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# From Mainframe to the Cloud with AWS and Atos

A background image of a financial chart on a screen, showing a line graph with a significant upward trend. The chart has a dark background with a light-colored line and a shaded area underneath. The x-axis is labeled with dates from Nov 25 '11 to Aug 2 '12. The y-axis has values like 362.02 and 360.79. The Atos logo is in the bottom right corner.

**Atos**

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## Executive Summary

The customer, a Fortune 500 financial services provider, is an industry leader in cloud transformation. They were able to lower their costs by reducing data centers, and moving away from mainframes while simultaneously gaining availability, reliability, scalability, agility, and security. It also brought their Big Data to light, unlocking the potential of machine learning (ML) and AI. Atos was a strategic partner on the client's mainframe to AWS journey, delivering AWS cloud-native data pipelines, application modernization, enterprise APIs, and clickstream analytics which laid the foundation for instant, enriched, and tailored adaptive experiences for their consumers.



## About the Customer



A top 10 US bank with multi-billion dollars in revenue from business and operations centers distributed across the globe.

## Customer Challenge

The cloud revolution is changing the world and our lives at an accelerating pace. Enormous computing power and data accessibility has given rise to new customer products and experiences that provide instantaneous solutions tailored and adapted for the needs and wants of the consumer.

Banking is on this trajectory as well. One challenge is that banking is a legacy industry, with deep infrastructure investment and a high level of regulation. For banks to deliver new capabilities, they must first hurdle their entrenched ways of doing business, completely reinventing their tooling, how they work, and even their business model.

Meeting regulatory requirements in a way that enabled more secure platforms and faster feature development was required. Refactoring data formats onto a more ubiquitous platform was also required to securely unlock the value of the data. Modernizing legacy applications with APIs was required to enhance on-demand feature development. An example of the scope included moving from procedural System Z to object oriented Java, onto a cloud native containerized architecture.

The customer recognized the opportunity to create data-enriched adaptive products that yield better customer experiences, and they were the first to commit to an all-in public cloud journey. Existing, on-premise infrastructure did not offer the scalability, reliability, security, and broader ecosystem of tools and services. The customer needed to make this vision a reality.

## Why AWS

Recognizing the value of the cloud early, the bank, after performing an "Experimental Phase" in 2013 and 2014, recognized several strategic benefits of using AWS, including the enablement of a superior security model and breaking down barriers of innovation, speed, observability, recovery, system transparency, and corporate collaboration.



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## Why the Customer Chose the Partner

The Atos relationship with the bank began with a single project in 2016 and has blossomed into a robust partnership with more than 20 projects that touch many critical elements of the enterprise, including cloud-native application and services development, data engineering, analytics, and ML. Their vision for the future of the industry and their own digital transformation and disruption fit squarely with Atos' deep cloud expertise and outcome-oriented delivery model.

The three projects below offer highlights from the customers mainframe migration journey:

### 1. Authorizations

### 2. Charge-Offs

### 3. Credit Card Application Platform Analytics

## Partner Solution

The following section details a selection of the relevant projects. Multiple data sources and legacy applications were migrated from z/OS and cobol. Using a proprietary process, we converted business rules into unit tests accelerating the migration from cobol to java, then refactored the output with new security requirements. Data was processed and tokenized for rest/transit. Existing legacy systems were decommissioned.

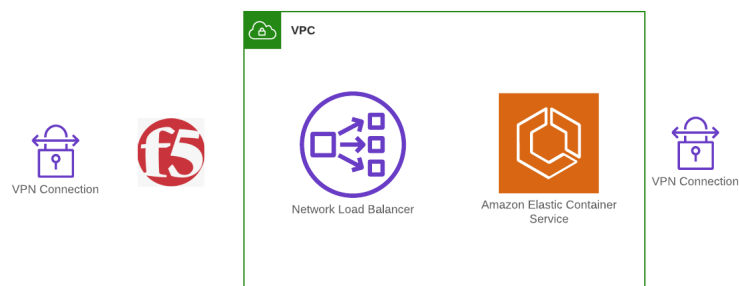
## 1

## Authorizations

Atos partnered with the bank to exit data centers and modernize credit card transaction authorization at the point of sale (POS). POS authorization is used by nearly every retailer, and enhancements enable a faster response time, greater throughput, and strengthened credit and risk controls.

In this complex migration, traffic had to be migrated from the legacy mainframe infrastructure to the modernized platform with 100% uptime and airtight "what if" scenarios. Delivering the solution involved dedicated TCP connections, AWS Route53, Network Load Balancers, ECS, and EC2 instances. Each partner was given separate, dedicated EC2 instances to minimize the risk of disruption. The benefits of this migration included cost reduction, automation (deployments, automated testing), modernized tech stack (AWS, ECS, TCP/IP), and standard formatting (ISO-8583).

## Authorizations Architecture - RPM





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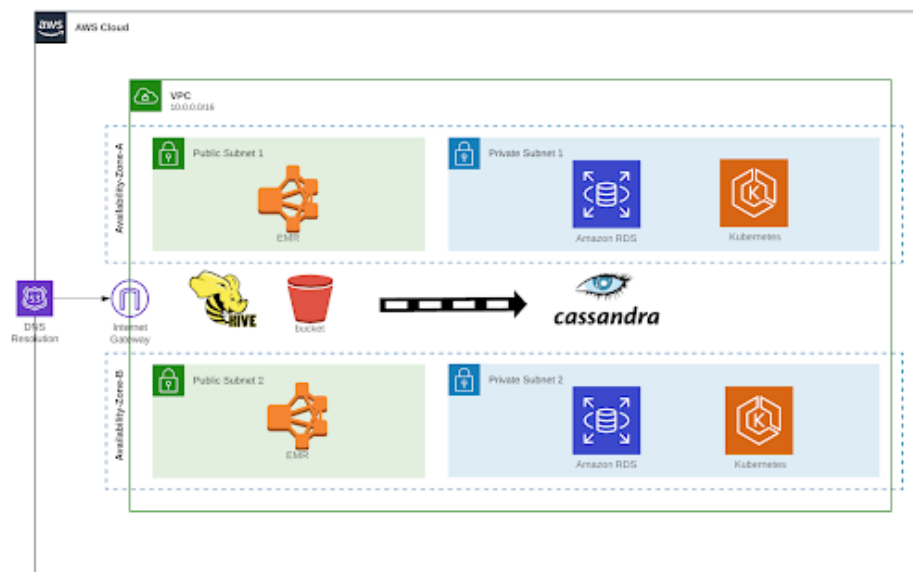
### Authorizations

Results	<ul style="list-style-type: none"><li>• Improved platform resiliency</li><li>• Enhanced platform instrumentation and data production</li><li>• Augmented monitoring and support</li><li>• Enabled federated development</li><li>• Simplified pipeline automation</li></ul>
Overall	Significant improvements over the legacy system included shutting down data centers, removing legacy licensing costs, reduced complexity with standard formatting (ISO-8583), significant performance improvements using NLB (Network Load Balancer), and optimizing workflows.
Next Steps	Implement the final phase to onboard the remaining retail partners.

## 2

### Charge-offs

Charge-offs, the purged accounts application, became the central system of record consolidation for many departments, including fraud, military servicing, and cybersecurity. This consolidated application removed multiple steps across disparate mainframe systems, eliminated copy-paste errors, and streamlined workflow. The demand for data warranted a separate API to allow for individual departments to automate their interactions with the system. The architecture handles the load of users and automated systems, enabling a platform with the promise to create more business value.



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Charge-offs	
Results	<ul style="list-style-type: none"><li>• 5,000 plus users distributed globally</li><li>• Eliminated security risk liability from legacy systems</li><li>• Reduced annual run cost</li><li>• Eliminated OCC MRA (Matter Requiring Attention)</li><li>• Eliminated two legacy systems</li><li>• Agent performance has increased considerably, nearly doubling the number of cases handled per hour</li><li>• Elimination of the copy and paste functionality when working with NPI data thereby reducing info security risk</li></ul>
Overall	Shutting down data centers, removing legacy licensing costs, reducing dependencies, addressing significant regulatory risks, optimizing workflows for users, expanding pipelines for technologists, and reducing cybersecurity threats. The extending platform's capabilities well beyond that of the legacy platforms it had replaced.
Next Steps	Charge-offs is now a data service platform, increasing security and enabling use cases that were not possible before. This has become the blueprint for managing charged off accounts from all acquired and consolidated businesses in the bank's portfolio. The next phase includes building on top of this framework, bringing further visibility and flexibility to the many different use cases consuming this data. This includes data warehousing access, pre processed analytics, and embedding micro-app integration into larger frameworks.

### 3

## Credit Card Application Platform Analytics

The Atos data team laid the foundation for an analytics and data science competency for the bank's retail partner card credit business unit, with a specific focus on the customer credit card application experience across all partnership card products and all customer acquisition channels. The big business question at hand was whether or not the online customer acquisition platform was successful in capturing customers and enabling them to start spending. This involved tracing each customer experience from their acquisition into the application, to their experience completing the application, to the processing of that application, to their card activation, and to spending patterns. This spanned multiple datasets and streams curated by disparate teams and required finding a way to properly join them together to get a complete customer experience view.

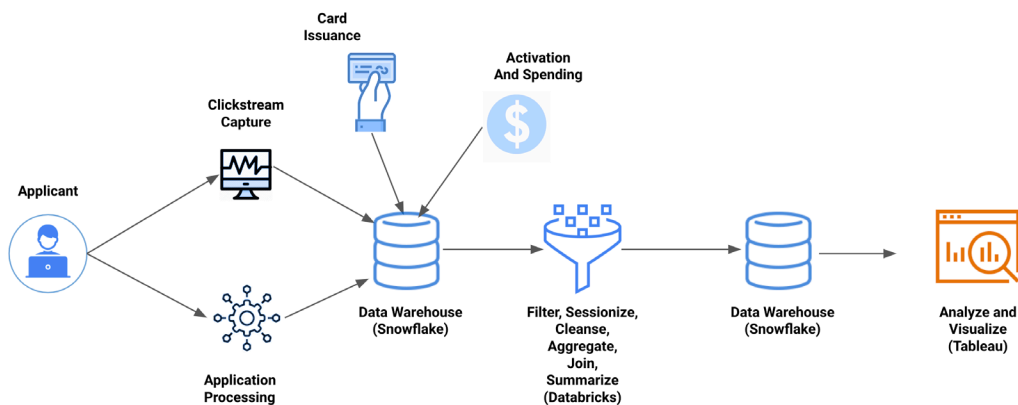
Third-party tools integrated with AWS and already in wide use across the enterprise were chosen - including Databricks, Snowflake, and Tableau. KPIs, metrics, and data definitions were standardized, documented, and shared to all teams to gain a common vocabulary and understanding.



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### Credit Card Application Platform Analytics

Results	Dataset and dashboard generation were automated. These became widely used to provide insights and prescriptive actions for the platform design and to uncover new business opportunities, including real-time ML and adaptive platforms.
Overall	The business gained greater visibility and understanding into data they already had, but which was otherwise inaccessible for answering complex concerns. What started out as a project to measure and improve the customer experience completing a card application, evolved into a methodology and tool to aid development teams in platform debug and feature delivery, assess A/B testing of application options, and measure success of marketing and retail sales efforts. It has also evolved into analytics as a service, a way for the bank to better serve their institutional card partnerships, with data, insights, and advice on how best to tune their businesses.
Next Steps	The bank now has a curated, credible, and well understood dataset that provides a great foundation for ML exercises. For example, is it possible to use the clickstream to predict who might abandon the application, and if known, how can the form adapt to keep the customer better engaged? Similarly, is there anything in the clickstream or application data that can predict the ultimate activation and spending pattern, and if so, can it be influenced?



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## Overall Solution and Results

All applications and data are cloud-native, with cross-region resiliency. Enterprise-wide data catalogs, data lakes, and data warehouses serve tens of thousands of internal consumers. Modern microservices interact through standard interfaces such as RESTful APIs. Development follows a product-centric Scaled Agile Framework with integrated DevOps practices. The power of Big Data and ML/AI are now being brought to bear.

The bank didn't complete this journey on its own. Foundationally, they entered into a strategic partnership with AWS, and they accelerated success with multiple apps, data, and analytics teams from Atos. Further, they embraced the broader community through open source adoption and contribution. Importantly, they significantly recruited and grew their technology workforce, and they plugged into the rich world of third-party innovation through AWS and their ecosystem, even investing where appropriate.

## About the Partner

Atos has been a partner in the customer's digital transformation journey since 2016. Atos has been an AWS GSI Advanced Consulting Partner since 2013, holds the Migration Delivery Competency, is a Well-Architected and Public Sector partner. Atos has 675 AWS certified experts with 1,145 certifications. The company has over 45 years of experience in IBM Mainframe services, 70+ successful mainframe transitions and 100% customer success rate. We assist clients in changing the way technology experiences are delivered by leading companies to change the way they work and thrive in the digital age. To help organizations maximize economic outcomes and advancements, Atos brings a rich blend of industry-specific technological expertise, agile-integrated design and best practices for transformation.