Patent activities of (many) Italian spin-off companies

Netval Winter School 2015

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Alba di Canazei, 26th March, 2015

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Questel
IP Business Intelligence

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Case study

This case study aims to provide an insight on the patent activities of (many) Italian spin-off companies

More specifically it focuses on:

- **Top players**
- **Publication trend, Geographical coverage, Technological fields**
- **Spin-off year of foundation, geographical location, inventors**

Use has been made of Questel's IP Business Intelligence module integrated in the Orbit portal and of information retrieved in the web.

Roadmap

- **Starting point: 300 spin-off companies**

- **Search strategy and results**

- **Analysis**

- **Remarks**

Starting point / Results

- **150 Life sciences–biomedical spin-off companies**
  - **132 spin-off companies retrieved in Orbit**
  - **18 applicants with same name as spin-off companies**
  - **70 spin-off companies with 0 results**
  - **62 spin-off companies with from 1 to 29 results/each**
  - **246 patent families in total**

- **150 ICT spin-off companies**
  - **113 retrieved in Orbit**
  - **37 applicants with same name as spin-off companies**
  - **83 spin-off companies with 0 results**
  - **30 spin-off companies with from 1 to 12 results/each**
  - **84 patent families in total**

SEARCH STRATEGY AND RESULTS

ORBIT Database Fampat
Assignee search
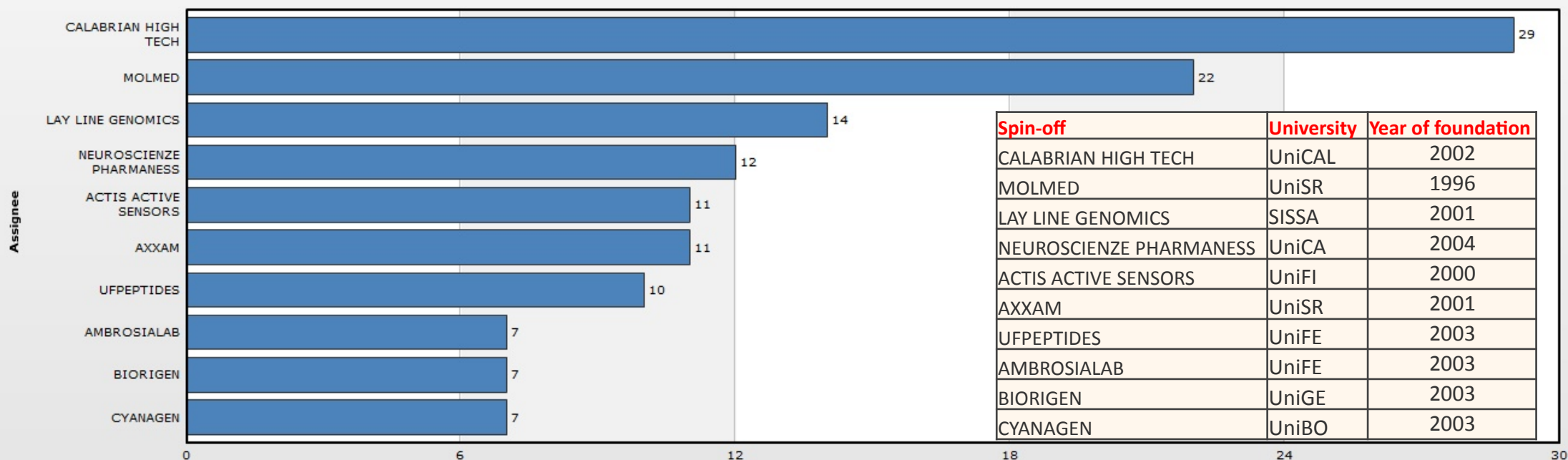## Results: Life sciences–biomedical 246 ICT 84

ANALYSIS
LIFE SCIENCES - BIOMEDICAL

Analysis

- **Publication trend**

- **Geographical coverage**

- **Main concepts**

- **Top 10 IPC codes**

- **Technology domains**

Top 10 players

Distribution of search results by Assignee

Spin-off	University	Year of foundation
CALABRIAN HIGH TECH	UniCAL	2002
MOLMED	UniSR	1996
LAY LINE GENOMICS	SISSA	2001
NEUROSCIENZE PHARMANESS	UniCA	2004
ACTIS ACTIVE SENSORS	UniFI	2000
AXXAM	UniSR	2001
UFPEPTIDES	UniFE	2003
AMBROSIALAB	UniFE	2003
BIORIGEN	UniGE	2003
CYANAGEN	UniBO	2003

Assignee values (bar chart):
- CALABRIAN HIGH TECH: 29
- MOLMED: 22
- LAY LINE GENOMICS: 14
- NEUROSCIENZE PHARMANESS: 12
- ACTIS ACTIVE SENSORS: 11
- AXXAM: 11
- UFPEPTIDES: 10
- AMBROSIALAB: 7
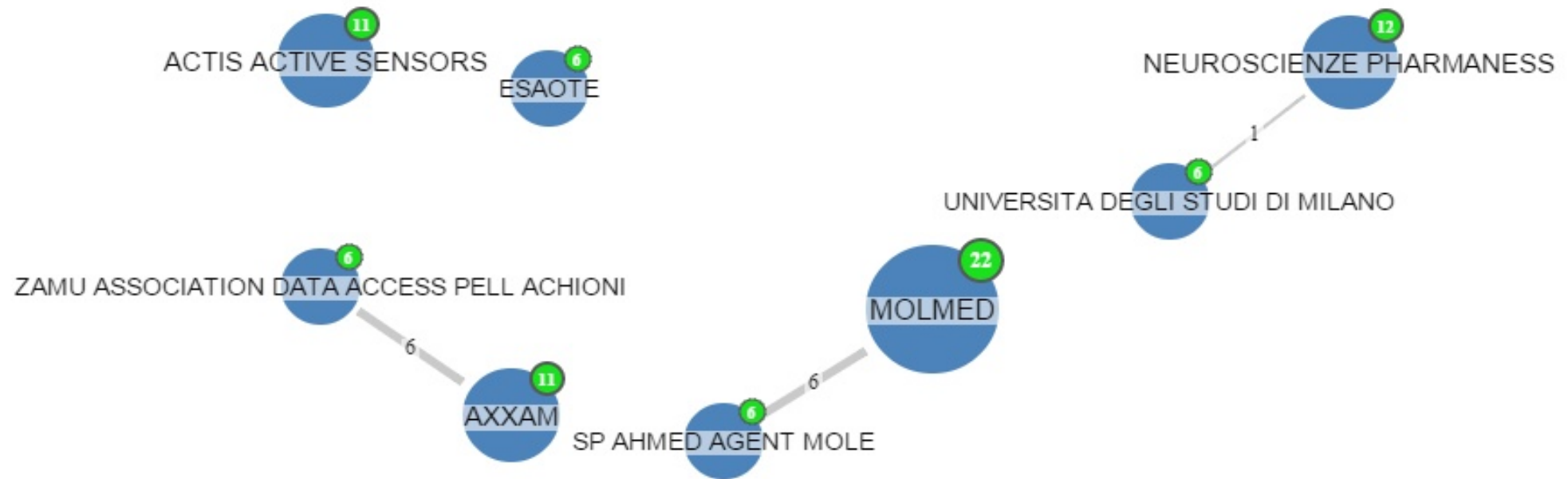- BIORIGEN: 7
- CYANAGEN: 7

Top 10 players / 1°priority year

Distribution of search results by Assignee / 1st priority year
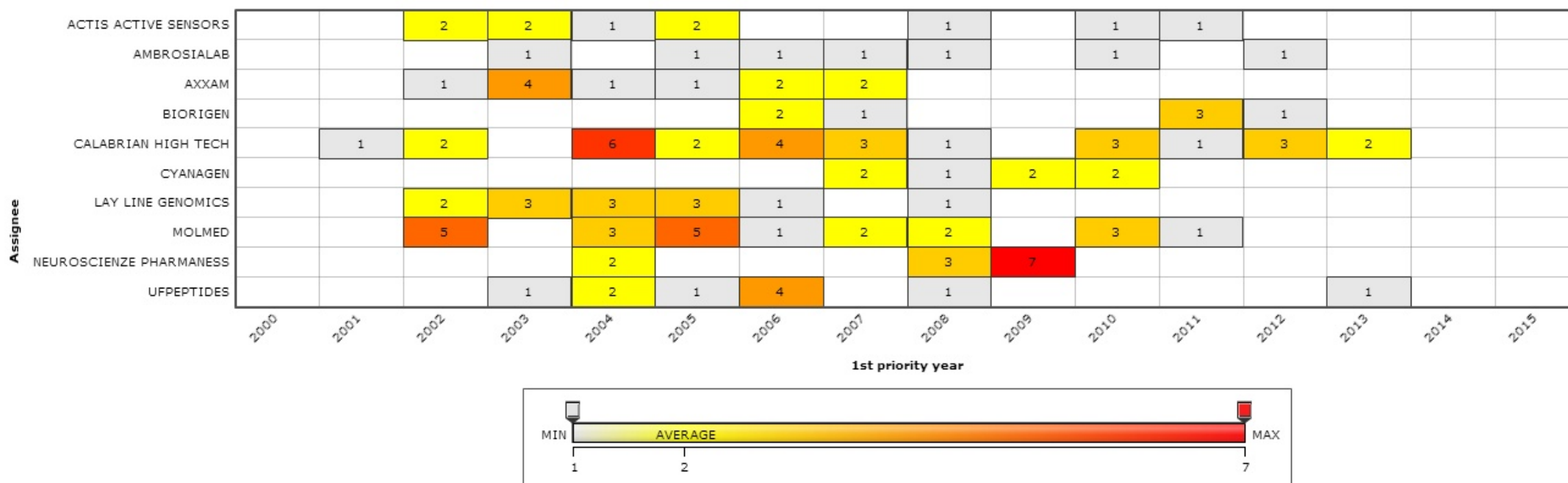
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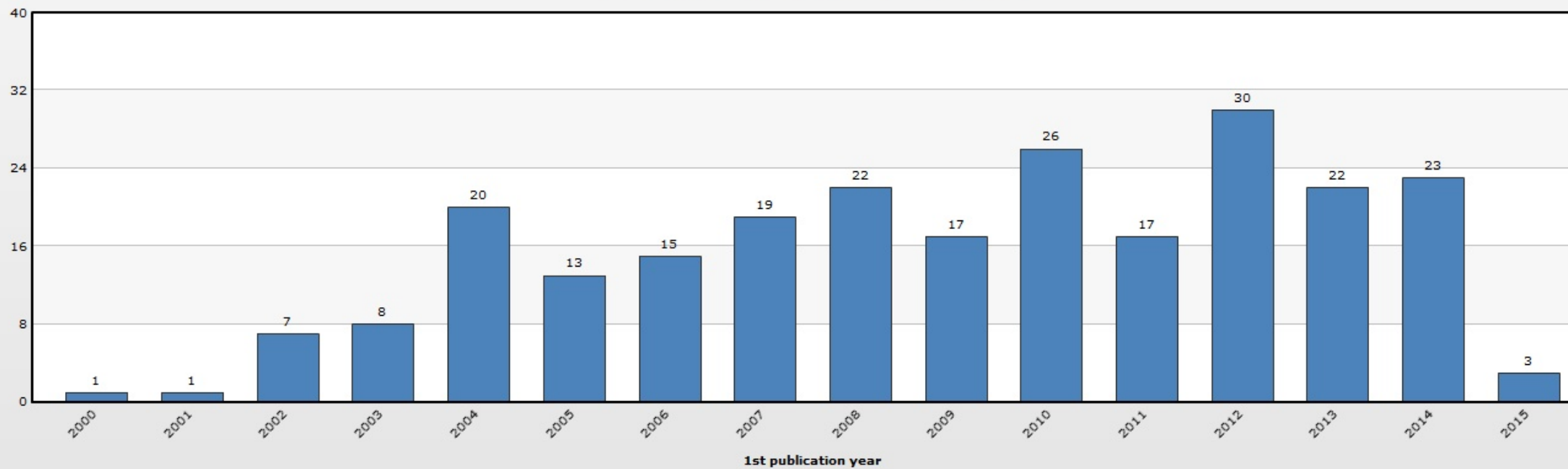# Co-assignment
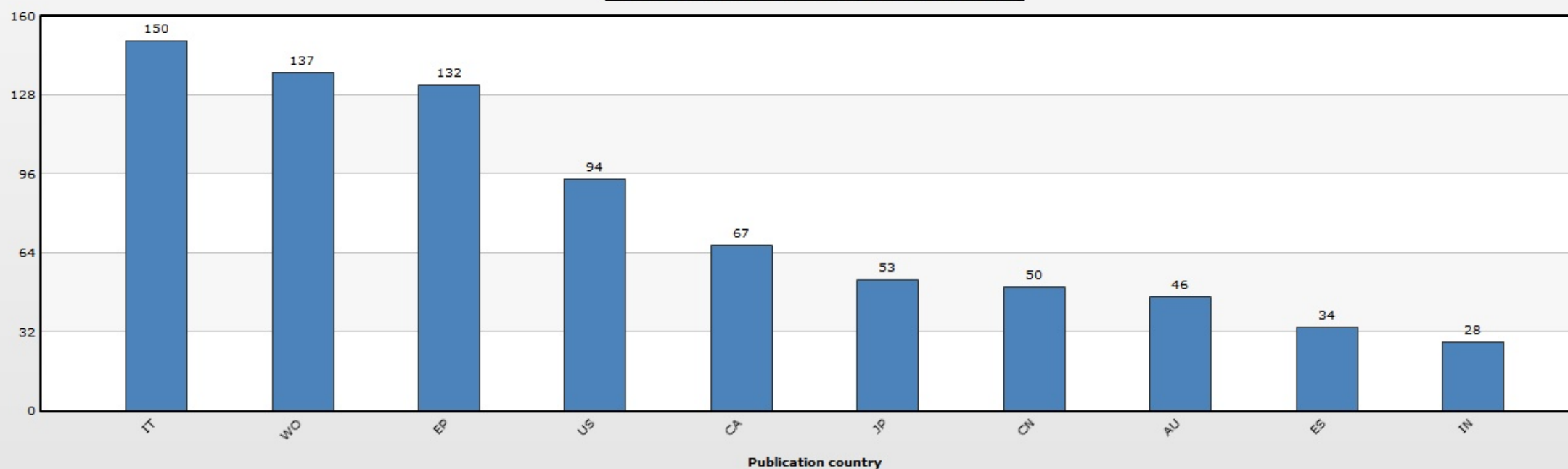

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Publication trend
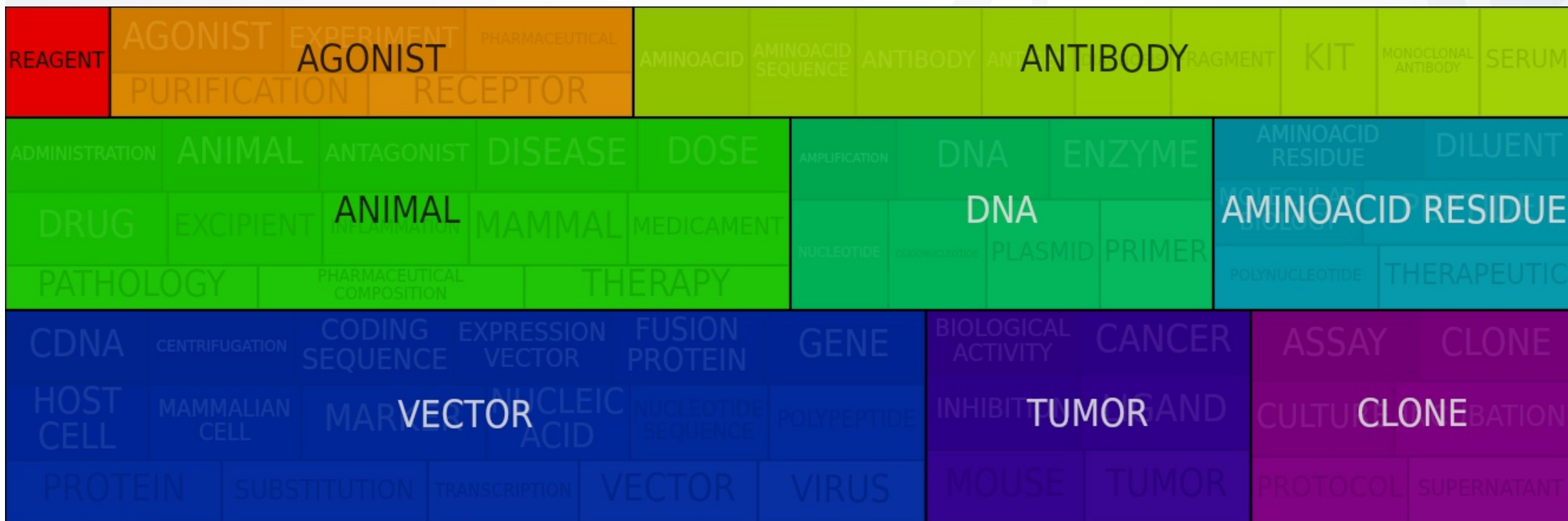

Distribution of search results by 1st publication year

Geographical coverage

Distribution of search results by Publication country
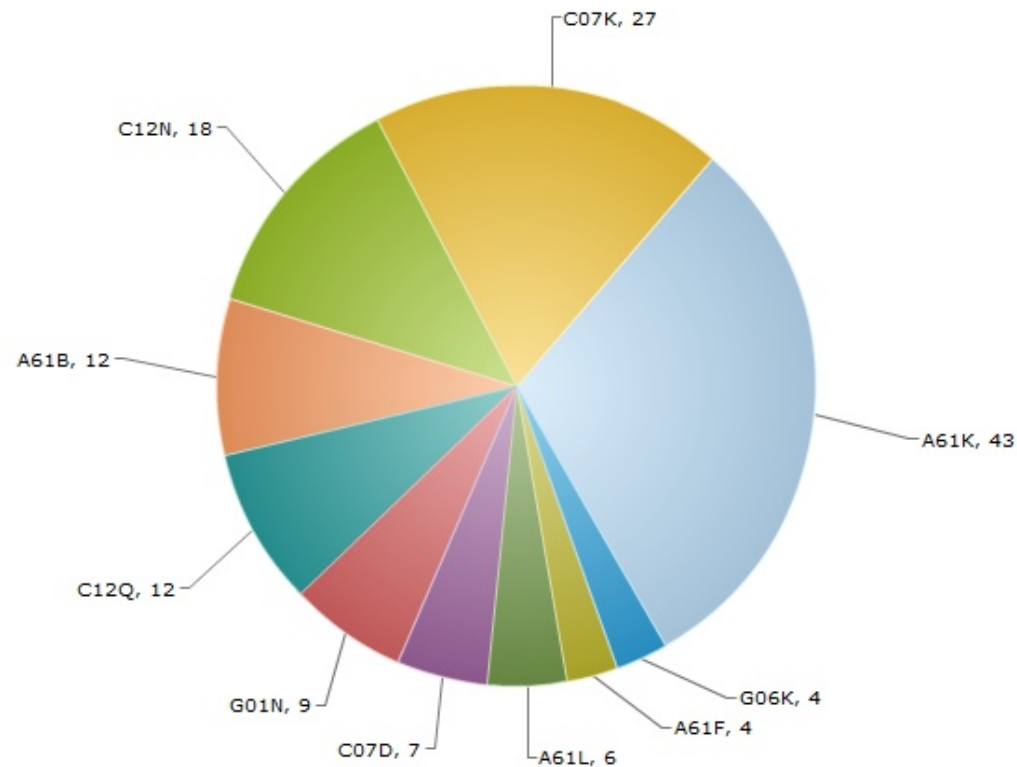
Main concepts

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Top 10 main IPC subclasses
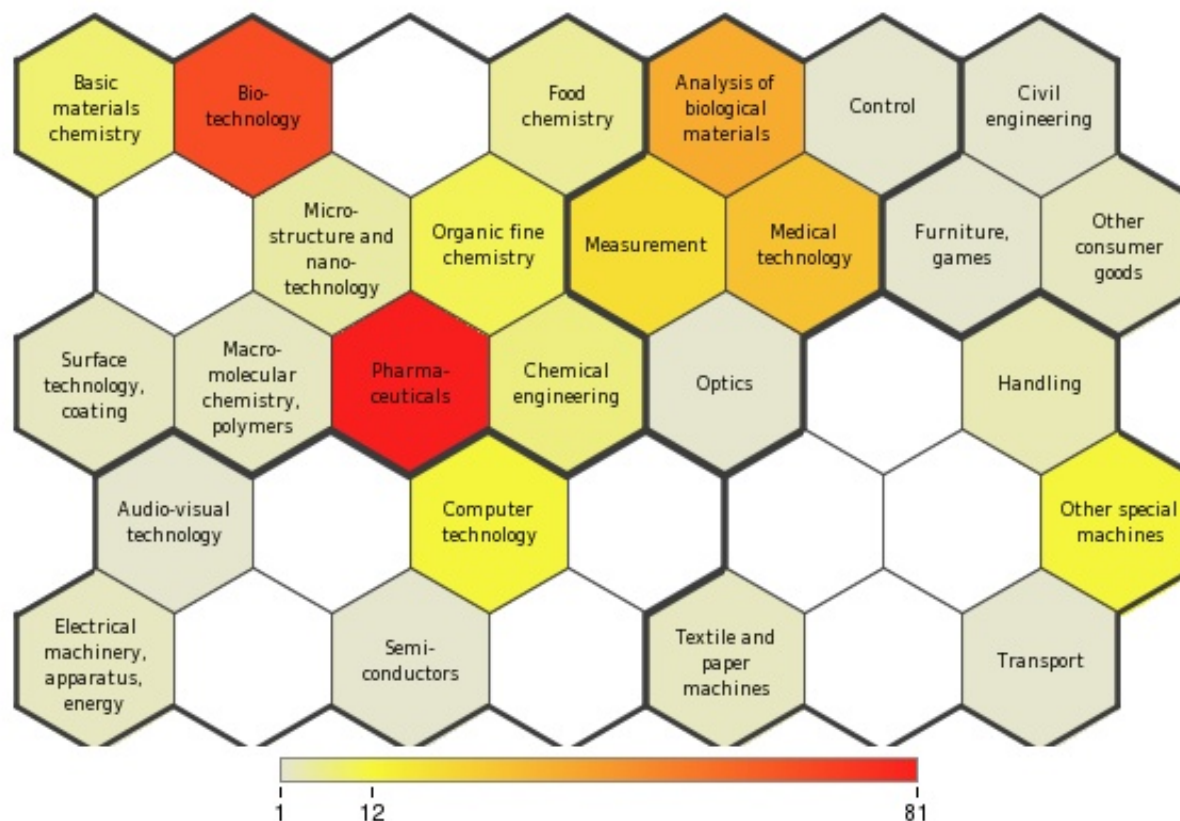
Distribution of search results by Main IPC subclass

- C07K, 27
- C12N, 18
- A61K, 43
- A61B, 12
- C12Q, 12
- G01N, 9
- C07D, 7
- A61L, 6
- A61F, 4
- G06K, 4

IPC codes definition

IPC code	Definition
A61K	PREPARATIONS FOR MEDICAL, DENTAL, OR TOILET PURPOSES
C07K	PEPTIDES
C12N	MICRO-ORGANISMS OR ENZYMES COMPOSITIONS THEREOF
A61B	DIAGNOSIS; SURGERY; IDENTIFICATION
C12Q	MEASURING OR TESTING PROCESSES INVOLVING ENZYMES OR MICRO-ORGANISMS
G01N	INVESTIGATING OR ANALYSING MATERIALS BY DETERMINING THEIR CHEMICAL OR PHYSICAL PROPERTIES
C07D	HETEROCYCLIC COMPOUNDS
A61L	METHODS OR APPARATUS FOR STERILISING MATERIALS OR OBJECTS IN GENERAL; DISINFECTION, STERILISATION, ETC.
A61F	FILTERS IMPLANTABLE INTO BLOOD VESSELS; PROSTHESES; ETC.
G06K	RECOGNITION OF DATA. PRESENTATION OF DATA; RECORD CARRIERS; ETC.

Technology domains

Distribution of search results by Technology domain

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ANALYSIS
ITC

Analysis

- **Top 10 players**

- **Publication trend**

- **Geographical coverage**

- **Main concepts**

- **Top 10 IPC codes**

- **Technology domains**

Top 10 players

Distribution of search results by Assignee
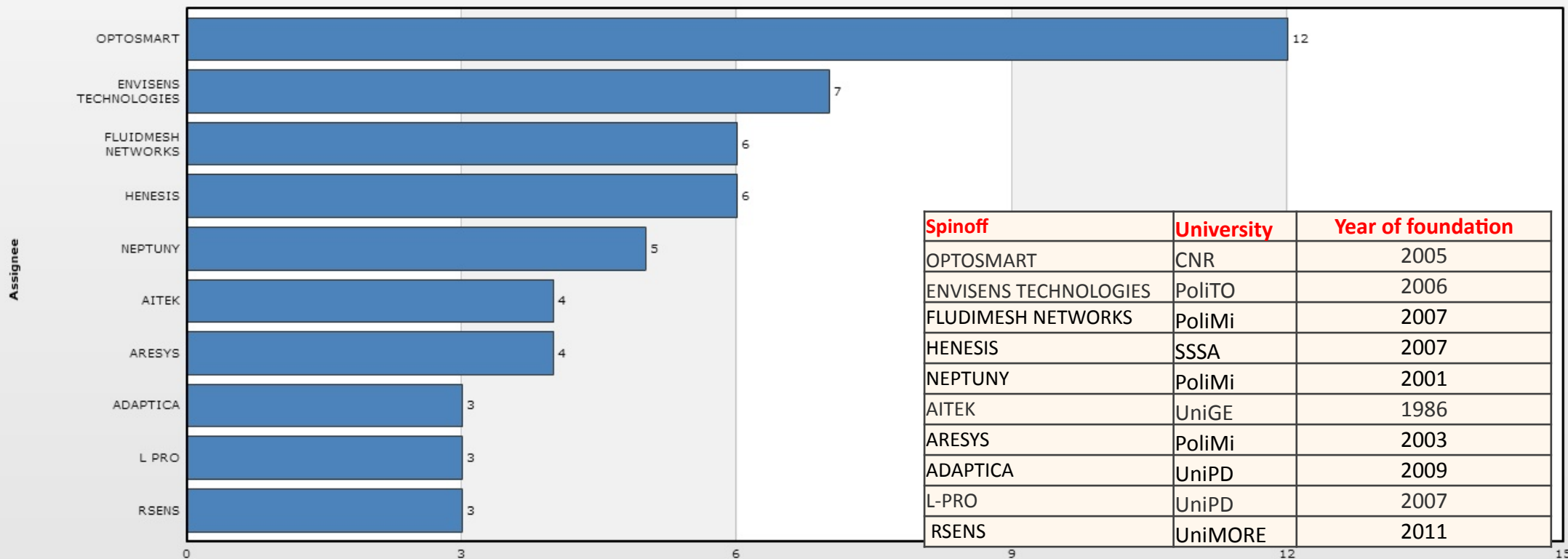
Spinoff	University	Year of foundation
OPTOSMART	CNR	2005
ENVISENS TECHNOLOGIES	PoliTO	2006
FLUDIMESH NETWORKS	PoliMi	2007
HENESIS	SSSA	2007
NEPTUNY	PoliMi	2001
AITEK	UniGE	1986
ARESYS	PoliMi	2003
ADAPTICA	UniPD	2009
L-PRO	UniPD	2007
RSENS	UniMORE	2011

Top 10 players / 1°priority year

Distribution of search results by Assignee / 1st priority year

Co-assignment

Publication trend

Distribution of search results by 1st publication year

Geographical coverage

Distribution of search results by Publication country

Publication country

Main concepts extracted from total hits
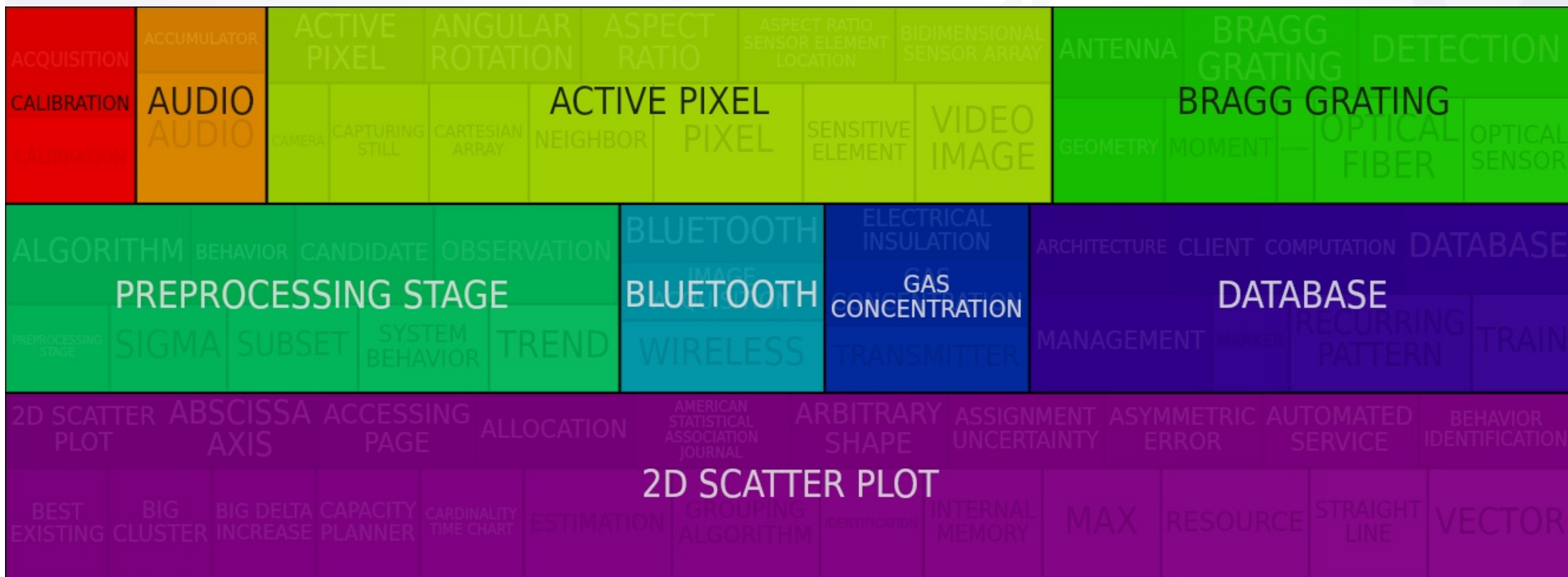
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Top 10 main IPC subclass

Distribution of search results by Main IPC subclass

- G01T, 4
- G01S, 5
- H04L, 7
- A61B, 2
- H04N, 3
- G06Q, 3
- G06N, 3
- G06F, 3
- G02B, 3
- G01N, 3
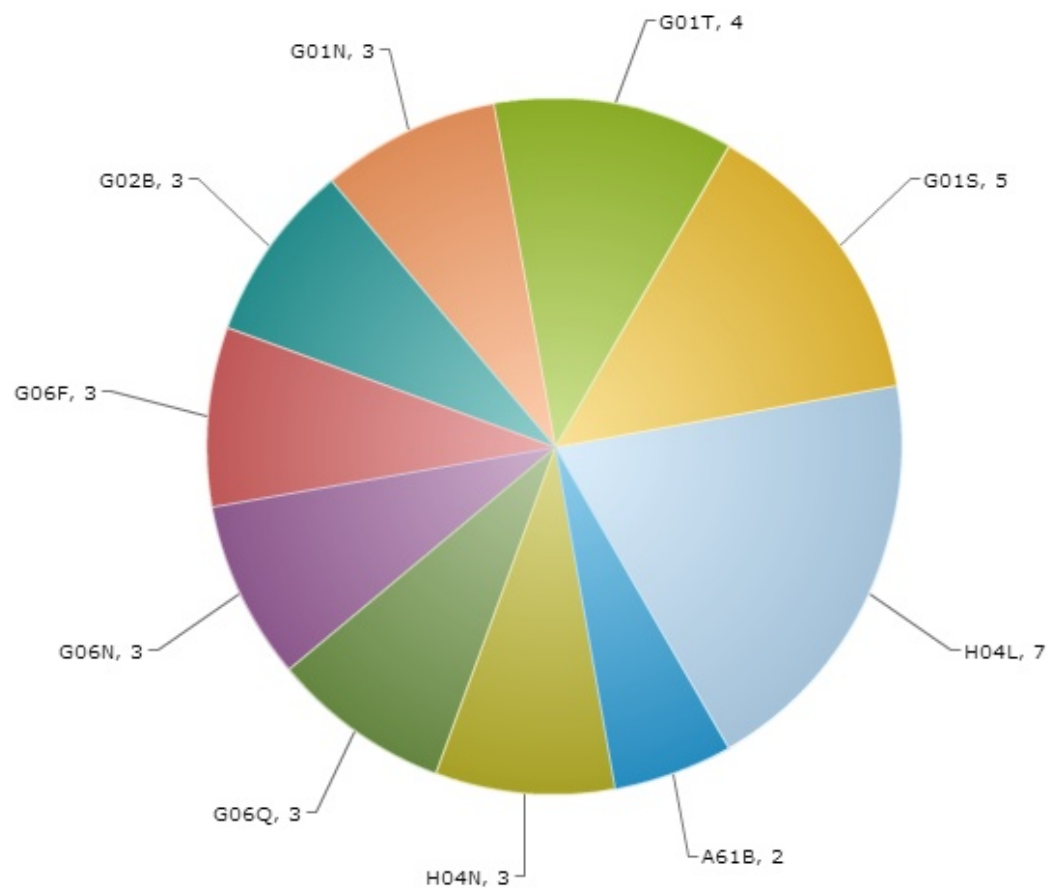
IPC codes definition

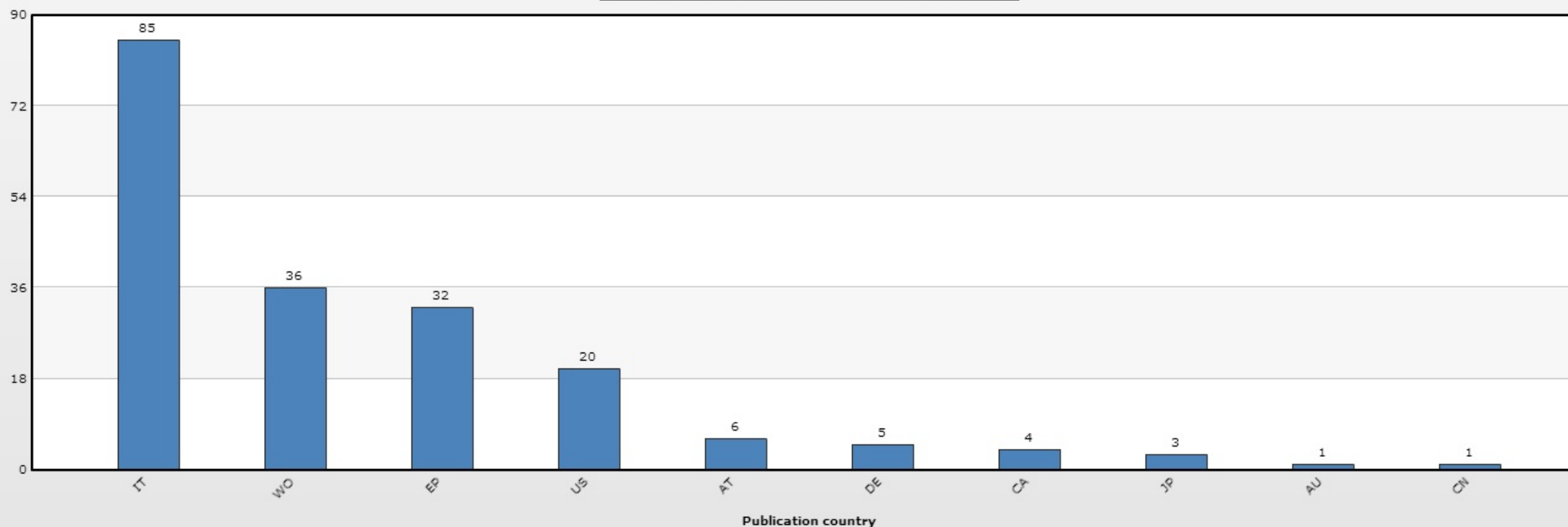| IPC code	Definition
H04L	TRANSMISSION OF DIGITAL INFORMATION
G01S	RADIO DIRECTION-FINDING; RADIO NAVIGATION; DETERMINING DISTANCE OR VELOCITY BY USE OF RADIO WAVES
G01T	MEASUREMENT OF NUCLEAR OR X-RADIATION
G01N	INVESTIGATING OR ANALYSING MATERIALS BY DETERMINING THEIR CHEMICAL OR PHYSICAL PROPERTIES
G02B	OPTICAL ELEMENTS, SYSTEMS, OR APPARATUS
G06F	ELECTRIC DIGITAL DATA PROCESSING
G06N	COMPUTER SYSTEMS BASED ON SPECIFIC COMPUTATIONAL MODELS
G06Q	DATA PROCESSING SYSTEMS OR METHODS, SPECIALLY ADAPTED FOR ADMINISTRATIVE, COMMERCIAL PURPOSES, ETC
H04N	PICTORIAL COMMUNICATION, e.g. TELEVISION
A61B	DIAGNOSIS; SURGERY; IDENTIFICATION

Technology domains

Distribution of search results by Technology domain
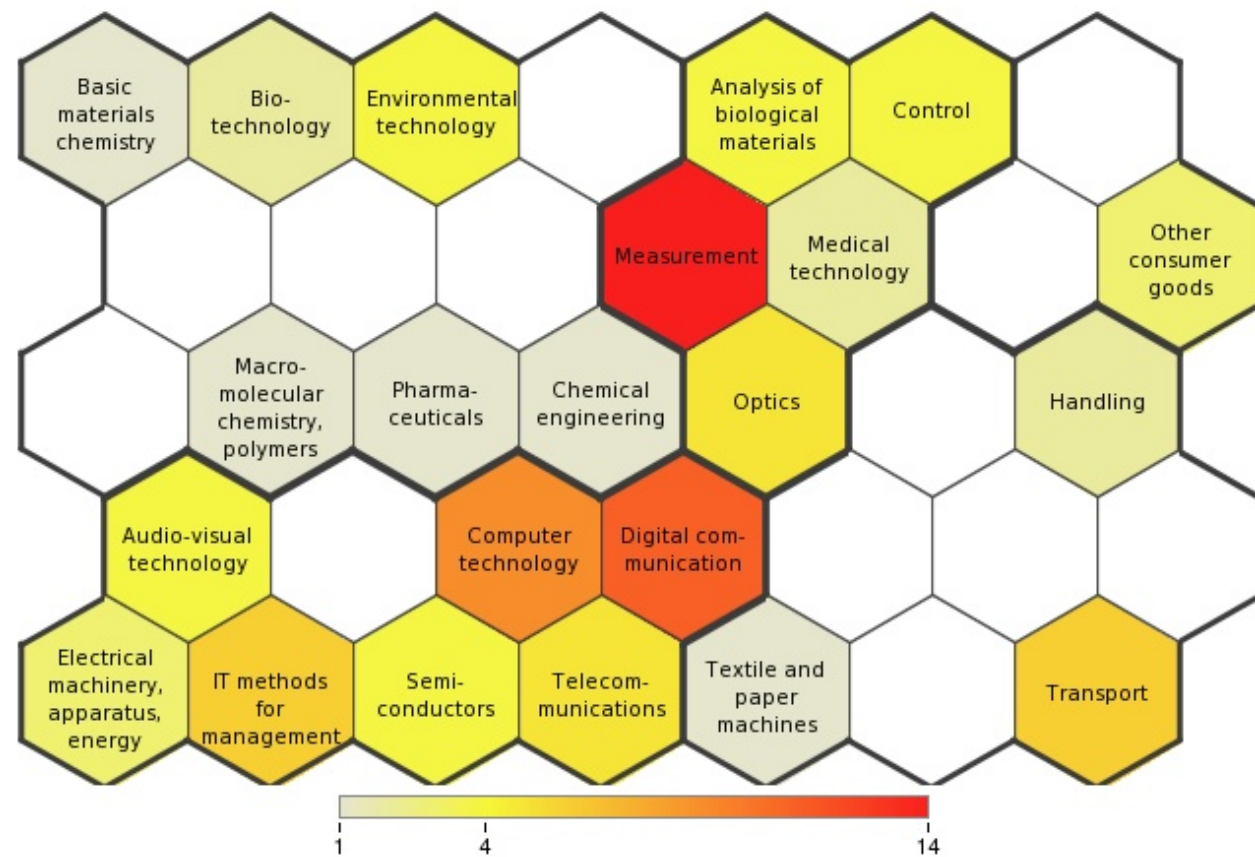
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LANDSCAPE
LIFE SCIENCES – BIOMEDICAL
ITC

Analysis Landscape
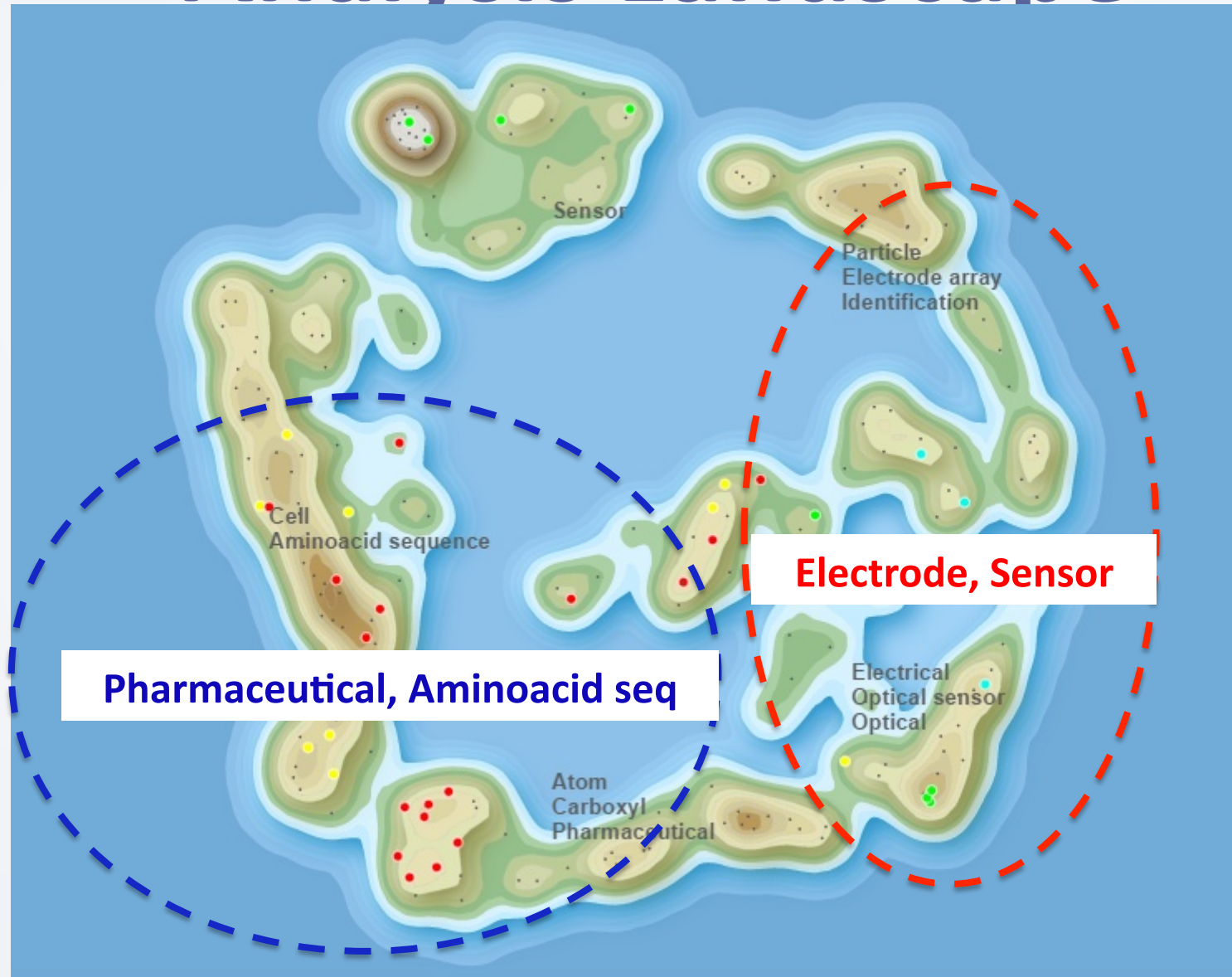
Remarks

- **Assignee:** disambiguation, search, analysis

- **Publication trend:**
  Biomedical/life-sciences increase in 2012; ICT increase in 2009-2010

- **Geographical coverage:** IT, WO, EP, US

- **Top technological fields:**
  pharmaceutical, biotechnology, digital communication, computer technology

ANALYSIS
YEAR OF FOUNDATION
GEOGRAPHICAL LOCATION
INVENTORS

Number of patent families

Spin-off year of foundation	Number of patent families					
	Life sciences/biomedical			ICT		
	Spin-off number	Average number	Total	Spin-off number	Average number	Total
Up to 1999	2	8,3	25	2	2,5	5
2000	1	11,0	11	3	1,3	4
2001	4	7,0	28	1	2,5	5
2002	2	16,0	32	1	1	1
2003	7	6,1	43	4	2	8
2004	5	3,4	17	1	1	1
2005	7	2,1	15	6	4,2	25
2006	6	2,0	12	4	3,3	10
2007	4	3,0	12	3	3,3	10
2008	4	1,2	5	--	--	--
2009	5	3,0	15	2	2	4
2010	6	2,7	16	3	1,5	3
2011	6	1,2	7	1	3	3
2012	1	1,0	1	1	2	2
2013	1	2,0	2	--	--	--

Number of patent families

Spin-off year of foundation	Total number of patent families							
	Life sciences/biomedicale				ICT			
	Spin-off number	North	Center	South	Spin-off number	North	Center	South
Up to 1999	2	25	0	0	2	4	1	0
2000	1	0	11	0	3	15	0	0
2001	4	14	14	0	1	5	0	0
2002	2	0	2	30	1	0	1	0
2003	7	43	0	0	4	5	3	0
2004	5	4	0	12	1	1	0	0
2005	7	8	7	0	6	7	4	14
2006	6	12	0	0	4	12	0	4
2007	4	5	5	2	3	8	2	0
2008	4	4	1	0	--	--	--	--
2009	5	4	6	5	2	12	0	0
2010	6	15	0	1	3	0	2	3
2011	6	13	0	2	1	3	0	0
2012	1	1	0	0	1	0	1	1
2013	1	0	0	2	--	--	--	--

Number of patent families

Spin-off geographic location	Number of patent families			
	Life sciences/ biomedical	ICT		
North	148	72		
Center	46	14		
South	54	22		

Fields	% spin-off co-assignee				
	Italian companies	Foreign companies	Universities	Public research Institutions	Medical Institutes Hospitals
Life sciences/biomedical	25,0	25,0	33,3	4,2	12,5
ICT	50,0	18,2	18,2	13,6	0,0

Number of inventors

Number of patent families	Number of inventors					
	Life sciences/biomedicale			ICT		
	Spin-off number	Average number	Total	Spin-off number	Average number	Total
Up 1999	3	10,7	32	2	3,5	7
2000	1	14,0	14	3	5,0	15
2001	4	10,5	42	2	4,0	8
2002	2	14,0	28	1	1,0	1
2003	7	8,8	62	4	4,5	18
2004	5	6,4	32	1	2,0	2
2005	7	5,7	40	6	8,0	48
2006	6	4,8	29	3	5,3	16
2007	4	4,3	17	2	7,0	14
2008	4	4,3	17	--	--	--
2009	5	4,6	23	2	6,0	12
2010	5	6,2	31	2	2,5	5
2011	6	2,8	17	1	14,0	14
2012	1	2,0	2	2	1,5	3
2013	1	4,0	4	--	--	--

Questions and Answers
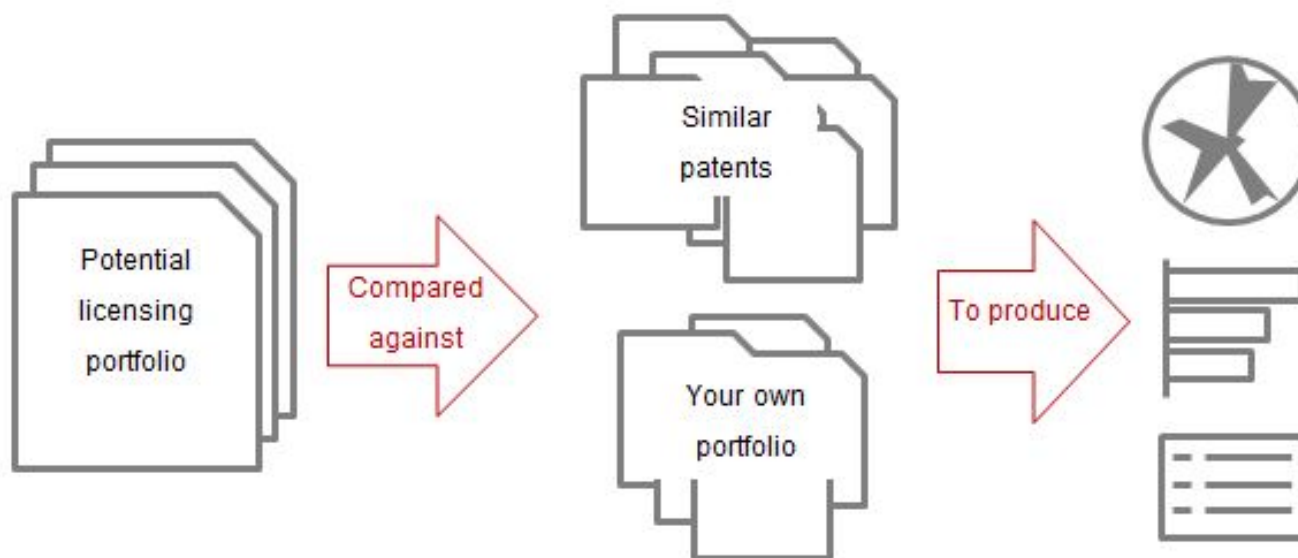
Grazie!
rosella@questel.com

Evaluation

Once the IPBI analysis has been completed, it is possible to perform some further data mining by running the evaluation module. This feature allows to assess the strengths of a portfolio on three different levels:

- *Legal*

- *Technical*

- *Geographical*

Evaluation

Licensing in activity

Potential licensing portfolio — Compared against → Similar patents / Your own portfolio — To produce →

This guided activity compares a selected licensing portfolio against your own portfolio and comparable art to provide.

1. Visualisation of 45+ patent portfolio strength indicators.
2. A list other parties who may also be interested in licensing the same patents.
3. A ranked ordered list of the source portfolio patents.

Start licensing in

Validity and Ownership Value of Assets

1	Litigation count	Positive - Patents that survive litigation are enforceable	The number of patent families that are reported in the US litigation database
2	Reexamination count	Positive - Patents that survive reexamination are likely enforceable	The number of patent families that have at least one family member that are reported to have been involved in re-examination
3	Opposition count	Positive - Patents that survive opposition are likely enforceable	The number of patent families that have at least one family member that are reported to have survived a opposition process
	Uncited prior art	Negative - Patents with uncited prior art are more likely to be weak in litigation	The percentage of patent families in an assignee's portfolio where one of top 20 most similar patent families from the comparable set has an earlier filing date and is not a
	Copending prior art	Negative - If there was copending art the examiner may not have seen it and cited it as a reference	The percentage of patent families in an assignee's portfolio where one of top 20 most similar patent families from the comparable set has an earlier filing date and is not a backward citation (reference)
6	Avg back cites	Positive - More references seen and deemed ok by examiner helps validity	Average number of backward citations per patent family
	Avg age	Positive - More references seen and deemed ok by examiner helps validity	Average age in years since first publication per patent family
8	Over 5 years left	Positive - Art needs to have enough enforceable life to be worth licensing	The number of patent families in an assignee's portfolio that have at least one family member that has over five years of life left if all future maintenance fees are paid
9	Co-assigned art	Negative - Co-assigned art has enforcement problems if parties are not cooperating	The percentage of patent families in an assignee's portfolio that have more than one assignee listed
	Avg inventors	Negative - Many inventors during litigation may undermine the case with many stories	Average number of inventors per patent family
	Doc workload	Negative - Large numbers of patents increases legal and technical workload decreasing quality	Total Patent and Application Count in an assignee's portfolio that are still Alive

Technical and Use Value of Assets 1)

1	Cite velocity	Positive - High citation activity indicates that others think the art has value	The average number of forward citations per patent family per year since publication
2	Avg fwd cites	Positive - High citation activity indicates that others think the art has value	Average number of forward citations per patent family
3	Avg fwd cites by others	Positive - High citation activity by others indicates they think the art has value	Average number of forward citations excluding citations from the assignee (self citations) per patent family.
4	High fwd cites	Positive - Grandfather patents have statistically outstanding citation counts	Number of patent families in an assignee's portfolio wherein the number of forward citations are in excess of the average plus 3 standard deviation (derived from the number of forward citations from all patent families in the set of source / comparable)
5	Shark presence	Positive - Presence of IP Sharks indicates another entity felt the technology was of commercial value	Number of families in an assignee's portfolio wherein over 30% of the forward citations (minimum of 3) are from a single entity that is not the same as assignee
6	Predator presence	Positive - Presence of IP Predators indicates another entity felt the technology was of commercial value	Number of families in an assignee's portfolio wherein over 15% and less than 30% of the forward citations (minimum of 2) are from a single entity that is not the same as assignee
7	Company fences	Positive - Presence of a patent fence indicates assignee felt technology was of commercial value	Number of families in an assignee's portfolio wherein over 30% of the forward citations (minimum of 3) are from the same assignee (self-citations)
8	Fwd vs back cites	Positive - If more people cite than reference, then patent is likely a next-generation improvement	The percentage of citations which are forward citations as opposed to back citations.
9	Self vs others' cites	Positive - This indicates assignee has invested in derivative innovation	The average per patent family of the percentage of forward citation which are owned by the assignee (self citations)

Technical and Use Value of Assets 2)
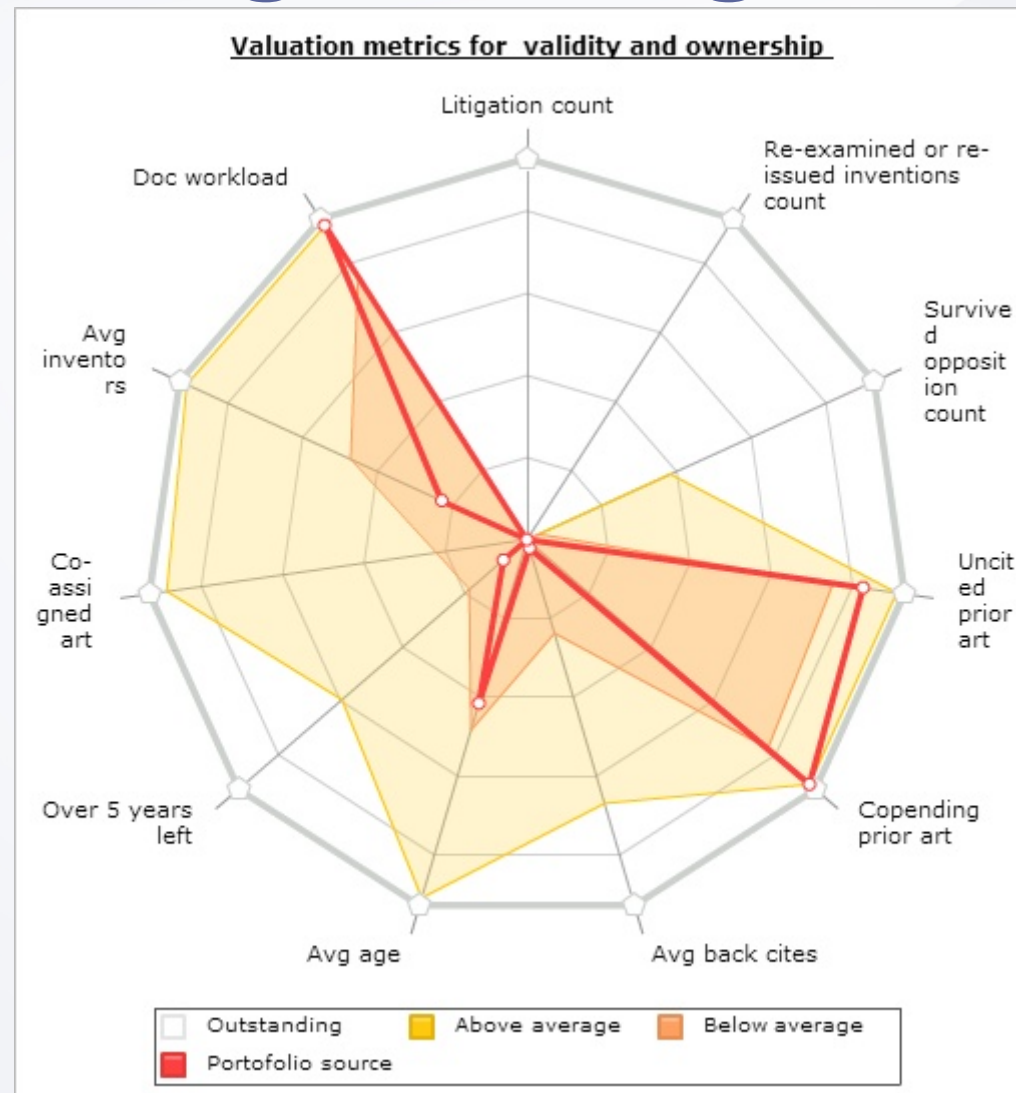
10	High back cites	Positive - Grandfather systems patents have statistically outstanding reference counts	The number of patent families wherein the number of backward citations (references) are in excess of the average plus 3 standard deviation (derived from the number of backward citations (references) from all patent families in the set of source / comparable)
11	IPC dispersity	Positive - More technologies and uses represents more licensing opportunities	The number of different IPC/CPC subclasses (i.e. H04G) in each assignee's portfolio
12	Avg IPC dispersity	Positive - Broad patents represents more licensing opportunities	Average number of different IPC/CPC subclasses (i.e. H04G) per patent family
13	High IPC dispersity	Positive - Patents having statistically outstanding IPC counts suggest a breakthrough technology	The number of patent families wherein the number of IPC/CPC subclasses (i.e. H04G) is in excess of the average plus 3 standard deviation (derived from the number of IPC/CPC subclasses from all patent families in the set of source / comparable)
	Generality index	Positive - Values range between 0 and 1; high scores indicate a wider application across different technology groups, low scores indicate more specific application	The score is calculated for each patent family and averaged across the assignees portfolio. Briefly; forward citations to a wider spread of technology groups will generate a higher score. Fully Defined by Hall, Jaffe, and Trajtenberg (2001)
	Originality index	Positive - Values range between 0 and 1; high scores indicate more breakthrough technologies, low scores indicate more incremental improvement	The score is calculated for each patent family and averaged across the assignees portfolio. Briefly - backward citations to a wider spread of technology groups will generate a higher score. Fully Defined by Hall, Jaffe, and Trajtenberg (2001)
	Radicalness index	Positive - Values range between 0 and 1; high scores indicate more breakthrough technologies, low scores indicate more incremental improvement	The score is calculated for each patent family and averaged across the assignees portfolio. In brief the calculation for Radicalness is similar to Originality (backward citations to a wider spread of technology groups will generate a higher score) but for Radical ness the IPCs that are listed in both the current patent family and cited patents are not counted. Fully defined by Shane, 2001.
17	Non-patent vs patent refs	Positive - Non-patent references correlate to scientific novelty	The percentage of backward citations which reference non-patent literature citations as opposed to citations which reference other patents.
18	Claim length	Negative - Longer independent claims tend to be more narrow in scope because of limitations	The score is calculated for each patent family and averaged across the assignees portfolio. The number of non-duplicate words in the first independent claim
19	New in last 5 years	Positive - Recent filings indicates that the technology has recent commercial interest	The number of patent families that have at least one family member that was filed in the last five years
20	Reassignement frequency	Positive - Reassignement activity shows interest in the technology	The total number of patent reassignements that have occured within this portfolio

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OPTOSMART

EP1902923B1

SYSTEM FOR REAL-TIME MONITORING OF THE STATE OF OCCUPATION OF RAILWAY LINES

Legal strength

Valuation metrics for validity and ownership

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Technical strenght

Valuation metrics for technical and use

Potential Licensees

Potential licensing entities

Entity	Citation count
UNIVERSITY OF STRATHCLYDE	1
OPTASENSE HOLDINGS	1
QINETIQ	1
MER MEC	1
SOUTHWEST JIAOTONG UNIVERSITY	1
HYUKSHIN ENGINEERING	1
ACE	1
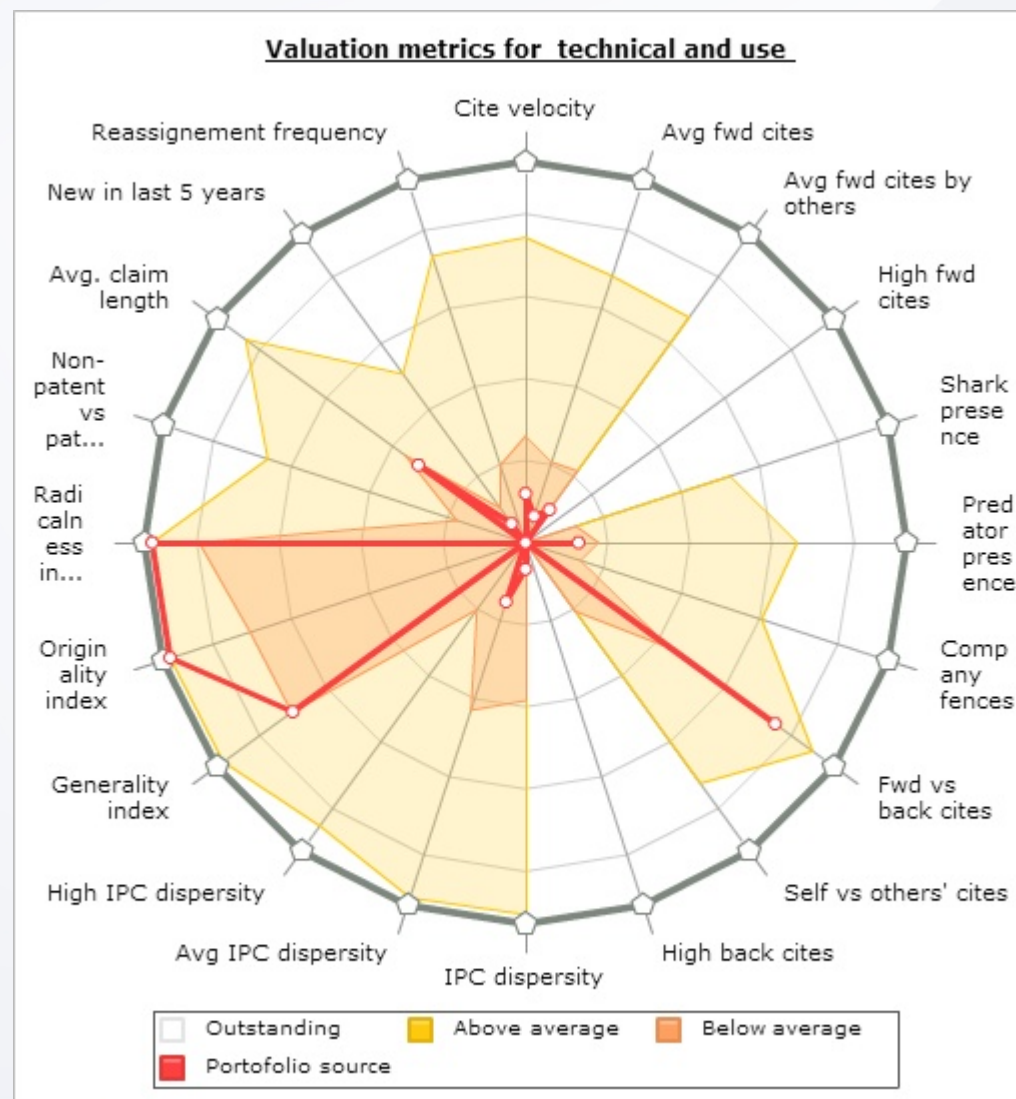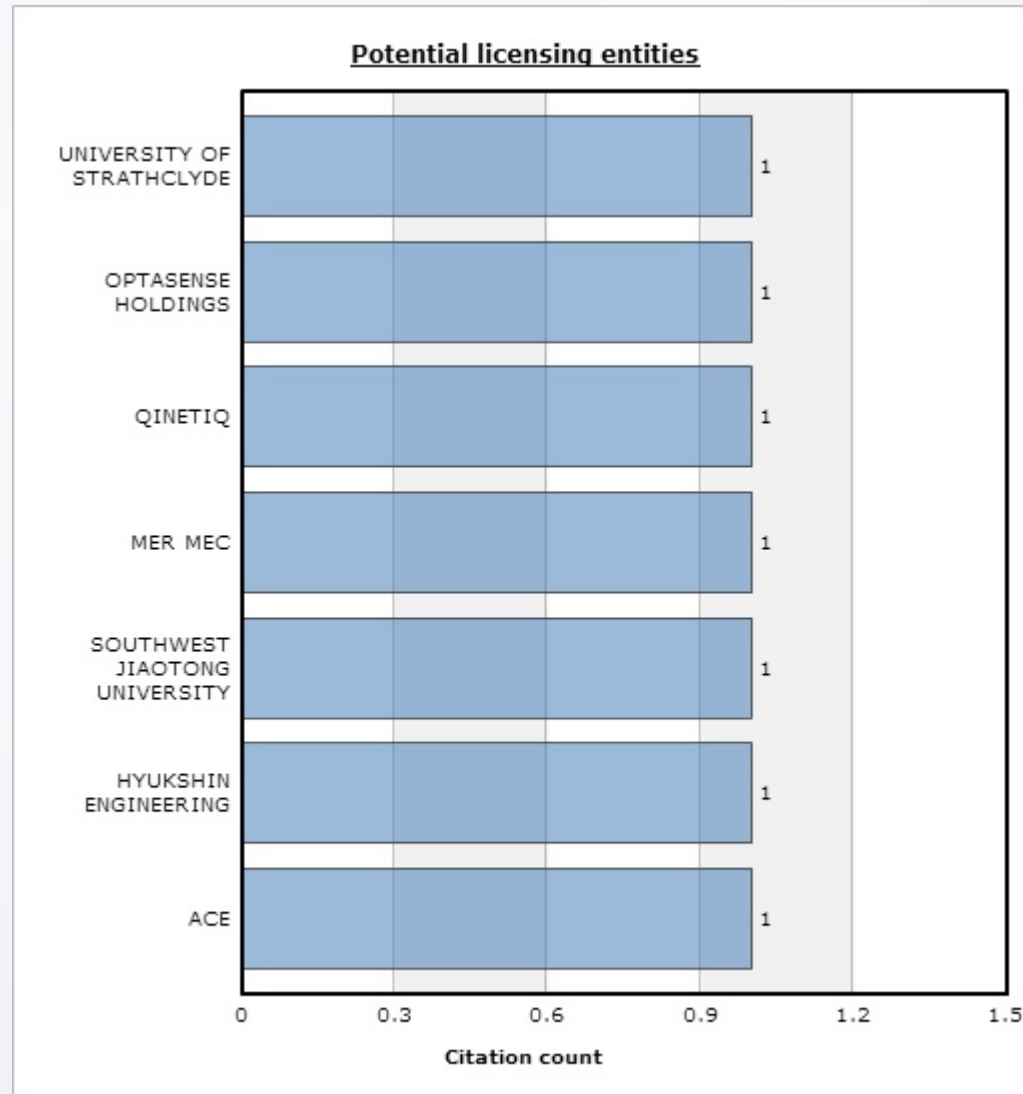
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Pruning

- To maintain patents alive, associated fees become expensive overtime
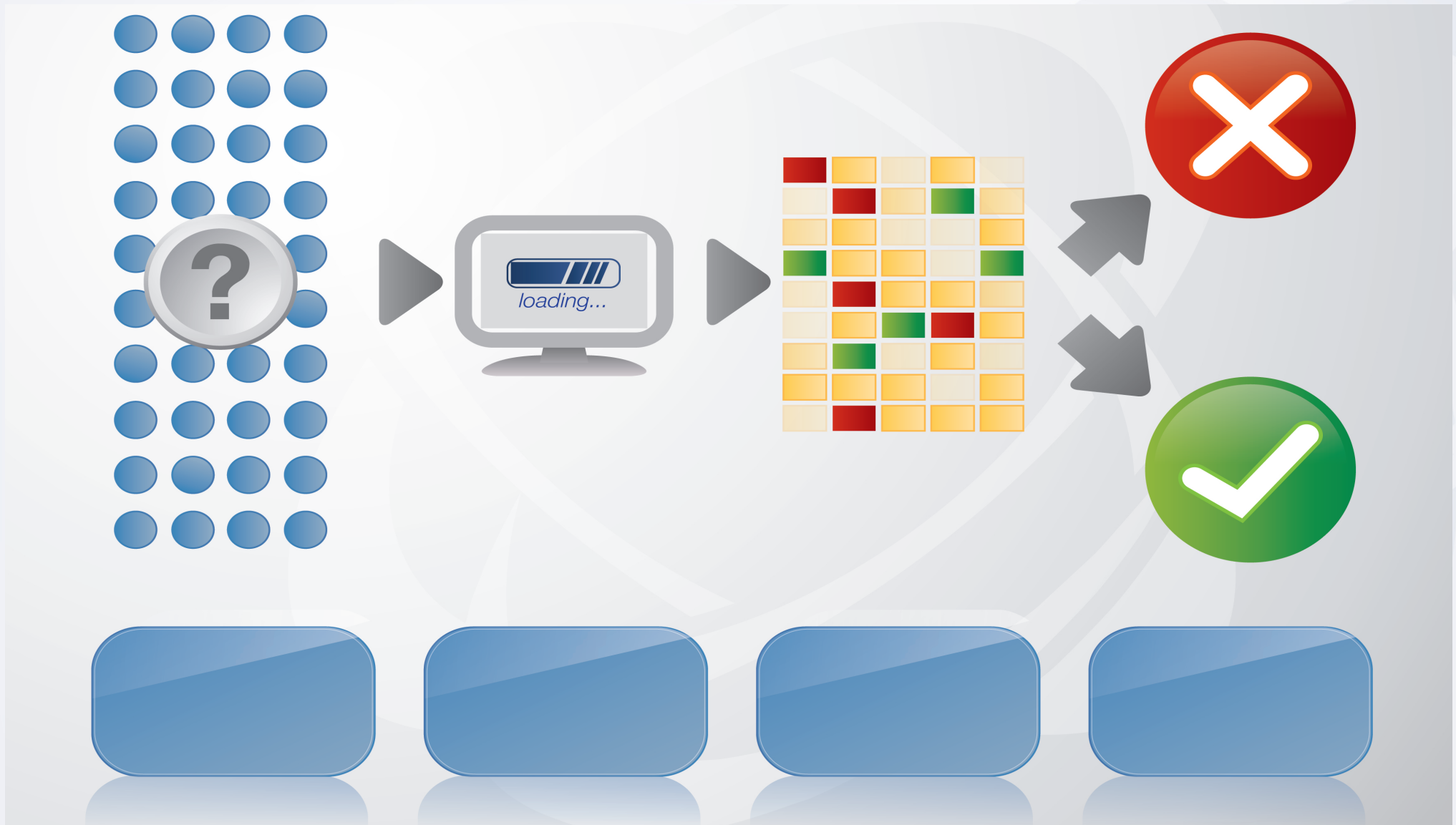
- The Orbit pruning module allows you to audit your own portfolio and track down:
  - the most valuable patents
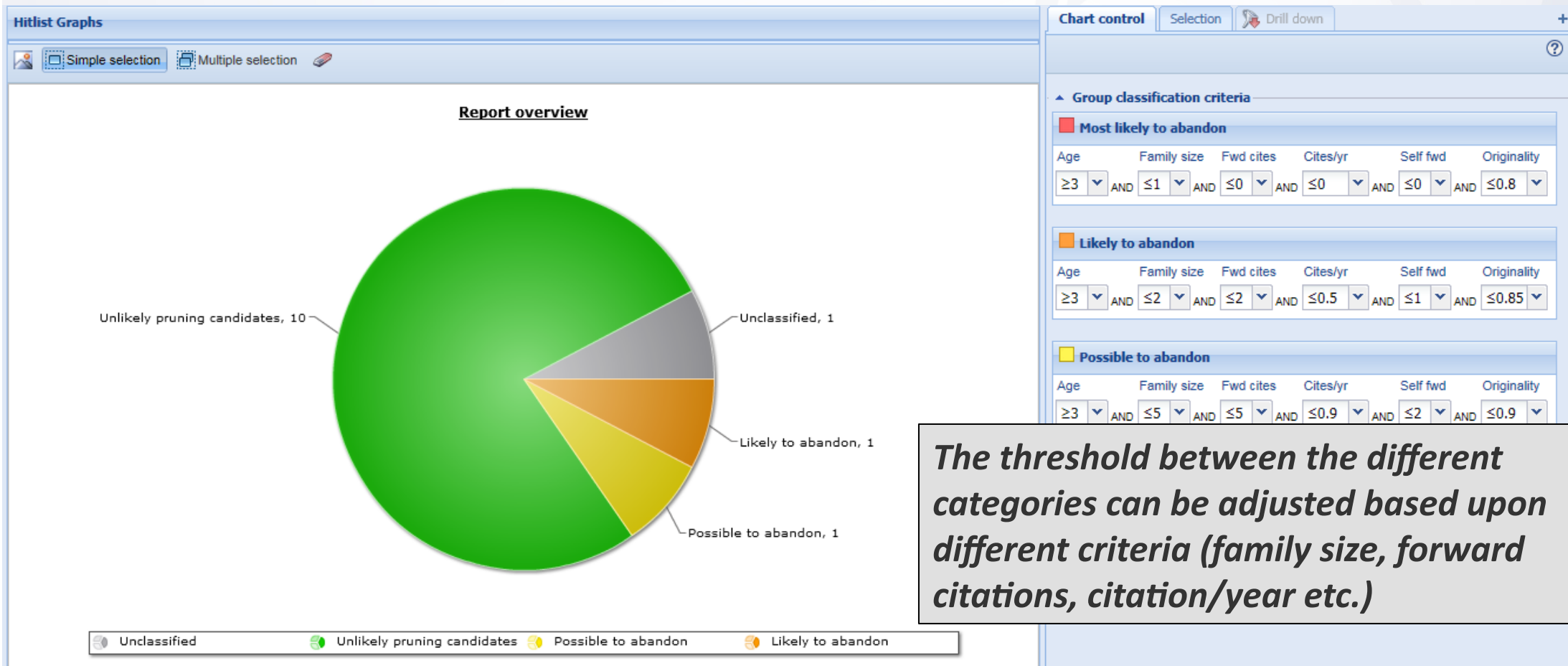 - those which can be abandoned

Pruning

Pruning metrics

Metric definitions

Metric	Value Correlation & Literature Summary of Metric's Use	Metric Definition
Family size	Positive - Larger families can indicate greater investment and a wider scope for protection.	The number of granted or pending patents in this patent family
Fwd cites	Positive - Forward citations can indicate continued interest in the patent.	The total number of times this patent family has been cited by other patent families
Avg cit/yr	Positive - Forward citations can indicate continued interest in the patent.	Total Forward Citations divided by the number of years since the 1st publication of this patent family
Predator	Positive - The presence of predators can indicate a more active patent market.	Predator Presence : SHARK : if more than 30% of the forward citations (minimum 3) come from a single assignee which is not the patent owner we mark the Predator Presence as SHARK. PREDATOR : if between 15-30% of the forward citations (minimum 2) come from a single assignee which is not the patent owner we mark the Predator Presence as PREDATOR
Generality	Positive - Generality index, high score indicates a wider application across different technology groups, low score indicates more specific application.	Briefly; forward citations from a wider spread technology groups will generate a higher score. Fully Defined by Hall, Jaffe, and Trajtenberg (2001)
Originality	Positive - Originality Index, high scores indicates breakthrough technology, low scores indicates incremental improvement.	Briefly; backward citations to a wider spread of technology groups will generate a higher score. Fully Defined by Hall, Jaffe, and Trajtenberg (2001)
Validated	Positive - Previous litigation, opposition or re-examination indicates that the patent is more robust.	Marked as Yes if a member of the patent family has been litigated in the US, opposed or re-examined anywhere in the world
Self fwd	Positive - Self forward citations indicate that follow on work has been completed by the owner.	Number of forward citations from other patent families owned by the same assignee.
Self back	Positive - Self backward citations indicates that this inventions builds off work which has been previously patented by the owner	Number of backward citations to other patents owned by the same assignee.
Ind. claim	Positive – more independent claims tend to indicate a wider scope of protection	Number of independent claims in this patent family
Dep. claim	Positive – more dependant claims tend to indicate a wider scope of protection	Number of dependant claims in this patent family

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CALABRIA HIGH TECH

Pruning Overview

The threshold between the different categories can be adjusted based upon different criteria (family size, forward citations, citation/year etc.)

Pruning detailed report

Display ▾ | 🖌 ▾ | ⬆ Cat ▾ | 📊 | Browse portfolio

#	Cat		Title	Applicant/Assignee	Publication number	Publication	Age	Family size	Cites/yr	Fwd cites	Predator	Generality	Originality	Validated	Self fwd	Self back	Ind claim	Dep claim
1.	🟧	☐	Measuring device made of an open kine	CALABRIAN HIGH	⏳ EP1843876	2006-02-16	🔴 9	🟠 2	🟠 0.11	🟠 1	NONE	0		🔴 0	NO	🔴 0	1	1	6
2.	🟨	☐	Sistema di bilanciamento delle forze d ir	CALABRIAN HIGH	⏳ ITCS20100011	2011-12-26	🔴 3	🔴 1	🔴 0	🔴 0	NONE	0	🟡 0.89	NO	🔴 0	0		
3.	🟩	☐	Nuova versione doppia pinza per laparo	CALABRIAN HIGH	⏳ ITCS20120032	2014-03-08	🟢 1	🔴 1	🔴 0	🔴 0	NONE	0	🔴 0					
4.	🟩	☐	Doppia pinza per laparoscopia monoacc	CALABRIAN HIGH	⏳ ITCS20120006	2013-08-22	🟢 1	🔴 1	⚪ 1	🟠 1	NONE	0	🔴 0					
5.	🟩	☐	Sistema di bilanciamento delle forze d'in	CALABRIAN HIGH	⏳ ITCS20110006	2012-09-03	🟢 2	🔴 1	🔴 0	🔴 0	NONE	0	🔴 0					
6.	🟩	☐	Sistema per il controllo delle vibrazioni d	CALABRIAN HIGH	⏳ ITCS20100017	2012-05-23	🟢 2	🔴 1	🔴 0	🔴 0	NONE	0	🔴 0.72					
7.	🟩	☐	Sistema integrato per il rilievo del calco	CALABRIAN HIGH	⏳ ITCS20100015	2012-04-29	🟢 2	🔴 1	🔴 0	🔴 0	NONE	0	🔴 0.67					
8.	🟩	☐	Quarto gruppo di possibili versioni della	CALABRIAN HIGH	⏳ ITCS20130023	2015-03-06	🟢 0	🔴 1	🔴 0	🔴 0	NONE	0	🔴 0					
9.	🟩	☐	Twin forceps for single access laparoscc	CALABRIAN HIGH	⏳ WO2015033368	2015-03-12	🟢 0	🔴 0	🔴 0	🔴 0	NONE	0	🔴 0					
10.	🟩	☐	Meccanismo per rendere intercambiabili	CALABRIAN HIGH	⏳ ITCS20130021	2015-02-02	🟢 0	🔴 1	🔴 0	🔴 0	NONE	0	🔴 0.67					
11.	🟩	☐	Twin forceps for single access laparoscc	CALABRIAN HIGH	⏳ EP2840979	2013-09-26	🟢 1	🟠 2	🔴 0	🔴 0	NONE	0	🔴 0					
12.	🟩	☐	Terza versione della doppia pinza per la	CALABRIAN HIGH	⏳ ITCS20130001	2014-07-12	🟢 0	🔴 1	🔴 0	🔴 0	NONE	0	🔴 0.51					
13.	⬜	☐	Orthopaedic system allowing alignment	CALABRIAN HIGH	⏳ EP0977514	1998-02-05	🔴 17	🔴 1	🟠 0.41	⚪ 7	SHARK	0.73	🔴 0					

✓ 7. Abandonment metrics

Select the low scoring patent families that you would like to consider for abandonment.

By default the table is sorted in the order in which the columns appear *Publication date* through to *Dep claim* count. You can customise the sorting preference using the control above the table.

🟥 ☑ Most likely to abandon (146)

🟧 ☐ Likely to abandon (51)

🟨 ☐ Possible to abandon (166)

🟩 ☐ Unlikely pruning candidates (469)

⬜ ☐ Unclassified (33)