

Reflections on the Application of TAR Technology in the Legal Field

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Abstract

In Chapter 6, the author primarily introduces the application of Technology-assisted review (TAR) in document search. The core component of TAR technology is Supervised Machine Learning for TAR, which fundamentally constitutes a machine learning approach that utilizes examples to train models for document classification, thereby reducing operator workload while enhancing operational efficiency and precision. The following discussion will present the chapter's content and personal reflections from the perspectives of TAR technology's concept, advantages, and disadvantages.

Full Text

Reflections on the Application of TAR Technology in the Legal Field: A Reading Response to Chapter 6

In Chapter 6, the author primarily introduces the application of Technology-Assisted Review (TAR) in document search. The most important aspect of TAR technology is Supervised Machine Learning for TAR, which is essentially a machine learning method that uses examples to train a program to classify documents, thereby reducing operators' workload while improving both efficiency and accuracy.

This reflection will address the chapter's content and insights from three perspectives: the concept of TAR technology, its advantages, and its disadvantages.

1. The Concept of TAR Technology

The author defines TAR technology as “the process of using computer software to classify each document in a collection as either responsive or non-responsive, or to rank documents from most likely to least likely to be responsive based on human review and coding of a small portion of documents in the collection.” As

an auxiliary review method, TAR's core function is to identify needed documents from a given collection. Compared with cumbersome manual review, TAR is more convenient and efficient, and comparative experiments demonstrate that it can often achieve higher accuracy and recall rates.

In Section 3, the author mentions several review methods currently in use, among which Supervised Machine Learning for TAR demonstrates significant superiority. This approach can be divided into three models: SPL, SAL, and CAL. Among these, CAL achieves the highest degree of autonomy and is the method the author most recommends. After initial collection analysis, CAL can independently judge and continuously refine its identification rules based on ranking. Compared with TAR 1.0 (SPL and SAL), CAL achieves greater autonomy, and during the identification process, as new features of responsive documents are continuously identified and incorporated, CAL can achieve higher recall and precision rates. From this perspective, whether TAR 1.0, rule-based TAR technology, or manual review methods, none can automatically update responsive document features while maintaining efficiency. This represents the advantage of TAR 2.0.

2. Advantages of TAR Technology

The advantages of TAR (primarily TAR 2.0 represented by CAL) can be summarized as follows. First is high autonomy. As previously mentioned, Supervised Machine Learning for TAR is essentially a form of machine learning. Through program configuration and initial training, operators enable machines to develop their own "awareness" and identify required documents according to certain logic. This high autonomy can liberate humans from heavy and repetitive screening work, providing tremendous convenience for legal professionals. Although legal document screening typically involves only the initial phase of a case, this process is extremely time-consuming and labor-intensive. The introduction of TAR can significantly save lawyers' time, allowing them to concentrate on more important matters.

The second advantage is high efficiency. Unlike manual review, after initial collection training, TAR technology can extract features from responsive documents and use these features to determine whether documents in new collections meet requirements, thereby selecting appropriate ones. Both TAR 1.0 and TAR 2.0 follow this workflow. Compared with manual review, machines do not need to examine legal documents word-by-word to determine compliance, substantially improving work efficiency and speed. As is well known, legal documents are extremely complex. In common law countries, searching for prior precedents is a critical step in case handling, and the quantity of relevant precedents found directly affects adjudication quality. Applying TAR technology can better locate case-related legal documents on the internet, enhancing case processing efficiency.

The third advantage is high precision. In this chapter, the author uses two

statistical metrics to reflect TAR's primary function in document search: recall and precision. In Section 5, the author cites examples including the "EDI study," the "TREC conference's legal track task," and "The 2011 Richmond Journal of Law and Technology Study" to illustrate TAR's practical effectiveness. Using "The 2011 Richmond Journal of Law and Technology Study" as an example, in this task test, manual review achieved an average recall of 59%, precision of 32%, and F1 score of 36%; TAR achieved an average recall of 77%, precision of 85%, and F1 score of 80%. Except for recall, which lacked statistical significance, TAR demonstrated comprehensive superiority in precision and F1 metrics. This indicates that even when recall evaluation can only prove that both methods found a certain proportion of documents, TAR can complete designated tasks while searching through fewer irrelevant documents. This further demonstrates TAR's tremendous role in improving efficiency. High precision means TAR can find responsive documents within a smaller margin of error and reduce manual screening volume, thereby completing search tasks with high quality.

Finally, TAR's integration of technology with traditional work corresponds precisely to the intelligent development trend of the internet era. The arrival of the internet and big data eras has elevated artificial intelligence development to a higher platform. For legal work, traditional methods can no longer adapt to contemporary development rhythms. Text retrieval, as the most fundamental and complex task, is characterized by large work volume and low specialization. In traditional manual review, relevance examination is conducted manually—a process that is not only time-consuming but also limited in scope due to various factors. Internet development has broken geographical and temporal constraints, broadening the search scope for legal documents. However, the surge in searchable quantity is accompanied by rising search costs. Technological progress has successfully driven transformation in traditional fields. In the legal domain, recent developments such as smart courts, electronic evidence, and online publication of judicial documents all reflect the integration trend of technology and law. TAR technology can better align with these developments, thereby promoting comprehensive intelligent reform across the legal field. Overall, TAR's emergence and application fully meet the requirements of the times, and its demonstrated advantages are unmatched by other review methods. Its promotion and application in the legal field are not only reasonable but also necessary.

3. Disadvantages of TAR Technology

Despite these numerous advantages, TAR technology is not perfect. After thoroughly reading this chapter, several questions and concerns arise. First is the uncertainty of review objectives. The goal of all review work is to find "all and only relevant" documents in a collection. As the standard for determining document relevance, "all and only relevant" essentially lacks an objective definition. The process of defining relevance itself involves subjective judgment, with no concrete standard. This uncertainty in defining review objectives di-

rectly affects the evaluation of review methods. Unlike statistical measurement standards, the uncertain objectives of review methods prevent truly objective evaluation of various approaches, particularly for TAR technology. The metrics for measuring TAR—recall and precision—both require accurate data on “all and only relevant” documents before evaluation can proceed. However, for the reasons stated above, the determination of relevant documents cannot be an objective value, which substantially undermines the persuasiveness of derived recall and precision rates.

Second, can TAR technology comprehensively capture all relevant documents? The author notes that when the total number of relevant documents is 100, two sets of data cannot have more than 67 documents commonly identified as relevant by both reviewers. This example reflects not only the subjectivity of relevance criteria but also demonstrates that even with identical requirements, different reviewers reach different conclusions based on their own relevance determinations. In such cases, as long as each reviewer works diligently and conscientiously, there is no basis to claim one dataset is closer to the ideal state; each dataset is correct, merely employing different evaluation criteria. For TAR technology, which follows a single evaluation standard throughout, whether its identified “all and only relevant” documents are truly comprehensive remains questionable.

Third, is TAR technology comprehensively superior to manual review? The review objective is to find as many “all and only relevant” documents as possible. The criteria for “all and only relevant” can be subdivided into two standards: relevance and comprehensiveness. As mentioned above, TAR technology applies a single evaluation standard throughout, making its identification of relevant documents in a collection relatively rigid and uniform. While this evaluation standard can greatly improve work efficiency, manual review may yield better results when the document collection is not large. Multiple reviewers select relevant documents based on their own relevance determinations, then aggregate these documents for a second round of screening. This repeated screening process continues for multiple rounds, ultimately identifying documents recognized by most reviewers as relevant. Although this process is much more complex than TAR screening, its relevance criteria determination and document screening undergo evaluation by multiple reviewers. In such cases, the final identified relevant documents may be more accurate and comprehensive than those identified by TAR technology.

Fourth, privacy protection issues in TAR’s market application. The author mentions that TAR’s future development goals, besides making determination standards more objective and definite, are more importantly to achieve complete automation of TAR technology. TAR’s search scope would no longer be limited to collections provided by human reviewers but would search for “relevant documents” meeting standards across broader network regions. While this search method can more comprehensively collect relevant documents, it may also compromise internet users’ privacy during information searches. The author states

at the chapter's beginning that TAR technology involves only a specific stage of e-discovery. If TAR technology were applied to broader internet regions, the technology itself would not know how to identify which information constitutes private information. Fully automated TAR excludes human intervention, with the entire process from document selection to relevant document determination completed autonomously. Without pre-emptive human review and subsequent screening stages, TAR technology would pose a significant threat to internet users' information. Meanwhile, as a "new product" combining technology and law, TAR technology currently lacks clear legislation for regulation, essentially creating a legislative void in this area. This absence of legal regulation will, in turn, hinder TAR's market application. In fact, infringement of internet users' privacy rights is merely one aspect of the broader legal regulation issues concerning TAR technology. For any new technology, law must anticipate potential legal problems and develop responsive solutions to prevent adverse social impacts.

Finally, whether TAR technology is necessary in China also warrants discussion. The author clearly states that TAR's objective, like manual review, is to find "all and only relevant documents" as comprehensively as possible within a collection. TAR's application in the legal field aims to help lawyers or judges find more effective judgments similar to the case at hand during the initial case stage, thereby assisting lawyers in developing more effective litigation strategies or helping judges make correct adjudications.

4. Applicability Space of TAR Technology in China

Beyond technical considerations, we must also recognize TAR's current predicament. According to the two authors' article, only a few countries have adopted TAR technology; most still rely primarily on manual review. Although TAR has achieved tremendous success in scientific experiments, its application in social production remains uncertain, with no strong evidence to support whether it can achieve expected results. This indicates that TAR's transformation from "laboratory" to "market" still requires time, and public acceptance of TAR technology will also be a gradual process.

As previously mentioned, this work is critically important for common law countries like the UK and US. In common law jurisdictions, judges must first consider precedent when making rulings, using prior case summaries and analysis to reach correct decisions. Unlike common law countries, China does not rely on precedent; case adjudication is based entirely on current legal provisions, not prior cases. Precedent plays at most a guiding role in judges' case handling and does not substantially influence case outcomes. Searching for precedents is not a key focus for lawyers or judges, and precedent is not as important as in common law countries. Under these circumstances, whether TAR technology has broad applicability in China remains debatable.

5. Potential Legal Issues in TAR Application

The legal issues potentially involved in TAR technology were briefly mentioned when discussing its disadvantages. Fundamentally, as an AI-based text search technology, TAR currently faces minimal legal regulation, creating a situation where its application lacks legal basis.

According to the author's narrative, TAR's ultimate goal in legal technology is to "completely liberate human hands." However, when searching for documents, AI does not pre-screen internet files to determine which are public and which are private. Without human intervention, this could significantly threaten internet users' privacy rights.

Second is the conflict between TAR application in the judicial field and judicial personnel ethics. Technology and human rationality often share consistent objectives, which in TAR means finding all required documents as comprehensively as possible. TAR's application in the judicial field primarily reflects an efficiency value pursuing benefit enhancement, which aligns completely with judicial personnel's ethical norms of diligent and conscientious work. However, judicial ethics encompass more than this value; they also include humanistic care and emotional values demonstrated by judicial personnel in legal work. Judicial work, including adjudication, does not mechanically apply legal texts—purely rational thinking cannot solve problems in judicial processes, which rely more on judicial personnel's consideration of legal principles and human sentiments. However, texts collected by TAR technology are screened according to uniform standards. When judicial personnel review and compare relevant precedents, they often develop fixed thinking patterns about cases due to prior precedents, potentially overlooking the particularities of individual cases. In manual review, although collected documents may not be as comprehensive as TAR's, human review based on inner emotions and value choices only retains cases most similar to the pending case in terms of factual and legal considerations, rather than retaining all cases meeting certain fixed standards. This provides precedent references for judicial personnel while avoiding prejudgment. Compared with manual review, although TAR may achieve higher precision and efficiency ratios in document finding, the public may not trust decisions made based on purely rational thinking, ultimately undermining judicial credibility.

6. Understanding and Reflection on TAR Technology

First, this reflection does not support complete automation of TAR technology that would further remove human intervention, as this would mean humans could only passively accept TAR's feedback results during document review. Therefore, human intervention must be implemented in TAR application processes. Second, this reflection supports the limited application of TAR technology in the judicial field. Document review is indeed complex and inefficient; introducing TAR technology into legal document review can effectively improve work efficiency. However, given potential legal issues from TAR promotion,

TAR technology must be combined with manual review methods. Documents screened by TAR technology should undergo re-examination to select precedents with genuine relevance to the case being handled, providing references for legal professionals while minimizing influence on judges.

The above represents this reflection's thoughts on the chapter's content. In summary, technological progress has profoundly impacted social life, and the legal field is no exception. Beyond handling core issues, delegating simpler and repetitive tasks to algorithms is a sound approach. However, algorithmic application must also be regulated by law to better serve social life.

Note: Figure translations are in progress. See original paper for figures.

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