

Agentic AI-Enabled Automation for Financial Document Processing

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Business Problem

A prominent US-based bank operates in a highly regulated and complex financial environment where the timely and accurate processing of critical financial documents, such as audited financial statements, accounts receivable reports, loan applications and tax forms, is essential for compliance, risk management and decision-making. However, the bank faces significant operational challenges in its back-office functions due to reliance on manual and semi-automated processes. Each day, thousands of documents must be reviewed, analyzed and processed by staff, requiring hours of effort to validate information, extract key data and perform calculations. These repetitive tasks not only increase the risk of human error but also lead to inefficiencies, delays and potential regulatory issues. As data volumes and complexity grow, the bank is under mounting pressure to enhance operational efficiency, reduce compliance risks and meet evolving regulatory requirements and covenant obligations.

To address these needs, the client is exploring the adoption of Agentic AI, an emerging technology that employs autonomous, task-specific agents to execute complex financial workflows. By

leveraging Agentic AI, the client aims to automate end-to-end document processing, dynamic formula evaluation and real-time compliance validation. This approach is expected to significantly reduce manual effort, enhance accuracy and accelerate turnaround times, while providing a scalable and adaptable foundation for future operational and regulatory demands.

Solution Overview

In collaboration with the client account team, the AABG LaunchPad team developed a customized, scalable solution leveraging a suite of AWS services to automate multiple operational processes. Central to this solution is the Agentic AI framework, which integrates advanced AI capabilities to create a dynamic and intelligent system. This framework autonomously performs compliance checks and extracts critical data from financial documents using Amazon Textract, while Amazon Bedrock is utilized to structure and refine the extracted data for seamless downstream processing.

A multi-agent collaborative Agentic AI framework is used to enable a flexible and intelligent workflow. Through a single API endpoint, the system can dynamically handle multiple tasks, including complex calculations, data queries and compliance validation, ensuring adaptability and reducing the need for multiple service-specific integrations. This AI-driven approach not only minimizes manual effort and accelerates decision-making but also positions the bank for scalable, error-resistant, and future-ready operations, significantly enhancing both operational efficiency and customer satisfaction.

Reference Architecture

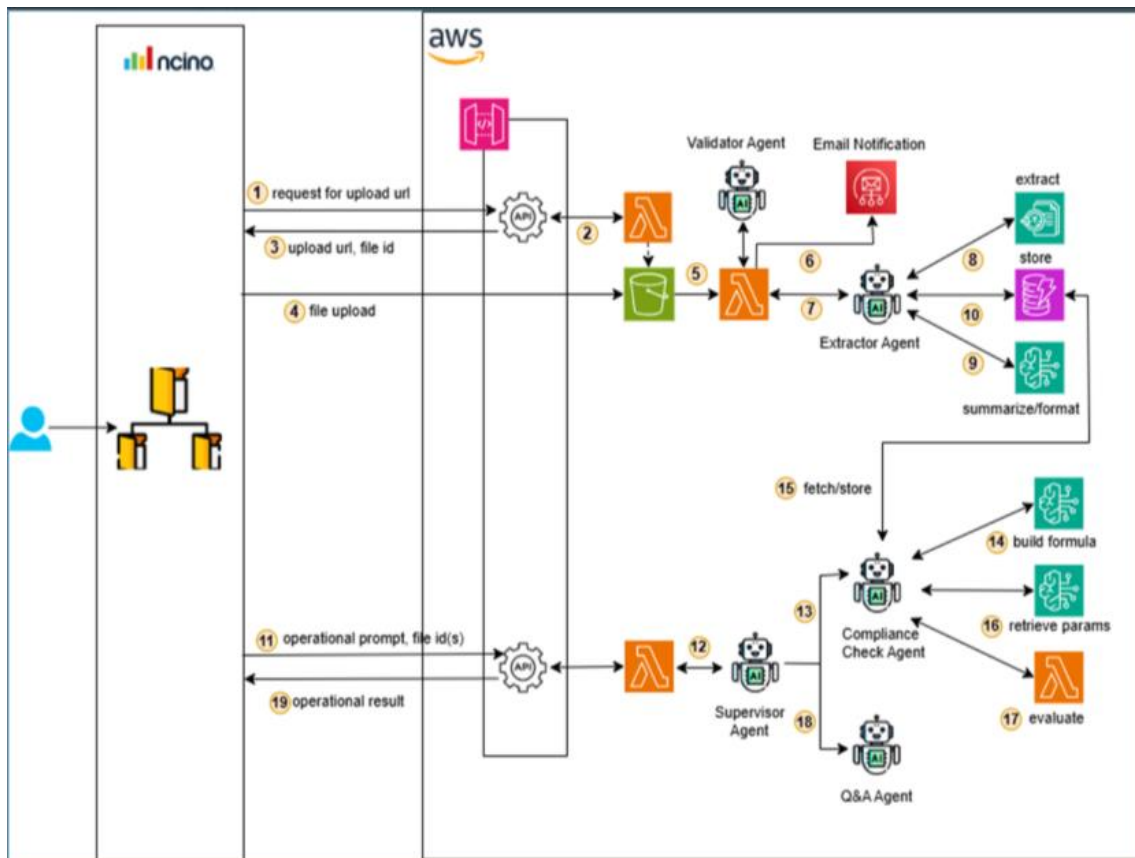


Figure 1. Solution Reference Architecture

Solution Walkthrough

1. User sends a request for a file upload URL.
2. API Gateway captures the file name and triggers a Lambda function.
3. Lambda returns a presigned URL to user via API Gateway.
4. User uploads the file to S3 bucket using the URL.
5. The upload event triggers a Lambda function that invokes "Validator Agent."
6. The Agent validates the file content and sends email in case of incorrect documents.
7. The Lambda reloads "Extractor Agent" if the file is correct.
8. This Agent works with Textract to extract the file data.
9. The Agent works with LLM to format the Textract output.
10. The Agent stores the Textract output and formatted output in DynamoDB.
11. User now sends API request with operational prompt and file-ids.
12. The Lambda invokes a "Supervisor Agent" that analyses the prompt.

If the request was to do compliance validation for the files:

13. "Supervisor Agent" sends the user request to "Compliance Check Agent."
14. "Compliance Check Agent" works with Bedrock LLM to build the mathematical formula from the user prompt.
15. Agent fetches the previously stored formatted file data.
16. Agent works again with Bedrock LLM to identify required params to compute the formula.
17. Lambda then uses the formula and params to calculate the compliance check.

If the request was to query the file content:

18. "Supervisor Agent" sends the user request to "Q&A Agent."

Conclusion

This solution represents a transformative advancement in automating and streamlining the end-to-end processing of financial documents. By leveraging secure and scalable upload mechanisms, AI-driven validation, advanced data extraction and real-time financial computation—all powered by AWS services and Bedrock Agent—the architecture eliminates manual inefficiencies, reduces error rates and accelerates business workflows. Its ability to deliver contextual, document-specific insights through simple API interactions provides users with actionable intelligence, enhancing decision-making and operational efficiency. This comprehensive pipeline not only improves agility but also establishes a robust, scalable foundation for intelligent document processing, unlocking significant value across critical business functions.

For more information on this solution, please contact [Raktim Chowdhury](#).