



White Paper

FROM OCR TO IDP:

Why Businesses Must Evolve Beyond
Traditional Automation

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EXECUTIVE SUMMARY

In this digital age, the importance of data cannot be overstated. Data has always been a crucial part of businesses, and the most successful enterprises are those that make the best use of it.

Data processing involves collecting, sorting, storing, and drawing valuable insights from data. Over the years, various systems, from manual to digital, have been employed for this purpose, leading to the development of Optical Character Recognition (OCR) technology as part of document automation. OCR enabled businesses to convert scanned text and images into machine-readable data, which could later be used for analysis and interpretations. Though OCR addressed the major challenges of manual data entry such as reducing errors and the time taken for the process, it still remained a limited technology - designed primarily for text extraction, with little capacity for interpretation, classification, or integration into intelligent workflows.

Businesses across industries deal with vast amounts of structured, semi-structured, and unstructured data from various sources. This has created the need for a more versatile system that can not only recognize text but also understand, categorize, and validate data in alignment with regulatory compliance and operational needs.

After extensive deliberation and experimentation by data experts, Intelligent Document Processing (IDP) emerged. Unlike OCR, which can only scan and recognize text, IDP goes further by understanding what each piece of data represents. For example, while OCR can scan a purchase order and recognize the words and figures, IDP can differentiate between product names, quantities, and prices, and automatically populate these into a company's inventory management system, flagging inconsistencies or triggering restock actions without manual intervention.

This white paper explores the evolution from OCR to IDP, highlighting how IDP combines artificial intelligence (AI), machine learning (ML), and natural language processing (NLP) to enable smarter, end-to-end document automation. It makes the case for why organizations must transition from traditional OCR to IDP to unlock higher efficiency, compliance, and competitive advantage.



OCR & LIMITATIONS OF TRADITIONAL OCR

Optical Character Recognition (OCR) is a text-recognition technology that uses software and hardware, such as scanners or other image-capturing devices, to convert data from scanned documents, PDFs, and photos into machine-readable text that can be edited, searched, and stored digitally. OCR automates data extraction, eliminating the need for manual data entry, which is prone to errors and is less efficient. However, manual intervention is required to verify the accuracy of the results by comparing them with the source documents. Besides the above mentioned, there are other limitations to the traditional OCR technology which are:

- **Accuracy:** OCR systems are generally 99% accurate with high-quality, black-and-white input documents with large, recognizable fonts. However, accuracy decreases with handwritten content, skewed texts, or intricate layouts. OCR also struggles with minuscule texts and low-quality images, affecting the overall quality and integrity of the extracted data.
- **Formatting errors:** OCR systems cannot preserve the original formatting of input documents without third-party software. Elements like font styles, line breaks, graphs, tables, and indentations are often misinterpreted, resulting in incorrect line breaks, misaligned text, and incomprehensible tables. These inconsistencies require manual correction, reducing productivity.
- **Dependency on image quality:** OCR results depend heavily on the quality of the input image. Faded texts, poor lighting, or low-resolution images introduce noise that affects character recognition accuracy. Blurry or distorted images can cause OCR software to misinterpret characters, leading to transcription errors that require human intervention.
- **Language and font support:** OCR systems are built with a set of characters and fonts in their database, limiting their ability to recognize texts, characters, and fonts from other languages. The lack of adaptive algorithms means OCR may fail to identify unique language symbols or misinterpret certain characters, making it challenging for organizations to use OCR for multilingual and diverse document processing.

- **Lack of contextual and semantic understanding:** OCR systems lack machine learning and natural language processing algorithms, rendering them incapable of understanding text nuances and relationships between extracted data. This limitation is evident when companies try to create interconnected knowledge repositories using only OCR platforms, as they can only establish connections using keywords, and not user's search intent.
- **Sensitive information exposure:** Traditional OCR systems may inadvertently upload sensitive information, such as IDs and financial documents, to the software provider's server. OCR cannot distinguish between different types of input documents, making sensitive data vulnerable to cyberattacks and security breaches. Enterprises must ensure secure storage and utilization of such information per GDPR and SOC-2 regulations to avoid heavy penalties.
- **Time and resource intensive:** Integrating OCR software with existing business workflows requires significant investment in time, capital, and human resources. OCR systems need high-quality inputs, necessitating further investment in ancillary applications. Additionally, custom pattern recognition algorithms may be required for unique document formats, and employees need training on the new system.

These limitations make OCR a redundant technology for widespread industrial use, especially when dealing with documents of varying nature, fonts, and formats.



WHAT IS INTELLIGENT DOCUMENT PROCESSING (IDP)?

Intelligent Document Processing (IDP) is the next stage of document processing for enterprises. Besides extracting data from text images, IDP employs AI tools like machine learning (ML), natural language processing (NLP), computer vision, and neural networks to enhance document processing. With these AI tools, IDP can intuitively understand the context of documents and process a wide variety of documents, including structured, semi-structured, and unstructured documents, just like humans, while eliminating common human errors like misinterpretation and document duplication.

IDP uses ML algorithms to classify documents into different categories based on their content, layout, or other characteristics. For example, IDP can differentiate between invoices and contracts and categorize them accordingly. These categorized documents are then transferred to pre-trained extraction models, which analyze and understand the data within the document and extract business-critical information. IDP validates this extracted data against specified rules or parameters and flags discrepancies for human assessment. This method, called human-in-the-loop (HITL) feedback, enhances the extraction models, which constantly learn and improve based on manual corrections. When the system encounters the same discrepancy again, it refers to the previous corrections and makes the adjustments automatically, reducing the need for human intervention.

The NLP feature of IDPs enables them to understand the context of the information they read. For example, IDP can determine whether the word "beetle" refers to a bug or a car model, or whether "sue" refers to a person's name or a legal action.

IDP systems can be easily integrated with existing business processing systems like ERP or CRM. With low-code/no-code platforms, individual developers can deploy IDP technology in just a few days without massive IT infrastructure support and maintenance on the client's side. Additionally, IDPs powered by NLP can support various font types and languages, overcoming OCR's limitations like language barriers and formatting errors by deploying adaptive algorithms.

These capabilities enable IDP software to interpret data meaningfully and perform intricate tasks like categorization, data validation, and decision-making.



WHY BUSINESSES MUST EVOLVE BEYOND OCR

Businesses across industries face constant pressure to do more, faster, with minimal errors and resource usage. Organizations are increasingly focusing on enhancing customer and employee experiences, understanding that better employee experiences lead to improved productivity and better customer experiences lead to increased loyalty, revenue, margins, and retention.

As Jonathan Grandperrin, CEO and co-founder of Mindee, stated, "IDP platforms are not just about recognizing text; they are about transforming documents into structured data that can seamlessly integrate into digital workflows."

Successful implementation and deployment of IDP can enhance both customer and employee experiences, enabling companies to achieve successful and beneficial digital transformation.



BENEFITS OF IDP

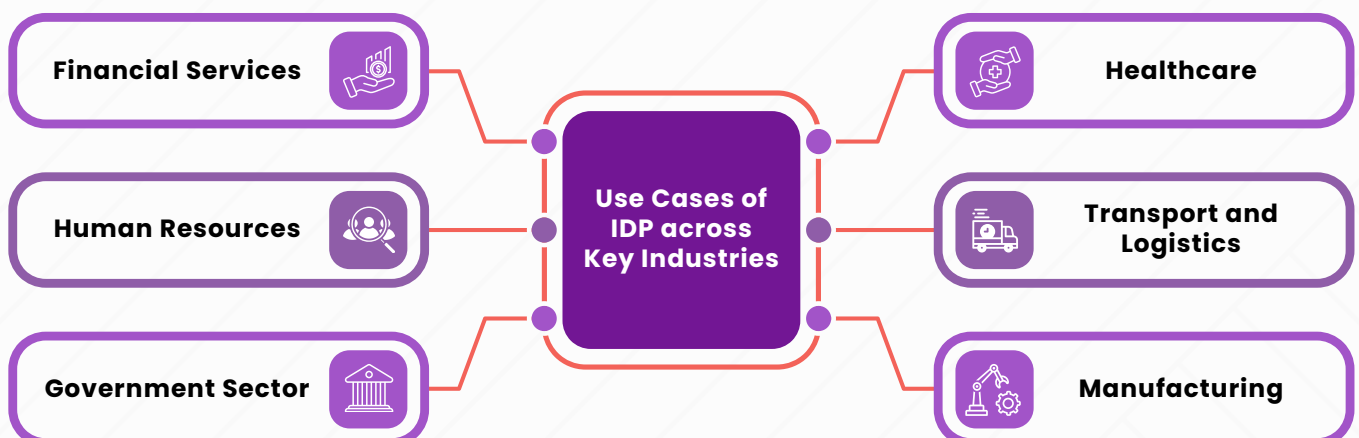
- **Time and Cost Savings:** IDP reduces document processing time, especially for industries handling large volumes of paperwork, such as healthcare, insurance, financial services, legal, and logistics. The self-learning ML algorithm of IDP minimizes human intervention, increasing productivity and efficiency.
- **Improved Accuracy:** Machines do not get distracted or tired, reducing the chances of costly mistakes. Fewer errors and faster operations result in better accuracy and efficiency.
- **Faster Decision Making:** Improved speed and accuracy in data extraction and processing enable faster decision-making, particularly useful in industries where timely decisions significantly impact outcomes, such as healthcare, finance, and customer care.

- **Better Security and Compliance:** IDP processes data by evaluating it against set parameters and rules, flagging discrepancies for human correction, ensuring security and compliance.
- **Easy Integration with Legacy Systems:** IDP systems are designed to integrate seamlessly with existing business workflows, such as ERPs and CRMs, enabling efficient digitization of business processes.
- **Scalability:** IDP can scale for larger document volumes according to business requirements without a proportional increase in labor costs.
- **Better Customer Experience:** Faster decision-making, improved accuracy, faster processing time, and quicker response to customer queries contribute to better customer satisfaction and loyalty.

These benefits make IDP a superior choice over OCR for businesses.

➤ KEY USE CASES OF IDP

According to Grand View Research, the global intelligent document processing market size was estimated at USD 2.30 billion in 2024 and is projected to reach USD 12.35 billion by 2030, growing at a CAGR of 33.1% from 2025 to 2030. Factors driving market growth include increasing digital transformation investments and the need for cost-effective and efficient document processing solutions.



- **Financial Services:** IDP streamlines document-intensive processes, enabling real-time monitoring, greater consistency, and improved efficiency. Examples include loan processing, invoice processing, claims processing, fraud detection, and mortgage processing.
- **Human Resources:** IDP streamlines employee document management workflows, improving accuracy and efficiency. Examples include resume screening, employee onboarding, and securing information.
- **Government Sector:** IDP helps streamline tax returns processing, compliance audits, and public records management, improving efficiency and document management.
- **Healthcare:** IDP reduces manual errors and optimizes workflows in managing administrative paperwork and patient records. Examples include medical records management and medical insurance processing.
- **Transport and Logistics:** IDP enhances document management and data processing, improving operational efficiency. Examples include shipping and inventory management, sales and distribution, and logistics.
- **Manufacturing:** IDP ensures smooth operations by managing large volumes of purchase orders, shipping documents, and bills of lading.



IDP: CHALLENGES AND SOLUTIONS

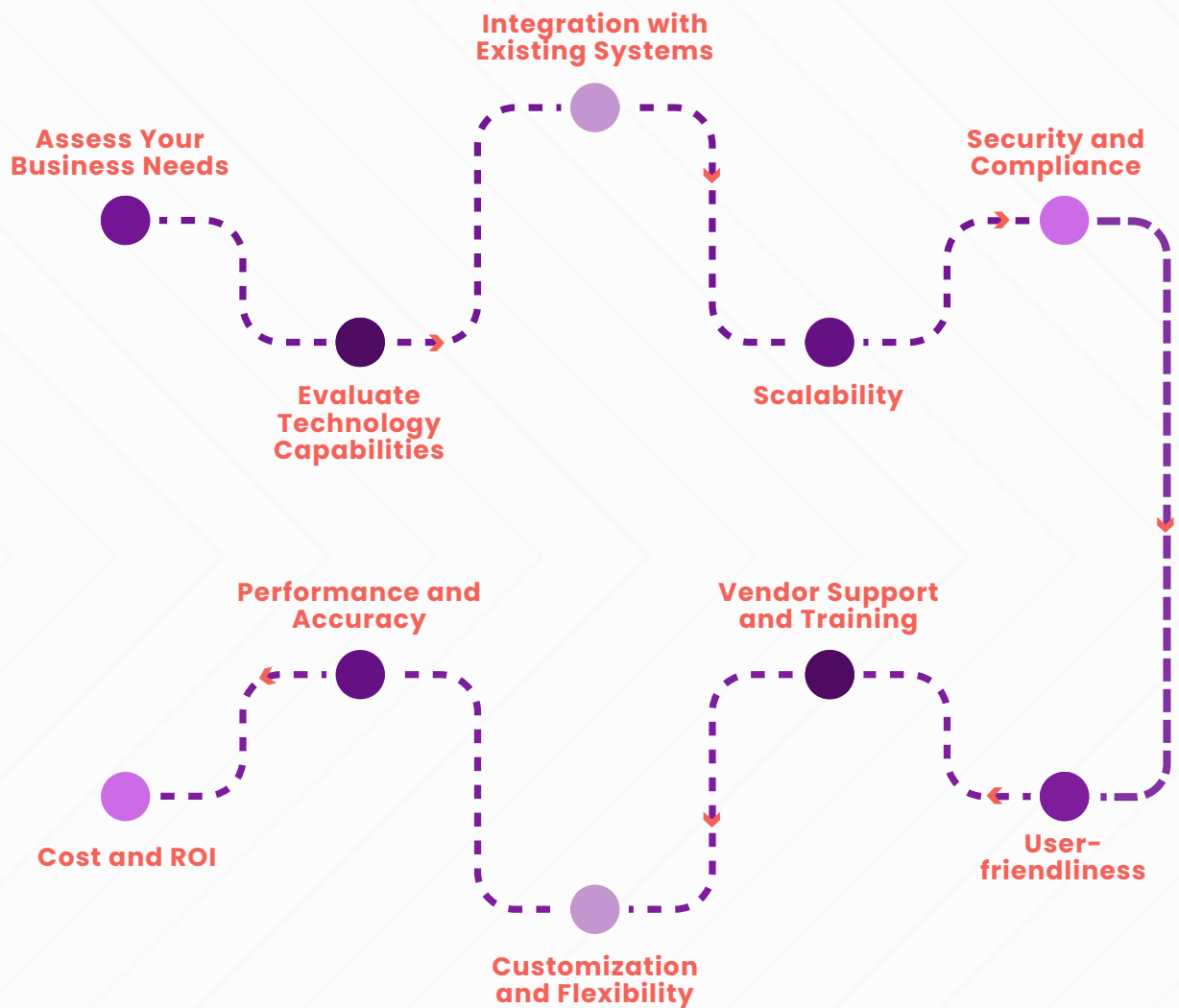
While IDP offers numerous benefits, it also presents challenges. Here are some challenges and solutions:

- **Quality of Data:** Factors like different document formats and poor image quality can affect data quality. Employing pre-processing techniques like image enhancement and normalization, advanced ML models, and regular updates can ensure better accuracy and reliability.
- **Data Privacy and Security:** Handling sensitive information raises concerns about data privacy and security. Opting for IDP solutions with robust security features, including encryption, access controls, and audit trails, and ensuring compliance with regulations like GDPR and HIPAA can address these concerns.
- **Integration Challenge:** Integrating IDP systems with existing IT infrastructure can be complex. Choosing IDP solutions with robust APIs and flexible integration options and working with vendors providing comprehensive support can facilitate smoother integration. A phased implementation approach can minimize disruptions.
- **Operational Challenges:** Challenges include employee resistance to change, fear of job displacement, lack of skilled personnel, and the need for ongoing system updates. Involving key stakeholders early in the process, providing adequate training, and establishing a dedicated team for IDP system monitoring can address these challenges.
- **Cost of Implementation:** The initial cost of implementing IDP can be high, especially for small or medium-sized organizations. Opting for cloud-based IDP solutions, flexible pricing models, and calculating ROI by considering long-term labor and efficiency savings can justify the cost.



ROADMAP TO TRANSITION FROM OCR TO IDP

Transitioning from OCR to IDP requires careful consideration. Here are key aspects to consider:



- **Assess Your Business Needs:** Evaluate your document processing needs, including the types of documents, data volume, and specific processes to automate.
- **Evaluate Technology Capabilities:** Look for IDP solutions with features like OCR, intelligent character recognition (ICR), NLP, and computer vision. Ensure the system can handle structured, semi-structured, and unstructured documents and has advanced AI and ML capabilities.

- **Integration with Existing Systems:** Choose IDP software that supports APIs for seamless integration with existing systems like CRM or ERP.
- **Scalability:** Ensure the IDP system can handle larger document volumes as your business grows. Cloud-based IDP solutions often offer better scalability and flexibility.
- **Security and Compliance:** Choose an IDP system compliant with relevant regulations and standards, such as GDPR and HIPAA, and ensure it provides robust security measures.
- **User-friendliness:** Ensure the IDP solution has an interactive and easy-to-use interface to minimize training time and improve productivity.
- **Vendor Support and Training:** Ensure the IDP provider offers active customer support and training services.
- **Customization and Flexibility:** Choose an IDP solution that provides customization options to fit your business needs.
- **Performance and Accuracy:** Thoroughly check the IDP solution's accuracy and efficiency through pilot tests.
- **Cost and ROI:** Calculate and compare the solution's initial cost against potential ROI to determine its viability for your business.

CONCLUSION

Intelligent Document Processing (IDP) has the potential to transform document management by utilizing cutting-edge technologies like AI, ML, NLP, and computer vision. Unlike conventional OCR, IDP offers superior data extraction, verification, and scalability, boosting efficiency, accuracy, and productivity. IDP systems also address data security issues and provide significant ROI by minimizing time and resources dedicated to repetitive tasks and reducing manual data entry errors.

Selecting the appropriate IDP solution requires thorough consideration of business requirements, technological capabilities, scalability, integration readiness, and other relevant factors. A partner like DeepKnit AI, with extensive experience in deploying automation and AI solutions, can assist in this process.

The advancement of IDP technology will drive digital transformation and operational excellence, helping businesses stay competitive. Adopting IDP allows businesses to streamline operations, cut costs, and improve decision-making. As technology progresses, IDP will play a critical role in shaping the future of document processing across industries.

Embracing IDP goes beyond efficiency improvements—it's about unlocking new avenues for innovation, collaboration, and growth in the digital era.



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