KlearStack

Digitizing Banks Through **S**

Document Automation

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Introduction

Business automation has become the new norm for enterprises that are looking forward to having lean growth. Be it large enterprises or medium-sized firms, organizations of all sizes are adopting technologies that can improve operational efficiency in their day-to-day workings resulting in getting more done in less. Business automation can be for a variety of purposes. Workflow automation, database management, document centric process automation, CRM based activities and many such aspects can fall under the banner of business automation.

Document centric process automation is one of the many aspects of business automation. It is the need of the hour as organizations are doing away with physical documents and want to digitize their records for seamless procedures and transactions. Even with digital document centric processes, one needs to automate the steps of reading from document, interpreting information out of it, validating and transforming that information as per business rules and entering that information in the system of records. Many organization from the industries such as banks, manufacturing firms, logistics enterprises, insurance companies and so on have yet to adopt **document automation**. Most of their documents (whether physical or digital) are still being processed manually which leads to many inaccuracies and is a time-consuming process overall.

Need for Document Automation in Banks

Banks have many physical documents to process on daily basis. Loans, cheques, account form documents, KYC documents and so on. They deal in an enormous amount of physical documents that are manually processed.

LetÎs take the case of our banking client – a large private bank from India (hereafter referred to as “The Bank”) and understand the challenges they were facing in terms of document processes.

On average, the banks process **500,000+** Consumer loans per month which comes down to approximately **20,000** loans on daily basis.

Loans have various other documents such as KYC, NACH mandate forms, invoices (proof of purchase of the item against which the loan is sanctioned) and insurance policy (proof of insurance of Two-Wheeler or 4-wheeler loaned for) and all these are processed manually.

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Processing 20,000 Loans/day Would result in:

- Slow transaction turnaround time as it would take at least a few hours for an end-to-end processing for each document.
- High cost of operations as plenty of human resources was required to process documents.
- An increase in inaccuracies leads to more time consumption and loss of business.
- Lack of agility in business operations when the transaction volumes would surge up during peak seasons. Managing time for existing as well as new clients would become extremely difficult. Also, it becomes very difficult, time consuming and costly affair to manage knowledge and productivity retention when you have a high attrition rate of your data entry operators.

Overcoming Existing Challenges Through KlearStack AI

To overcome the above-mentioned challenges, KlearStackÎs AI-driven solution was implemented by the The Bank. Let us understand the key steps of the KlearStack AI process:

KlearStack AI Process

Step 1: Pre-Processing

At this stage, machine learning algorithms scan and evaluate the quality of the document – detects bad quality, automatically enhances image quality or rejects poor quality documents if they cannot be enhanced.

This stage is crucial in the extraction process to ensure high-quality extraction through cleaning, organizing and transforming the raw data to meet expected quality SLAs or IDP and machine learning performance expectations.

Step 2:
Document Classification

The initial phase of KlearStack Intelligent Document Processing begins with classifying the type of document being processed. Classify document types like Loan Documents, ID Cards, invoices, purchase orders, NACH mandate forms, insurance policies etc.

This classification is accomplished using the combination of Computer Vision (CV), Natural Language Processing (NLP) and machine learning.

Step 3:
Document Extraction

Once the document is classified, the next and most significant step in the process is to extract valuable information from the documents. The OCR software recognizes characters and symbols on a document as it scans the images and photographs of documents. However, OCR cannot interpret the meaning of the raw text.

KlearStackÎs Machine Learning models interprets and extracts specific fields, irrespective of the document formats and layouts. The ML models are continuously trained to understand the data extraction and interpretation irrespective of layouts and formats/ field naming conventions.

Step 4:
Document Validation

Confirm data items extracted by the system such as hand-written text, human signatures and map the extracted text to specific fields. User can configure any number of custom data validation conditions that mimic their business rules. This allows KlearStack to automate validation and transformation of the extracted data. This step also plays a role in improving ML model confidence and accuracy in future processes.

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Step 5:
Straight-Through Processing

Using KlearStackÎs three-layered data validation technology, straight-through processing is achieved. End-to-end documentation is completed at this stage. It automatically highlights documents that fail any validation checks.

Step 6:
API and Integrations

Data is seamlessly integrated with any downstream system – whether CRM, RPA platform, BPM software, accounting software, ERP or RPA system.

Document
Automation Process
for The Bank

Here's the step-by-step breakdown of the document automation process for The Bank through KlearStack AI:

Step 01 Bank sales representatives (spread across India) take a photo of the document (invoice, NACH mandate form, insurance policy etc) using the The BankÎs phone app.

Step 02 The phone app calls KlearStack REST API for the bank tenant on KlearStack secure cloud.

Step 03 KlearStack's template less document capture technology reads and interprets the invoices using the proprietary AI/ML models. Each page goes through the rich and multi-layered document processing pipeline.

a) The first layer is our proprietary document pre-processor where multiple validations take place. If the image does not meet these preliminary validations, then within 1-2 seconds the document is rejected.

b) The second layer is that of computer vision. In this layer, KlearStack AI uses the proprietary image processing algorithm that consists of multiple computer vision models trained using deep learning algorithms. This layer mimics the function of the human eye when a person looks at any document.
Instantaneously the human eyes assess the document pictorially before beginning to read the same. That's exactly what KlearStack computer vision layer

c) The third layer is that of OCR (optical character recognition). Here we leverage KlearStack OCR as well as one more 3rd party OCR. Our proprietary
technology is able to pick best of the breed OCR results across both OCR

d) The fourth layer is of text analytics. Since OCR just dumps all the text encountered in any image and does not have any interpretation capabilities, this interpretation is done by our proprietary text analytics layer. In this layer, KlearStack leverages our ML and deep learning models trained using various NLP (Natural Language Processing) techniques.

e) The last layer is the consolidation and correlation engine where results of all the previous layers are consolidated and correlated. The final document interpretation happens, and the interpreted data is stored in the database. Then the data validation and transformation layer takes over. Once the data validation and transformation completes, the results are pushed forward in a JSON response in a push or pull API.

Step 04 KlearStack then calls the REST API of the bank's downstream application to forward the interpreted results immediately after those are available for each document.

Step 05 These results are reconciled by the downstream app by data comparison against the bank's various data sources.

Step 06 The documents where data reconciliation passes are passed on automatically for loan approval.

Step 07 The documents where even one data reconciliation rule fails (either because the document does not have the expected data or because the image quality did not meet the prerequisites) are thrown into an exception queue and are eyeballed by bank employees, minor corrections are done and then those are pushed into the approval queue.

Step 08 A small minority of the failure cases might need KlearStack improvements. For such cases, based on the user feedback, KlearStack ML models are consistently retrained/ refined to ensure continuous improvement in accuracy.

Step 09 The bulk of the failure cases are due to invoice printing or photo errors. Such errors are taken up by the bank for training their dealer partners as well as the sales representatives.

The Final Outcome

After implementing KlearStack AI at The Bank, the results were had been quite positive. In numbers, these are the results so far (and improving):

70% **Cost Reduction** In Document Processing Operations

100% Improvement in team **productivity**

300% Improvement in **Turnaround time** for processing loans

15000 **Human hours** saved per month

Apart from that, there were many qualitative outcomes such as

- Improvement in the consumer experience,
- Increase in dealer experience, because they donÎt have to wait for hours or days to get the loan disbursal.
- Significant improvement in business agility. Processing documents and loans during peak season become hassle-free due to the implementation of an **end-to-end automated document process.**

About KlearStack

KlearStack is a G-local multiple awards winning solution used by Global Brands and Fortune-100 companies across many verticals. Some of the use cases include:

Banking: Many renowned banks and financial service providers have leveraged the AI-based OCR services of KlearStack to expedite real-time data extraction and automate several critical processes related to KYC, accounts payable, and loan sanctioning.

Trade: Trade finance involves the sharing and distribution of millions of paper-based documents. KlearStack's AI-based OCR solution automates the document processing for transactions, document reviews, compliance checks, application forms, etc.

Inventory Management: KlearStack automates the vital task of managing inventory data with its IDP and OCR solutions. The RPA services automate error free intersystem reconciliations.

Invoice Processing: No templates, no formats. Process and extract data from invoices and manage payments more effectively.

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