in this area, which may include acquiring patents from other inventors or companies.

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**Observations:**
Sensor or indicator patenting is of significant interest across a wide range of landscape assignees, regardless of portfolio size.

**Insights:**
Sensor technologies enhance a number of other categories, from web feeding to proximity detection to data collection and dissemination.

**Conclusions:**
A competitive advantage in the use, application and integration of sensor technologies is critical and a deeper dive in this area is warranted.
Observations: Procter & Gamble’s portfolio in dispensing is large, yet it has relatively little presence in the categories within this landscape.

Insights: P&G is primarily claiming dispensing for wipes, as well as dispensers that are disposable and for small packages.

Conclusions: P&G does not appear to present a significant threat in commercial or AFH dispensing using its own patent portfolio. P&G’s use of vendors or suppliers in the area should be investigated to determine blocking potential by Georgia-Pacific’s portfolio.

Observations: Competitor Bay West, which has recently grown its portfolio, has higher than expected quality in its patents.

Insights: Higher quality patents are related to multi-roll dispensers, which add convenience for facility managers. In addition, claims language is significantly similar to Georgia-Pacific’s.

Conclusions: Based on portfolio and ~7% US AFH market share (SCA), this company should be assessed for infringement – or perhaps partnership/acquisition.
Portfolio mining is an analytical activity designed to answer key questions:

- What do we have?
- What do we need?
- Acquire what we need
- Divest what we don’t need

Visualization tools and techniques aid significantly in the mining activity and in the communication of findings.

Mining can be systematically performed within portfolios and across industry areas.

Understanding the portfolio in the context of relevant peer assets provides a most useful approach to assessing strengths and weaknesses in order to build a business case for licensing, acquisition and disposition.
Perception Partners is an advisory services firm that provides unique IP Analytics Solution Suites that help clients understand, quantify and maximize the value derived from innovation and intellectual property.

We enable our clients to increase revenues and profits with facts, using cutting-edge IP and business intelligence tools, algorithmic discovery techniques, and extensive legal, technical, and business expert teams.

We help our clients innovate in new products and services, find new market opportunities, discover acquisition targets and facilitate licensing of IP portfolios.
Understand, Quantify and Maximize the Value from Innovation. *That’s the IP Advantage™*

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