

Aufstrebende Technologiezentren

Regionale und institutionelle Schwerpunkte aufstrebender
Technologien von 1980 bis 2020

Zielsetzung der Kurzstudie

Ziel dieser deskriptiven Kurzstudie ist es, erfolgreiche Innovationsökosysteme zu identifizieren und besser erklärbar zu machen.

Die der Studie zugrundeliegende Methodik geht von folgenden Grundüberlegungen aus:

Weltweit werden Patentveröffentlichungen von allen Patentämtern als Grundlage für die Darstellung der Verbreitung von Technologien genutzt. Aus diesem Grund können sie als zuverlässiger Frühindikator für die Einführung neuer Technologien dienen. Insbesondere die Metadaten zu innovativen Ländern, zur Institution des Anmelders, dem Veröffentlichungsdatum und Technologien sind nützliche Datengrundlagen für eine tiefergehende Analyse.

Analytische Vorgangsweise der Kurzstudie

Bei der Analyse wird folgendermaßen vorgegangen:

In einem ersten Schritt wird der Bestand der weltweit auftauchenden Technologiekombinationen verwendet, um einen Gesamtdatensatz von Patentpublikationen neuer Technologien aufzubauen.

Aus einer Matrix von 28,8 Mrd möglichen Kombinationen werden neu entstehende Technologiekombinationen in Form von Paaren von in der Patentanmeldung genannten Patentklassen bestimmt. Wenn die Zahl der Patentanmeldungen in den vergangenen Quartalen exponentiell zugenommen hat, werden diese Technologiekombinationen als neu entstehende Technologiekombinationen bezeichnet. Von allen analysierten Kombinationen weisen 7500 Verbindungen zwischen 5000 Technologien das Verhalten des exponentiellen Wachstums auf. Diese können mit Methoden der Social-Network-Analyse weiter gebündelt werden und die zentralen Technologieknoten des Clusters als Schlüsseltechnologien des betreffenden aufstrebenden Technologieclusters identifiziert werden.

Inventare neu entstehender Technologiekombinationen (ETCs) wurden punktuell für fünf Jahre in der Vergangenheit erstellt, nämlich 1980, 1990, 2000, 2010 und Mai 2019. Für jedes einzelne Inventar von ETCs werden die entsprechenden Patentanmeldungen, die in den zehn Jahren vor dem Snapshot-Datum veröffentlicht wurden (z.B. für ETCs 1980 die vom 01.01.1970 bis 12.11.1979 veröffentlichten Patentanmeldungen ausgewählt) und im Laufe der Zeit auf die regionale Innovationsquelle analysiert. Es wurden zwei Intervalle innerhalb des 10-Jahres-Zeitraums ausgewählt, d.h. die aktuellsten zwei Jahre für die späten Patente der ETCs (z.B. für die ETCs 1980 das Intervall 1978-01 bis 1979-12) und die frühen Patente des ETC, 4-6 Jahre vor dem Erfassungsdatum (1974-01 bis 1975-12).

Die Regionalstatistiken (Anteil der Patente nach Regionen) der frühen und späten Patente in ETCs unterscheiden sich. Das Verhältnis der Anteile der frühen und späten Patentveröffentlichungen an ETCs aus einer bestimmten Region kann als Innovation Pioneering Index interpretiert werden.

Der Anteil der frühen und späten Patentanmeldungen an neu entstehenden Technologiekombinationen aus Europa (Erfinderländer innerhalb der derzeitigen EU-28 plus EFTA) liegt seit 1980 leicht über ¹. Europäische Erfinder tragen ständig zu neuen Technologien bei, von der frühen bis zur späten Phase. Ein anderes Bild ergibt sich für die USA, die 1980 einen geringen Anteil an frühen Patenten in ETCs hatten, der bis 2010 anstieg, bevor er wieder zurückging und derzeit wieder unter 1 liegt. Die dramatischsten Veränderungen in den Erfindungsstrategien vom Technologie-Follower zum Innovationspionier sind in China und Korea zu beobachten.

Aus institutioneller Sicht stieg die Zahl der Universitäten unter den Top-1000-Anmelder von Patentanmeldungen in ETCs von 0,4% (1980) auf 13,6% (2020). Der Anstieg wird primär von China getragen.

Abschließende Bemerkungen und Schlussfolgerungen

Zusammenfassend soll eine wichtige Beobachtung erwähnt werden. Wenn wir uns mit erfolgreichen Innovationsökosystemen befassen, betrachten wir hiermit die Quelle der Innovation - den Standort des Humankapitals. Es gibt jedoch noch einen weiteren wichtigen Standort - den Standort der Verwertung. Eine beträchtliche Anzahl von Patentanmeldungen in neue Technologien hat ihre Quelle (Land der Erfinder) an einem anderen Ort als ihre Verwertung (Land des Anmelders). Europa hat aus dieser Sicht einen Nettoabfluss von Patentanmeldungen (negativer Saldo der geistigen Eigentumsrechte, d.h. die Zahl der Patentanmeldungen in ETCs von Erfindern in Europa, die für außereuropäische Entsandte eingereicht wurden, ist höher als die Zahl der Patentanmeldungen von Erfindern außerhalb Europas für europäische Institutionen bzw. Patentanmelder). Die USA weisen den mit Abstand höchsten positiven Saldo der geistigen Eigentumsrechte auf.

Abschließend ist anzumerken, dass das europäische Innovationsökosystem zwar stabil ist, aber im Saldo negativ abschneidet. Ohne wirksame politische Maßnahmen zur Anziehung von Wissensflüssen besteht die Gefahr eines Innovationsverlustes.

¹ Ein Verhältnis von Patentanteilen in der frühen Phase zu Patentanteilen in der späten Phase von unter 1 bedeutet, dass die jeweilige Region besonders intensiv an der frühen Entwicklung der später exponentiell wachsenden Technologiekombination beteiligt war. Die Region hat den Charakter eines Innovations-Pioniers. Ein Verhältnis von über 1 zeigt eine höhere relative Patentintensität in der späten Phase an. Entsprechend haben solche Regionen den Charakter von Innovations-Followern.

EMERGING TECHNOLOGY HUBS

REGIONAL AND INSTITUTIONAL FOCAL POINTS OF EMERGING TECHNOLOGIES
1980 - 2020

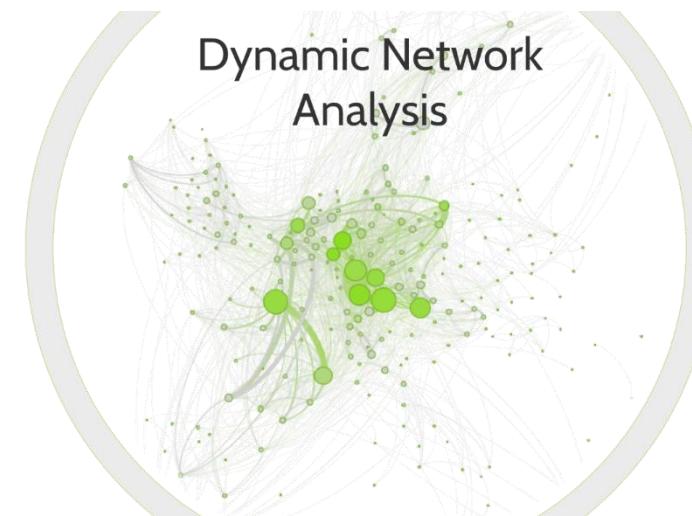
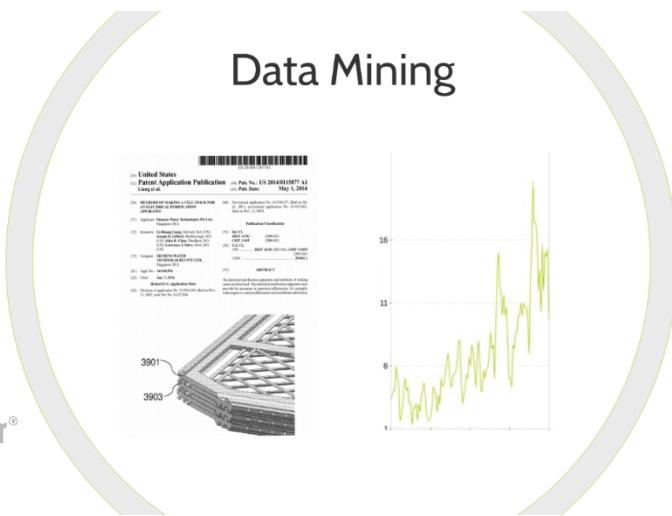
CONTENT

- Determination of Emerging Technology Combinations (ETCs) from Patent Data
- Emerging Technologies – Top 40 Clusters
- Focal Points of Innovation by Region
- Focal Points of Innovation by Institution
- Inter-regional IPR Balances

DETERMINATION OF EMERGING TECHNOLOGY COMBINATIONS (ETCS) FROM PATENT DATA

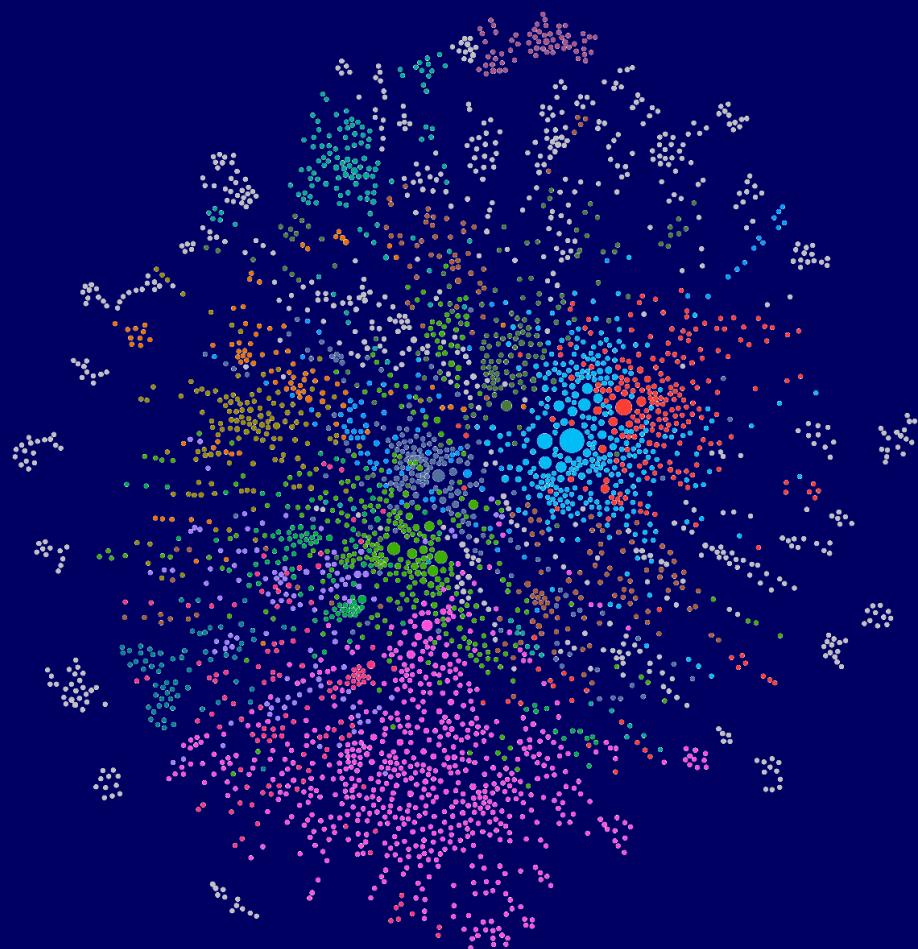
- Technology diffusion materializes in inter-disciplinary patent applications
- From 28.800.000.000 technology combinations we identify those with exponential dynamics in the past quarters
- We weekly derive the network of emerging technologies, plotting connected technologies as nodes for all exponentially growing technology combinations
- We calculate modularity classes of the nodes to distinguish distinct network clusters

Techmeter®



EMERGING TECHNOLOGIES – TOP 40 CLUSTERS

DETECTED AND UPDATED WEEKLY



3548

Emerging Technology Nodes (out
of 240.000)

6423

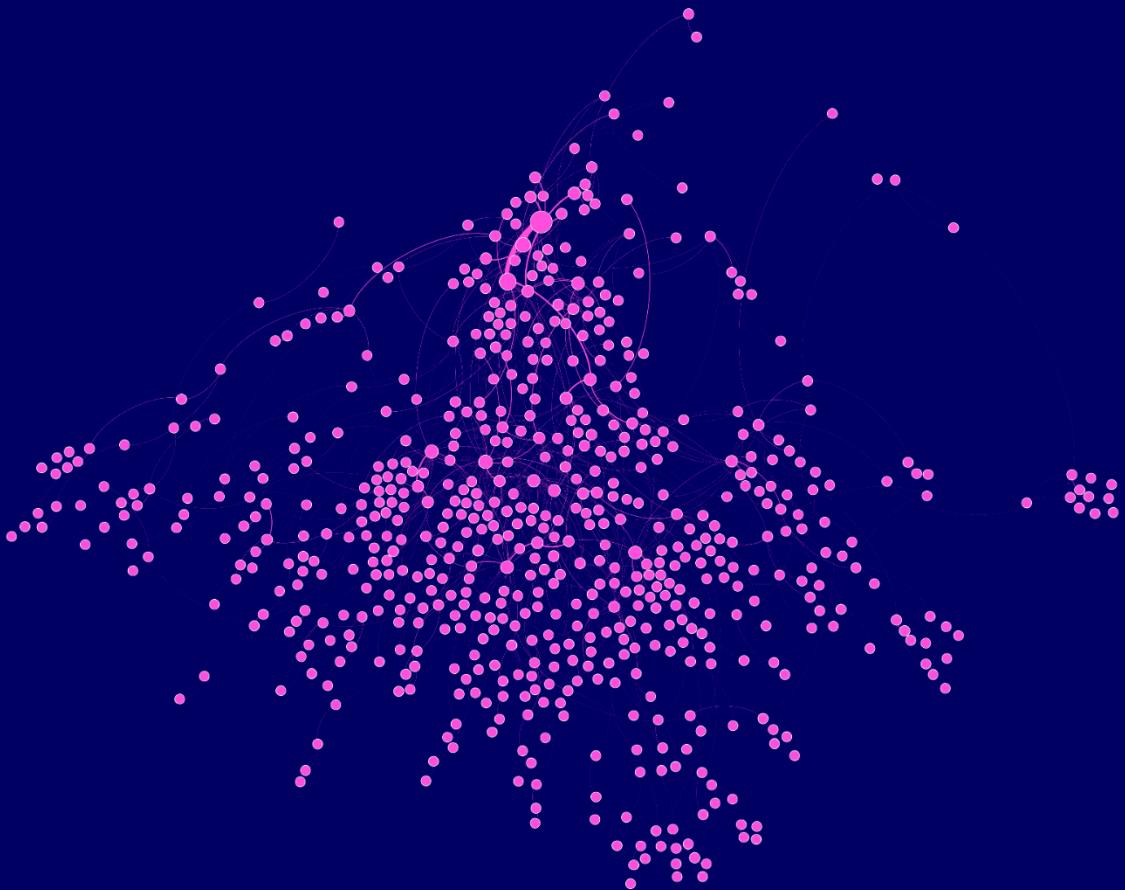
Emerging Technology Edges (out
of 28.800.000.000)

40

Clusters

EMERGING TECHNOLOGIES – SENSOR-CLUSTER

DETECTED AND UPDATED WEEKLY



632

Emerging Technology Nodes (out
of 240.000)

872

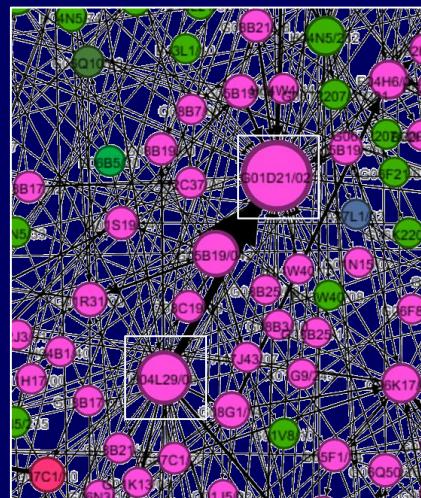
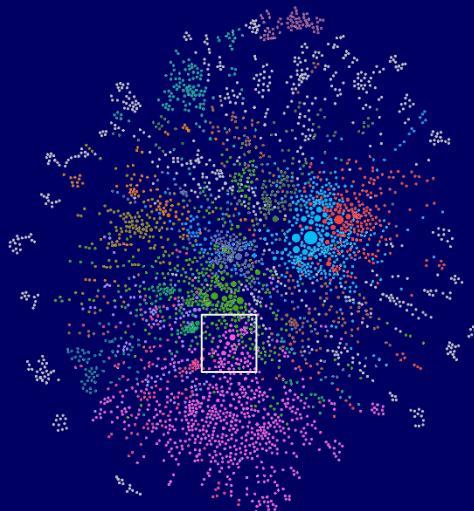
Emerging Technology Edges (out
of 28.800.000.000)

Selected Cluster

Sensors

EMERGING TECHNOLOGIES – SENSOR-CLUSTER

KEY ENABLING TECHNOLOGIES IN THE CORE OF A CLUSTER



IPC-Class
G01D21/02

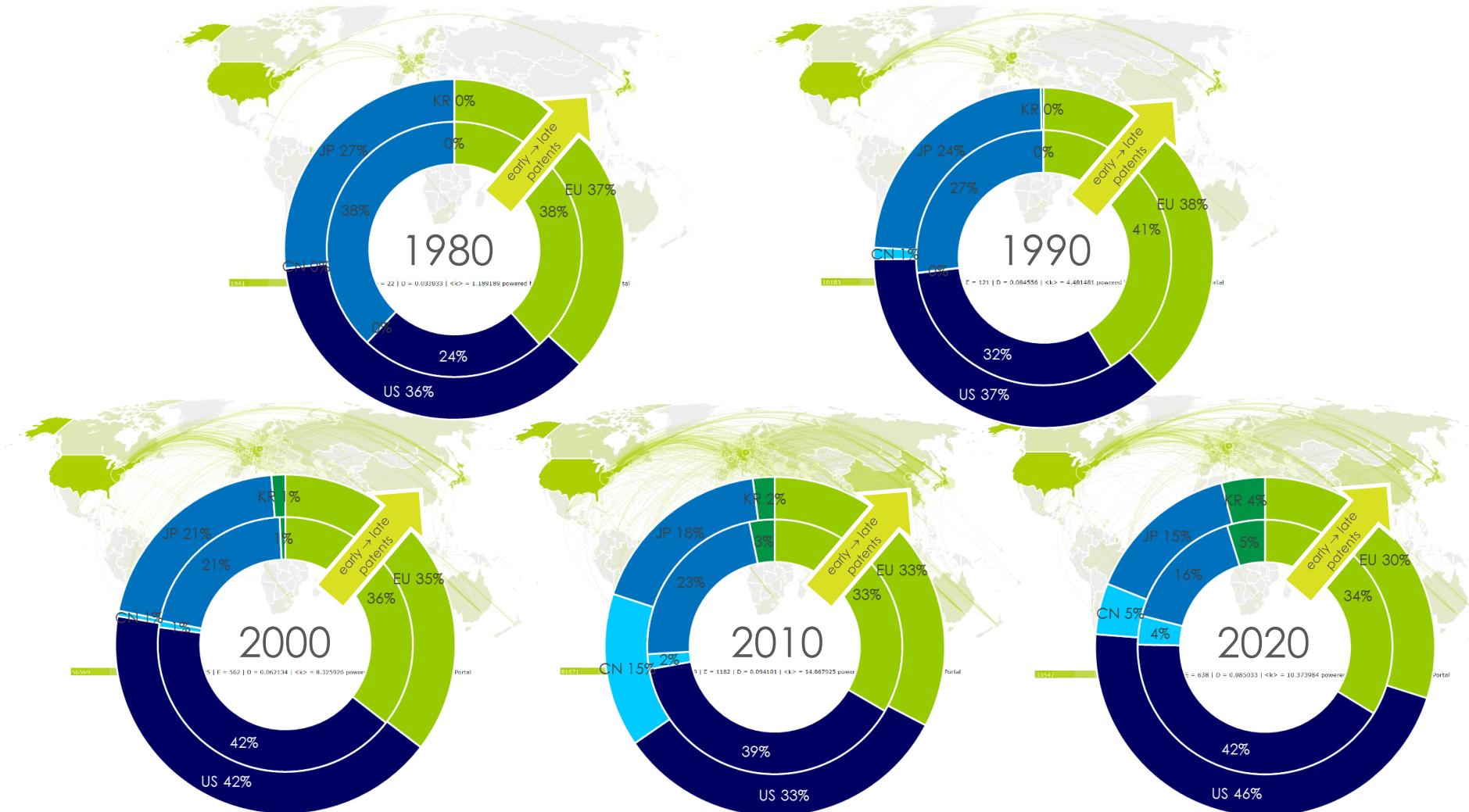
Measuring two or more variables by means not covered by a single other subclass

H04L29/08

Data transmission control procedure, e.g. data link level control procedure

Detection of clusters, networks and patent-classes

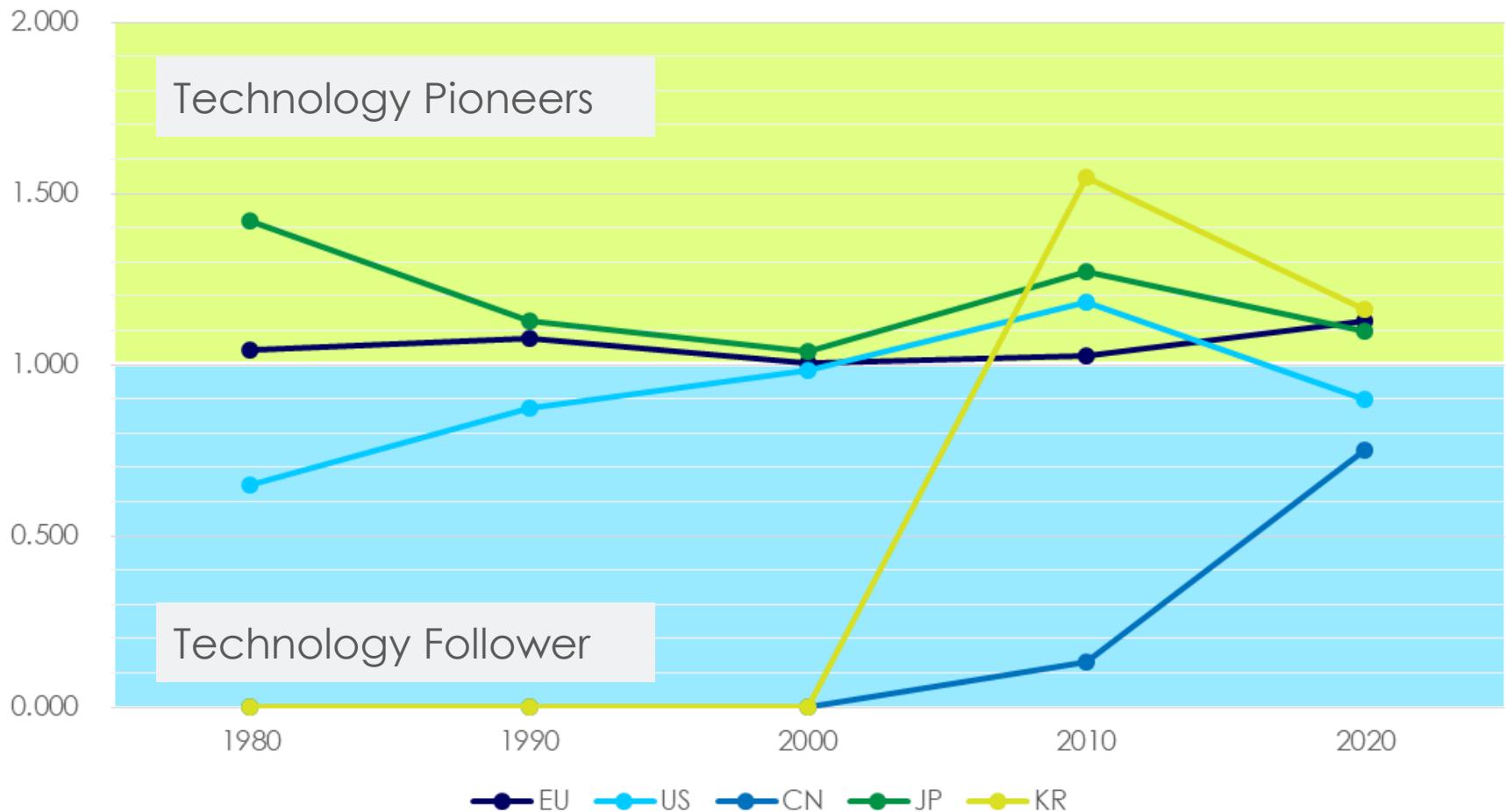
FOCAL POINTS OF INNOVATION IN EMERGING TECHNOLOGIES BY REGION



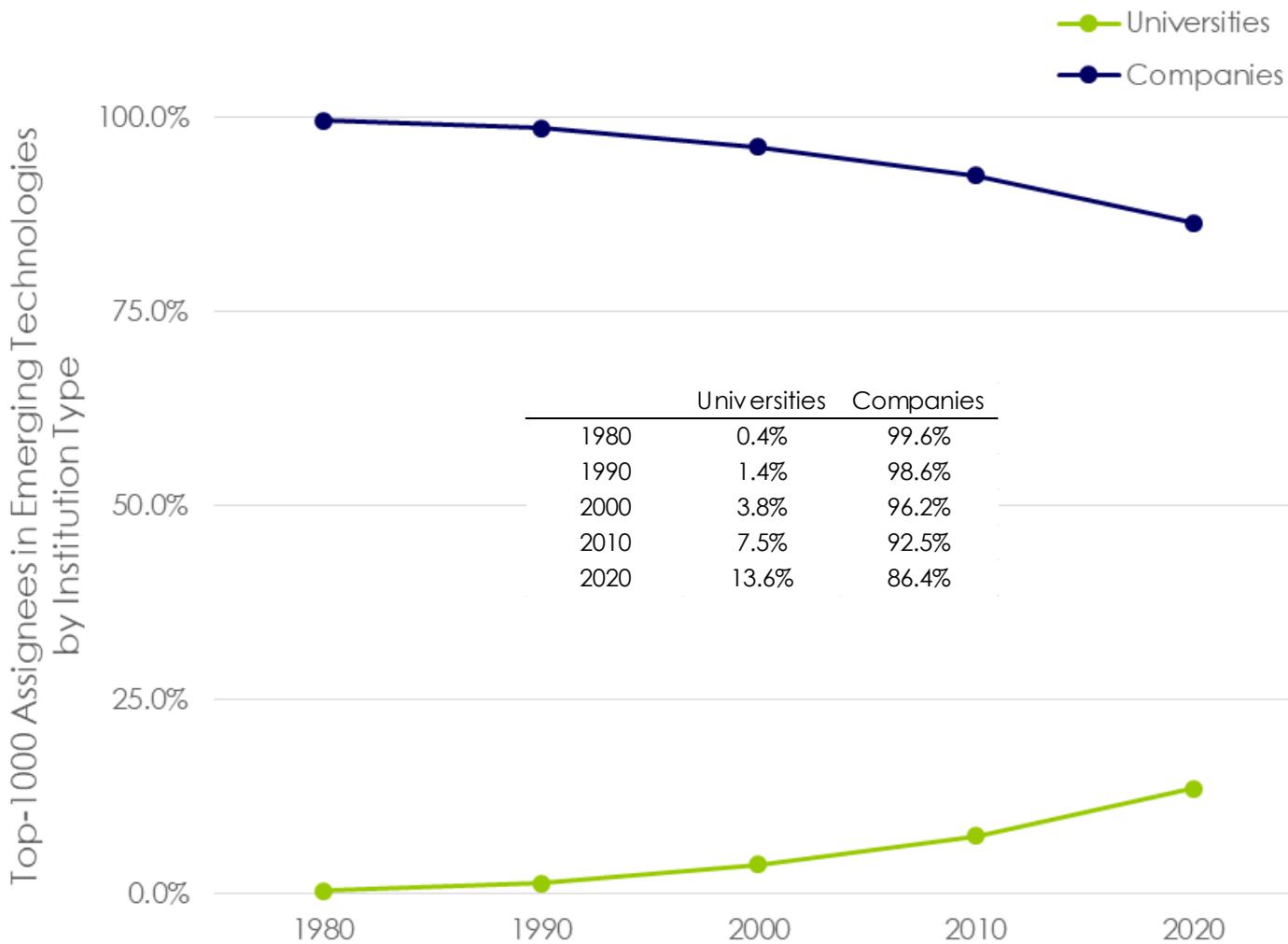
INNOVATION PIONEER REGIONS

ETC Year	Innovation Pioneer Index*				
	EU	US	CN	JP	KR
1980	1.042	0.649	0.000	1.419	0.000
1990	1.076	0.872	0.000	1.129	0.000
2000	1.006	0.984	0.000	1.038	0.000
2010	1.024	1.184	0.130	1.270	1.546
2020	1.129	0.897	0.751	1.098	1.163

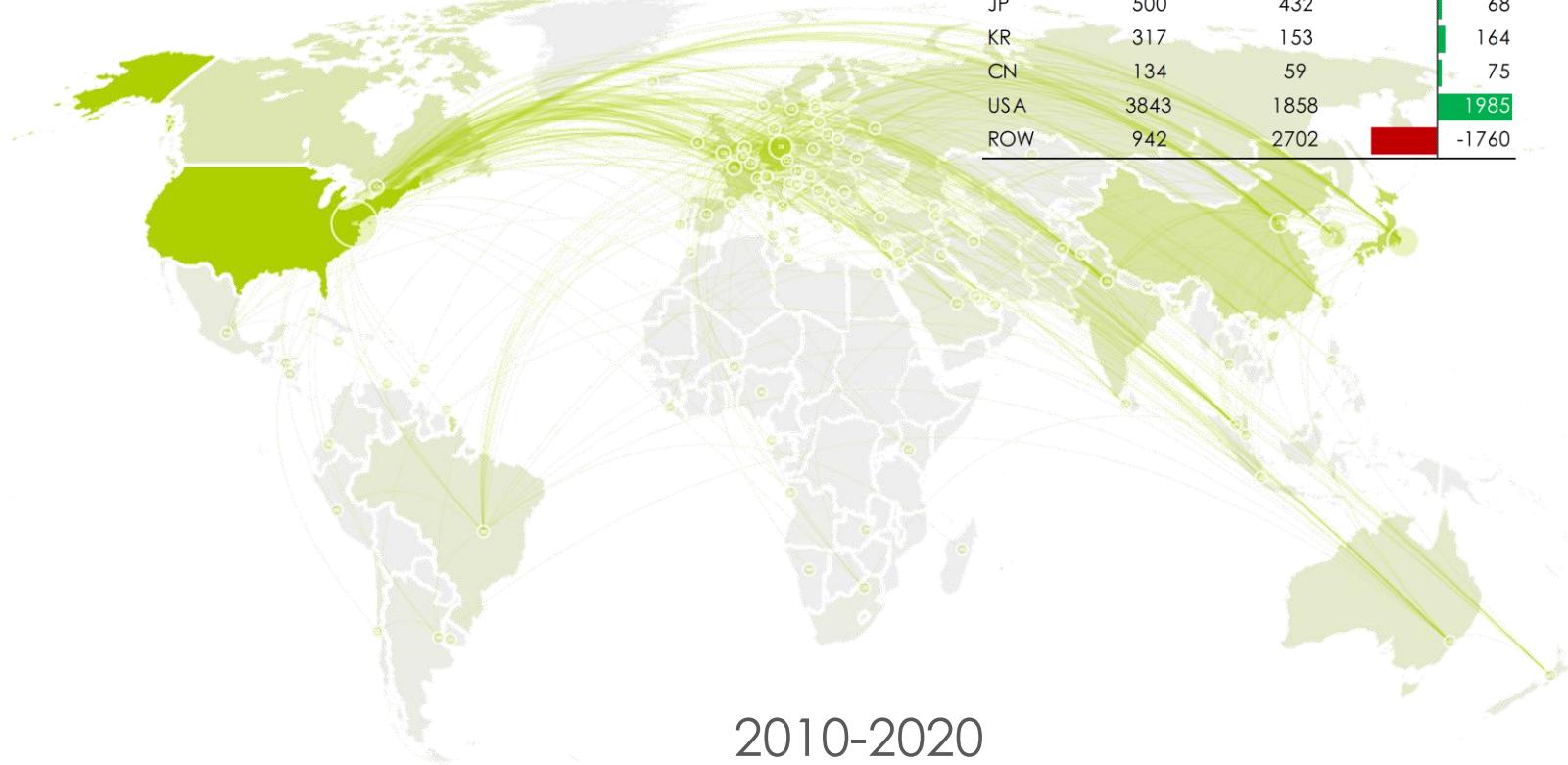
*ratio of early and late inventions in emerging technologies, min. 1% invention share required



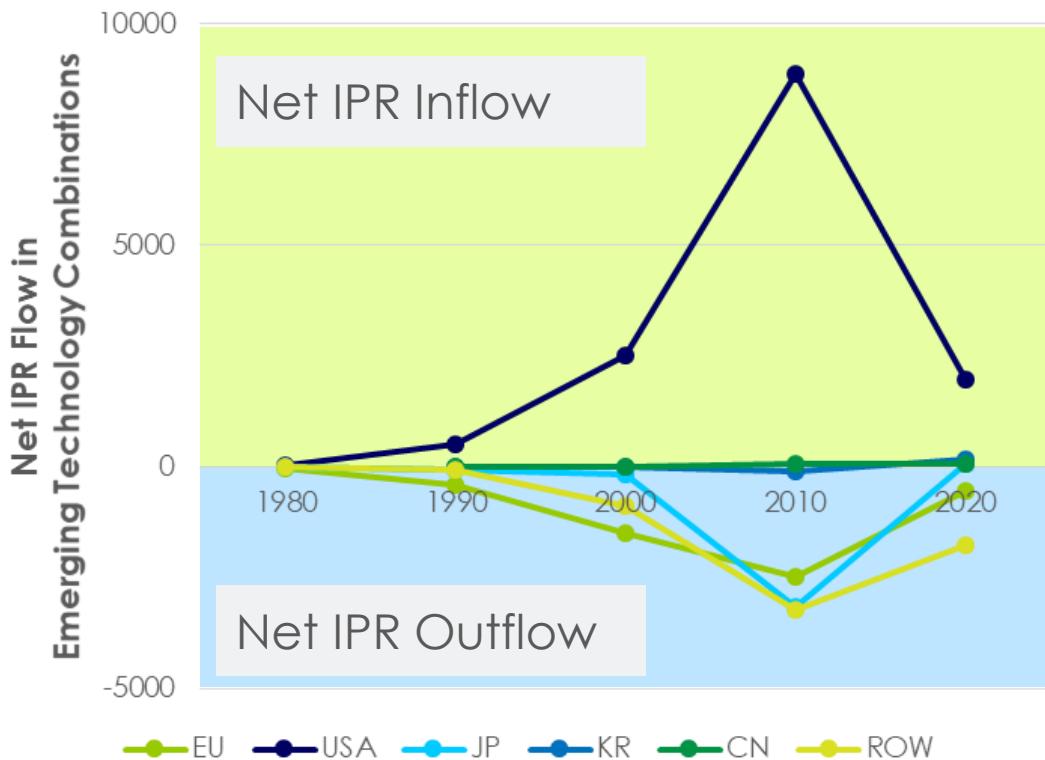
FOCAL POINTS OF INNOVATION BY INSTITUTION



INTER-REGIONAL IPR BALANCES IN CURRENT ETCs



INTER-REGIONAL IPR BALANCES IN ETCs



	1980	1990	2000	2010	2020
EU	-14	-406	-1475	-2461	-532
USA	23	501	2518	8883	1985
JP	-6	-48	-156	-3141	68
KR	2	2	2	-108	164
CN	-2	-9	58	75	75
ROW	-3	-47	-880	-3231	-1760

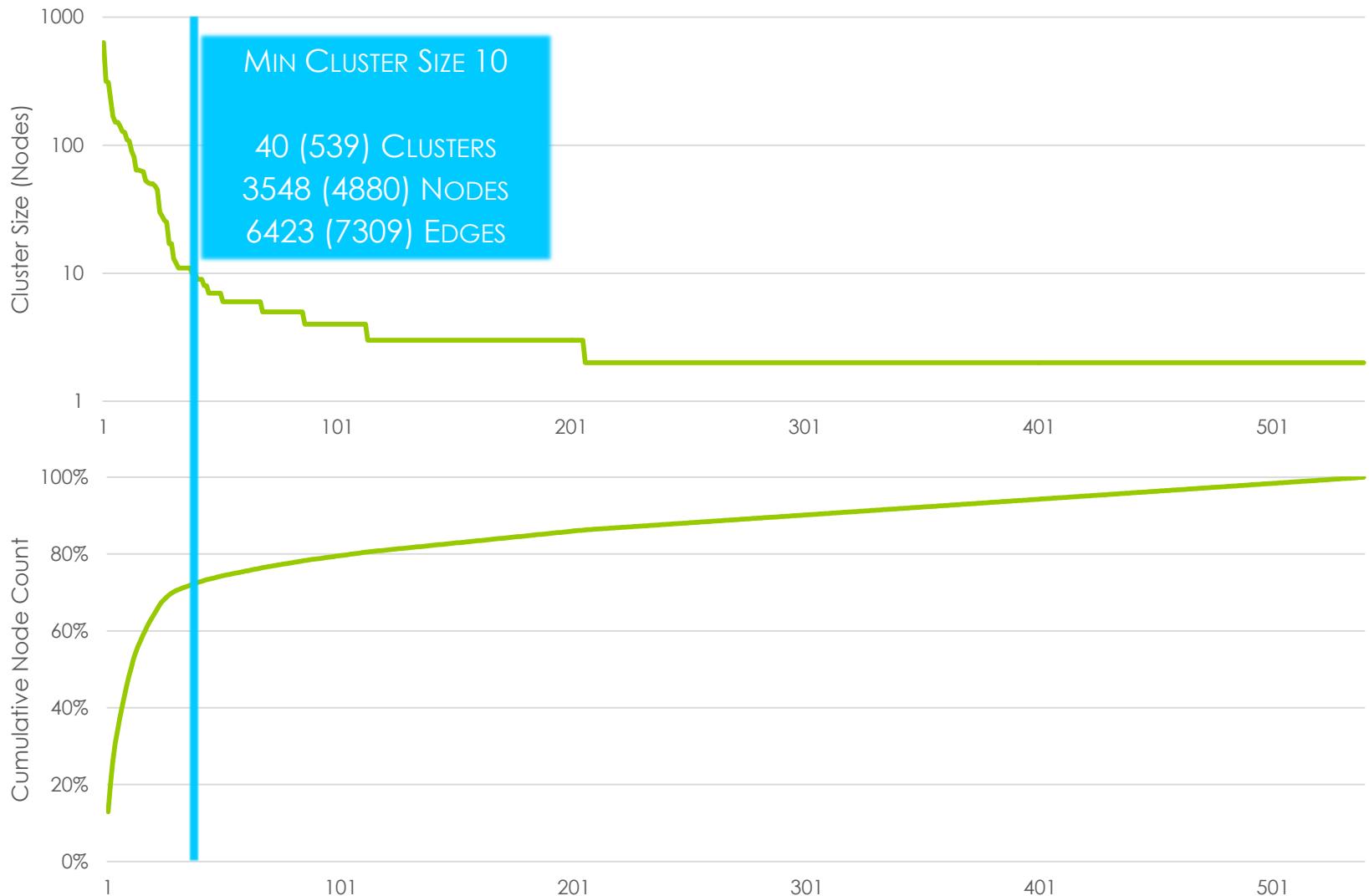
IPR-Balance = IPR-Inflow - IPR-Outflow

IPR-Inflow: Inv entor from outside and company within region

IPR-Outflow: Inv entor within region and company outside region

EMERGING TECHNOLOGIES – CLUSTER SIZES

DETECTED AND UPDATED WEEKLY – PICTURE PER MARCH 2019



EMERGING TECHNOLOGIES – FIRST & CURRENT EVIDENCES

DETECTED AND UPDATED WEEKLY – PICTURE PER MARCH 2019

Patent Families by Inventor Country in Current Emerging Technology Clusters (per 2019-03)

Cluster Size	Central Node of Cluster	Tags
230	763	G01D21/02
		FERROELECTRIC MONITOR LEARNING RECOGNITION SMART PARKING VOICE ROBOT SAFE ALARM
26	539	H04N5/225
		SURVEILLANCE INTELLIGENCE STREET PROJECT MONITOR TEACHING OUTDOOR CLEAN DISSIPATION ADJUST
71	506	F26B21/00
		SMASH TEALEAVES CLEAN SIEVING DISINFECTION CRUSHER CRUSHING SORTING PHOTOVOLTAIC GARBAGE
126	386	A23N17/00
		SMASH FODDER APPARAT CRUSHER RUBBING LIVESTOCK UNMANNED AERIAL CRUSHING IRRIGATION
211	277	F21V33/00
		WARDROBE STREET BIRD GUARDRAIL GARDEN MOSQUITO FENCE CABIN PURIFIER MULTIFUNCTIONAL
82	269	F16F15/04
		APPARAT CRUSHER PUNCH ATTENUATION TRANSFORMER DAMPING SHOCK CRUSHING ELEVATOR MILL
207	222	B25J11/00
		DREIDIMENSIONALER OBJEKTE DREIDIMENSIONALEN OBJEKTS ROBOT HERSTELLEN FERRITE MANIPULATOR ADDITIVE SORTING
269	204	G06K9/00
		ATTENDANCE MAKEUP REHABILITATION CHAIR ASSISTANCE MASSAGE FINGERPRINT RECOGNITION TRAIN LANGUAGE
108	173	B32B33/00
		CARPET WATERPROOF FIREPROOF PILLOW LAMINATE CORRUGATED COAT DECORATIVE SOLE PACK
129	172	H02J7/00
		HARNLESS RECORDER FAHRZEUG PHONE MONITOR ACOUSTIC ELECTRON MOUNT TAKE - PHONE
267	166	C02F1/30
		PHOTOCATALYST PHOTOCATALYTIC BISMUTH NANOPARTICLE HYDROGENATION NANOMETER SYNTHESIZING DEGRADATION NITRIDE NANO
249	161	G07C9/00
		FIREPROOF EXTINGUISHING SUBSTATION CONSTRUCT FINGERPRINT INTELLIGENCE SAFE PACK WOOD SECURITY
13	143	E03B3/02
		SHELTER RAINWATER GREENHOUSE COLLECT GARDEN ECOLOGICAL IRRIGATION CULTIVATION AGRICULTURAL RAIN
133	117	H02K7/14
		IRISBLENDENMECHANISMUS AUFLADEVORRICHTUNG AQUACULTURE ELEKTROMOTOR BLOWER POND MOUNT CENTRIFUGAL FISH STATOR
201	89	B01D50/00
		INTEGRATE KITCHEN PURIFY PURIFIER ULTRASOUND CLEAN HOOD STOVE COOKER HOUSEHOLD
252	80	B01D35/02
		BEARBEITUNGSVERFAHREN STRAINER FAUCET SUBSTRAT CHUCK CLEAN ELECTROSTATIC MACHINING FILTRATION WORKPIECE
361	78	G09G2310/0264
		LICHTEMITTIERENDE ANZEIGEVORRICHTUNG ORGANISCHE OLED ETCH ELECTROLUMINESCENT Holographic ELECTRO FINGERPRINT DIODE
		KRAFTGETRIEBENES HYBRIDANTRIEB LUFTFAHRZEUG COGENERATION PROPULSION AFTERTREATMENT AIRCRAFT HYBRID COMBINE ARCHITECTURE
79	72	F01D15/10
		AIRHOT HEIZEINRICHTUNG THAWING COMBUSTOR PREMIX ELEKTRISCHE EVAPORATOR STOVE BURNER REFRIGERATOR
91	71	F24H9/18
		MICRALLOY SMELTING ANNEALING TOUGHNESS CAST STAINLESS QUENCHING WEAR-RESISTING WEAR-RESISTANT HIGH-STRENGTH
152	66	C22C33/06
		UROPORPHRINOGEN MUTANT DECARBOXYLASE PROGNOSIS DEGRADING COMPOST BACILLUS REDUCTASE KINASE MICROBIAL
66	64	C40B40/08
		SUPERPLASTICIZER POLYCARBOXYLATE POLYCARBOXYLIC WATERBORNE SOLE POLYURETHANE COAT ACRYLATE SHOE ASPHALT
173	61	C08F220/20
		KALINA GOSWAMI FRACTIONATION POTABLE RANKINE CAPACITIES TRIPLE SIMULTANEOUS DISTILLATION WASTEWATER
208	61	F28D21/00
		LAMINATE SHIELD GRAPHENE THERMALLY ABSORBING POLYURETHANE NANO MULTILAYER DISSIPATION THERMOPLASTIC
241	61	H05K9/00
		SAUNA LITERATURE ENGLISH TEACHING BLACKBOARD BOOTH EDUCATION DEMONSTRATION SCHOOLSHOW
120	45	E04H1/12
		BODHIDHARMA ARTWARE CELADON SPARROW BUDDHA GALLOPING PORCELAIN SWALLOW BUDDHIST GLAZE
213	32	C03C8/00
		SOFTENER PURIFIER BUTTERFLY FAUCET PILOT SPOOL FILTRATION PNEUMATIC VENT BEVERAGE INTEGRIERTE NONVOLATILE FABRICATION HERSTELLUNGSVERFAHREN FUSE DISCRIMINATING REPAIR PROGRAMMING PROGRAMMABLE LAYOUT
399	32	B01D35/04
		KNIT DYED BLEND CHIMERIC STRETCHABLE WOVEN CONJUGATE SPUN SCAFFOLD YARN NONVOLATILE NAND ERASE FLASH PROGRAMMING DECODER STRING STACK DECODING WORD
271	26	H01L21/822
266	17	D03D15/00
455	17	G11C16/08

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0	4	2	0	0	0	0	0	0	0	3	
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0	1	1	0	3	3	0	1	0	0	6	
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1	3	2	3	1	2	38	0	0	1	19	
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ABOUT TECHMETER

TechMeter GmbH has been founded in 2009 and is based in Hagenberg.

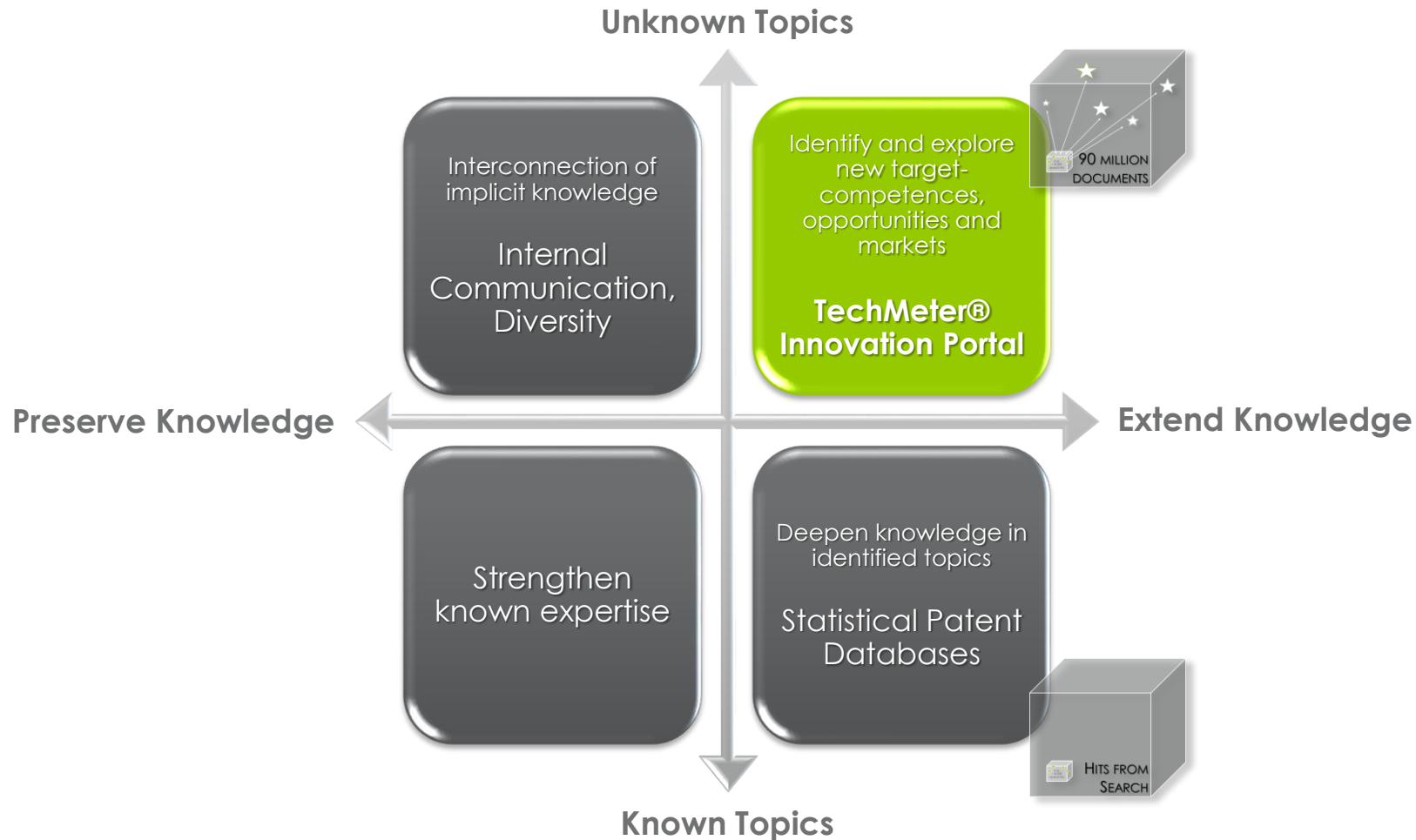
Our proprietary software package "Techmeter Innovation Portal" turns patent big-data analysis into value. From the complete patent universe of more than 90 million documents, our algorithms for

- DATA-MINING UND
- SOCIAL NETWORK ANALYSIS („WEAK SIGNAL DETECTION“)

provide insight in current technology trends, industry- and cooperation structures, emerging technologies, geographic innovator hubs and global information flows.

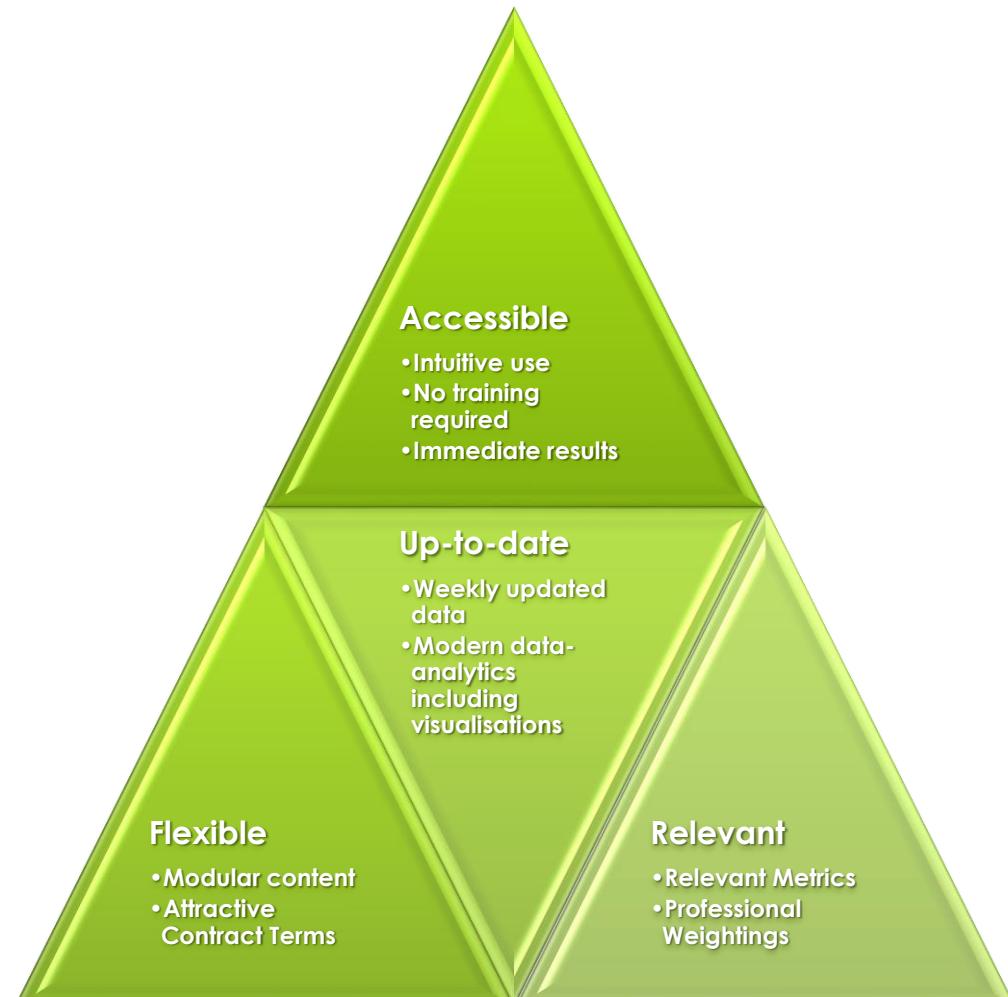
TECHMETER® INNOVATION PORTAL

BEYOND PATENT STATISTICS:
TECHMETER ALGORITHMS SUPPORT INNOVATION PIONEERS



TECHMETER® INNOVATION PORTAL

HIGHLY ACCESSIBLE SET OF DATA-ANALYTICS FOR PATENT-BASED INFORMATION WITH INTERACTIVE REPORTING



Chapter 1, Part 1:
M. Stadlbauer (Techmeter),
G. Drexler (Mondi)
De-Bottlenecking Open Innovation:
Turning Patent-Based Technology Network Analysis into Value

KEY PERFORMANCE INDICATOR SET

MEASUREABLE SUCCESS IN INNOVATION AND TECHNOLOGY HYPERAWARENESS

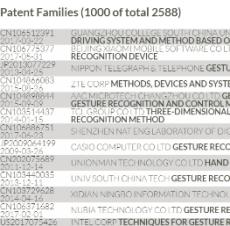
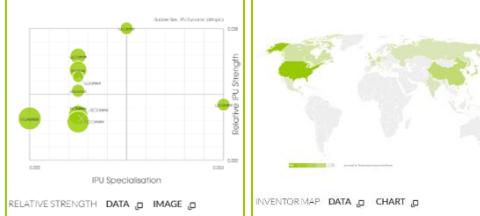
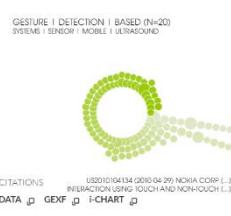
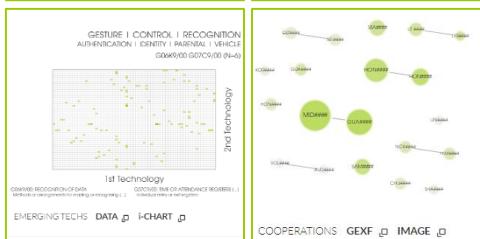
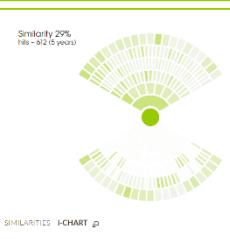
	BUSINESS DRIVER	INDICATOR	MEASURE
R&D	INNOVATION VALUE	INVENTION OBJECTIVES LINKED TO EMERGING TECHNOLOGIES	NPV OF PROJECT PIPELINE > ## M EUR
	TIME-TO-MARKET	IDEA TO CASH PROCESS SPEED (TIME TO MARKET)	I2C <# YEARS
	SUCCESS RATE	PATENT GRANTING RATE	>##% OF FILINGS GRANTED
MARKETING	HYPERRAWARENESS	DISRUPTORS IDENTIFIED AND LINKED WITH BUSINESS OPPORTUNITIES	DISRUPTORS REVIEWED WEEKLY AND ALIGNED WITH STRATEGY
	STRATEGIC AGILITY	COMPETITOR TECHNOLOGY SWIFTS IDENTIFIED BEFORE MARKET ENTRY	NEW PRODUCT LAUNCHES PREDICTED 2 3 YEARS BEFORE MARKET ENTRY
	COMPETITIVE INTELLIGENCE	COMPETITOR LANDSCAPE PREDICTION LEAD TIME	COMPETITORS IDENTIFIED 1 2 YEARS BEFORE MARKET ENTRY
M & A	IDENTIFICATION OF TARGETS	NEW OPPORTUNITIES IDENTIFIED	## AGILE SPECIALIST COMPANIES ON RADAR
	VALUE AT RISK	REDUCED PORTFOLIO RISK	##% DEFAULT-RISK REDUCTION
SALES	VALUEABLE CUSTOMERS	LEADS GENERATED AND SEGMENTED BASED ON INVENTION OUTPUT IN LINKED TECHNOLOGIES	##.000 NEW LEADS IN PRIME-TECHNOLOGY-SEGMENT
PURCHASE	INVENTIVE SUPPLIERS	SUPPLIERS RATED BY INVENTIVE STRENGTH	##% OF SUPPLIERS AMONGST TOP-# INVENTORS BY TECHNOLOGY
HR	EMPLOYER BRANDING	COOPERATIONS WITH TOP-UNIVERSITIES ESTABLISHED	##% OF PHD FUNDINGS ALLOCATED TO TOP-## UNIVERSITIES
	COMPETENCE MANAGEMENT	NEWHIRES FROM TOP-UNIVERSITIES	##% OF NEWHIRES FROM TOP-## UNIVERSITIES
MANAGEMENT	TECHNOLOGY HYPERRAWARENESS	DISRUPTORS IDENTIFIED AND LINKED WITH BUSINESS OPPORTUNITIES	DISRUPTORS REVIEWED WEEKLY MONTHLY AND ALIGNED WITH STRATEGY
	ROBUST AND UP-TO-DATE TECHNOLOGY ROADMAPS	TECHNOLOGY ROADMAPS UPDATED BASED ON EMERGING TECHNOLOGIES	TECHNOLOGY ROADMAP UPDATED MONTHLY QUARTERLY
	VALUABLE INNOVATION PIPELINE	INVENTION OBJECTIVES LINKED TO EMERGING TECHNOLOGIES	NPV OF PROJECT PIPELINE >## M EUR
	STRATEGIC ALLIANCES	MOST AGILE COMPANIES REVIEWED AND EVALUATED	## ACQUISITION TARGETS IDENTIFIED BY INNOVATION PERFORMANCE
	COMPETITIVE INTELLIGENCE	COMPETITOR LANDSCAPE PREDICTION LEAD TIME	COMPETITORS IDENTIFIED 1 2 YEARS BEFORE MARKET ENTRY

EXAMPLE: STRATEGIC R&D MODULE

90 MILLION DOCUMENTS · DISRUPTIVE TECHNOLOGIES
REPORTED WEEKLY

BUSINESS DRIVERS

- INNOVATION VALUE
- TIME-TO-MARKET
- SUCCESS RATE

WHAT ARE THE LATEST TECHNOLOGIES AND INVENTIONS?	WHICH TECHNOLOGIES WILL CHANGE THE LANDSCAPE MOST AND OPEN MOST OPPORTUNITIES?	IS A CERTAIN TECHNOLOGY WORTH INVESTING?			
WHICH TECHNOLOGIES ARE NEXT TO GROW EXPONENTIALLY?	WHICH OTHER TECHNOLOGIES ARE LEVERAGING THE CORE TECHNOLOGIES? WHERE ARE FUTURE TECHNOLOGY OPPORTUNITIES?	WHICH REGIONS HAVE THE HIGHEST DENSITY OF INVENTORS? WHERE (GEOGRAPHICALLY) SHOULD I SPEND MY R&D BUDGET TO FIND THE BEST EXPERTS?			
WHICH COMPANIES OR UNIVERSITIES HAVE THE HIGHEST INFLUENCE IN THE TECHNOLOGY? HOW DO COMPANIES COOPERATE?	WHICH SUB-TECHNOLOGIES ARE PART OF THE SEARCHED TECHNOLOGY?	WHERE ARE COMPETITORS PROTECTING THEIR INVENTIONS? WHAT'S THEIR GEO-STRATEGY?			
HOW TO PHRASE A SEARCH SYNTAX TO FIND SIMILAR DOCUMENTS?	WHICH ARE THE CENTRAL INVENTOR-CLUSTERS IN THE GLOBAL INVENTOR NETWORKS?				

TECHMETER OFFERS

CONSULTING AND/OR CONTINUOUS ACCESS TO YOUR INNOVATION PORTAL

- Kick-Off Workshop
- Presentation
- 2-3 weeks

Narrow Analysis



- Kick-Off Workshop
- Validation
- Presentation
- Reporting
- Interactive Tools
- 3-6 weeks

Competitive and Technology Analysis



- Weekly updated
- Individual configuration
- Training of Key Users

TechMeter® Innovationsportal



INNOVATION PORTAL MODULES & CONTACT

- Which patent families are published >90 million documents?
- How disruptive are the innovations in defined technology area?
- Is the technology emerging, growing, maturing or stagnating – what's its phase in the technology lifecycle?
- Which technologies are emerging?
- Are there weakly linked emerging technologies?
- Where are the geo-hubs of inventors (where is innovation happening)?
- Which are the central companies and universities in the cooperation network?
- How is the topic semantically structured (which subtopics arise)?
- Where are the protective rights applied and what's the geo-strategy?

R&D Module



- How disruptive are the innovations in defined technology area?
- Is the technology emerging, growing, maturing or stagnating – what's its phase in the technology lifecycle?
- Which technologies are emerging?
- Which companies are leading in terms of IPR-protection?
- Technology Hyperawareness / Which companies are new and dynamic in a technology area?
- Technology Hyperawareness / Which companies are the most agile and most specialized (and hence perfect matches for cooperations)?
- Where are the protective rights applied and what's the geo-strategy?
- How are similar search profiles perfectly phrased to achieve analogue results to a reference?

Marketing Module



- Which technologies are emerging?
- Which companies are leading in terms of IPR-protection?
- Technology Hyperawareness / Which companies are the most agile and most specialized (and hence perfect matches for cooperations)?
- Where are the protective rights applied and what's the geo-strategy?
- How are similar search profiles perfectly phrased to achieve analogue results to a reference?

Sales Module



- Which technologies are emerging?
- Which companies are leading in terms of IPR-protection?
- Technology Hyperawareness / Which companies are the most agile and most specialized (and hence perfect matches for cooperations)?
- Where are the protective rights applied and what's the geo-strategy?
- How are similar search profiles perfectly phrased to achieve analogue results to a reference?

Purchasing Module



- Which companies are leading in terms of IPR-protection?
- Technology Hyperawareness / Which companies are new and dynamic in a technology area?
- Technology Hyperawareness / Which companies are the most agile and most specialized (and hence perfect matches for cooperations)?
- Where are the geo-hubs of inventors (where is innovation happening)?
- Which are the central companies and universities in the cooperation network?
- Analysis of global inventor networks of >2 million experts?

HR Module



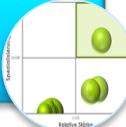
- How disruptive are the innovations in defined technology area?
- Is the technology emerging, growing, maturing or stagnating – what's its phase in the technology lifecycle?
- Which technologies are emerging?
- Which companies are leading in terms of IPR-protection?
- Technology Hyperawareness / Which companies are new and dynamic in a technology area?
- Technology Hyperawareness / Which companies are the most agile and most specialized (and hence perfect matches for cooperations)?
- Which are the central companies and universities in the cooperation network?
- Where are the protective rights applied and what's the geo-strategy?

Management Module



- Which companies are most agile in a technology area?
- Is the technology portfolio competitive?

M&A Module



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