MDM System Highlights:

Reduced or eliminat *impact of bad data quality on trading desks*

Gave Proactive Notifications *and warnings rather than user discovery of problems*

Provided Visibility *to both IT and the business of any data issues*

Established Checks and Controls *on data movement / ETL processes*

Improved Reliability and Trust *of IT by the business*

"We could not afford traders using wrong market data and not even be aware of it." - Nomura Securities Product Controller

Data Monitoring Case Study of an MDM System: Financial Instrument and Market Data Hub

Industry: Investment Bank

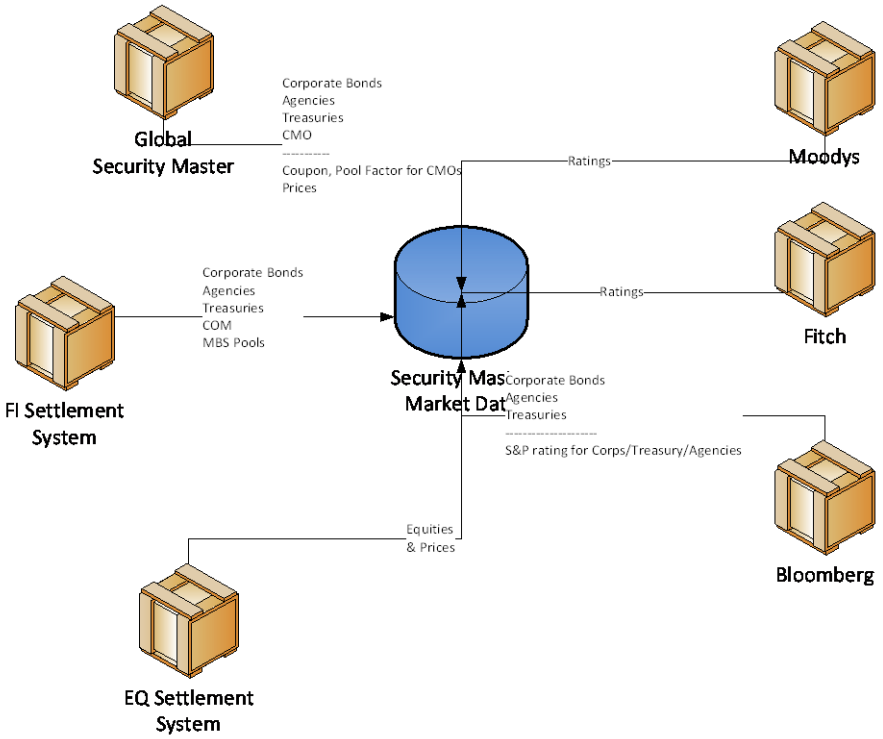
Section 1.01 Background

The Investment Banking industry is becoming very conscious of the need to reduce and if possible eliminate operational risk inherent in the data. At the same time, there are significant efforts to reduce costs on all fronts. In Nomura Securities both of these drivers were particularly relevant in when a decision was made to upgrade a major Master Data Management (MDM) system. Yet, the link between data integration and data quality presented a considerable challenge.

> ***"We do not run oil refineries without monitoring; so how are we running thousands of data movement processes without any kind of monitoring?" - S. Gawande***

At Nomura Securities, the trading desks heavily relied on the MDM solution for Financial Instrument and related market data for their trading decisions. This solution consolidated information from internal and external sources. Data such as ratings, coupon rates, pool factors, prices and securities reference data determined what positions would be kept or liquidated. Unfortunately, as with many global banks, all this data was dispersed among a variety of systems, and locations, making integration difficult.

As a result, the Bank experienced a number of issues that were ultimately found to have been caused by data quality. To reduce its vulnerability to this form of operational risk, the Bank turned to *iCEDQ Soft* for their data quality and monitoring solution.



Once a data exception has gone undetected, then challenges created by dynamic nature of data are difficult to handle. The business can incur unpredictable financial losses.

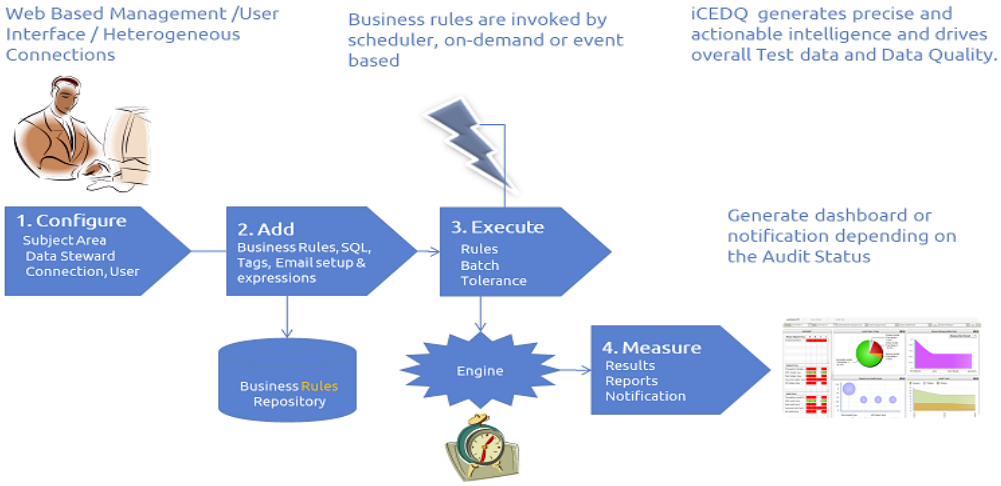
Section 1.02 Data Monitoring Challenges and Solution

To minimize the impact of bad data on trading decisions, business was keen to find the best way to get good data to the trading desks. Their focus was on **proactive monitoring, notification, and prevention of recurrence of detected data quality problems.**

(a) Data Quality Governance via Feedback

Data quality issue detection and prevention is a continuous process. That is why the IGOVERN tool, a dedicated iGOVERN Data Quality Monitoring Framework, was implemented for securities data quality monitoring.

Using the iGOVERN Data Monitoring Framework, the Bank:



"There are many people, processes and systems involved in a MDM system. For optimal results they all have to be orchestrated in a well-defined workflow."
S. Gawande

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- ✓ Categorized data into multiple Subject Areas
- ✓ Had Data Stewards assigned to each Subject Area
- ✓ Had business provide the key data points for IT to monitor
- ✓ Had SMEs provide the logical rules for configuration in iGOVERN
- ✓ Had IT create the physical rules for data quality
- ✓ Had the iGOVERN rules embedded in the data Movement process, or scheduled to run at predetermined time
- ✓ Permitted iGOVERN to stop the processes or/and notify concerned SME in case of errors, depending on issues detected.

Next, iGOVERN was configured to support a Monitoring Framework to achieve goals of communication, accountability, global collaboration and visibility to management.

"iGOVERN stopped the process or/and notified us of data exceptions before any damage was done to downstream processes or users." - Nomura ecurities Business Analyst

Key Technical Challenges in Data Monitoring without iGOVERN

- Data Process run **without Checks and controls**
- **No Automated comparisons** within production data
- **No Reconciliation** of data between databases
- **No Notification** to users about data exceptions

(b) Physical implementation of iGOVERN and its Impact

Data is consumed in vast amount and variety for different purposes. It is very difficult, if not impossible, to watch each and every data elements. The very first task was to identify the critical data elements that are required for key trading decisions. The data elements were classified as "Blocker", "Critical", and "Warning". These were defined as follows:

Business Blocker Data Elements: Business cannot continue without considerable monetary or reputational risk being put at stake. Also, these data elements if loaded incorrectly would create a situation that will be difficult to reverse.

Business Critical Data Elements: Business can continue but there will be some undesirable financial impact.

Business Warning Data Elements: These will have minor impact on business and should be fixed in the near term.

This effectively provided the high-level requirements for iCEDQ to come up with a solution to monitor or control the quality of data elements. The next step was to identify methods to monitor them. Regardless of the level of data exceptions, the way to monitor them differed depending on the characteristics of data and nature of the source.

Some data elements were compared with the source data before and after a load. Other data elements were compared with their past state to figure out if they were same with no deviation. For some elements, the reconciliation principle had to be applied - they were compared internally with other subject areas, and externally with data vendor feeds. There were some situations where data had no known values to compare with other than those based on business requirements.

Once the logic for validating data was known, the rules were coded by data quality teams into physical rules. The rules got executed either within the ETL processes, or on a predetermined schedule based on inputs of the business users and technical team.

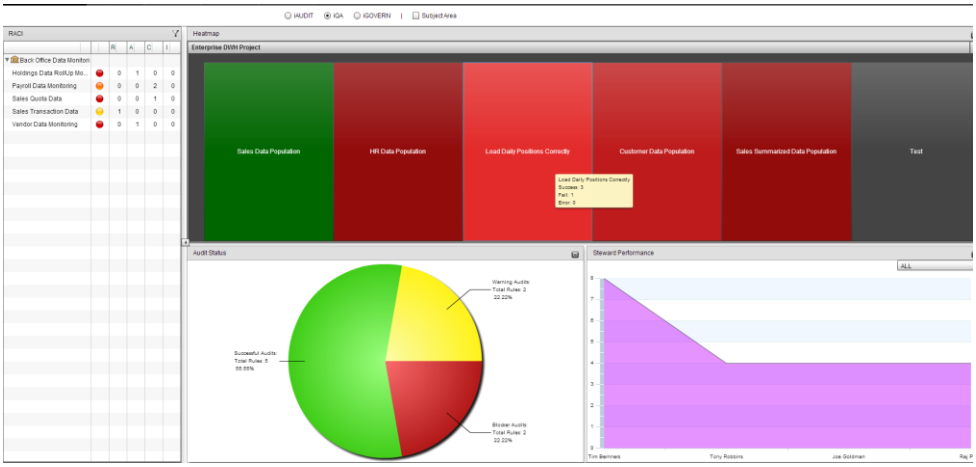
As in any MDM system, the integration of identifiers is the most critical task. In this case, the integration was based on alternate securities identifiers such as CUSIP, ISIN, SEDOL, etc, and other supporting attributes such as Maturity Date and Exchange Code. But the rules-based integration is not enough, it needs to be governed. iGOVERN successfully deployed within the securities integration framework and constantly monitored the breaks with effective distribution of reports to the concerned SMEs and technical team for action. This constant feedback found many dormant issues and kept them on a manageable scale.

iGOVERN also monitored the supporting attributes of security master such as country and currency that detected new domain values and thus preventing breaks in the reports.

For securities market data such as prices, pool factors, and ratings, iGOVERN monitored its trend and reported exceptions about the probability of data issues.

The **dashboard** provided visibility to actual status of the health of the MDM environment. Rapid feedback in the form of reports of **data with material** and drill down abilities enabled quick decisions and actions.

"Instead of reacting to the user discovered concerns, iGOVERN empowered us to proactively act or report actionable intelligence on data exception" - Nomura Securities Product Controller



"iGOVERN gave us the Data Quality Governance capabilities for data quality." - Nomura Securities

A well thought framework and agile toolset provided many tangible and intangible benefits.

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Section 1.03 How the bank benefited from iGOVERN implementation for Data Quality?

The following lessons were learned from the successful implementation of the data quality governance on the Securities MDM system

- The iGOVERN Data Quality Governance framework provided consistent, **reliable** and **automated** exception reporting for IT, business users, and management.
- iGOVERN supported **checks** and **controls** for the data process so that if severe data exceptions were detected the process could be stopped.
- 80% to 90% of the production breaks were found and fixed before they affected downstream trading desks (compared to virtually none before iGOVERN was implemented).
- The ability to get **automated** and **quick feedback** to SMEs and the capability to **drill down** on the problem dataset led to effective investigation and fixes.
- It was easy to take necessary action because of the metadata stored in iCEDQ repository (e.g. affected ETL process).
- The iGOVERN RACI matrix together with the dashboard provided clear accountabilities defining clear actions expected of all individuals.

The success of iGOVERN is its continued and consistent reporting. iGOVERN acts as an independent data auditor creating a bridge of trust between IT and business stakeholders.

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