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JUNE 2026

WHITEPAPER

A Practical Framework for Using AI in Patentability Searches

Designed for IP Counsel, Patent Teams, and Innovation Leaders

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Executive Summary

Patentability search has become increasingly difficult to scale economically and operationally. IP teams today face rising filing volumes, faster innovation cycles, growing prior-art complexity, and continued pressure to reduce cost and turnaround time, without compromising search quality or defensibility.

Artificial Intelligence is emerging as a response to these operational challenges. AI-enabled search systems can improve semantic discovery, automate repetitive workflows, accelerate document analysis, and help patent teams process significantly larger volumes of technical information more efficiently. Yet adoption without governance creates new risks, and many IP counsel and patent leaders remain uncertain about:

- Where AI actually adds value
- Whether AI compromises search quality
- How much human oversight is still needed
- Which parts of the workflow should remain expert-driven
- Whether AI meaningfully reduces cost and turnaround time
- How to adopt AI without increasing legal risk

This whitepaper presents a practical framework for integrating AI into patentability search workflows.

Rather than positioning AI as a standalone technology trend, this framework focuses on the operational realities of patent searching:

- Where AI provides measurable efficiency
- Where human expertise remains essential
- How to balance cost, quality, and speed
- How different search matters require different levels of automation

Accordingly, this paper introduces a practical three-tier operating model:

- Manual expert-driven searches for strategically critical and high-risk matters
- AI-assisted workflows for most standard corporate patentability programs
- Selective AI-driven models for high-volume screening and early-stage evaluation workflows

Manual Searches | **AI-Assisted Search** | **AI-Driven Search**

The objective is not full automation. It is to apply AI selectively where it improves scalability and operational efficiency while preserving expert-led legal and technical judgement.

Why Patentability Search Needs Reinvention

Traditional patentability search workflows were built for a lower-volume innovation environment.

Today, IP teams face the need to manage faster R&D cycles, rising filing volumes, increasingly complex prior-art landscapes, and tighter turnaround expectations, often without proportional increases in budget or search resources.

At the same time, the scale and complexity of searchable prior-art have increased significantly. Modern patentability searches frequently require analysis across:

- Millions of patent records
- Multi-language documents
- Non-patent literature
- Cross-domain technologies
- Emerging AI-generated disclosures
- Increasingly overlapping technical concepts

The challenge is no longer simply the volume of data. It is the growing complexity of efficiently and reliably identifying relevant prior-art.

Traditional keyword-centric search approaches also face increasing limitations. Relevant prior-art may use entirely different terminology, emerge from adjacent technical domains, or remain buried within large patent families and semantically similar disclosures. As a result, search quality often depends heavily on the experience and intuition of the search professional, making workflows difficult to scale consistently.

At the operational level, this creates growing pressure on patent teams:

- Higher review burden
- Longer search cycles
- Increased reviewer fatigue
- Difficulty scaling high-quality searches economically
- Greater pressure to balance cost, speed, and defensibility

This is the operational gap AI is attempting to address.

The Core Business Problem

At its core, every IP counsel and patent professional is trying to answer a fundamental question: 'How can organisations perform high-quality patentability searches faster, at lower cost, and at greater scale, without materially increasing legal or technical risk?'

AI-enabled patentability search systems attempt to address this challenge through capabilities such as:

- Search automation
- Semantic search
- Intelligent ranking
- Automated patent analysis
- Iterative relevance learning
- Workflow optimisation

However, not every patentability search should be fully AI-driven.

The appropriate search model depends on several factors, including technology complexity, filing importance, litigation sensitivity, budget constraints, required turnaround time, and portfolio scale.

This is why a one-size-fits-all approach to AI adoption is often ineffective. The most practical implementation strategies align the level of automation with the sensitivity, complexity, and business importance of the search matter itself.

A Practical Three-Tier Framework

Not all patentability searches carry the same level of legal, technical, or commercial sensitivity. Rather than forcing every search into one approach, organisations should align the workflow model with business risk, filing importance, complexity, and cost expectations.

The framework below outlines three practical operating models for AI-enabled patentability searching.

Model	Best Use Case	Human Involvement	Cost Profile	Speed	Operational Risk	Recommended Adoption Strategy
Manual Search	High-value inventions, litigation-sensitive patents, niche technologies, complex biotech and chemistry inventions	High	High	Slow	Lowest	Retain for strategically critical matters
AI-Assisted Search	Standard corporate filing programs requiring balanced quality and efficiency	Medium	Balanced	Fast	Controlled	Best starting point for most IP teams
AI-Driven Search	High-volume screening, portfolio analytics, and invention intake filtering	Low–Medium	Lower per-search at scale	Very fast	Requires governance	Elevate's agentic AI, ELMA[1], automates multi-stage workflows with defined human validation checkpoints and governed review controls

The key strategic mistake many organisations make is attempting to over-automate high-sensitivity patent work while underutilising AI in scalable, lower-risk workflows.

The most effective implementation strategies align the level of automation with the legal, technical, and commercial sensitivity of the search matter.

[1]ELMA (ELM Agent) is Elevate's agentic AI platform for legal work, combining AI-powered automation with domain expertise to support complex workflows. Read more, https://elevate.law/elma/

When Manual Search Still Makes Sense

Despite advances in AI, there are situations where manual expert-driven searches remain the safest approach.

Recommended Use Cases

Manual searching is still preferred for:

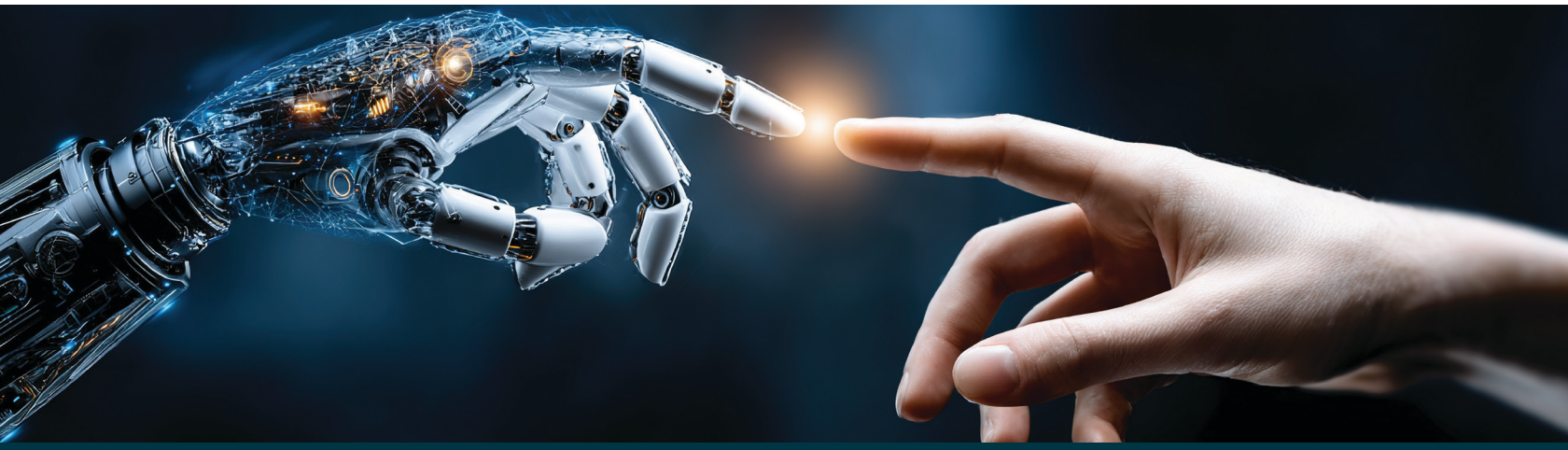
- Strategically important inventions
- Litigation-sensitive patents
- Standard-essential technologies
- Highly specialised scientific inventions
- Complex biotech and chemistry inventions
- Cases involving nuanced claim interpretation
- Pre-litigation or invalidity-sensitive searches

Why Human Expertise Still Matters

AI can significantly improve search efficiency, but it still faces limitations in areas requiring contextual legal and technical judgment. These limitations may include:

- Nuanced claim interpretation
- Legal reasoning
- Inventive step and obviousness analysis
- Functional ambiguity
- Broad conceptual claims
- Strategic prosecution context

For high-sensitivity matters, experienced patent professionals remain indispensable for interpreting search results within the broader legal, technical, and strategic context of the invention.



Practical Guidance for IP Counsel

For strategically critical matters, AI should augment expert workflows rather than replace them. Instead, organisations can still use AI selectively to:

- Improve search coverage
- Accelerate document review
- Reduce repetitive effort
- Assist with ranking and summarisation

However, expert-led legal analysis and final patentability assessment should remain human-controlled.

AI-Assisted Search: The Most Practical Starting Point

For most corporate IP departments, AI-assisted patentability searching is currently the most practical and commercially viable operating model.

Rather than replacing patent professionals, this model keeps humans in control while allowing AI to optimise operational efficiency.

This approach is gaining traction because it addresses the two biggest concerns IP counsel typically have fear of losing search quality and pressure to reduce cost and turnaround time.

Unlike fully automated search models, the AI-assisted workflow is well-suited for standard corporate patentability programs where organisations seek both operational efficiency and defensibility.

Human-in-the-Loop (HITL) systems provide a critical framework for integrating AI into patent law without compromising legal standards. These systems ensure that AI outputs are rigorously reviewed and validated by patent professionals. For example, embedding-based AI models excel in conducting semantic searches across multilingual and multi-domain patent databases.[2]

-World Patent Information, 2025

[2]*Read more: https://www.sciencedirect.com/science/article/abs/pii/S0172219025000080*

A Practical AI-Assisted Workflow

The table below outlines a practical operating framework in which AI augments the operational stages of patentability searching, while human experts retain responsibility for legal interpretation and strategic decision-making.

Step	Workflow Stage	Human Expert Role	AI-Assisted Role	Business Value	Human Oversight Required?
1	Understand the Invention	Review disclosure, identify inventive concept, define novelty drivers, and understand claim scope and technical differentiators	Structure invention disclosures, extract technical terminology, generate summaries, and identify related concepts	Faster invention understanding and improved search preparation	Yes, critical for legal and technical interpretation
2	Create Search Strategy	Define search direction, validate terminology, and determine strategic search scope	Generate keywords, semantic synonyms, CPC/IPC classes, functional equivalents, alternative claim language, cross-domain terminology	Reduces query preparation time and improves search coverage	Yes, strategy validation required
3	Execute Semantic Search	Validate search relevance and ensure technical alignment	Perform semantic search, vector similarity search, keyword expansion, conceptual matching, cross-domain discovery	Improved recall and hidden prior-art discovery	Yes, relevance confirmation required
4	Result Ranking and Filtering	Review top references, assess novelty impact, and shortlist critical documents	Rank documents by relevance, cluster similar patents, remove duplicates, summarise patents, extract claims, and highlight matching passages	Reduced review burden and improved analyst efficiency	Yes, AI ranking is not legal judgment

Step	Workflow Stage	Human Expert Role	AI-Assisted Role	Business Value	Human Oversight Required?
5	Iterative Search Refinement	Mark references as relevant/irrelevant, guide refinement direction	Learn from reviewer feedback, re-rank results, refine semantic models, suggest new queries and search pathways	Adaptive search quality improvement and improved precision	Yes, expert feedback drives optimisation
6	Prior-Art Analysis	Assess novelty, inventive step, technical overlap, and legal significance	Generate summaries, compare references, identify overlapping features, and group related patents	Faster technical analysis and improved consistency	Yes, legal conclusions require expert review
7	Mapping and Claim Charting	Validate claim mapping and patentability conclusions	Highlight matching text, generate mapping tables, draft claim charts, and preliminary reports	Reduced documentation effort and reporting time	Yes, final validation required
8	Final Patentability Opinion	Deliver legal opinion, risk assessment, and filing recommendations	Assist with report drafting and evidence organisation	Faster report preparation and operational efficiency	Fully human-controlled final sign-off

This workflow demonstrates that AI creates the highest value in repetitive, data-intensive, and pattern-recognition-heavy stages of patentability searching, while human experts remain essential for legal interpretation, strategic reasoning, and final decision-making.

Where AI Creates the Highest ROI

AI does not create equal value across all stages of patentability searching. In practice, the highest operational ROI is typically achieved in workflow stages that are repetitive, data-intensive, and heavily dependent on information retrieval and analysis speed.

The table below outlines where AI currently delivers the most meaningful operational impact:

Workflow Stage	AI Value
Query Expansion	Very High
Semantic Search	Very High
Result Ranking	High
Patent Summarisation	High
Deduplication	High
Mapping Assistance	Medium-High
Final Legal Opinion	Low
Obviousness Determination	Medium (human-led)

The Practical Takeaways

- Use AI strategically for operational efficiency
- Use human expertise for legal judgment

Governance and Controls for Safe AI Adoption

One of the biggest concerns for IP counsel is reliability.

AI can significantly improve operational efficiency, but safe implementation requires governance, validation, and clear workflow controls.

Recommended Governance Models:

Human-in-the-Loop Validation

Every final patentability conclusion should be reviewed by patent counsel, senior search professionals, and domain experts.

AI outputs should support expert analysis, not replace legal judgment or determine final legal conclusions.

Tiered Search Policies

Not all patentability searches require the same level of automation.

Example:

Invention Type	Recommended Model
Strategic Platform Patents	Manual + AI Support
Standard Corporate Filings	AI-Assisted
Bulk Invention Disclosures	AI-Driven Screening
Early-Stage Idea Evaluation	AI-Driven

This prevents over-automation of high-risk matters while allowing scalable use of AI where operational risk is lower.

Auditability

AI systems should provide:

- Search traceability
- Query transparency
- Relevance reasoning
- Ranking explainability

These capabilities are especially important for defensibility, internal review, litigation-sensitive matters, and examiner discussions.

Secure Data Handling

Patentability searches frequently involve confidential invention disclosures and commercially sensitive technical information.

IP-sensitive disclosures should not be uploaded into uncontrolled public AI tools.

Organisations should evaluate confidentiality protections, model training policies, data retention practices, and enterprise AI controls.

This is a significant legal, operational, and IP protection consideration.

At Elevate, AI governance frameworks for legal and IP workflows incorporate audit trails, validation checkpoints, and governed deployment models designed to support defensibility, operational accountability, and secure handling of sensitive invention and legal data across AI-enabled workflows, including our AI-enabled entity management solution[3].

[3]*Read more: https://elevate.law/entity-management/*

A Realistic View of AI Limitations

IP counsel should approach AI adoption realistically.

AI can significantly improve operational efficiency in patentability searching, but it is not a magic replacement for patent expertise. Current limitations include:

Limited Legal Reasoning

AI can summarise patents and identify semantic similarities effectively. However, novelty, inventive step, and patentability assessments still require contextual legal and technical interpretation.

Hallucinations

Generative AI systems may:

- Misstate technical details
- Create unsupported conclusions
- Over-summarise complex disclosures

Validation and expert review, therefore, remain essential.

Contextual Ambiguity

AI can struggle with:

- Broad claims
- Functional claiming
- Means-plus-function interpretation
- Nuanced claim construction

Semantic similarity alone does not determine legal relevance or patentability risk.

Explainability Gaps

Some AI ranking and retrieval systems may behave like 'black boxes'.

However, counsel often need explainable reasoning for internal review:

- Litigation support
- Examiner discussions
- Client reporting.

Lack of explainability can create challenges for defensibility and enterprise adoption.

Practical Cost Optimisation Opportunities

For many organisations, the primary drivers of AI adoption in patentability searching are operational efficiency and cost optimisation.

Here are the most practical areas where AI reduces cost without materially increasing risk.

Faster First-Pass Searches

AI can rapidly eliminate clearly irrelevant results and prioritise potentially relevant disclosures for expert review. This helps reduce:

- Initial screening effort
- Manual filtering time
- Search cycle duration

Lower Review Burden

Automated summarisation can significantly reduce manual document review effort and reading time. This is especially valuable for large patent families, software patents, and high-volume filing programs.

Scalable Multi-Country Searching

AI improves cross-language and cross-jurisdiction search efficiency across global patent landscapes.

High-Volume Invention Intake Screening

AI-driven screening is particularly useful for:

- Corporate innovation programs
- R&D idea filtering
- Early-stage patentability assessment

Reduced Repetitive Work

AI automates several low-value repetitive activities, including deduplication, keyword expansion, initial clustering, and preliminary mapping.

This improves operational efficiency and allows patent professionals to focus more time on high-value legal and technical analysis.

What an Ideal Future Patentability Workflow Looks Like

The most realistic future for patentability searching is not 'fully autonomous AI patent search.' The most effective future model is governed collaborative intelligence, where AI and human experts operate together within structured, expert-led workflows.

The Emerging Best-Practice Model

AI Handles	Human Experts Handle	Hybrid Model Combines
Large-Scale Searching	Legal Interpretation	AI Scalability
Semantic Analysis	Novelty Analysis	Human Judgment
Query Expansion	Obviousness Reasoning	Operational Efficiency
Document Ranking	Strategic Decisions	Legal Defensibility
Patent Summarisation	Risk Assessment	
Data Clustering	Final Patentability Opinions	
Preliminary Mapping		

The future competitive advantage is unlikely to come from automation alone. It will come from how effectively organisations combine AI-driven efficiency with expert-led judgment and governance.

At Elevate, our agentic AI, ELMA[4], supports this model by automating multi-stage legal and IP workflows while maintaining structured human validation checkpoints and governed review controls.

[4]*Read more: https://elevate.law/elma/*

Recommended Adoption Strategy for IP Counsel

Organisations typically achieve the best outcomes when AI adoption is implemented incrementally rather than through large-scale workflow replacement.

A phased approach allows IP teams to improve operational efficiency progressively while maintaining governance, validation, and expert oversight.

Phase 1: Controlled AI Assistance	**Phase 2: Workflow Integration**	**Phase 3: Selective AI Automation**
Start with AI-assisted capabilities such as:	Integrate AI more deeply into operational workflows, including:	Use AI-driven workflows selectively for:
▪ Semantic search	▪ Search refinement	▪ Bulk screening
▪ Patent summarisation	▪ Result clustering	▪ Early-stage evaluations
▪ Query generation	▪ Mapping workflows	▪ Portfolio analytics
▪ Ranking assistance	▪ Reporting support	▪ High-volume intake
Maintain full expert-led review and validation across all patentability conclusions.	At this stage, introduce governance controls.	Retain human checkpoints and expert-led validation for higher-sensitivity legal and technical decisions.

Key Strategic Takeaways

For IP counsel evaluating AI adoption, the key question should not be:

'Can AI replace patent professionals?'

The better question is: 'Which parts of the patentability workflow should be optimised using AI, and which parts should remain expert-driven?'

The most successful organisations will be those that:

- Use AI pragmatically rather than aggressively
- Optimise repetitive operational tasks
- Preserve expert-led legal and technical oversight
- Implement governance and validation frameworks
- Align workflow models to risk profiles

AI is not eliminating patent expertise. It is changing where human expertise creates the greatest operational and strategic value.

Organisations that successfully combine AI efficiency with expert judgment are likely to achieve:

- Faster turnaround times
- Improved scalability
- Better cost efficiency
- Stronger search coverage
- More strategic IP operations

without materially compromising quality, reliability, or defensibility.

The Way Forward

AI-enabled patentability searching is no longer experimental. It is becoming an operational necessity for organisations managing increasing filing volumes, faster innovation cycles, cost pressure, and global patent landscapes.

However, successful implementation requires a balanced and practical approach.

The most effective model today is typically neither fully manual nor fully autonomous. It is a carefully governed hybrid model where:

- AI improves efficiency, scalability, and discovery
- Human experts provide legal judgment and strategic oversight

For IP counsel, the objective should not be to 'adopt AI' simply as a technology trend.
The objective should be to build a smarter, faster, and more scalable patentability search function while maintaining confidence in legal and technical quality.

That is where AI creates meaningful business value in patentability searching.

To discuss practical approaches for implementing AI-assisted and AI-driven patentability search workflows in your IP teams, connect with our experts at Elevate.

Embedding-based AI models excel in conducting semantic searches across multilingual and multi-domain patent databases. As demonstrated in World Patent Information 2023, embedding-based approaches outperform traditional keyword searches by identifying semantically relevant prior art that would otherwise be overlooked. However, the involvement of human experts remains indispensable for assessing the legal relevance and jurisdiction-specific applicability of AI-identified prior art.[5]

-World Patent Information, 2025

[5]*Read more: https://www.sciencedirect.com/science/article/abs/pii/S017221902500008*

About the Author

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Dhananjay Kumar Das (aka DJ) is Director at Elevate, helping global corporations, law firms, startups, licensing companies, and research institutes solve business-critical challenges through customised intellectual property solutions across the patent and trademark lifecycle.

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With over a decade of experience in IP consulting and analytics, DJ advises global customers on transforming complex patent data into actionable business strategies. His expertise spans portfolio mining, infringement analysis, standard essential patent (SEP) intelligence, and patent transaction support.

DJ has developed the SEP Hotline, a centralised platform aggregating essential patent data from global Standard Setting Organisations. He has also contributed to the development of proprietary IP tools, including PatGPT.ai, applying his operational insights and IP expertise to create scalable, customer-focused solutions.