From Research to Innovative Legal Tech Products

Anna Ronkainen
Chief Scientist + co-founder, TrademarkNow
Executive committee member, IAAIL
President, Finnish Legal Tech Forum
@ronkaine

Tallinn 2016-05-26
What technology has had the biggest impact on law?
Writing!

Code of Hammurabi,
Mesopotamia 1754 BCE
(Wikipedia: Rama CC BY-SA 2.0)
The printing press probably comes a close second
Law has no problem with technology – at least some of the time

U 1959.40 H:
The Danish Supreme Court said it's ok to apply for recording a deed using a document produced with a novel technology – the ballpoint pen!
On to the computer age...
Law as a true IT pioneer: The first search-and-replace ever

- terminology change in the Pennsylvania health code in the late 1950s: s/retarded child/exceptional child/g
- legislative technique required all instances of textual changes to be enumerated individually
- the legislature turned to prof Horty at Penn
- first tried to solve this manually, too unreliable
- solution: input text into computer, index the position of each word to find all occurrences of the word in question
- obviously generalizable into textual information retrieval in general
Next steps

- M.U.L.L. (later Jurimetrics) journal 1959–
- case law retrieval experiments by Colin Tapper (Oxford) through the 1960s
- Centre d'études pour le traitement de l'information juridique (IRETIJ, Montpellier) 1965
- CREDOC (Belgium) 1967
- OBAR (Ohio) 1964 -> LEXIS 1970
- NORIS (Norway) 1970
- Westlaw 1975
First expert systems: mid-1980s

- inspired by systems from other fields (e.g. MYCIN)
- Latent Damage Law (Susskind and Capper)
- British Nationality Act (Bench-Capon and Sergot)
- SHYSTER (Popple)
Institutionalization: 1980s

- scholarly societies and the conferences they sponsor start: Stichting voor juridische kennisystemen + JURIX (initially NL/BE); International Association/Conference for Artificial Intelligence and Law (IAAIL/ICAIL)
- legal informatics firmly established as a field of legal education, or so it seemed...
Where did all the lawyers go?

- the PC revolution (1980s) and the launch of the commercial Internet (1993) -> computer-related legal problems everywhere!

- expert systems were considered a failure – not just in law – for good reason -> the AI winter of late 1980s

- leaving the field to computer scientists and legal theorists made AI & law less relevant for practice innovations
E-discovery: a wake-up call

- taking general natural language processing tech to solve the legal issue of document review (predictive coding)
- became into existence less than 15 years ago, now a multi-billion-dollar industry
- in some cases oldskool review no longer acceptable
- (solves a legal problem that mostly only exists in common-law countries...)
Legal startups – law's R&D department

– 10 years ago: maybe 20 legal startups total
– now: 600–1200 legal startups (depending on definition and who you ask)
– approx 2/3 of legal startups are from the US!
– for more information, see AngelList or ...
Discover Legal Technology
Explore a curated list of 549 companies changing the way legal is done.

Search for a company
Search

Browse by Category

Marketplace
Document Automation
Practice Management
Legal Research

http://tech.law.stanford.edu/
What does this mean for legal practice?
Legal Sector Sheds 2,000 Jobs in August

Nell Gluckman, The Am Law Daily

September 4, 2015 | 0 Comments
Armies of Expensive Lawyers, Replaced by Cheaper Software

By JOHN MARKOFF  MARCH 4, 2011

When five television studios became entangled in a Justice Department antitrust lawsuit against CBS, the cost was immense. As part of the obscure task of “discovery” — providing documents relevant to a lawsuit — the studios examined six million documents at a cost of more than $2.2 million, much of it to pay for a platoon of lawyers and paralegals who worked for months

“People get bored, people get headaches. Computers don’t,” said Bill Herr, a lawyer who used to work for a chemical company.

Ramin Rahimian for The New York Times
Exhibit 4

Sized applications of automation of knowledge work could have direct economic impact of $5.2 trillion to $6.7 trillion per year in 2025

<table>
<thead>
<tr>
<th>Sized knowledge worker occupations</th>
<th>Potential economic impact of sized occupations in 2025 $ trillion, annually</th>
<th>Estimated scope in 2025</th>
<th>Estimated potential reach in 2025</th>
<th>Potential productivity or value gains in 2025</th>
</tr>
</thead>
<tbody>
<tr>
<td>Common business functions</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Clerical</td>
<td>1.1–1.3</td>
<td>$4.4 trillion in knowledge worker costs</td>
<td>50–65 million full-time equivalents (FTEs) of work potentially automatable</td>
<td>$35,000 value per FTE of additional productivity</td>
</tr>
<tr>
<td>Customer service and sales</td>
<td>0.6–0.9</td>
<td>125 million knowledge workers</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Professional services</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Finance</td>
<td>0.4–0.5</td>
<td>$1.5 trillion in knowledge worker costs</td>
<td>10 million FTEs of work potentially automatable</td>
<td>$65,000 value per FTE of additional productivity</td>
</tr>
<tr>
<td>Legal</td>
<td>0.2–0.3</td>
<td>25 million knowledge workers</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Other potential applications (not sized)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sum of sized potential economic impacts</td>
<td>5.2–6.7</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

NOTE: Estimates of potential economic impact are for some applications only and are not comprehensive estimates of total potential impact. Estimates include consumer surplus and cannot be related to potential company revenue, market size, or GDP impact. We do not size possible surplus shifts among companies and industries, or between companies and consumers. These estimates are not risk- or probability-adjusted. Numbers may not sum due to rounding.

SOURCE: McKinsey Global Institute analysis

200–300B USD/year!
The Susskind model of professional services evolution

From artisanal ("bespoke") lawyering through standardization and systematization to commoditized legal services (with no human involvement)
How does the average lawyer seem to feel about all this?

No thanks!

We are too busy
What is already out there?
Who is Stoker? (For one welcome out, New York Overlords)
$1,000

Who is Bram Stoker?
$17,973

Who is Bram Stoker?
$5,600
Built on top of Watson, IBM's cognitive computer,

ROSS is a digital legal expert that helps you power through your legal research.
You ask your questions in plain English, as you would a colleague, and ROSS then reads
Built on top of Watson, IBM's cognitive computer,

ROSS is a digital legal expert that helps you power through your legal research.

You ask your questions in plain English, as you would a colleague, and ROSS then reads
KELSEN

LEGAL INTELLIGENCE POWERED BY BIG DATA

COMING SOON
OCT 08, 2015

Thomson Reuters and IBM Collaborate to Deliver Watson Cognitive Computing Technology

Thomson Reuters to deploy Watson technology to enhance customer solutions

NEW YORK — Thomson Reuters, the world’s leading source of intelligent information for businesses and professionals, and IBM (NYSE: IBM) today announced they have entered into an agreement to enhance customer solutions across Thomson Reuters using Watson.

The collaboration underscores the ongoing commitment by Thomson Reuters to deliver innovative technology solutions within specific industry domains to its customers via its in-house technology development, as well...
Watson is not the only machine-learning-as-a-service service out there

Watson may be a closely-guarded secret, but open-source machine learning tool kits are a big trend in 2015–16:

- Google: TensorFlow, SyntaxNet
- Facebook: Torch
- Amazon Machine Learning
- etc etc etc

For legal, it's mostly just a set of bold promises, unlike...
How It Works

**CAPTURE**
- PACER: All 94 US District Courts
- USPTO: Patent Information
- EDIS: ITC §337 Investigations

**PREPARE**
- Lexpressions™ Engine
- Lex Machina Data
  - Judges, Lawyers, Parties, Patents

**DELIVER**
- Legal Analytics
## Motion Metrics Report

Showing metrics for 1984 orders issued by Judge Sue Lewis Robinson (SLR) in 1360 cases from the Search for Patent cases before Judge Sue Lewis Robinson; filed between 2000-01-01 and 2015-09-17.

### View orders issued by
- Judge Sue Lewis Robinson (SLR)

<table>
<thead>
<tr>
<th>Issue Type</th>
<th>Grant Outcome</th>
<th>Deny Outcome</th>
<th>Partial Outcome</th>
<th>Total Decided Orders</th>
<th>Grant Rate</th>
<th>Moot or Other Outcome</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dismiss (Contested)</td>
<td>81</td>
<td>95</td>
<td>25</td>
<td>201</td>
<td>40%</td>
<td>23</td>
</tr>
<tr>
<td>Dismiss (Uncontested)</td>
<td>936</td>
<td>2</td>
<td>2</td>
<td>940</td>
<td>100%</td>
<td>10</td>
</tr>
<tr>
<td>Stay Pending ITC</td>
<td>7</td>
<td>1</td>
<td>0</td>
<td>8</td>
<td>88%</td>
<td>0</td>
</tr>
<tr>
<td>Stay Pending PTAB</td>
<td>10</td>
<td>4</td>
<td>1</td>
<td>15</td>
<td>67%</td>
<td>0</td>
</tr>
<tr>
<td>Stay Pending USPTO</td>
<td>11</td>
<td>11</td>
<td>1</td>
<td>23</td>
<td>48%</td>
<td>1</td>
</tr>
<tr>
<td>Stay Pending Appeal / Related Matter</td>
<td>153</td>
<td>16</td>
<td>0</td>
<td>169</td>
<td>91%</td>
<td>4</td>
</tr>
<tr>
<td>Stay (Deadlines, Settlement, Other)</td>
<td>58</td>
<td>21</td>
<td>4</td>
<td>83</td>
<td>70%</td>
<td>5</td>
</tr>
<tr>
<td>Summary Judgment</td>
<td>102</td>
<td>192</td>
<td>90</td>
<td>384</td>
<td>27%</td>
<td>26</td>
</tr>
<tr>
<td>Transfer</td>
<td>24</td>
<td>40</td>
<td>0</td>
<td>64</td>
<td>38%</td>
<td>8</td>
</tr>
</tbody>
</table>

Motion Metrics is in BETA while we refine this new feature. Please send us Feedback or Corrections.
Judge Analytics

Designed to help you understand how judges think, write, and rule.

Patterns from the Writing of Lucy Haeran Koh

Number of Citations and Case Name

- **199** Ashcroft v. Iqbal
- **182** LOPEZ v. SMITH
- **150** CELOTEX CORP. v. CATRETT
- **131** MANZAREK v. ST. PAUL FIRE & MARINE INS. CO.
- **122** BALISTRERI v. PACIFICA POLICE DEPT.
- **113** ADAMS v. JOHNSON
- **109** FAYER v. VAUGHN
- **103** FOMAN v. DAVIS
- **101** ANDERSON v. LIBERTY LOBBY, INC.
- **98** SHWARZ v. U.S.
- **92** LEADSINGER, INC. v. BMG MUSIC PUB.
- **89** WESTERN MIN. COUNCIL v. WATT
- **86** CARVALHO v. EQUIFAX INFORMATION SERVICES, LLC
- **79** WEISBUCH v. COUNTY OF LOS ANGELES
- **76** WEST v. ATKINS

**Ashcroft v. Iqbal**

May 18th, 2009
556 U.S. 662
United States Supreme Court

**SUMMARY**

"Affirming, that court assumed without discussion that it had jurisdiction and focused on the standard set forth in Bell Atlantic Corp. v. Twombly, 550 U.S. 544, 127 S.Ct. 1955, 167 L.Ed.2d 929, for evaluating whether a complaint is sufficient to survive a motion to dismiss. Concluding that Twombly's "flexible plausibility standard" obliging a pleader to amplify a claim with factual allegations where necessary to render it plausible was inapplicable in the context of petitioners' appeal, the court held that Iqbal's complaint was adequate to allege petitioners' personal involvement in discriminatory decisions which, if true, violated clearly established constitutional law."

Language citing Ashcroft v. Iqbal

- In CREAGRI, INC. v. PINNAACLE INC.  Case No. 5:11-CV-06635-LHK. Northern District of California - January 1st, 2013
  - "While "detailed factual allegations" are not required, a complaint must include sufficient facts to "state a claim to relief that is plausible on its face." Ashcroft v. Iqbal, 556 U.S. 662, 678 (2009) (quoting Twombly, 550 U.S. at..."
within 35 U.S.C. §101 whether viewed as a process or a machine. 

**Section 101** of the Patent Act states: Whoever — in embracing new fields in the scope of section 101. Patent law has nicely fostered technological advance — including improvements, may thus receive patent protection. Section 101 explicitly covers both processes and 2d Cong., 2d Sess. 6 (1952). Section 101 does not suggest that patent protection extends to some so clarified that section 101 means what it says: any new and useful invention is entitled to patent protection — which it employs. The limits on patentable subject matter within section 101 do not depend on whether an the scope of section 101. U.S. Const. art. I, § 8. This court should not permit the Patent and Trademark eligibility for the patent reward in general, requires a judgment that the applicant for the patent has
This **New User (Basic)** search form allows for searching of the most commonly searched fields: word marks, serial or registration numbers, and owners.

The **Combined Word Mark** is the default search field and includes the **word mark** and translation.

Use the $ for truncation in any field. For **Combined Word Mark** searches, the * is a more efficient truncation operator for left and/or right truncation. For example, the search for \textit{Word Mark} will retrieve marks with common variations of the word DOG in the word mark or translation statements. Use of the $ truncation operator sometimes results in a true wildcard to retrieve marks containing additional characters in the middle of the word.

For serial number or registration number searches, enter the 8-digit serial number (e.g., 75123456) or 7-digit registration number (e.g., 1234567) and select **Serial or Registration** search. If multiple serial or registration numbers are searched, separate the numbers by spaces and change the **Results Must Contain** value to Any Search Terms (OR). (Alternate Boolean OR operator without adjusting the **Result Must Contain** value.)
Result for: dagniaux

- 3 my trademarks
- 0 identical trademarks
- 25 similar trademarks
- 72 other marks
- 0 relevant industry results
- 12 other industry results

Safety level 2
You may want to consider changing your mark. Only less than 25% of applicants proceeded to file an application with this or higher risk.

TRADMARK RESULTS

3 my trademarks

0 identical trademarks

25 similar trademarks

danio
Trademark owner: COMPAGNIE GERVASIS DANONE
Similarity: 87.33%
Application: INT WIPO 1219857
Result for: dagniaux

Safety level 2
You may want to consider changing your mark. Only less than 25% of applicants proceeded to file an application with this or higher risk.

2/5 Safety level

3 my marks
0 identical marks
25 similar marks
72 other marks
0 relevant industry results
12 other industry results

TRADEMARK RESULTS  INDUSTRY DATA  WORD MEANINGS  INTERNET DOMAINS

_present words you should be aware of

Danio
Translingual
1. _taxon genus family Cyprinidae_ the _darios_ or _danionins_, _small tropical fish_ often used in aquariums

danio
English
1. _label chiefly in combination_ Any of various _fish_ of the _genera_ _Danio_ species and _taxlink Devario_ species.

Disclaimer: The results comprise a sample of the trademarks that our system has estimated to be closest to your request. No warranty of any kind
### Found 18 trademarks

<table>
<thead>
<tr>
<th>TRADEMARK</th>
<th>TRADEMARK OWNER</th>
<th>APPLICATION</th>
<th>STATUS</th>
<th>INTL. CLASSES</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kalev</td>
<td>AS KALEV</td>
<td>EU EUIPO 010825057</td>
<td>Valid (exp. 2022-04-20)</td>
<td>29-30, 32, 35</td>
</tr>
<tr>
<td>KALEV</td>
<td>AS KALEV</td>
<td>EU EUIPO 003464237</td>
<td>Valid (exp. 2023-10-29)</td>
<td>30</td>
</tr>
<tr>
<td>KALEV</td>
<td>AS KALEV</td>
<td>EU EUIPO 003464849</td>
<td>Valid (exp. 2023-10-29)</td>
<td>30</td>
</tr>
<tr>
<td>KALEVEI</td>
<td>Sichuan Kalevei Technology Co., Ltd.</td>
<td>EU EUIPO 010529601</td>
<td>Valid (exp. 2021-12-28)</td>
<td>12</td>
</tr>
<tr>
<td>KALEVAJAL</td>
<td>Kalevaia Koru Oy</td>
<td>EU EUIPO 011469327</td>
<td>Valid (exp. 2023-01-07)</td>
<td>9</td>
</tr>
<tr>
<td>KALEVA TRAVEL</td>
<td>CWT Finland Oy</td>
<td>EU EUIPO 009914078</td>
<td>Valid (exp.</td>
<td>39, 43</td>
</tr>
</tbody>
</table>
When it Comes to Divorce, We Help You
GET IT RIGHT.

Find a Wevorce Professional Near You

Enter city, state, or zip code

Save money. Save time. Save your relationships.

Protect what matters to you. Wevorce connects you with certified
The Wevorce 5-Step Process

Foundation Building
Set the "rules of the road" between Wevorce, you and your spouse.

Parenting Planning
Outline a practical plan for successful co-parenting now and for the rest of your lives.

Due Diligence
Our team of professionals help make certain everything
What is the CRT?

The CRT is going to be very different from other dispute resolution options that have been available in British Columbia. The CRT will give you choices about how, when, and where you resolve small claims and strata property (condominium) disputes, built around your needs and your life.
The Civil Resolution Tribunal, British Columbia (Canada)

- small-claims court online, starting in 2016
- 1\textsuperscript{st} step: online resources for identifying and resolving your legal problems yourself
- 2\textsuperscript{nd} step: online mediation between the parties
- 3\textsuperscript{rd} step: court trial carried out entirely online
- similar system proposed in England (HMOC)
What about research?
Research commercialization is difficult in general – not only for AI & law

- innovation and commercialization are tossed around as vital research policy goals a lot these days pretty much wherever you go
- said tossers* tend to treat it as a black box, basically thinking that telling academics to be innovative is all it takes
- there are two parts in the equation, and only one of them can be said to be the academics' responsibility

* sorry, couldn’t resist
Why research commercialization fails

- most such ventures fail for a simple reason: putting the cart before the horse
- solution looking for a problem, not the other way around
- academics (typically) don't have a very commercially oriented mindset
- perhaps most importantly, product design and management are often left out of the equation altogether
- basic research is a fairly blunt instrument: research end-product (good enough for publication) very different from a marketable and commercially viable product
The first part of the equation: What academics can do about it

– consider potential uses even when planning and carrying out basic research
– and of course there’s also applied research: for legal tech, a lot of general AI/NLP stuff just waiting to be (tried out to see if it can be) used (cf. e-discovery)
– try to take an active role in seeking out potential partners for commercialization (no time for that, I know...)

### Applied and basic research: Pasteur's quadrant

<table>
<thead>
<tr>
<th>Quest for fundamental understanding?</th>
<th>Pure basic research (Bohr)</th>
<th>Use-inspired basic research (Pasteur)</th>
</tr>
</thead>
<tbody>
<tr>
<td>yes</td>
<td></td>
<td></td>
</tr>
<tr>
<td>no</td>
<td>Pure applied research (Edison)</td>
<td>yes</td>
</tr>
<tr>
<td>no</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Considerations of use? (Stokes 1997)
The other part of the equation: The people with the actual problems

- you are more likely to end up with a viable product when you start with a problem and use research to look for a solution, not the other way around

- the initiative should come from someone who has experienced the pain points first hand – or at least people who can see an inefficiency, have an idea about what to do about it, and can figure out how to fill in the blanks
Exhibit A: LexMachina

- started as a research project (IP Litigation Clearinghouse) between Stanford Law and CS departments
- spun off as an independent company in 2008
- initial university funding $3M, seed $2M, series A $4.8M (according to Wikipedia)
- sold to LexisNexis in 2015
Exhibit B: TrademarkNow

- started(1) as a research project into computational modelling of vague legal concepts, using trademark likelihood of confusion as a random example
- started(2) as one frustrated trademark lawyer's quest for better tools
- incorporated in 2012, 4 co-founders (3 tech, 2 legal)
- funding: $300k seed, $3M series A, plus gov't innovation funding (Tekes)
Exhibit C: Riverview Law
- one of the biggest ABSs in the UK
- started a collaboration with University of Liverpool in January 2015
- Riverview pays for two(?) researchers to work on figuring out how to use the legal AI research from Liverpool (esp. strong on legal argumentation) to solve business problems
- success? Too early to tell yet...
Exhibit D: Dutch government agencies

- e.g. Tax and Customs Administration and Immigration and Naturalization Service (IND)
- leveraging the strong Dutch AI & law community by using university researchers in consulting roles
- development work done by the usual external suppliers (Accenture etc.)
- e.g. INDIGO: http://vimeo.com/43187024
Oh, and don't forget education

- tech will be a bigger part of most lawyers' day-to-day work
- new types of emerging legal careers where deep tech/design skills also needed (but you still need the deep legal expertise as well)
- legal tech/entrepreneurship programs established in many US universities, first EU ones just getting started
- I taught Intro to Legal Tech in Turku in 2015 (and again later this year), do take a look and feel free to borrow...
What about Estonia?
Do I even have to say it...?

Evert Nõlv @evertnolv · May 21
Proud to be Estonian! Estonia has been mentioned 4 times in the last panel.

#FutureLaw2016

(CodeX FutureLaw 2016 conference at Stanford, panel on e-government)
Why Estonia

- strong track record of doing things right in public sector IT
- existing legal AI research base
- small country: easier to be agile
- small market: nobody from the outside is going to come and build it for you
- strong and competitive startup/tech scene, well positioned for many major markets in Europe
What more do you need?

- innovative lawyers to start using (and helping to create!) new technologies
- willingness from the courts (and the bar) to try new things
- startups, startups, startups!
- introduce legal tech in legal education
- and of course targeted research funding wouldn't hurt, either
Thank you!

More information:
@ronkaine on Twitter
http://slideshare.net/ronkaine
https://www.trademarknow.com/
http://iaail.org/