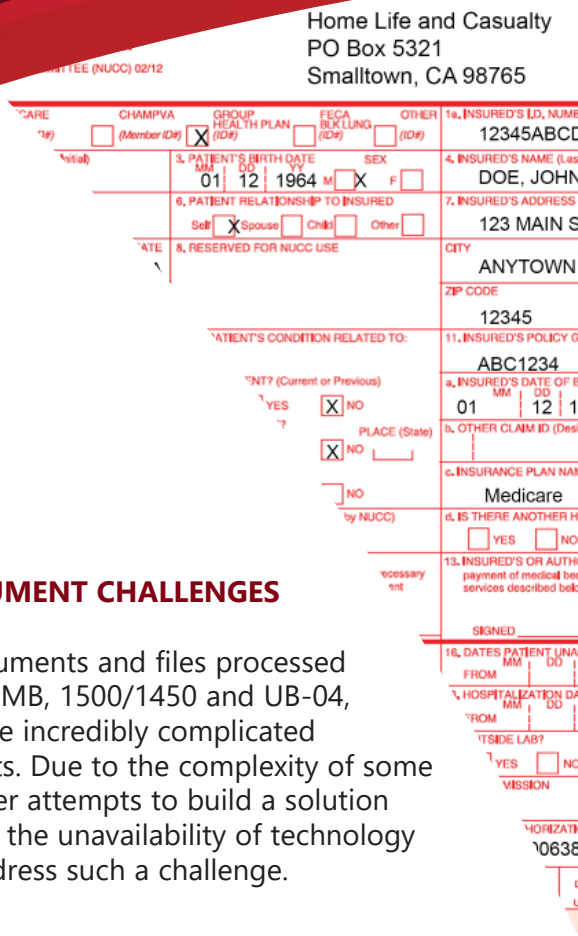
Advanced Document Classification and Data Extraction Solutions



MACHINE LEARNING

Axis Technical Group and their client, industry leading financial services holding company, recently completed a major medical claims processing initiative by leveraging their Axis Machine Learning Solution for Automated Classification, Separation and Data Extraction running in the Microsoft Azure platform.

BUSINESS PROBLEM

The Client processes approximately 9.5 million claims annually, with about 4.5 million coming in the form of paper. The way in which the Client received and handled paper claims with the previous vendor was slow and outdated, primarily due to older technology.

The purpose of the project was to address the technology and process changes required for Axis to take over for their previous vendor and ultimately be responsible for converting paper claim forms into textual data.

COMPLEX DOCUMENT CHALLENGES

The types of documents and files processed included EOB, EOMB, 1500/1450 and UB-04, some of which are incredibly complicated document formats. Due to the complexity of some of these files other attempts to build a solution had failed due to the unavailability of technology obtainable to address such a challenge.

SOLUTION

With 4.5 million paper claims processed annually, the previous technology process, slow and outdated, was due for a significant overhaul. It was experiencing inefficient turnaround times for claims processing as well as an excessive amount of manual claims entry, which was now required due to the previous low OCR capture rate. The solution would require massive processing power and building the application in a cloud environment was an only real option. **Microsoft Azure was the go-to choice for it's processing capacity and highly extensible machine learning environment.**

HIGH-LEVEL BUSINESS REQUIREMENTS

Axis was called upon by the Client to take on this massive project and, subsequently, take the proper steps in order to produce a viable solution. Axis' goals were to implement a Digital Mail Process with the client partner; increase the Auto-Adjudication Rate for Paper Medical Supply Claims, all while complying with EDI HIPAA Standards for the transfer of claims data.

By enhancing the reporting for the claims processing, Axis was able also to expedite the System Exception reporting, improve the communications and controls for the Digital Mail Process, and streamline the Quality Audit Process.

PROJECT SCOPE

Though the strategic implementation was already in place, individual tasks, team efforts and workflows needed to be executed in order to:

- Implement a process for sending and receiving scanned paper claim forms via email or fax
- Examine existing procedures for the data scrub
- Batch rules and automation jobs that are currently in place for claims processing
- Create a standard file format that will contain the captured claims data with mapped the data types
- Streamline the reject codes and define the rules to identify system exceptions
- Leverage processes to test HIPAA compliance
- Review existing system processes to determine what modifications may be needed
- Identify which files need to be rerouted for manual claims adjudication
- Establish controls and communications for daily transmissions and corrupt records

AZURE CLOUD PROVIDED THE PLATFORM

Axis Technical leveraged the Microsoft Azure Cloud Solution to provide scalability for the solutions processing power demands and the added security required for sensitive information transfer. From Azure Batch, Snapshots and Web Jobs to their offerings on Azure SQL, Storage, Geo-Replication, VM, Key Vault and Active Directory, Axis took advantage an array of features to build a world-class application that could be scale efficiently as processing demands increased.

OPERATIONAL OUTPUT

Azure has allowed Axis to remain nimble and decrease costs by offloading IT requirements, such as management, infrastructure, hosting, and scale, to the Microsoft cloud. This has allowed Axis to maintain control of its operational output and to determine the best solution which supports architectural expectations.

AXIS TECHNICAL GROUP

CLOUD-BASED SOLUTION

Axis has offered a revolutionary machine learning AI solution, which classifies and extracts data from complex documents and returns the essential data back to the client. Using Azure to facilitate the set of workflow processes combined, the product delivers high-quality data extractions of electronic documents in the matter of a few short hours.

HIGHLY SCALABLE

The job scheduling and auto-scaling features of Azure Batch, to run processes on a large scale has many improved operations. It also allows our production system to scale up to meet the demands during peak times and scale down as needed to minimize operational cost. By tuning the autoscale feature, Axis is able to optimize the resource usage while still meeting performance goals.

Axis also utilizes the Azure App Service Web Jobs to schedule and run maintenance, status, and supporting application, which improves overall operational efficiency and provides another layer of versatility.

STORAGE & REDUNDANCY

Axis uses a combination of Azure Storage and Azure SQL to meet its primary storage needs. By leveraging the Azure Blob and Azure Table storage, client and process data can be stored, after which Azure Queue can then manage workflow queues and trigger processes.

Azure's Geo-Replication feature is also leveraged to provide redundancy and geographic data distribution, which ensures increased uptime and low response times. It enables the user to configure up to four readable secondary databases in the same, or different, data center locations.

WEB APPLICATIONS

Because Axis leverages web application tools for machine learning training, configuration, and data validation, it elects to host these applications in Azure App Service Web Apps. It allows configuration of the scale-up/scale-out logic to meet the application's load demands, thus enabling the applications to scale to the needs of the users.

SECURITY & HOSTED APPLICATIONS

Axis uses the features in Azure Key Vault to encrypt and secure the client's data, both in transit and at rest, while Azure Active Directory is used for user authentication and entitlement management. For cases where the processes do not fit the model for an Azure Batch process, Axis hosts these processes in the Azure VM service, which allows the team to control the specifics of the VM environment that are not available in the Batch service.

RESOURCE MANAGEMENT

Azure Resource Groups and Storage Accounts categorizes different Azure resources within logical groups. A resource group can include all of the resources for a solution that is needed to manage as a group. It provides an excellent measure to control or segregate the resource costs for a set-up. The Storage Accounts also offer a unique namespace to store and access the data objects, all of which are billed together as a group.

The Axis team has successfully implemented the Azure Resource Groups to segregate resources across environments as well as different clients, thus assisting in the storage of large amounts of client data in an organized manner.

IDENTITY MANAGEMENT & ACCESS CONTROL

By using the Azure Active Directory, Axis is able to take full advantage of the entire identity and access management cloud solution, which provides a robust set of capabilities to manage several users and groups.

Azure Identification and Access Control help to manage access to limited users. Within the same subscription, the Axis team has been able to utilize multiple environments by controlling user access.

BATCH & SCALING SERVICES

Axis also uses Azure Batch for running its large-scale parallel and high-performance computing (HPC) applications in the cloud. This allows for deployment of processes that handle a high volume of transactions involving a data.

Because the Axis team requires several thousand CPUs to process high volume computing efficiently, Azure Scaling Services is invaluable, as it enables the use of hardware resources as per the load or requirement of an application.

BENEFITS

By Axis replacing the previous vendor, overall processes were expedited, and the volume of data entry for paper claims was significantly reduced. In addition to the turnaround time for scanned paper claims being reduced from four days to two, which improved upon delivery times, the OCR capture rates were significantly improved from approximately 33% with the previous vendor to 78% under Axis. In addition, there was an increase in the auto-adjudication rate by having fewer exception errors, which provided the peace of mind for the effectiveness of this software.

ADVANCED DOCUMENT CLASSIFICATION AND DATA EXTRACTION SOLUTIONS

AXIS TECHNICAL GROUP

BUSINESS VALUE AND ROI

There are many factors that impact the savings and ROI for the Axis implementation, including the number of people performing manual entry, the number of claims processed and overall man hours for adjudication.
The Client was able to cut overall claims processing costs by 65% through a combination of automated data extraction and auto-adjudication functionality.

This meant 50% cost savings without auto adjudication. Furthermore, 95% of their claims could be adjudicated, which could not have been done so before implementation.

The 78% OCR capture rate that was achieved resulted in a time and cost savings of 10% total savings per medical claim, which equates to $450,000 savings per year.

Keep in mind Axis is capturing info from an EOB, which is the most challenging document to pull data from. It's important to note that customer EOBs/ Remittance Notices delivered to patients from the physician are much different than the EOB supplied to the insurance company.

The medical claims processing is incredibly intricate but is being revolutionized by technology such as Axis Azure Machine Learning solutions to significantly impact overall claims processing accuracy, turn-around times for providers, doctors, and patients, and overall improved reliability between claim data being exchanged between the aforementioned.

By building the solution upon Microsoft Azure, it delivers a robust and flexible cloud platform that provides limitless power and agility to develop, deploy and manage common technical components such as activities, applications, and infrastructures.

Axis professional services and technical know-how of cloud application development helped our clients determine the proper mix of high performance features that best suit their business needs, which result in Cloud Applications, Composite Solutions and Hybrid Applications that are cost-effective, scale and extensible.

The knowledge aquired from this impliementation can now be applied to an array of document processing applications within the client's environment or even for other client projects with similar challenges.

INDUSTRY EXPERIENCE

- HEALTHCARE
- LAND AND TITLE
- OIL AND GAS
- FINANCIALS AND BANKING
- INSURANCE

Microsoft GOLD CERTIFIED Partner

AXIS TECHNICAL GROUP

CORPORATE HEADQUARTERS
300 S. Harbor Blvd. Suite 910
888 491-2636
www.axistechnical.com