deepset

Transform Complex Document Analysis Workflows with Generative AI

Increase efficiency and revenue with AI-powered, expert-assisted Intelligent Document Processing (IDP) with LLMs

Table of Contents

Executive Summary

In today's data-intensive business environment, the ability to quickly process, analyze, and extract insights from varied and complex documents is critical to making informed decisions – whether evaluating investment and lending opportunities, writing business memos, assessing insurance claims, reviewing legal contracts, analyzing customer feedback, or conducting regulatory compliance audits.

Intelligent Document Processing (IDP) powered by Large Language Models (LLMs) transforms information into actionable intelligence, delivering three key business advantages:

Efficiency

IDP with LLMs and a human-in-the-loop approach can process documents of all types 60-70% faster than a human can do alone.*

Accuracy

LLM-augmented automated document processing is very thorough and never tires of repetitive tasks. This makes it more likely to capture all the information contained in your documents and provide the basis for a well-documented analysis to inform business decisions and mitigate risk.

Revenue growth

Automating manual steps removes bottlenecks and increases the throughput of complicated document analysis, allowing organizations to redirect human expertise to higher value decisions, handle more cases in less time, and generate additional revenue.

Traditional IDP solutions based on machine-learning and robotic process automation (RPA)–from data ingestion to information extraction–have left much to be desired, with vendors offering tools that are limited in scope and operation.

But thanks to recent advances in generative AI, today's IDP is revolutionizing document processing, offering unprecedented accuracy and insight over an increasingly diverse set of documents. IDP with LLMs is changing document processing across industries like finance, healthcare, legal, and more, accelerating workflows and revealing hidden information from vast dataroom repositories.

This white paper explores how LLM-powered IDP is transforming how enterprises handle analysis-intensive tasks across industries and the substantial business outcomes they are achieving through its implementation.

*Based on deepset customers that were able to save 40%+ time on document processing with LLMs

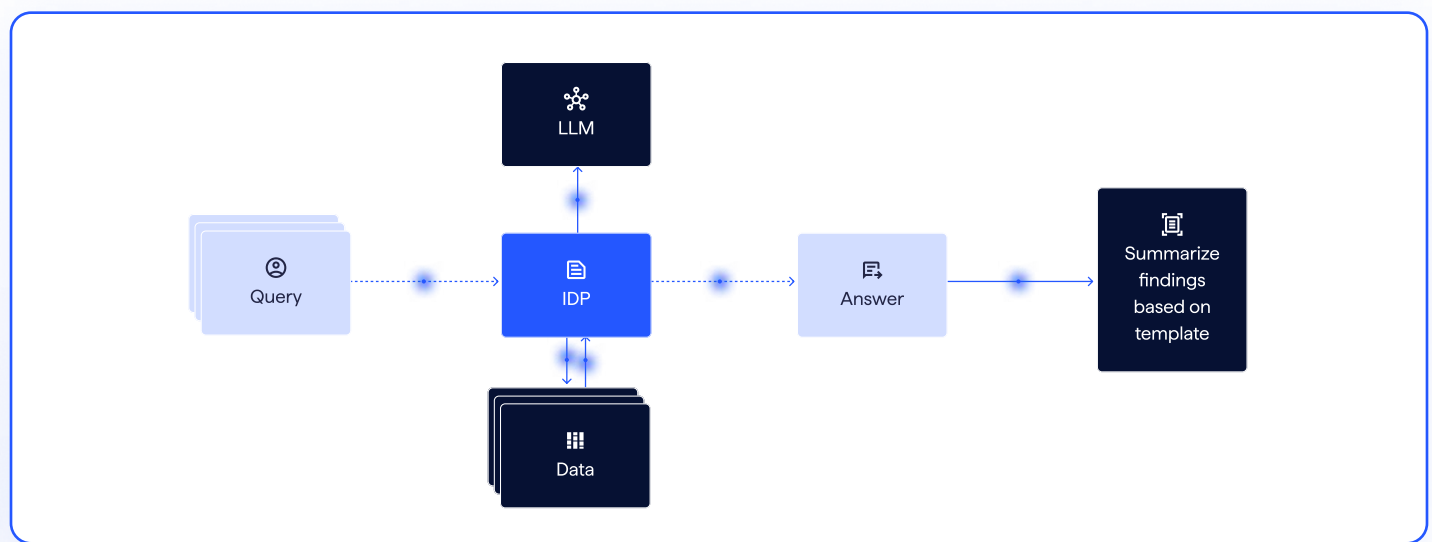deepset

IDP Today: Challenges and Opportunities

Intelligent Document Processing (IDP) is software that analyzes business documents to extract meaningful information. Early IDP tools were limited by the technology of their time and could only handle standardized documents that followed specific templates. Unstructured or noisy data was beyond the scope of these tools. Modern IDP solutions powered by generative AI can handle complex documents and adapt to different document types, formats, and structures.

For example, in financial lending, the latest generation of IDP tools can simultaneously process loan applications, analyze income verification documents, review credit reports, evaluate property appraisals, and assess risk factors from multiple sources to make comprehensive lending recommendations.

Rather than rigidly extracting pieces of information, these systems can understand the context and relationships between data points, enabling them to answer questions about document content. This advanced capability is made possible with LLMs and the underlying compound AI systems they run on to transform multi-step workflows with unprecedented speed, accuracy, and growth potential.

IDP with LLMs

LLMs are computational beasts. They have incorporated so much data into their billions of parameters that they can not only converse like humans, but also think like humans by creatively applying higher-level reasoning skills to changing inputs. As a result, LLMs can understand nuanced context, identify implicit relationships, and even draw conclusions from information scattered across multiple documents. It's easy to see how these skills make a difference when it comes to IDP.

When a credit analyst reviews a loan application, they're not just looking for specific numbers – they're considering how income relates to debt, what payment history might indicate about creditworthiness, and how employment stability might affect repayment capacity. LLMs can now do the same, but at a much faster pace.

The key to using LLMs effectively is structuring document analysis workflows in a **Compound AI** system. This forms the basis of a Gen AI IDP application that can be easily customized to your specific needs. Successful implementations break down complex tasks into comprehensive query sets. These query sets encode the implicit questions that experienced analysts consider when reviewing documents. The LLM systematically addresses each query and provides referenced, verifiable answers.

Multimodal IDP

It's not just the complexity of human language that has traditionally challenged IDP solutions. The multimodal data in most enterprise documents has also made it difficult to build comprehensive document processing solutions. Modern AI has overcome these challenges through multimodal training. It can understand documents holistically, such as the loan applications, where different textual and visual elements must be considered together to draw conclusions.

Multimodal AI systems are a game-changer for real-world applications. For example, when analyzing a commercial real estate portfolio, the LLM simultaneously processes:

- Rental income tables
- Occupancy rates
- Floor plans
- Photos and images
- Property condition assessments

The system doesn't just extract this information – it synthesizes it into a coherent analysis, much like an experienced real estate analyst would. This comprehensive understanding enables more accurate valuations and risk assessments than ever before possible with automated systems.

IDP and Industries: Benefits and Use Cases

The impact of IDP is particularly profound in industries where document analysis is a critical part of daily operations, such as:

Financial Services

- Analysts can process lengthy documents such as tax returns, insurance policies, and market research in minutes instead of days.
- LLMs extract key metrics, identify trends, and flag potential concerns, while maintaining clear references to source documents for verification.

Legal Services

- Law firms streamline their M&A due diligence processes. What once took teams of lawyers weeks to review can now be completed in days.
- LLMs identify key clauses, potential risks, and compliance issues across thousands of contracts.

Insurance

- Claims processing and underwriting are transformed by automated analysis of contracts, incident reports, medical reports, police records, and policy holder correspondences.
- LLMs help accelerate the claims and underwriting process, automating document review, finding key precedents, ensuring thorough compliance with policy terms and conditions, and identifying potential fraud indicators.

Healthcare

- Comprehensive analysis of clinical trial applicants, medical records, test results, and treatment plans.
- LLMs can identify patterns across patient populations while helping to ensure regulatory compliance and improve care coordination.

Real estate

- Lending and mortgage transactions move faster with automated analysis of surveys, environmental reports, leases, regulations, and financial statements.

- LLMs extract key terms and conditions while identifying potential risks or opportunities in offering individual and commercial real estate products to the right, qualified customers.

Public Sector

- Government agencies efficiently process permit applications, grant proposals, regulatory filings, and citizen requests by analyzing multi-source submissions, historical records, and compliance requirements.

- LLMs streamline government workflows by extracting relevant information from extensive paperwork, ensuring compliance, identifying eligibility criteria, and prioritizing cases based on urgency or need while maintaining transparency in decision-making.

These industries need to extract insights from large volumes of documents accurately and by the book. IDP doesn't replace human expertise, but it helps by doing the time-consuming review and organization of critical information so that experts can focus on analysis and decision-making.

IDP with LLMs: Three Real-World Examples

Let's take a look at three examples from industries that have already implemented high-value applications of LLM-based IDP in production. These examples come directly from our user base.

Example 1: Auditing financial compliance

Insurance companies prepare annual reports on their financial condition and file them with a government agency, which audits them to assess their ability to cover expenses in the coming year. Before using LLM, the government agency would manually review the reports.

Now, experts run hundreds of tests to measure an insurance company's liquidity. The LLM extracts relevant sections of reports and presents them to analysts, who verify the information. This solution speeds up the tedious process of finding information and lets analysts ask more questions.

Example 2: Private equity

A private equity fund hires lawyers to assist with due diligence on potential investments. They review documents, prepare a report, and then present an investment memorandum to the fund's committee. The entire process used to take six to eight weeks. The fund now uses LLMs to manage documents and streamline the diligence process. The LLMs search the data to answer a set of queries defined by the human analysts and lawyers.

Their ability to quickly process large amounts of data helps uncover insights that humans miss, and they significantly increase efficiency. However, human oversight is still required to ensure accuracy. Analysts use the time saved to produce more detailed reports.

Example 3: Real estate underwriting

Banks must perform due diligence on the properties they finance. Previously, analysts extracted relevant information from legal, lease, and environmental reports to underwrite loans and present proposals to investment committees. Proposals were always presented in a standard format.

With LLM's approach to IDP, real estate banks and loan funds can pre-define underwriting criteria using standardized queries and run them against the dataset. As a result, they can present a term sheet to their borrowers faster, close deals ahead of the competition, and deliver returns to their clients sooner.

IDP with LLMs and Analysts: Better Together

The success of an IDP implementation depends on finding the right balance between automation and human expertise. While LLMs can handle repetitive tasks, human expertise remains critical. Experienced professionals ensure the final output meets the highest quality standards.

Initial skepticism from analysts is natural when implementing LLM-based IDP systems. However, experience has shown that analysts appreciate these tools as valuable co-pilots in their document processing workflows. The key is to position LLMs as powerful tools that augment human skills.

> **"At first, our analysts were skeptical,"** says Ralf, CEO of credX, a digital financing platform that facilitates commercial real estate lending by connecting qualified borrowers with lenders. **"but they soon realized that this technology could free them from reading and memorizing tons of documents, allowing them to use their expert knowledge to make faster business credit decisions."**

The future of IDP lies in its use as a valuable complement to human expertise. As IDP technology evolves, we can expect to see more mature applications that facilitate document-intensive workflows while maintaining human oversight. Organizations that successfully implement these solutions will find themselves well positioned to handle the growing volume and complexity of document processing tasks in today's business environment.

IDP in deepset: Build Your Perfect IDP Solution

Traditionally, implementing IDP solutions has meant either using rigid point solutions or engaging in time-consuming development. But with deepset, organizations can build sophisticated, customized IDP workflows without the engineering overhead typically associated with such projects. This is thanks to deepset's recipe for success:

Business outcomes are the northstar.
Productivity, Efficiency
Growth, Accuracy

Services drive your success.
Advisory, Implementation, Optimization, Onboarding, Training

The Platform delivers time-to-value.
AI Orchestration: Build, Test, Deploy, Monitor

1. Focus on Outcomes

We begin with your business goals, not technology. Whether you need to accelerate due diligence, improve risk assessment accuracy, or enhance regulatory compliance, we align our solutions to deliver measurable impact on your key performance indicators. Rather than offering a one-size-fits-all solution, we provide organizations with precisely the tools, components, templates, and custom code that they need to achieve their specific objectives.
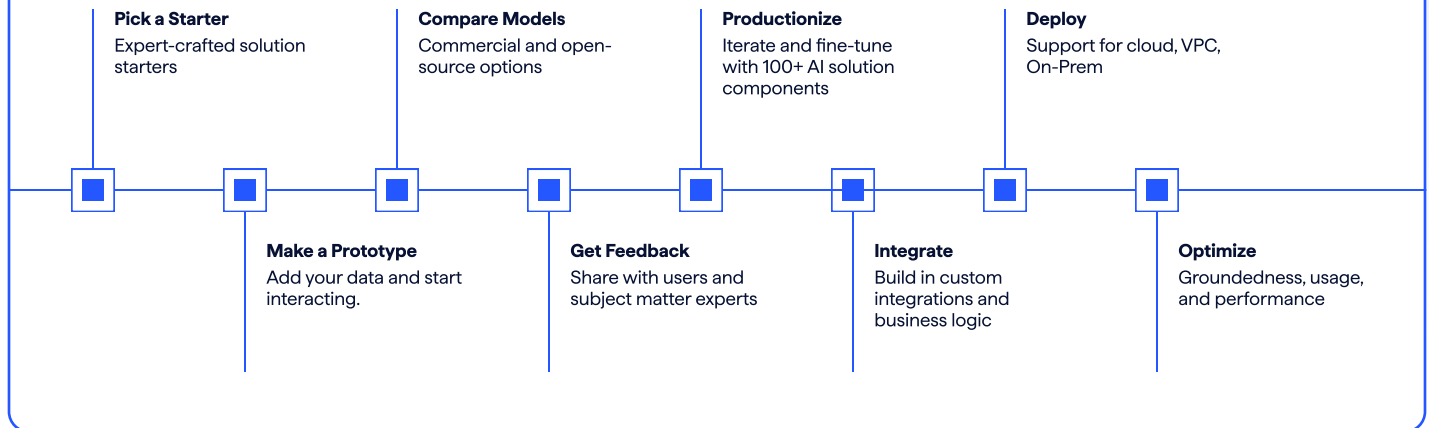
2. Accelerate Success

Our team of AI engineers and consultants help you go from concept to production faster. We work with your teams to translate their domain expertise into specific questions and extraction tasks that guide the document analysis process. We then design optimal IDP workflows and either seamlessly integrate with existing systems or create new products that enhance your offering. This collaborative experience ensures solutions that truly reflect your organization's unique expertise and requirements.

3. Streamline the AI Lifecycle

The deepset AI Platform provides an intuitive and powerful platform for building tailored IDP solutions with unmatched time to market. The platform uses our popular open-source framework for LLM orchestration, Haystack, and augments it with intuitive tooling, workflow builders, and auto-scaling capabilities.

The deepest AI Platform

Orcheastrates the AI Lifecycle into fast, repeatable execution

Pick a Starter
Expert-crafted solution starters

Compare Models
Commercial and open-source options

Productionize
Iterate and fine-tune with 100+ AI solution components

Deploy
Support for cloud, VPC, On-Prem

Make a Prototype
Add your data and start interacting.

Get Feedback
Share with users and subject matter experts

Integrate
Build in custom integrations and business logic

Optimize
Groundedness, usage, and performance

deepset's outcome-first approach combines deep AI expertise with a composable AI orchestration platform that lets organizations build the IDP solution they need without the extensive time and engineering overhead typically associated with such projects.

The platform provides detailed reports with source references, enables human oversight for quality control, and offers modular capabilities to select the right models for specific document types, ensuring both accuracy and efficiency. Its flexibility future-proofs investments by allowing solutions to adapt as IDP technology and business needs evolve.

Best of all, with deepset you can expand to additional mission-critical use cases outside of IDP for your organization, to deliver additional solutions with included frameworks for custom agents, retrieval augment generation (RAG), semantic search, Text-to-SQL, and more.

deepset AI Platform provides:

- Pre-built logic for intelligent document processing and analysis
- Streamlined API connectors to various LLMs and AI models
- Powerful data handling abstractions
- Intuitive interfaces for document upload and processing
- Multi-modal components for text, audio, images, and video
- Customizable query sets that encode analyst expertise
- Built-in evaluation and monitoring capabilities
- Automatic report generation based on templates
- References on all extracted insights

deepset

deepset's outcomes-based approach, expert services, and trusted technology are enabling the next generation of IDP solutions – helping organizations deliver measurable business impact while maintaining the balance between AI automation and human expertise.

Want to see how IDP with LLMs can work for your organization? Book a demo or talk to an expert.