Citation Information in Espacenet and the Common Citation Document (CCD)
What are citations?

Cited documents are documents cited either during any of the procedures before the patent authority for a specific jurisdiction (search, examination, review, opposition, limitation, revocation or appeal), or by the applicant.

A cited document can be a patent document or an item of non-patent literature.
What are citations?

- ... prior art citations, can be written in any language ...
- ... disclosures on the internet form part of the state of the art ...
- ... the search can also cover internet sources: f.ex online technical journals...
- ... (applicant) citations related to details may be disregarded by the examiner ...
- ... video & audio media fragments available on the internet are converted into a non-patent literature citation (URL of the original location on the internet, screenshots,...)
What is Non Patent Literature?

→ Cited publications that are not patent documents
For example:
- Scientific publications & articles
- Product manuals & brochures
- Technical notes
- Abstracts from specialised data bases (Medline, CAS,..)
- Published international standards and legislation
- Dissertations (published)

NPL citations – what does it tell us?

- there are no patents (yet) to refer to → New technology?
- science strength of a patent
- which scientific journals are potentially contributing to innovation? (innovation impact factor)
- which scientific journals contribute to a specific technological field?
- what companies have patents with above average NPL citations?
- policy: impact of public funded R&D (universities) on innovation
- knowledge flow from public R&D to private R&D
- collaboration networks between scientist (co-authors) (FB ?)
NPL citations – what does it tell us?

- Proportion of scientific references to be found in patents, divided by region of origin.
- For example: "EU → US = 30%" implies that 30% of the scientific publications cited in EU-patents, in a specific technology field, originate from research conducted in the US.
- Based on the "authors" of the papers.

(Traces of Prior Art: An analysis of non-patent References found in patent documents; Julie Callaert et al.)
## Origin of citations; where in the procedure?

<table>
<thead>
<tr>
<th>Patent Application</th>
<th>Search</th>
<th>Examination</th>
<th>Opposition</th>
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<tbody>
<tr>
<td><strong>Source:</strong> patent applicant</td>
<td><strong>Source:</strong> search division, earlier applications (PCT, PPH)</td>
<td><strong>Source:</strong> examining division</td>
<td><strong>Source:</strong> opposition division</td>
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<td>→ patent publication with(out) search report (A1-A3), EPO Register</td>
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**Origin of citations**

**APP citations introduced by the applicant**

*Most extreme case?*

US9986419B2
published on 2018-05-29

→ 6715 citations by the applicant
Origin of citations

SEA citations introduced during search (from Search Report)

ISR International search report

SUP Supplementary search report

Most extreme case?

US9694165B2
published on 2017-07-04
→ 762 citations by the examiner

EP1283199A1 → 85
Origin of citations

EXA citations introduced during examination → sometime none if SEA was sufficient
Origin of citations

- **OPP** the real opposition documents (citations) selected by the opposition division (published with a European Patent Specification (EP-B2))
- **APL** citations introduced when filed for appeal by applicant / proprietor
- **FOP** opposition → citations introduced by the opponent or the proprietor.
- **TPO** citations introduced because of Third Party Observations (Art 115 EPC)
**Where do you find citations?**

In the search report.

<table>
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<th>NPL serial citation</th>
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<tbody>
<tr>
<td>NPL serial citation</td>
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<td>NPL data base citation</td>
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<tr>
<td>Patent citation</td>
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</table>
Where do you find citations?

In the application → cited by the applicant

Essential oils have been used in dentifrice compositions, primarily as flavorants. Many essential oils are oils of plants, but the composition of an oil of a plant is differs a great deal from an extract of that plant.

U.S. Patent No. 7,244,463 discloses the addition of Mangosteen to animal food products, but does not disclose the addition of extracts of mangosteen. U.S. Patent No. 6,730,333 discloses nutricultural compositions that contain the fruit of Garcinia mangostana L., but does not disclose the use of extracts of that plant.

U.S. Patent Nos. 6,800,292 and 6,630,163 disclose the use of fruit extracts, such as pomegranate fruit extracts, for use in treating dermatological disorders. They do not disclose the use of mangosteen extracts.
Where do you find citations?

In the EPO register

Citations: EP2689805

Type: Patent literature
Publication No.: JP2009203193
Type: Patent literature
Publication No.: CN101428044
Type: Patent literature
Publication No.: US2003091517
Publication information: [1] - RASSAMEEMASMAUNG SUPANEE ET AL. Effects of herbal mouthwash containing the pericarp extract of Garcinia mangostana L on halitosis, plaque and papillary bleeding index., JOURNAL OF THE INTERNATIONAL ACADEMY OF PERIODONTOLOGY JAN 2007 LNKD. PUBLMED:17274236, VOL. 9, NR. 1, PAGE(S) 19 - 25, (200701), ISSN 1466-2054, XP009144229 [1]: 1-10 * abstract * "Introduction" and "Discussion"
Where do you find citations?

In the EPO register

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| Type:    | Non-patent literature         |
| DOI:     | http://dx.doi.org/10.1038/35047123 |
| Type:    | Non-patent literature         |
Why are we interested in citations?

To retrieve cited prior art. (Common Citation Document)

From a statistical point of view:

- To discover "relations" and "interdependencies"
- To discover "valuable" patents $\rightarrow$ value indicator
- To discover potential infringers (litigation & licencing)
- To discover potential partners (research & licencing)
- Cross industry technology flows (policy)
- Cross country/area technology flows (policy)
- Patent offices $\rightarrow$ save work, patent prosecution highway
Patent interdependencies

- Patent documents are often classified in various IPCs: Thus growing interdependencies of IPCs allow to identify growing interdependencies between technologies.

- Citation information
Forward and backward citations

**Backward citations:**
earlier documents

**Forward citations:**
later documents

- WO0037377
- US2006105103
- US2006181760
- FR2912977
- EP1460473
- WO0037376
- EP1099671
- EP0978494
- EP0820967

- JPS638602
- JPH04328701
- JPS61286802
- US2478817
- EP0689962

**time**
Forward citation as an indicator

- Family X
  - EP X
  - US X
  - WO X
  - DE X
  - IT X

- Family Y
  - EP Y
  - IT Y
  - CN Y

- Family Z
  - EP Z
  - US Z
  - WO Z
  - DE Z
  - IT Z

- no under-counting
- no over-counting

family – family citation
I am important! I have been cited 4 times!
My family is VERY important!
We have been cited many times
Interconnections between companies
3D Scatter Graph to identify patent clusters
Interconnections between companies

Company A  Company B  Company C

All IPCs

Time
Citation analysis: industry - industry

A: What are most influential patents of the industry?

B: Where is the industry's technology mostly used

C: Which technology does the industry build on?

D: What are the most influential patents used in the industry
Citation analysis: applicant - applicant

A: Who are most influential applicants? (most cited applicants)

B: Who is using technology from applicant 1?

C: What technology is applicant 1 relying on?

D: What are the most influential patents from applicant 1 (most cited applications)
Citation analysis: Boeing – applicant

Boeing: IPC=A47 – furniture: 130 patents
Citation analysis: country – country (technology flow)

A: Which is the most influential country? (most cited “countries”)

B: Who is using technology from country 1

C: What technology from which country is country 1 relying on?

D: What are the most influential patents within country 1 (most cited applications → strengthening)
Cooperation or Litigation in the fuel cell industry?

What advice can be given to UTC?

- potential infringers
- candidates for cooperation

 Courtesy: Inrea; http://www.inrearesearch.com/
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Breakthrough inventions $\rightarrow$ high impact inventions

Top 1% of cited patents

Similar to forward citations.
Limited to examiner citations (excluding applicant citations).
Problem of timeliness $\rightarrow$ 5 to 7 year after publication needed to allow citations to "appear".

Example: 'Audio-visual technology' (hands-on)
Breakthrough inventions $\rightarrow$ high impact inventions

Example: 'Audio-visual technology'

```
SELECT TOP 1 PERCENT appln_auth+appln_nr, appln_filing_year, nb_citing_docdb_fam, appln_title, tls201_appln.appln_id FROM tls201_appln ...tls901_techn_field_ipc ... tls202_appln_title on WHERE appln_filing_year = 2012 and techn_field = 'Audio-visual technology' and nb_citing_docdb_fam > 0 and appln_auth = 'EP' GROUP BY ... ORDER BY nb_citing_docdb_fam desc
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### Breakthrough inventions → high impact inventions

Example: 'Audio-visual technology'

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Breakthrough inventions ➔ high impact inventions

Example: 'Audio-visual technology'
Breakthrough inventions $\rightarrow$ high impact inventions

Example: 'Audio-visual technology'

Flexible displays OPTICS!

Codecs, TV, stereoscopy

HUD

European Patent Office
Radicalness index

Sum of the weighted fractional counts of IP4-digit codes of a patent j cited in patent p, that are not allocated to p.

The more technologies cited form outside the citing patent, the more radical. The higher the ratio, the more diversified the technologies on which the application (invention) relies on.

Example:
Radicalness index

Sum of the weighted fractional counts of IP4-digit codes of a patent j cited in patent p, that are not allocated to p.

\[
\text{Radicalness index} = \frac{2}{6} + \frac{1}{6} = 0.5
\]

\[
\text{Radicalness index} = \frac{3}{6} + \frac{2}{6} + \frac{1}{6} = 1
\]

p2 more radical than p1
Amplifying nucleic acid sequences
Citations in New Espacenet - Hands on

- Hands on

 Amplifying nucleic acid sequences
Citations in CCD: Common Citation Document

- Hands on

Amplifying nucleic acid sequences
CCD – Common Citation Document

- Hands on
Conclusions

Working with patent citations requires:

- understanding the “different kinds” of citations
- understanding the patent granting procedures
- understanding "methodology" & "background"

- don't be afraid to adapt to your needs
- specific needs require tailor made solutions
Thank you for your attention!

Johannes Schaaf
European Patent Office
Vienna

Geert Boedt
European Patent Office
Vienna

patentinformation@epo.org

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