WestSearch, the WestlawNext™ search engine, is the result of five years of research and development dedicated to one goal: to effectively search the world’s most comprehensive collection of legal content—some 2.2 million documents—and then efficiently deliver the documents to help you answer your legal questions.

WestSearch combines sophisticated information retrieval, natural language processing, and machine learning to take maximum advantage of the editorial enhancements West editors have added to legal documents since 1876 and the descriptive metadata generated around legal documents by West editors and computational processes. This intricate melding of technology and human interaction brings together epistemological (i.e., relating to the nature and scope of knowledge) and ontological (i.e., relating to categorization and relationships between concepts) approaches to legal documents to present a complete picture of the law. Yet, as intricate and complex as WestSearch may be behind the scenes, it still provides you with a simple and easy-to-use search engine.

**Information Retrieval**

When you run a search at the WestlawNext home page (Figure 1), WestSearch examines all core legal documents on WestlawNext. Document retrieval is no longer dependent on specifying a database; instead, the WestSearch federated search simultaneously searches all core legal content for the jurisdiction you choose.

Core legal content on WestlawNext comprises 12 categories:

- **Cases.** All federal and state cases reported in West’s® National Reporter System®, as well as unreported cases.
- **Statutes and Court Rules.** United States Code Annotated® (USCA®) and rules of procedure for the
federal courts, plus statutory compilations and court rules for all 50 states and the District of Columbia.

- Regulations. Code of Federal Regulations (CFR) and compilations of state administrative rules and regulations for all 50 states and the District of Columbia.

- Administrative Decisions and Guidance. Adjudications by federal and state administrative agencies, advisory opinions, Treasury Department and Internal Revenue Service materials, and other administrative materials providing guidance on state and federal rules and regulations.

- Trial Court Orders. Final judgments and other court orders issued by state trial courts.

- Secondary Sources. Analytical resources on WestlawNext include comprehensive legal encyclopedias such as Corpus Juris Secundum® (C.J.S.®); American Law Reports (ALR®); the American Jurisprudence (Am Jur®) family of products; federal treatises such as Federal Practice and Procedure® (Wright & Miller) and Wharton's Criminal Evidence; restatements of the law and model jury instructions; state-specific texts and practice manuals; topical treatises, law reviews and bar journals; and legal newspapers.

- Briefs. Briefs and petitions filed with state and federal appellate courts.

- Pleadings, Motions, and Memoranda. Pleadings, such as complaints and answers; motions; and memoranda filed in state and federal trial courts.

- Expert Witness Testimony. Affidavits, depositions, and transcripts of trial testimony of expert witnesses from state and federal courts.

- Jury Verdicts and Settlements. Summaries of jury verdicts, judgments, settlements, and arbitrations filed in state and federal courts.

- Pending and Proposed Legislation. Session laws enacted by, and proposed legislation pending in, the current Congress and state legislatures.

- Pending and Proposed Regulations. Proposed and final rules and regulations reported in the Federal Register and issued by state administrative agencies.

WestSearch searches all documents in these 12 content categories simultaneously. The comprehensive result is organized by core content category (see Figure 2), making it easy to browse. You can click a content category in the left column of the result page (e.g., Cases) to display the result page for that content category.

**Note** WestSearch is able to recognize what you are looking for based on what you type in the text box at the top of a page.

- If you type descriptive terms in the text box at the top of a core legal content category page (e.g., Secondary Sources), WestSearch runs a federated search of all content listed on that page.

- If you type descriptive terms in the text box at the top of a nonlegal category page (e.g., News), WestlawNext runs a federated natural language search of the content listed on the page.

- If you type a Boolean search in the text box—a search that includes a grammatical (e.g., /p), numerical (e.g., +3), or BUT NOT connector (%); a root expander (!) or universal character (*); or a field restriction (e.g., sy,di(breach! /p “duty to warn”))—WestlawNext processes it as a Terms and Connectors query.

- If you type fi: followed by a citation, e.g., fi: 125 sct 2655, in the text box, WestlawNext recognizes it as a Find request and retrieves the document with this citation.

- If you type kc: followed by a citation, e.g., kc: 93 sct 1817, in the text box, WestlawNext recognizes it as a KeyCite® request and retrieves the KeyCite result for the document with this citation.
Natural Language Processing

The WestSearch federated search employs natural language processing to retrieve relevant documents. Natural language processing takes a plain-English description of an issue and converts it into computer language to search for relevant documents—and vice versa so the computer speaks in human terms.

WestSearch natural language processing builds on the Westlaw® Natural Language search method with which you may already be familiar. It removes common terms such as is and for; generates variations of terms, such as defame, defamed, and defaming for defamation; and identifies legal phrases and other concepts, such as legal citations or topic and key numbers.

Natural language processing on WestSearch, however, represents a further evolution. The implementation of improved knowledge-based engineering, statistical classifications, and machine-learning techniques allows WestSearch to break down the words and phrases in legal documents; recognize the syntactic relationships between them, including those involving legal abstractions; and analyze the granularities in a document to determine the meaning of the whole.

The artificial intelligence of WestSearch enables it to better understand the words and phrases you use for searching, including the legal concepts for which they stand, and to know how to associate the words, phrases, and concepts in a meaningful way to retrieve relevant documents. You can’t chat with your computer yet, but it is learning the basics of written and spoken language so you can communicate with it in a natural way.

Machine Learning: The WestSearch Algorithm

While any adequate federated search engine with natural language processing can search a broad collection of content and deliver comprehensive results, WestSearch stands out because it combines these processes with a complex algorithm that determines the rankings of your search results and pushes better results to the top of your result list based on the metadata and past knowledge attached to the documents, rather than by a simple ranking based on term location or date.

Instead of simply getting results with a term frequency that matches the key words in a search query, WestSearch runs an algorithm of more than 60 queries that determine alternate terms that may apply to an issue, the legal documents most frequently cited for that issue, and authoritative analytical resources that discuss the issue.

The WestSearch algorithm unites the editorial enhancements and the metadata generated around the legal documents on WestlawNext—by both human editors and computational processes. Some examples of significant elements in the algorithm include the following:

• The West Key Number System™. For more than 100 years, West attorney-editors have read, summarized, and classified points of law found in court decisions, thereby conceptualizing and arranging the entire body of American case law in an orderly and logical way. WestSearch uses this analysis, including the key number classifications and headnotes—which may include synonyms and other terms that don’t appear in the opinion—to draw connections between documents and retrieve highly relevant documents.

• Editorially created statute indexes. West attorney-editors also add synonyms and related terms to indexes for the USCA and state statutory codes on WestlawNext. WestSearch uses the organization and terms of the indexes to identify correlated terms and relationships between issues and thereby retrieve relevant documents.

• The KeyCite citation research service. The citing references of KeyCite cumulate in a web of interlocking documents providing a network of federal and state cases in West’s National Reporter System, as well as more than 1 million unpublished cases; federal and state statutes and administrative codes; and thousands of analytical resources. WestSearch analyses the connections between relevant documents to bring the most-cited documents to the top of your WestlawNext result list.
• Secondary resources. WestSearch scans the thousands of authoritative treatises, practice guides, and legal encyclopedias on WestlawNext to detect citations and legal terms and phrases applicable to your search terms and concepts. In addition, since many of these resources are jurisdiction specific, WestSearch can retrieve discussions of primary law in secondary resources specific to a jurisdiction and bring them to the top of your WestlawNext result list.

• Document usage patterns. WestSearch integrates the meaningful interactions between a user and a document. For example: How often have judges, attorneys, and legal scholars cited a document while discussing an issue? How often have WestlawNext users printed a document? When did they view a KeyCite result for a document? Did they save a document to a folder or add a note to the document? These are all actions that represent significant user–document interactions. WestSearch aggregates these usage patterns to determine which documents strongly correlate with specific terms and with other documents. This helps WestSearch determine what kinds of documents users are searching for and what documents they regard as valuable within the search context. Documents with usage patterns that indicate they are valuable—those with content most highly related to your issue—are brought to the forefront of your search results.

Mike Dahn, vice president for New Product Development at Thomson Reuters (Legal), has said that WestlawNext ends “the tyranny of the key word.” Relevancy is not based on the frequency of the terms you select, their co-occurrence, or their proximity in a document, but on an algorithm that takes into account your search query, as well as metadata associated with all core legal documents on WestlawNext. WestSearch then presents the documents that appear most relevant to the legal issue or issues behind your query.

The algorithm retrieves legal documents of high recall, as well as high precision. Recall—a measure of completeness—is delivered by the metadata. Relevant documents are retrieved whether they contain your key words or not. Your search is, therefore, much broader than previous searches on Westlaw that were restricted to key word occurrences. To counter these broad results, WestSearch uses document usage patterns to deliver precision—a measure of exactness or accuracy. Recall and precision together retrieve not only relevant documents but also the documents important to you.

Putting It All Together: WestSearch on WestlawNext

By combining a complex information retrieval method that simultaneously searches all core legal content with the knowledge-based engineering and human interaction of natural language processing and an intricate algorithm designed to take advantage of a machine’s ability to interpret human behavior based on empirical data, WestSearch retrieves the most relevant documents and ranks them by their importance.

WestSearch on WestlawNext takes the guesswork out of legal research. You don’t have to try and game the system by using key words you think—or hope—the search engine wants. Instead, WestSearch works best when you simply describe exactly what you want. The algorithm fills any gaps in your description with knowledge gathered from the human enhancements added by West’s attorney-editors and the expert analysis found in secondary resources on WestlawNext—plus machine-learned recognition of document usage patterns—to deliver the documents you are looking for.

This is an important reason why WestlawNext is said to put the human back onto center stage in legal research. Together, the user-centered design of WestSearch and the easy-to-use WestlawNext interface provide you with confidence that you have found the documents you need to understand the legal issues, draft documents for your client, or prepare for trial or appeal.