

DEPTH. FOCUS. SERVICE.

MERCATOR
ADVISORY GROUP

TAMING THE DATA DEMON:

FINANCIAL DATA MANAGEMENT IN THE AGE
OF MAXIMUM VOLUME AND VELOCITY

Table of Contents

Executive Overview	2
Taming the Data Demon	4
A Unified Platform Solution	5
The Four Pillars of the DataSeers Platform	6
Data Management in Action: A Case Study.....	7
FinanSeer, a Machine Learning Platform for Data Management.....	8
Conclusions	9

Executive Overview

Financial data was once considered the savior of banking operations and analytics, but it is becoming a threat. The sheer amount of financial data being produced today has led to complexities in analyzing and deploying it. This data comes from many sources—new devices connected in the Internet of Things, digital banking, and mobile payments and other transactions—filling the financial “data lake” by the nanosecond. The consequences have rattled banking executives. In a recent survey, nearly 90% of banks said they have major concerns about data management. Only 10% were neutral on these concerns. Not a single bank had “no concerns” regarding data management.ⁱ

Nearly half (42%) of the banks surveyed told researchers that creating an integrated, consistent view of data across their organizations is their largest challenge with regard to data management. Banks also still struggle with data security; 80% of bankers surveyed indicated their organizations are planning to increase investments in security technologies in the next three years.ⁱⁱ Prepaid program managers in particular are constantly looking to improve reconciliation of the data generated by multiple prepaid programs, multiple prepaid processors, multiple banks, multiple reload and payment networks, and multiple distribution channel partners. These multiple sources overlap data elements, different data types, and different data element names. Fortunately, open-source software and new platforms are available that can normalize this diverse data and then automate the generation of reports that guide internal operations, meet regulatory requirements, manage fraud, and reconcile positions across banks, processors, networks, and partners.

Bringing simplicity to this seeming chaos is the purpose of new open-source machine learning platforms that establish multiple analytic stages, including data identification, data mapping between systems, field and record validation, and then analytics addressing operational, regulatory, and reconciliation requirements.

The core of any data solution lies in data management. What is needed is a solution that will integrate and coordinate compliance, reconciliation, fraud monitoring, and visualization.

This research brief provides a senior executive level look at the problems presented by the current state of financial data management in the face of compliance concerns. The paper describes methods to improve data management in the age of machine learning and artificial intelligence. Its focus is the prepaid business, which has become a new target for fraud, in part because it lacks the predictability and strict regulation of the credit card business.

Taming the Data Demon

Volume is not the problem. The data demon for banks can be tamed not by managing scale alone, but by taming the process, integration, and structure of that data. Open-source data management and consolidated analytics platforms are the best weapons to fight the data demon. And they are the best way to fight data's unfortunate byproduct: payments fraud.

First, the landscape. Financial data produces more than 50 billion data points a day.ⁱⁱⁱ This runaway acceleration has led to data and privacy regulations, with GDPR (General Data Protection Regulation) in the European Union at the strictest end of the spectrum. While many analysts warn of the danger of too much data and attracting too much regulatory attention, it's becoming clear that data management, not limitations, is the right strategy.

The combination of volume, velocity, and variety is a potentially toxic mix. If not managed efficiently, that mix can lead to more serious problems with compliance. Banks that cannot identify bad actors on their data platform may attract attention from regulators. If those problems escalate, banks become vulnerable to potential fines.

Every banking product, from mortgage to checking to credit and debit, generates data. An underrated source of data is the prepaid business. According to Mercator Advisory Group's projections, the closed-loop prepaid business will maintain steady growth through 2020 with the total amount loaded on prepaid cards topping \$346 billion. Even if its rate of growth is slow, analyzing the prepaid business is important because it is expanding into new customer segments, including gig economy workers and mass merchant customers looking for a financial management tool. For example, millennials use 66% of reloadable prepaid cards in the United States.

Prepaid merits attention for its data-producing capabilities. Prepaid formats are being used by the underbanked (33%) and unbanked (21%), and usage data can inform strategies for optimizing those segments.^{iv}

Prepaid products are populated by fintech companies and characterized by innovations in access and customer interactions. Gift cards in particular can be an attractive target for fraud and money laundering. With tighter post-financial crisis regulation on larger amounts of money, and with safer EMV chip-enabled debit and credit cards at the point of sale, fraud has migrated to prepaid. The patterns that have been time-tested in identifying credit fraud need to become more defined in the prepaid business.

Prepaid cards are forecast to account for 9% of global card fraud in 2025. The amount that merchants pay to cope with each dollar of fraud has been on the rise for the last four years. Based on merchant estimates, it now costs \$2.94 to resolve each \$1.00 of online fraud, up from \$2.77 last year. That includes the total cost of chargebacks, fees, merchandise redistribution, labor, investigation, legal issues, and IT/software security according to software provider Lexis-Nexis Risk Solutions.^v

Adwait Joshi, Chief Seer of the financial data management platform company DataSeers, explains the necessity of using artificial intelligence (AI) based on machine learning (ML) to defend against fraud attacks in the prepaid industry:

The prepaid industry has seen a slew of bad actors. The fraudsters are not only smart, but they have more advanced technology than some of the processors. Hence, rule-based fraud or compliance monitoring is a thing of the past. The only way banks can keep up with fraudsters and make a meaningful effort against it is by using AI and ML. Machine learning works on a simple “garbage in, garbage out” basis, so the most important piece of any ML-based algorithm is to have clean and actionable data. Our platform is different in this way because while most platforms struggle getting clean data, this is what we do ahead of time.

—Adwait Joshi, Chief Seer, DataSeers

Recent business initiatives on both the prepaid card and prepaid mobile fronts are examples of activity requiring vigilance against fraud. Bank of America launched a commercial prepaid mobile app in late July and offers two types of commercial prepaid cards, a business funds card and a personal funds card. According to First Data, mobile gift card apps are a significant category driving more digital gift card sales. Among consumers surveyed who were aware of mobile gift card apps, 52% had used one, and among millennial survey respondents, 65% said they had used an app to purchase a gift card. This increase in mobile gift cards represents yet another source of third-party data that must be evaluated since it represents an additional potential fraud vector.

A Unified Platform Solution

In short, disparate and mismanaged data result in longer lead times in identifying fraud. The solution begins with open-source computing platforms that can be updated frequently enough by the participating community to handle the kinds of changes and volume challenges that the current financial data landscape presents. DataSeers uses High Performance Computer Cluster (HPCC Systems®) from Lexis-Nexis Risk Solutions, which has been in development since 2000. In 2011, HPCC Systems’ capabilities were changed to accommodate AI and ML. Flavio Villanustre, Vice President and Chief Information Security Officer, Lexis-Nexis Risk Solutions, says the development of HPCC Systems has manifested itself in the current applications available for financial data:

Banks are competitive, work for market share and have to change with the tides of compliance and security. Every day that job becomes more complex regardless of whether you’re a CIO that focuses on the back office or one that likes to get into the data. Banks are under constant scrutiny. Mistakes are met with huge fines and public outcry.

—Flavio Villanustre, VP and CISO, HPCC Systems, Lexis-Nexis Risk Solutions

DataSeers, an innovative new financial data platform provider based in Alpharetta, Georgia, utilizes HPCC Systems to enable banks to see business rules, data structures, and customer interactions with accuracy and scale, regardless of the volume or complexity of the data. HPCC Systems is an important toolset that enables banks to analyze and integrate data processes and deploy predictive modeling tools.

Even with HPC Systems, though, there is still a need for effective database creation and access to achieve insight and utility of that data. Organizing data around central tenets is critical for scalable solutions and for category-specific analytics such as prepaid, according to Adwait Joshi.

We welcome the flood of data. But banks do not have clean data to start; our system bridges that gap by providing data cleansing and homogenizing routines as a start. The more data a client can send to the device, the better our system can learn, predict, and respond to events. On the growth side, our platform is designed to be able to scale fast using the distributive nature of HPC Systems, which not only handles speed but also allows both horizontal and vertical scaling with virtually no down time.

—Adwait Joshi, DataSeers

The Four Pillars of the DataSeers Platform

Using the open-source platform of HPC Systems, DataSeers machine learning solution collects, organizes, and unifies structured and unstructured financial data from across the enterprise. The resulting repository is structured specifically to enable the analysis and forecasting that will guide the operation of four business critical functions that are common to all prepaid programs:

- 1. Reconciliation.** Operations, treasury, capital markets, and accounting all are involved in reconciling transactions across multiple networks. Without a single point of access and single data platform, high account and transaction volumes and ever-changing regulatory requirements make data unmanageable. Basically, all the data gathered and analyzed by the various departments of a bank must be reconciled with speed and regulatory accuracy. HPC-based systems make the reconciliation process seamless, regardless of the data volume.
- 2. Compliance.** While the focus of compliance efforts has been on Know Your Customer and data gathering requirements, many financial institutions still work in a siloed environment. This creates a challenge with respect to data because they cannot gain a holistic view of customers and their activities. Combine this challenge with the cost associated with having a solution for managing their data, a separate solution for meeting their compliance needs, and separate solutions for fraud management and reconciliation. Compliance cannot be effectively overseen in this fashion. An automated solution that combines BSA/BSM/AML and automatically sends alerts about possible inconsistencies is needed to manage compliance.
- 3. Fraud.** The tip of the spear for combatting fraud is using AI and ML to find suspicious patterns in financial data. Hybrid machine learning and rule-based engines can detect anomalies in transactions, especially in prepaid where new fraud tactics are being discovered.
- 4. Visualization.** Complexities in financial data make it hard to create presentations and dashboards that present opportunities and potential problems. Multilayered analytics is provided by FinanSeer through modules using Elasticsearch, Logstash, and Kibana for visualization.

Data Management in Action: A Case Study

A clear example of financial data problems and opportunities can be seen in Sutton Bank, based in Attica, Ohio. According to Senior Vice President of Prepaid Services Jeff Lewis, the bank's core business is in its eight-branch community-based lending business, including agriculture, where business is personal and often handled on a one-to-one basis. Data is basically limited to the client's track record, credit rating, and revenue. Lewis joined the Sutton Bank in April 2017 and saw an opportunity to expand its business at a rate acceptable to the bank through launching new products that would allow the bank to play more aggressively in the digital space.

Prepaid became an effective vehicle for expanding into new customer segments and growing the business at scale without abandoning Sutton's community roots. When Lewis started, managing the data that would result from a spike in transactions relied on a manual process. And like many banks entering the prepaid business, Sutton needed to step up its fraud recognition capabilities. Lewis recognized that the HPCC Systems and a unified platform could be an essential part of the data management upgrade. The bank needed speed, accuracy, and an upgrade in overall data quality.

After meeting with DataSeers, Lewis saw that the most important aspects of its platform were fraud detection and compliance. While adding hundreds of prepaid accounts per month, Sutton lacked the latest technology for recognition of data patterns necessary to see oncoming fraud tactics. After implementing the DataSeers platform in late 2017, Lewis was surprised by the dramatic time reduction in data analytics and specific report creation on the reconciliation side. In fact, some report times were cut from 45 business days to just 5 minutes. The HPCC Systems solution was a "huge help," according to Lewis, providing analysis of problems all the way back to the beginning of the data process. For example, if data quality suffered from an onboarding process that lacked rigor, the system helped to improve the onboarding process.

With the sheer amount of data we needed to manage, I wanted to see an outcome that gave us speed, ease of development and customization. I was surprised at how my expectations were surpassed. We went beyond reconciliation and into forecasting. We forecast our business rather than react to it.

—Jeff Lewis, SVP, Prepaid Services, Sutton Bank

Lewis summarizes the DataSeers impact in two areas. First, Sutton Bank has gone from a manual to an automated data management platform. Second, it has gone from a narrow view of its business to a broad view.

DataSeers has enabled us to act like a fintech when we want to, and compete with fintechs when we want to. Data is not static. It's dynamic. Data management is the same. It's not a static process.

—Jeff Lewis, Sutton Bank

FinanSeer, a Machine Learning Platform for Data Management

As payments-related data expands into the future, the need for secure and automated data management grows with it. Enter DataSeers. Its platform, **FinanSeer**, is designed to ingest large amounts of disparate data and unify it into one format, giving clients a 360-degree view of their business. Although the platform is not limited to the prepaid business, the company finds that banks have processes that need to be integrated for unique issues associated with prepaid. DataSeers gives banks a complete solution to transform structured and unstructured data into a single-pointed distributed file system. It then categorizes that data into deliverable solutions.

Our platform is designed to follow the banks' needs and solve their data pain points. When you look at the issues they deal with right now in the prepaid business, it is critical for every person involved in the business to have access to the same information. A bank can have 50 processors and 500 programs for its prepaid products and lack a common login. It's a huge issue.

—Adwait Joshi, DataSeers

FinanSeer is based on a machine learning-based approach to financial data. The platform consists of built-in modules for compliance, reconciliation, off-line fraud, and analytics. The FinanSeer platform is fully scalable both horizontally and vertically, so it can work for banks of any size. It is designed to easily increase the number of nodes to accommodate growth. FinanSeer platform has four modules:

ComplianSeer, the compliance module, is a rule-based engine that oversees compliance with regulatory requirements such as BSA/AML, CIP Monitoring, HIDTA, HIFCA, FinCEN 314a & b, Death Master List, OFAC, and Elderly Abuse. After implementation, it becomes a complete complement for a financial company's compliance management system.

ReconSeer, the reconciliation module, also a rule-based engine, oversees reconciliation of cards and accounts at unprecedented speeds. This includes roll forward, three-way reconciliation, network versus processor versus core bank, network settlement, chargebacks, and representments.

FraudSeer, the off-line fraud detection solution, is a hybrid machine learning and rule-based engine that detects anomalies in transactions and predicts fraud. Areas covered include merchandise return fraud, stolen identity fraud (tax fraud), unusual activity (geography, pattern, travel), under age/over age, and blacklisting of people, as well as addresses and merchants. Future applications of FraudSeer will include algorithms designed to identify risks associated with human trafficking, money laundering, and other financial crimes.

StrataSeer, the analytics module, is a predictive engine for analytics and traditional reporting providing clients with a holistic view of their data, with visualization through Elastic and Kibana. It includes more than 100 prebuilt dashboards with the ability to create fully customized reports. All data is also fully searchable with the ability to drill down to individual cardholders.

Figure 1: A Simplified Diagram of the DataSeers Platform.



Source: DataSeers

Conclusions

Volume, velocity, variety, and veracity. Those are the issues in financial data in the age of AI. Opportunity for data unity and more productive use of data does not rest simply with the amount of it. A unified platform accommodates volume and solves the problems of utility and compliance. Banks that cannot react quickly allow bad actors into their databases, a risk that is taken seriously by regulators.

Machine learning and artificial intelligence play an integral part in solving data problems for banks. Some organizations try to keep up with fraudsters with manual intervention. They identify problems too late in the process and are left cleaning up the mess after a fraudster has done damage. Utilizing ML and AI, as DataSeers does, can identify patterns and anomalies and utilize the information to identify fraud early in the process, thus mitigating the damage and liability for financial institutions. Data platforms must be fully scalable—both horizontally and vertically—and designed to work for banks of any size.

The fraud threats, regulations, and market dynamics that banking executives face have rarely been more urgent. Looking at new payment flows and dynamically changing products like prepaid requires certainty and automation, which can make data not a demon to be tamed, but an asset to be protected.

Endnotes

- ⁱ http://www.wolterskluwerfs.com/Press_Releases/2018-06-12_New_Research_from_Wolters_Kluwer_and_The_Banker_Reveals_Banks_Planning_Further_Integration_of_Regulatory_Data/
- ⁱⁱ <https://www.ey.com/gl/en/services/advisory/ey-global-information-security-survey-2017-18>
- ⁱⁱⁱ <https://blogs.thomsonreuters.com/financial-risk/fintech-innovation/keeping-pace-with-the-big-data-explosion/>
- ^{iv} <https://www.statista.com/statistics/416044/banking-status-of-households-using-prepaid-cards-usa/>
- ^v <https://www.paymentsource.com/list/data-the-new-pain-points-of-mobile-commerce?brief=00000157-2f43-d6a6-a9f7-ffc013e0000>



Copyright Notice

External publication terms for Mercator Advisory Group information and data: Any Mercator Advisory Group information that is to be used in advertising, press releases, or promotional materials requires prior written approval from the appropriate Mercator Advisory Group research director. A draft of the proposed document should accompany any such request. Mercator Advisory Group reserves the right to deny approval of external usage for any reason.

Copyright 2018, Mercator Advisory Group, Inc. Reproduction without written permission is completely forbidden.



About Mercator Advisory Group

Mercator Advisory Group is the leading independent research and advisory services firm exclusively focused on the payments and banking industries. We deliver pragmatic and timely research and advice designed to help our clients uncover the most lucrative opportunities to maximize revenue growth and contain costs. Our clients range from the world's largest payment issuers, acquirers, processors, merchants, and associations to leading technology providers and investors. **Advisory services** include *Credit, Debit and Alternative Products, Prepaid, Customer Interaction, Commercial and Enterprise Payments, Emerging Technologies, and Global Payments practices*, which provide research documents and advice. **Primary data services** include the *CustomerMonitor Survey Series*, which report and analyze data collected in our biannual consumer surveys, as well as the *Customer Merchant Experience Survey* and the *Small Business Payments and Banking Survey*. **Consulting services** enable clients to gain actionable insights, implement more effective strategies, and accelerate go-to-market plans; offerings include tailored project-based expertise, customized primary research, go-to-market collateral, market sizing, competitive intelligence, and payments industry training. Mercator Advisory Group is also the publisher of the online payments and banking news and information portal PaymentsJournal.com. Visit www.mercatoradvisorygroup.com.