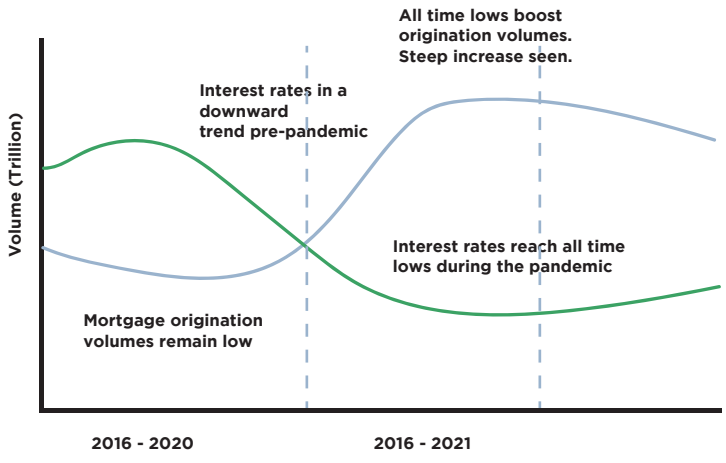
Reimagining Mortgage Processing with Intelligent Automation

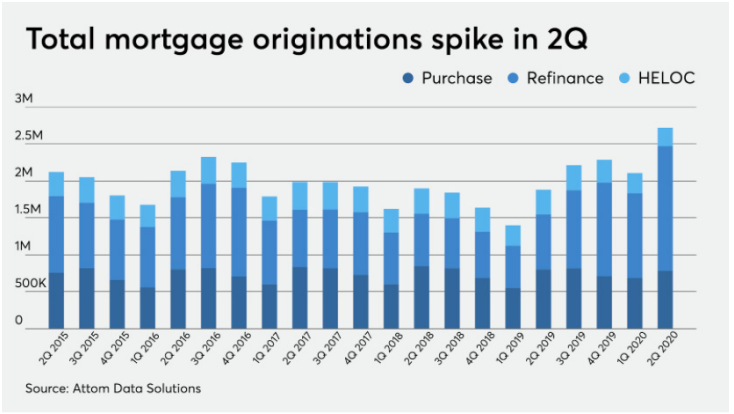
quantiphi

Solving What Matters

Introduction

Mortgage is one of the most complex banking products. Multitude of institutions across geographies offer various types of mortgage products with different funding structures. Of these, the U.S. mortgage market remains prominent as it has evolved through several distinct phases to reach its current status as the largest, most innovative, and most complex home-financing market in the world with outstanding debt at $16.6 trillion [1].





The industry was at its peak in Q4 2019 with the lowest delinquency rates since 2012[2], higher originations, and increased profitability. However, it witnessed a dramatic change during the pandemic in 2020, driven by the sudden plummet of mortgage rates.

In March 2020, amid nationwide lockdowns, the Federal Reserve dropped the benchmark federal funds rate to record-low levels. As a result, mortgage rates hit their lowest levels in almost 50 years according to Freddie Mac. The average rate on the popular 30-year fixed mortgage hit 2.97% in June of 2020. For top-tier borrowers, some lenders quoted as low as 2.75%[3]. These market conditions boosted mortgage origination volumes. Mortgage refinance was up over 500% in Q2 2020 relative to the previous year[4].

This trend is most likely to continue in 2021. This could be a year of high lending volume owing to rising competition among lenders and favorable policies from the federal reserve. Fannie Mae projects the total mortgage originations to reach $2.7 trillion in 2021.

As mortgage volumes rise, lenders must improve response time and application processing time to ensure seamless customer experience. With delinquency rate, **hitting record high of 8.22% of all outstanding loans (Q2 2020),** lenders must bring in intelligent automation in document processing and underwriting workflows to minimize human errors in decision making.

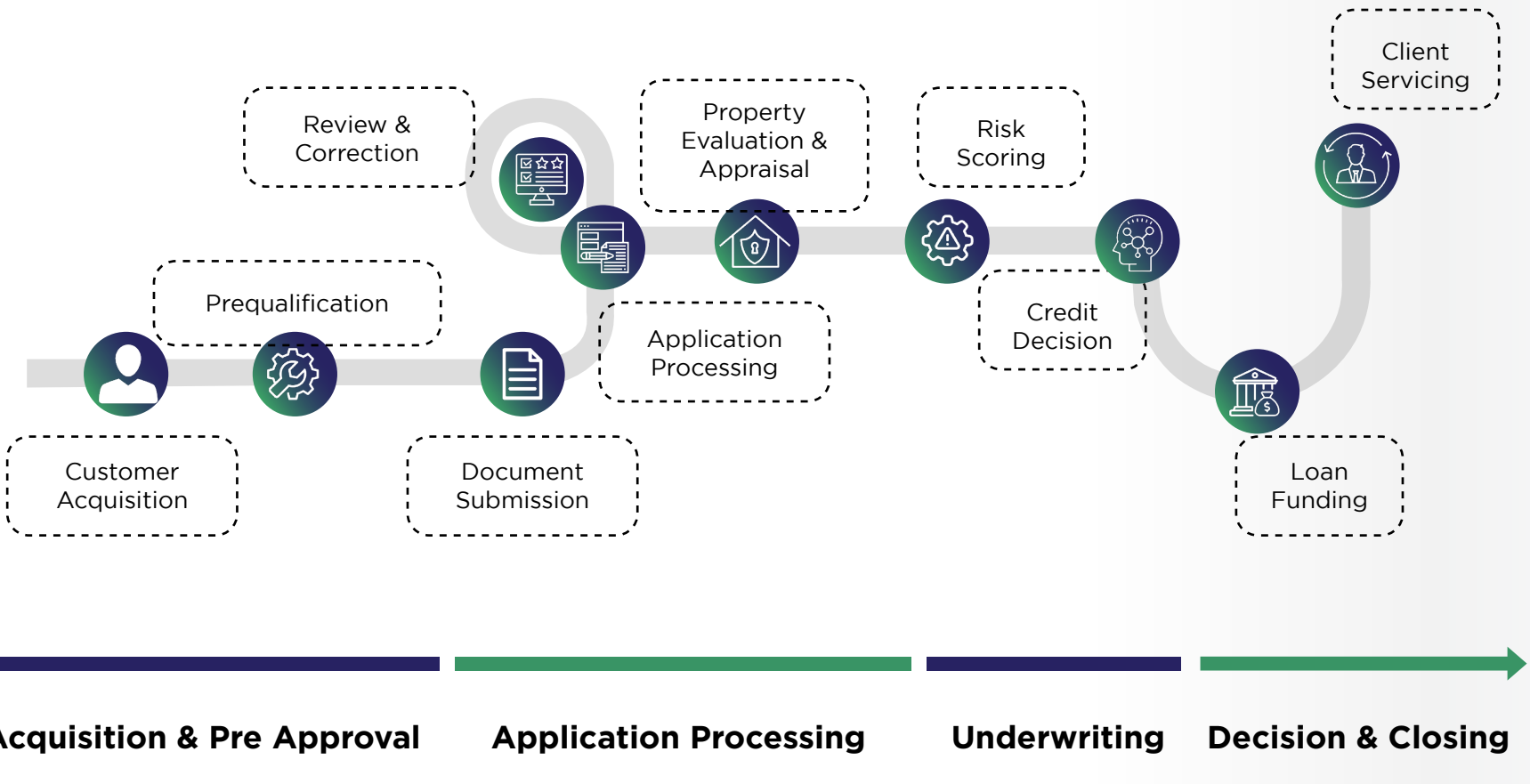
1. US mortgage debt outstanding 2020
2. IMBs Post Strongest Fourth Quarter Profits Since 2012
3. Mortgage rates set new record low, falling below 3% as concerns rise about coronavirus second wave
4. The pandemic hits the mortgage market: Assessing the impact in 2020 and beyond

Mortgage Origination Process Flow

Optimizing loan origination is critical for the lender's profitability as loan origination accounts for 40% of total mortgage lending costs[5].

This process consists of four critical components:

1. Acquisition and pre-approval of leads and customers
2. Processing of the loan application
3. Mortgage underwriting
4. Decision on the loan application and closing of the escrow account



5. The importance of automated document processing in lending

Challenges in Traditional Mortgage Processing

Inefficient Customer Targeting

Despite huge marketing budgets, many mortgage houses struggle to devise targeted and personalized marketing campaigns. In a survey, 40% of respondents cited a lack of knowledge and training regarding content marketing as one of the major struggles they face in their organization[6].

Manual Data Collection

Manual data collection and subsequent back and forth with the customers is a big challenge in the mortgage application process. Legacy systems, data residing in departmental silos, out-of-date information and data inconsistency are significant concerns for businesses. It costs $20 in labor to file a document, $120 to locate a misfiled document, and $220 to recreate the document if it can't be located[7].

High Compliance Risks and Decisioning Bias

Manual underwriting workflows may be error-prone and can lead to incomplete loan packages due to missing or lost information during data transfer leading to regulatory penalties at times. Moreover, there are incidents of biased credit decisioning affecting the borrower.

Manual Processing and High Turnaround Time

Loan files often contain 700+ pages. Information identification, retrieval, and verification from these documents are tedious administrative tasks and can cause inter departmental friction, slowing down application processing. Moreover, underwriters spend millions of hours to manually skim through application documents. Slow onboarding remains a leading cause of customer attrition.

Manual Evaluation and Property Appraisal

During the application evaluation process, human underwriters may miss out on identifying key risks and certain factors indicating bad debts. Moreover, underwriters have to rely on third-party data for property appraisal which may be outdated and inaccurate.

High Risk of delinquency

5.6% of all mortgages are in some stage of delinquency in the US (Jan 2021), 3.8% of which are in serious delinquency (90 days or more past due). Manual error in application processing, Inefficient customer risk profiling, biased credit decisioning are primary reasons for delinquency[8].

6. 4 Main Challenges of Marketing Financial Services
7. The Benefits of Paperless Mortgage Servicing
8. CoreLogic Reports US Mortgage Delinquency Rates

Digital Transformation Trends

Data Analytics, Artificial Intelligence, and Machine Learning have the potential to revolutionize the mortgage industry by addressing the aforementioned challenges. AI Opportunity Landscape research shows that approximately 15% of the venture funding raised for AI vendors in the banking industry is for the lending solutions[9].

Going Paperless

As a document-intensive industry, significant time and costs are involved in manual document processing. Thus, mortgage lenders are increasingly gravitating towards document management solutions that can completely digitize the mortgage loan origination process.

Moreover, electronic documents facilitate compliance with regulatory and reporting requirements. The digital storage capability allows for optimum control of the documents for record retention and easier access for audits, research, or responding to borrower inquiries. It also benefits the environment, as paper mortgages require roughly 2.2 billion sheets of paper annually[10].
Let's dive under the hood to understand how mortgage firms can benefit from an intelligent document management solution.

Data Storage layer

- With the next gen solutions, the required documents can be scanned and uploaded through a mobile application or a web portal. These scanned documents are then stored in enterprise data warehouses, preferably in the cloud.

Processing Layer

- The documents are **ingested** using APIs and **preprocessed** using rule-based engines, The preprocessing includes templatization and masking of PII data and annotation.

- Then the ingested documents are **classified** into different categories and identified.

- Then a bundle of specialized document **extraction** focused on multiple document types associated with a mortgage is used to extract relevant information from the documents.

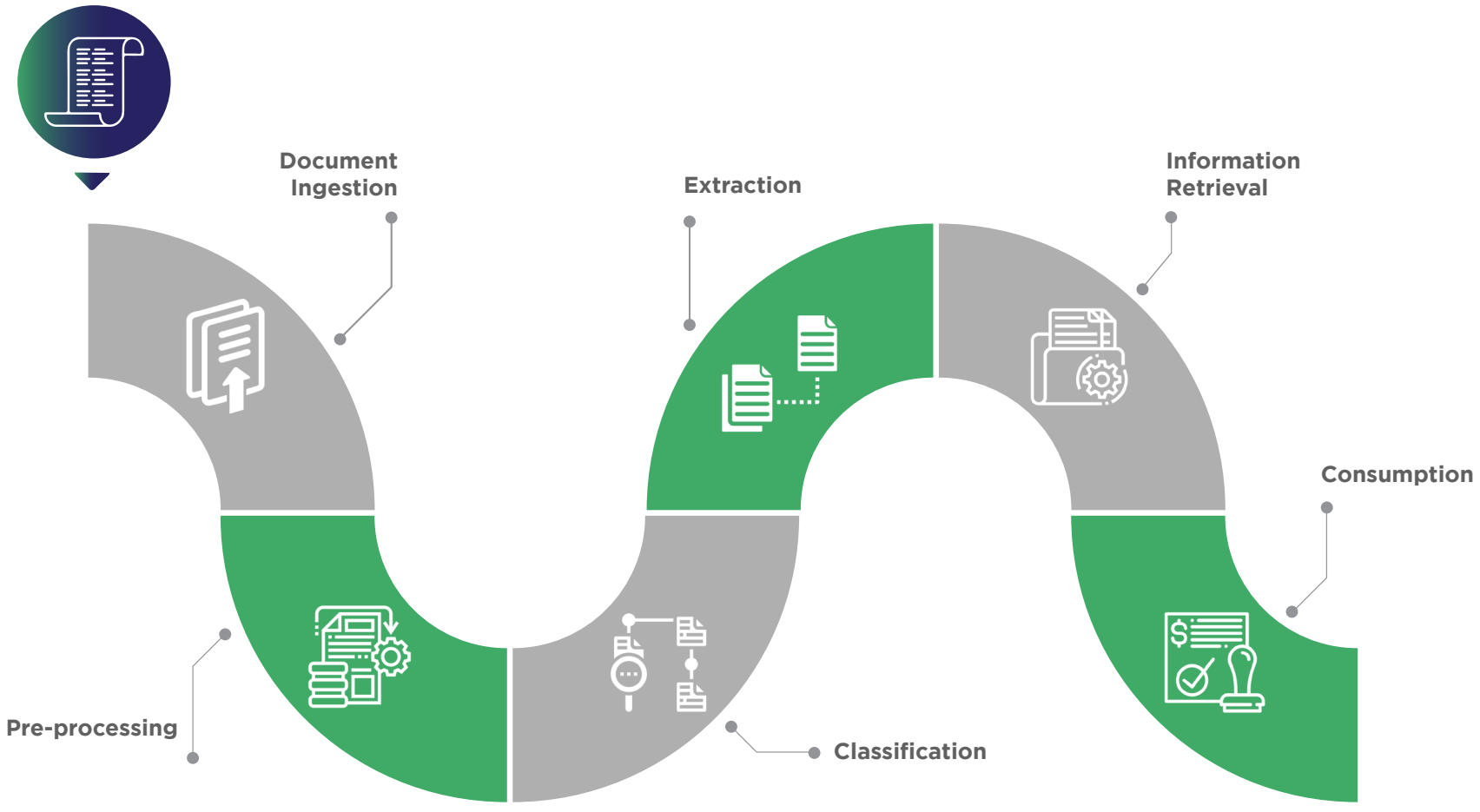
Consumption Layer

- The extracted information is **verified** and stored in data systems.

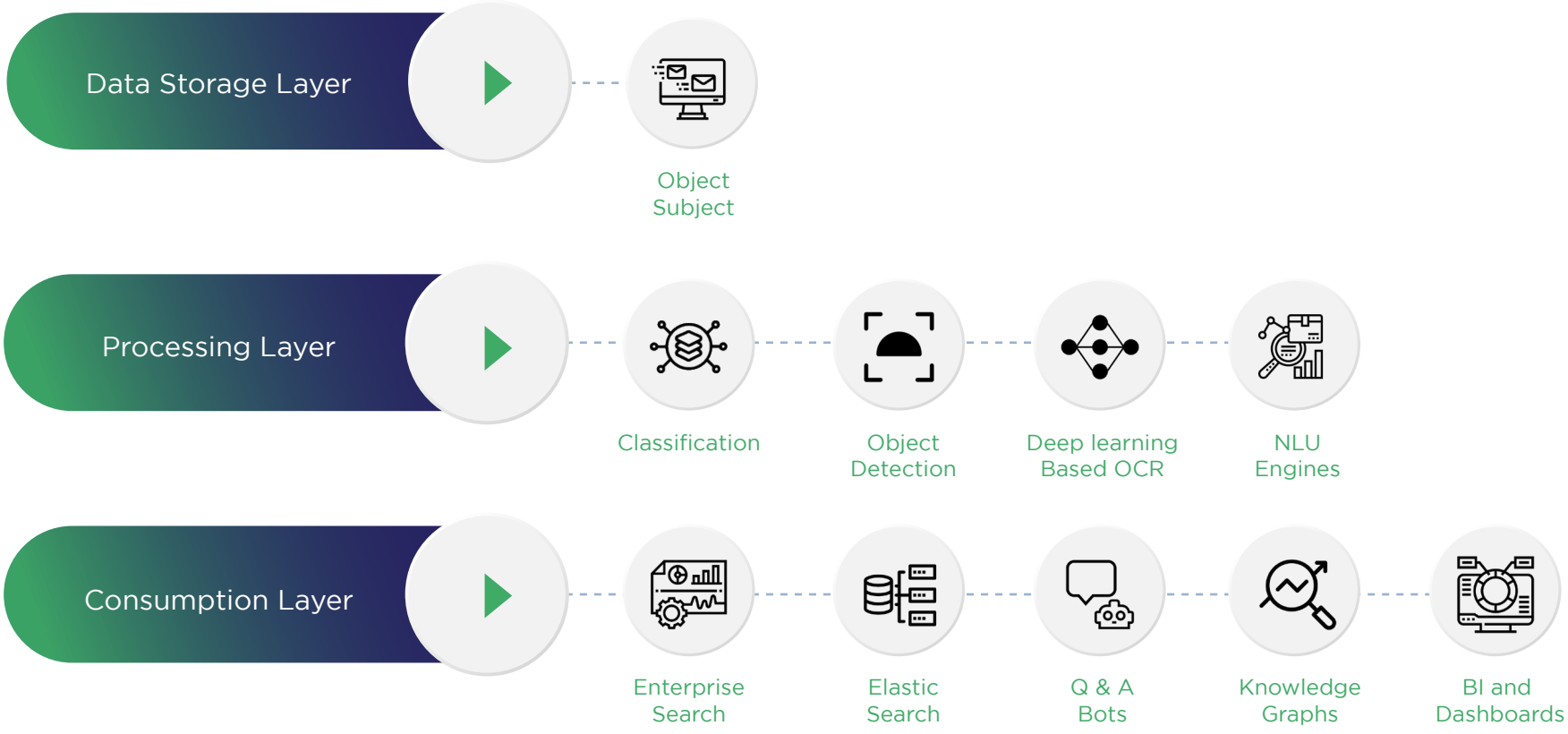
- BI platforms and analytical tools are leveraged to uncover key insights from the documents.

9. AI Opportunity Landscape | for Banking and Financial Services
10. 7 Interesting Facts About Digital's Impact on the Mortgage Industry

Intelligent Document Processing Process Flow



Nextgen Document Management system



Your New Digital Ecosystem: 1/2

Submission Intake

Upload Case Documents

Underwriter uploads the case documents through a web portal or batch process

Provides input on entities to be highlighted/ bookmarked

Data Extraction & Ingestion

Data such as form fields, checkboxes, signature/ handwriting presence, tables are extracted, transformed and loaded into a database

Document Categorization

Intelligent Classification of documents such as medical reports, credit reports, etc present in the application

Quality & Eligibility Check

Application Validation

AI augmented check to identify missing documents and data fields in individual documents

Incomplete applications are dealt with agents through a virtual chatbot assistant

Data Augmentation

Conversion of documents to searchable pdfs

Entities are highlighted and bookmarked based on predefined user inputs

Events of interest sorted based on chronological order

Automated processing through QDox

QDOX

Your New Digital Ecosystem: 2/2

Quality & Eligibility Check

Detection of Anomalies

Extracted data is compared against different levels of fulfillment parameters and anomalies are high-lighted

Risk Scoring

Applications are scored and prioritized through a ML based initial risk assessment

QDOX Automated processing through QDox

Risk Assessment

Review Risk

Underwriter reviews application with the highest priority

Automated insights provided from customer's data

All low risk applications are routed through an automated underwriting workflow

Decisioning and Closing

Quotation

Recommendation engine suggests loan rates based on Customer's risk profile.

Underwriter reviews quotation and loan terms.

For low-risk applicants, ML engines automatically create Quotation in real-time and forward it to customer/agent.

Closing Documentation

Closing Documents are automatically generated and are sent to the customer/agent.

Reimagining Underwriting

Document Processing

AI-based document processing models can seamlessly automate end-to-end document processing in underwriting. Moreover, specialized parsers can be used to extract documents while ensuring compliance by de-identification of PII information and data annotation.

Data Augmentation

In order to properly gauge the risk associated with a customer, it is imperative to look beyond the information submitted in the application. Third party data providers can play a critical role in improving quality and augmenting existing data. Underwriters can also use ML to leverage information from several unstructured data sources to check for data inconsistencies and spot potential fraud.

Risk Scoring

AI/ML and business rule-based risk rating models can be leveraged to assess mortgage risk using customers' income, credit history, demographics, and other relevant data provided in the application. Based on the risk scores, low-risk customers are approved by automated underwriting systems while high-risk customers are flagged and reviewed by experienced underwriters.

Property Evaluation

Computer Vision applications are being utilized to uncover insights from property images and videos. For home insurers, a video of the customer's home can help them quickly detect items such as electronic devices, and other valuable items in real time. Integration with external data such as GIS, GMaps, etc. can help them to do a quick risk assessment of the neighborhood.

Recommendation Engine

Recommendation engines aid underwriters in their decision-making process. These are customized rules engine and ML-based algorithms, such as delinquency predictors, to create a risk profile based on customer's history and external data including data from IoT devices, and suggest relevant rate and term changes for the customer.

Improving Customer Experience

With evolving customer expectations and shifting demographics towards Gen-Z and millennials, mortgage lenders are facing mounting pressure to reorient their customer service strategies. According to a Tempkin survey, 69% of customers who plan to leave their bank say it was due to poor service rather than poor products[11]. Some key trends observed in this area are:

Need for Omnichannel Origination

Today's customers expect a choice for their medium of interaction. A hybrid customer service incorporating different communication channels into a seamless experience is the best way to engage customers. Accenture's customer survey found that more than half of the respondents preferred an omnichannel banking experience where they could switch seamlessly between physical and digital channels.

Demand for Digital Banking

Seamless and well integrated digital banking solution is crucial for every bank to improve customer experience due to the simplicity and convenience it offers. The total number of online and mobile banking users will exceed $3.6 billion by 2024[12]. Pandemic induced lockdowns across the globe have accelerated this transition.

Personalized Services

Delivering personalized experiences is becoming imperative for both mortgage providers and customers. According to Salesforce, 62% of consumers now expect companies to adapt based on their actions or behaviors. Offering proactive and personalized engagement can also drive 5-15% revenue growth for companies in the financial services sector[11].

Rising Engagements with Virtual Assistants

Banks and mortgage lenders are increasingly adopting smart virtual assistants and chatbots for quoting, customer servicing, application status tracking, and numerous other services. Besides driving down the operating costs, it enables their agents to focus on more complex queries. Juniper Research predicts that 90% of interactions in banks will be automated by 2022 using chatbots.

Transparency, Security and Ethics

Transparency and data privacy practices have become increasingly important for customers while selecting their lender. Companies must always address customers' privacy concerns on priority to gain trust and improve the experience. According to Salesforce, 80% of customers are more loyal to companies with "good ethics" while 68% of customers won't buy from companies with questionable ethics[13].

11. 35+ Epic Statistics and Facts for Customer Experience in Banking
12. Online Banking Statistics
13. 5 Customer Experience Trends for Banking in 2020

Advanced Analytics in Lending

Advanced analytics has emerged as one of the major disruptions in the financial services industry. It has assisted banks in efficiently managing cybersecurity, enhancing customer experience, driving sales management strategies, detecting frauds, and assessing financial risks, thereby boosting the use of predictive analytics in banking. The global predictive analytics market size in banking was valued at $1.2 billion in 2018 and is projected to reach $5.43 billion by 2026, with a CAGR of 20.8%. Some advanced analytics use cases in the lending industry are[14]:

Hyper-Targeted Marketing

Leveraging large volumes of customer data, banks are developing real-time insights and personalized engagement strategies for individual prospects. Advanced analytics allow banks to segment customers and design targeted marketing campaigns, explore customer performance history, measure campaign effectiveness, predict customer lifetime value.

Fraud Analysis

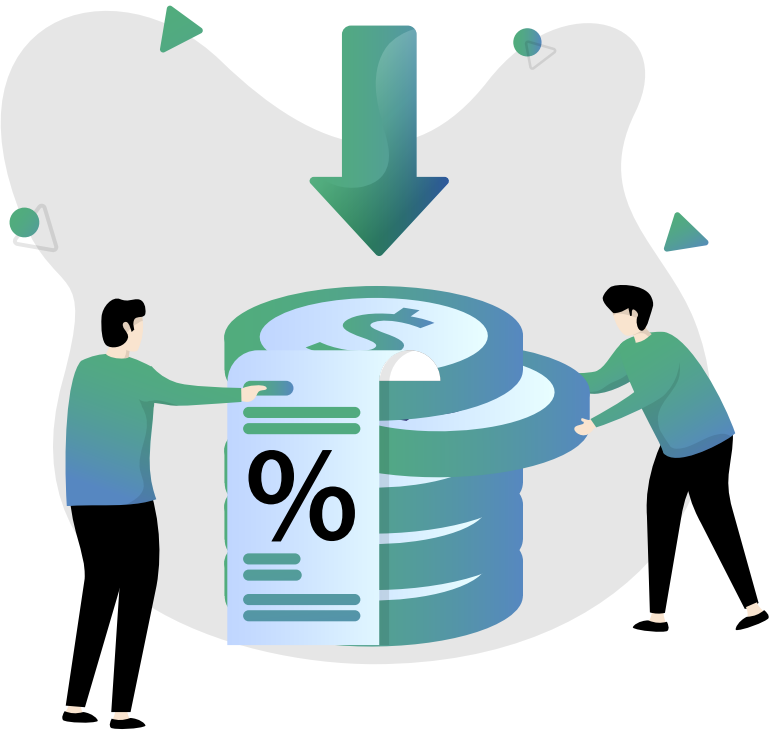
With unstable economic conditions, fraud attempts are at an all-time high. There were 1,316 fraud attempts on an average at mortgage companies per month in 2020, up from 1,280 in 2019. The numbers were even higher for digital mortgage lenders at 1,810 in 2020 compared to 1,390 in 2019[15].

Predictive analytics can help banks study customer behavior, identify suspicious activities, and protect accounts against repeated cyber-attacks. Analytics tools can flag and help in investigating financial crimes like fraud, money laundering, and criminal financing activities.

Credit Risk Assessment

Banks are using big data and advanced analytics to strengthen their credit risk management process as well. These help underwriters to accurately determine the applicant's risk score, thereby improving credit decisioning. Juniper Research estimates that loans issued via AI underwriting platforms will reach $315 billion in value by 2025[16].

14. Predictive Analytics in Banking Market Outlook - 2026.
15. 4 trends in mortgage fraud to watch out for.
16. Juniper: Loans issued by AI underwriting to reach $315bn by 2025



Delinquency Risk Prediction

The pandemic has increased the unemployment rate to an all-time high causing the rise in delinquencies. With this, delinquency rose by 10.8% in 2020. Banks can use predictive analytics to identify and flag customers before they become delinquent. Remediation methods can be used to prevent customers from becoming delinquent and can help banks in losing revenue due to bad debts[17].

Collection Optimization

Banks are leveraging recommendation engines for drafting personalized collection plans. Moreover, automated payment reminders and schedulers are being used to prevent low-risk customers from becoming delinquent. The market for debt collection software is forecasted to register a CAGR of 9.7% from 2021 to 2026[18].

Cross-Sell/Up-Sell

With access to information about customer behavior and identification of pivotal life moments, banks can now prepare hyper-personalized cross-sell and up-sell strategies for their products and services with predictive analytics.

17. [CNBC] Consumer debt hits new record of $14.3 trillion
18. Debt Collection Software Market | Growth, Trends, and Forecasts (2021 - 2026)

How Quantiphi Enables Digital Transformation

Quantiphi accelerates digital transformation for global financial services companies to help them derive higher business value. Our innovative AI-enabled solutions help mortgage lenders achieve operational efficiency, drive automation and lower costs.

Quantiphi's intelligent document processing solution combines AI and ML technologies to capture, classify and extract relevant insights from large volumes of unstructured data.

What? ---------- **Why?** ---------- **How?**

Intelligent Document Processing

Automated PII Redaction

Cumulative Intelligence of Human Reviewers

Actionable Insights

Reduced Processing Time
in closing documents per application

Enhanced Accuracy
with solution trained on industry specific documents

Decreased Regulatory Risks
with automated compliance & audits services

Reduced TCO and Nimble Engagement Model
with a unique combination of product + AI/ML professional services

Cloud Native

Computer Vision & OCR

Text Mining & Machine Learning

NLP and Deep Learning

Knowledge Graphs

Here's how Quantiphi helped a customer extract actionable insights from the documents and data with intelligent document processing.

Success Story

A leading wholesale lender in the United States that offers home loans, refinance, mortgages, is known for providing best-in-industry turn times, competitive rates. However, their existing document classification model was trained only on 60-110 document types out of 1600 possible document types. They required an automated document processing environment to help speed up their business processes to improve their turnaround times and provide more transparency to customers regarding their application.

Solution

Quantiphi developed a cloud platform for users to upload various income and asset verification document types and receive a classification or entity extraction response for the specific document type using a template-based and template-free approach.

The cloud-based solution has an automated pipeline to classify (on a page level) different financial documents such as tax forms with high accuracy and extract relevant information from those documents.

Business Impact

The solution classifies documents and extracts structured data from agreed-upon document types that provide significant business value to the customer while meeting its rapidly changing and evolving business needs. It helped the customer achieve an overall accuracy of **95%+** for page-wise classification and **80%+** for Entity Extraction.

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Solving What Matters

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