

Information Quality in the Mortgage Industry: A Freddie Mac Perspective

CHARLES MCKINNEY^{1,2}
Corresponding Author

GENI GOMEZ MOREJON², LORRAINE FELLOWS², DIANE SCHMIDT², DAVID BARKLEY², JAY WRIGHT², SABRINA LOZANO², EDWARD ALBRIGO² and RICHARD WANG³
Contributing Authors

Abstract: Freddie Mac is a government-sponsored enterprise that purchases, guarantees and securitizes mortgages originated in the United States. The quality of data that Freddie Mac receives from counterparties in the primary mortgage market, produces through its business activities, and uses for external reporting, risk management and business decisioning is a critical success factor. Freddie Mac's enterprise information management highlights levers for integrating data quality into business operations, best practices for straight-through processing, and upsides of standardizing industry data exchanged among counterparties.

Keywords: Data quality, data management, information measurement, information management policy, business data dictionary, mortgage industry data standards, mortgage origination in the United States.

I. INTRODUCTION

The Federal Home Loan Mortgage Corporation (Freddie Mac) is a government-chartered corporation with a mission to bring liquidity, stability and affordability to the United States housing market. Freddie Mac guarantees more than \$1.8 trillion worth of mortgages, and it has made home ownership possible for more than 50 million Americans. With approximately 5,000 employees, Freddie Mac relies extensively on information to conduct its business activities, and data quality is a critical success factor in the company's operations, external reporting, regulatory compliance, and enterprise risk management.

Given its importance, Freddie Mac treats information, both data and records, as a financial asset. Improving data quality is a longstanding priority, and efforts are ongoing to adopt and improve upon best-practice concepts, tools and methods. On a broader strategic level, Freddie Mac's journey to data quality is part of a multiyear effort to renovate its business and technology infrastructure and play a leadership role in the mortgage industry's adoption of common

¹ Correspondence can be addressed to Charles McKinney at charles_mckinney@freddiemac.com.

² Charles McKinney, Geni Gomez Morejon, Diane Schmidt, Lorraine Fellows, Jay Wright and Sabrina Lozano are Directors in the Enterprise Services Division of Freddie Mac. David Barkley is a Director in the Operation Division of Freddie Mac. Edward Albrigo is the Senior Vice President in charge of the Enterprise Services Division.

³ Richard Wang is Chief Data Quality Officer of the U.S. Army and Director of the MIT Information Quality Program.

standards for exchanging mortgage data. While Freddie Mac is in the midst of its journey to data quality, its experiences offer lessons for the mortgage industry and others.

II. BACKGROUND

Many Americans are familiar with mortgages from buying a house. The process of a borrower obtaining a loan involves becoming prequalified by a mortgage lender, filing an application, and obtaining a loan after agreeing to purchase a property. A borrower then makes monthly principal and interest payments to a mortgage servicer, which distributes these payments to the mortgage holder and performs other loan administration activities. A mortgage lender holds mortgages it underwrites on its balance sheet or sells those mortgages to another party in the secondary market. Likewise, there are established processes for other mortgage origination activities, such as the refinance of a home, purchase of an investment property, and development of a multifamily apartment complex.

Operating in the secondary mortgage market, Freddie Mac plays a vital role in promoting and sustaining homeownership in the United States through its three business lines:

- **Single Family Credit Guarantee (Single Family):** The Single Family line of business uses mortgage securitization to fund millions of loans each year. Securitization is a process where Freddie Mac purchases home loans that lenders originate, packages these loans into mortgage securities that it sells to the capital markets, and recycles the proceeds back to lenders. During 2008 Freddie Mac guaranteed \$358 billion in home loans to 1.9 million families.
- **Multifamily business:** Internal creation or derivation of new data produces complete, valid records according to business rules for these production processes. Freddie Mac's multifamily transactions are large in size and typically financed through the issuance of corporate debt securities. Freddie Mac funded \$24 billion in multifamily loans, representing housing for 418,000 Americans, in 2008.
- **Investment business:** The Investment business, commonly known as Freddie Mac's retained portfolio, invests in mortgage-related securities that are guaranteed by Freddie Mac or other financial institutions and in individual loans that are guaranteed by Freddie Mac but not initially securitized. Freddie Mac's investment business had an outstanding portfolio balance of \$805 billion at the end of 2008.

Freddie Mac's Single Family line of business illustrates the importance of information quality. When Freddie Mac purchases mortgages, counterparties (sellers) submit data about the loan, borrower, and property. In total, Freddie Mac receives approximately 100 attributes, which are specified through representations and warranties governing its purchase of loans. These attributes are proprietary to Freddie Mac in terms of how they are defined, and their valid values are specified.

Freddie Mac uses attributes from sellers to produce data that are consumed by many business processes, for financial reporting, and to make business decisions and manage enterprise risks. Information flows that start with seller-delivered attributes encompass more than 1,000 database tables in Freddie Mac's corporate data warehouse, business transaction systems, data marts, and other information repositories. Freddie Mac's complex data environment makes information management and data quality a very important and difficult undertaking.

Freddie Mac's data quality aspirations can be summarized as follows:

- **Counterparty data delivery:** Data from counterparties are complete, conform to data delivery instructions, and are bona fide according to an authoritative source of information about loans (e.g., loan file records).
- **Internal data production:** Internal creation or derivation of new data produces complete, valid records according to business rules for these production processes.
- **Data management:** Data are consistent across information flows and over time, or processes of updating, changing and enriching data produce expected outputs.
- **Data consumption:** Attributes that are inputs to business processes are consumed at appropriate points and with high quality. If data quality is outside control limits set for business process inputs, business managers are able to gauge impact on business process outputs and take steps to manage the associated risk.
- **Data disclosure:** The business has reasonable assurance that attributes disclosed to counterparties, regulators, or the public are complete, conform to disclosure requirements, and are bona fide.

Freddie Mac's enterprise strategy for managing information and data quality facilitates achievement of these aspirations. Strategy implementation has been ongoing for a number of years and will continue into the future. This is because information management and data quality are foundational to Freddie Mac's business model, and they cannot be dissociated from continuous management of the enterprise and efforts to renovate its business and technology infrastructure.

III. INFORMATION MANAGEMENT FRAMEWORK

Freddie Mac promulgates an ideology that information is critical to virtually all business activities—supporting the mortgage market, promoting affordable housing, maintaining strong revenue and capital positions, and managing risk and compliance—and an expectation that all business areas exercise a role in information management and accountability for data quality.

To put information management in a business context, Freddie Mac operates with continuous oversight by its regulator, the Federal Housing Finance Agency, and substantial scrutiny by its auditors and others. Integration of data quality into the business and a high degree of managerial oversight focused on enterprise risk, internal controls and compliance are important to Freddie Mac's operational effectiveness, financial integrity and business performance. As such, information management and data quality efforts place a premium on best practices, such as the company's leadership role in the mortgage industry's eventual adoption of common standards for exchanging mortgage data.

Expectations for information management and data quality are conveyed through a corporate information management policy and standards. Company executives, managers and staff put these expectations into practice through the leadership practices, oversight mechanisms, and internal control systems of the company. Freddie Mac has dedicated information management groups that support compliance with the policy by publishing information management standards and delivering a set of business capabilities that promote data quality. Integration of information management and data quality into the business operations of the company is

supported by a corporate culture that emphasizes risk management and compensation practices that reward all managers and employees for timely, sustainable remediation of internal control gaps (see Figure 1).

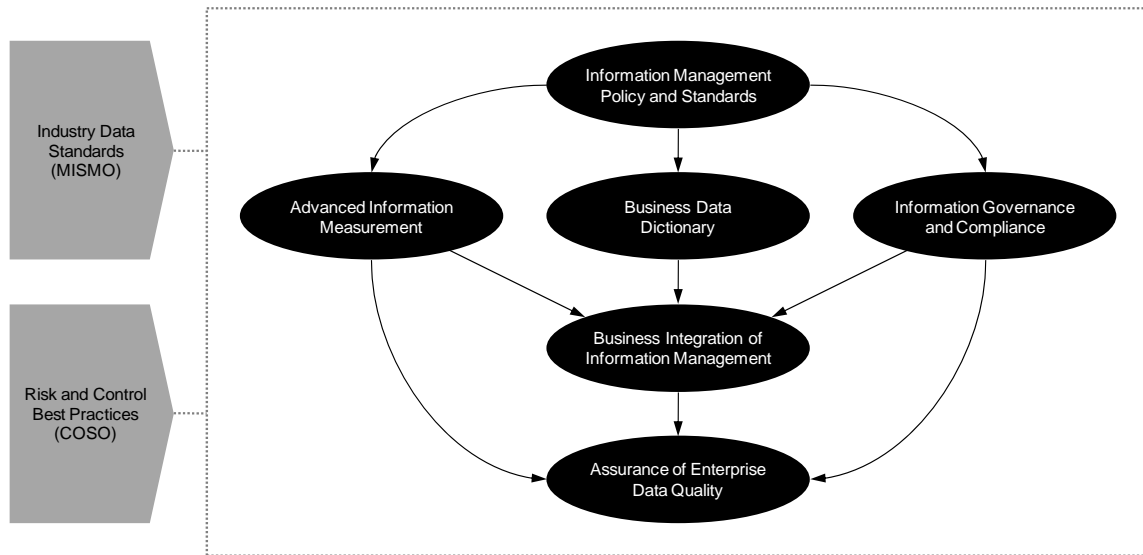


Figure 1. Enterprise Framework for Promoting Data Quality. Freddie Mac manages enterprise data quality through its information management policy and standards. Advanced information measurement practices, a business data dictionary, and information governance and compliance activities promote integration of information management standards into business processes. This in turn enables Freddie Mac to obtain assurance of its enterprise data quality. This enterprise framework facilitates adoption of mortgage industry data standards and risk and control best practices.

III.1. Information Management Policy and Standards

Freddie Mac's information management policy and standards set forth criteria that must be met in the conduct of information management activities. These standards define information to be inclusive of data and records because structured data and unstructured content are used extensively in Freddie Mac's business processes. These standards elevate information management as a business concern, rather than limiting it to the information technology domain. The broad applicability and characteristics of Freddie Mac's information management standards are commensurate with the importance of data quality.

An ongoing concern of business areas is their role in enacting compliance with these standards. To accommodate the dynamic nature of Freddie Mac's information flows and complexity of Freddie Mac's business operations, the information management standards define three fundamental roles:

- **Information producer:** Producers are the individuals who manage business processes through which information is created or introduced to Freddie Mac for the first time.
- **Information manager:** Managers are the individuals who handle data distribution, data operations, and other activities that connect data production and consumption.

- **Information consumer:** Groups and individuals that use information to conduct business processes are information consumers. Information consumers are responsible, among other things, for defining data quality requirements, records retention, and business information and events that must be auditable.

The roles of information producer, manager and consumer overlap when overlaid onto Freddie Mac's organizational structure. For example, an operations department that handles acquisition of mortgage data from counterparties may have responsibilities that make it a producer and manager of information. These roles are intended to assist business areas in meeting the information management standards.

The information management standards establish criteria for information governance, data modeling, data creation, information sourcing and movement, change management, and records retention. Each of these areas prescribes criteria with which compliance is mandatory. For example, standards for data modeling require "an enterprise information model consisting of three components: a subject area model, a conceptual model, and a canonical data model." Standards for information sourcing and movement prescribe that "the company will develop and maintain a list of authoritative sources that will be defined for each subject area for use by data consumers."

The information management standards articulate a bright line for compliance with Freddie Mac's information management policy. Importantly, these standards do not specify how the company's divisions are to comply with the information management standards. Adoption of the standards is left to business areas with support from Freddie Mac's information management functions and the business capabilities they deliver.

III.2. Business Data Dictionary

Freddie Mac's complex data environment is a barrier to managing metadata and business requirements for information. Historically, teams that delivered information technology had to invest significant time in defining business data requirements. Business areas had to rely on individuals' institutional knowledge to understand Freddie Mac's data. Executives raised concerns that a lack of enterprise data visibility meant key individuals would always have demands on their time to explain the company's data, and their business areas would not be able to effectively fulfill their information management responsibilities.

To improve enterprise data visibility, Freddie Mac has a Business Data Dictionary. A work in progress, the Business Data Dictionary is the authoritative source of business terms throughout Freddie Mac—defining the information Freddie Mac needs to conduct its business activities. The Business Data Dictionary organizes and defines the subject areas, classes and attributes that make up Freddie Mac's business terms. Information recorded for each attribute includes its definition, valid values, sources and uses, data quality rules, and data retention rules.

Freddie Mac's Business Data Dictionary focuses on delivering information to improve the accuracy of data analysis, reduce the time required for delivery of systems, and help improve data quality across the company. Given the enormity of Freddie Mac's data environment, the Business Data Dictionary tries to get each subject area to a critical mass where business areas can use its contents; as people and projects use these contents, they refine them through an editorial process. The technical implementation of the Business Data Dictionary in an intranet

environment where users can read, search, and comment on business terms supports the iterative development, use and editing of content.

Freddie Mac's Business Data Dictionary is different from the data modeling products of an enterprise architecture group. The Business Data Dictionary defines in business terms the data required by Freddie Mac, and it is the basis for the company's canonical data model. To use an analogy, the Business Data Dictionary is a book about Freddie Mac; the canonical data model is the set of pictures that illustrate the book.

III.3. Advanced Information Measurement

Data quality ultimately depends on measurement and analysis; otherwise business managers cannot know with certainty if the data they use meet their requirements for quality. Yet data quality is a challenge at Freddie Mac for many reasons: the immaturity of industry best practices, lack of enterprise data visibility, a large number of data elements, and complex data flows through the company's information systems.

To elevate the importance of measuring data quality, Freddie Mac is creating an advanced information measurement capability. Advanced information measurement applies statistical modeling, data mining and risk analysis techniques to the problem of establishing data quality metrics that inform business areas about data quality problems and their business impact. Given the size of Freddie Mac's data environment, implementation of advanced information measurement is focusing on the Single Family business line and occurring in stages. The current focus is attributes delivered by sellers and used in financial reporting.

II.3.1. Counterparty Data Delivery

Around the same time as it initiated development of its Business Data Dictionary, Freddie Mac began introducing advanced information measurement for data quality. The first generation of advanced information measurement focuses data delivered by Freddie Mac's counterparties (sellers and servicers) for single-family loans. Information measurement quantifies the completeness, validity, and accuracy of attributes delivered by counterparties. These measurements help business areas manage and reduce operational risk by establishing front-end preventive controls for receiving data from counterparties; auditing counterparties' delivery of data for loans purchased by Freddie Mac; and fixing distribution of data received from counterparties to internal systems.

Freddie Mac's measurement of seller-delivered information combines automatic queries of databases and leveraging comparison of data to loan-file documentation. Comparison of seller-delivered data to loan-file documentation is a long established quality control practice that allows accuracy to be measured for the population of loans in Freddie Mac's portfolio through statistical techniques. Having an estimate of the percent of loans whose data are comparable to loan-file documentation, the authoritative source of information about a loan, gives Freddie Mac confidence in the fidelity of its data or knowledge for undertaking improvement of data quality.

II.3.2. Internal Data Production and Management

The next generation of advanced information measurement will enumerate the quality of internal data production and consistency of data across Freddie Mac's internal information flows. Since many data consumers use derived attributes, measuring the completeness, validity and accuracy

of internal data production will quantify the quality of direct inputs to critical business processes. Measuring internal data consistency will determine if actual inputs to these processes match what is expected.

A borrower's debt-to-income (DTI) ratio illustrates measurement of internal data production and management. The DTI ratio is based on (a) the sum of a borrower's monthly debt payments, including monthly housing expenses that incorporate the mortgage payment a borrower is making at the time of the delivery of a mortgage to Freddie Mac, divided by (b) the total monthly income used to underwrite a borrower as of the date of the origination of a loan. The quality of DTI can be modeled from the completeness, validity and accuracy of the source data—a borrower's monthly income, debt obligation, and housing expense—Freddie Mac receives. The internal consistency of DTI can be measured by comparing actual DTI values that are inputs to a business process to expected DTI values for a population of loans whose data are consumed.

II.3.3. Data Volatility

Freddie Mac's advanced information measurement incorporates the concept of data volatility. Data volatility measures change patterns for attributes after important events, such as booking the purchase of a loan, and outside routine data updates and enrichment. Historically, certain reference data for loans, properties and borrowers that should be stateful tended to change because of problems with sellers' data delivery or Freddie Mac's internal data processing. Measurement of data volatility enumerates how data change over time, and if data-change patterns indicate risk to Freddie Mac's operations.

II.3.4. Impact Measurement

Measuring counterparty data delivery and internal data production provides business information about Freddie Mac's defect rates, but it does not quantify the cost of poor quality. Measuring the cost of poor quality is an exercise of treating data quality as an independent causal variable and testing its impact on key performance indicators, key risk indicators and compliance measures for a business. Freddie Mac's impact measurement tests the sensitivity of critical business process outputs to variation in the quality of input data. These tests yield a severity level for business attributes.

II.3.5. Decisioning Metrics

Measuring data quality and modeling its business impact provides information business areas need to manage operational risk. A practical issue is whether the actions and decisions taken by business areas align operational risk management with the expectations of Freddie Mac's board of directors, executives, regulators and auditors. Advanced information measurement is set up to highlight the causes of data having low quality, being volatile, and impacting the business. Decisioning metrics translate this causal analysis into information that helps business areas understand data quality problems, assess data quality risks, and make decisions to prioritize and resolve problems or accept risks.

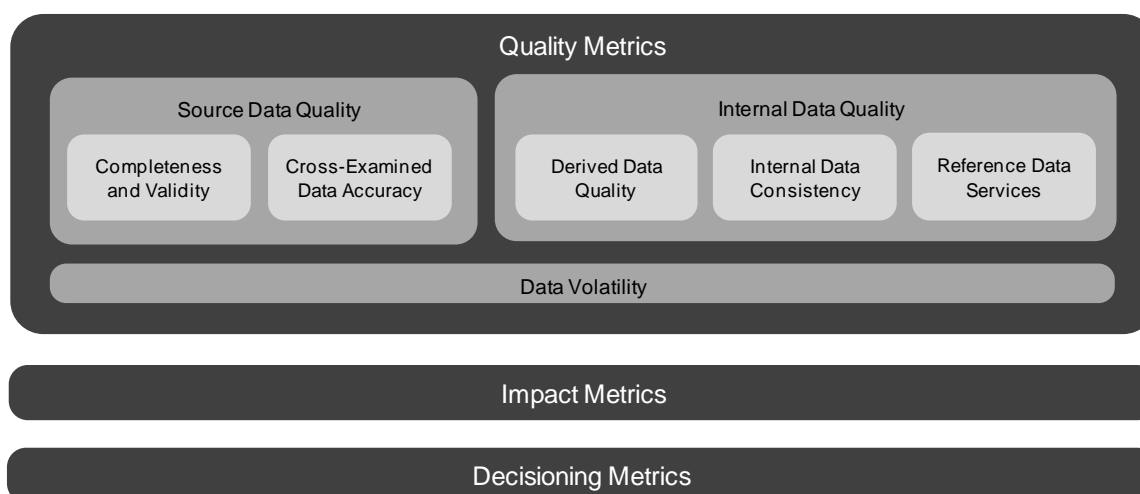


Figure 2. Advanced Information Measurement Framework. Freddie Mac employs quality metrics for data delivered by counterparties and produced by internal systems, impact metrics, and decisioning metrics to achieve a cycle of measuring data quality, determining its business implications, understanding its root causes, and equipping the business to make decisions about reducing, managing or accepting risk.

III.4. Information Governance and Compliance

Promoting business action on the knowledge delivered by Freddie Mac's Business Data Dictionary and Advanced Information Measurement is the linchpin of its information management strategy. Information governance and compliance promote integration of information management and data quality into Freddie Mac's business, operations and information technology functions.

Freddie Mac's central group in charge of information strategies and management, including the company's policy and standards for information management and capabilities to promote data quality, advises business areas on all aspects of information management, and it has an ongoing role in the planning and control of corporate initiatives that introduce new products, reengineer business processes, change information technology, and address enterprise risk management and compliance mandates. This consultative engagement model positions Freddie Mac's business areas to make appropriate decisions about their business transactions, operational support and requirements for information technology.

Information technology delivery is an important focus of information governance and compliance. Recognizing that Freddie Mac's legacy data environment and data quality concerns are an outgrowth of decisions about information technology architectures, solutions and practices, all information technology projects and important changes are subject to a review for compliance with the information management standards. This review occurs in the early part of Freddie Mac's project management lifecycle after business requirements are defined. A project is rated according to whether it will improve, maintain or degrade data quality. Freddie Mac's management committee in charge of funding projects receives the results of assessing each project for compliance with the information management standards. A project is required to address a finding that it will degrade data quality, and project funding depends on the outcome of an information management review.

Since information management reviews occur at the beginning of an information technology project, there is potential that decisions about a project's scope, solution or timing will have unanticipated consequences for data quality. Freddie Mac is establishing new compliance monitoring procedures that determine if the information technology solution that is designed and delivered is traceable to the business requirements that are reviewed for compliance with the information management standards and approved by the management committee in charge of funding projects. Adverse findings can result in a project having to address weaknesses in its solution design or gaps in its delivery.

Business decisions about introducing new products, structuring deals, and acquiring data can impact enterprise risk management, financial reporting and regulatory compliance through the quality of data. For example, Freddie Mac might structure a deal involving seasoned loans that are missing required attribute data, and decision-making about the tradeoffs between generating new business on the one hand and data quality and its business impacts on the other hand ensues. Freddie Mac's business areas are expected to make the appropriate decision in consultation with oversight groups and through escalation up the management chain. Freddie Mac's information management groups are engaged in these processes, particularly the development of new products and introduction of new terms of business that drive requirements for counterparties to deliver data in conjunction with the sale of loans.

Freddie Mac enacts oversight of business areas' activities and decisions related to data quality through its information compliance procedures. As part of the company's internal control over financial reporting, business areas provide attestations for data quality. In their attestations business areas are required to raise issues or concerns that Freddie Mac should factor into its financial reporting disclosures. Freddie Mac is introducing supplemental procedures where business areas self-assess their compliance with its information management standards, and an independent group corroborates these self-assessments.

Freddie Mac coordinates information governance and compliance through its management structure. Rather than having a standalone executive steering committee for data quality, Freddie Mac vests data quality accountabilities with its executives and embeds information governance in its appropriate management committees. For example, the management committee in charge of overseeing operational risk periodically reviews enterprise data quality reports and champions the implementation of new data quality metrics. Embedding information governance promotes business areas' accountability for data quality.

III.5. Business Integration of Information Management

The early successes of its information management strategy illustrate how data quality is central to business transformation efforts now underway. One such example is Freddie Mac's investment in reference data services. Two years ago, Freddie Mac began investing in shared services for deriving and managing reference data. The first project implemented a shared service for deriving geographic attributes of properties. Universal geocoding became business enabler when new legislation raised the conforming limit for loans Freddie Mac can purchase based on the geographic location of a mortgaged property.

The heavy lifting to integrate best practices for information management and data quality into Freddie Mac's renovation of its business and technology infrastructure. Projects are underway to improve business flexibility and customer satisfaction in the front-office and market-facing functions and achieve straight-through processing and better internal in the back-office, finance

and risk management areas. These projects involve reengineering processes, integrating new technologies, and converting to a new data environment.

The introduction of leading information management concepts, tools and technologies—including reference data services, master data management, and advanced business intelligence and data mining capabilities—is foundational to Freddie Mac’s business and technology renovation. Freddie Mac’s legacy data environment—much of it designed and built before Freddie Mac began the journey to data quality it is now on—has an onerous level of complexity (e.g., a ratio of employees to database tables in shared corporate repositories that is less than five to one). Efforts to rationalize the data architecture, master reference data, introduce operational sub-ledgers, improve accounting workflows, and achieve straight-through processing are necessary components of an operations and technology infrastructure that supports Freddie Mac’s aspirations around business flexibility, operational effectiveness, robust internal control and enterprise risk management.

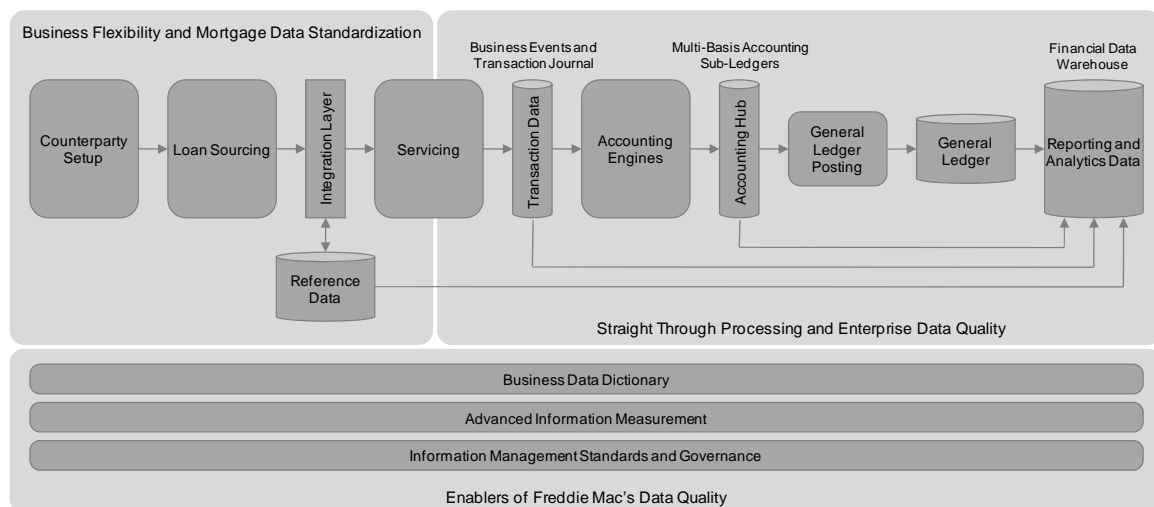


Figure 3. Business and Technology Renovation. Freddie Mac is investing in business process reengineering and information technology renovation for its single-family line of business. The initiative will transform Freddie Mac’s data environment and provide leadership to the mortgage industry’s adoption of standards for exchanging mortgage data.

IV. INDUSTRY STANDARDS AND BEST PRACTICES

Freddie Mac’s adoption of best practices in its information management is particularly evident in its leadership of the mortgage industry in adopting MISMO and alignment of data quality with widely recognized internal control frameworks.

IV.1. Mortgage Industry Data Standards

Freddie Mac’s journey to data quality will lead the mortgage industry to standardize how it exchanges mortgage data. Freddie Mac’s leadership will occur through its adoption of the Mortgage Industry Standards Maintenance Organization’s (MISMO) electronic commerce

specifications.⁴ This standardization will begin with Freddie Mac accepting data for mortgages it purchases and guarantees in a MISMO-compliant format. Widespread adoption of MISMO in the primary mortgage market should follow.

MISMO, a nonprofit subsidiary of the Mortgage Bankers Association, leads electronic commerce and technology standards development for the residential and commercial mortgage industries. More than 15 subscriber organizations—mortgage bankers, lenders, servicers, vendors and service providers—support MISMO in its standards development. MISMO's standards focus on important business segments of the mortgage industry, including underwriting, mortgage insurance application, credit reporting, flood and title insurance, property appraisal, loan delivery, products and pricing, loan servicing, and secondary mortgage market investor reporting.

Work on standardizing mortgage data goes back twenty years. The Mortgage Bankers Association formed Mortgage Technology Workgroups in 1988 and a Technology Committee in 1990. These groups and their participants defined important standards in the 1990s, including Electronic Data Interchange specifications. MISMO was formed in 1999 to support an emerging XML standard.

MISMO publishes an XML specification and a data dictionary of business terms and their corresponding data element tag names. MISMO's coverage of the entire mortgage life cycle, from origination, automated underwriting and service fulfillment through loan administration and investor reporting, make it the de facto standard for mortgage data in the United States. MISMO adoption is not yet industry-wide; instead it is prevalent in automated underwriting, commercial loan origination, and other distinct areas. Its widespread adoption depends on standardization in the secondary mortgage market.

Freddie Mac is a longtime participant in MISMO's efforts to standardize mortgage data exchange between the primary and secondary mortgage markets. However, Freddie Mac and Fannie Mae, its chief competitor, maintain their own unique data delivery requirements, published in each organization's Seller/Servicer Guide. Since Freddie Mac is a dominant institution in the secondary mortgage market, having its own data delivery places burdens on the primary market. Adopting MISMO will enable the mortgage industry to accrue benefits of using a common specification to exchange mortgage data. In addition, combining MISMO adoption with efforts to improve its business processes will allow Freddie Mac to overcome certain data quality limitations linked to its current proprietary specification for receiving data from mortgage sellers.

IV.2. Risk and Control Best Practices

An aspect of Freddie Mac's commitment to best practices that differentiates it from other companies is the use of the leading internal control framework, COSO, to design its data quality measurement capabilities. COSO establishes criteria for designing, evaluating and improving internal control in the areas of control environment, risk assessment, control activities, information and communication, and monitoring.⁵ Freddie Mac's advanced information measurement is one of the first metrics programs for data quality that applies COSO's guidance on monitoring internal control systems.

⁴ More information about the Mortgage Industry Standards Maintenance Organization is available at <http://www.mismo.org>.

⁵ More information about the COSO framework is available at <http://www.coso.org>.

COSO defines monitoring as a process that assesses the quality of the performance of internal controls over time. Monitoring is carried out in various ways, including management and supervisory activities and other actions personnel take in performing their duties, separate evaluations of internal control, or a combination of both. Monitoring enables management to determine whether internal control systems continue to be relevant and operationally effective. COSO's guidance on monitoring internal control systems is well-suited to Freddie Mac's efforts to obtain assurance about the quality of its data that is based on quantitative measurement linked to predictive and causal analytics.

V. CONCLUSIONS

Freddie Mac's journey to data quality is a long-term voyage in flight. Freddie Mac's early accomplishments provide a foundation for data quality through the development and adoption of data quality tools, including Freddie Mac's business data dictionary, advanced information measurement, and information management standards, governance and compliance. These foundational activities are part of ongoing management and governance of Freddie Mac's control environment.

The hardest challenges and most significant accomplishments in Freddie Mac's journey to data quality will occur through its renovation of its business and technology infrastructure and its adoption of MISMO. This will assist transformation of how the mortgage industry processes and exchanges mortgage data. With the adoption of MISMO, the mortgage industry will have new potential to achieve high levels of quality, transparency, and consistency in mortgage data that will benefit many stakeholders, including homeowners, businesses, and public institutions with a role in regulating the safety, soundness and affordability of the mortgage industry. In that sense, the latter stages of Freddie Mac's journey to data quality are about business and industry transformation.