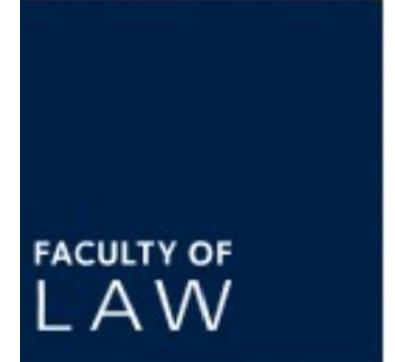
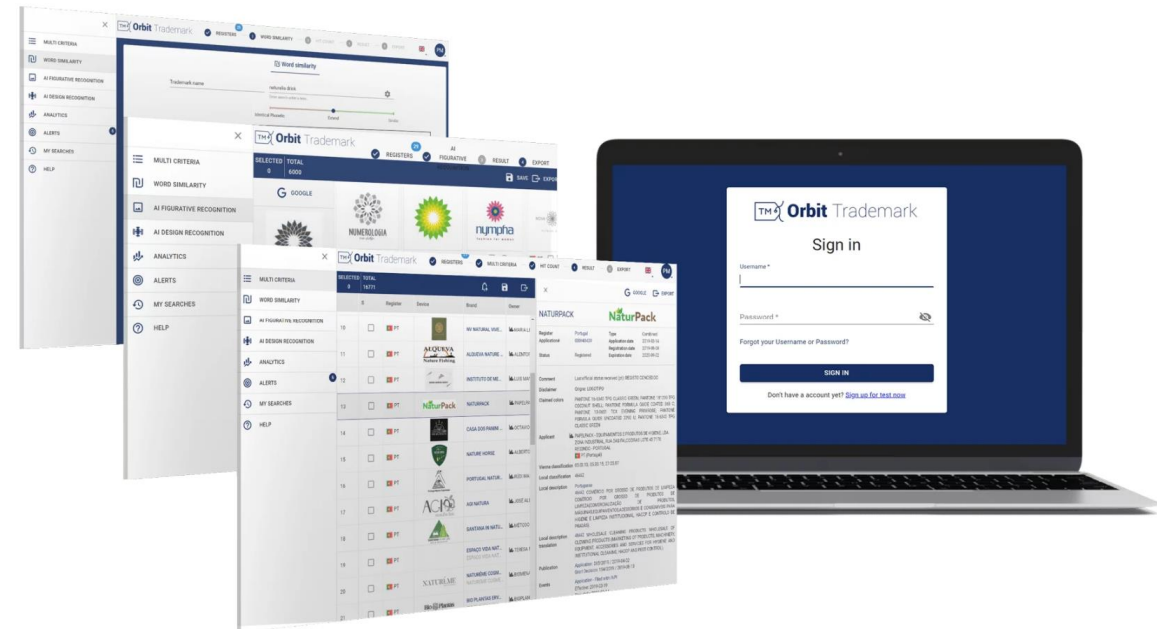




# Scaling Up? AI in trade mark registration and enforcement



Prof. Dev Gangjee,  
University of Oxford



# A. Broader Policy Context

# Reasons for policy interest

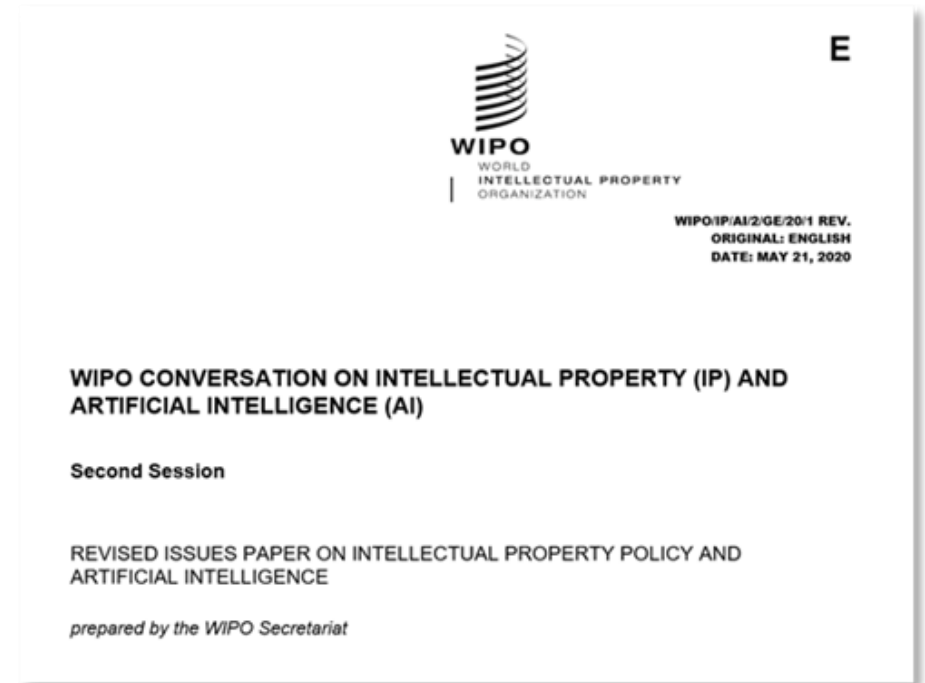
- AI as a transformative general purpose technology:
  - “Artificial intelligence (AI)” is a discipline of computer science that is aimed at developing machines and systems that can carry out tasks considered to require human intelligence, with limited or no human intervention. (WIPO)
  - Sub-field of interest – (Supervised) Machine Learning: combine inputs to provide useful predictions on unseen data

## *Singapore National AI Strategy (Smart Nation)*

- ‘Machine learning, which includes techniques like neural networks and deep learning, has emerged as the primary enabler of this wave of AI progress. Machine learning algorithms improve their ability to perform a particular task by learning from data over time. This allows computers to adapt to unpredictable situations that defy codification by static rules’ [e.g. autonomous vehicles or virtual shopping assistants].

# WIPO: AI and TMs

- Revised [issues paper](#) (WIPO/IP/AI/2/GE/20/1 REV)
- ‘Trademarks are intended to distinguish the origin of goods and services and to prevent consumer confusion. Current trademark law is therefore based concepts of human perceptions and recollection both for determining whether a trademark is registrable and whether it is infringed’. [37]
- ‘The emergence of AI and e-commerce platforms is changing the nature of the process of buying goods and services’. [38]



# Legal Issues Raised

- Will the use of AI, knowingly or unknowingly, by the consumer for product selection affect brand recognition?
- Will principles of trademark law, such as distinctiveness, recollection, likelihood of confusion or average consumer need to evolve due to the increasing use of AI? Are these issues for policymakers to consider?
- Who is ultimately responsible for AI's actions, in particular when recommendations include infringing products?

# Initial Responses

Summary of responses from the floor discussion ([WIPO/IP/AI/3/GE/20/INF/5](#)):

- AI influences how consumers encounter, search for and compare products
- Personal assistants (e.g. Alexa) can act as ‘gate keepers’ → control information
  - Possibility for biased choice framing
  - AI shops and compares differently; opens up a gap with trade mark doctrine (e.g. oral, phonetic, conceptual comparison of two mark). May prioritise (say) aural/phonetical elements in the course of verbal communication.
- If counterfeits recommended by AI
  - 3P infringer remains liable
  - Unless AI also ‘skews’ decision towards counterfeit purchase
- Does our core consumer model in TM law need to be adapted?

# Responses (cont.)


Individual written responses available [here](#); (AIPPI Sweden); (Curtis); (ICC); (Japan) etc

- Distinguish between processes that are
  - AI-generated (e.g. ‘Buy me a new energy efficient light bulb’ – black box decision?)
  - AI-assisted (e.g. Amazon product recommendations)
- TM/brand creation by AI, without any of the ©/patent issues on authorship, inventorship
  - Automated, bad faith AI applications?
- Is TM law AI-ready? Adopt a case by case approach in adapting TM principles (recognition, distinctiveness, recollection, and likelihood of confusion) for AI-assisted purchases [*wait and watch*]
  - E.g. legal presumption that attentiveness of consumers depends on g/s but will AI be equally attentive for all products?

# Responses (cont.)

- For attribution of responsibility for the operation of autonomous AI (e.g. product recommendations) drop back into tort law to find causal elements for liability
  - Adopt a 'safe harbours' type approach for AI providers/users? Awareness of infringement + expeditious removal
- Remember the potential for Unfair Competition as an incubator
- Will AI shopping assistants use TMs as 'generic' indicators of categories of products? (Substitution)

# Similar Range of Issues in Other Consultations

 Intellectual Property Office

Open consultation  
**Artificial intelligence call for views: trade marks**  
Published 7 September 2020

Contents  
[Introduction](#)  
[Infringement](#)

## Introduction


Trade mark registration protects a right holder's branding, for example a trading name or logo. This means the right holder can distinguish their business's goods or services from those of its competitors, generating goodwill and brand recognition. Registration empowers the right holder to prevent unauthorised use of their intellectual property.

The legal framework for trade marks is the Trade Marks Act 1994 (the "TMA") together with the Trade Marks Rules 2008.

The main consideration for artificial intelligence (AI) and trade marks is infringement.

Public Views on Artificial Intelligence  
and Intellectual Property Policy

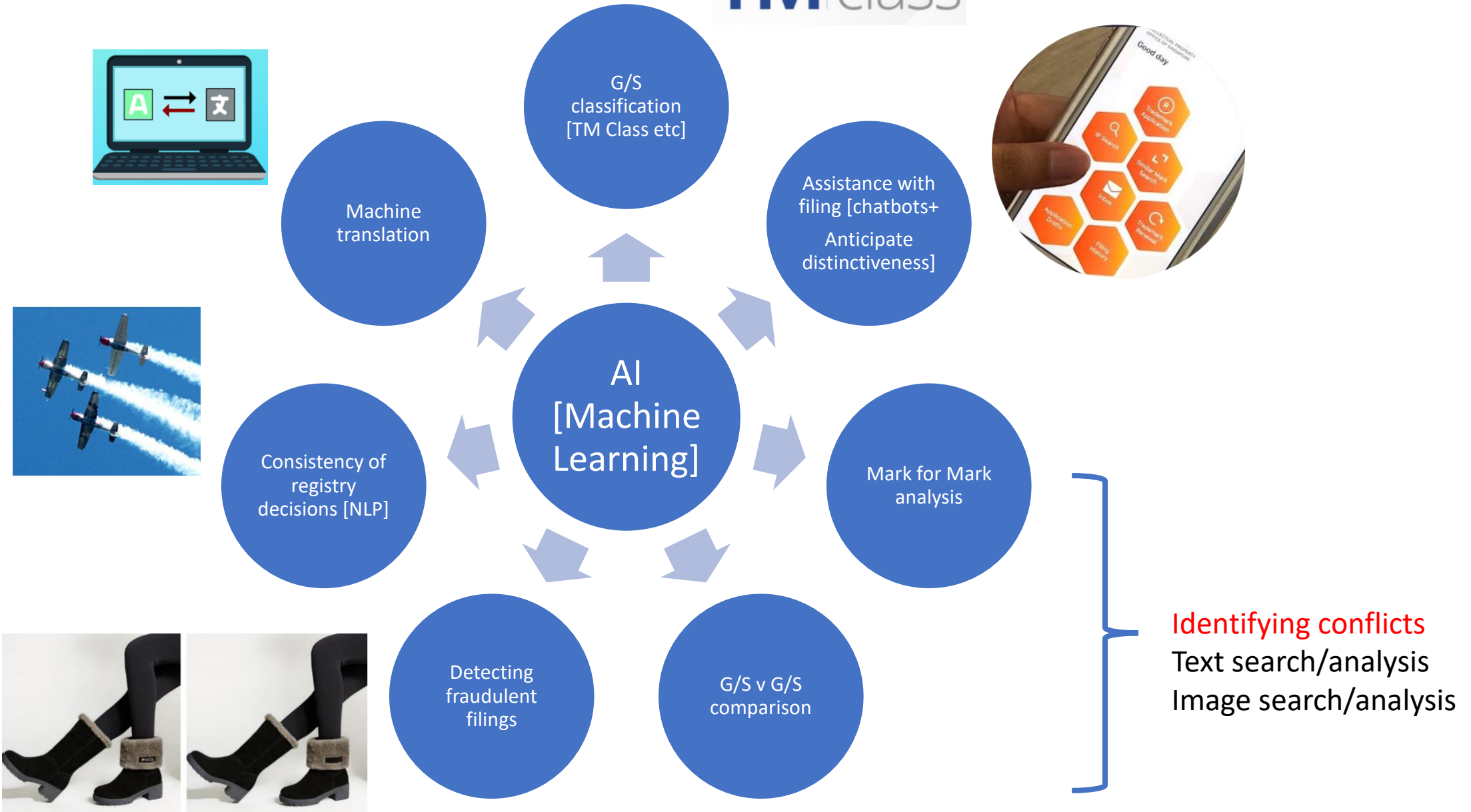
October 2020



UNITED STATES  
PATENT AND TRADEMARK OFFICE  
**uspto**

## B. Registration

# A quiet revolution...



# WIPO Index of Initiatives ([here](#))

- Image search (prior rights)
- Virtual assistant to help with application
- Goods and services classification
  - Helping applicants to select
  - Checking after amendments (change too far?)
- Machine translation (EUIPO)
- Review of decisions/performance quality



# E.g. 1: Advances in Image Classification

(540) Mark



(526) Disclaimer

THE DEPICTION OF A GLASS OF MILK, A PAIR OF HAZELNUTS, A CUBE OF CARAMEL, AND A CANDY BAR

(532) Description of the figurative elements of the mark according to a national classification

01.15.18, 01.15.25, 05.07.05, 06.03.03, 08.07.25, 08.09.02, 08.09.03, 08.09.04, 08.09.25.

- Can AI match human assignment of codes?
  - *Can AI image matching ultimately replace codes entirely?*

Previous approach – manually assign image codes → search codes to subsequently identify similar images

## USPTO Design Search Codes

- 01 Celestial bodies, natural phenomena
- 01.15 Natural phenomena
  - 01.15.18 More than one drop including tears or raindrops
  - 01.15.25 Other natural phenomenon including light rays, sand, puddles...
- 05.07.05 Nuts, with shells
- 08.09.\*\*\*\*\* the ice creams...

# Enter the WIPO Vienna Classification Assistant

Drop in an image;  
automatically suggests  
categories; sections - ranked  
by relevance (\*\*\*\*\*)

Useful for applicants but also a  
training tool for registry officials

WIPO IP PORTAL MENU Vienna Classification Assistant HELP ENGLISH LOGIN WIPO

1 CELESTIAL BODIES, NATURAL PHENOMENA, ...  
2 HUMAN BEINGS  
3 ANIMALS  
4 SUPERNATURAL, FABULOUS, FANTASTIC OR...  
5 **PLANTS** \*\*\*\*\*  
6 LANDSCAPES  
7 CONSTRUCTIONS, STRUCTURES FOR ADVERTISEMENT...  
8 FOODSTUFFS  
9 TEXTILES, CLOTHING, SEWING ACCESSORIES, ...  
10 TOBACCO, SMOKERS' REQUISITES, MATCHES, TRAVE...  
11 HOUSEHOLD UTENSILS  
12 FURNITURE, SANITARY INSTALLATIONS  
13 LIGHTING, WIRELESS VALVES, HEATING, COOKING OR...  
14 IRONMONGERY, TOOLS, LADDERS  
15 MACHINERY, MOTORS, ENGINES  
16 TELECOMMUNICATIONS, SOUND RECORDING OR REPRODUCTION, ...  
17 HOROLOGICAL INSTRUMENTS, JEWELRY, WEIGHT...  
18 TRANSPORT, EQUIPMENT FOR ANIMALS  
19 CONTAINERS AND PACKING, REPRESENTATION, ...  
20 WRITING, DRAWING OR PAINTING MATERIALS, OFFIC...

WIPO IP PORTAL MENU Vienna Classification Assistant HELP ENGLISH LOGIN WIPO

Back [Esc.]

### 6 - LANDSCAPES

CLASSIF.	DESC. Search / filter...	RELEVANCE
6.6.3	Other landscapes with palm trees <i>Suggested</i>	*****
6.6.25	Other tropical-type landscapes <i>Suggested</i>	****
6.6.2	Oases <i>Suggested</i>	***
6.6.1	Desert landscapes or landscapes with very sparse vegetation	**
6.3.2	Beaches, coasts, bays	**
6.3.3	Islands, reefs	**
6.3.1	Lacustrine or maritime scenes	*
6.3.10	Other lacustrine or maritime scenes	
6.3.20	Other landscapes with running water	
6.3.1	Other landscapes	
6.1.1	Crags, rocks, walls of rocks Note : Including rock formations like pinnacle rocks and fairy chimneys. Note : Not including reefs (6.3.1).	
6.1.2	Mountains, mountain landscapes	

Select suggested sections  
or start a manual selection on the right.

1:39 / 2:53

E.g. 2 UK IPO  
Pre-Apply  
Service

Embedded within the TM  
application form

## Trade Mark Pre-Apply



Today, IPO has launched its new trade mark pre-application service. It is a new online tool to help individuals and businesses improve their chances of successfully registering a trade mark. It is aimed at people who have not applied for a trade mark before, and have little or no knowledge of the application process.

Customers can use the tool before they apply for a trade mark to:

- check if anyone already has a trade mark too similar to the one they want
- identify whether aspects of their proposed trade mark are not appropriate, such as offensive words or protected symbols (for example, geographical indications)
- identify the right groups of goods and services for their proposed trade mark
- see an estimate of their application costs

# Some absolute and relative grounds checks

## Your trade mark

Cyberlaw

## Your goods and services

### Class 41:

Legal education services

### Class 45:

Legal services

Legal consultancy services

## What we have checked for

### Offensive words

Your trade mark does not appear to contain any words that would offend the public

### Protected terms

Your trade mark does not appear to contain any legally-protected terms e.g. 'Champagne', 'Melton Mowbray pork pie', 'Highland Scotch Whisky'.

### Protected symbols, flags and crests

Your trade mark does not appear to contain protected symbols e.g. National flags, Olympic Rings, Red Cross

AI-assisted  
similarity  
ranking



## Trade marks with similar word or phrase

Top 5 (of 500) results

Sorted by: most to least similar

### [UK00912451969](#)

Mark Text:	cyberlago	
Status:	REGISTERED	cyberlago
Classes:	16, 35, 41, 42	
Trade mark type:	Word or phrase	

### [UK00917891150](#)

Mark Text:	CYBERLABS	
Status:	REGISTERED	CYBERLABS
Classes:	9, 41, 42	
Trade mark type:	Word or phrase	

### [UK00801470540](#)

Mark Text:	Überlaw	
Status:	REGISTERED	
Classes:	45	

# C. Registration: Prior Rights Conflicts

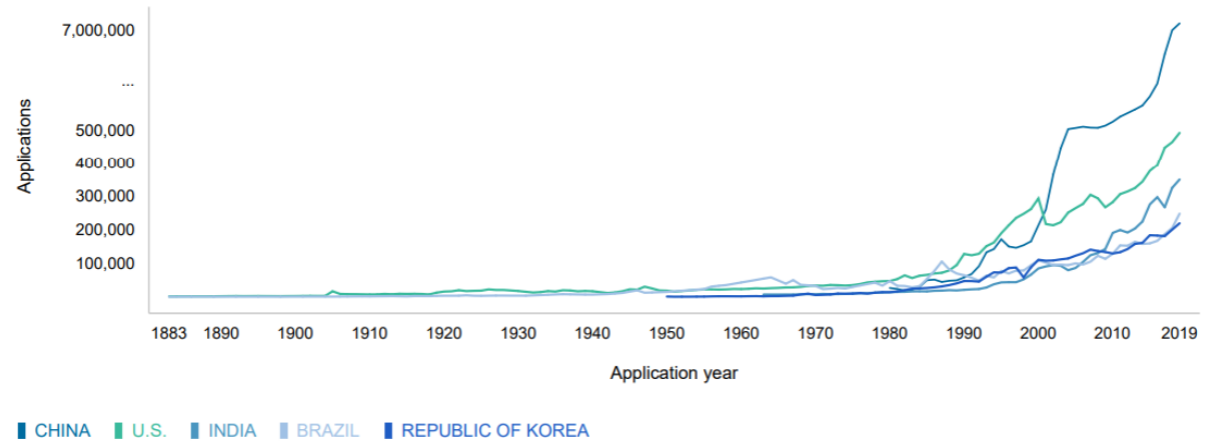
# Focus on conflict identification

High volume hose-pipe of trade mark applications

WIPO *World IP Indicators* (2020)

- Estimated 11.5 million applications filed globally in 2019
- Challenging for
  - TM registries
  - Search services
  - Watching services
  - + their users/clients

Trend in trademark applications for the top five offices, 1883–2019



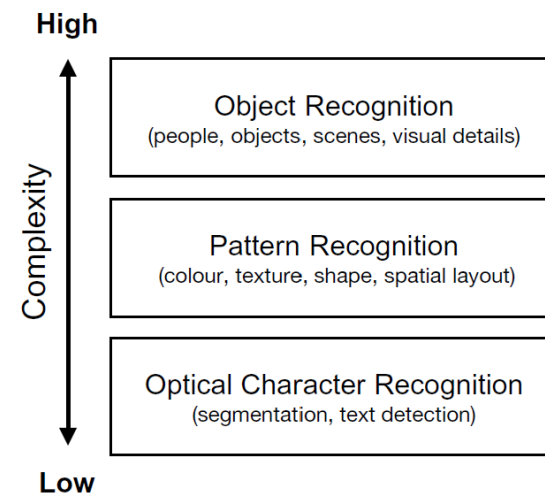
# How the tech works (outcomes)

- Mark similarity

- Previously, text string similarity (visual, spelling)
  - But 'steel' v 'steal' problem?
- Now also phonetic similarity
- And semantic similarity
  - Can assess H<sub>2</sub>O or aqua being similar to water
- Image searches: visual similarity
  - Previously, Vienna classification - elements
  - However humans prioritise shape + image structure + semantic meaning
  - Today reverse image search increasingly accurate
- Gestalt/adding elements together?
  - Weighting elements: e.g. distinctive and dominant

- Product (g/s) similarity

- Classification based on past examiner decisions finding g/s to be similar
- algorithm then inductively learns to compare



Kim et al;  
Fig 14.2

Clarivate  
CompuMark™

How can  
TM go365™  
help you be  
CompuMark  
confident?

Easy-to-use,  
self-service research



### Technology



Powered by  
sophisticated  
artificial intelligence



Strengthened by  
analyst insights



Based on machine  
learning algorithms

### Self-service research



Image and d  
research as e  
as drag, drop  
go



4 simple sea  
rches for wor  
mark researc

### Data depth

186

trademark registers  
for word and image  
mark screening

17

industrial design  
databases

### Industry firsts



Image recognition  
for visual trademarks




The tech is  
here...  
E.g. TM go365

# Improvement in image search

**SERION** CompuMark™

Home TM go365™ Japanese Search SAEGIS® Price & Order Nordic Search Inbox & Analysis Tool Watch

Search Strategy 

Delabases 1  
TM: DE, EM, GB, US, WO

Classes 1  
9, 14, 18, 21, 24

Similarity

Active Hits

ref-02MAY19

Enter Trademark  Enter Owner   Exclude Owner

Type to display keywords or code references (English Only)

[View Code List](#) | [View Suggested Codes](#)

Preferred Results

















Print Tiles | X

Actions Quick Export Highlighting Filter And Sort Flag Definitions Reference Material

Overview US DE GB EM WO

Sort [Default] Filter [None]

Select All

 EM-1 Design Only Class: 9 28 41 Owner: ELECTRONIC ARTS I... <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	 DE-1 GLAMOURA DESIGN Class: 14 18 25 Owner: Halbour Design GbR (...) <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	 DE-2 OWNER DESIGN Class: 18 25 35 Owner: Bachchuster, Max (G... <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	 DE-3 S DIAMOND TOWER Class: 14 35 36 37 Owner: Sari, Adem (Germany) <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	 DE-4 kamokids Class: 12 14 28 Owner: Max, Katrin (Germany) <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	 EM-2 DIAMOND+ COATING Class: 8 21 35 Owner: MARKEN HOLDINGS ... <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	 EM-3 Z Zicpix Class: 9 36 45 Owner: Eoentic Ltd (Hong Ko... <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	 DE-5 AKADEMIE HERKERT Class: 9 35 41 Owner: Forum Verlag Herkert ... <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
 EM-4 Design Only Class: 7 9 11 12 36 37 Owner: FCA US LLC (United ... <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	 DE-6 HEROES OF WEBDESIGN Class: 9 41 42 Owner: Galtmeier, Marc (Ger... <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	 DE-7 Design Only Class: 18 24 25 Owner: Orina BW GmbH (Ger... <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	 DE-8 V Class: 14 18 25 Owner: TT Trendline GmbH ... <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	 DE-9 V.V.O.S.T. Germany Class: 14 18 25 Owner: TT Trendline GmbH ... <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	 DE-10 v vzbl Class: 9 25 28 41 Owner: Bahkalam, Jascha (G... <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	 DE-11 M mageprofis Class: 9 35 42 Owner: Mage-Profis GmbH (G... <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	 DE-12 RETAILREPORTS Class: 9 35 37 Owner: RetailRepos GmbH (... <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>

vertigo



Trademark Sources (754)



Additional Sources

none included in this search

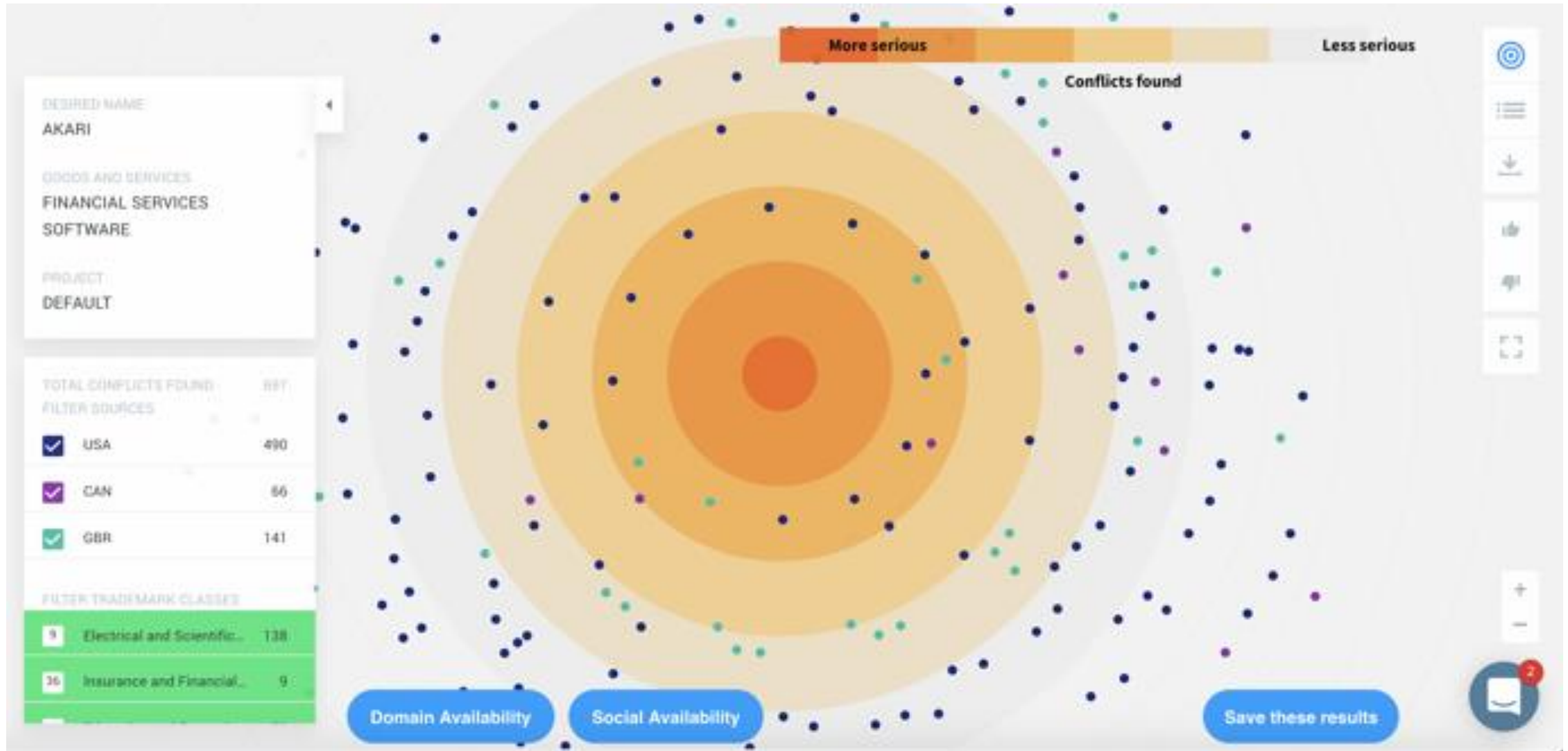
TRADEMARK SOURCES OVERVIEW

[Knockout](#) | [Tag Cloud](#)

Source	Hits	▼ Identical	With Elements	Similar	Other Classes	Inactive	
France	172	1	-	150	21	-	
Italy	66	1	-	55	10	-	
USPTO	186	-	-	115	25	46	
EU trade marks	134	-	-	120	14	-	
International Register	85	-	-	72	13	-	
Germany	78	-	8	68	1	-	
United Kingdom	33	-	-	26	7	-	

Result of search: risk profiles

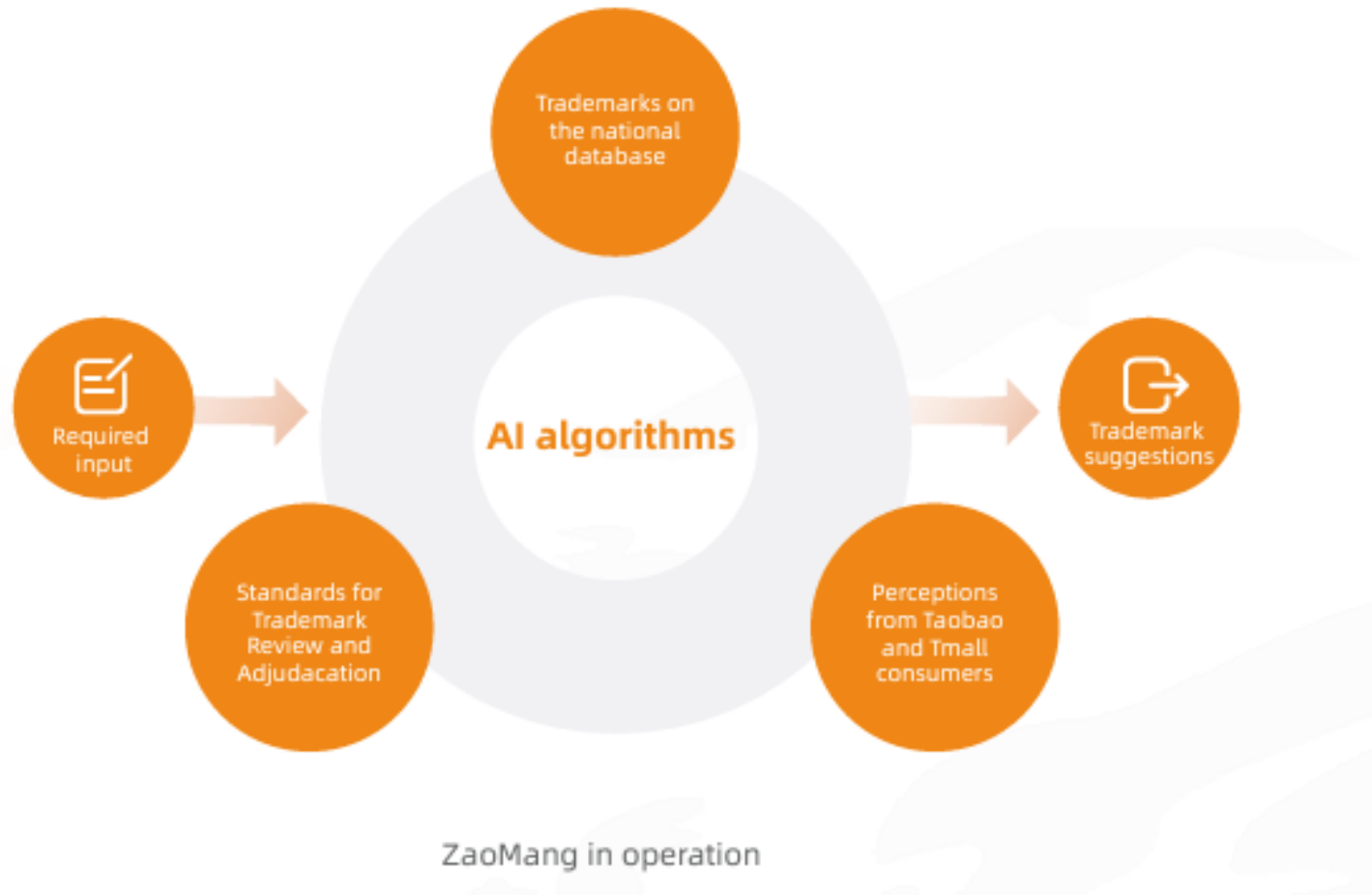
# Value added services e.g. Naming Matters



# AI assistance in mark/brand selection

- Registers are increasingly crowded/congested
  - Barton Beebe and Jeanne Fromer, [‘Are We Running Out of Trademarks? An Empirical Study of Trademark Depletion and Congestion’](#) (2018) 131 Harv L Rev 945
- Also cluttered i.e. unused marks
  - Georg von Graevenitz et al [Cluttering and Non-Use of Trade Marks in Europe](#) (UKIPO, 2015)
- For certain products like pharmaceuticals, additional regulatory hurdles (so start with a long list of 200+ marks)
- **Increasingly difficult to choose marks which are available**
  - S Katyal and A Kesari, [‘Trademark Search, Artificial Intelligence and the Role of the Private Sector’](#) (2021) 35(2) Berkeley Tech LJ 501

# Alibaba's ZaoMang



- New trade mark clearance service, especially for SMEs
- Generates potential marks that appear to comply with China's trademark application specifications, and which may be available for registration.
- Preliminary search service
- Minimizes time and resources in developing branding that turns out to be covered by existing trademark registrations or are in the process of being registered.

# Unresolved questions...

- Limits of conflict resolution analysis (Moerland and Freitas; Gangjee)
  - What about dilution?
  - What about enhanced distinctiveness/marketplace reputation? Conversely, weak distinctiveness?
  - Prior rights beyond TMs (copyright, designs)
- Variation 1: across AI providers? (Katyal and Kesari)
- Variation 2: will AI outperform human examiners (e.g. find more conflicts)?
  - +ve: Greater consistency
  - -ve: Harder to register marks?
- What about cluttered registers (unused marks) and many false positives? (*SkyKick* problem)
- Will relative grounds analysis collapse into marks and goods similarity – algorithmically assessed – ignoring actual or even hypothetical consumer perceptions?
  - Specificity of training datasets (e.g. English language bias)
  - Consumer sophistication ignored? E.g. Doctors or financial managers – LoC less likely
  - Motifs common to the sector (e.g. leaf or tree for environmental products) ignored?
  - Normativity of consumer model
- Will AI assessment at the registry level leak across and 'infect' infringement analysis? Make it more simplified? Less like the real world? Ignore normative dimensions of infringement (*should* the defendant be held liable)?

## D. Enforcement

# Overview of Infringement

## 1. How is AI helping police infringement? Automated/algorithmic TM enforcement online

- *Privatized enforcement? Are interests being balanced?*
- Excellent overview: Daniel Seng, [‘Detecting and Prosecuting IP Infringement with AI: Can the AI Genie Repulse the Forty Counterfeit Thieves of Alibaba?’](#) (2019)

## 2. Is AI creating infringement? E.g. shopping recommendation systems

- *Who is the infringer?*
- *Primary TM liability?*
- *Do established intermediary/secondary liability models (tort) help?*
- *Or existing approaches to ‘safe harbours’ as a defence-based approach?*

# Enforcement in online marketplaces

Counterfeits and other forms of (clear cut) infringement a major concern for legitimate sellers

Response is:

- To allow TM owners to complain via a reporting mechanism
- **And** increasingly automated detection systems, powered by AI

However IP rights sometimes asserted to unfairly takedown a seller (abuse of process)

- Product suspensions function as preliminary injunctions
- Being 'asked to run a judicial system, without the commitments to transparency and precedent of a real judicial system'. (Rebecca Tushnet)

# E.g. Amazon's options for TM owners



English ▾

## Report Infringement

**i** If you are a rights owner with a registered trademark, you may be eligible to enroll your brand in the Amazon Brand Registry. Amazon Brand Registry provides access to powerful tools including proprietary text and image search, predictive automation based on your reports of suspected intellectual property rights violations, and increased authority over product listings with your brand name. To learn more and start the enrollment process, [click here](#).

**i** **NEW!** If you want to retract a previously submitted complaint, you can now do so using the [Retraction Form](#).

### Sign in Required

If you wish to file a notice of infringement, please sign in to access Amazon's Report infringement form.

[Sign in](#)



## Protect your brand

### Accurate listings

Better manage your brand's product listings so that customers see accurate information.

### Proactive brand protection

Our automated protections use information about your brand to proactively remove suspected infringing or inaccurate content. The more information you provide, the better Brand Registry can help you protect and improve your brand experience.

### Report violations

Our powerful search tools let you find and report suspected violations with a simple, guided process.

# Proactive Algorithmic Policing at Scale

- ‘[More] than 300 million active customer accounts and over 1.9 million selling partners worldwide’
- ‘We leverage a combination of advanced machine learning capabilities and expert human investigators to protect our store proactively from bad actors and bad products... In 2020, **we prevented over 6 million attempts** to create new selling accounts, stopping bad actors before they published a single product for sale, and **blocked more than 10 billion suspected bad listings** before they were published in our store’.



# Tools Used: Broad range of factors (incl. TM use)

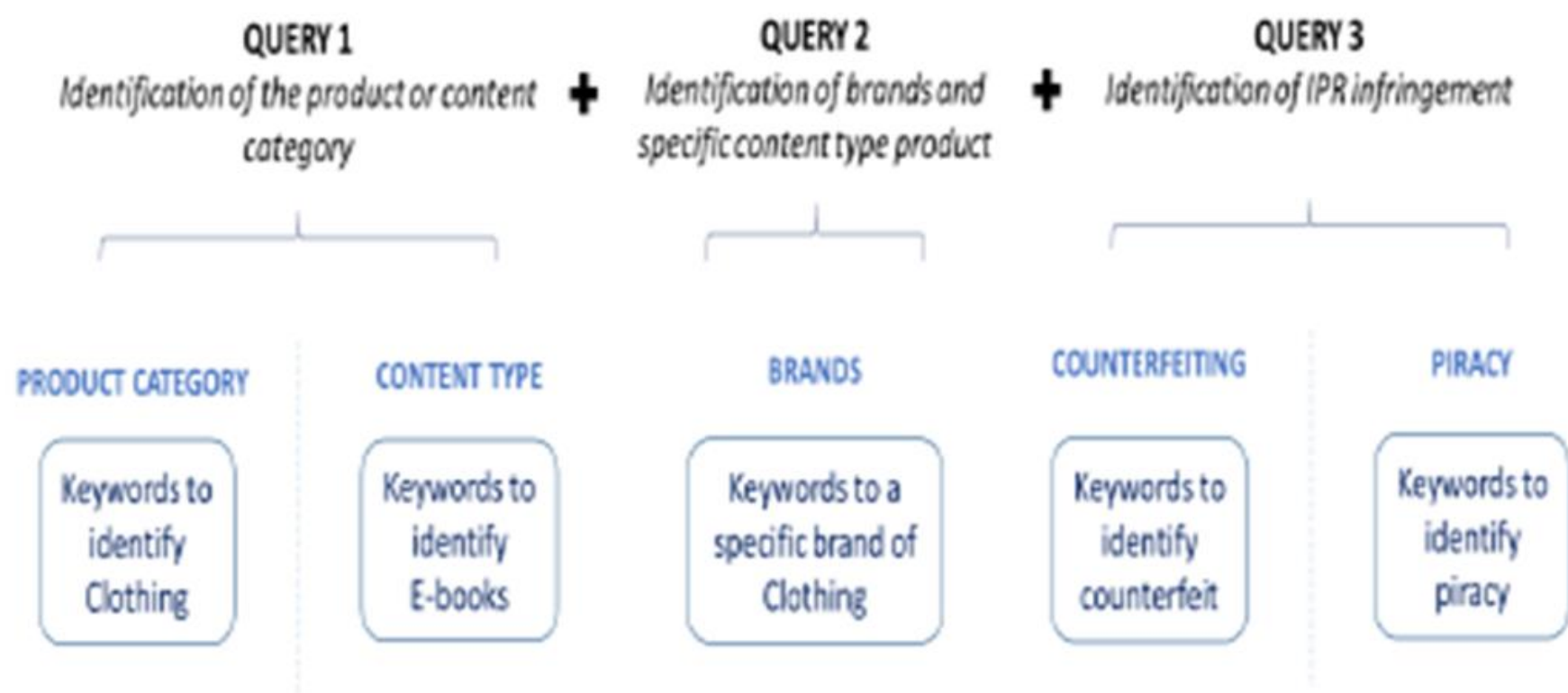
- **Identity verification** for sellers: government-issued photo ID and information about their identity, location, taxpayer information, bank account, credit card, and more
- AI system then analyses data points to verify information/detect risk
  - Against 3P or government records; live video chat verification etc
  - Against previously detected and blocked actors
- **Trace payments** to ultimate destination via payment service providers programme: participating providers must meet risk and compliance assessment standards
- **Continuous monitoring** of sellers in store
- Close account; withhold fund disbursement; contact law enforcement
- In 2020 scanned > 5bn attempted changes to product detail pages
- Seized and destroyed >2 mn products at fulfilment centres, prior to sending out

# Detection based on social media conversations

- [EUIPO Study \(May 2021\)](#) used **Social Intelligence Analytics (SIA)** – NLP tools
- public social media conversations: Twitter, Facebook, Instagram and Reddit.
- Sample of 6 EU countries (geolocation)
- Focus on text (posts, comments, #);
- Images/videos used for qualitative analysis
- Total of 3.9 million conversations studied.







**Figure 9 – Queries combination to filter and identify IPR infringement**

Two examples of these keyword sets are shown below.

perfume	makeup	lotion	cream	fragrance	mascara
gel	serum	eyeshadow	concentrate	concealer	eyeliner
foundation	palette	protection	powder	lipstick	moisturiser
highlighter	nail	cologne	blush	cleaner	mask

**Figure 3 – List of keywords to filter conversation about products in the Perfume and Cosmetics category**

offers	outlet	copy	mirror image	wholesale	look alike	knock off
cheap	coupon	factory	original	overruns	authentic	DM
rip-off	replica	stock lot	AAA	for sale	PM	best deal
discount	promo	promotion	sales	clearance	dupe	excess stock

**Figure 4 – List of keywords to support the identification of counterfeiting conversations**

# Insights from the analysis

Social media promotion strategies supplement sales/circulation of infringing goods; avoid restrictions on marketplace platforms; free access; global audience; flexibility

What is being discussed?

- physical products: toys, perfume and cosmetics > volumes of conversation.
- digital content: films, music and video games > volume of conversation.

Emerging themes:

- When examining highest number of IPR infringement incidences, clothing, footwear and jewellery all featured in the top 3 for physical products.
- E-books, TV shows and music recorded the highest number of infringements for digital content.
- Analysis on the basis of platform, language and timeline allows the identification of trends (e.g. what is a hot shoes knockoffs topic on Instagram this month)
- Conversations vary across platforms (Reddit: films/TV; Twitter: music, books; Instagram: physical products)
- Different types of business models used: Orders through direct messaging (DM); building a customer database for future sales; Promotions and Discounts etc [+ indicators to identify counterfeits within these business models] (p 56)

# Automated detection on social media

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## SOCIAL MEDIA – DISCUSSION PAPER

New and existing trends in using social media for IP infringement activities and good practices to address them



June 2021

What are social media platforms doing proactively?

- Use ML to analyse a variety of data features:
  - Ads/e-commerce listings: brands; certain keywords; price and discount indicators
  - User accounts: behaviours – unusually large numbers of users accessing a new account
- Then take action (take down or block post; de-register user etc)
- Identify these data features from complaints filed by brand owners using ‘notice and action’ reporting mechanisms

# Conclusion

- AI is here
- At scale
- And seductively good...
  
- *What should we be thinking about as IP lawyers, scholars, registries and judges?*