


## Article

# Legaltech and Lawtech: Global Perspectives, Challenges, and Opportunities

Esther Salmerón-Manzano 

Faculty of Law, Universidad Internacional de La Rioja (UNIR), 26006 Logroño, Spain; esther.salmeron@unir.net

**Abstract:** Legaltech refers to the application of new technologies to the world of law, to carry out tasks that, until recently, were performed by lawyers or other personnel working in law firms. From 2015 onwards the Lawtech alternative has emerged. In this work, the concepts of Legaltech and Lawtech have been analyzed by searching the two main scientific information databases such as Scopus and Web of Science (WoS). There has been a clear trend to use the concept of Legaltech against Lawtech. Six clear research lines have been detected from the whole of the published documents regarding these concepts. These are the related to Computer Science, Justice, Legal profession, Legal design, Law firms, and Legal Education. It is proposed to use the term Legaltech to include all technological advances in the legal field. From the point of view of opportunities, the irruption of Legaltech will be able to offer accurate legal advice to the public, reducing the price of this and on the other hand, analyze large amounts of data that law firms and legal advisors will use to improve their management and increase their productivity. In short, Legaltech and Lawtech are opening up new opportunities in the legal sector encouraging technological innovation, giving greater access to legal services, even try to achieve the goal of universal access to justice.

**Keywords:** legaltech; lawtech; justice; legal profession; legal design; law firms; legal education



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## 1. Introduction

The advance of information and communication technologies has led to changes in the way in which we relate to each other and to the administrations (Fang 2002). Law is no exception to these changes, its mandatory duty to modernize points to a new concept called Legaltech, which, despite its difficult conceptualization, has positioned itself as a relevant advance in the way in which law is conceived, through the inclusion of technological tools (Pasquale and Cockfield 2018). These days, legal technology such as software solutions for the delivery of legal services have become the key element in the current competition among the players in the legal market (Hongdao et al. 2019).

It should be noted that, although the concepts of Legaltech may seem recent, as early as 1873 Shepard developed a citation index following the codification that applied to federal trial judgments in the United States. This is even the background for the proposed importance of citations in bibliometrics and the impact of scientific papers (Garfield 1955). Another great example of how the legal services is a pioneer of bibliometrics is the West-law database, founded in the early 1970's and acquired by Thomson Corporation (now Thomson Reuters) in 1996. As is known, Thomson Reuters owns Web Of Science (WoS).

In the early 1970s, the US company Lexis Nexis was a pioneer provider of computer-assisted legal research services. It introduced the world's first terminal with a telephone dialer that connected the very few law firms that could afford it to the law and jurisprudence databases of some U.S. libraries. Initially they offered full text search of Ohio and New York case law (Dale 2019). In the last 40 years, much progress has been made in legal technology, and the concept of technology applied to the supply or business of legal services has certainly become more popular from 2008 onwards (Mandel 2017).

In fact, the Legaltech landscape has grown so large and extensive that competing concepts such as Lawtech have emerged and the definition of what Legaltech does or does not mean has been widening or narrowing depending on the case and the context (Dubois 2020).

Legaltech is the acronym for Legal Technology, although at first it was used as legal tech (separate), it was undoubtedly the first way to talk about legal technology. In that sense, Legaltech is commonly understood to refer to the use of technology to provide legal services (Munisami 2019). That would be Legaltech, which could be defined as the use of technology in legal services to create:

- Online services that reduce or eliminate the need to go to the legal sector in its most traditional form;
- Online services that accelerate the procedures and the management of tasks of the lawyers themselves, reducing the cost and time that a professional must invest in many of their tasks;
- Online services that simplify and modify the form of contact between legal professionals and potential clients.

The objective of this work is to analyze the two terms described, Legaltech and Lawtech in the main scientific databases, Scopus and WoS, to determine their possible differences if any, and on the other hand to determine which are the main lines of research in which scientific works related to this discipline are being developed. Note that the advantages and disadvantages of the technology's uses is not the focus of this study. It is about seeing how the concepts have arrived on the scientific agenda and how those concepts have taken shape.

The roadmap of this article has been, first, to review the background of both concepts in the scientific literature. Secondly, to see the relative importance of both terms in the two main scientific databases, Scopus and WoS. Thirdly, analyze the scientific fields and their temporal evolution in which the term Legaltech is being used, to try to identify the challenges and opportunities of research in this area.

## 2. Background: Legaltech or Lawtech

The transformation that the legal industry is suffering with the introduction of technology is driving the emergence of these new concepts. Since the emergence of Legaltech in 2017, the concept has continued to grow in popularity and variety, and it is when new versions of it have begun to emerge. For example, in the U.S. and U.K., the term Lawtech is also appearing. In fact, for The Law Society of England and Wales there is only Lawtech, not Legaltech. The Law Society of England is the professional body representing solicitors in England and Wales. For example, there are those who understand Legaltech as solutions for lawyers who do their work cheaper and efficient (Bues and Matthaei 2017), while Lawtech would be legal self-services for small companies and without the need for lawyers.

In line with the above, there are those who propose the differentiation of how Legaltech implies the digital transformation of the legal profession, emphasizing the idea of Legaltech as tools for lawyers (Navas 2019). Lawtech, on the other hand, is the concept of tools that replace lawyers, and also feature a high component of artificial intelligence and other computer science techniques.

Regarding the legal profession, lawyers skilled in technology, willing to adapt to the opening of new or specialized legal markets by technological changes, could also find lucrative market opportunities by pursuing low-level litigation that can be more easily and cheaply resolved through legal technology (Caserta and Madsen 2019).

For other researchers (Susskind 2008), Lawtech is a broader concept since Legaltech is associated with back-office technologies such as accounting systems, and less with new technologies such as artificial intelligence or expert systems related to lawyers, online courts, etc., which was the focus of the 1980s (Susskind 1986). Finally, they consider Legaltech to be more used and applied by the legal sector, while Lawtech would be more inclusive and open to technologists from any field (Susskind and Susskind 2015). However, this is not what the data obtained show, in fact the opposite is the case. Lawtech is the

term used to describe technologies that aim to support, supplement, or replace traditional methods for delivering legal services, or that improve the way the justice system operates (Webley et al. 2019). So, Lawtech covers a wide range of tools and processes, such as:

- document automation;
- advanced chatbots and practice management tools;
- predictive artificial intelligence;
- smart legal contracts;
- knowledge management and research systems.

The Lawtech sector consists of law firms delivering legal services through technology, and the vendors that develop and supply technology solutions to those firms.

Other authors consider that Legaltech would be the appropriate term as it describes the activities of the legal sector, as does RegTech, the technology that helps to comply with regulation, for example helping to reduce the large amount of time and high costs that banks spend on regulatory compliance (Butler and O'Brien 2019), InsurTech as technologically-based insurance service (Gramegna and Giudici 2020), or FinTech as finance and technology to accelerate the digitalization of both the financial and insurance sectors (Rundo et al. 2019). Wealthtech can also be considered a subcategory of Fintech, given that its objective is to manage and grow people's financial wealth through technological advances (Chishti and Puschmann 2018). Therefore, all these sub-concepts can be understood to fall under the term Legal since we are talking about the legal industry, the legal market, and the legal sector, i.e., they are included in the broad concept of Legaltech.

Both concepts, Legaltech and Lawtech benefits legal services by:

- increasing efficiency, productivity, and growth;
- reducing costs;
- better outcomes for clients and organizations.

Nowadays there are systems that can draft documents, conduct legal research, disclose documents in litigation, conduct due diligence, provide legal guidance, and resolve litigation online. Note that only in 2018, USD 1663 million has been invested in legal tech (Caserta 2020).

In summary of this section, it is noted that the two terms and their respective merits are not always clearly distinguished in the reviewed scientific literature.

### 3. Significance of Both Terms in the Scientific Literature: Results

In this section the indexing of scientific articles with the terms Legaltech and Lawtech in the two major scientific databases, Scopus and Web of Science, will be briefly analyzed. Table 1 summarizes these terms according to the database consulted. It can be seen that both databases show a higher number of documents for Legaltech. To make a comparative view, a word cloud has been elaborated with all the keywords of both terms used in the scientific literature, obtaining Figure 1 for Lawtech and Figure 2 for Legaltech. In Figure 1, from the first place, the term human in Lawtech is remarkable, and analyzing the issue a more in depth, these documents focus on the impact of new technologies on the rights of individuals, such as the cyberhate (Blaya 2019), the impact of biotechnology as an example in reproductive medicine (Griffiths 2016), or Genetic Intervention and Bioethics (Conti 2017). Undoubtedly, the latter perspective is far from the object of this research.

**Table 1.** Legaltech and Lawtech del 2000 al 2020.

Database	"Legal Tech" or "Legaltech"	"Lawtech" or "Law Tech"
Scopus	54	10
WoS	45	10

Figure 2, for Legaltech, shows the predominant terms used as techniques: Artificial Intelligence, Machine Learning, or Natural Language Processing Systems. As well, on the other hand, the target application is Legal Education or Law Students, Legal Profession,

[illegible]

In a more detailed analysis of these keywords in the two previous figures, Table 2 is obtained. In this Table 2 the top 10 keywords appearing in the cited documents are listed, in which the search terms (Legaltech and Lawtech) have been excluded.

Rank	“Legal Tech” or “Legaltech”	“Lawtech” or “Law Tech”
1	Legal Education	Human
2	Artificial Intelligence	Technology
3	Laws and Legislation	Humans
4	Legal Services	Law
5	Law	Laws and Legislation
6	Legal Profession	Information Systems
7	Machine Learning	Innovation
8	Natural Language	Methodology
9	Processing Systems	Bioethics
10	Access to Justice	Blockchain



From Table 2 it is remarkable that Legal education occupies the first position, this is due to the fact that a low number of documents makes collective works such as books, which are indexed by chapters, significantly increase the number of documents compared to the rest, e.g., the book “Modernizing Legal Education” (Denvir 2020).

#### 4. Discussion: Main Clusters on Legaltech

To analyze in which scientific fields or research clusters Legaltech-related works are present, a scientific community detection software, vosviewer, has been used (Van Eck and Waltman 2010). This software has proven to be useful in the analysis of many fields of knowledge such as medicine (Garrido-Cardenas et al. 2020), social sciences (Muyor-Rodriguez et al. 2019) or engineering (Salmeron-Manzano and Manzano-Agugliaro 2018). Thus, Figure 3 was obtained. This figure shows 4 different clusters that currently exist in the scientific literature, which can be distinguished according to the different colors of each one. The clusters are linked by the common keywords of all the documents analyzed. For each cluster, the main associated keywords are summarized in Table 3, and finally, a name is given to encompass the topic of each cluster.

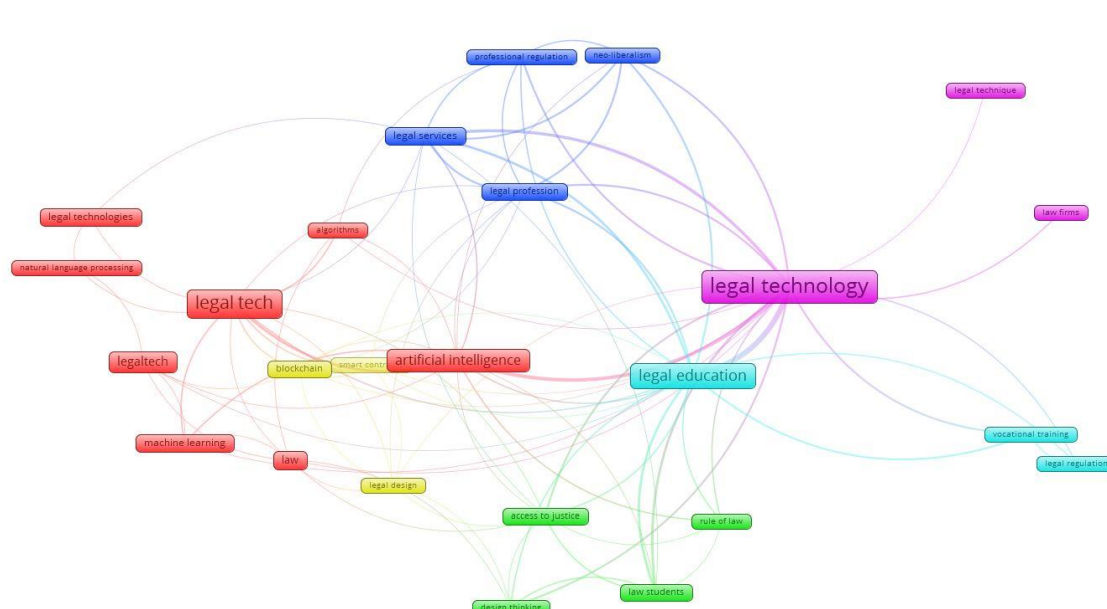


Figure 3. Main clusters detected on Legaltech documents.

Table 3. Main clusters detected on Legaltech documents.

Cluster	Main Keywords	Name
Red	Algorithms, artificial intelligence, law, legal tech, legal technologies, legal tech, machine learning, natural language processing	Computer Science
Green	Access to justice, design thinking, law students, rule of law	Justice
Blue	Legal profession, legal services, neo-liberalism, professional regulation	Legal profession
Yellow	Blockchain, legal design, smart contract	Legal design
Purple	Law firms, legal technique, legal technology	Law firms
Cyan	Legal education, legal regulation, vocational training	Legal Education

The first cluster is focused on computer science as verified by the main keywords involved: Algorithms, artificial intelligence, law, legal tech, legal technologies, machine learning, natural language processing. Regarding Artificial Intelligence, the first paper in this regard was “Can the mechanization of law triumph over lawyers?” from 2017 (Fortuit and Hamidou 2017), should be highlighted. The use of machine learning (ML)

techniques for legal analysis and decision making in the U.S. judicial system has recently been analyzed ([Delgado 2019](#)), concluding how ML came to be adopted as a standard tool for automating fact discovery for high-stakes civil litigation.

Regarding natural language processing (NLP), there are five areas of legal activity where NLP is playing an increasing role ([Dale 2019](#)):

- Legal research: Finding information relevant to a legal decision;
- Electronic discovery: Determining the relevance of documents to an information request;
- Contract review: Checking that a contract is complete and avoids risk;
- Document automation: Generating routine legal documents;
- Legal advice: Using question-and-answer dialogs to provide tailored advice.

The second cluster is focused on Justice, as evidenced by the main keywords involved: Access to justice, design thinking, law students, rule of law. Within this topic there are works within what one could classify as philosophy of law, who argue that advances in equal access to justice and the rule of law lie primarily in the introduction of lawyers' own cognitive operations in contexts where human lawyers cannot be deployed for purely economic reasons ([Gowder 2018](#)).

The third cluster is focused on the legal profession, as can be seen from the main keywords involved: Legal profession, legal services, neo-liberalism, professional regulation. Within the field of legal services, it is worth mentioning the analysis of automated Online Dispute Resolution (ODR), where 3 cases can be identified ([Barnett and Treleaven 2018](#)):

- Consumer ODR, which seeks to facilitate the resolution of disputes between parties to electronic commerce, typically online suppliers, and consumers;
- Judicial ODR, involves means of resolving "ordinary" disputes where a hearing is held (using technology) but outside the courtroom, such as divorce or personal injury cases;
- Corporate ODR, focused on managing the resolution of any contractual disputes that may arise from large multipartner projects or financial transactions.

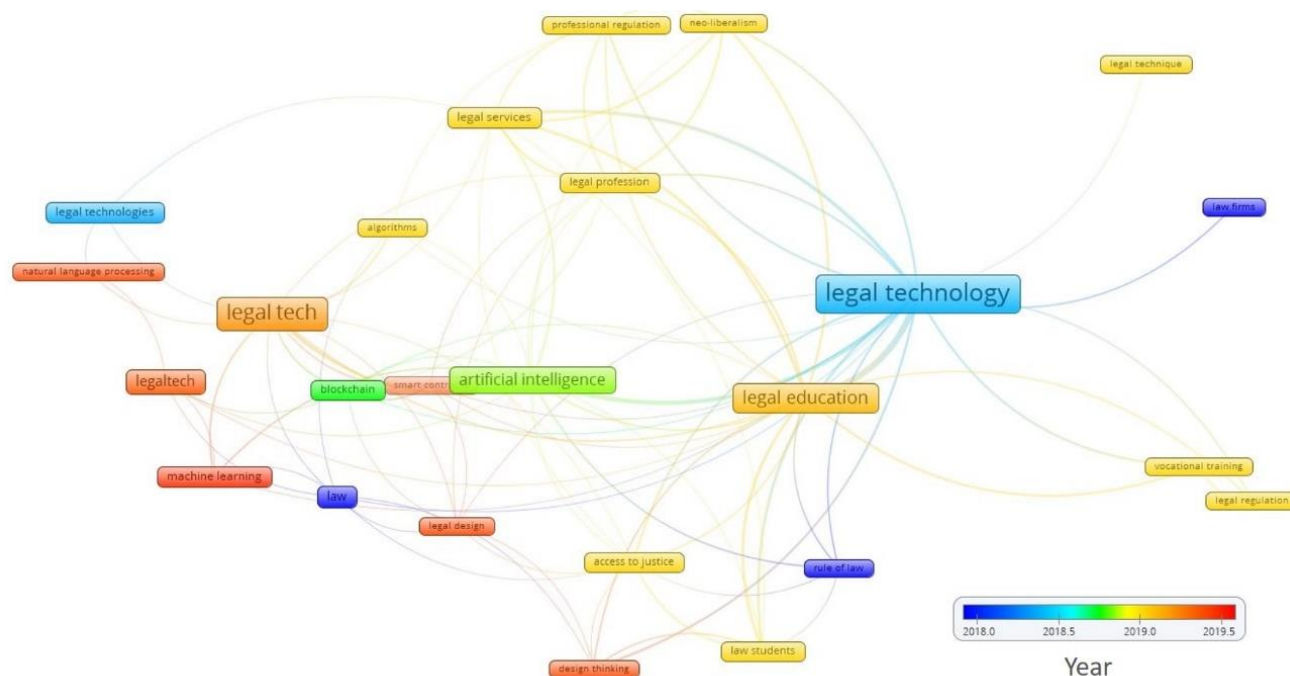
The fourth cluster is focused on Legal design as evidenced by the main keywords involved: Blockchain, legal design, smart contract. The blockchain technology has several legal consequences and the one with the greatest need for legal regulation are cryptocurrencies such as bitcoins ([Salmeron-Manzano 2017](#)). Legal design aims to apply human-centered design to the world of law, to make legal systems and services more human-centered, usable, and satisfying ([Hagan 2017](#)). In short, legal Design is an interdisciplinary approach to apply human-centered design to prevent or solve legal problems. The legal design manifesto is available on-line ([LeDA 2021](#)). On the other hand, "smart contract" means the specific use of the use of software code to formulate, check and enforce an agreement between contracting agents ([Salmerón-Manzano and Manzano-Agugliaro 2019](#)).

The fifth cluster is centered on Law firms as evidenced by the main keywords involved: Law firms, legal technique, legal technology. Law firms are increasingly adopting digital technologies to make their work more efficient as opposed to traditional work methods. The business model of many law firms, like the legal professions as a large whole, will face a significant paradigm shift, as the work provided by law firms in the form of billable hours largely consists of services that do not require higher legal training, but involve mere data processing ([Kerikmäe et al. 2018](#)).

The sixth cluster is focused on Legal Education as evidenced by the main keywords involved: Legal education, legal regulation, vocational training. Anticipated changes in the training needs of lawyers and solicitors present a challenge to law schools to revise their curricula ([Ryan 2020](#)). Thus, as the legal profession begins to seriously deploy digital technology in the delivery of services and information, more law schools are including technology education in their curricula ([Jackson 2016](#)).

The evolution of the concepts related to Legaltech are shown in Figure 4. The colors represent the evolution over time, with blue being the oldest and red the most modern. It can only be seen in the last two years of the study, observing how it evolves from law firms and rule of law at the beginning of 2018, to artificial intelligence or machine learning,

i.e., incorporating technologies from computer science. The most occurrence of Legaltech related terms is mostly in 2019. See for example, legal profession, professional regulation, legal services, legal regulation, vocational training, access to justice or law students.



**Figure 4.** Evolution of subjects related to Legaltech.

Regarding the concept itself, it can be seen that at the beginning it was legal technology, later legal tech, and finally it has been coined as a term in itself Legaltech. Legaltech appears as an author keyword, according to WoS, in 2017, with no previous records found.

## 5. Conclusions, Challenges, and Opportunities

In short, from the comparison of the two terms studied, there is no clear difference between the two terms, although it has been observed that there is a greater tendency to use Legaltech in the USA and Lawtech in the UK.

According to the databases analyzed and summarizing everything studied above, Legaltech is the most widespread and oldest concept; its most common use refers to the use of technology to provide legal services and aims to increase the effectiveness of the services provided. From 2015 onwards the variant of Lawtech arises.

Legaltech as reflected in the scientific literature is a considerably more holistic concept and is associated with the incorporation of new technologies such as artificial intelligence or machine learning, while Lawtech is more focused on the legal sector itself. Thus, it is common to associate Lawtech to technologies or tools that aim to help the legal sector, while Legaltech also encompasses the development of tools such as artificial intelligence, machine learning, or natural language processing. In view of the results found in the scientific literature, and for better searchable indexing in scientific databases related to this scientific field, it is proposed to use the term Legaltech to include all technological advances in the legal area, i.e., Legaltech is a concept that encompasses Lawtech.

The greatest challenge of this study is that the legal professions are undergoing major changes with the introduction of the new technologies, which will transform the sector, requiring it to become reinvented. In addition, legal knowledge has a number of features that facilitate its digitization and automation, in fact, it has been seen to be the precursor of scientific fields such as bibliometrics, and even bibliometric indicators of citation index measurements. It is therefore not understandable how this issue has been left aside for so long, perhaps because now with the era of communications is the right time.

As drawbacks, one can cite that on the one hand legal technology tools can also pose risks, especially because of the biases perpetuated by algorithms. As well, from a legal perspective, ensuring that the ethical issues surrounding legal technology are fully considered. As in other sectors, there is a potential for a dangerous concentration of Legaltech in high-tech industries. As in other sectors, there could be a dangerous concentration of Legaltech in high-tech industries that consider it a great business potential, therefore it is necessary that the law continues to ensure antitrust regulation as it does in the USA and the European Commission.

From the point of view of opportunities, artificial intelligence-based systems can provide accurate legal advice and analyzing large amounts of data that law firms and legal advisors will use to improve their management and increase their productivity. Therefore, this technology should be applied in the administrative and civil fields, as well as in those that speed up the administrative process. Like other technological advances, these will reduce legal costs and thus improve universal access to justice.

In short, Legaltech and Lawtech offer us the opportunity and challenge to promote a just and equitable society, and to empower individuals. Thus, giving greater access to legal services and the possibility of achieving the goal of universal access to justice.

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