

GISSC 2024

Global ICT Standards Conference 2024

2024. 11. 4. ^(MON) ~ 6. ^(WED)

ELTOWER GRACE Hall 6F

A.I 시대 특허전쟁의 진화

A.I를 활용한 표준특허 가치평가와 효과적인 라이선스 전략

안형진 부장, 렉시스넥시스



*ICT Standards and Intellectual Property:
Inclusive Innovation*

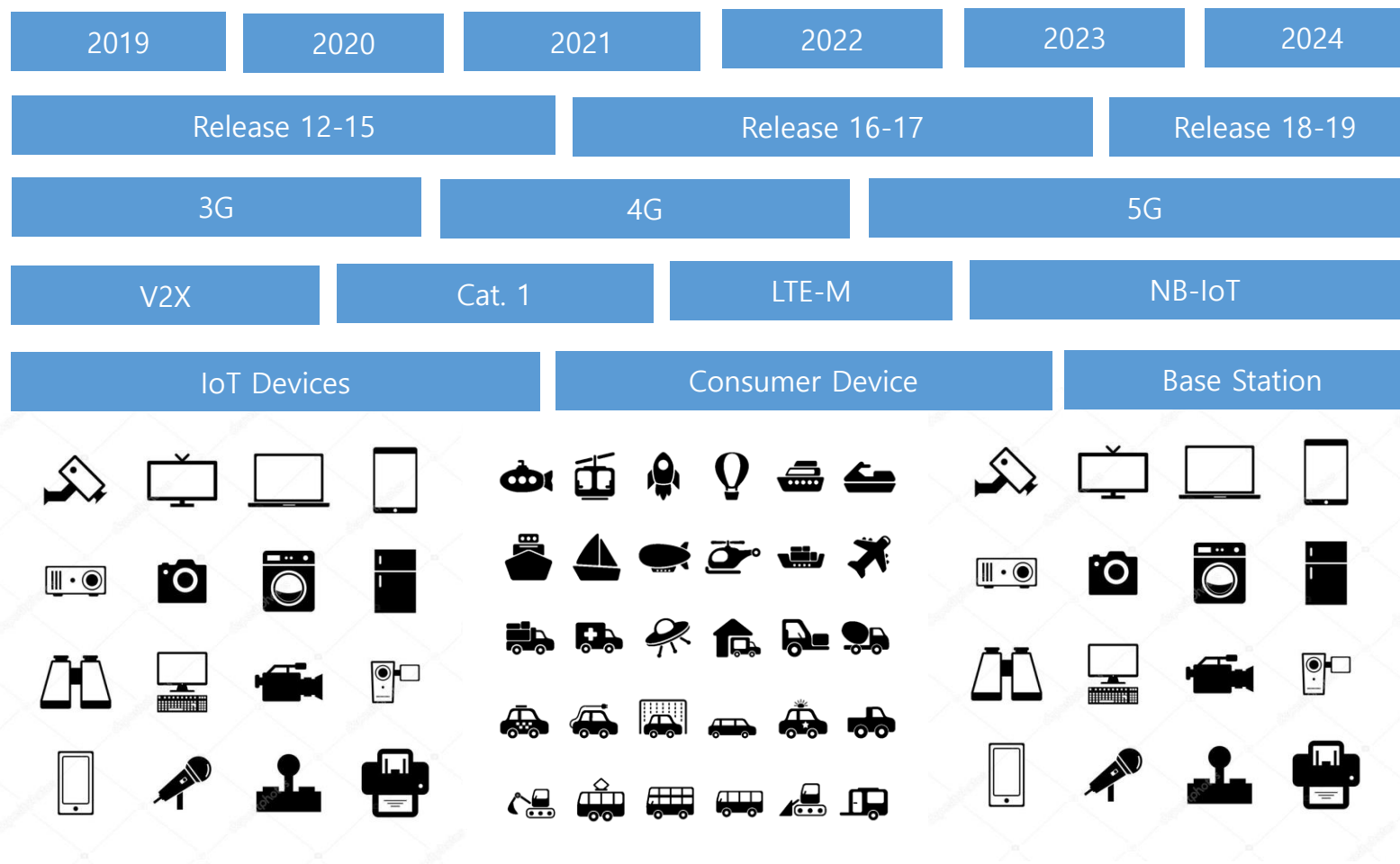
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03 Solving Data Challenges with Standard Essential Patents

The Complex Relationship of Standards and Products



Patent Data is Divorced from Standards Data



Global
Patent
Data

Patent declaration databases are **not linked** to standard databases.

Patent declaration databases are **frequently incomplete**, with patents hidden under blanket declarations.

Declared patents are often **disconnected** from ownership and legal status information.

Patent declaration databases **lack in formation on the essentiality** of patents to standards.



Technical
Standard
Data

Most Frequently Asked Standards Implementers Questions:

- Which standards implemented in our products are subject to SEPs?
- Who holds SEPs for the standards we implement in our products?
- How many SEP holders are likely to request royalties from us?
- What is the **aggregate royalty** amount we must pay for all SEPs related to a particular standard?



The Standards Implementer Perspective: HEVC example

SEP Owner / Licensor / Patent Pool

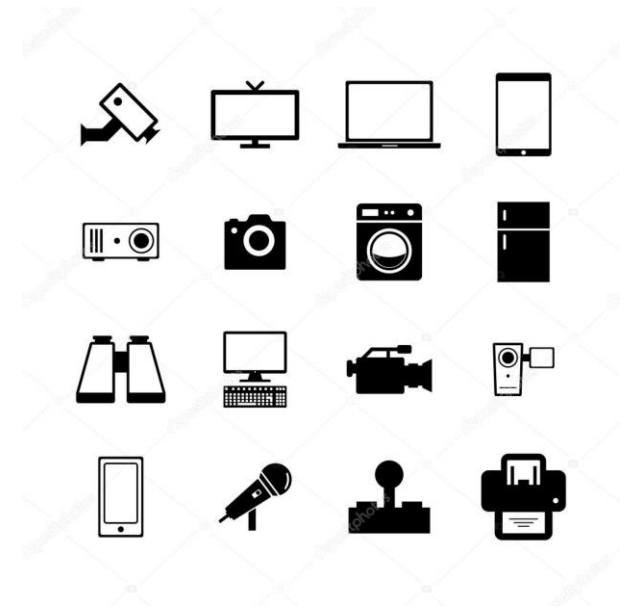


“Your product XY implements HEVC, a standard subject to SEPs that are covered by our pool program. We respectfully request a royalty payment of \$0.40 per unit.”



The standard is implemented in the following products:

Original Equipment Manufacturer (OEM)



Public Royalty Rates for HEVC

Pool Admin	Rates per device (handset or connected smart device)	Source
HEVC Advance	\$0.40	https://accessadvance.com/wp-content/uploads/2021/06/HEVC-Advance-Program-Overview-March-2024.pdf
HEVC Via LA	\$0.20	https://www.via-la.com/licensing-2/hevc-vvc/hevc-vvc-license-fees/

A Standards Implementers Question Marks:

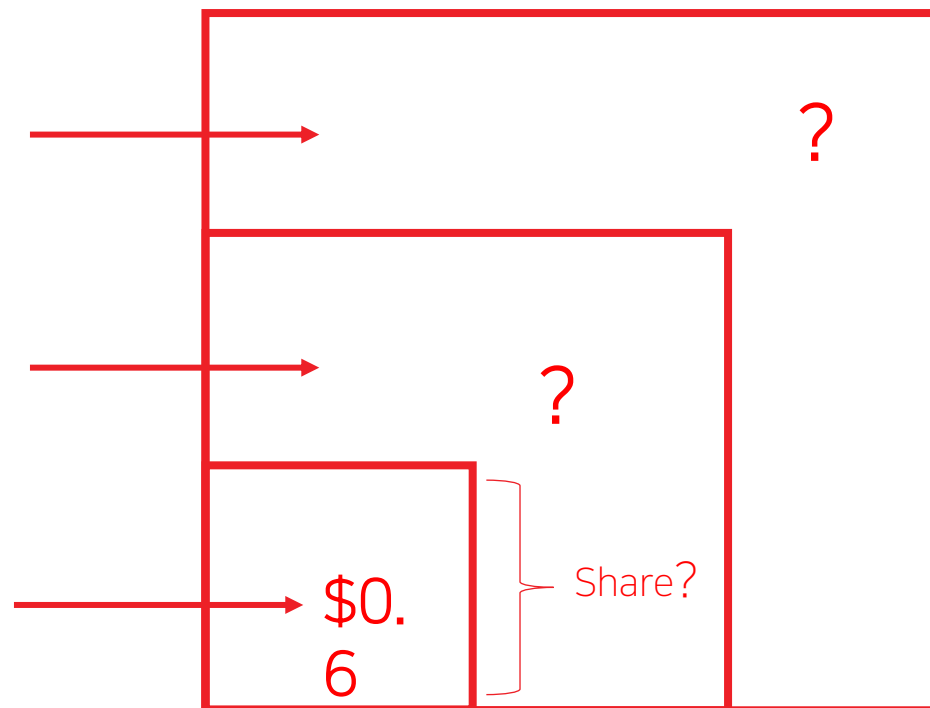
- What percentage of all HEVC SEPs is covered by the patent pool?
- Which SEP holders are part of the patent pool (pool insider), and which are not (pool outsider)?
- Are all potential SEP holders in the market identified?
- Have any SEPs been reassigned to Patent Assertion Entities (PAEs)?



Royalty ask from unknown
SEP licensors

Royalty ask from known
SEP licensors

Royalty ask from
SEP patent pool



Standard Implementer Requirements

FRAND Negotiation
Preparation

SEP Royalty Calculation

SEP
Portfolio Valuation

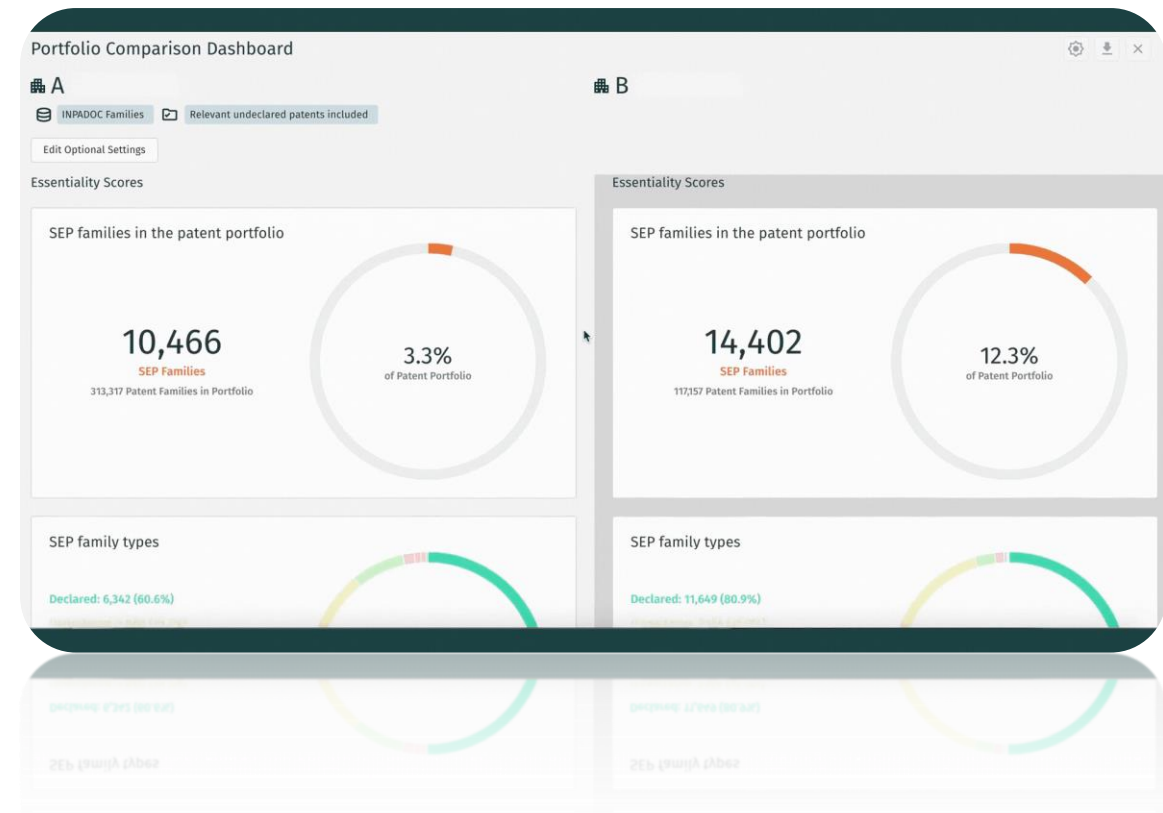
SEP Monitoring & Risk
Management

SEP Standards
Identification

LexisNexis IPlytics: Brining Clarity to SEP data

How can we bring clarity?

- LexisNexis IPlytics leverages AI to **identify** patents related to standards that are hidden within blanket declarations and to **assess the essentiality** of patents related to:
 - Cellular (3G, 4G, 5G)
 - Video (AVC, HEVC, VVC, AV1, VP9)
 - Wi-Fi (4, 5, 6, 7)
 - Audio (AAC, OPUS, MPEG-H, EVS)
 - Wireless Power (Qi, Ki)
 - IoT (NB-IoT, LTE-M, Cat1)
 - Broadcasting (ATSC / DVB)



Results: Analytics Search Data

14,098 Declarations
12,112 SEPs
4,290 Families

Market Overview Over Time Industry Trend Authority Indicators **Rank** Industry Clusters IPC/CPC Portfolio Concentration Citation Co-Assignee Litigation Transferred

Ultimate Owner

Analytics



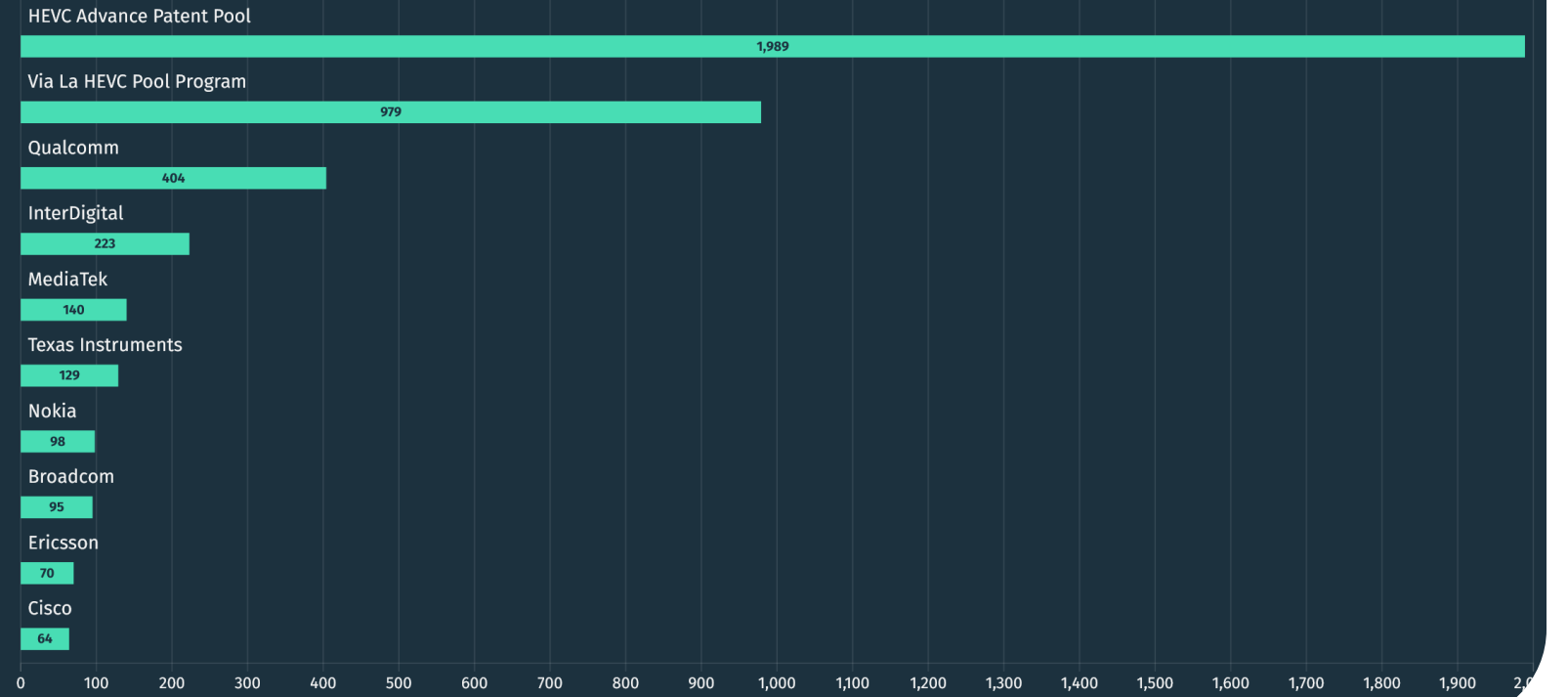
Ultimate Ow... SEPs Fam. Share MC TR SES

> HEVC Advance Patent Pool	7,270	1,989	46.4%	3.36	0.5	66.5%	
> Via La HEVC Pool Program	3,802	979	22.8%	3.41	0.43	66.4%	
Qualcomm	872	404	9.4%	1.81	0.87	70.7%	
InterDigital	447	223	5.2%	1.51	0.49	64.5%	
MediaTek	298	140	3.3%	2.56	0.83	69.8%	
Texas Instruments	351	129	3%	1.37	0.32	68.6%	
Nokia	207	98	2.3%	1.12	0.86	72%	
Broadcom	137	95	2.2%	1.15	0.36	66.6%	
Ericsson	202	70	1.6%	1.74	0.33	72.8%	
Cisco	113	64	1.5%	0.91	0.36	67.5%	
Key Patent Innovations	95	58	1.4%	0.61	0.51	69.7%	
Intel	111	52	1.2%	3.2	0.5	62.9%	

Rank

Stacked Bar Chart

Options Export



The Standard Implementers Use Case

Use Cases for LexisNexis IPlytics:

- Identify the numerator and denominator to measure the **SEP owner's patent share** compared to the total stack of patents relevant to a standards.
- **Value and determine SEP** portfolios offered for license.
- Prepare for **FRAND negotiation** by comparing royalty ask to public data reference points.
- **Identify standards subject to SEPs** in the complex value chain of suppliers as SEP holder approach OEMs or at least module supplier
- Monitor SEP filing, SEP change of ownership and litigation to **quantify risks and plan royalty payments**.

Using LexisNexis IPlytics Data to Calculate Royalty Rates:

The HEVC and Wi-Fi 6 Example

Royalties based on Pool Rates: HEVC Example

LexisNexis IPlytics Empowers Standards Implementers to Extrapolate Royalty Calculations:

- Via LA & Access Advance offer HEVC SEPs for a total royalty of **\$0.6 per unit** (based on the sum of the public pool rates)
- Via LA & Access Advance HEVC patent family share sums up to a total of **52.12%** (based on IPlytics data)
- The cumulative royalty calculates: $(100 / 52.12) \times \$0.6$ per unit = **\$1.15 per unit**

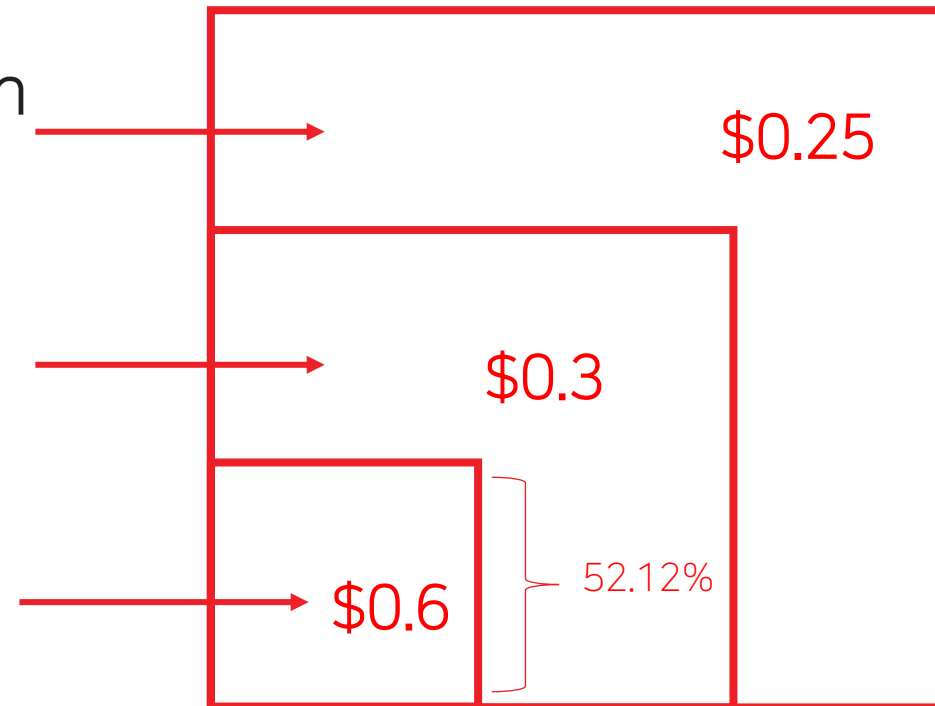
Royalties based on Pool Rates: HEVC Example

LexisNexis IPlytics Fills Questions Marks with Data:

Royalty ask from unknown
SEP licensors

Royalty ask from known
SEP licensors

Royalty ask from
SEP patent pool



Royalties based on Pool Rates: HEVC Example

LexisNexis IPlytics Fills Questions Marks with Data:

Aggregate HEVC
Royalty Rate
Based on Patent
Pool Rates



\$1.15

Royalties based on Pool Rates, by HEVC SEP Owner

- LexisNexis IPlytics Identifies HEVC Royalty Rates for each SEP Owner (extrapolated from patent pool rates):

Licensor Name	Licensor HEVC share (based on IPlytics)	Suggested Royalty Ask (extrapolated from patent pools)
Qualcomm (pool outsider)	9.42%	\$0.108
InterDigital (pool outsider)	5.20%	\$0.060
MediaTek (pool outsider)	3.26%	\$0.038
Nokia (pool outsider)	2.28%	\$0.026
Ericsson (pool outsider)	1.63%	\$0.019
Key Patent Innovations (pool outsider)	1.35%	\$0.016
Dolby (pool insider)	3.19%	\$0.037
Huawei (pool insider)	2.56%	\$0.030
Sun Patent Trust (pool insider)	3.71%	\$0.043

HEVC Example: Royalties based on HEVC Study

*“Dr. Mario A. Lopez from economic consulting firm Edgeworth Economics and Martin Bader of law firm Sheppard Mullin, develop a methodology grounded in economic theory, real-world data, and recent legal decisions. The report demonstrates that HEVC rates should be comparable to or less than the cost of licensing the main patent pool for AVC (MPEG LA), HEVC’s predecessor codec. It concludes that the total per unit HEVC patent royalty should most likely not be higher than **\$0.28 per unit**, depending on use case and device type.”*

Royalties based on Study, by HEVC SEP Owner

- LexisNexis IPlytics Identifies HEVC Royalty Rates for each SEP Owner (extrapolated from HEVC economic study):

Licensor Name	Licensor HEVC share (based on IPlytics)	Suggested Royalty Ask (extrapolated economic HEVC study)
Qualcomm (pool outsider)	9.42%	\$0.026
InterDigital (pool outsider)	5.20%	\$0.015
MediaTek (pool outsider)	3.26%	\$0.009
Nokia (pool outsider)	2.28%	\$0.006
Ericsson (pool outsider)	1.63%	\$0.005
Key Patent Innovations (pool outsider)	1.35%	\$0.004
Dolby (pool insider)	3.19%	\$0.009
Huawei (pool insider)	2.56%	\$0.006
Sun Patent Trust (pool insider)	3.71%	\$0.010

Royalties based on Pool Rates, by HEVC Patent Pool

- LexisNexis IPlytics Identifies HEVC Royalty Rates for Patent Pool Programs (extrapolated from HEVC economic study):

Pool Program	Patent Pool HEVC patent share (based on IPlytics)	Royalty Ask (based on public pool rate)	Royalty Ask (extrapolated from Study = \$0.28)	Royalty Above / Below Economic Study Reference
HEVC Advance Patent Pool	46%	\$0.400	\$0.130	\$0.270
Via La HEVC Pool Program	23%	\$0.200	\$0.064	\$0.136

Royalties based on Pool Rates: Wi-Fi Example

LexisNexis IPlytics Empowers Standards Implementers to Extrapolate Royalty Calculations:

- Sisvel offers Wi-Fi SEPs for a royalty rate of **\$0.5 per unit**
- Sisvel's aggregated Wi-Fi 6 patent share is **16.34%** (based on IPlytics data)
- The cumulative royalty calculates: $(100 / 16.34) \times \$0.5 = \3.06 **per unit**

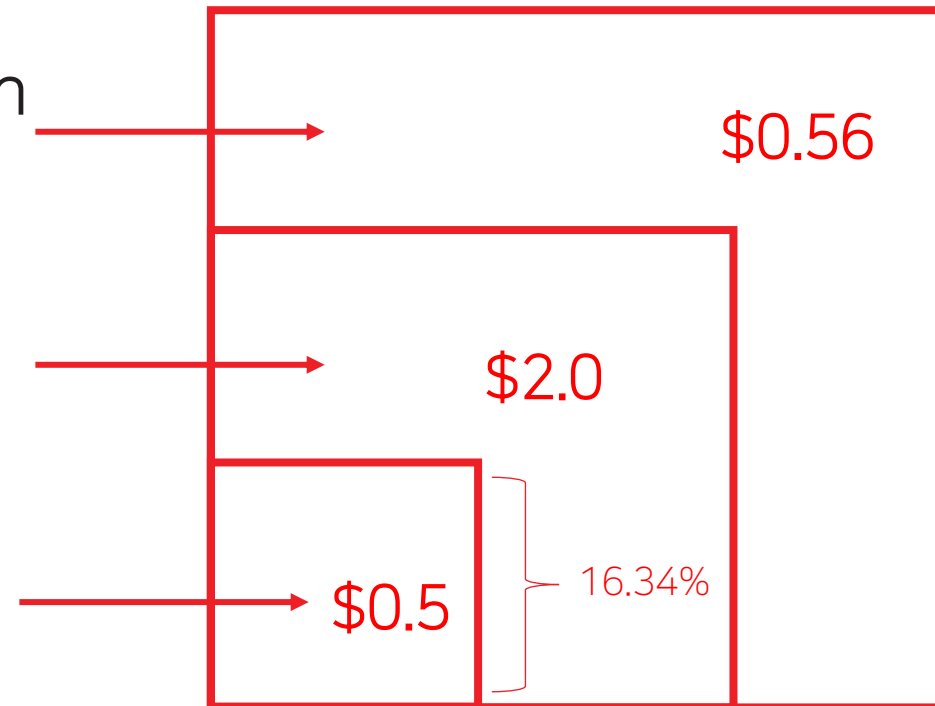
Royalties based on Pool Rates: Wi-Fi 6 Example

LexisNexis IPlytics Fills Questions Marks with Data:

Royalty ask from unknown
SEP licensors

Royalty ask from known
SEP licensors

Royalty ask from
SEP patent pool



Royalties based on Pool Rates: Wi-Fi 6 Example

LexisNexis IPlytics Fills Questions Marks with Data:

Aggregate Wi-Fi 6
Royalty Rate
Based on Patent P
ool Rate



\$3.06

Royalties based on Pool Rates, by Wi-Fi 6 SEP Owner

- LexisNexis IPlytics Identifies HEVC Royalty Rates for each SEP Owner (extrapolated from patent pool rates):

Licensors Name	Licensors Wi-Fi 6 Share (based on IPlytics)	Suggested Royalty Ask (extrapolated from patent pool rate)
Qualcomm (pool outsider)	11.26%	\$0.345
Ericsson (pool outsider)	2.63%	\$0.081
InterDigital (pool outsider)	2.03%	\$0.062
Acacia Research (pool outsider)	1.77%	\$0.054
Nokia (pool outsider)	1.17%	\$0.036
Huawei (pool insider)	10.68%	\$0.327
Philips (pool insider)	0.71%	\$0.022
Panasonic (pool insider)	1.05%	\$0.032

Wi-Fi Example: Royalties based on Wi-Fi 6 Study

“The Brattle Group, a renowned group of economists and damages experts, announced its economic report on the reasonable and non-discriminatory (“RAND”) licensing value of patents essential to the Wi-Fi standard (“Standard Essential Patents” or “SEPs”). Brattle calculated the range of reasonable and non-discriminatory (“RAND”) royalty rates for the universe of SEPs essential to implement the full capabilities of Wi-Fi, including up to Wi-Fi 6/6E, to be between \$0.04 and \$0.69. .”

Royalties based on Study, by Wi-Fi 6 SEP Owner

- LexisNexis IPlytics Identifies Wi-Fi 6 Royalty Rates for each SEP Owner (extrapolated from Wi-Fi economic study):

Licensor Name	Licensor Wi-Fi 6 Share (based on IPlytics)	Suggested Royalty Ask (extrapolated from economic Wi-Fi study)
Qualcomm (pool outsider)	11.26%	\$0.078
Ericsson (pool outsider)	2.63%	\$0.018
InterDigital (pool outsider)	2.03%	\$0.014
Acacia Research (pool outsider)	1.77%	\$0.012
Nokia (pool outsider)	1.17%	\$0.008
Huawei (pool insider)	10.68%	\$0.074
Philips (pool insider)	0.71%	\$0.005
Panasonic (pool insider)	1.05%	\$0.007

Royalties based on Pool Rates, by Wi-Fi Patent Pool

- LexisNexis IPlytics Identifies Wi-Fi Royalty Rates for Patent Pool Programs (extrapolated from Wi-Fi economic study):

Pool Program	Royalty Ask (extrapolated from pool)	Royalty Ask (extrapolated from Unified Patents Study = \$0.69)	Royalty Above / Below Unified Patents Study Reference
Sisvel Pool	\$0.500	\$0.113	\$0.387

FRAND Determination Use Case

- LexisNexis IPlytics allows **determining the share of patents** held by each licensor and patent pool to extrapolate a suggested royalty rate.
- This enables standard implementers to assess:
 - Is the patent owner's royalty demand **excessive**?
 - Is the patent owner's royalty demand **comparable** to **patent pool rates**?
 - Is the patent owner's royalty demand **in line** with royalty rates identified by economic studies?
 - Is the patent owner's royalty demand **consistent** with **court-ruled FRAND rates**?

LexisNexis IPlytics Approach to Solving Data Challenges with Standard Essential Patents

SEP data challenge 1: Over-declaration

Databases of declared patents are **not verified** to be **essential** neither by the patent holder nor by third parties.

The share of **non-essential patents** in such database is estimated as high as **60-90%** (depending on the standard).

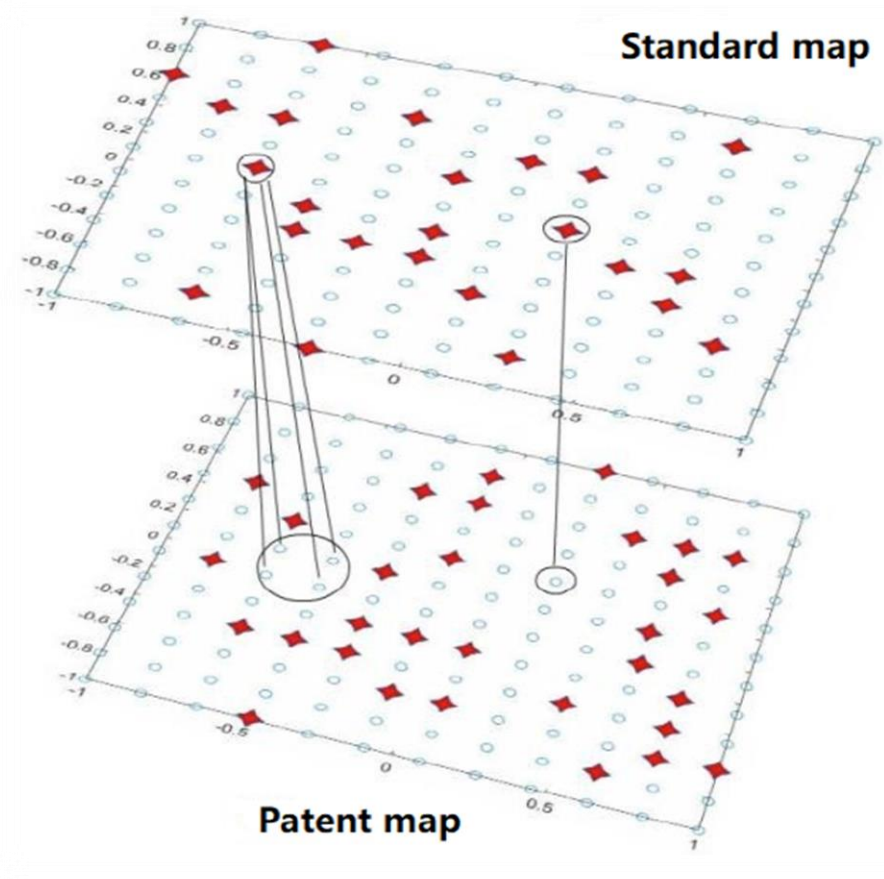
Experts assume that **essentiality rates differ** across declared patent **portfolios** due to different declaration practices.

Rigorously claim charting all declared patents is however **economically not feasible**.

The challenge: How can we leverage AI to estimate the essentiality of declared patents.

SEP data solution 1: Semantic Essentiality Scoring (SES)

- The LexisNexis® IPlytics AI team trained a **semantic model (transformer model)** that understands the context of claims and standards to recognize claim elements in standards sections.
- **Patent pool** data and **claim charts** were utilized as training data.
- The SES algorithm scores each patent from **1-100%** and provides the most **relevant claim section combination**.



Semantic Essentiality Scoring

How can you use SES?

- SES allows **sorting** a given list of patents where the top 20% represent 95% confirmed fully claim charted SEPs (as to training data).
- SES can well **filter out** all non-mappable patents (e.g. 30% of all 4G or 5G declared patents) but SES may yet **not accurately differentiate** between fully mappable and partially mappable patents.

The screenshot displays a web interface for patent analysis. At the top, a navigation bar includes 'Overview', '44 Family Members', '1 Citing Patents', 'Semantic Essentiality 80%', '1 Literature', 'Standards', and '1 Companies'. Below this, a 'Semantic Essentiality Score: 80%' is prominently displayed. A circular callout highlights the '80%' value. The interface also shows 'Publication Number' as US9641655B2 and 'Standard Document Id' as TS 38.322 v16.2.0. Two sections, 'SEMANTICALLY SIMILAR CLAIM 6' and 'SEMANTICALLY SIMILAR SECTION 5.4', are visible, each with a copy icon. The text under 'SEMANTICALLY SIMILAR CLAIM 6' describes a wireless transmit receive unit (WTRU) configuration and PDCP discard timer logic. The text under 'SEMANTICALLY SIMILAR SECTION 5.4' describes RLC SDU discard logic.

SEP data challenge 2: Blanket-declaration

Some standards organizations allow its members to only make **blanket statements** without disclosing specific lists of patents.

As a result, the **patent landscape** for standards such as Wi-Fi, Video Codec, Audio Codec, Broadcasting, Qi standard, or other standards is **not public**.

Keyword searching is **inaccurate**, letting SMEs analyze patents one by one is **economically not feasible**.

The challenge: How can we leverage AI to identify undeclared patent portfolios.

SEP Data Challenge: Example = HEVC /VVC and Wi-Fi

Under-declaration

HEVC/VVC declaring entities

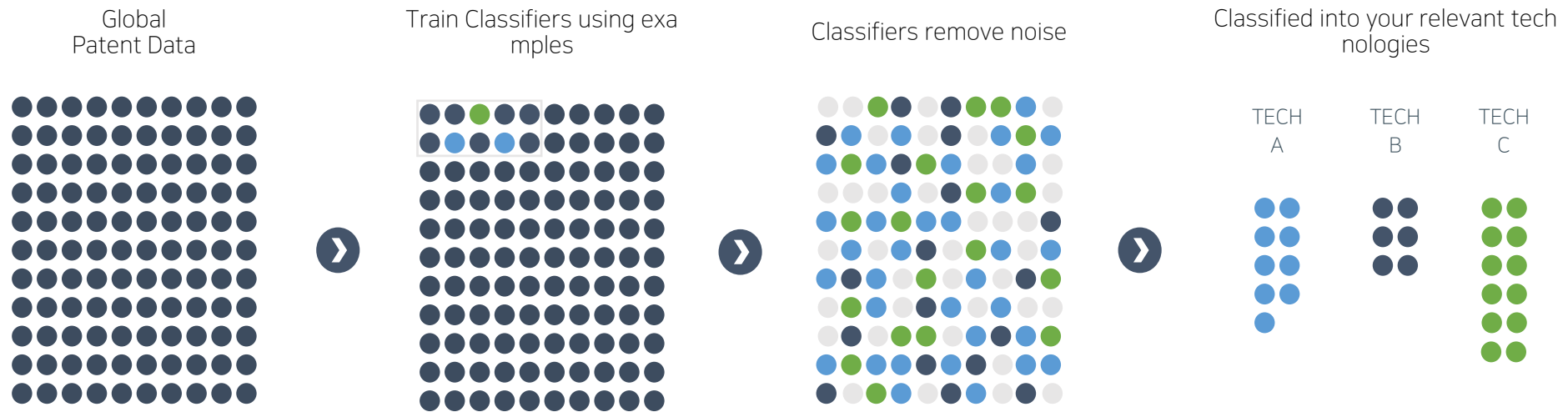
Only 5 out of 43 (~12%) **d**
e
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s have submitted specific patent declarations at the ITU-T.

Wi-Fi contributors

As little as **9%** of the Wi-Fi **contributing companies** have submitted specific patent declarations at the IEEE.

SEP data solution 2: Undeclared Patents

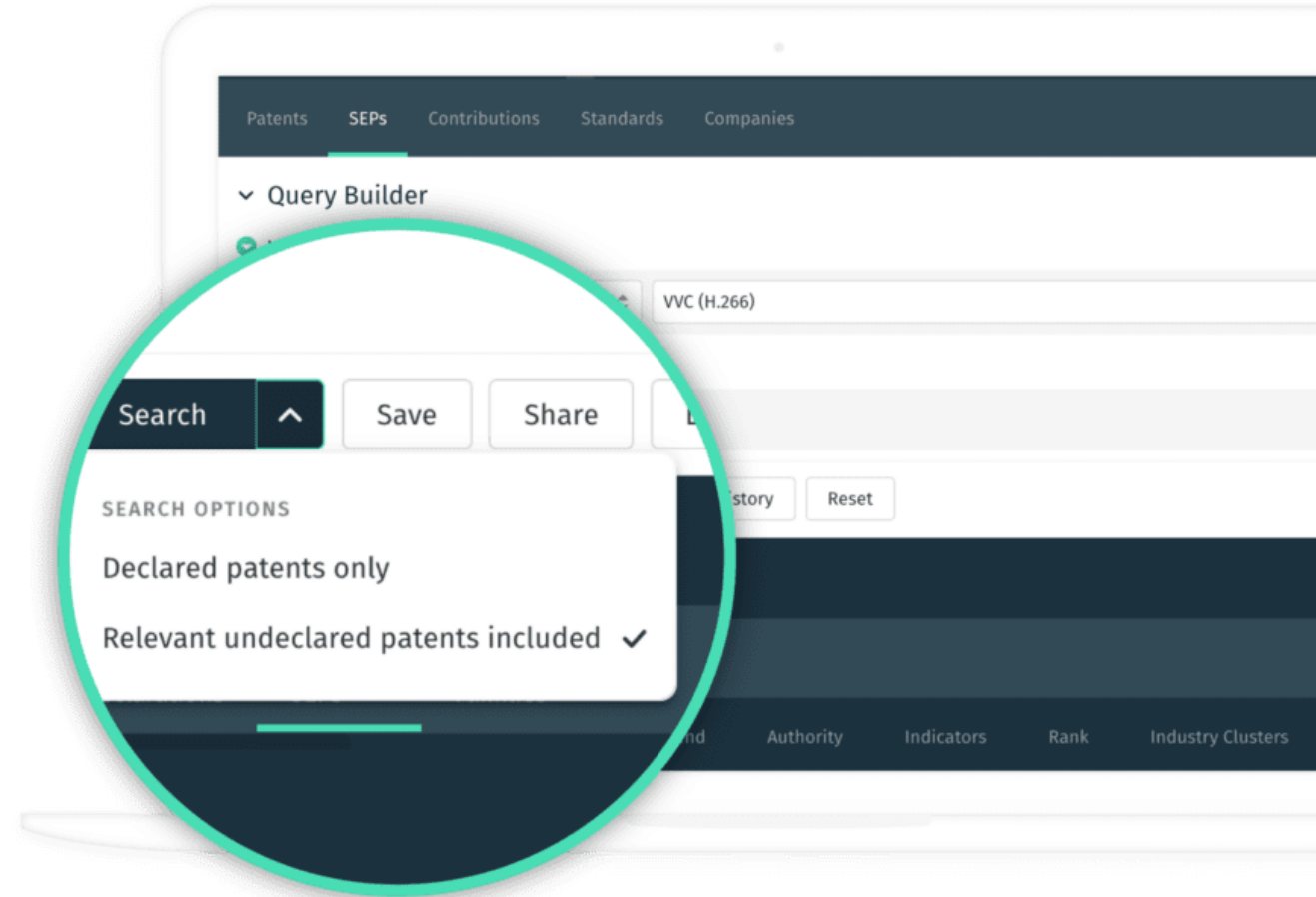
- The LexisNexis® IPlytics data team has utilized a supervised Machine Learning algorithm (from PatentSight+ Classification, powered by Cipher) to identify undeclared patents (Wi-Fi, AVC/HEVC/MVC, Qiskin standard).
- The algorithm uses **true positive** (patent pools) and **true negative training data** to build patent landscape classifiers with independently verified accuracy.



SEP data solution 2

How can I use Undeclared Patents?

- It allows discovering patents that may be essential, even though they're not publicly listed (hidden in blanket declarations).
- It enables to gain a complete view of the patent owner in the standard sector.
- Undeclared patent landscapes identify patents within portfolios that are yet un-licensed SEPs.



LexisNexis IPlytics: SEP data solution

- Declared patents 3G, 4G, 5G
- Undeclared patents AVC, HEVC, VVC
- Undeclared patents AV1, VP9
- Undeclared patents Wi-Fi 4, 5, 6
- Undeclared patents Qi
- Undeclared patents ATSC
- Undeclared patents AAC
- Undeclared patents OPUS Audio
- Undeclared patents JEDEC

The screenshot displays the LexisNexis IPlytics search interface. At the top, there is a search bar with the text "e.g. biotech, 3D print*, car or vehi". Below the search bar, there are two filter sections: "Technology Generation" and "Current Assignee", both with dropdown menus. A search button is visible. Below the search bar, there is a section for "Add Query" and "Related Keywords: Not Available". The main search results are displayed in a list format, with "Wi-Fi 6 (IEEE 802.11ax)" selected. The interface also includes a "Results:" section with tabs for "Analytics" and "Search Data", and a "History" button.

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감사합니다.

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