AXIOMSL®
PLATFORM FOR CHANGE

SLE Series

# GOING GREEN WITH YOUR DATA

## ACHIEVING CROSS-REPORT RECONCILIATION

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GOING GREEN WITH YOUR DATA

# ACHIEVING CROSS-REPORT RECONCILIATION

## EXECUTIVE SUMMARY


***Going Green With Your Data – Achieving Cross-Report Reconciliation** arises from AxiomSL's more than 25 years of industry experience working with global financial institutions on regulatory reporting and its deep understanding of the evolution of regulatory reporting data. The idea of "green" data stems from recognizing the broadening and thickening interconnectedness between regulatory reporting requirements and underlying datasets. As requirements grow both in terms of vastness and granularity, it is imperative that financial institutions have a better view of dataset commonalities and develop approaches that help them achieve sustainable green data and cross-report reconciliation.*

*In this edition of the SLE series, AxiomSL describes the interconnection challenge and introduces sustainable green data best practices that enable financial institutions to:*

- *Establish a regulatory-reporting data framework driven by a green data dictionary architecture*
- *Identify critical data elements (CDE) – living building blocks of efficient regulatory reporting datasets*
- *Determine that data is fit for use*

*With a well-nurtured green data foundation, the seemingly impossible becomes achievable: financial institutions can implement reusable cross-report reconciliation methodologies that work within and across interconnected reports.*

*In the near term, green data practices yield immediate benefits in terms of easier data sourcing and faster, cleaner reconciliation. In the longer term, going green with data enables financial institutions to develop accurate and efficient regulatory datasets that consistently:*

- *Meet complex cross-report reconciliation requirements*
- *Reduce enterprise and operational risks*
- *Satisfy stringent data quality standards*
- *Deliver insight across datasets and functional silos, bringing diverse products (derivatives, mortgages, loans, etc.) into a comprehensive, reconcilable view*

*The ideas discussed in this paper can help financial institutions plant the seeds of green, sustainable data enabling them to nurture, reuse, and repurpose their most valuable resources – data and time.*


*The Service Level Expectations (SLE) concept is the theme for AxiomSL's **SLE Series** — a means to share ideas and best practices on topics centering on the SLE approach: Delineating SLEs for each core dataset defines the data-quality bar for a financial institution's risk and regulatory reporting organization, enabling data veracity, interconnectivity, process improvement and insight across the enterprise.*

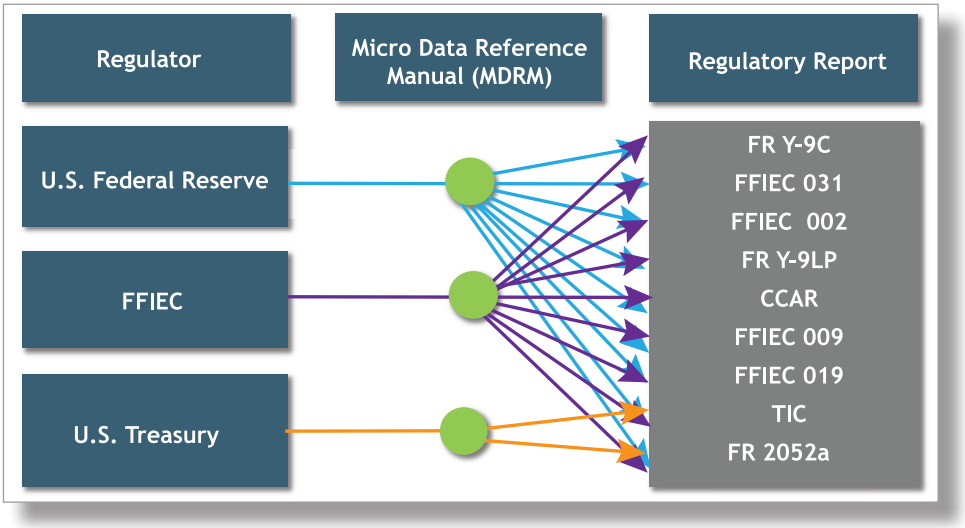
## THE INTERCONNECTION CHALLENGE

In today's ever more complex and interrelated regulatory reporting arena, financial institutions must be concerned not only with submitting the correct data for each specific report, but also with connecting the dots between and among various reports. The data the financial institution submits for a specific report must often make its way into many other reports. Reconciling each exposure across many filings can be a time-consuming nightmare, attracting audits that are difficult and costly to defend. Therefore, it is worth exploring the interconnection challenge.

### A Muddy Landscape: MDRMs, Business Lines, Product Datasets, Jurisdictions, Etc.

In the course of reporting to regulators, financial institutions must wrangle data from various lines of businesses at various levels of granularity and consolidation and make that data correctly land in multiple regulatory reports – with accuracy that stands up to scrutiny. The typical reporting landscape of a large financial institution operating in the U.S. perfectly illustrates the problem. As depicted in the following diagram, many links exist between various U.S. regulators, their detailed data requirements issued in the form of a Micro Data Reference Manual (MDRM), and the array of regulatory reports the financial institution must submit on a regular basis.

**Interconnections Between U.S. Regulators And Reports**




**Reconciling each exposure across many reports can be a time-consuming nightmare.**

The FR Y-9C report showcases the scope of interconnectedness represented in the diagram. The U.S. Federal Reserve requires this quarterly filing from almost all financial institutions in the U.S. including domestic bank holding companies (BHCs), savings and loan holding companies (SLHCs), securities holding companies (SHCs) and U.S. intermediate holding company (IHCs) with total consolidated assets of $3 billion or more. A baseline report, it requires respondents to report against various products and contains a consolidated balance sheet and income statement with detailed schedules including one for off-balance-sheet items and regulatory capital. A financial institution must report against the following key products and datasets:

- Derivatives
- Loans
- Securities
- Deposits
- Capital
- General Ledger (GL)
- Counterparties

It is easy to imagine the data-management and reporting complexities that arise as many rivers of data flow through a multi business-line financial institution to its balance sheet. The key point here is that there is a great deal of overlap in product data – loans, securities, etc. – across multiple reports.

## Product-Type Level Data Across Interconnected Reports

In general, common categories of financial reporting data are:

- Assets: Mortgages, securities, cash, etc.
- Liabilities: Deposits, repurchase agreements, other borrowed money, etc.
- Capital: Basel related fields for calculating risk weighting, etc.
- Off balance-sheet items: Foreign exchange, etc.

The extent of the interconnectedness of regulatory reports at the product-type data level is evident in the following matrix developed by AxiomSL.

### Matrix Of Product Types And U.S. Regulatory Reports

| | FR Y-9C | FFIEC 031 | FFIEC 002 | FFIEC 009 | FR Y-15 | FR Y-14Q |
|---|---|---|---|---|---|---|
| **Assets** | X | X | X | X | X | X |
| Cash Due From | X | X | X | X | X | X |
| Balances Due From | X | X | X | X | X | X |
| Fed Funds Sold and Reverse Repos | X | X | X | X | X | X |
| Securities - U.S. Treasury | X | X | X | X | X | X |
| Securities - U.S. Govt Agency | X | X | X | X | X | X |
| Securities - States and Local Govt | X | X | X | X | X | X |
| Securities - Mortgage Backed Securities | X | X | X | X | X | X |
| Securities - Asset Backed, Structured Products | X | X | X | X | X | X |
| Securities - Other | X | X | X | X | X | X |
| Securities - Investments in Mutual Funds and Other Equity Securities with Available Fair Values | X | X | X | X | X | X |
| Loans - Real Estate Construction and Development | X | X | X | X | X | X |
| Loans - Real Estate Farmland | X | X | X | X | X | X |
| Loans - Real Estate Residential Properties | X | X | | X | X | X |
| Loans - Real Estate Nonfarm and Nonresidential | X | X | X | X | X | X |
| Loans - Depository Institutions | X | X | X | X | X | X |
| Loans - Commercial and Industrial | X | X | X | X | X | X |
| Loans - Retail | X | X | | X | X | X |
| Loans - Foreign Govts and Official Institutions | X | X | X | X | X | X |
| Loans - Nondepository Financial Institutions | X | X | X | X | X | X |
| Loans - Lease Financing | X | X | X | X | X | X |
| Premises and Fixed Assets | X | X | X | | | X |
| Other Real Estate Owned | X | X | X | | | X |
| Intangible Assets | X | X | | | | |
| Other Assets | X | X | X | X | X | X |
| **Liabilities** | X | X | X | | X | X |
| Cash Due To | X | X | X | | X | X |
| Balances Due To | X | X | X | | X | X |
| Fed Funds Purchased and Repos | X | X | X | | X | X |
| Other Borrowed Money | X | X | X | | X | X |
| Subordinated Notes and Debt | X | X | | | X | X |
| Other Liabilities | X | X | X | | X | X |
| **Capital** | X | X | | | | X |
| Common Stock | X | X | | | X | X |
| Retained Earnings | X | X | | | | X |
| Other Capital | X | X | | | | X |
| **Income and Expenses** | X | X | | | X | X |
| **Allowance for Loan and Lease Losses** | X | X | | | | X |
| **Derivatives and Off Balance Sheet Products** | X | X | X | | X | X |
| Unused Loan Commitments | X | X | X | | X | X |
| Securities Underwriting Commitments | X | | | | X | X |
| Letters of Credit | X | X | X | | X | X |
| Securities Lent/Borrowed | X | X | X | | X | X |
| Credit Derivatives | X | X | X | | X | X |
| Spot FX | X | X | X | | X | X |
| Interest Rate Contracts | X | X | X | | X | X |
| FX Contracts | X | X | X | | X | X |
| Equity Derivative Contracts | X | X | X | | X | X |
| Commodity and Other Derivative Contracts | X | X | X | | X | X |
| **Liquidity** | | | | | X | |
| Cash Flows - Incoming (Assets) | | | | | X | |
| Cash Flows - Outgoing (Liabilities) | | | | | X | |
| **Custody Accounts** | | | | | X | |

Another aspect of the interconnectedness challenge is that common balance sheet and income reports such as FR Y-9C and FFIEC 031/041/002 require almost identical datasets and MDRM-level granularity; however, they also add layers of complexity due to the various levels of consolidation and legal entities for which the product data must be reported.

If there is lack of trust in the accuracy of the data to begin with, this problem intensifies. Financial institution executives are quite aware that the data they capture and submit is not necessarily correct. Increasingly, they also are aware that their organizations may not be in the best position to cope with the demands of this tangled web. Underappreciating the interconnectedness of regulatory datasets and being underprepared to manage it, creates costly inefficiencies, and exposes financial institutions to risk.

## A Chief Data Officer's (CDO) Top Five Questions – Data Sustainability Drivers Vs. Daily Frustrations

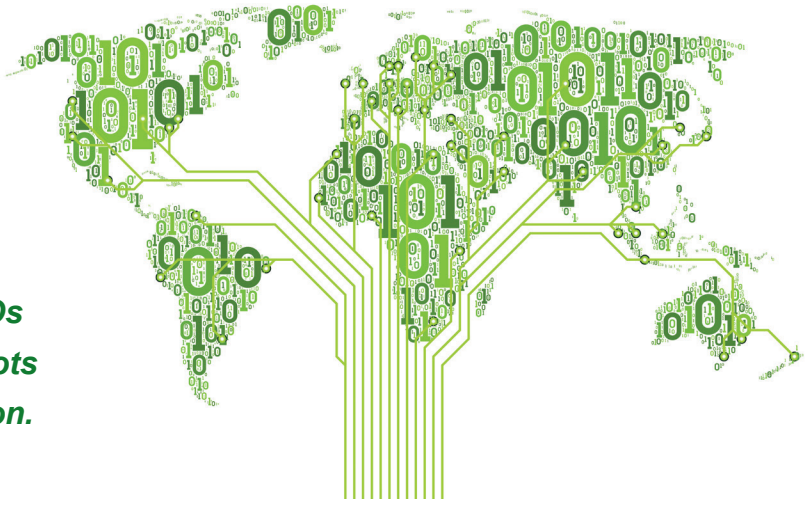
As financial institutions endeavor to drive efficiencies in their overall approach to regulatory data management and reporting, questions emerge that are central to the idea of achieving data sustainability. CDOs and executive leadership ask questions about data sustainability drivers including:

1. ***Is our regulatory data framework optimized in terms of handling product types, entities, granularity, frequency, and jurisdictions?***
2. ***Does our regulatory framework enable us to reconcile product data and balances across multiple reports?***
3. ***How flexible and scalable is our regulatory data framework? Can we adapt quickly to new and changing requirements?***
4. ***How well does our regulatory data framework enable us to manage operational risk associated with the reporting process?***
5. ***How mature is our regulatory data framework in terms of data governance and controls?***

**Organizations may not be in the best position to cope with the demands of this tangled web.**

But as financial institutions consider these central data efficiency drivers, every-day frustrations continue, triggering a litany of familiar questions:

1. ***Why are we are constantly reinventing the wheel as we source data?***
2. ***Why are we mired in endless investigations and error correction?***
3. ***Why do we struggle to track data elements from report to source?***
4. ***Why do we find it so difficult to reconcile within and across reports?***
5. ***How much time is lost tracking and updating during each reporting cycle?***



***Thinking green about data helps CDOs kill the weeds of frustration at their roots and grow a sustainable data foundation.***

## SUSTAINABLE DATA FRAMEWORKS – GOING GREEN WITH DATA DICTIONARIES

AxiomSL believes that creating the right data dictionary architecture is key to establishing an efficient data framework, which requires some green thinking.

Consider that a data dictionary architecture must address myriad requirements, including:

- Sourcing from multiple disparate data sources
- Having well-defined data requirements
- Having a rules library
- Being easy to scale
- Being able to support complex calculations
- Being able to support reconciliation

**There is no such thing as a one-size-fits-all data dictionary.**

And, consider that there exist many approaches for solving the data dictionary conundrum for risk and regulatory reporting. The adage says, "There is no such thing as a free lunch." Similarly, AxiomSL says "There is no such thing as a one-size-fits-all data dictionary." Based on its experience, AxiomSL believes that the monolithic approach must be eliminated from the start. Creating a single standard data dictionary to serve the needs of multiple regulators' MDRMs and reports simply is not feasible. The burden and cost of having to run regression tests across the entire reporting system for each change for each report make this an unsustainable model.

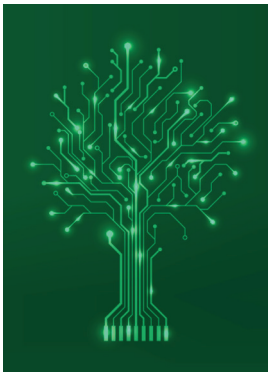
Instead, AxiomSL has arrived at a sustainable approach that recognizes the essential differences in regulatory requirements and therefore enables flexibility and efficiency.

On the one hand, AxiomSL creates rules-based libraries to power balance-sheet and income statement-based reports such as the FR Y-9C and call reports that share common rules.

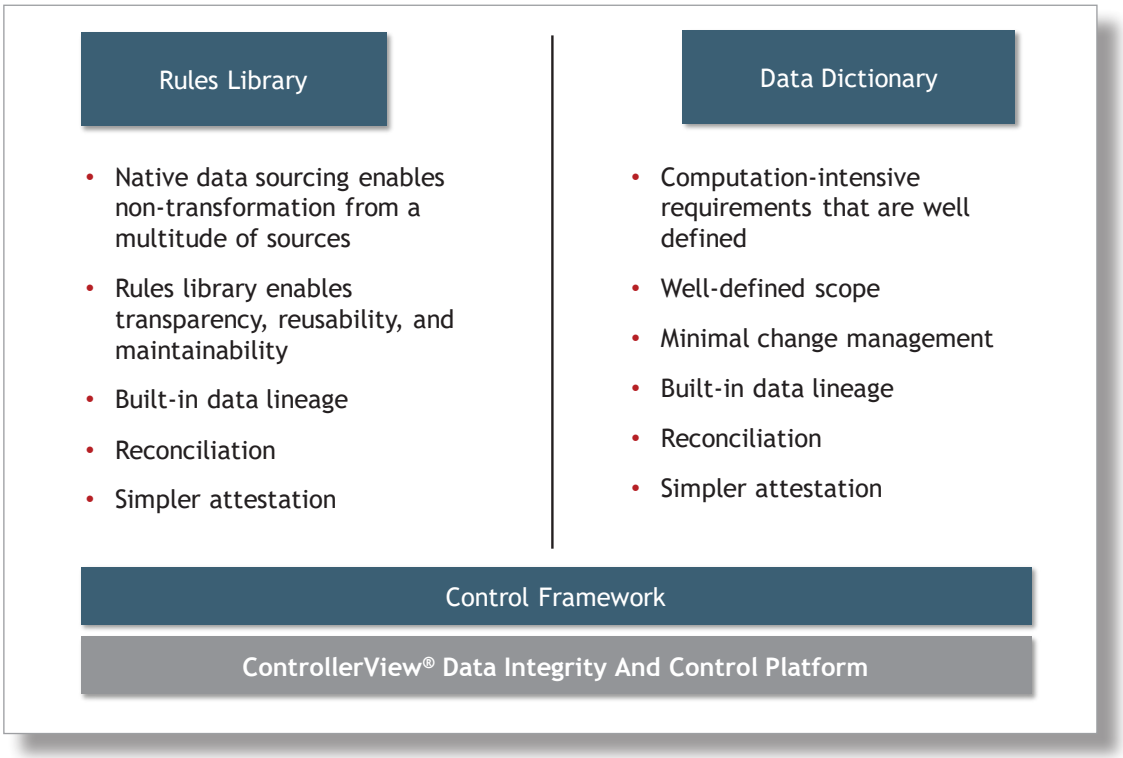
On the other hand, AxiomSL creates bespoke data dictionaries to power solutions for defined-scope computation-intensive regulatory requirements, as for example, FDIC Part 370. To comply, financial institutions must be prepared deliver on 24 hours' notice an integrated view of the entire deposit base in four tables, including depositors, beneficiaries, and trustees across all account types, deposit systems, and customer identifiers. AxiomSL designed its proprietary *CustomerView* data dictionary to support the entirety of FDIC Part 370-required deposit data and insurance calculations.

**AxiomSL's architecture solves the data dictionary conundrum.**

Thus, AxiomSL's architecture for solving the data dictionary conundrum accommodates two needs. As depicted in the following diagram, both approaches – rules-library driven and data-dictionary driven – are native to AxiomSL's ControllerView® data integrity and control platform, and power its array of risk and regulatory reports and solutions.



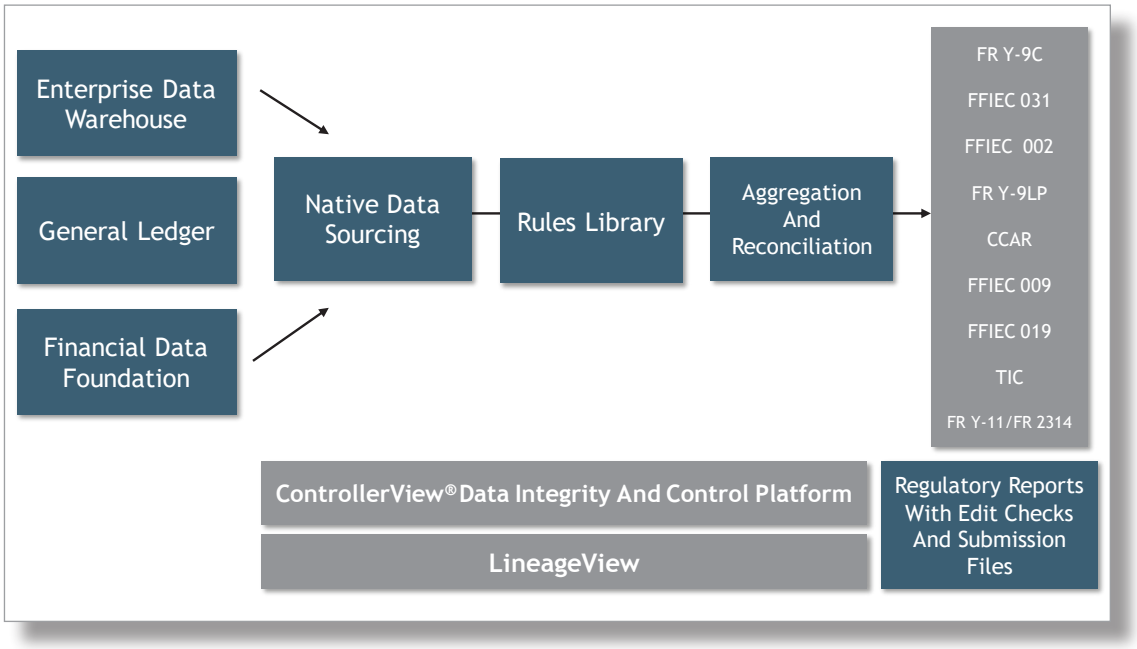
**AxiomSL's Sustainable Data Dictionary Architecture – Dual Approaches**




## The Rules-Library Based Approach

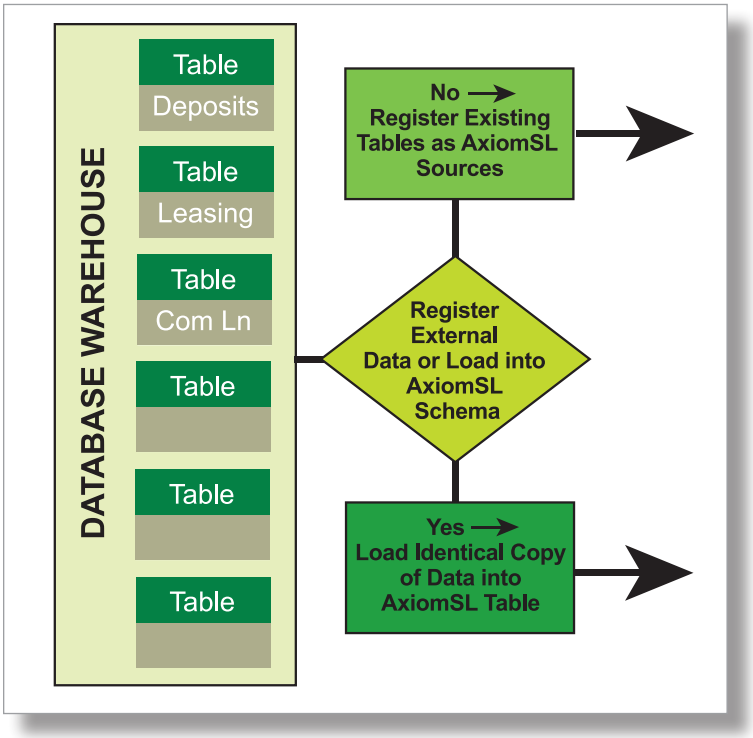
The driving concept of the rules-based approach is that it seamlessly ingests data in its native format from multiple data sources. Native-data ingestion enables the implementation of shared logic and aggregation by entities and reporting schedules and thus, creates a reconciled reporting architecture. Because lineage is embedded, the rules-based approach delivers a simpler attestation framework for the aggregated data. For example, the following diagram depicts the architecture to deliver typical balance sheet/income statement-driven U.S. regulatory reports.

**Rules Library-Based Approach Creates A Reconciled Reporting Architecture**



**Native Data Sourcing – Sustainable And Report-Agnostic**

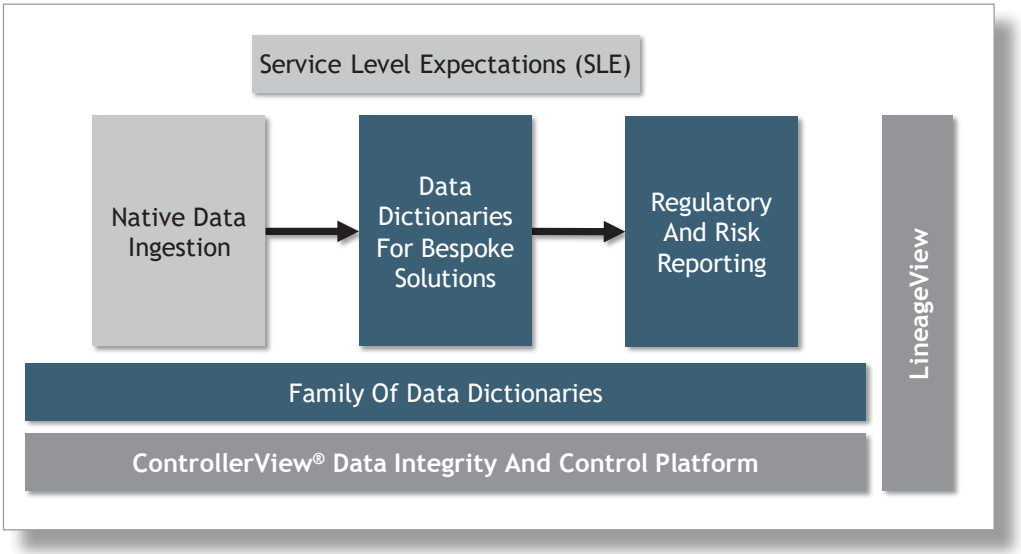
Native data ingestion is a green data concept that inherently enables the reuse and repurposing of original data. When data is sourced in its native format, ingestion does not change the original meaning of the information. And thus, there is no need for an extract, transform, load layer – ETL. Rather, ControllerView can ingest data from hundreds of sources and automatically registers and maintains all metadata details, as illustrated in the following flow chart.




## The Data-Dictionary Based Approach

In this approach, AxiomSL creates discrete data dictionaries to power a functional area/scope that are governed by its Service Level Expectations (SLE), as depicted in the following diagram.

**Data-Dictionary Based Approach Defined By Service Level Expectations**




SLEs are standards by which the governance of any dataset's structure can be measured. They conform to BCBS 239 principles and provide minimum requirements for each element across a set of data-quality dimensions.

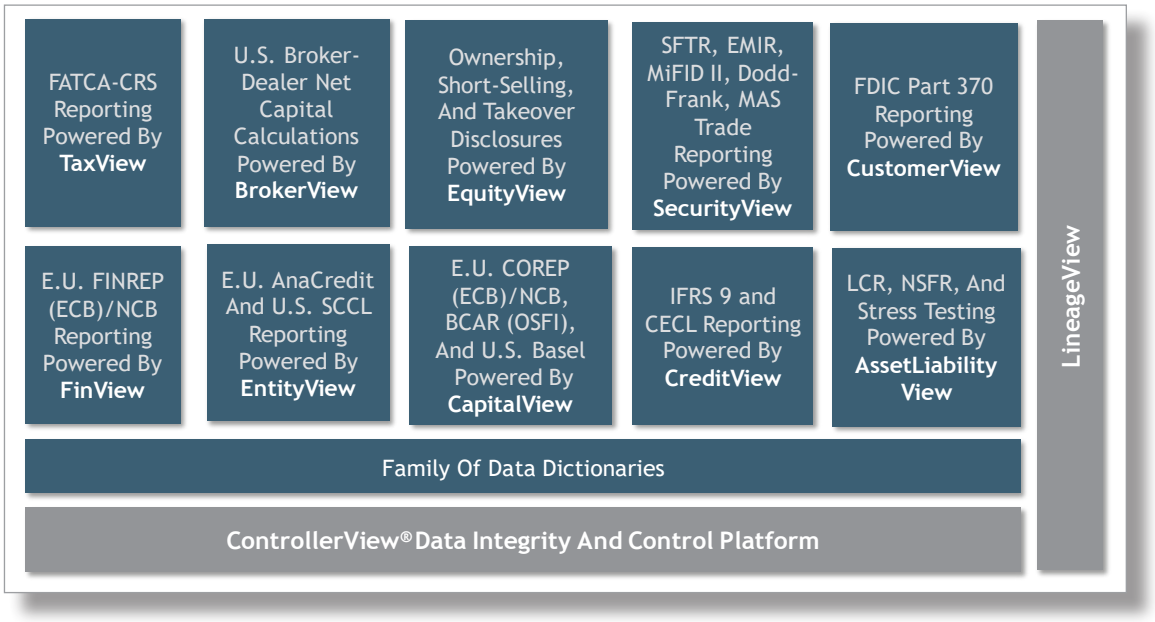
*CustomerView*, the dictionary powering the FDIC Part 370 solution, exemplifies this approach. With attestation and regulatory compliance at stake, senior executives must be able to trust that the rivers of deposit data flowing to their balance sheet are of high quality and will accurately complete the required deposit-customer-account data nexus. AxiomSL's SLE approach enables the client to set the right data quality bar for FDIC Part 370 and to know its accounts (KYA) more deeply and accurately. Examples of SLEs pertinent to FDIC Part 370 across nine core data-quality dimensions are delineated in the following table.

| Data-Quality Dimension | Description | Element Example |
|---|---|---|
| Completeness | Being optional or mandatory | Clear definition of an account relationship to a customer or beneficiary |
| Timeliness | Refreshed for the given reporting period | Produce the FDIC Part 370 outputs in 24 hours |
| Accuracy | Valid and correct | Account Ownership Rights and Capacity (ORC) for each account resident within the covered institution |
| Precision | Accurate to the exact decimal place | Balances and accrued interest for each of the accounts |
| Conformity | Adherence to a series of rules, standards and/or formats | Dataset that enables the accurate calculation of insurance coverage |
| Congruence | Having a range similar to prior values and identical in form | Applying a consistent set of rules to calculate insurance coverage by account type |
| Collection | Valid when all related components exist | Linkage between accounts-customers-beneficiaries-pass through details |
| Cohesion | Aligned with all other data | Reconciliations with other filed reports, in this case the Call Report |
| Lineage | Metadata associated and a mechanism to deliver traceability | All imported files and elements in a regulatory and reporting system |

**A Family Of Bespoke Data Dictionaries Power Solutions**

AxiomSL updates the dictionaries to reflect regulatory changes and constantly enhances them with knowledge gleaned from working directly with clients implementing each solution. A sample of solutions powered by bespoke data dictionaries across the global reporting landscape is shown in the following diagram.

**AxiomSL's Family Of Data Dictionaries**



# CRITICAL DATA ELEMENTS (CDE) – KEYS TO SUSTAINABILITY

With a flexible, green approach to data dictionaries in place, financial institutions can focus on the role of particular data elements to further bolster green, sustainable data evolution. The mission here is to identify critical data elements and reuse them across multiple regulatory reports, effectively understanding their journey from disparate datasets and MDRMs to interconnected reports.

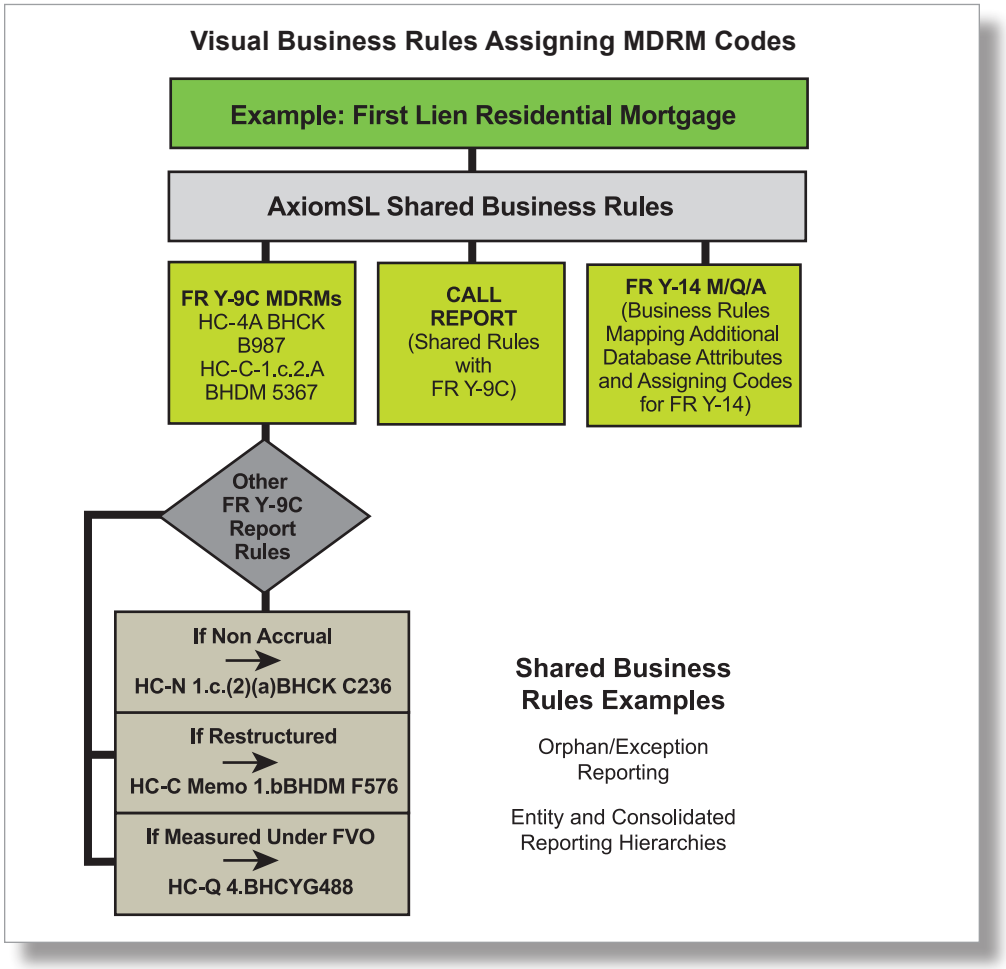
At AxiomSL, identifying CDEs has been an ongoing practice based on extensive implementation experience and regulatory subject matter expertise. The power of identifying CDEs applies to both the rules-based and data-dictionary driven approaches, as illustrated by the following use cases.

**The mission is to reuse critical data elements across multiple regulatory reports.**

## Rules-Based Approach Use Case – Delivering Transparency, Data Reusability, And Easy Maintenance

In this approach, AxiomSL first identifies common product types present in multiple regulatory reports (as listed in the product-type matrix shown previously). Then, AxiomSL develops business rules for each product type – known as *shorthands* in ControllerView. These shorthands determine how the exposure will eventually be reported in a consistent manner across multiple reports, as depicted in the following flow chart.

**Rules Based Use Case – First Lien Residential Mortgages**



The rules library provides the shared business rules on how to process this asset class and includes capabilities such as:

- Holistic exception processing: Managed once, versus in each report line item, thereby lessening the burden of downstream reconciliation and adjustment
- Easy logic extension: Adding conditional statements to automate the population of data sets to be aggregated for each report
- Automatic lineage: Source data, transformations, and aggregations are automatically tracked enabling audit defense

## Data-Dictionary Approach Use Case – Leveraging CDEs For New Regulatory Requirements

Under this approach, whenever a new regulatory-reporting requirement is initiated, AxiomSL immediately undertakes to identify if existing regulatory requirements articulated in a data dictionary can be leveraged to provide an industry solution. The power of taking a green approach to CDEs is demonstrated in the following case.

### SCCL And The RWA Data Dictionary Equivalency

The Single Counterparty Credit Limit (SCCL) rule launched in 2019 applies to all large financial institutions, foreign and domestic, and limits net credit exposure to a single counterparty to 15% or 25% of capital. Financial institutions must report SCCL net exposures quarterly on a new form, the FR 2590. AxiomSL recognized that it could leverage its risk-weighted assets (RWA) solution to inform the data dictionary for the new SCCL requirement. Powered by the *CapitalView* data dictionary, AxiomSL's comprehensive RWA calculation solution for financial institutions operating in the U.S. has been fine-tuned and tested across many implementations.

In the table below, AxiomSL identifies that 71% of SCCL mandatory CDEs already existed in its *CapitalView* data dictionary, along with more than 30% of optional or special case datapoints.

**SCCL Mandatory And Optional Overlap With RWA Critical Data Elements**

| Type Of Exposure | Mandatory/Common Fields | | | Optional/Special Case Fields | | |
|---|---|---|---|---|---|---|
| | SCCL Maps | Out Of | Coverage | SCCL Maps | Out Of | Coverage |
| Loans, debt securities | 10 | 15 | 67% | 2 | 5 | 40% |
| Commitments, off-balance sheet | 11 | 17 | 65% | 2 | 5 | 40% |
| Equities | 4 | 7 | 57% | 2 | 7 | 29% |
| Funds and constituents | 8 | 11 | 73% | 9 | 13 | 69% |
| Derivatives | 16 | 20 | 80% | 5 | 26 | 19% |
| Securitizations | 10 | 20 | 50% | 2 | 13 | 15% |
| Secured financing transactions (SFTs) | 14 | 17 | 82% | 3 | 9 | 33% |
| Collateral | 12 | 15 | 80% | 2 | 6 | 33% |
| Credit risk mitigation (CRM) guarantees | 7 | 8 | 88% | 1 | 4 | 25% |
| Unsettled transactions | 0 | 0 | 0% | 0 | 0 | 0% |
| Total | 92 | 130 | 71% | 28 | 88 | 32% |

Drilling into the derivatives exposure where there are 80% commonalities with RWA, AxiomSL identified critical data elements as well, some of which are detailed in the following table.

***In addition, through its implementation efforts at numerous financial institutions, AxiomSL has identified common CDEs across reports that it incorporates in requirements mapping. Those fields are highlighted in green in the following tables.***

**SCCL Derivatives Overlap With RWA Critical Data Elements**

| Derivatives RWA Data Configuration | | | SCCL Mapping |
|---|---|---|---|
| **Title** | **Field Description** | **Notes** | **G_4_M_2_Derivatives** |
| **UNIQUE ID** | Unique position ID | Should uniquely identify the exposure across entire project (within entity). | *exposure_id* |
| **SUBGROUP ID** | Placeholder field for client defined subdivision of inputs | Used as a stream key. | *entity* |
| **ACCT INTENT** | Accounting intent: Trading, Other | Affects HC-R reporting lines. | *acct_intent* |
| **FAIR VALUE** | Mark to market value in (Reporting CCY) | | *fair_value* |
| **NOTIONAL AMT** | Notional amount in (Reporting CCY) | | *notional_amt* |
| **PROT PROVIDED Y/N** | Y/N flag for derivative being a provided protection (_.34.a.1.ii.E) | | *Based on direction* |
| **FV COLLATERAL CCP** | Fair value of collateral posted to CCP or clearing member (cleared derivatives only, 35.b.2.i.A) | | *fv_collateral_posted* |

Similarly, drilling into the CRM guarantees exposures where there are 88% commonalities with RWA, AxiomSL identified critical data elements, some of which are detailed in the following table.

| CRM Guarantees RWA Data Configuration | | | SCCL Mapping |
|---|---|---|---|
| **Title** | **Field Description** | **Notes** | **M_2_General_Risk_Mitigants** |
| **UNIQUE ID** | Unique position ID | Should uniquely identify the exposure across entire project (within entity). | *mitigant_id* |
| **GUARANTEE ID** | ID linking guarantees with the reference (protected) exposures | | *guarantee_link_id* |
| **SUBGROUP ID** | Placeholder field for client defined subdivision of inputs | Used as a stream key. | *entity* |
| **PROTECTION AMT** | Amount of credit exposure protection or notional (Reporting CCY) | | *protection_amt* |
| **RESIDUAL MAT MONTH** | Residual Maturity Months | | *Based on residual_maturity_years* |
| **ORIGINAL MAT MONTH** | Original Maturity Months | | *Based on original_maturity_years* |

As mentioned previously, by taking a sustainable, green data approach, AxiomSL quickly delivers solutions for new regulations that enable clients to reuse and repurpose their data. This approach creates efficiencies for all parties and enhances clients' ability to comply with complex new regulatory requirement such as SCCL more quickly and with confidence.

## Leveraging A Product-Data Attribute Framework Across Interconnected Reports

Taking a green data approach to identifying attributes that are common across multiple reports is also highly effective. This product-data attribute framework can be leveraged as an early scoping tool during report implementations with results including:

- Improved data integrity and quality and controls
- Better data governance
- Easier reconciliation
- Traced lineage across reports
- Easier signoffs and attestation

The following table delineates attribute details for the *Deposits-Due-To* product type and indicates if it is mandatory or optional in a selection of reports.

**Granular Product-Data Attributes Framework For The Deposits-Due-To Product Type**

| Attribute | Attribute Definition | Schedule E Call Reports/ FR Y-9C | FR 2644 | FR 2900 Sections A&C |
|---|---|---|---|---|
| Product ID Code | Identification code for the financial product | X | X | X |
| Product Type | Time Deposits, CDs, Savings, Demand, Interest Bearing, Non-Interest Bearing, etc. | X | X | X |
| Product Description | Time Deposits, CDs, Savings, Demand, Interest Bearing, Non-Interest Bearing, etc. | X | X | X |
| Trade Date | This refers to the date on which an agreement is entered into. Companies that use this date in their accounting do not wait until the funds have entered or left their account to record the transaction, but instead record it as soon as the deal is reached. | X | X | X |
| Settlement Date | This refers to the date on which a financial transaction is settled and monies from the transaction arrive in the recipient's account. Companies that use settlement date accounting principles do not officially record a transaction until the deal has closed and the money has entered their financial accounts. | Optional | Optional | Optional |
| Issue Date | This refers to the date on which the contract was issued | X | X | X |
| Maturity Date | This refers to the date on which a contractual agreement, financial instrument, guaranty, insurance policy, loan, or offer becomes due for settlement | X | Optional | X |
| Repricing Date | This refers to the date when the interest rate is due to change | X | Optional | X |
| Issued CCY (e.g. USD, EUR. YEN, etc.) | The Issued Currency (Contracted/Transactional Currency) | X | Optional | Optional |
| Amount USD | The U.S. dollar base value of a financial instrument or account at the time of transaction and/or reporting cycle | X | X | X |
| Amount in Issued CCY | The Issued Currency base value of a financial instrument or account at the time of transaction and/or reporting cycle | X | Optional | Optional |
| Accrued Interest Payable USD | Accrued Interest Payable in USD Equivalent | Optional | Optional | Optional |
| Accrued Interest Payable Issue CCY | Accrued Interest Payable in Issued Currency | Optional | Optional | Optional |
| Accrued Fees Payable USD | Accrued Fees Payable in USD Equivalent | Optional | Optional | Optional |
| Accrued Fees Payable Issue CCY | Accrued Fees Payable in Issued Currency | Optional | Optional | Optional |
| Interest Rate | Current Interest Rate (non-interest bearing can be defined as a null or blank value, i.e., having no interest rate) | X | Optional | Optional |
| Interest Rate Type | Type of Interest Rate i.e., Fixed, Variable (ARMs), Floating, etc. | X | Optional | Optional |

# FIT FOR USE AND CROSS-REPORT RECONCILIATION

Executives justifiably harbor doubts as to the veracity of their data, particularly where regulatory reporting is concerned. It is of paramount importance that they know their data (KYD) and present their core datasets accurately – derivatives, loans, securities, deposits, counterparties, etc. – by managing the many data rivers flowing to their balance sheet according to best practices discussed in this paper.

## Controls And Governance Benefit From Identifying CDEs

Clearly, the financial institution must have confidence that its data is fit for use; CDEs are mission-critical to that determination. Equally, it is imperative that the financial institution establishes the correct level of controls, governance, validations, and reconciliations to ensure the reporting dataset is fit for use.

Taking a green CDE-driven approach for new requirements gathering enables the financial institution to streamline downstream effects on quality control, data validations, data governance, and controls. For example, once the maturity date for debt securities is identified as a CDE and a correct level of controls, governance, and validation is established, any new report requiring this field will follow the same standards. Thus, changes, updates, or errors generated for this field can be handled in an automated way across the system.

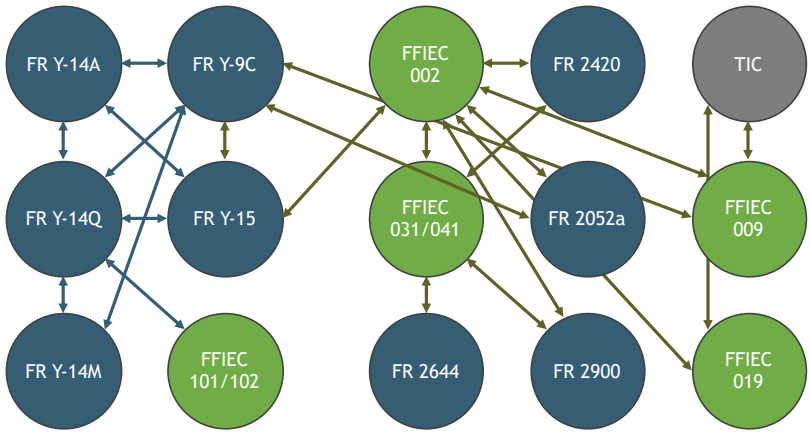
## AxiomSL's Cross-Report Reconciliation – A ControllerView-Native Application

Having insight into identifying CDEs across a variety of regulatory reports has uniquely prepared AxiomSL to address the critical and growing client need that is the subject of this paper – reconciling reported data across many interconnected reports. AxiomSL first addressed this need in 2016 in response to the U.S. Federal Reserve's CCAR reconciliation and attestation requirements. That tool handles reconciliation points between CCAR and anchor reports such as FR Y-9C, FR Y-15, and FFIEC 101, and includes an interactive dashboard to support the attestation requirement. The more than 1,000 reconciliation points are sourced from:

- FRB edit checks
- FRB instructions
- Proprietary research (AxiomSL subject-matter expert team)
- Client collaboration

Inspired by its CCAR reconciliation-driven framework, AxiomSL has created a new ControllerView-native application that performs cross-report reconciliation across an array of reports deemed top priority per the U.S. Federal Reserve Bank's guidelines as depicted in the following diagram.

**Evolving Landscape Of AxiomSL's U.S. Cross-Report Reconciliations**



## Cross-Report Reconciliation Functionalities

AxiomSL's automated reconciliation application provides essential functionalities including:

### Reconciliation Types

- **One to One:** Exact reconciliation of one report to another at line-item level
- **One to Many / Many to Many:** Exact reconciliation of one or more report(s) line item(s) to one or more report(s) line item(s)
- **Threshold:** Reconciliation within a given threshold percentage between one report's line item(s) and another report's line item(s)

### Workbench Functionality

The application provides a framework for users to account for known differences that occur in certain reconciliations. The workbench enables granular adjustments applicable to such scenarios.

**AxiomSL has created a new ControllerView-native application that performs cross-report reconciliation across an array of reports.**

For example, the reconciliations from FR 2052a to FR Y-9C / FFIEC 002 and from FR 2420 to Call Reports do not have a true line-item tie-out due to known regulatory differences. To cover this circumstance, the workbench highlights all known gaps. In the FR 2420 to Call Report reconciliation template, for example, the *Federal-Funds-Purchased* exposure type corresponds to FFIEC 031 RC line items that report *Federal-Funds-Purchased*. However, a key difference is that the FR 2420 report has an inclusion criterion not found in the call reports – a known gap. Of the 12 counterparty types in the FR 2420 instructions, only five are included for *Federal-Funds-Purchased* reporting instructions:

- U.S. depository institution
- U.S. branch or agency of a foreign bank
- Other financial institution defined as an exempt entity
- U.S. government-sponsored enterprise (GSE) defined as an exempt entity
- Other exempt entity

So, for a true reconciliation to occur, these counterparty types should be excluded on FFIEC 031. The workbench functionality enables users to easily pinpoint such granular differences between the reports and thereby enables transparency and auditability.

### Commentary

To create a clear audit trail and facilitate future reconciliations, users can add reference comments to all reconciliation checks. For example, if the counterparty types mentioned previously are not available in a granular manner at the reporting institution, users can add a manual adjustment to counterparty type exclusion and explain the source and reason for the adjustment.

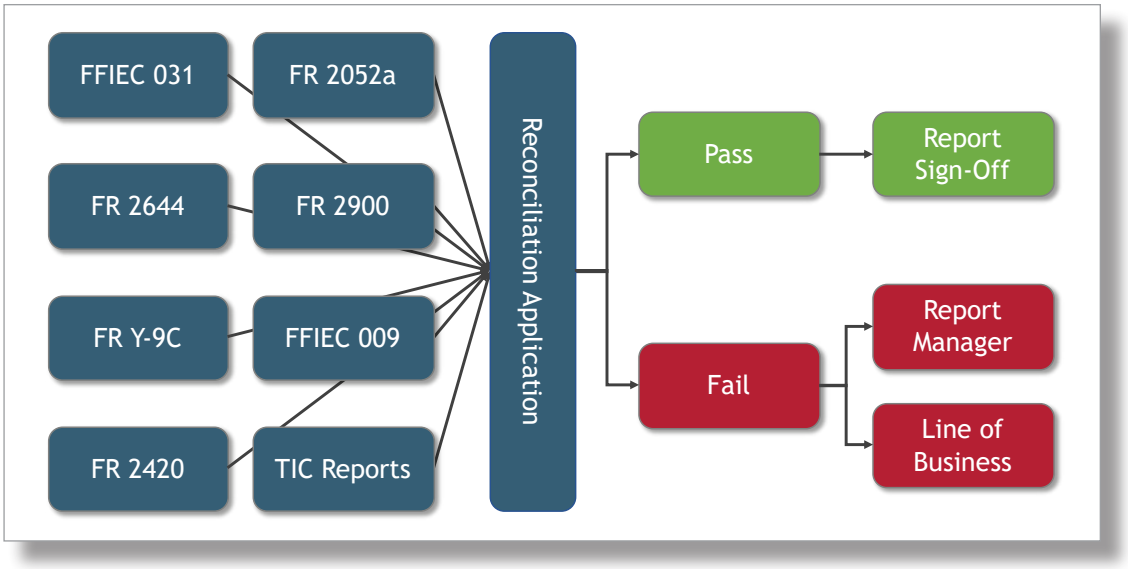
### Variance Reporting

To inform business users and substantiate audits, the application provides additional analytics that capture variances across reconciliation gaps over time. For example: FR 2052a PID I.U.1 (domestic placements) relates to FR Y-9C HC 3.a. Since there is a known regulatory difference of interest payments that are only part of FR 2052a reporting, the reconciliation solution compares these differences over time.

**Workflow Functionality**

The application provides an automated, configurable workflow functionality for end-to-end execution of the reconciliation process as depicted in the following diagram. The process also generates automated reports for sign-off and error remediation.

**End-To-End Reconciliation Workflow**




The reconciliation status report, depicted in the following exhibit, enables users to monitor a specific reconciliation's process in a single view, and immediately address and remediate any failed items.

**Reconciliation Summary Report FR Y-14Q Schedules Vs. FR Y-9C**

| | A | B | C | D | E | F | G | H | I | J | K | L | M |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | | BANK ENTITY | | | | | | | | | | | |
| 2 | As Of Date | 3/31/2020 | | | | | | | | | | | |
| 3 | | | | | | | | | | | | | |
| 4 | | AxiomSL Template Produced (Y/N) | Overall Reconciliation Status | Most Recent Execution Date | | | | | | | | | |
| 5 | FR Y-9C | Y | INCOMPLETE | 03-Apr-2020 | | | | | | | | | |
| 6 | | | | | | | | | | | | | |
| 7 | | Is The Schedule Filed (Y/N) | AxiomSL Template Produced (Y/N) | Reconciliation Status | Published Checks | | | | Non-Published Checks | | | | Most Recent Execution Date |
| 8 | FR Y-14Q Schedules | | | | Total | Passed | Failed | N/A | Total | Passed | Failed | N/A | |
| 9 | A.1: International Auto Loan | N | N | NOT FILED | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | 31-Mar-2020 |
| 10 | A.2: US Auto Loan | N | N | NOT FILED | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | 01-Apr-2020 |
| 11 | A.3: International Consumer Cards | N | N | NOT FILED | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | 31-Mar-2020 |
| 12 | A.4: International Home Equity Loans | N | N | NOT FILED | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | 02-Apr-2020 |
| 13 | A.5: International First Lien Home Mortgages | N | N | NOT FILED | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | 02-Apr-2020 |
| 14 | A.6: International Other Consumer Loans | N | N | NOT FILED | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | 02-Apr-2020 |
| 15 | A.7: US Other Consumer Loans | Y | Y | COMPLETE | 0 | 0 | 0 | 0 | 6 | 0 | 0 | 6 | 02-Apr-2020 |
| 16 | A.8: International Small Business Loans | Y | Y | COMPLETE | 0 | 0 | 0 | 0 | 7 | 7 | 0 | 0 | 01-Apr-2020 |
| 17 | A.9: US Small Business Loans | Y | Y | INCOMPLETE | 0 | 0 | 0 | 0 | 7 | 0 | 7 | 0 | 02-Apr-2020 |
| 18 | A.10: Student Loans | Y | Y | IN PROGRESS | 0 | 0 | 0 | 0 | 6 | 1 | 5 | 0 | 31-Mar-2020 |
| 19 | B.1: Securities | Y | Y | IN PROGRESS | 0 | 0 | 0 | 0 | 46 | 20 | 26 | 0 | 02-Apr-2020 |
| 20 | C.1: Reg Cap Instruments As Of Quarter End | Y | Y | COMPLETE | 0 | 0 | 0 | 0 | 5 | 0 | 0 | 5 | 31-Mar-2020 |
| 21 | C.3: Reg Cap Instruments Issuances During Quarter | Y | Y | COMPLETE | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 02-Apr-2020 |
| 22 | D.1: Capital Composition | Y | Y | IN PROGRESS | 3 | 0 | 3 | 0 | 36 | 1 | 30 | 5 | 01-Apr-2020 |
| 23 | D.2: Exceptions Bucket Calculator | Y | Y | INCOMPLETE | 0 | 0 | 0 | 0 | 2 | 0 | 2 | 0 | 02-Apr-2020 |
| 24 | D.4: Risk-Weighted Assets - Standardized RWA | Y | Y | INCOMPLETE | 0 | 0 | 0 | 0 | 38 | 0 | 38 | 0 | 02-Apr-2020 |
| 25 | D.5: Leverage Exposure | Y | Y | INCOMPLETE | 0 | 0 | 0 | 0 | 3 | 0 | 3 | 0 | 02-Apr-2020 |
| 26 | G.1: PPNR Submission Worksheet | Y | Y | INCOMPLETE | 8 | 0 | 8 | 0 | 1 | 0 | 1 | 0 | 02-Apr-2020 |
| 27 | G.2: PPNR Net Interest Income (NII) Worksheet | Y | Y | IN PROGRESS | 0 | 0 | 0 | 0 | 13 | 10 | 3 | 0 | 31-Mar-2020 |
| 28 | G.3: PPNR Metrics | Y | Y | IN PROGRESS | 7 | 1 | 6 | 0 | 0 | 0 | 0 | 0 | 01-Apr-2020 |
| 29 | H.1: Corporate Loans | Y | Y | IN PROGRESS | 35 | 1 | 14 | 20 | 15 | 0 | 10 | 5 | 02-Apr-2020 |
| 30 | H.2: Commercial Real Estate Loans and Leases Data | Y | Y | INCOMPLETE | 20 | 0 | 8 | 12 | 7 | 0 | 7 | 0 | 02-Apr-2020 |
| 31 | J: Retail FVO/HFS | Y | Y | INCOMPLETE | 11 | 0 | 11 | 0 | 1 | 0 | 1 | 0 | 02-Apr-2020 |
| 32 | K: Supplemental | Y | Y | REFERENCE H1/H2 | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | 02-Apr-2020 |
| 33 | M.1: Balances | Y | Y | COMPLETE | 21 | 0 | 0 | 21 | 36 | 0 | 0 | 36 | 02-Apr-2020 |
| 34 | M.2: Balances | Y | Y | COMPLETE | 8 | 0 | 0 | 8 | 20 | 0 | 0 | 20 | 02-Apr-2020 |
| 35 | M.3: Balances | Y | Y | COMPLETE | 0 | 0 | 0 | 0 | 3 | 0 | 0 | 3 | 02-Apr-2020 |

## CONCLUDING THOUGHTS

The regulatory requirements landscape is becoming increasingly interconnected as illustrated herein by examples including a matrix detailing the thick connections existing at the product-type level across several key U.S. reports. Financial institutions must often report the same datapoints in numerous interrelated reports, and those instances must be accurate and consistent. It would seem obvious that the logical conclusion to a financial institution's regulatory data management and reporting process would be to automate cross-report reconciliation.

However, achieving that desired state has proved extremely difficult. Financial institutions struggle with this crucial end-stage, relying upon a patchwork of manual processes that yield unsatisfactory results. The lack of control over and transparency into data that lands in many different reports means inconsistencies often do not surface until after submissions, unduly exposing financial institutions to regulatory scrutiny. Without a sustainable process, dealing with the reconciliation problem places a burden on resources and time.

In this paper, AxiomSL has described the basis by which it now provides clients with efficient cross-report reconciliation and has shown the new application's functionality for the nexus of top-priority U.S. regulatory reports. The key to this success is AxiomSL's regulatory-reporting data framework that enables clients to go green with their data.

### The Right Data Dictionary Architecture And A CDE-Driven Data Culture Drive Sustainable Data That Is Fit For Use

AxiomSL has created a regulatory-reporting data framework that is driven by a unique green data dictionary architecture that recognizes the essential differences between types of regulatory requirements and flexibly accommodates them. On the one hand, its rules-library based approach supports balance-sheet and income-statement driven reporting requirements. On the other, its family of bespoke data dictionaries governed by service-level expectations (SLE) drive solutions that demand complex calculations. It is a framework wherein AxiomSL can continually identify critical data elements (CDE) across reporting datasets.

Taking a CDE-driven approach to requirements gathering enables AxiomSL to quickly deliver solutions for new or changing regulatory requirements. And it streamlines downstream effects on data quality, validations, governance, and controls, ultimately enabling financial institutions to determine that data is fit for use. This green data foundation enables cross-report reconciliation.

### Cross-Report Reconciliation – Automated, Flexible, Transparent, And Sustainable

By integrating AxiomSL's new ControllerView-native cross-report reconciliation application into their end-to-end regulatory reporting processes running on the platform, financial institutions can now invoke reconciliation in alignment with their reporting-cycle needs, automating what previously were manually reliant, non-repeatable, yet crucial processes. Users and observers alike have complete transparency into reconciliation logic and can quickly identify root cause when reconciliation breaks arise. Automated comparisons and alerts facilitate monitoring and remediation.

Automated cross-report reconciliation delivers sustainability into the entire regulatory reporting process freeing resources, saving time, reducing operational risk, and strengthening financial institutions' ability to satisfy audits and examinations.

## Going Green With Your Data

A well-nurtured green data foundation enables financial institutions to understand interconnected data and empowers them to navigate regulatory and risk reporting with confidence. Accurate and efficient regulatory datasets enable these institutions to sustainably:

- Meet complex cross-report reconciliation requirements
- Reduce enterprise and operational risks
- Identify data gaps, inconsistencies, and other data challenges
- Satisfy stringent data quality standards
- Provide insight across datasets and functional silos, bringing diverse products (derivatives, mortgages, loans, etc.) into a comprehensive, reconcilable view
- Deliver trustworthy data from ingestion to submission

**With AxiomSL's new cross-report reconciliation application incorporated into their regulatory reporting processes running on the ControllerView data integrity and control platform, clients can go green with their data.**

AXIOMSL®
PLATFORM FOR CHANGE

## ABOUT AXIOMSL

AxiomSL is a global leader in risk data management and regulatory reporting solutions. Its unique enterprise data management platform empowers firms to address data governance and risk aggregation objectives while delivering the analytics, workflow automation, validation, traceability, data lineage and reporting required by multiple stakeholders across global and local regulatory landscapes.

Leveraging its more than 25 years' experience, AxiomSL combines deep industry expertise with an intelligent data management platform to deliver services around regulatory and risk reporting, liquidity, capital and credit, operations, trade and transactions, and tax analytics. Its global footprint spans a client base of regional and global financial institutions with more than $43 trillion in total assets and investment managers with more than $11 trillion in assets under management. It covers more than 110 regulators across 55 jurisdictions.

AxiomSL's collaborative platform is known for its robustness, adaptability, transparency and state-of-the-art data-lineage module. The platform, which imposes no constraints on where the data is located, seamlessly integrates clients' source data from disparate systems. AxiomSL's enterprise-wide approach enables clients to reduce implementation costs, accelerate time to market and deliver trusted information.

AxiomSL's cutting-edge platform and outstanding client-service satisfaction have been recognized by many industry leaders and observers, including the Waters Technology Rankings, RegTech Awards, American Financial Technology Awards, The Asian Banker Award and Chartis RiskTech 100® rankings.

For more information regarding AxiomSL, please visit: **www.axiomsl.com**