Tech Commercialization
Patents Searching

Ms Kho Su Yian & Ms Loh Mee Lan
NUS Libraries
Learning Outcomes

• Locate industry analyses & trends in technology for various sectors
• Locate information on companies
• Find out about consumer trends & behaviour
• Understand the overview of patent filing process
• Read a patent document
• Analyse patent data using Patsnap tools like Patsnap Insights and landscape maps
• Conduct effective searches in The Lens
• Q & A / Feedback
Why Research?

Kho Su Yian
Why Research Industries?

• Understanding – Get the macro view of an industry, the overall trends and major events that shape it.

• Viability – Is it realistic to enter a particular market? What are the possible risks and rewards for particular industries (and in particular countries)?

• Context – What are the benchmarks for performance, revenue and other factors for an industry? (E.g. mobile phone market value is $950m, but home insecticides only $20m). Who are the major companies holding the most market share?
Research Process Methodology

1. Patent Review
   - Innovators and Innovations
2. Interview Participants
   - Stakeholder Insights, Perspectives, and Strategies
3. Assess Innovations

Secondary Research
- Technology Journals
- Periodicals
- Market Research Reports
- Technology Policy Information Sites
- Internal Databases
- Thought Leader Briefings

Primary Research
- Engineers
- CTOs/CEOs/CIOs
- Technical Architects
- Research Heads
- Strategic Decision Makers
- Technology Policy Heads

Outcomes:
- Market Impact Analysis
- Industry Landscape
- Industry Funding Scenario
- Strategic Insights

Outcome: Market impact of key innovations, adoption scenario, funding scenario and growth opportunities

Source: Frost and Sullivan
Data: Macro to Micro

- **Country**
  - **Statistics**: Demographics, GDP, Wages etc...
  - **Analyses**: Economic, Social, Political, Legal etc...

- **Industry**
  - **Statistics**: Industry size, Brand & Market Shares etc...
  - **Analyses**: Trends, Highlights, SWOT etc...

- **Company**
  - **Statistics**: Financial data, Company size etc...
  - **Analyses**: SWOT, News, 3rd Party reports etc...
### What is SWOT?

<table>
<thead>
<tr>
<th></th>
<th>Positive</th>
<th>Negative</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Internal</strong></td>
<td><strong>Strengths</strong></td>
<td><strong>Weaknesses</strong></td>
</tr>
<tr>
<td><strong>External</strong></td>
<td><strong>Opportunities</strong></td>
<td><strong>Threats</strong></td>
</tr>
</tbody>
</table>
The “sweet spot” of innovation is where your solution is at the convergence of **Feasibility**, **Viability** and **Desirability**.

Source: [https://www.ideou.com/pages/design-thinking](https://www.ideou.com/pages/design-thinking)
# Database Matrix

<table>
<thead>
<tr>
<th>Databases</th>
<th>Desirability</th>
<th>Feasibility</th>
<th>Viability</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Social</td>
<td>Political</td>
<td>Technology</td>
</tr>
<tr>
<td>ABI/Inform</td>
<td>Yes</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>Business Source Premier</td>
<td>Yes</td>
<td>Limited</td>
<td>Limited</td>
</tr>
<tr>
<td>EIU.com</td>
<td>Limited</td>
<td>Yes</td>
<td>Limited</td>
</tr>
<tr>
<td>Factiva</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Frost &amp; Sullivan</td>
<td>No</td>
<td>No</td>
<td>Limited</td>
</tr>
<tr>
<td>Gartner</td>
<td>No</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>Passport</td>
<td>Yes</td>
<td>Limited</td>
<td>No</td>
</tr>
<tr>
<td>Patsnap</td>
<td>No</td>
<td>No</td>
<td>Yes</td>
</tr>
</tbody>
</table>
Quick Question

• Are you familiar with:
  • FindMore @NUSL
  • Find It! @ NUS Libraries in **Databases**
  • Find It! @ NUS Libraries in **Google Scholar**
  • Proxy Bookmarklet
  • Boolean Logic (And, Or, Not)
Resources

Kho Su Yian
Industry Databases

- **EIU.com** – Contains within Country Reports industry analyses for selected industries (automotive, consumer goods, energy, financial services, healthcare and telecommunications)

- **Frost & Sullivan** - Has market research on various technical and technology industries. Also provides market drivers and restraints, as well as possible market opportunities.

- **Passport** - Provides statistics, analysis, reports, surveys and breaking news on consumer product industries, some services, F&B packaging and ingredients. Also contains data and analysis on consumer lifestyles, population trends, and socioeconomic analysis for several countries.
Company Databases

• **Business Source Premier** - Contains company profiles and SWOT analyses of major companies. USA-centric, so coverage outside of USA is not comprehensive.

• **ABI/Inform** – Snapshots of various companies, SWOT analyses and some risk analyses. Global coverage is better than BSP, but still not comprehensive.

• **Factiva** – Company Snapshots and reports, listing of peer companies, breaking news of current events.
• Find out which companies are involved in similar research by looking at patent assignees.

• Searching for patents is also essential to research, as you do not wish to unknowingly infringe on an active patent.
Business Database List

• A lot to take in?
  Don’t panic, you can read about the databases at your leisure with this handout:
  nus.edu/2MbUGdl

• More information on relevant library resources can also be found here:
  http://libguides.nus.edu.sg
Free (or Almost Free) Resources

- Blogs and free reports from major market research companies, e.g.
  - Economist Intelligence Unit (EIU)
  - Euromonitor
  - Forrester
  - Gartner
  - McKinsey
  - Mintel

- Government websites can offer free statistics and analyses e.g.
  - Enterprise Singapore
  - Export.gov (USA website but with international data)
  - Industry.gov.au
Free (or Almost Free) Resources

• Some free or partially free databases are available online:
  • UNIDO Statistics Data Portal
  • Statista (free version)
  • World Bank Open Data
  • IMF e-Library

• The National Library (NLB) has a range of e-resources (some may have to be accessed from a specific terminal in the library)
Demo

Kho Su Yian
• Go to [www.lib.nus.edu.sg](http://www.lib.nus.edu.sg) to access the Library Portal
Introduction to Intellectual Property (IP) & Patents

Loh Mee Lan
Introduction to IP & Patents

What are the types of IP found in such products?

**Trademarks** – apple logo, “Iphone”

**Registered designs** – aesthetic appearance (shape of the phone)

**Layout design of ICs**

**Copyright** (embedded operating system and other software)

**Patents** – Functional features and is one of several forms of intellectual property (IP)

For more information, go to [Patent Libguide](#) (FAQs and Articles section).

Source: 2019 Iphone Renders (UPDATED) by Daniel Rivas is licenced under CC by NC-ND 4.0
• Some case studies on how companies apply different IP strategies
  • Intellectual Property of Singapore (IPOS) – Case Studies from IPValueLab
  • World Intellectual Property Organization (WIPO) – Case Studies on Intellectual Property (IP Advantage)
  • European Patent Office (EPO) – SME Case Studies
  • IP Australia – Case Studies
A Very Simple Timeline - Patent Filing

Inventor File for Patent

Publication of Patent Application

- Typically published **18 months** after the filing date of application

Publication of Granted Patent

- May take up to several years before a patent is granted
- Generally, protected for **20 years** from date of filing

Patents may be abandoned or may expire earlier
How to Read a Patent Document

Loh Mee Lan
## HOW to Read a Patent Document

<table>
<thead>
<tr>
<th>Fields</th>
<th>Generally consist of</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bibliographic Data/Information</td>
<td>Patent Number; Type of Patent [e.g. granted or application] Title; Inventor Name; Assignee Name; Publication/Issue Date; References; Abstracts Classification Numbers [can use to search for similar patents]</td>
</tr>
<tr>
<td>Drawings</td>
<td>- May contain drawings</td>
</tr>
</tbody>
</table>
| Descriptions (of the Invention)| - Background of the Invention [e.g. problem trying to solve, summary of what is known]  
- Detailed description of the invention  
- May contain examples |
| Claims [defines legal boundaries of the patent document] | - May consist of: Independent Claims, Dependent Claims  
- Usually starts with phrases like “I claim”, “We claim”, What is claimed is”, “The invention claimed is” |

For more details about how to read a patent, see Patent Libguide ([http://libguides.nus.edu.sg/patents](http://libguides.nus.edu.sg/patents))

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### FAQs and Additional Read

  This journal article appears as part of special issue. Beat of the British Medical Science (September 2015).
- FAQ: How to find a patent number?  
  Quick guide on how to find your patent document if you have the number.  
- FAQ: How to read a patent?  
  This is one of the FAQs from The Lens. A U.S. patent is used as an example to explain the purpose and goals for each section of the patent document.
- Inventions Handbook.  
  Basic guidance on the key stages of turning an invention into a commercial product. - EPPO
  Understanding P & I (Patent And Invention).  
  The author in this article aims to give some tips and techniques to read patent documents to locate key scientific findings.
  IFU guidelines on patenting and marketing for scientifically and technologically advanced countries.  
  Singapore: World Scientific (accessed March 5, 2019).
  This book chapter explores about how to read a patent document.
  FAQ on Patents
- WIPD’s Guide to linking patent information
How to Read a Patent Document

- Independent Claims
  “Generally an independent claim is one that does not refer to any other claim. Some independent claims may refer to other claims....”

- Dependent Claims
  “A dependent claim can depend upon one or more independent claims or one or more dependent claims....”

Patent Searching – The Basics

Loh Mee Lan
# Patent Searching – Introduction

## 5W1H – Searching Patents

<table>
<thead>
<tr>
<th>Why?</th>
<th>Hold exclusive right to use the invention for a period of time *</th>
</tr>
</thead>
<tbody>
<tr>
<td>When?</td>
<td>Every step of the innovation journey *</td>
</tr>
<tr>
<td>What?</td>
<td>What are you looking for? Purpose of Your Search?</td>
</tr>
<tr>
<td>How?</td>
<td>How to Read a Patent Document How to Search Patents</td>
</tr>
</tbody>
</table>

* Source: [https://www.ipos.gov.sg/understanding-innovation-ip/patent](https://www.ipos.gov.sg/understanding-innovation-ip/patent)

Scoping Searches e.g. keywords search
- Start broadly.... using Synonyms, Truncations, wildcards variations,
- Refine with additional keywords, classification numbers, etc.

Pearl Growing Searches e.g. start from a single document
- Start with a known patent document
- Find other patents with patents using relevant classification numbers, citations analysis, references (including non patent literature), etc.

Classification Search
# Quick Comparison of 3 Patent Databases

<table>
<thead>
<tr>
<th>Coverage (information from their websites)</th>
<th>Patsnap</th>
<th>The Lens</th>
<th>Google Patents</th>
</tr>
</thead>
<tbody>
<tr>
<td>Over 130 million patent publications + DocDB (covers nearly 100 jurisdictions)</td>
<td>Over 117 million documents Bibliographic DocDB (covers nearly 100 jurisdictions) Full Text and Images US, EP, WIPO PCT, Australia</td>
<td>Over 120 million patent publications from 100+ patent offices</td>
<td></td>
</tr>
</tbody>
</table>

| Semantic Search or similar functions | Yes (by publication number or text with at least 2000 characters). Retrieved up to 1000 relevant documents. Document level – “Similar Patents” Function | No | No separate search option Document level – have “Find Prior Art” or “Similar” Functions |

| Scholarly Works (found in patents document) / Non Patent Literature (NPL) | Listed but not hyperlinked in patent documents (citations) | Start search either by patents or scholarly works. Scholarly data from PubMed, CrossRef, Microsoft Academic Scholarly works that found in Lens.org are hyperlinked. | - Can includes NPL from Google Scholar at searching screen - Includes a copy of the technical documents and books indexed in Google Scholar and Google Books - Listed but not hyperlinked in patent documents (citations) |

| Landscape Maps | Yes | No | No |

| Patent Analysis | Yes Patsnap - Overview : 7 options e.g. Application Trends, Top Assignee(s) with further subtopics Patsnap Insights – Company and Technology Dashboards, each with breakdown by subtopics | Yes Display “Graphical Analysis”: up to 10 options e.g. Top 10 inventors | Yes Display 3 options: (assignee, inventors, CPCs) e.g. top assignees |
Patent Searching

Access Patsnap via NUS Portal (http://lib.nus.edu.sg)
Access Patsnap via NUS Portal (http://lib.nus.edu.sg)

Subscribed database for NUS staff and students

Registration for 1st Time Users

- Patsnap
- Registration Guide
Bloomberg.com

Dyson Is Working on an Air Purifier That’s Also Headphones
By Giles Turner and Debby Wu
November 9, 2018, 10:43 PM GMT+8

Dyson is considering developing a wearable air purifier that could double as a pair of headphones, hoping to tap demand from pollution-choked cities in Asia, people with knowledge of the project said.

The U.K. company submitted patents for a “wearable air purifier” this year, according to filings to the U.K. Intellectual Property Office. The gadget is primarily an air
Quick search on Google would give you some ideas on what’s already available on the market.
Dyson has filed 9 patents on wearable air purifier.
# Search Topic – Wearable Air Purifier

Patsnap - Initial Search on air purifier and headphones

<table>
<thead>
<tr>
<th>Field</th>
<th>Search Strategy</th>
<th>No of Records</th>
</tr>
</thead>
<tbody>
<tr>
<td>Title / Abstracts</td>
<td>TA:(&quot;air purifier&quot;) AND TA:((wearable OR portable OR personal)) AND (TA:(headphone) OR TA:(earphone))</td>
<td>7</td>
</tr>
<tr>
<td>IPC Classification</td>
<td>IPC: (H04R1/10 ) AND IPC: (A62B7/10)</td>
<td>11</td>
</tr>
<tr>
<td>A04R1/10</td>
<td>Earpieces; Attachments therefor [2006.01]</td>
<td></td>
</tr>
<tr>
<td>A62B7/00</td>
<td>Respiratory apparatus (for medical purposes A61M 16/00) [2006.01]</td>
<td></td>
</tr>
<tr>
<td>A62B7/10</td>
<td>with filter elements [2006.01]</td>
<td></td>
</tr>
<tr>
<td>Keywords</td>
<td>(earphone OR headphone) AND &quot;air purifier&quot;</td>
<td>1359</td>
</tr>
</tbody>
</table>
Patent Searching – Patsnap

Single Patent Document Search

Patent No: WO2015140776A1

Title: Smart, personal air purification device
Semantic Search

- Using search algorithm to find relevant patents
- By patent number or using a paragraph of text

See Patsnap Help Info

Patent No: WO2015140776
### Patent Searching – Patsnap

#### Help on Patsnap Search Operators, Syntax, etc.

<table>
<thead>
<tr>
<th>Operator</th>
<th>Explanation</th>
<th>Example</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>AND</strong></td>
<td>2 keywords must be found in document</td>
<td>apple AND orange</td>
</tr>
<tr>
<td><strong>OR</strong></td>
<td>Either keywords found in document</td>
<td>apple OR orange</td>
</tr>
<tr>
<td><strong>NOT</strong></td>
<td>1st keyword must be found but exclude 2nd keyword</td>
<td>apple NOT orange</td>
</tr>
<tr>
<td><strong>“ ”</strong></td>
<td>Keywords within quotation marks must be next to each other in the order specified</td>
<td>“apple juice”</td>
</tr>
<tr>
<td><strong>( )</strong></td>
<td>Using parentheses to define search order</td>
<td>(apple OR orange) NOT juice</td>
</tr>
<tr>
<td>*<strong>$</strong></td>
<td>Replace a string of characters</td>
<td>function*</td>
</tr>
<tr>
<td><strong>$Wn</strong></td>
<td>Search words within “n” words of each other, in any order</td>
<td>vitamins $W5 nutrients</td>
</tr>
<tr>
<td><strong>$WS</strong></td>
<td>Search words within SAME sentence</td>
<td>vitamins $WS nutrients</td>
</tr>
</tbody>
</table>

Go to Search Helper for more tips: [Search Syntax Tab](#); Use of [stemming and wildcards](#)
Keyword Searching

(wearable OR personal) AND (“air purifier” OR “air cleaner” OR “air filter”)

Refine the search results
Tips: HOW to Search Patents Effectively

Beware of "naïve" keyword searches!

Patent jargon is used to broaden scope of the patent.

Sometimes the applicant simply doesn't want his application to be found.

"energy-storing means"

"fastening means"

"spherical object with floppy filaments"

"plurality of balls"

Patsnap Analysis

Landscape Maps
Patsnap Insights

Loh Mee Lan
- Broad overview of the technology
- Identify trends
- Who are the major companies/institutions

Remember!!
Patent analysis forms part of the overall analysis about the market/technology

Combine with business information, current affairs, non patent literature, etc. to get a more accurate view.
How the patents are organized:
- “patent analysis algorithms to create what is essentially a self-organising map”
- “Similar patents are positioned closer together, and different patents are spaced further apart”
- “the mountains, where patents will be clustered, represent areas of high activity and the low lying areas represent lower levels of patent activity”
- Clusters based classification codes and semantic analysis of keywords (title/abstracts)

Sources: Patsnap Help: Using The Landscape Tool & How are patents assigned to each category in Landscape
((wearable OR personal) AND (“air purifier” OR “air cleaner” OR “air filter”)) AND (headphone)

Additional Help (from Patsnap Website):
- Help on Landscaping
Additional Tips

- See the “forests” (big picture/overview)
- Landscape maps based on the set of documents retrieved
- Is accurate as of today (legal status will change, new patents are published, etc.)
- Lastly....
  - Store your relevant patents in workspace
  - Set up alerts to keep updated......
Question
I did a search on patents on Dyson (assignee). Limit to application year 2017-2019

Found the 9 patents on wearable air purifier

But when I create a landscape map, I cannot find the 9 patents.

Example
GB201800104D0
A wearable air purifier

WHY?
Patsnap Insights

Patsnap Insights provides business intelligence information. You can assess opportunities and threats, find valuable information about the company or technology, etc. The data is based on information extracted from Patsnap database.

2 Types of Dashboards
- Technology
- Company

How to Access
- From Search Results Sets (Patsnap)
- Workspace (Patsnap)
- Direct from NUS Libraries Portal

Titles/Abstracts
Wearable air purifier

Patsnap Insights

Additional Help
- Quick guide on finding company information
- Quick guide on finding technology information

Patsnap Website
- Additional Help on Patsnap Insights
In Summary – Wearable Air Purifier

- Search several ways/rounds to scope relevant patents
- Apply different search techniques to narrow or broaden search results
- Save relevant records to workbin for review / further analysis
- Set up alerts or save search strategies
- Generate landscape maps
- Patsnap Insights – company or technology dashboards
- Information on latest market information, etc....
Patent Searching – Lens.Org

Loh Mee Lan

- “The Lens serves global patent and scholarly knowledge as a public resource to make science- and technology-enabled problem solving more effective, efficient and inclusive”
- Free patent database
- Includes over 117 million documents (bibliographic / full text)
- Full text documents from US Patents, European Patents, WIPO Applications, Australian Patents, etc.) and non patent literature (over 195 million scholarly records from PubMed, CrossRef, Microsoft Academic Scholarly)
Patent Searching – Lens.Org

https://www.lens.org/

- Strengths: Able to find number of cites from patents to scholarly works and vice versa

- Lens Video Tutorials (Help Support)

- Optional: Sign up for a free Lens.org account (e.g. save records, set alerts)
• Search A Patent Document (US7892306)
  ▪ Search Inventor(s)
  ▪ Identify and search suitable classification codes
  ▪ Find Citations (Scholarly Works, Cited By or Cites)
## Patent Searching – Lens.Org

<table>
<thead>
<tr>
<th>Operators</th>
<th>Explanation</th>
<th>Example</th>
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<tbody>
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<tr>
<td>*</td>
<td>Replace a string of characters at the end</td>
<td>function*</td>
</tr>
<tr>
<td>?</td>
<td>Replace a single character anywhere within the word</td>
<td>Ne?t</td>
</tr>
<tr>
<td>~</td>
<td>Proximity Search (similar to N or W or NEAR operators in other databases). Enter ~ followed by a number. In this example, it will retrieve apple pie, apple sweet potato pie, etc.</td>
<td>&quot;apple pie&quot;~2</td>
</tr>
<tr>
<td><strong>Field Search</strong></td>
<td>Search Specific field (e.g. Title) Field followed by use of &quot;.&quot; Can also use structured search form</td>
<td>title:treatment title:(apple AND orange) full_text:&quot;competitive advantage&quot;</td>
</tr>
</tbody>
</table>

### Boolean Operators

### Proximity

### Search Syntax

### Wildcards
(wearable OR costume OR apparel) AND "air purifier"

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Topic Search
Filter/Refine Search
Patent Analysis
Cited Works
How to Search Lens.Org - ORCID

• Dr Ge Yu, Julia - orcid.org/0000-0002-0861-2488

For more information on Open Researcher and Contributor ID (ORCID), see ORCID Libguide
GRADUATE RESEARCH INNOVATION PROGRAM (GRIP)

Librarians will be available for clinic sessions for your teams.

Date: 16, 18, 24 September 2019
Duration: 0.5 hour per slot (maximum of 2 teams per slot)

Sign up with GRIP Admin staff
Thank You For Your Feedback by Got Credit is licensed under CC by 2.0

HAVE A MINUTE? HELP US IMPROVE
j.mp/RU_feedback

Session Details:

Date & Time: 17 Aug 2019 9.30am
Workshop/Event Title: Tech Commercialization
Additional Search Tips

Loh Mee Lan
Can’t View Full Text Articles?

– Try apply Library Proxy Bookmarklet to see if NUS Libraries has the online version of the article. NUS staff/students may be able to access full text article.

We may also have the print copy of the journal in our library.
Need help on searching Patsnap?

Go to Patent Libguide: Databases

Patsnap Online Help
Refer to NUS Libraries Patent Libguide

- FAQs and articles on IP and patents
- Powerpoint presentations on other sessions conducted by NUS Libraries
- Quick Guides to Searching Patsnap and Patsnap Insights
- Access to other subscribed and free patent related databases
- Etc...

http://libguides.nus.edu.sg/patents